Bureau of Invasive Plant Management

Florida Department of Environmental Protection

Preserving the Real Florida

Upland Invasive Exotic Plant Management Program

This report was prepared to provide an annual assessment of the control achieved and the funding necessary to manage non-native (exotic, alien) invasive plants on public conservation lands in Florida. The authority of the Department of Environmental Protection (department) as addressed in §369.251, Florida Statutes, extends to the management of all upland invasive exotic plants on all public conservation lands, including land owned by federal, state, and local government entities. The Upland Invasive Exotic Plant Management Program on Florida's public lands involves complex operational and financial interactions between state, federal, and local governments, as well as private sector companies. Therefore, a summary of the entire management program on public conservation lands and associated funding contracted or monitored by the department during Fiscal Year 2002-2003 is included in this report.

FLORIDA INVASIVE UPLAND PLANT SPECIES


Brazilian pepper


Melaleuca


Australian Pine

Table of Contents

Over 1 million acres of Florida's conservation lands have been invaded by alien (non-native, exotic) 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. 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.

Upland Invasive Exotic Plant Management Program

In 1997, a program was established under §369.252, Florida Statutes, within the then Bureau of Aquatic Plant Management to address the need for a statewide coordinated approach to the upland invasive exotic plant problem. The Upland Invasive Exotic Plant Management 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; thus providing *more protection*, with *less process*. The Uplands Program section of the bureau funds individual exotic plant removal projects on public conservation lands statewide. Projects are considered for funding based upon recommendations from Regional Invasive Plant Working Groups.

The mission of the Upland 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*). These and over one hundred other alien plants have invaded at least 1 million acres of Florida's 8.5 million acres of public conservation lands, affecting an ecotourism economy valued at over $7.8 billion annually. Once invasive plants become established in native habitats, eradication is difficult, if not impossible, to achieve; therefore, continuous maintenance of invasive non-native plants is needed to sustain wildlife habitat and recreational opportunities while preserving native plant communities on public conservation lands.

Upland invasive weeds infested approximately 15% of public conservation lands statewide in 2003 and are currently under maintenance control on 110,000 acres. Approximately $6.3 million were spent controlling 34,409 acres of upland weeds on 101 publicly managed areas during FY 2003. Public land managers are responsible for maintenance control of areas initially treated through bureau funding. The bureau provided herbicide to assist land managers with maintenance control at a cost of $109,885 for FY 2003.

Florida's Upland Invasive Exotic Plant Management Program

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 Hawai'i, California, and Louisiana as one of the states with the highest number of non-native species, both plants and animals. South Florida alone is home to more introduced plants than any other region of the United States. Thirty years ago, a Smithsonian publication described tropical Florida as a "biological cesspool of introduced life." 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 lack of awareness by citizens and tourists alike about the invasiveness of non-native species introduced into the Florida environment.

When our state was first named *La Florida*, its profusely blooming foliage was composed of a panoply of colorful native plants. Since that time, many visitors besides humans have come to Florida. And stayed. Today, roughly one-third of Florida's plant life are exotic species. Most of these new residents are well-behaved, and many support an economically important horticultural industry. However, just like in any barrel, there are always a few bad apples (tropical soda apple, for one). An estimated 10% of the thousands of non-native plants in Florida are "invasive," or 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 have diminished wildlife habitat, decreased recreational resources, and negatively affected the natural health and economy of the state.

Florida covers 36 million surface acres, with over 10 million acres in public ownership owned and managed for natural resource protection. Invasive exotic plants have invaded approximately 15% of these public conservation lands, affecting an ecotourism economy valued at nearly $8 billion annually.

The major direct effect of exotic plant invaders on Florida's ecosystems is the adverse alteration of native habitats. Such invaders change the composition, structure, and/or processes of native plant and animal communities, often with significant ripple effects throughout the larger system. Most easily observed are the obvious examples of displacement: 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 the natural flow or percolation of water or by increasing the chance of fires 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 of invasive exotic plants is needed to sustain wildlife habitat and recreational opportunities while preserving native plant communities on public conservation lands.

Recognizing the ecological and economic threat of invasive exotic plants, the 1993 Legislature charged the Florida Department of Environmental Protection (DEP) with establishing a plan to control invasive exotic plants on public conservation lands (§369.252, Florida Statutes). With a statewide perspective already established in its aquatic weed control program, the DEP Bureau of Invasive Plant Management (bureau) merely needed to expand its focus to terrestrial weeds to fulfill its charge. After first developing an assessment of the current problems with invasive exotic plants in Florida and identifying the highest priority invasive species for control (An Assessment of Invasive Non-Indigenous Species in Florida's Public Lands, 1994), the bureau then developed a comprehensive interagency strategy for elimination or control of the highest-priority species and management to control and minimize the spread of other pest plant species.

The 1997 Legislature charged the bureau further with the task of creating a program to bring invasive exotic upland plant species under maintenance control. A maintenance control program, as defined in §369.22, F.S., 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." Meeting this charge required a statewide cooperative program that would coordinate upland invasive exotic plant management activities. This coordinated effort would be directed toward halting the introduction and spread of invasive exotic plants, removing existing populations of pest plants, and assisting in restoring native plant communities.

The Upland Invasive Exotic Plant Management (Upland Weeds) Program was established within the bureau in 1997. To implement its statewide cooperative strategy, the Upland Weeds program formed Regional Invasive Plant Working Groups (working groups) comprised of federal, state and local government agencies, non-governmental organizations (NGOs), and other interested stakeholders, in 11 areas of the state and encompassing all of Florida's 67 counties. The working groups provide place-based management experience to identify regional priorities for invasive plant control operations. The Upland Weeds Program melds these regional priorities into an integrated process that provides the needed support infrastructure (e.g., control method development, research results, public education, technology transfer, policy, oversight, and funding) to conduct an efficient and cost-effective statewide control program.

The Upland Weeds Program funds individual invasive exotic plant control projects on public conservation lands throughout the state, based upon the recommendations from the working groups. Program funds are allocated equally across the working groups for the highest priority projects, based upon available funding. The program also established service contracts with regional invasive plant control contractors with an established fee schedule to help all Florida governmental entities streamline the process of obtaining plant removal services.

As addressed in the DEP 2000-2005 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 sets forth specific strategies to implement the program's long-term goal. These strategies include:

- Implement an integrated control program that uses chemical, mechanical, and biological control technologies. Modify implementation procedures as appropriate to specific public lands to assure the greatest protection for natural systems;
- Improve the general public's awareness, sensitivity, and responsiveness to the values of natural systems and the threat of loss of biological diversity from invasive plants, by developing and promoting a comprehensive educational program;
- Inventory and map the distribution of invasive exotic plant species through use of a Geographic Information System database by the year 2010; and,
- Research the introduction and use of appropriate biological control 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 of Florida's well known weeds, once covering more than one million acres of public conservation lands. The Florida Exotic Pest Plant Council (FLEPPC) lists 67 exotic plants found on public conservation lands as Category I pest plants and another 56 species as Category II. FLEPPC 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. Funding has historically been insufficient to address every problem weed; therefore, plants like Japanese climbing fern (*Lygodium japonicum*) and air-potato (*Dioscorea bulbifera*) have had an opportunity to expand their range over previous decades. Like melaleuca in the mid-1990s, these and other plants are on the verge of overwhelming parks and forests across the state.

Nearly $20 million (not counting the $7 million dollars directed to the Melaleuca Program) have been spent bringing 110,000 acres of upland weeds (not including total acres treated for melaleuca) under maintenance control since the inception of the Upland Weeds Program. In that time, the program has assisted public land managers on 292 federal, state, and county managed areas located in 48 different counties by funding 516 invasive plant control operations treating 94 recognized weed species. The Uplands Program cooperated on projects with 4 federal agencies, 5 state agencies, 3 regional agencies (WMD), 19 counties, and 15 cities. Another 70 initial control projects are expected to be funded during FY 2004. Public land managers are responsible for the continued maintenance control of areas originally treated with bureau funding. The bureau has further assisted land managers by providing herbicide for maintenance control, at a cost of nearly $1.8 million since beginning this service in FY 2001.

Clearly, the Upland Weeds Program has 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 for other states and countries in developing their invasive species plans, the most recent example being the National Invasive Species Strategy of The Commonwealth of The Bahamas.

Florida's Ten *"Most Unwanted"* Invasive Exotic Plants for 2003

Plant Treated	Acres Controlled to Date	% of Total Project Acres
Melaleuca	23,742	42.6
Brazilian pepper	19,563	35.1
Lygodium spp.	5,146	9.2
Chinese tallow	3,524	6.3
Australian pine	3,457	6.2
Cogon grass	1,588	2.9
Ardisia spp.	1,228	2.2
Chinaberry	1,138	2.0
Air-potato	739	1.3
Privet (*Ligustrum* spp.)	705	1.3

Table 1. Although the Upland Weeds Program has controlled nearly 100 different invasive species, these 10 are the worst, based upon cumulative acres treated between 1998-2003.

Fortunately for Brevard County, the Upland Weeds Program is already actively controlling kudzu.
Copyright Jeff Parker, 2003. Used with permission.

Invasive Exotic Plant Control Methods

Herbicides, biological controls, manual, mechanical, and physical controls are used separately or in combination to slow the spread of invasive plants. Every control method represents a certain level of disturbance, although land managers strive for the minimum amount necessary to allow recovery of a habitat from the detrimental effects of an alien invasion. Sometimes this "healing" process seems unsightly to passersby, but the end result is a return to the natural health and beauty of the native Florida landscape.

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 very 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 leaves with aerial or ground based equipment. Foliar applications can be either directed or broadcast. Broadcast applications are used where damage to non-target vegetation is minimal or where a selective herbicide is used. Some variations on foliar use include the "cut foliar" application, where the plant, typically a grass, is cut or mowed and allowed to resprout before the herbicide is applied. A newer method is "lacing," a low-volume selective foliar application in which only the leaves of the target vegetation are treated. This method was developed in Florida by the BASF Corporation. At present, it has been used to treat Brazilian pepper with an imazapyr herbicide (Arsenal®).

Basal (or "basal bark"). Herbicide is applied directly to the bark around the circumference of each stem/tree up to 15 inches above the ground. The herbicide is absorbed through the bark and translocated throughout the plant.

Frill, or girdle (or "hack-and-squirt"). Cuts are made into the cambium completely around the circumference of the tree or with no more than three-inch intervals between cut edges. Herbicide is then applied to each cut. Frill or girdle treatments are slow and labor intensive, but sometimes necessary in mixed plant communities to kill target vegetation and minimize damage to native vegetation.

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 or, when using dilute solutions, the entire stump may be coated.

Manual removal is very time consuming, but can be a major component of effective invasive plant control. Seedlings and small saplings of some tree species can sometimes be pulled by hand from the ground, but even small seedlings of some plants have tenacious roots that will prevent extraction or cause them to break at the root collar. Plants that break off at the ground will often resprout and even small root fragments left in the ground may sprout. Repeated hand pulling or follow-up with herbicide applications is often necessary. Removal of uprooted plant material is important. Stems and branches of certain species (i.e., melaleuca) left on the ground can sprout new roots, and attached seeds can germinate. If extracted plants cannot be removed from the site, they should be burned or piled in a secure area that can be monitored for new plant growth.

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 the United States, the associated pests are thoroughly screened by government regulations at the time of importation. Favorable growing conditions and the absence of these associated pest species 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. Grazing management, through the introduction of animals such as cattle, sheep, goats, or weed-eating fish, may also be used to control certain invasive exotic plants. However, environmental impacts of using such nonselective herbivores in natural areas should be carefully considered before implementation.

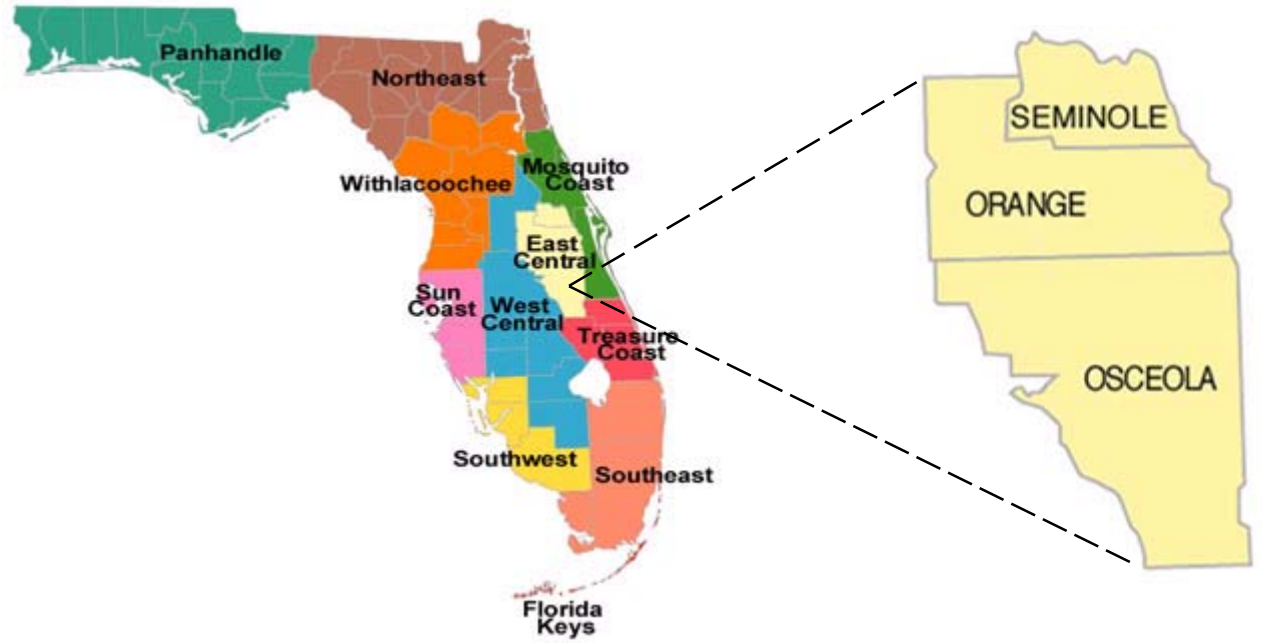
Prescribed burning and water level manipulation are cultural practices that are used in management of pastures, rangeland, and commercial forests, and, in some situations, may be appropriate for vegetation management on natural areas. Land use history is critical in understanding the effects of fire and flooding on the resulting plant species composition. Little is known about the effects of fire management on altered communities where invasive plants are already established in natural communities. Some species, such as melaleuca and cogon grass, respond positively to fire, so prescribed burning, if used, must be coupled with another control method.

Funding for the Upland Invasive Exotic Plant Management Program is provided through the Invasive Plant Management Trust Fund as set forth in Section 369.252(4), Florida Statutes, 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 §201.15(6) shall be used for the purpose of controlling nonnative, upland, invasive plant species on public lands." The trust fund provided $6 million to fund upland weed control projects for Fiscal Year 2003.

The Regional Invasive Plant Working Group (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 expertise within each working group to set regional control priorities based upon severity and potential threat to existing public conservation lands. This is accomplished by the working group reviewing and ranking control project proposals. 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.

Descriptive information presented for each of the following projects was current as of the date of submission to a working group. Control data is derived from daily progress reports submitted by the contractor performing the work. Each project description contains a table indicating the plants treated, control method(s), and herbicide(s) used. In this table, "herbicide" indicates the brand name of the chemical used. No indication is given of the percent mix or the other constituents used such as basal oil, surfactant, etc. Contractors use various preferred mixes for treating invasive exotic plants, depending upon factors such as site/soil conditions, plant densities, proximity to water bodies, or personal experience. In the table, where two herbicides are used in a mix, this is indicated with a "+" sign; e.g., "Rodeo+Escort." Where two different mixes are used to control the same plant on a project, for example Garlon 4 is used in one area and Roundup is used in another, this is indicated with a "/" sign; e.g., "Roundup/Garlon 4." There is no one "right" mix for any plant under all conditions. The control method is typically agreed upon by the site manager, contractor, and program staff before work begins.

East Central Regional Working Group



The East Central Regional Working Group liaison is Ms. Brandy Hancock, DEP Bureau of Invasive Plant Management, 8302 Laurel Fair Cr., Suite 140, Tampa, Florida 33610, phone: 813-744-6163, fax: 813-744-6165, e-mail: brandy.hancock@dep.state.fl.us. Three of the eight projects completed in this working group benefited the City of Orlando. The project manager for all three projects was:

Nancy Caskey, Landscape Project Coordinator
City of Orlando Public Works
400 S. Orange Avenue, Orlando, Florida 32801
Phone: 407-246-3645, Fax: 407-246-2892
E-mail: nancy.caskey@ci.orlando.fl.us

This first project was a follow up to complete work begun in the previous fiscal year.

Langford and Dickson Parks Invasive Exotic Plant Control	County: Orange
PCL: Langford Park PCL: Dickson Azalea Park	PCL Size: 21.95 acres PCL Size: 3.40 acres
Project ID: EC-021	Project Size: 25.35 acres
Fiscal Year: 02/03	Project Cost: $12,271.84

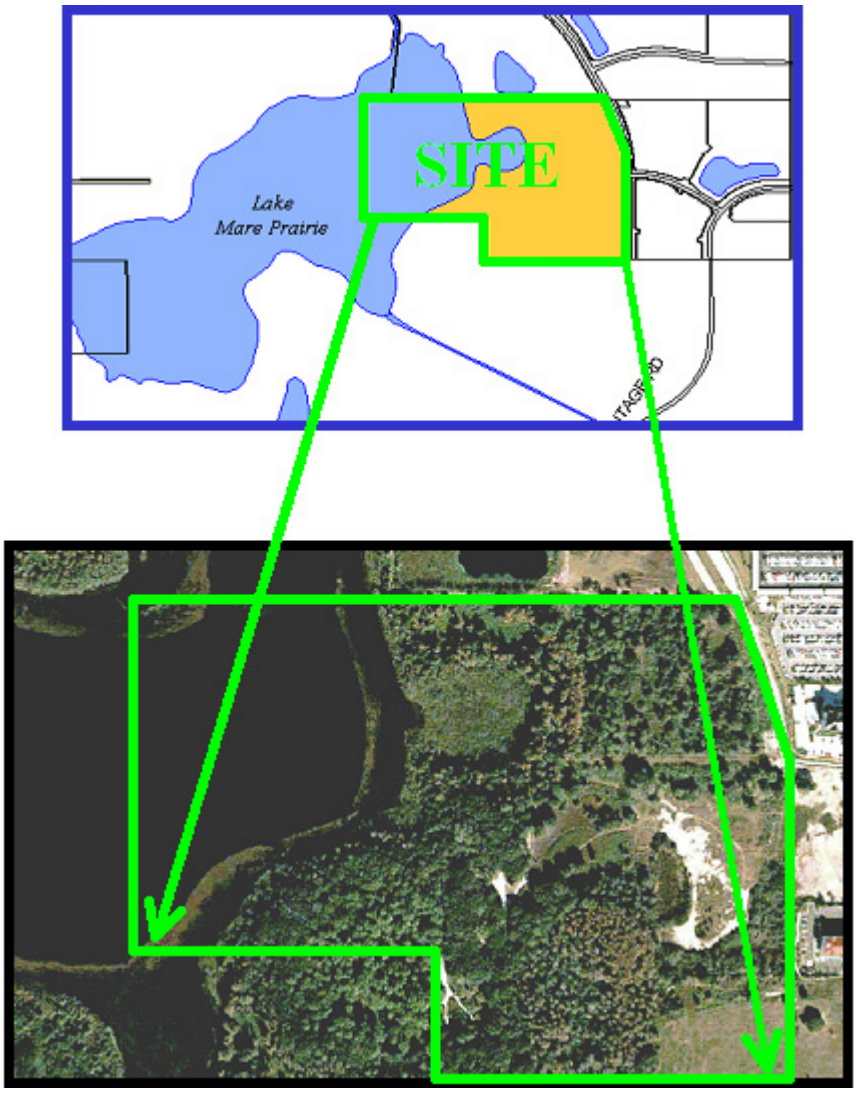
Langford and Dickson Azalea Parks were originally areas of Hydric Hammock. The primary purposes of these parks are to provide environmental and historical education and to support passive recreation. The wetland areas were in need of renovation because of encroachment by invasive plants.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Cinnamomum camphora	camphor tree	Category I	hand pull	n/a
Sapium sebiferum	Chinese tallow	Category I	basal	Garlon 4
Melia azedarach	Chinaberry	Category I	basal	Garlon 4
Dioscorea bulbifera	air potato	Category I	foliar	Rodeo
Colocasia esculenta	wild taro	Category I	foliar	Rodeo
Urena lobata	Caesar's weed	Category II	foliar	Rodeo

Airport Lakes Park Invasive Exotic Plant Control	County: Orange
PCL: Airport Lakes Park	PCL Size: 56 acres
Project ID: EC-012	Project Size: 56 acres
Fiscal Year: 02/03	Project Cost: $8,423.32

Airport Lakes Park was purchased for the preservation and enhancement of valuable upland and wetland communities within the highly urbanized Orlando area. The Park contains a variety of upland and wetland vegetative communities that have been disturbed or altered to varying degrees over time including land clearing, hydrologic alteration, and fire suppression. The most intact communities on the site include Lake Mare Prairie and its associated wetland systems, longleaf pine-mixed hardwoods, and a live oak hammock located in the southwestern portion of the site. The wetland systems exhibited evidence of drainage and invasion by exotic and nuisance vegetative species. Off-road vehicles had extensively disturbed the ground cover of the oak hammock. Hardwoods (including laurel oaks and exotic species) had invaded the pine community as a result of past clearing activities and fire suppression.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Cinnamomum camphora	camphor tree	Category I	basal	Garlon 4
Sapium sebiferum	Chinese tallow	Category I	basal	Garlon 4
Melia azedarach	Chinaberry	Category I	basal	Garlon 4
Psidium guajava	guava	Category I	basal	Garlon 4
Imperata cylindrica	cogon grass	Category I	foliar	Rodeo
Urena lobata	Caesar's weed	Category II	foliar	Rodeo



Turkey Lake Park Invasive Exotic Plant Control	County: Orange
PCL: Turkey Lake Park	PCL Size: 300 acres
Project ID: EC-022	Project Size: 100 acres
Fiscal Year: 02/03	Project Cost: $64,286.13

Turkey Lake Park is classified as resource-based park. The park contains environmentally sensitive land (a relatively unaltered sandhill community) that skirts a park developed on previous citrus groves. This park is inventoried as a "municipal and special facilities" park; meaning that it is primarily a 'drive-to' facility and serves citizens from several communities. The park has approximately 10 acres used for active recreation, the rest being limited to passive recreation such as use of the nature trails, ecology center, boardwalks, and limited camping area. Overall coverage of exotics in the project area was approximately 5%.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Cinnamomum camphora	camphor tree	Category I	cut stump	Garlon 4
Sapium sebiferum	Chinese tallow	Category I	basal/cut stump	Garlon 4
Melia azedarach	Chinaberry	Category I	basal/cut stump	Garlon 4
Schinus terebinthifolius	Brazilian pepper	Category I	basal/cut stump	Garlon 4
Psidium guajava	guava	Category I	basal	Garlon 4
Dioscorea bulbifera	air-potato	Category I	foliar	Rodeo
Imperata cylindrica	cogon grass	Category I	foliar	Rodeo
Urena lobata	Caesar's weed	Category II	foliar	Rodeo
Enterolobium contortisiliquum	earpod tree	n/a	cut stump	Garlon 4

Wekiva Basin Invasive Exotic Plant Control — County: Orange, Lake

PCL: Wekiva Basin GEOpark — PCL Size: 43,000 acres

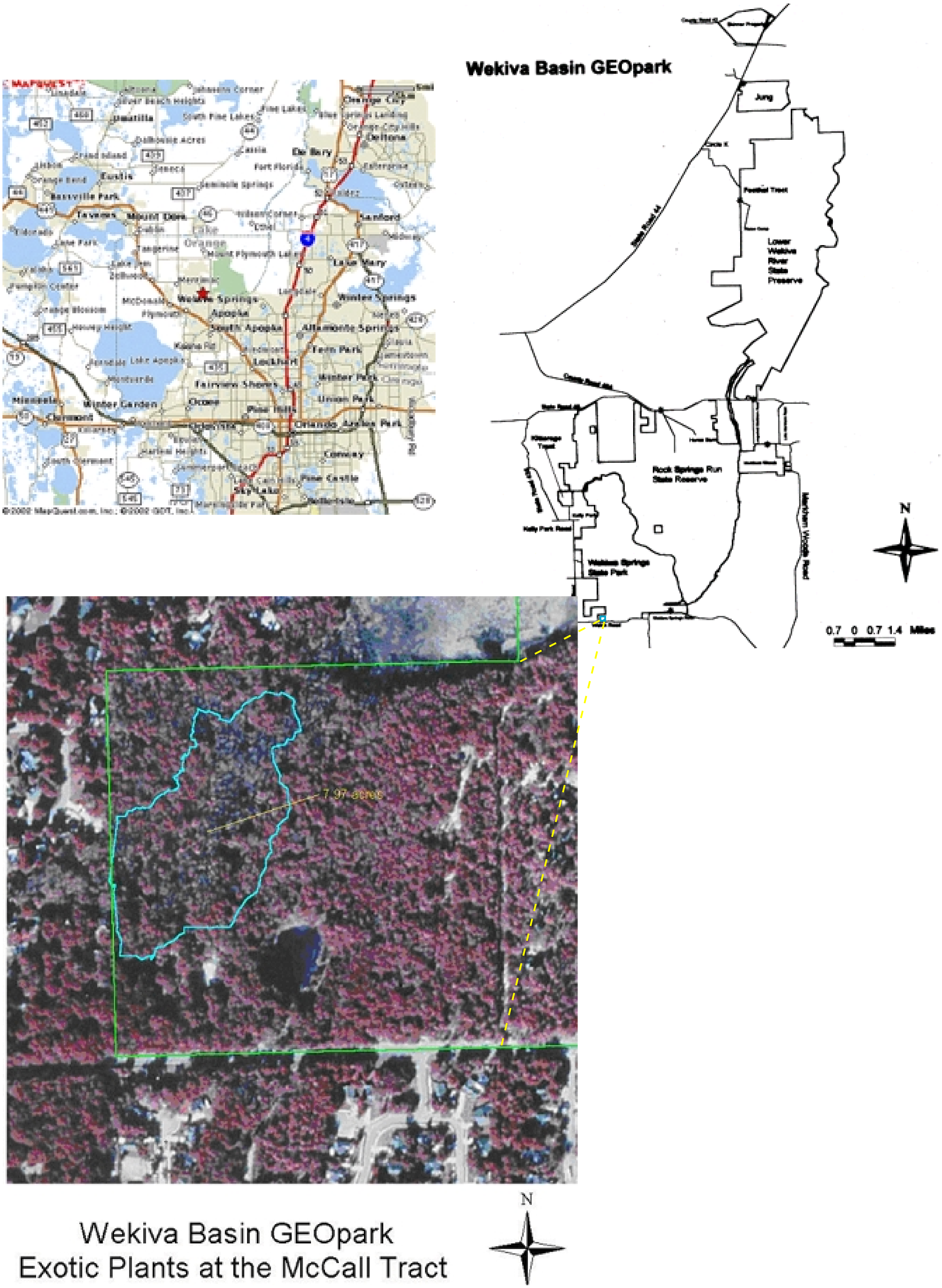
Project Manager: Florida Park Service (DEP)
Gregg Walker, Park Biologist
1800 Wekiwa Circle, Apopka, Florida 32712
Phone: 407-884-2006, Fax: 407-884-2039
E-mail: gregg.walker@dep.state.fl.us

Project ID: EC-019, -020 — Project Size: 25 acres

Fiscal Year 02/03 — Project Cost: $40,381

The Wekiva Basin GEOpark lies along the Wekiva River and harbors Florida black bear, Florida sandhill crane, wood storks, and other rare species. The property is divided into three units: Wekiwa Springs State Park, Rock Springs Run State Reserve, and Lower Wekiva River State Preserve. This project targeted the McCall and STS parcels, recently acquired parcels within the GEOpark. The bureau also funded a roving weed technician team to work on the park, and provided additional herbicides through its Herbicide Bank. This was a cost-share project with the Florida Park Service contributing $23,880 of the total project cost.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Albizia julibrissin	mimosa	Category I	cut stump	Garlon 4
Ardisia crenata	coral ardisia	Category I	basal	Garlon 4
			hand pull	n/a
Cinnamomum camphora	camphor tree	Category I	girdle	Garlon 4
			hand pull	n/a
Dioscorea bulbifera	air-potato	Category I	foliar	Roundup
Imperata cylindrica	cogon grass	Category I	foliar	Roundup
Lantana camara	lantana	Category I	foliar	Roundup
			hand pull	n/a
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Roundup+G3A
Melia azedarach	Chinaberry	Category I	girdle	Garlon 4
			hand pull	n/a
Mimosa pigra	catclaw mimosa	Category I	foliar	2,4-D
Nephrolepis cordifolia	sword fern	Category I	foliar	Roundup
Panicum repens	torpedo grass	Category I	foliar	Roundup
Paederia foetida	skunk vine	Category I	foliar	Roundup
Sapium sebiferum	Chinese tallow	Category I	girdle	Garlon 4
			hand pull	n/a
Solanum viarum	tropical soda apple	Category I	foliar	Roundup
			hand pull	n/a
Broussonetia papyrifera	paper mulberry	Category II	girdle	Garlon 4
Hemarthria altissima	limpograss	Category II	foliar	Roundup
Rhynchelytrum repens	Natal grass	Category II	foliar	Roundup
Sesbania punicea	purple sesban	Category II	foliar	Roundup
Urena lobata	Caesar's weed	Category II	foliar	Roundup
Wisteria sinensis	Chinese wisteria	Category II	foliar	Roundup
Bambusa spp.	bamboo	n/a	cut stump	Glypro
Citrus spp.	citrus	n/a	hand pull	n/a
Desmodium tortuosum	Florida beggarweed	n/a	foliar	Roundup
Ludwigia peruviana	primrose willow	n/a	foliar	Roundup
Musa spp.	banana tree	n/a	cut stump	Glypro
Paspalum urvillei	vasey grass	n/a	foliar	Roundup
Podocarpus macrophyllus	yew podocarpus	n/a	hand pull	n/a
Sorghum halepense	Johnson grass	n/a	foliar	Roundup
Typha latifolia	cattail	n/a	foliar	Roundup



Wekiva Basin GEOpark
Exotic Plants at the McCall Tract

Before (left) and after (right) treatment pictures from the McCall property (pictures do not directly correspond to each other).

Shingle Creek Invasive Exotic Plant Control | County: Osceola

PCL: Shingle Creek Recreational Preserve | PCL Size: 122 acres

Project Manager: Osceola County
Rod Schultz, Project Coordinator
1 Courthouse Square, Kissimmee, Florida 34741
Phone: 407-343-3409, Fax: 407-343-3415
E-mail: rsch@osceola.org

Project ID: EC-010 | Project Size: 122 acres

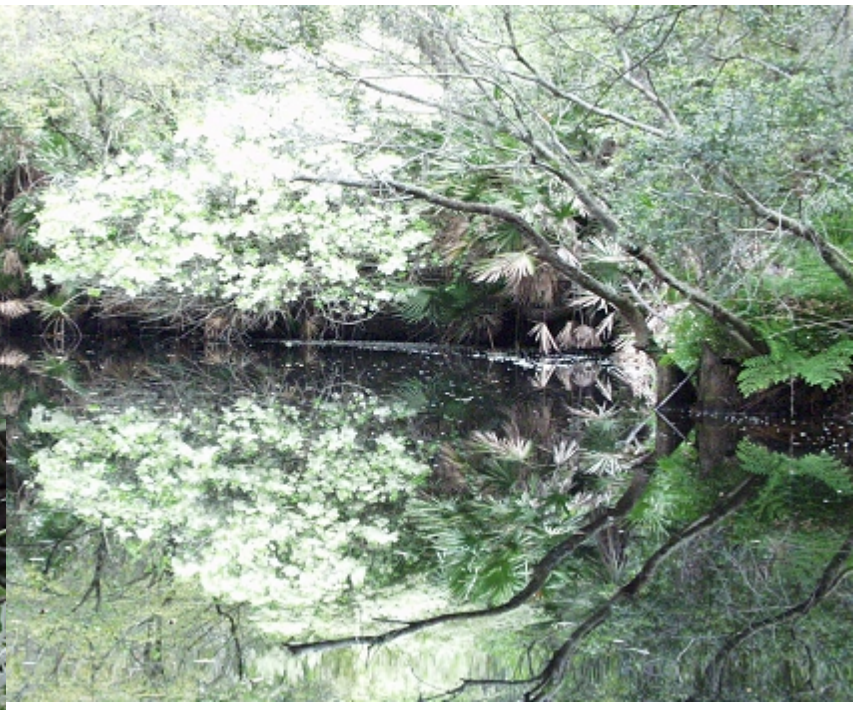
Fiscal Year: 02/03 | Project Cost: $108,627.28

Osceola County and the City of Kissimmee purchased a portion of the Shingle Creek Recreational Preserve (Preserve) with a Florida Communities Trust (P2000) grant in April 2000. The Preserve, when fully purchased will be approximately 182 acres. The project area comprised approximately 88 acres of County/City land and approximately 34 acres of City land. The project area consisted of approximately 29 acres of upland pasture natural restoration and 93 acres of wetlands.

The wetlands are riverine bottomland swamp primarily dominated with bald cypress trees. Shingle Creek's shoreline banks and associated project area within the wetlands contained significant numbers of mature guava trees, Chinese tallow, Brazilian pepper, Caesar's weed, rattlebox, primrose willow, and scattered camphor tree. The coverage was nearly 65-75% throughout the wetlands of the project area. The uplands are best characterized as abandoned pasture turned fallow. Dominant plant species included bahiagrass, Chinese tallow, bladderpod, soda apple, Brazilian pepper, and dog fennel. The coverage was nearly 85-90% throughout the uplands of the project area.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Psidium guajava	guava	Category I	basal/cut stump	Garlon 4
Sapium sebiferum	Chinese tallow	Category I	basal/cut stump	Garlon 4
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 4
Solanum viarum	tropical soda apple	Category I	foliar	Rodeo
Colocasia esculenta	wild taro	Category I	foliar	Rodeo
Urena lobata	Caesar's weed	Category II	foliar	Rodeo
Ludwigia peruviana	primrose willow	n/a	foliar	Rodeo

Protecting natives like this fringe tree is an important goal of invasive plant control.



Wild Taro

Chinese Tallow

Guava

Air Potato

Bladderpod

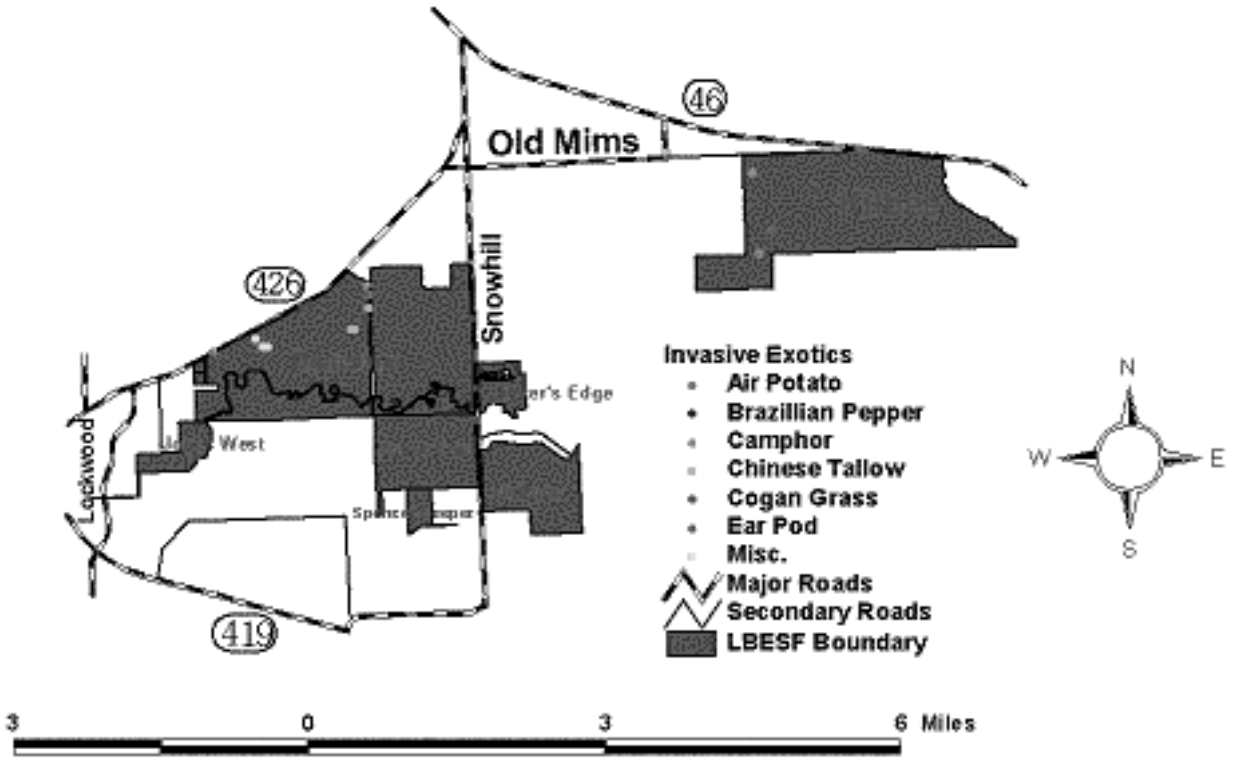
Public education efforts, like this poster produced by Osceola County, are especially important for smaller protected sites that are surrounded by development. Adjacent lands can be a seed source for re-infestation of treated areas.

Little Big Econ Exotic Plant Control	County: Seminole
PCL: Little Big Econ State Forest	PCL Size: 5,049 acres
Project Manager: Florida Division of Forestry (DACS) Wil Kitchings, Senior Forester 1350 Snowhill Road, Geneva, Florida 32732 Phone: 407-971-3503, Fax: 407-971-3504 E-mail: kitchiw@doacs.state.fl.us	
Project ID: EC-023	Project Size: 12 acres
Fiscal Year 02/03	Project Cost: $903.06

The Little Big Econ State Forest (LBESF) is located in Geneva, Florida, approximately fifteen miles east of Sanford, Florida. The lead agency managing the forest is the Florida Division of Forestry in cooperation with Seminole County Natural Lands, FWCC, and the St. John's Water Management District. Brazilian pepper is primarily found scattered throughout several cabbage palm hammocks and along the banks of the ditch that forms the northern boundary of the Kilbee Unit of LBESF. Cogon grass was found on eight sites scattered throughout the LBESF. BIPM provided herbicide for this project through its Herbicide Bank.

The predominant community on the Kilbee Unit is river flood plain marsh associated with the St. Johns River. 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. Also, in the southeast corner of the Kilbee Unit is where the Econlockhatchee River (Econ) empties into the St. Johns River. The Econ River is listed as an Outstanding Florida Waterway.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Imperata cylindrica	cogon grass	Category I	foliar	Roundup



St. Johns River at Tosohatchee Invasive Exotic Plant Control — County: Brevard, Orange

PCL: William Beardall Tosohatchee State Reserve — PCL Size: 34,345 acres

Project Manager: Florida Park Service (DEP)
Charlie Matthews, Reserve Manager
3365 Taylor Creek Road, Christmas, Florida 32709
Phone: 407-568-5893, Fax: 407-568-1704
E-mail: charles.matthews@dep.state.fl.us

Project ID: EC-018 — Project Size: 23 acres

Fiscal Year 02/03 — Project Cost: $47,274.38

The Tosohatchee Reserve contains a mosaic of freshwater marshes, swamps, wet and mesic flatwoods, wet prairie, and hardwood hammocks. It borders 19 miles of the St. Johns River. Brazilian pepper infested the habitat required by several of the designated species for the Reserve, including giant leather fern (*Acrostichum danaeifolium*), Florida jointtail (*Coelorachis tuberculosa*), wild coco (*Eullphia ecristata*), cinnamon fern (*Osmunda* spp.), royal fern (*Osmunda regalis*), and spoonflower (*Peltandra sagittifolia*).

Brazilian pepper was well established along the southern and northern side of SR 520, west of the St Johns River. The plants were in excess of 25 feet tall and formed a continuous, nearly impenetrable hedge for approximately six tenths of a mile. Brazilian pepper coverage was 85-90% in the southeastern corner of the property. Cogon grass occurred along Fish Hole and Beehead Roads, which are the main roads through the Reserve, and along the west side of St. Nicolas Road. The 3-acre cogon grass infestation was treated by Reserve personnel as an in-kind match equaling $5,206 of the total project cost.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 4
Imperata cylindrica	cogon grass	Category I	foliar	Roundup

Lake Lotus Invasive Exotic Plant Control — County: Seminole

PCL: Lake Lotus Park — PCL Size: 125 acres

Project Manager: City of Altamonte Springs
Robin Burgos, Park Ranger
1151 Lake Lotus Park Road, Altamonte Springs, Florida 32714
Phone: 407-293-8885, Fax: 407-293-8885

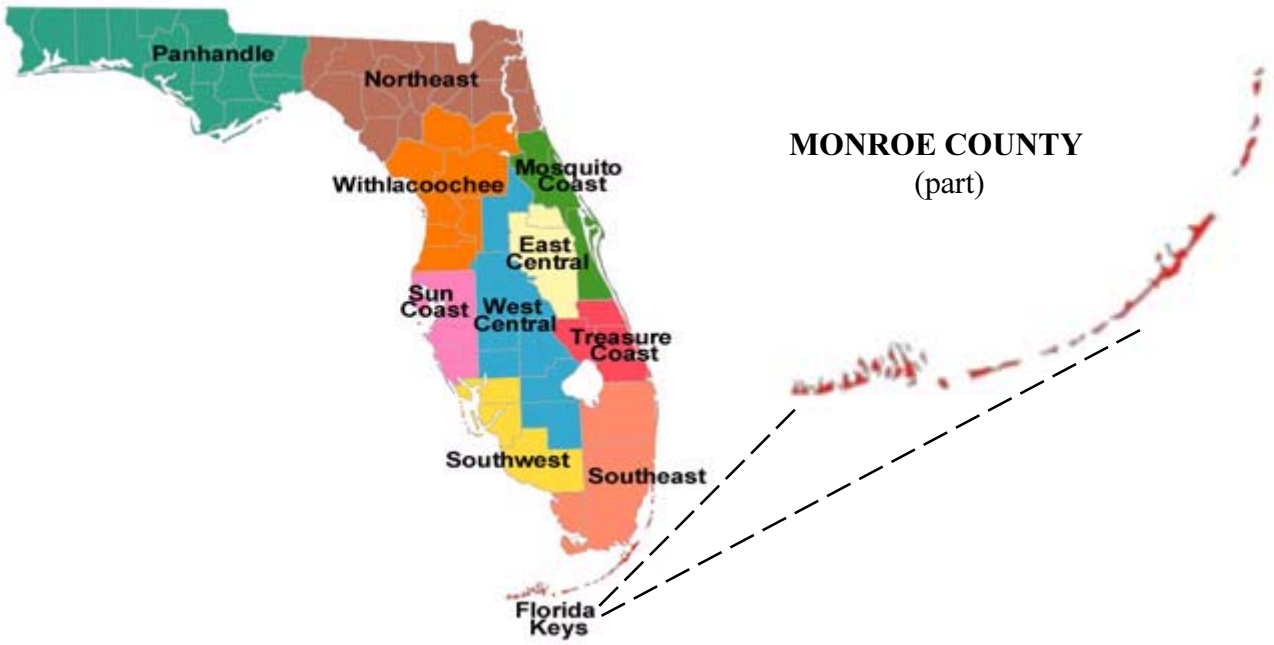
Project ID: EC-017 — Project Size: 1.25 acre

Fiscal Year 02/03 — Project Cost: $7,891.75

Lake Lotus Park is located on the banks of the Little Wekiva River and the southern shore of Lake Lotus. The Park is managed as a nature park, with 89.35 acres being a conservation easement. Natural habitat ranges from pine scrub to floodplain wetlands. There are two treatment areas: in the northern section just off the main boardwalk is an approximately ¼-acre infestation with an estimated coverage of 25%; in the northwestern section just off the new boardwalk construction is an approximately ¾-acre infestation with an estimated coverage of 75%. Both treatment sites are located in seasonally wet areas surrounded by bald cypress, dahoon holly, black gum, and various ferns and arums.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Paederia foetida	skunk vine	Category I	cut stump	Garlon 4

Florida Keys Regional Working Group



The Florida Keys Regional Working Group liaison is Mr. Chris Bergh, The Nature Conservancy, P.O. Box 420237, Summerland Key, Florida, 33042, phone: 305-745-8402, fax: 305-745-8399, e-mail: cbergh@tnc.org. Eleven projects were completed in the Keys, involving partnerships with local, state, and federal conservation agencies, as well as the U.S. Navy, and non-profit conservation groups.

The National Key Deer Refuge has participated since the beginning of the Uplands Program. The Refuge protects habitat critical to survival of the endangered key deer, and other species of rare animals and plants. Two projects were completed on the Refuge this year. The project manager for both projects was:

Phil Frank, Refuge Manager
U.S. Fish and Wildlife Service
28950 Watson Boulevard, Big Pine Key, Florida 33043
Phone: 305-872-2239, Fax: 305-872-3675
E-mail: phil_frank@fws.gov

Big Pine Key Invasive Exotic Plant Control	County: Monroe
PCL: National Key Deer Refuge	PCL Size: 8,650
Project ID: FK-016	Project Size: 137 acres
Fiscal Year 02/03	Project Cost: $60,583.20

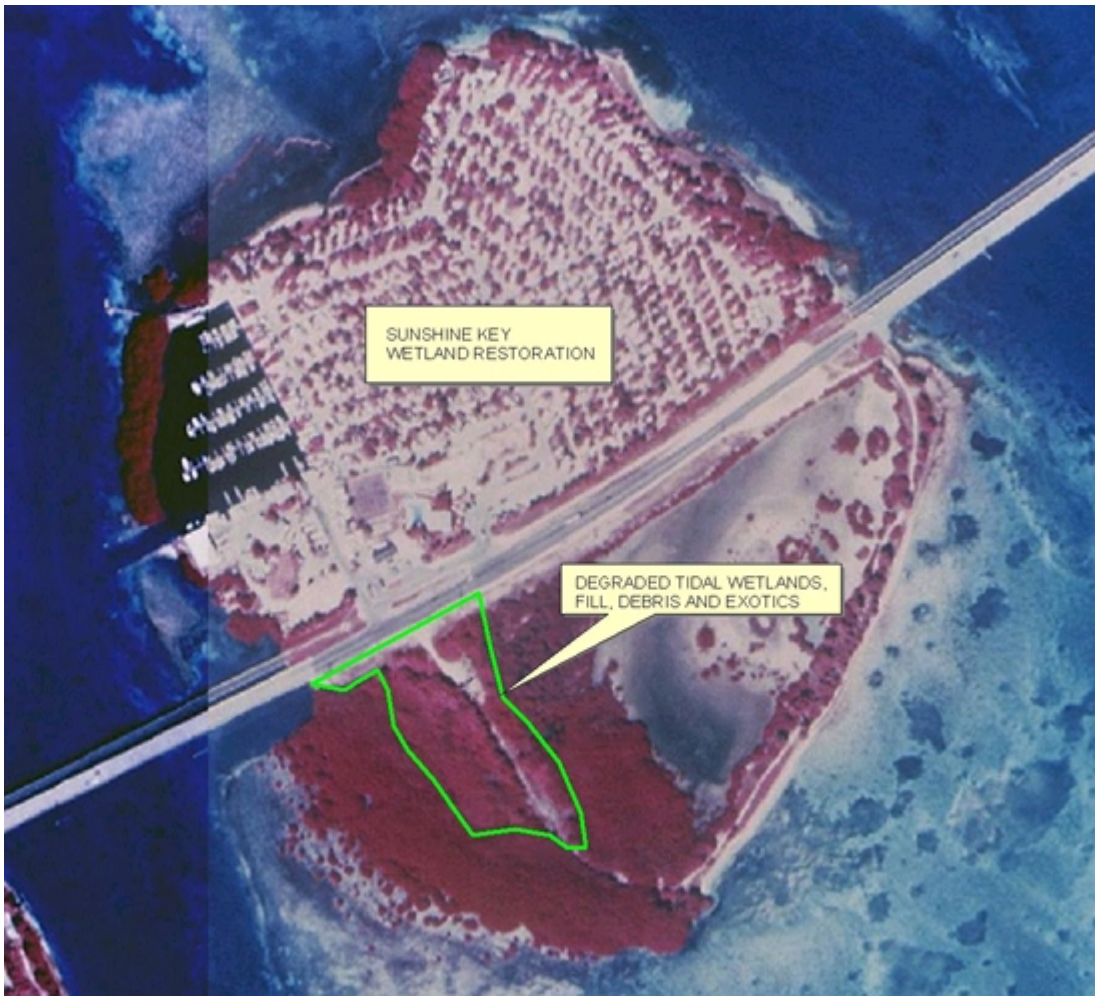
The site consisted of 834 parcels located on Big Pine and No Name Keys. These properties were purchased by the U.S. Fish and Wildlife Service, the CARL program, and the Monroe Land Authority, to provide essential habitat for the endangered Key deer. All lots targeted for this project are under public ownership by either the State of Florida, the U.S. Fish and Wildlife Service, or Monroe County. The lands are all managed by the U.S. Fish and Wildlife Service as part of the National Key Deer Refuge headquartered on Big Pine Key. These sites were infested by rapidly expanding populations of invasive exotic plant species, primarily Brazilian pepper and Australian pine.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Casuarina equisetifolia	Australian pine	Category I	cut stump	Garlon 4
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 4

Big Pine/Ohio Keys Invasive Exotic Plant Control	County: Monroe
PCL: National Key Deer Refuge	PCL Size: 8,649 acres
Project ID: FK-025	Project Size: 10 acres
Fiscal Year 02/03	Project Cost: $81,000

Natural communities on the Refuge include tropical hardwood hammock, pine rocklands, freshwater wetlands, and mangrove swamp. The refuge is home to a number of rare plants and animals, five of which are found nowhere else in the world. Ohio Key and Kinercha Subdivision on Big Pine Key were infested by rapidly expanding populations of invasive exotic plant species, primarily Brazilian pepper, Australian pine, seaside mahoe, and lather leaf. These properties were purchased by the U.S. Fish and Wildlife Service, the CARL program, and the Monroe Land Authority, to provide essential habitat for the endangered Key deer. All lots targeted for this project are under public ownership and are all managed by the U.S. Fish and Wildlife Service as part of the National Key Deer Refuge headquartered on Big Pine Key.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	mechanical	n/a
			cut stump	Garlon 3A
Casuarina equisetifolia	Australian pine	Category I	mechanical	n/a
			cut stump	Garlon 3A



Boca Chica Beach Invasive Exotic Plant Control County: Monroe

PCL: Key West Naval Air Station PCL Size: 6,323

Project Manager: Florida Keys Environmental Restoration Trust Fund
Jeanette Hobbs, Manager
11400 Overseas Highway, Suite 204, Marathon, FL 33050
Phone: 305-289-9988; Fax: 305-289-0073
E-mail: jhobbs@audubon.org

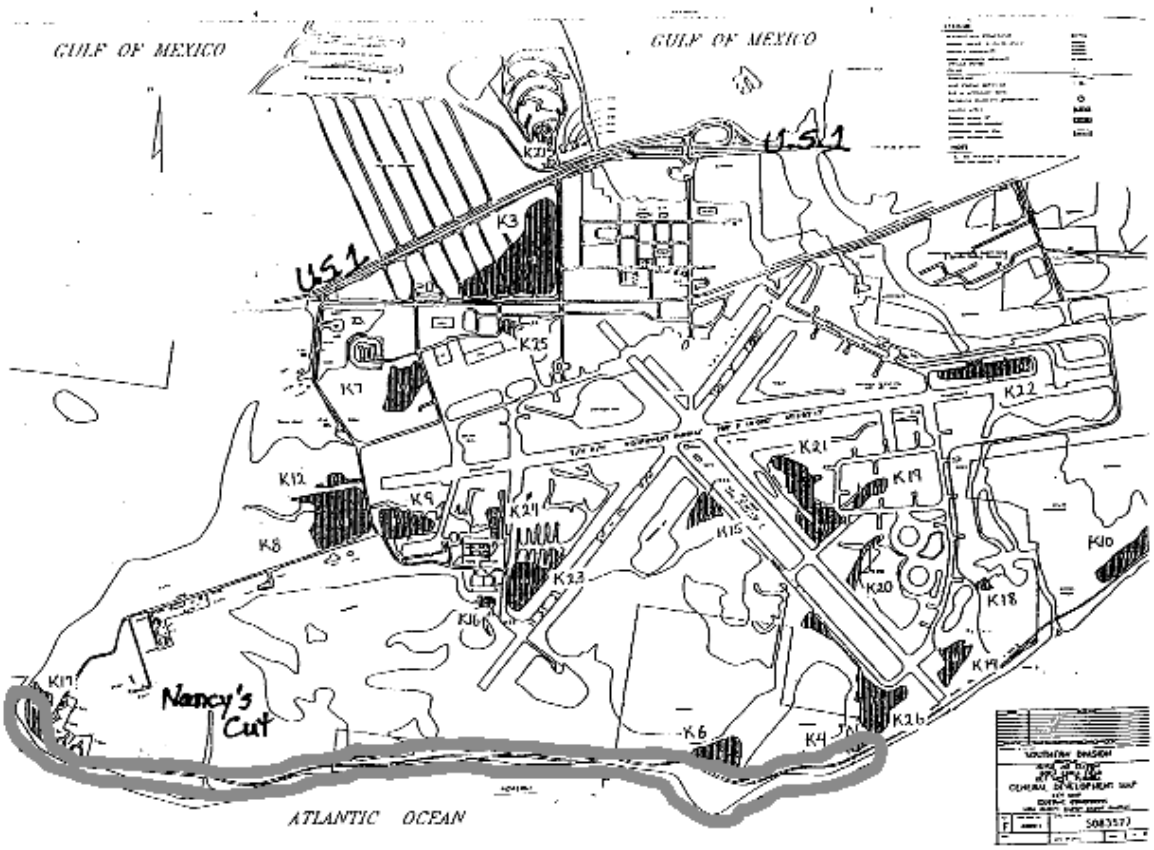
Project ID: FK-018 Project Size: 45 acres

Fiscal Year 02/03 Project Cost: $34,387

The site consists of a natural dune feature that runs along the southern perimeter of Boca Chica Key. This natural beach berm was infested by rapidly expanding populations of invasive exotic plant species. The two primary invaders were latherleaf and Brazilian pepper. Also present, to a much lesser extent, were Australian pine and seaside mahoe. The area treated is owned by the U.S. Navy as part of Key West Naval Air Station and is managed as open space and natural habitat. About 12.4 acres of the project area was west of an old tidal creek called Nancy's Cut, with the remaining 32.6 acres east of the cut. The exotics were largely concentrated along the berm top and road edges.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Colubrina asiatica	latherleaf	Category I	cut stump	Garlon 4+Stalker
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 4+Stalker
Casuarina equisetifolia	Australian pine	Category I	cut stump	Garlon 4+Stalker
Thespesia populnea	seaside mahoe	Category I	cut stump	Garlon 4+Stalker
Sansevieria hyacinthoides	bowstring hemp	Category II	cut stump	Garlon 4+Stalker

Boca Chica Beach Exotics
Project Map



Latherleaf (the leaves create a thin lather when crushed and rubbed in water) carpeted the old dune ridge with an impenetrable thicket.

Boca Chica Key

Treated latherleaf along the beach.

An Australian pine dying on the berm.

Treated latherleaf and Brazilian pepper on the berm.

Dove Creek Hammock Invasive Exotic Plant Control | County: Monroe

PCL: Florida Keys Wildlife and Environmental Area | PCL Size: 1,809 acres

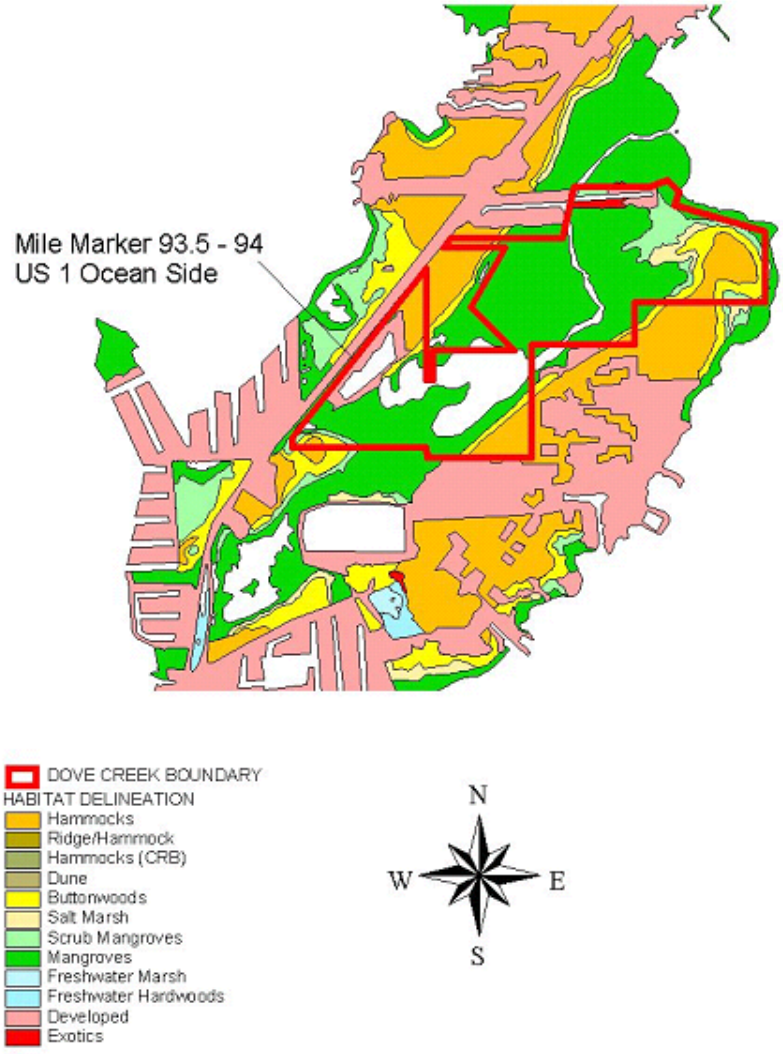
Site Manager: Florida Fish and Wildlife Conservation Commission
Randy Grau
P.O. Box 430541, Big Pine Key, Florida 33043
Phone: 305-872-0022
E-mail: graur@fwc.state.fl.us

Project ID: FK-022, -030 | Project Size: 51.82 acres

Fiscal Year 02/03 | Project Cost: $20,190.58

Dove Creek Hammock is a site on Key Largo and is part of the Florida Keys Wildlife and Environmental Area. The hammock harbors rare and endemic species of plants and animals. The project area lay along US-1 and included 29.51 acres of tropical hardwood hammock, 12.31 acres of scrub mangrove, and 10 acres of disturbed area. The exotics were randomly scattered throughout the tropical hardwood hammock and in the scrub mangrove habitat. A 2-acre infestation of lead tree was mechanically controlled with a Hydro-ax type brush mower, with a foliar spot application of all lead tree re-sprouts using Escort herbicide.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 3A
Casuarina equisetifolia	Australian pine	Category I	cut stump	Garlon 3A
Manilkara zapota	sapodilla	Category I	cut stump	Garlon 3A
Leucaena leucocephala	lead tree	Category II	mechanical	n/a



Dove Creek Hammock

A well-girdled tree.

Mechanical control is expensive, typically costing thousands of dollars per acre, but in a small area of dense infestation can be the most effecient means of control.

Plantation Key Conservation Lands Invasive Exotic Plant Control	County: Monroe
PCL: Roth Tract, Keoskie Key	PCL Size: 3.68, 15.1 acres
Project Manager: Islamorada, Village of Islands Zully Williams P.O. Box 568, Islamorada, Florida 33036 Phone: 305-664-2345, Fax: 305-853-5357 E-mail: zully.williams@islamorada.fl.us	
Project ID: FK-026, 031	Project Size: 18.32 acres
Fiscal Year 02/03	Project Cost: $29,629.73

The Roth tract and Keoskie property are state-owned lands managed by Islamorada as conservation areas on Plantation Key. The Keoskie property is predominantly Rockland Hammock, with approximately 10% of the site containing lead tree and Brazilian pepper. The Roth tract is a parcel of partially cleared land approximately 15% of which is Rockland Hammock, with the remainder in degraded condition. This portion of the site contained invasive exotic plant species, primarily Brazilian pepper, Australian pine, and lead tree. The southwestern portion of the property contained Brazilian pepper, which was close to residential housing. Australian pine occurred along the edge of a canal. Lead tree was pervasive throughout the property. Poisonwood trees on the two parcels serve as food for a variety of species, including the threatened white-crowned pigeon.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal/cut stump	Garlon 4
Lygodium microphyllum	Old World climbing fern	Category I	foliar	Rodeo
Leucaena leucocephala	lead tree	Category II	basal/cut stump	Garlon 4

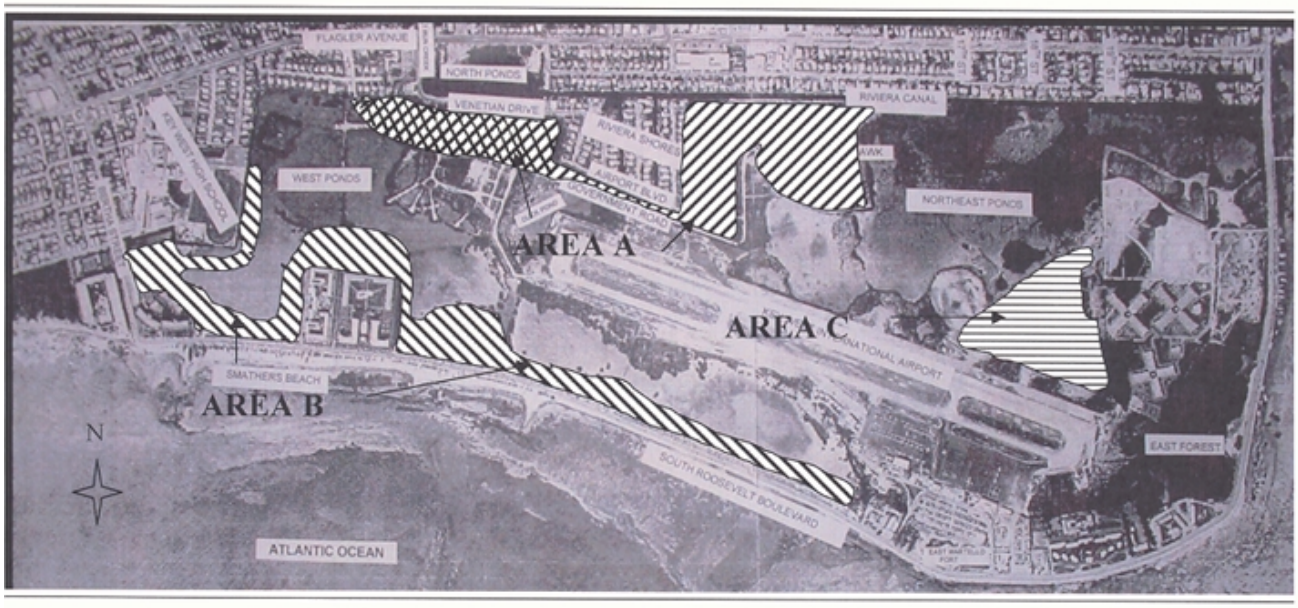
Dense growths of Brazilian pepper and Australian pine crowd out native hammock plants. Clearing out the invasive species is a necessary precursor to restoring the natural communities.

Key West Salt Ponds Invasive Exotic Plant Control	County: Monroe
PCL: Key West Salt Ponds	PCL Size: 150
Project Manager: City of Key West Cynthia Snell, Landscape Coordinator 1801 White Street, Key West, Florida 33040 Phone: 305-293-6418, Fax: 305-293-8320 E-mail: csnell@keywestcity.com	
Project ID: FK-029	Project Size: 150 acres
Fiscal Year 02/03	Project Cost: $97,400

The goal of this project was to treat Australian pine trees within designated portions of the Key West Salt Ponds. The City also received a $50,000 federal grant to assist in removing Brazilian pepper, schefflera, and other exotics from the property.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Casuarina equisetifolia	Australian pine	Category I	mechanical	n/a
			cut stump	Garlon 3A

Removal of Invasive Pest Plants from the Key West Salt Ponds
Aerial Photograph Identifying Work Areas



Area A - North of Government Rd, & South of Venetian Drive and the Riviera Canal, & includes the abandoned Hawk Missile Base.

Area B - Southern Salt Ponds, extending from Key West International Airport to Bertha Street and North behind Key West High School.

Area C - Northeast Salt Ponds, north of the eastern portion of the airport runway.

Area D - Area where Australian pines will be cut, chipped, and stumps ground.

Key West Salt Ponds

From outside the project area.. well, you can't see anything with all those Australian pines in the way.

Land managers can now access the site to begin restoration.

Chipping thousands of Australian pines results in a mountain of mulch.

Florida Keys Conservation Lands Invasive Exotic Plant Control | County: Monroe

PCL: Dagny Johnson Key Largo Hammocks Botanical State Park | PCL Size: 2,415 acres

Project Manager: Florida Park Service (DEP)
James G. Duquesnel, Park Biologist
P. O. Box 487, Key Largo, Florida 33037
Phone: 305-451-1202, Fax: 305-853-3555
E-mail: james.g.duquesnel@dep.state.fl.us

Project ID: FK-015, -021 | Project Size: 41.32 acres

Fiscal Year 02/03 | Project Cost:$186,596.19

A significant amount of Key Largo is held in public conservation lands. The native vegetation is primarily of the West Indian and Caribbean origin. This project includes several parcels within Key Largo Hammocks and John Pennekamp State Parks. This project integrates both mechanical and herbicidal control operations as part of an ongoing restoration and maintenance program.

Key Largo Island consisted of 10.62 acres of Australian pine that were mechanically controlled. Trees were uprooted with an excavator and later burned. Burma reed grass was also found on island. *Key Largo Cottages* consisted of several contiguous lots (slightly less than one acre in total) in the Key Largo City Cottages subdivision of Key Largo located adjacent to the Key Largo Hammocks CARL project. The site was infested with many invasive exotic species including lead tree, woman's tongue, Brazilian pepper, yellow elder, oyster plant, and Australian pine. The 1.6-acre *Ecotone Site*, a low marine tidal marsh and coastal rock barren ecotone between red mangrove marine tidal swamp and rockland hammock, was infested by a dense and expanding population of portia. *Shaw's Canal* consisted of 6.2 acres to the north of Shaw's' canal and 1.9 acres south of Shaw's' canal. Australian pine and a small area with portia tree were found within the site. *Anglers Club*, a less than one-third-acre site located on north Key Largo, was infested by dense and expanding populations of several invasive exotics, both herbaceous and woody species. *Pennekamp Campground* (located on John Pennekamp Coral Reef State Park) had five exotic tree species requiring removal. *Sea Kritters* was an approximately 19-acre site located at the east terminus of Sea Kritter Boulevard.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Casuarina equisetifolia	Australian pine	Category I	mechanical	n/a
			basal/cut stump	Garlon 4
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 3A
			basal	Garlon 4
Ficus microcarpa	laurel fig	Category I	basal/cut stump	Garlon 4
Thespesia populnea	portia	Category I	cut stump	Garlon 3A
Colubrina asiatica	lather leaf	Category I	basal	Garlon 4
Manilkara zapota	sapodilla	Category I	basal	Garlon 4
Albizia lebbeck	woman's tongue	Category I	foliar	Roundup
Tradescantia spathacea	oyster plant	Category I	foliar	Roundup
Neyraudia reynaudiana	Burma reed	Category I	foliar	Roundup
Hibiscus tiliaceus	mahoe	Category II	cut stump	Garlon 3A
Leucaena leucocephala	lead tree	Category II	basal/cut stump	Garlon 4
Sansevieria hyacinthoides	bowstring hemp	Category II	foliar	Roundup
Ficus benjamina	weeping fig	n/a	basal/cut stump	Garlon 4
Tecoma stans	yellow elder	n/a	cut stump	Garlon 3A
Delonix regia	royal Poinciana	n/a	cut stump	Garlon 3A
Panicum maximum	Guinea grass	n/a	foliar	Roundup
Philodendron scandens	philodendron vine	n/a	foliar	Roundup

Key Largo Hammocks

A key to any successful invasive control project is planning...

followed up by planning...

...along with a healthy dose of planning.

To treat the Australian pines, contractors first had to surmount this wall of woman's tongue (seen in closeup below).

Long Key Point Invasive Exotic Plant Control | County: Monroe

PCL: Long Key State Park | PCL Size: 911 acres

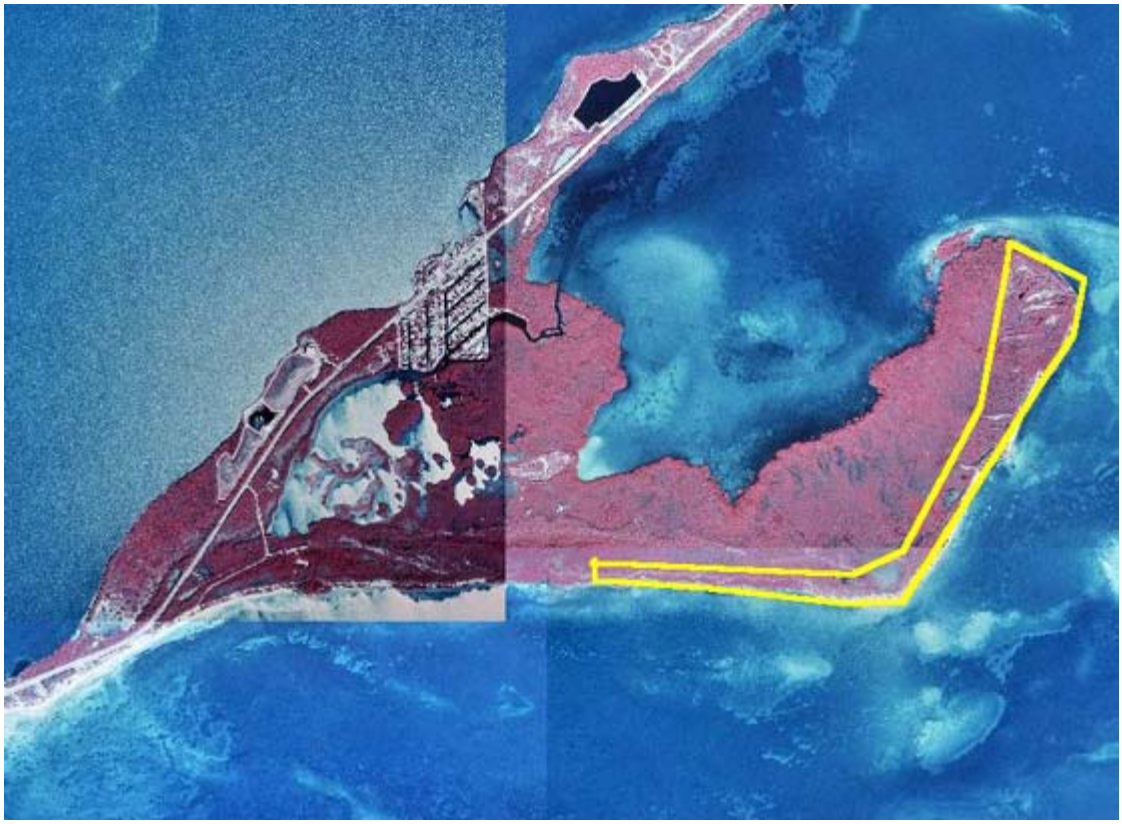
Project Manager: Florida Park Service (DEP)
Catherine Close, Park Manager
P.O. Box 776, Long Key, Florida 33001
Phone: 305-664-4815, Fax: 305-664-2629
E-mail: catherine.close@dep.state.fl.us

Project ID: FK-028 | Project Size: 25 acres

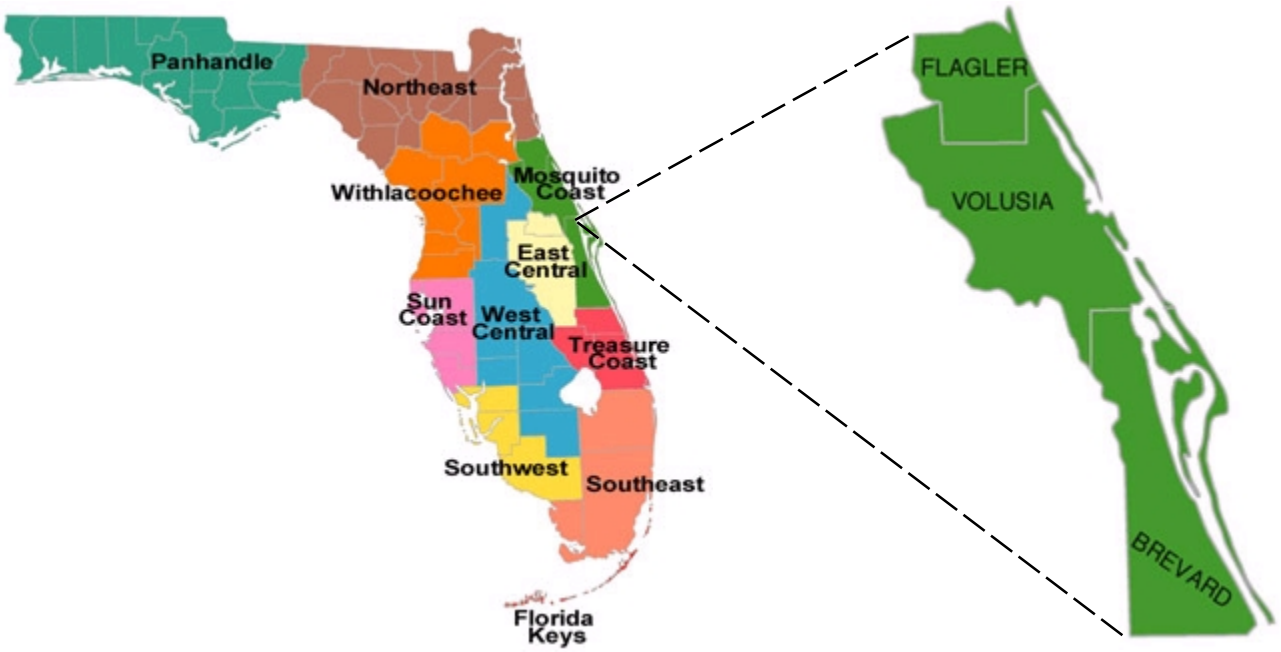
Fiscal Year 02/03 | Project Cost: $20,030.11

The project site is located on Long Key Point within Long Key State Park. The Long Key Point project area consists of Coastal Berm and Beach Dune communities that had low to moderate infestations of Brazilian pepper, Australian pine, and lather leaf. Long Key State Park was one of the initial control sites in fiscal year 1998, the first year of the Uplands Program.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4+Stalker
			cut stump	Arsenal+Escort
Thespesia populnea	seaside mahoe	Category I	basal	Garlon 4+Stalker
			cut stump	Arsenal+Escort
Colubrina asiatica	lather leaf	Category I	basal	Garlon 4+Stalker
			cut stump	Arsenal+Escort



Mosquito Coast Regional Working Group



The Mosquito Coast Regional Working Group liaison is Keith Fisher, DEP Office of Coastal and Aquatic Managed Areas, 1000 Buffer Preserve Drive, Fellsmere, Florida 32948, phone: 321-953-5004, fax: 321-953-5006, e-mail: keith.fisher@dep.state.fl.us. Three of the seven projects completed in this working group were on the Merritt Island National Wildlife Refuge, an annual partner of the Uplands Program. The project manager for these three projects was:

Ron Hight, Refuge Manager
U.S. Fish and Wildlife Service
P.O. Box 6504, Titusville, Florida 32782
Phone: 321-861-0667, Fax: 321-861-1276
E-mail: ron_hight@fws.gov

The first two (combined) projects controlled melaleuca, while the third project targeted Brazilian pepper.

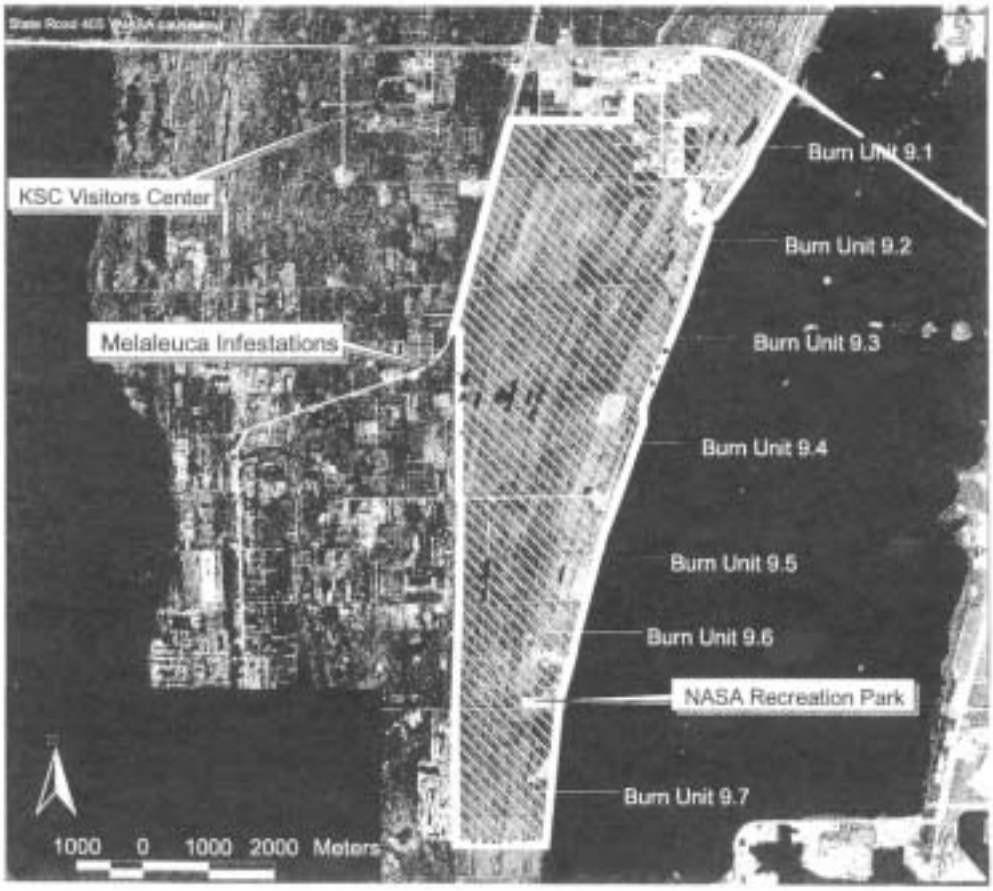
Merritt Island Melaleuca Invasive Exotic Plant Control	County: Brevard
PCL: Merritt Island National Wildlife Refuge	PCL Size: 139,174 acres
Project Manager: U.S. Fish and Wildlife Service	
Project ID: MC-027, -028	Project Size: 7,500 acres
Fiscal Year 02/03	Project Cost: $73,274.17

In the 1960s, NASA acquired the land that is now the John F. Kennedy Space Center and turned those lands not vital to the space program over to the U.S. Fish and Wildlife Service. Today, the Service manages this 43-mile long barrier island as Merritt Island National Wildlife Refuge and Canaveral National Seashore. The refuge is adjacent to the Indian River and Banana Rivers, and Mosquito Lagoon. Approximately one-half of the refuge consists of brackish estuaries and marshes. The remaining land consists of coastal dunes, scrub oaks, pine forest, pine flatwoods, and palm and oak hammocks. Numerous rare plants and animals are found on the refuge. These include seventeen state-endangered plants, such as satinleaf (*Chrysophyllum oliviforme*), crested coralroot (*Hexalectris spicata*), Florida peperomia (*Peperomia obtusifolia*), beach star (*Remirea maritima*), bay cedar (*Suriana maritima*), coastal hoary pea (*Tephrosia angustissima*), and sea lavender (*Tournefortia gnaphalodes*).

Melaleuca was first introduced by early homesteaders that occupied the land before it became a refuge. Settlers planted the tree as an ornamental and shade tree, and it later escaped into the wetlands of the area. This project controlled melaleuca scattered throughout the 7,500 acres within Burn Unit 9. Melaleuca trees lightly to moderately infested swales that run north to south through the marshes on the refuge.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
			hand pull	n/a

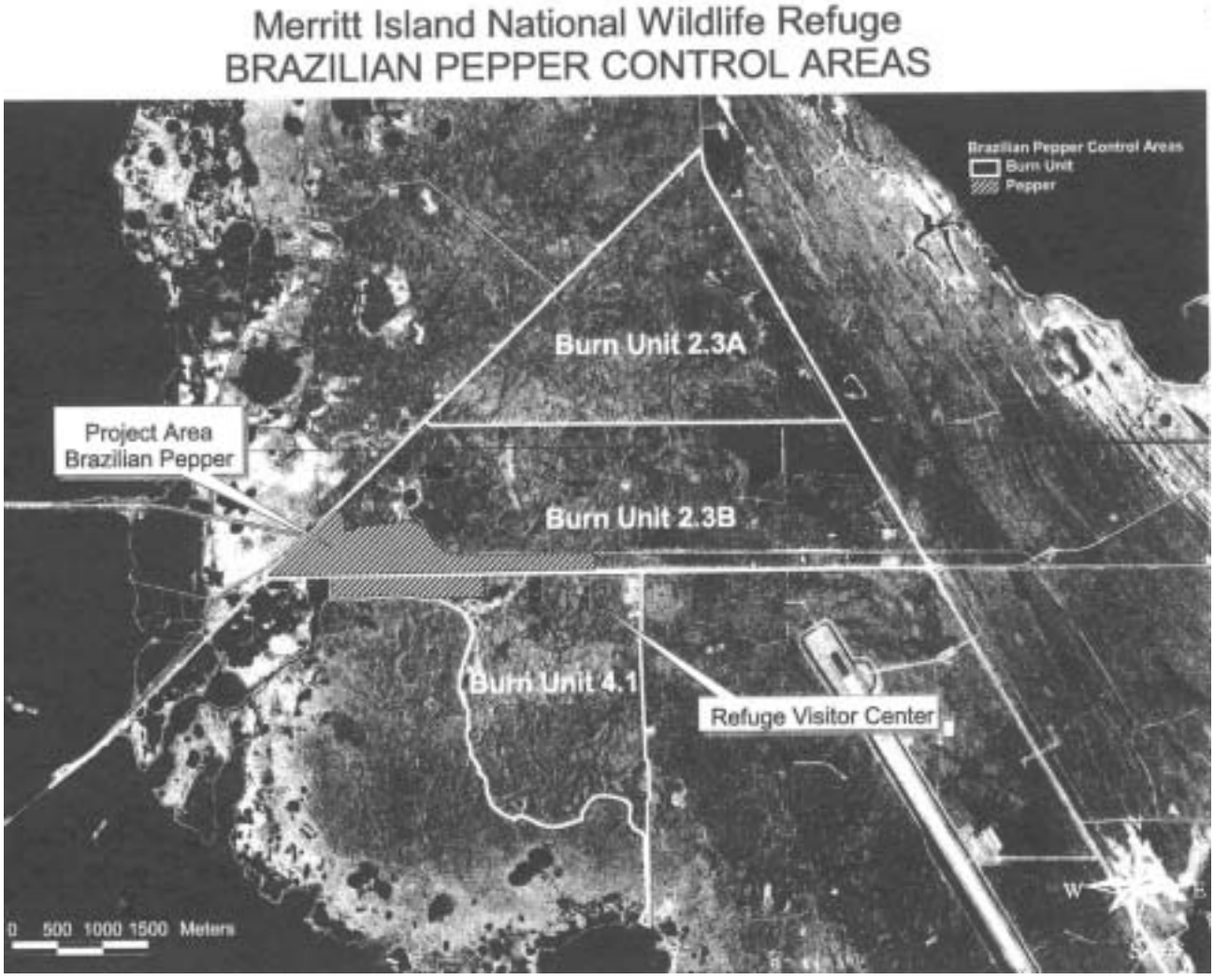
Melaleuca Burn Unit 9



Merritt Island Pepper Invasive Exotic Plant Control	County: Brevard
PCL: Merritt Island National Wildlife Refuge	PCL Size: 139,174 acres
Project ID: MC-030	Project Size: 394 acres
Fiscal Year 02/03	Project Cost: $72,000

Brazilian pepper was first introduced by early homesteaders who occupied the land before it became a refuge and planted the tree as an ornamental. This project controlled approximately 118 acres of Brazilian pepper that moderately infested the 394 acres of wetlands in Burn Units 2.3B and 4.1, which are near the MINWR Visitor Information Center. The Beach Road corridor is often the visitor's first look at MINWR, so it is essential this view be unobstructed by exotic plants, to provide the visitor an accurate depiction of the natural communities of Merritt Island. This project also played a key role in the restoration of marshes that provide vital habitat for Henslow's sparrows, bobolinks, sedge wrens, and other bird species. Canaveral National Seashore conducted an exotic control program on the east end of the Beach Road thoroughfare, thus linking with this project area and providing a corridor of native vegetation for wildlife and improving the visitor's experience.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
			cut stump	Arsenal
			hand pull	n/a
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
			hand pull	n/a
Casuarina equisetifolia	Australian pine	Category I	basal	Garlon 4



South Beaches Phase IV Invasive Exotic Plant Control | County: Brevard

PCL: Archie Carr National Wildlife Refuge | PCL Size: 234 acres

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

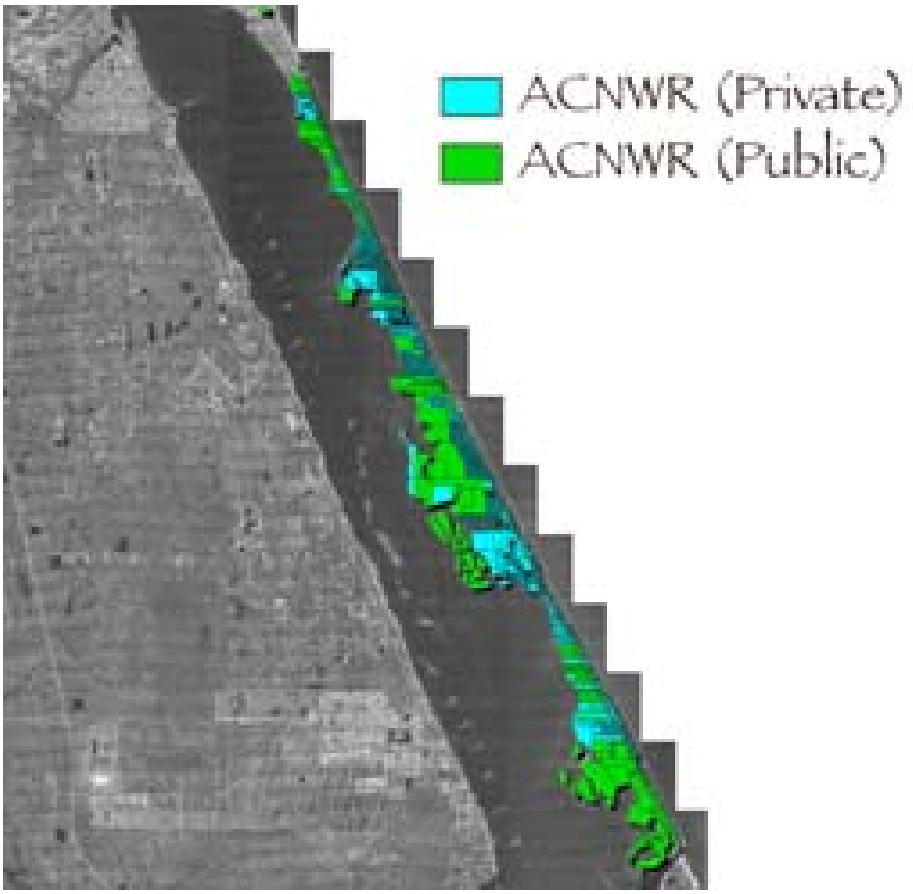
Project ID: MC-015 | Project Size: 51.29 acres

Fiscal Year 02/03 | Project Cost: $63,595.62

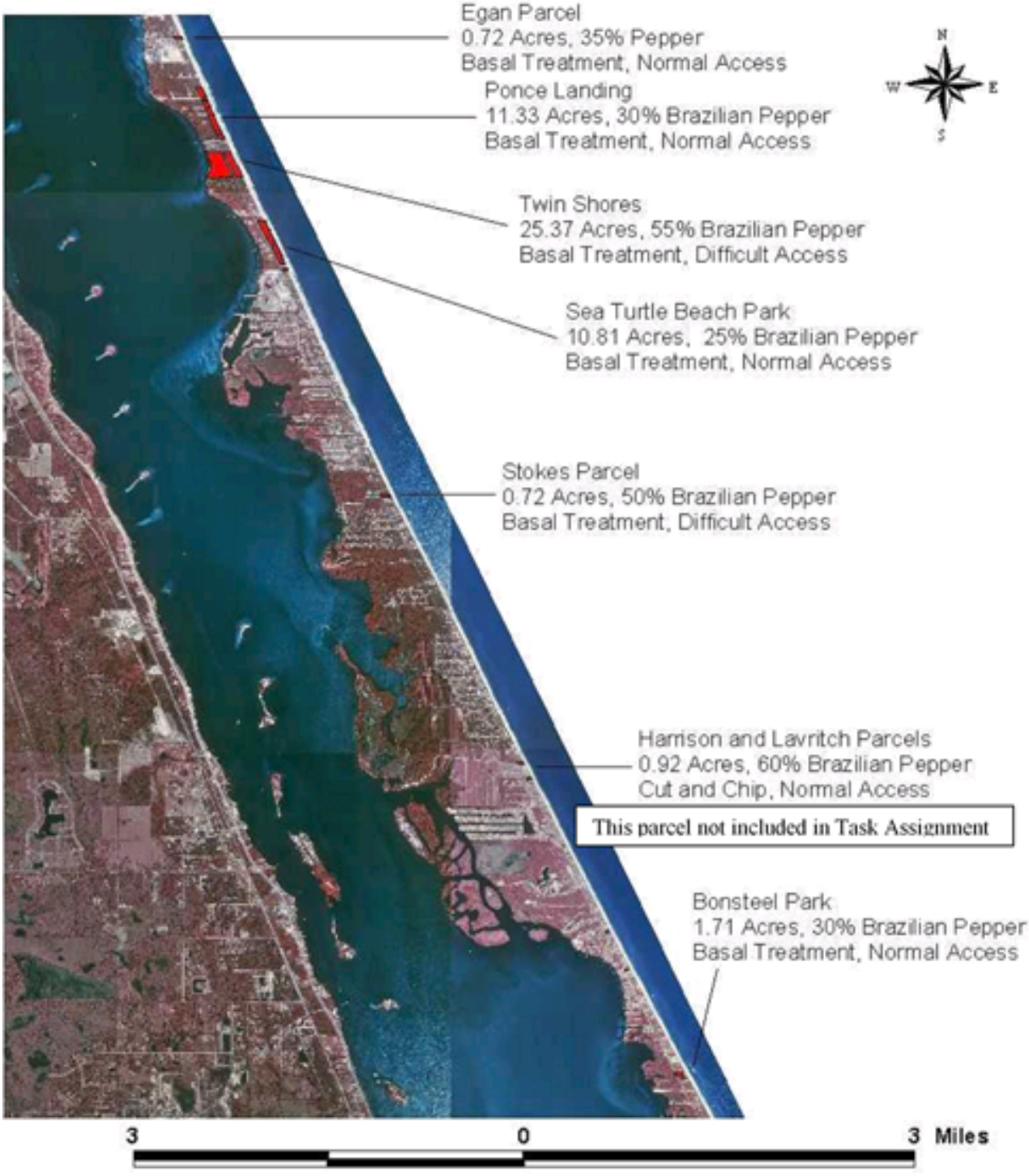
The South Beaches project is a cooperative effort between several partners, including federal, state, and local agencies. The project includes several parcels of publicly owned conservation lands within Brevard County's South Beaches Management Area. All of the property is located within the Archie Carr National Wildlife Refuge. 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 is the fourth phase of an aggressive program to remove Brazilian pepper and Australian pine from publicly held lands on the south beaches. This phase targeted six parcels managed by Brevard County Parks and Recreation Department under the Save Our Coast Program: the 0.72-acre Egan parcel, 11.33-acre Ponce Landing, 25.37-acre Twin Shores property, 0.72-acre Stokes parcel, and the 1.71-acre Bonsteel Park site, which is a beach access point. Sea Turtle Beach Park, a 10.81-acre site, was cleared of a Brazilian pepper monoculture with a "Brontosaurus" mower. The other five parcels had an average exotic coverage of 42%.

Target Plants	Common name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal, cut stump, hand pull	Garlon 4
			mechanical	n/a
Casuarina equisetifolia	Australian pine	Category I	basal, girdle, cut stump	Garlon 4



Brevard County Parks and Recreation
Save Our Coast Sites



Sebastian Inlet Invasive Exotic Plant Control — County: Brevard

PCL: Sebastian Inlet State Park — PCL Size: 870 acres

Project Manager: Florida Park Service (DEP
Ronald N. Johns, Park Manager
9700 South A1A, Melbourne Beach, Florida 32951
Phone: 321-984-4853, Fax: 321-984-4854
E-mail: ronald.n.johns@dep.state.fl.us

Project ID: MC-032 — Project Size: 49 acres

Fiscal Year 02/03 — Project Cost: $45,414.00

Sebastian Inlet State Park is situated on an Atlantic coast barrier island. Natural communities include Maritime Hammock, Beach Dune, and Mangrove Forest. This project was divided into two parts: one 5-acre area to mechanically remove trees with a Brontosaurus mower, and one 44-acre area to treat with herbicide.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	mechanical	n/a
			basal	Garlon 4

Volusia County Invasive Exotic Plant Maintenance Control — County: Volusia

PCL: *see below* — PCL Size: various

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

Project ID: MC-038 — Project Size: 155 acres

Fiscal Year 02/03 — Project Cost: $49,828.67

This project encompasses several county parks and one state park where initial control of Brazilian pepper was previously conducted. North Peninsula State Park and Lighthouse Point, Spruce Creek, and Smyrna Dunes County Parks are the sites targeted for maintenance control work. The natural communities of North Peninsula State Park and other conservation lands in the project area include Coastal Dune, Coastal Strand, Oak Scrub, Hardwood Hammock, Maritime Hammock, Mangrove Swamp, Salt Marsh, and Freshwater Marsh. Brazilian pepper totaled about 65 acres in sparse to dense stands throughout the project area. The County provided in-kind contributions of $16,205.66 for this project.

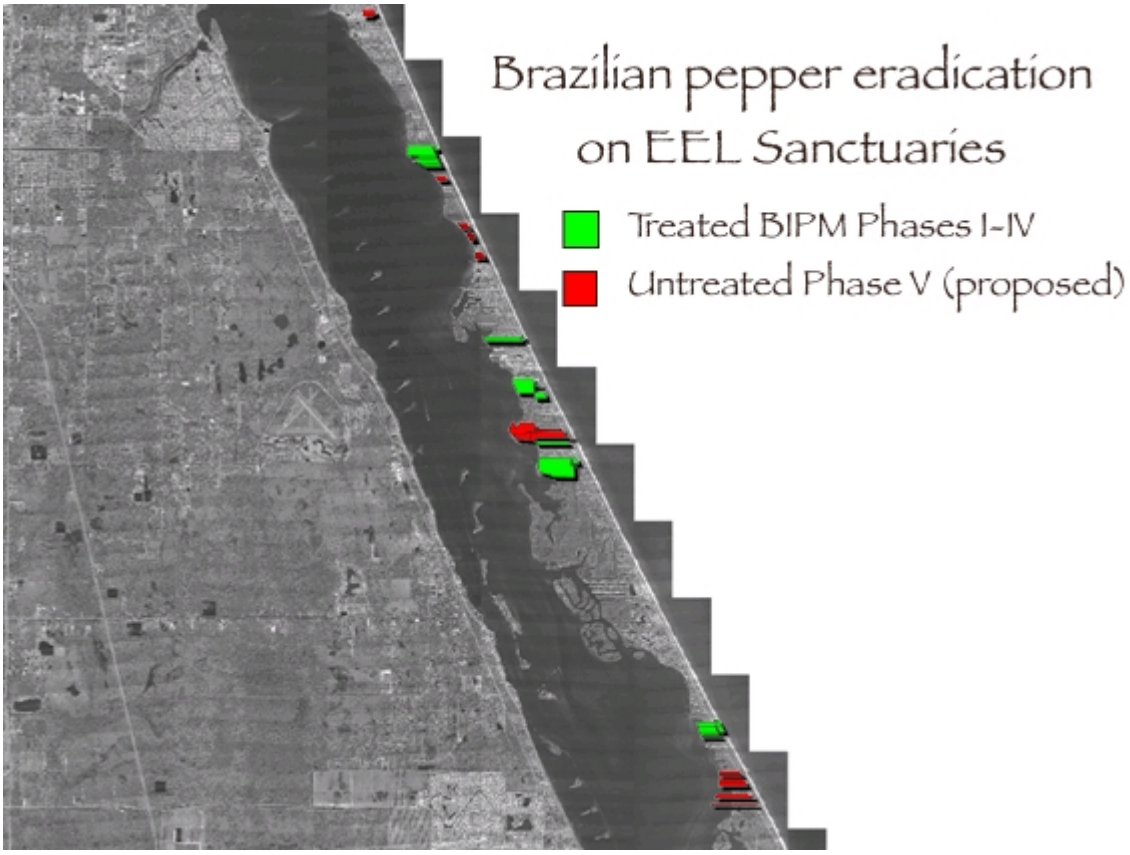
Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal, cut stump	Garlon 4

Brazilian Pepper Invasive Exotic Plant Maintenance Control	County: Brevard
PCL: *see below*	PCL Size: various
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	
Project ID: MC-037	Project Size: 331 acres
Fiscal Year 02/03	Project Cost: $32,274.51

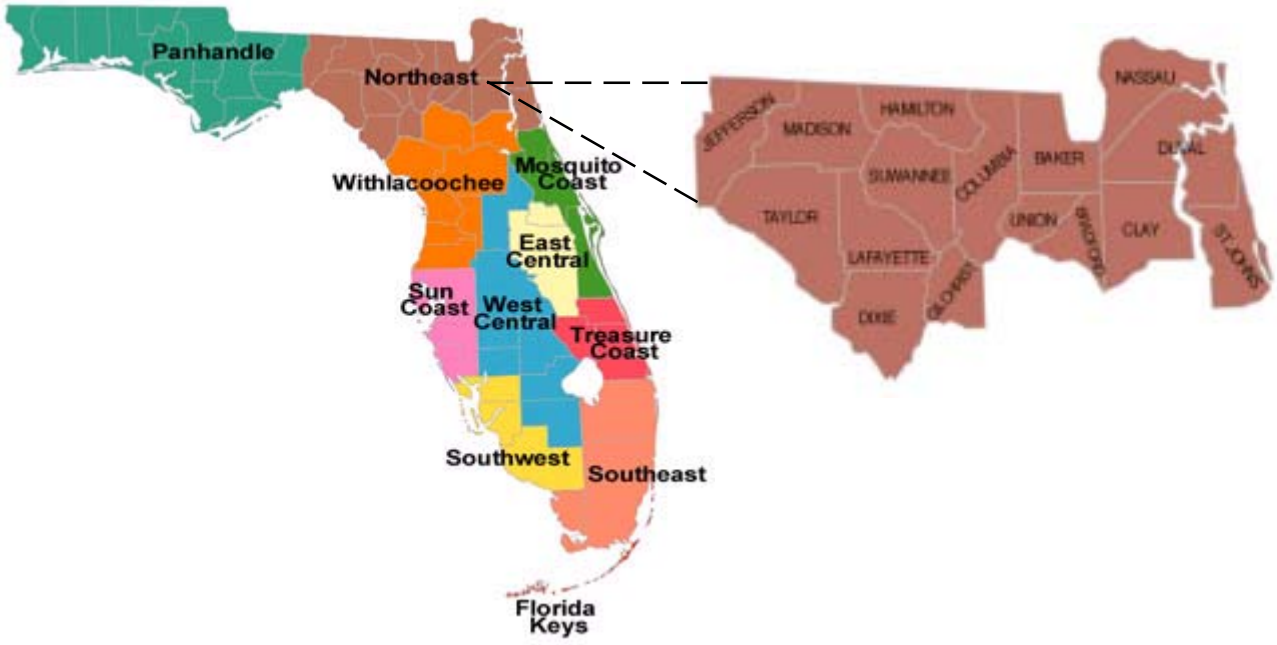
This project is part of an ongoing cooperative effort to remove invasive exotic plant species from within the Archie Carr National Wildlife Refuge and other County-managed sites that have received BIPM funds for treatment. The main project goals are: 1) to retreat invasive exotic plants (primarily Brazilian pepper) on all parcels within the Archie Carr National Wildlife Refuge, which are managed by the Florida Park Service, Brevard County Environmentally Endangered Lands Program, and the Brevard County Parks and Recreation Department, and 2) to retreat invasive exotic plants (primarily Brazilian pepper) on other parcels managed by Brevard County, including Pine Island Conservation Area, Kings Park, Coconut Point Sanctuary, Maritime Hammock Sanctuary, Washburn Cove Sanctuary, Hog Point Sanctuary, and the Barrier Island Ecosystem Sanctuary.

To extend the influence of the Archie Carr: Pepper Free by 2003 program, the U.S. Fish and Wildlife Service' Partnership program is contributing $25,000 per year for 5 years for the treatment and re-treatment of private lands within the refuge boundaries. This work is an extension of work begun under a Department of Community Affairs funded program that has resulted in the treatment of over 260 homes within the refuge boundaries. Since this work directly benefits eradication efforts on public conservation lands, it will be used as a match to requested funds in addition to manpower and equipment matches provided by the individual management agencies.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal, cut stump	Garlon 4



Northeast Regional Working Group



The Northeast Regional Working Group liaison is Jay Anderson, Suwannee River Water Management District, 9225 CR 49, Live Oak, Florida 32060, phone: 386-362-1001, fax: 386-362-1056, e-mail: anderson_j@srwmd.state.fl.us. The two projects completed in this working group both targeted the continuing spread of Japanese climbing fern.

Twin Rivers Invasive Exotic Plant Control — County: Hamilton, Madison, Suwannee

PCL: Twin Rivers State Forest — PCL Size: 14,775 acres

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

Project ID: NE-015 — Project Size: 30.2 acres

Fiscal Year 02/03 — Project Cost: $6,750.00

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, Wetlands, Upland Mixed Forest, Mixed Hardwood and Pine, and Sandhill.

Japanese climbing fern is found most extensively along the banks of the Withlacoochee River, intermittently all the way from the Georgia/Florida state line to the rivers confluence with the Suwannee River. The portion of the Forest adjoining the Suwannee River was not surveyed, but infestations were identified in the uplands. Sites ranged in size from less than 0.001 acre to greater than 0.1 acre in size. Accessibility of the sites ranged from moderately accessible and treatable (by boat), to difficult to treat (due primarily to sharply sloping riverbanks). Other sites had been treated during the prior fiscal year.

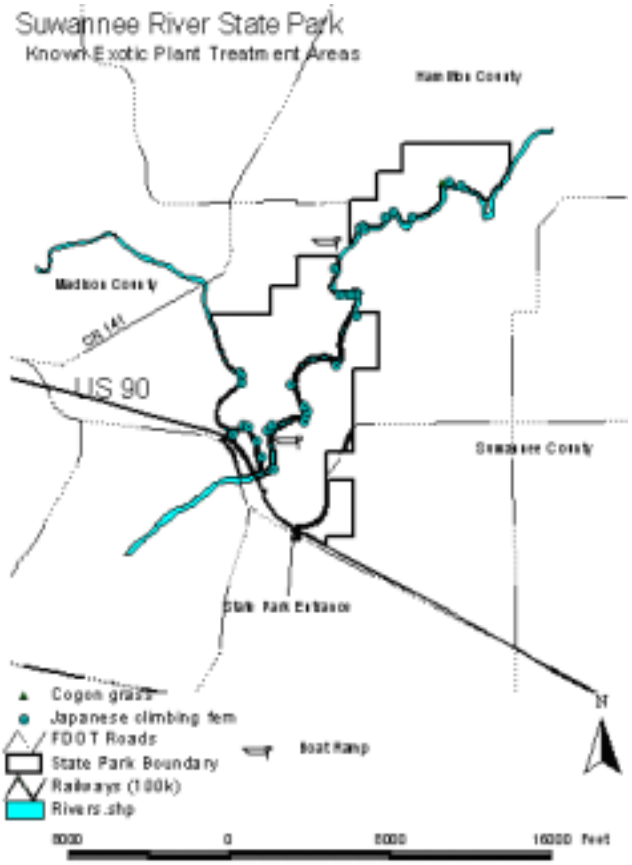
Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Lygodium japonicum	Japanese climbing fern	Category I	foliar	glyphosate+Escort

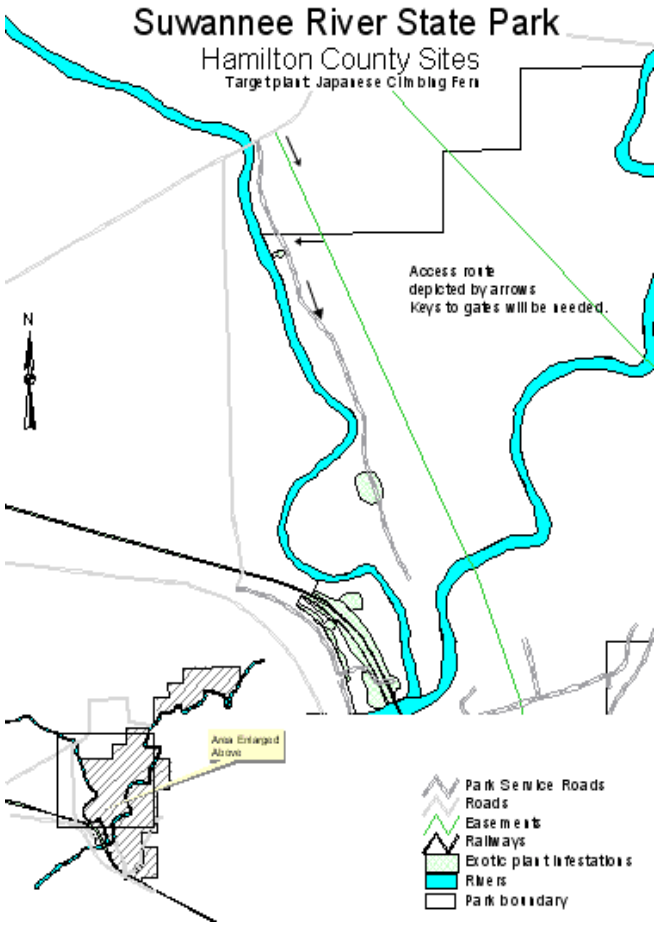
Suwannee Joint Lygodium Invasive Exotic Plant Control	County: various
PCL: *see below*	PCL Size: various
Project Manager: Florida Park Service Steve Yoczik, Park Manager 20185 County Road 132, Live Oak, Florida 32060 Phone: 904-362-2746, Fax: 904-362-1614 E-mail: stephen.yoczik@dep.state.fl.us	
Project ID: NE-016	Project Size: 25 acres
Fiscal Year 02/03	Project Cost: $17,383.95

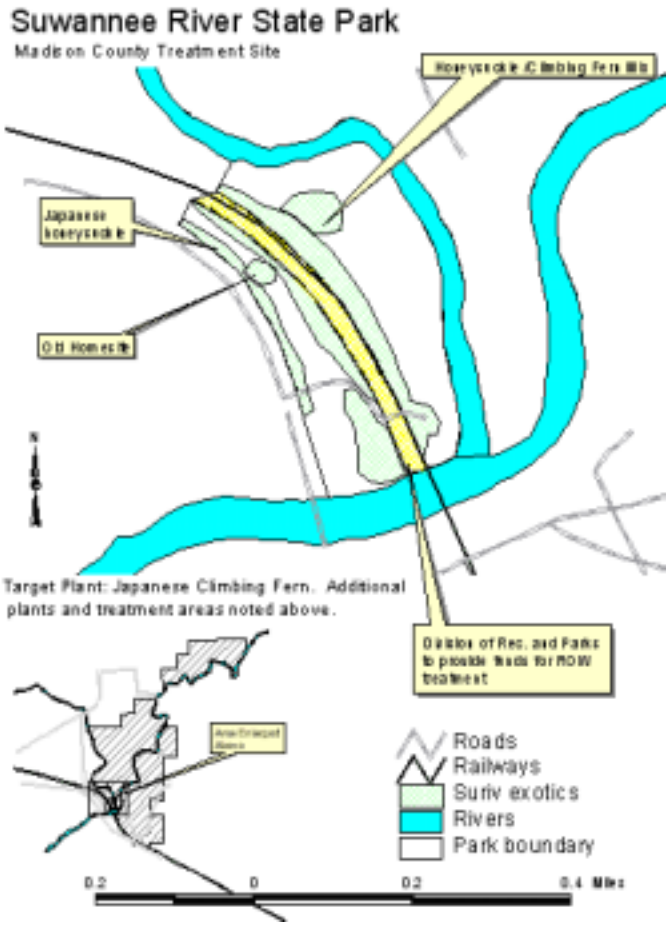
Japanese climbing fern occurs throughout the Withlacoochee and Suwannee River basins. The fern has invaded state sovereignty lands (below ordinary high water), State Park and State Forest lands, Suwannee River Water Management District lands, and privately owned lands. This project targeted primarily Japanese climbing fern on uplands and along the adjacent river banks at Suwannee River State Park and on Twin Rivers State Forest on the Withlacoochee, and Upper Suwannee Rivers. Chinese wisteria and Chinaberry were also controlled on Suwannee River State Park properties. There are about 17 miles of river frontage along the State Forest and about 8 miles of river frontage along the State Park. The Twin Rivers State Forest project area comprised 4,445 acres in Hamilton and Madison Counties. Japanese climbing fern occurred on the river bluffs and at several locations inland. The predominant natural communities are Sandhill and Upland Mixed Forest. In addition, there are Bottomland Forest, Floodplain Forest, Sinkhole, and Bluff communities present that provide ideal conditions for the establishment and perpetuation of Japanese climbing fern.

The Suwannee River State Park project area included land surrounding the confluence of the Suwannee and Withlacoochee Rivers. Park property extends up the Suwannee River above the confluence with the Withlacoochee River and also extends up the Withlacoochee River, primarily along the east bank. For much of that length, the Twin Rivers State Forest is across the river. In all, the park has 1,856 acres comprised of numerous natural communities including Sandhill, Upland Pine, Floodplain Forest, Bottomland Forest, Sinkholes, and Blackwater River and Streams. Much of the park has been in the state park system since the 1930s. Climbing fern occurred along river banks throughout the park. Material from populations upstream frequently becomes established in the disturbance-prone bluff environment of the river. The largest and densest populations are on the outside curves of the river, where it is often the predominate ground cover. These bluff populations also provide parent material for establishment of additional downstream populations, further spreading this aggressive invasive species.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Rodeo
Melia azedarach	Chinaberry	Category I	basal	Garlon 4
Wisteria sinensis	Chinese wisteria	Category II	basal	Garlon 4


Suwannee River State Park
Known Exotic Plant Treatment Areas
Hamilton County
Madison County
CR 141
US 90
Suwannee County
State Park Entrance
Cogon grass
Japanese climbing fern
FDOT Roads
State Park Boundary
Railways (100k)
Rivers.shp
Boat Ramp
N
8000
0
8000
16000 Feet

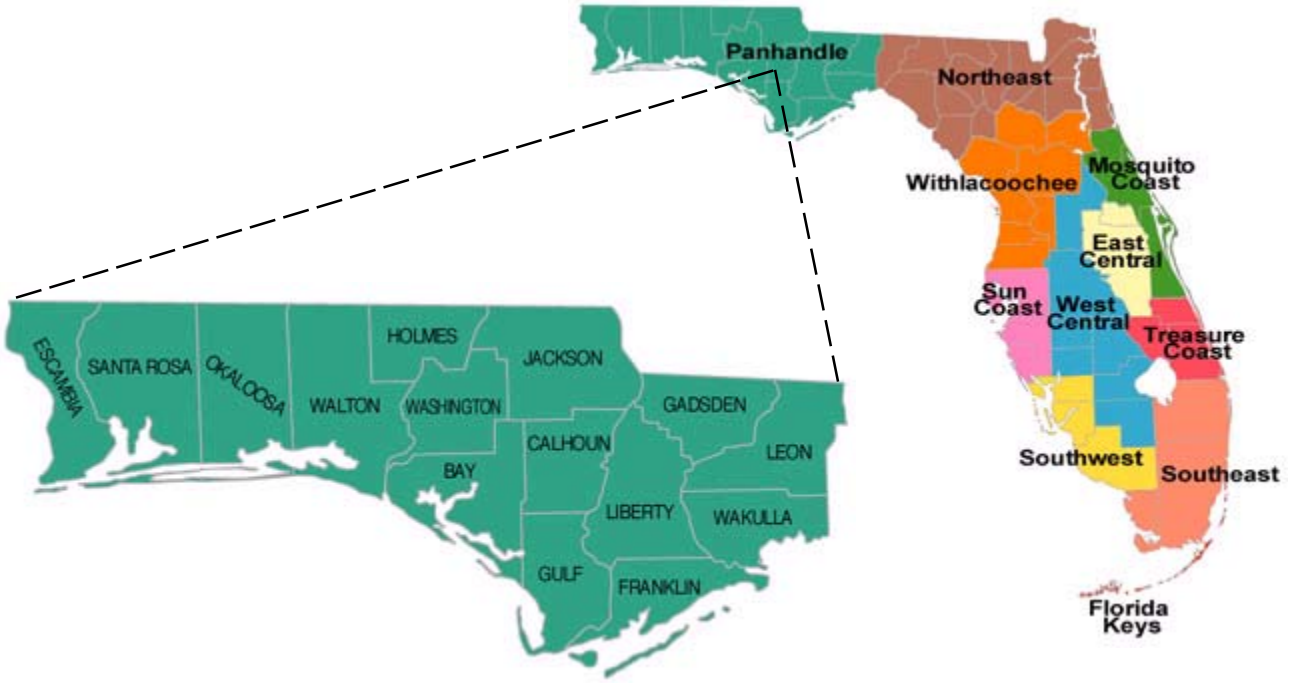

Suwannee River State Park
Hamilton County Sites
Target plant: Japanese Climbing Fern
Access route
depicted by arrows
Keys to gates will be needed.
N
Area Enlarged Above
Park Service Roads
Roads
Easements
Railways
Exotic plant infestations
Rivers
Park boundary


Suwannee River State Park
Madison County Treatment Site
Honeysuckle /Climbing Fern Mix
Japanese honeysuckle
Old Homesite
Target Plant: Japanese Climbing Fern. Additional plants and treatment areas noted above.
Division of Rec. and Parks to provide funds for ROW treatment
Area Enlarged Above
Roads
Railways
Surliv exotics
Rivers
Park boundary
0.2
0
0.2
0.4 Miles

The banks of the Suwannee River (top) are overrun with Japanese climbing fern (left).

The fertile fronds, ripe with spores (closeup above), are easily identified.

Panhandle Regional Working Group



The Panhandle Regional Working Group liaison is J.J. Bachant, The Nature Conservancy, 4025 Highway 178, Jay, Florida 32565, phone: 850-675-2884, fax: 850-675-5759, e-mail: jbachant@tnc.org

Eglin AFB Invasive Exotic Plant Control — County: Okaloosa

PCL: Eglin Air Force Base — PCL Size: 463,448 acres

Site Manager: Eglin AFB Natural Resources
Dennis Teague, Endangered Species Biologist
Jackson Guard, 107 Hwy. 85 N, Niceville, Florida 32578
Phone: 850-882-4164, Fax: 850-882-5321
E-mail: teagued@eglin.af.mil

Project ID: PH-016 — Project Size: 39 acres

Fiscal Year 02/03 — Project Cost: $32,963.45

Eglin Air Force Base is the largest forested military reservation in the United States. In addition to a large expanse of sandhill, there are thirty-four other natural communities present, including the most significant array of steephead seepage streams under a single ownership in Florida. The project area consisted of two control sites. The USAF provided $16,000 of the total project cost, and also provided in-kind services by treating 0.5 acres of cogon grass at the Barrier Island parcel, and 3 acres at the East Bay Flatwoods parcel.

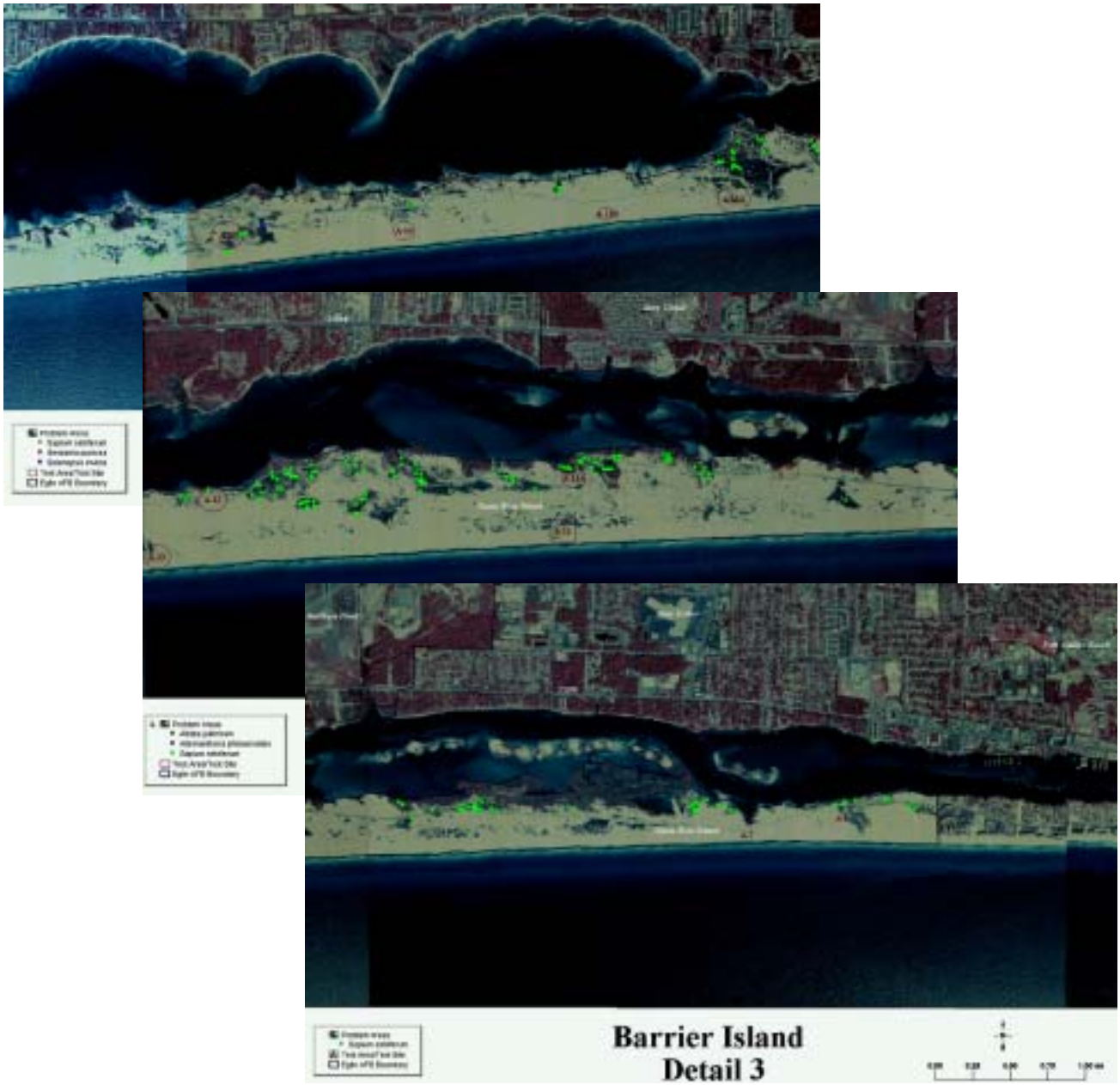
The Barrier Island parcel has 17 miles of high quality barrier island habitat, including coastal dunes, interdunal coastal swales, flatwoods, and coastal grasslands. The Chinese tallow infestation on the barrier island probably originated from seed dispersal by birds. Chinese tallow occurred in light densities except where clustered. The coastal interdunal swale habitat where Chinese tallow was established in some instances is immediately adjacent to habitat that supports *Cladonia perforata*, a federally listed endangered lichen, and Cruise's golden aster (*Chrysopsis cruiseana*) and Godfrey's golden-aster (*Chrysopsis godfrei*), both state listed endangered species. Control of invasive exotic species in this parcel benefited many sensitive barrier island plant and animal species, including the Santa Rosa beach mouse (*Peromyscus polionotus leucocephalus*).

The East Bay Flatwoods parcel contains high quality mesic flatwoods, which are fire-maintained, open canopied pine forests with little or no woody midstory and a dense ground cover of grasses, forbs, and low scrubs. This community occurs on relatively flat and moderately to poorly drained terrain. This area is interspersed with depression marshes and dome swamps. The Chinese tallow infestation on this site probably originated from illegal dumping and by bird dispersal of seeds. Chinese tallow occurred in moderate to light densities. Japanese climbing fern was found near the East Bay River in an area that is habitat for the federally endangered flatwoods salamander (*Ambystoma cingulatum*) and the red-cockaded woodpecker (*Picoides borealis*). Chinese tallow tree seedlings were also discovered in salamander breeding ponds.

Eglin Air Force Base

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Sapium sebiferum	Chinese tallow	Category I	basal/girdle	Garlon 4
			cut stump	Garlon 3A
			hand pull	n/a
Lonicera japonica	Japanese honeysuckle	Category I	foliar/girdle	Garlon 4
			foliar	Roundup+Escort
Ligustrum sinense	Chinese privet	Category I	basal/girdle	Garlon 4
Melia azedarach	Chinaberry	Category I	basal/girdle	Garlon 4
Albizia julibrissin	mimosa	Category I	basal	Garlon 4
Dioscorea bulbifera	air-potato	Category I	hand pull	n/a
Dioscorea alata	winged yam	Category I	hand pull	n/a
Aleurites fordii	tung oil tree	Category II	basal	Garlon 4
Wisteria sinensis	Chinese wisteria	Category II	basal/girdle/foliar	Garlon 4

Advances in technology allow mapping of invasive plants in the field with handheld GPS units. The data can then imported into GIS maps that show precise locations of the alien invaders.



Eglin Air Force Base

Eglin Air Force Base

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) to interior pine flatwoods (below).

Blackwater River Invasive Exotic Plant Control | County: Okaloosa, Santa Rosa

PCL: Blackwater River State Forest | PCL Size: 189,594 acres

Site Manager: Florida Division of Forestry
J. Henry Thompson, Senior Forester
11650 Munson Highway, Milton, Florida 32570
Phone: 850-957-6140, Fax: 850-957-6143
E-mail: thompsjh@doacs.state.fl.us

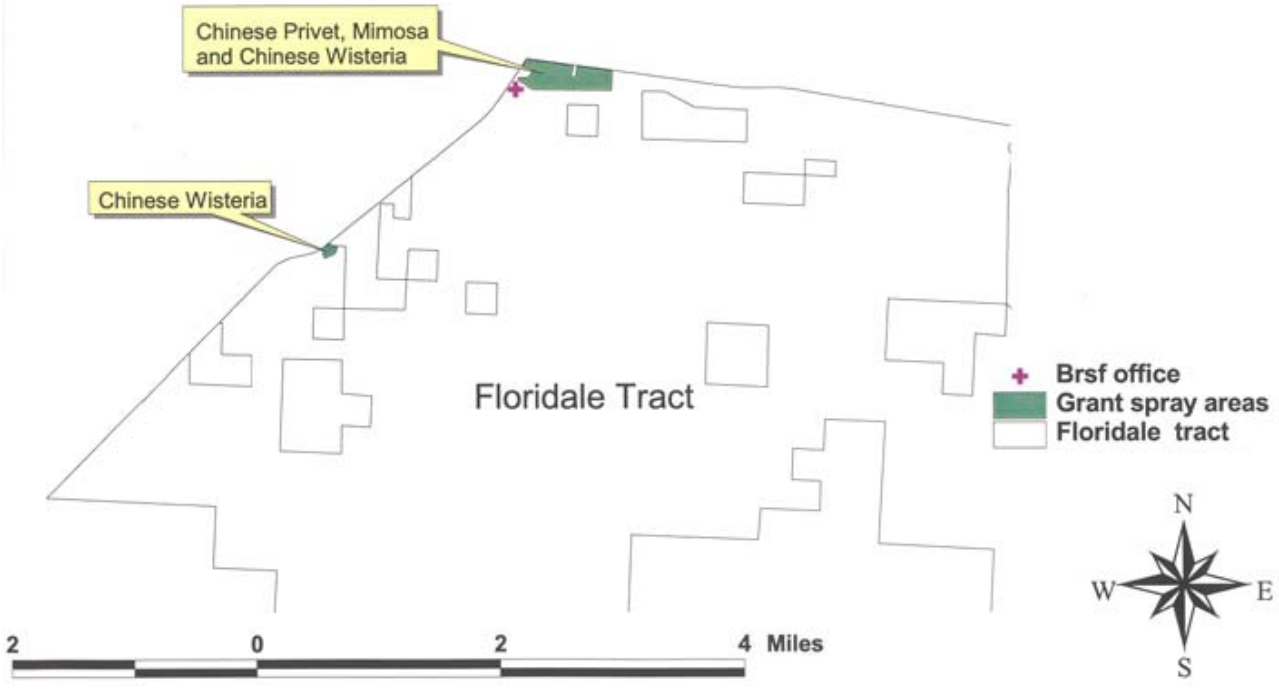
Project ID: PH-018 | Project Size: 151.5 acres

Fiscal Year 02/03 | Project Cost: $131,527.21

The Blackwater River State Forest (BRSF), the largest state forest in Florida, is named for the 30-mile river that runs through it. The Blackwater River is one of the last remaining shifting sand bottom streams still in its natural state for almost its entire length. The BRSF was acquired in 1955 from the US Forest Service and has been managed for multiple use benefits since that time.

Exotic plant management efforts primarily targeted cogon grass and Chinese tallow. Cogon grass occurred on 88 sites ranging in size from 2.3287 acres to 0.0023 acres (10ft. x10ft.), with many of the sites having 100% coverage. Previous control efforts, except for cogon grass, used prescribed burns. This proved ineffective for species such as Japanese climbing fern and kudzu. Japanese climbing fern was located in both uplands and bottomlands across the forest, commonly overgrowing Chinese privet, in coverages from 40-60%. The only known kudzu vine location was in a drain along a road where it had crossed under the road from private land. Chinese privet, due to a lack of fire in recent years, moved out of the bottomlands and into the uplands, where it caused problems for both timber management and the red-cockaded woodpecker program. There were two stands of privet, one 89 acres and the other 6 acres. In the Panhandle, mimosa is commonly found on old home sites. Mimosa was found near the DOF District Office within the larger privet site. Mimosa coverage was approximately 4% of the 89-acre privet site. Chinese wisteria occurred on two sites, one with 95% coverage and the other with less than 5% coverage.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Ligustrum sinense	Chinese privet	Category I	basal/girdle	Garlon 4
			foliar	Roundup+Arsenal
Albizia julibrissin	mimosa	Category I	basal/girdle	Garlon 4
Melia azedarach	Chinaberry	Category I	basal/girdle	Garlon 4
Sapium sebiferum	Chinese tallow	Category I	basal/girdle	Garlon 4
Cinnamomum camphora	camphor tree	Category I	basal	Garlon 4
Imperata cylindrica	cogon grass	Category I	foliar	Roundup+Arsenal
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Roundup+Escort
Pueraria montana	kudzu	Category I	foliar	Roundup+Escort
Elaeagnus pungens	silverthorn	Category II	basal	Garlon 4
Wisteria sinensis	Chinese wisteria	Category II	basal/girdle	Garlon 4



Leon County Greenways Invasive Exotic Plant Control | County: Leon

PCL: J.R. Alford Greenway | PCL Size: 880 acres
Miccosukee Canopy Road Greenway | 503 acres

Project Manager: Leon County Parks and Recreation
Paul Cozzie, Director
2280 Miccosukee Road, Tallahassee, Florida 32308
Phone: 850-488-0221, Fax: 850-487-3072
E-mail: cozziep@mail.co.leon.fl.us

Project ID: PH-019 | Project Size: 767 acres

Fiscal Year 02/03 | Project Cost: $155,788.62

The J.R. Alford Greenway is located in eastern Leon County and encompasses a peninsula that extends into Lake Lafayette. Approximately 450 acres of the property are upland hardwood forest, upland mixed forest, and basin swamp. The Miccosukee Canopy Road Greenway is located in eastern Leon County and encompasses a 6.4-mile linear park along this scenic route. Approximately 317 acres of the property are upland hardwood forest, upland mixed forest, pine forest, oak savanna, and floodplain forest. Leon County Parks and Recreation manage both properties under agreement with the Office of Greenways and Trails (DEP). This project targeted thirteen invasive exotic plants, with kudzu, Chinese privet, Japanese climbing fern, Chinaberry, and Chinese tallow the most widespread species. The project integrated grazing, herbicide application, and mechanical control.

A heavy kudzu infestation was initially grazed by sheep to reduce plant biomass. Sheep were grazed in a single pass averaging 24 hours per acre. A subcontractor was used to cut as much vertical kudzu vine as possible. Inmate labor was mobilized on site after grazing ended to complete vine cutting operations and to apply herbicide on all identifiable target tree and shrub species. Other exotic species were controlled using basal or foliar applications, as appropriate.

This was a cost-share project with Leon County providing most of the Miccosukee Greenway costs, as a match for BIPM work performed on the J. Alford Greenway. The county contributed $25,000, plus an additional $15,750 from City of Tallahassee greenway funds, toward contractor costs. The county also provided all labor and equipment, at a cost of $61,683. In addition to contractor costs BIPM provided all herbicide for treatments on both properties with total Bureau funding equaling $53,355.62.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Pueraria montana	kudzu	Category I	foliar	Roundup+Escort
			cut stump	Garlon 4
			grazing	n/a
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Roundup+Escort
Lonicera japonica	Japanese honeysuckle	Category I	foliar	Roundup+Escort
Sapium sebiferum	Chinese tallow	Category I	basal	Garlon 4
Albizia julibrissin	mimosa	Category I	basal/cut stump	Garlon 4
Melia azedarach	Chinaberry	Category I	basal/cut stump	Garlon 4
Ardisia crenata	coral ardisia	Category I	basal/cut stump	Garlon 4
Ligustrum sinense	Chinese privet	Category I	basal/cut stump	Garlon 4
Solanum viarum	tropical soda apple	Category I	cut stump	Garlon 4
Nandina domestica	heavenly bamboo	Category I	cut stump	Garlon 4
Aleurites fordii	tung oil tree	Category II	basal/cut stump	Garlon 4
Elaeagnus pungens	silverthorn	Category II	cut stump	Garlon 4
Wisteria sinensis	Chinese wisteria	Category II	cut stump	Garlon 4
Poncirus trifoliata	trifoliate orange	n/a	basal	Garlon 4

St. Marks Invasive Exotic Plant Maintenance Control | County: Taylor

PCL: St. Marks National Wildlife Refuge | PCL Size: 67,562 acres

Project Manager: US Fish and Wildlife Service
Michael Keys
P. O. Box 68, St. Marks, Florida 32355
Phone: 850-925-6121, Fax: 850-925-6930
E-mail: micheal_keys@fws.gov

Project ID: PH-022 | Project Size: 176.6 acres

Fiscal Year 02/03 | Project Cost: $21,880

St. Marks National Wildlife Refuge covers over 67,000 acres in three counties. Natural areas include estuarine tidal marsh, coastal hammock, mesic flatwoods, wet flatwoods, bottomland forest, and dome swamp. The refuge has extensive artificial impoundments that are managed for waterfowl, but are used by many other bird species as well. This project involved re-treatment of exotics on eight sites on the refuge. One site with Chinese tallow accounted for 101.3 acres or about 57% of the total area. With the exception of a subset of this site, which had been heavily infested and treated for tallow, the remainder of the area had a very light infestation, mostly occurring as scattered individual or clumps of tallow along pond margins.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Albizia julibrissin	mimosa	Category I	basal	Garlon 4
Ardisia crenata	coral ardisia	Category I	basal	Garlon 4
Colocasia esculenta	wild taro	Category I	hand dug	n/a
Dioscorea bulbifera	air-potato	Category I	hand dug	n/a
Dioscorea alata	winged yam	Category I	hand dug	n/a
Lantana camara	lantana	Category I	foliar	Roundup+Arsenal
			basal	Garlon 4
Lonicera japonica	Japanese honeysuckle	Category I	foliar	Escort+Roundup
			basal	Garlon 4
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Roundup+/-Escort
Melia azedarach	Chinaberry	Category I	basal	Garlon 4
Nandina domestica	heavenly bamboo	Category I	basal	Garlon 4
Sapium sebiferum	Chinese tallow	Category I	basal	Garlon 4
Phyllostachys aurea	golden bamboo	Category II	foliar	Roundup+Escort
Wisteria sinensis	Chinese wisteria	Category II	basal	Garlon 4

Maclay Gardens Invasive Exotic Plant Maintenance Control County: Leon

PCL: Maclay Gardens State Park PCL Size: 1,779.15 acres

Project Manager: Florida Park Service
Beth Weidner, Park Manager
3540 Thomasville Road, Tallahassee, FL 32304
Phone: 850-487-4115, Fax: 850-487-8808
E-mail: beth.weidner@dep.state.fl.us

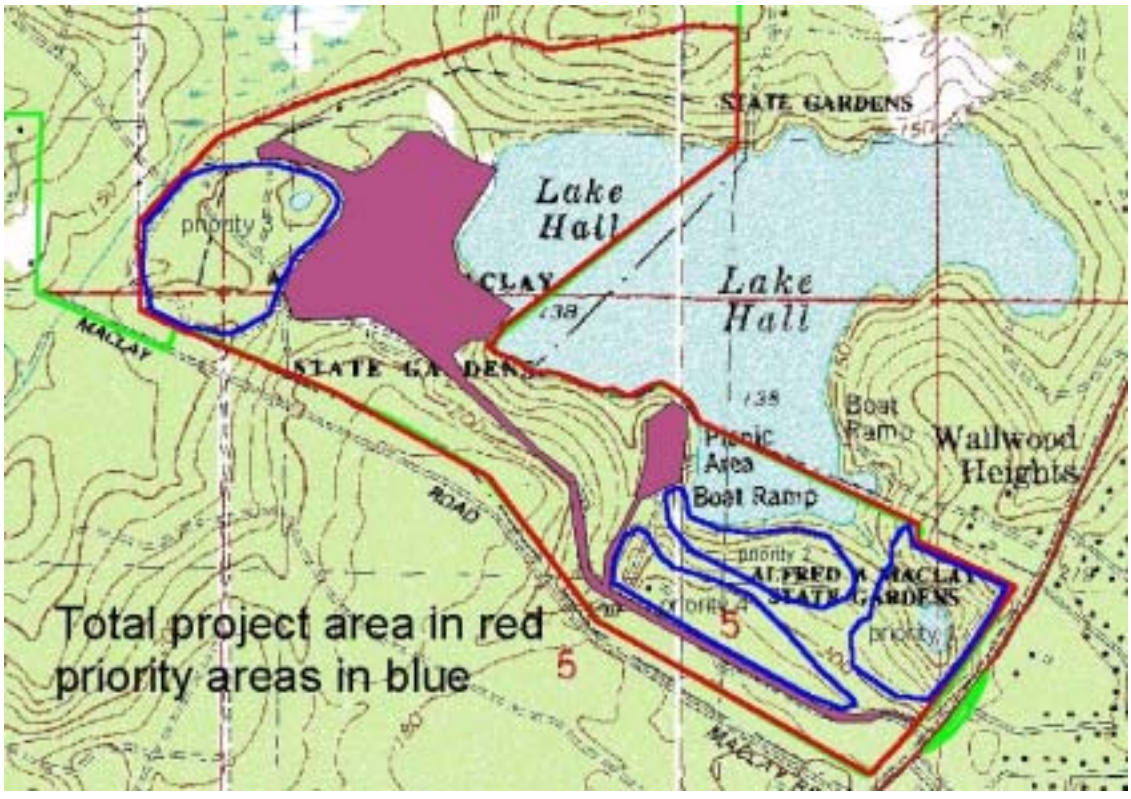
Project ID: PH-023 Project Size: 67 acres

Fiscal Year 02/03 Project Cost: $8,824.18

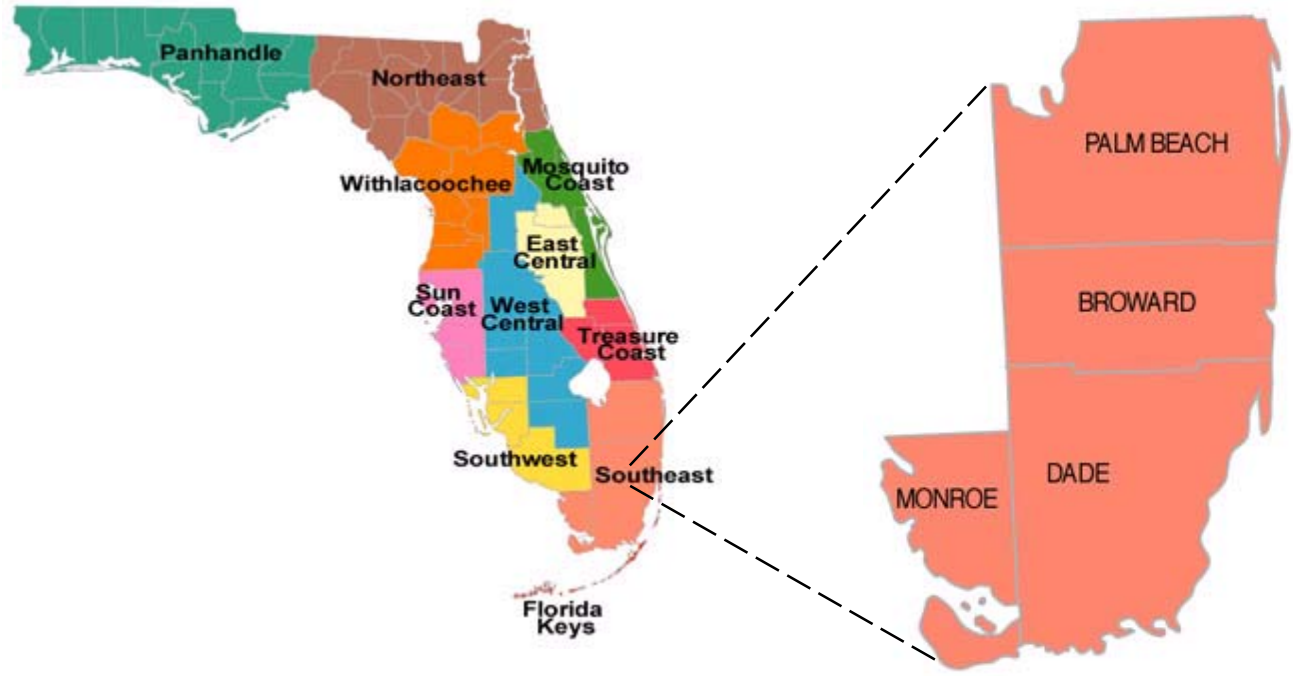
Maclay Gardens is located on US Highway 319 in Tallahassee. The majority of the park consists of secondary growth upland mixed forest, interspersed with steep ravines and slope forests that exhibit high plant diversity and harbor a number of rare species. Slope forest canopy species such as magnolia, beech, and white oak are still present, even in the most severely infested portions of the project area.

This project was a retreatment of the area originally designated as Zone A. Before initial removal efforts in 2001, monotypic stands of ardisia, nandina, Chinese tallow, and camphor trees were abundant, particularly around the sinkholes near Thomasville Road. Coral ardisia was the most widely spread exotic species throughout the total project area, with stem counts from 1,000 to 10,000 stems per acre.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Escort+Roundup
			foliar	Garlon 3A
Ardisia crenata	coral ardisia	Category I	foliar	Garlon 3A
Nandina domestica	heavenly bamboo	Category I	foliar	Garlon 3A
Lantana camara	lantana	Category I	foliar	Garlon 3A
Cinnamomum camphora	camphor tree	Category I	foliar	Garlon 3A
Melia azedarach	Chinaberry	Category I	basal	Garlon 4
Ligustrum lucidum	glossy privet	Category I	basal	Garlon 4
Wisteria sinensis	Chinese wisteria	Category II	foliar	Garlon 3A
			cut stump	Garlon 4
Podocarpus spp.	podocarpus	n/a	foliar	Garlon 3A
Bambusa spp.	bamboo	n/a	cut stump	Garlon 4



Southeast Regional Working Group



The Southeast Regional Working Group liaison is Joe Maguire, Miami-Dade Parks and Recreation, 22200 S.W. 137th Avenue, Miami, Florida 33170, phone: 305-257-0933, fax: 305-257-1086, e-mail: J57@miamidade.gov. Miami-Dade County has been a partner in exotic plant management since the inception of the Uplands Program, conducting exotic control operations under a 10-year contract with the state.

Deering Hammock Phase II Invasive Exotic Plant Control	County: Miami-Dade
PCL: Charles Deering Estate	PCL Size: 458 acres
Project Manager: Miami-Dade Parks and Recreation Cristina Rodriguez 22200 SW 137 Avenue, Miami, Florida 33170 Phone: 305-257-0933, Fax: 305-257-1086 E-mail: cristinar@miamidade.gov	
Project ID: SE-037	Project Size: 10 acres
Fiscal Year 02/03	Project Cost: $99,743

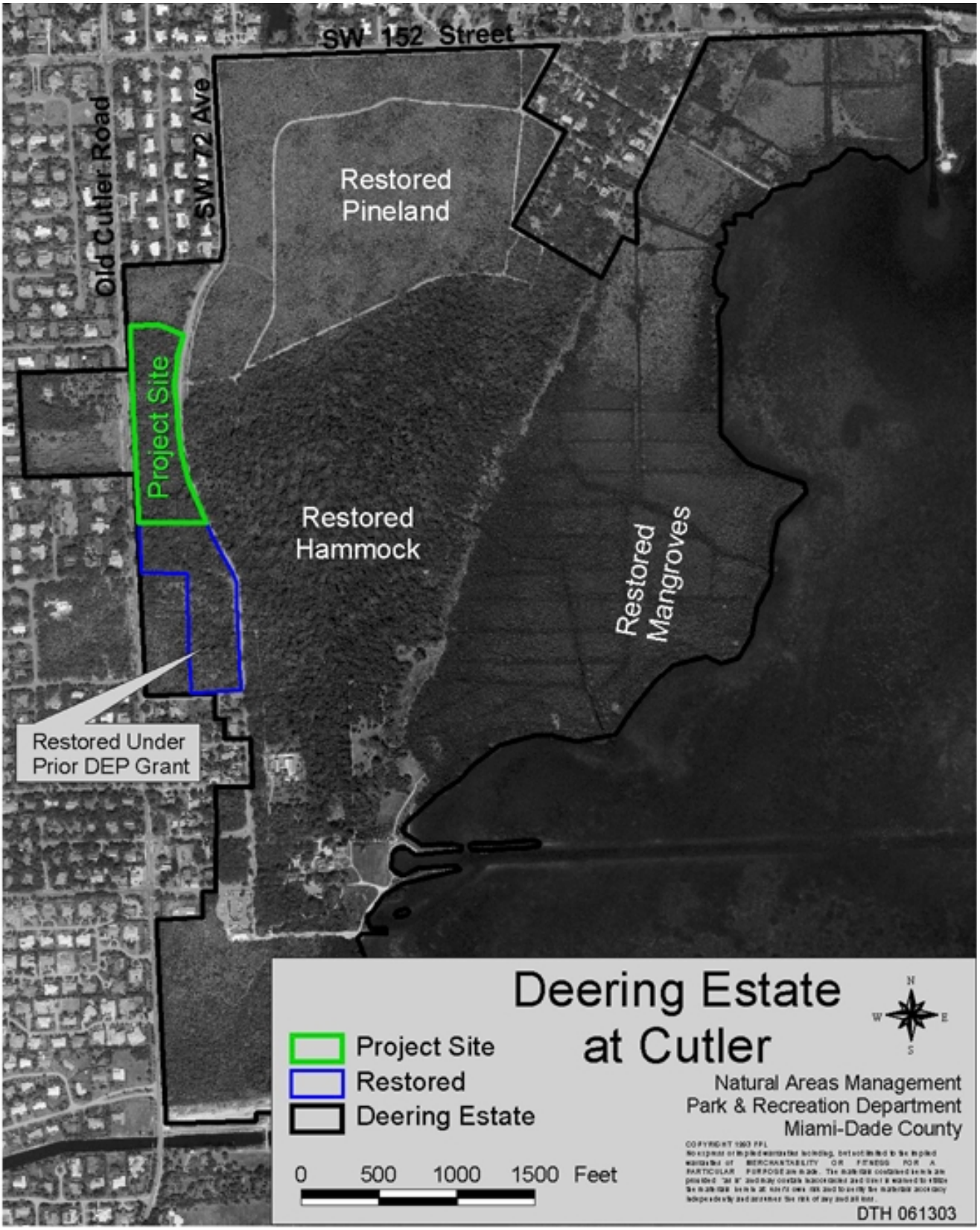
The Charles Deering Estate (a.k.a. The Deering Estate at Cutler) contains six biotic communities including pine rockland (105 acres), rockland hammock (142 acres), bottomland forest (39 acres), marine tidal swamp and marsh (156 acres), barrier island with beach dune (1.5 acres) and submerged benthic communities such as sea grass beds. There are 15 listed birds, 4 butterflies, 3 snails and 1 snake known to occur in the upland areas at the Deering Estate and 61 plants listed by FNAI and the Division of Plant Industry (FDACS) as endangered, threatened or commercially exploited.

The tropical hardwood hammock at the Deering Estate was severely impacted by air potato and jasmine vines. After 9 years of treatment, at least three-quarters of Deering's 142 acres of hammock is considered in "maintenance" condition. All of the natural areas of the Deering Estate, with the exception of the subject project area, have had at least initial exotics treatment. The project area consists of the mesic and hydric hammock areas at Deering West Hammock. The canopy contains red bay, willow, cocoplum, strangler fig, and spicewood. The understory contains native and exotic woody shrubs and tree seedlings. A number of rare native fern species occur in the floodplain of Cutler Slough. The major exotic plants of concern were Brazilian pepper, bishopwood, air potato and jasmine vines, and shoebutton ardisia. Treatments were conducted by Miami-Dade Natural Areas Management personnel.

Deering Hammock

Plants Treated	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 4
Abrus precatorius	rosary pea	Category I	cut stump	Garlon 4
Albizia lebbeck	woman's tongue	Category I	cut stump	Garlon 4
Ardisia elliptica	shoebutton ardisia	Category I	cut stump	Garlon 4
Bauhinia variegata	orchid tree	Category I	cut stump	Garlon 4
Bischofia javanica	bishopwood	Category I	cut stump	Garlon 4
Dioscorea bulbifera	air-potato	Category I	cut stump	Garlon 4
Eugenia uniflora	Surinam cherry	Category I	cut stump	Garlon 4
Jasminum dichotomum	Gold Coast jasmine	Category I	cut stump	Garlon 4
Jasminum fluminense	Brazilian jasmine	Category I	cut stump	Garlon 4
Manilkara zapota	sapodilla	Category I	cut stump	Garlon 4
Neyraudia reynaudiana	Burma reed	Category I	cut stump	Garlon 4
Schefflera actinophylla	Queensland umbrella tree	Category I	cut stump	Garlon 4
Tradescantia spathacea	oyster plant	Category I	cut stump	Garlon 4
Adenanthera pavonina	red sandalwood	Category II	cut stump	Garlon 4
Leucaena leucocephala	lead tree	Category II	cut stump	Garlon 4
Ptychosperma elegans	solitary palm	Category II	cut stump	Garlon 4
Sansevieria hyacinthoides	bowstring hemp	Category II	cut stump	Garlon 4
Syngonium podophyllum	arrowhead vine	Category II	cut stump	Garlon 4
Terminalia catappa	tropical almond	Category II	cut stump	Garlon 4
Alpinia speciosa	shell ginger	n/a	cut stump	Garlon 4
Carica papaya	papaya	n/a	cut stump	Garlon 4
Carissa macrocarpa	Natal plum	n/a	cut stump	Garlon 4
Mangifera indica	mango	n/a	cut stump	Garlon 4
Premna odorata	fragrant premna	n/a	cut stump	Garlon 4





SW 152 Street
SW 72 Ave
Old Cutler Road
Restored Pineland
Project Site
Restored Hammock
Restored Mangroves
Restored Under Prior DEP Grant
Deering Estate at Cutler
Project Site
Restored
Deering Estate
0 500 1000 1500 Feet
Natural Areas Management
Park & Recreation Department
Miami-Dade County
DTH 061303

Miami Hammocks Invasive Exotic Plant Maintenance Control — County: Miami-Dade

PCL: Charles Deering Estate — PCL Size: 458 acres
Bill Sadowski Park — 33 acres

Project Manager: Miami-Dade Parks and Recreation
Cristina Rodriguez
22200 SW 137 Avenue, Miami, Florida 33170
Phone: 305-257-0933, Fax: 305-257-1086
E-mail: cristinar@miamidade.gov

Project ID: SE-054 — Project Size: 58 acres

Fiscal Year 02/03 — Project Cost: $49,990

The Charles Deering Estate (a.k.a. The Deering Estate at Cutler) contains six biotic communities, including 142 acres of rockland hammock. There are 61 listed rare plants known to occur in the upland areas at the Deering Estate. Bill Sadowski Park contains approximately 25 acres of pine rockland and rockland hammock, which provide a diversity of habitats for at least 259 native plant species. Old Cutler Hammock, located within the park, is one of the last remnants of the "Hammock Ridge," an interesting and unique natural feature.

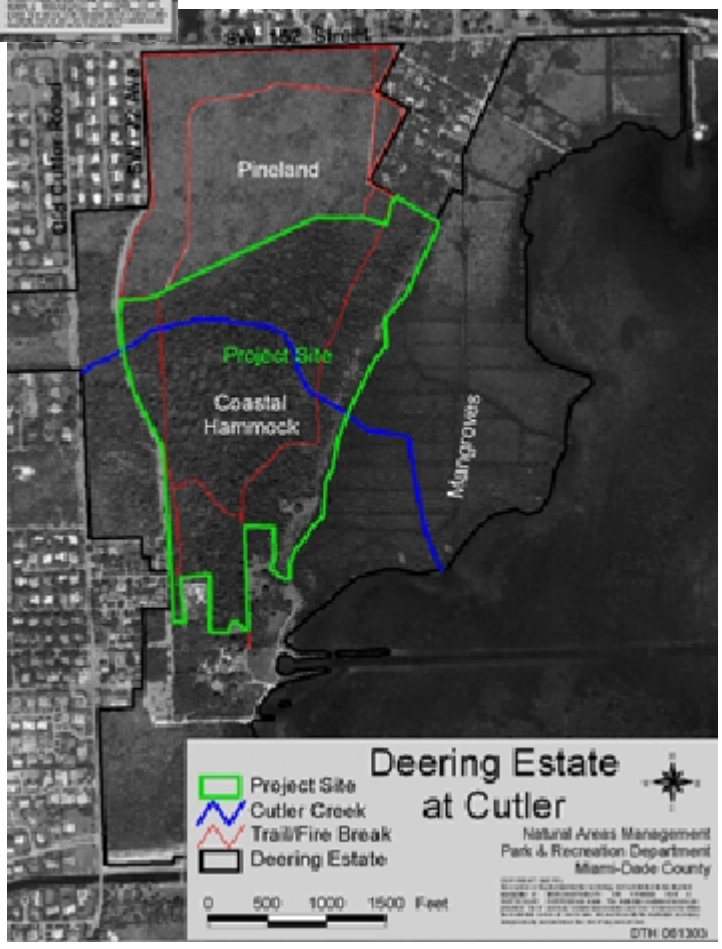
The canopy and sub-canopy of these hammocks contain 64 species of native hardwood trees and shrubs, including coco plum (Chrysobalanus icaco), buttonwood (Conocarpus erectus), gumbo limbo (Bursera simarouba), pigeon plum (Coccoloba diversifolia), mastic (Mastichodendron foetidissimum), lancewood (Nectandra coriacea), shortleaf fig (Ficus citrifolia), myrsine (Myrsine floridana), white stopper (Eugenia axillaris), and wild coffee (Psychotria nervosa), as well as the rare tropical tree, Krug's holly (Ilex krugiana).

There are ten species of native bromeliads in Deering Hammock, including *Tillandsia fasciculata* and *T. flexuosa*. Two other characteristic native plants are broad halberd fern (*Tectaria heracleifolia*) and least halberd fern (*T. fimbriata*). Eight epiphytic and three terrestrial orchid species also occur in the hammock. The moist shaded limestone surface of Old Cutler Hammock is rich in ferns and hosts at least four species which are rare in North America, the Florida tree fern (*Ctenitis sloanei*), leather fern (*Acrostichun aureum*), broad halberd fern (*Tectaria heracleifolia*), and the slender spleenwort, (*Asplenium trichomanes-dentatum*).

Before Natural Areas Management personnel initiated control, the entire hammock had been colonized by invasive exotic plants including Brazilian pepper, Queensland umbrella tree, Gold Coast jasmine, shoebutton ardisia, and the incised halberd fern. Exotic plant levels in the hammock have been reduced by over 90%. Follow up maintenance is still needed to control some exotic species. Maintenance treatments were conducted by Miami-Dade NAM.

Plants Treated	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 4
Ardesia elliptica	shoebutton ardisia	Category I	cut stump	Garlon 4
Jasminum dichotomum	Gold Coast jasmine	Category I	cut stump	Garlon 4
Schefflera actinophylla	Queensland umbrella tree	Category I	cut stump	Garlon 4
Tectaria incisa	incised halberd fern	Category I	cut stump	Garlon 4


Project Site
Pineland
Project Site
Pineland
Pineland
Bill Sadowski Park
(Old Cutler Hammock)
Project Site (18 acres)
Bill Sadowski Park
100 0 100 Feet


SW 192 Street
Old Cutler Road
SW 87 Ave
Pineland
Project Site
Coastal
Hammock
Mangroves
Deering Estate
at Cutler
Project Site
Cutler Creek
Trail/Fire Break
Deering Estate
Natural Areas Management
Park & Recreation Department
Miami-Dade County
0 500 1000 1500 Feet

Oleta River Mechanical Invasive Exotic Plant Control	County: Miami-Dade
PCL: Oleta River State Park	PCL Size: 1,033 acres
Project Manager: Florida Park Service (DEP) Steve Dale, Park Manager 3400 NE 163rd Street, N. Miami, Florida 33160 Phone: 305-919-1844, Fax: 305-919-1845 E-mail: steven.dale@dep.state.fl.us	
Project ID: SE-056	Project Size: 67.6 acres
Fiscal Year 02/03	Project Cost: $442,700

Bordering the north shore of Biscayne Bay, Oleta River State Park encompasses the mouth of its namesake, as well as hundreds of aces of mangroves and tidal swamp. The project area was former spoil sites that were infested with Australian pine, Brazilian pepper, and other exotics. These areas will be restores to Maritime Hammock. The project consisted of 10 sites around the park that were heavily infested with invasive plants, and 2 that were lightly infested.

Park staff and an Americorps crew have treated thousands of exotic plants in the park. Ongoing mitigation projects at the park will restore mangrove areas that neighbor some of the proposed removal sites.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Casuarina equisetifolia	Australian pine	Category I	cut stump	Garlon 4

Diefenbach Invasive Exotic Plant Control — County: Miami-Dade

PCL: Diefenbach Nature Preserve — PCL Size: 1.25 acres

Project Manager: City of North Miami Beach
Ana M. Gonzalez
17011 NE 19th Avenue, North Miami Beach, Florida 33162
Phone: 305-957-3524, Fax: 305-957-3517
E-mail: ana.gonzalez@citynmb.com

Project ID: SE-057 — Project Size: 1.25 acres

Fiscal Year 02/03 — Project Cost: $30,500

The Diefenbach Nature Preserve is approximately 1.25 acres of native hardwood hammock that runs along the west bank of the Snake Creek Canal. The Preserve contains native hardwood trees such as live oak, mahogany, and gumbo limbo, with a varied native understory including wild coffee and white stopper. About 25% of the site was covered by Australian pine and melaleuca. These trees were cut with a Hydro-axe and chipped in a tub grinder. The City of North Miami Beach contributed $5,902 of the total project cost.

Plants Treated	Common Name	FLEPPC Rank	Treatment	Herbicide
Casuarina equisetifolia	Australian pine	Category I	mechanical	n/a
Melaleuca quinquenervia	melaleuca	Category I	mechanical	n/a

Loxahatchee Slough Invasive Exotic Plant Control — County: Palm Beach

PCL: Loxahatchee Slough Natural Area — PCL Size: 11,000 acres

Project Manager: Palm Beach County
Michael Cheek, Environmental Analyst
3323 Belvedere Road, Bld 502, West Palm Beach, Florida 33406-1548
Phone: 561-233-2495, Fax: 561-233-2414
E-mail: mcheek@co.palm-beach.fl.us

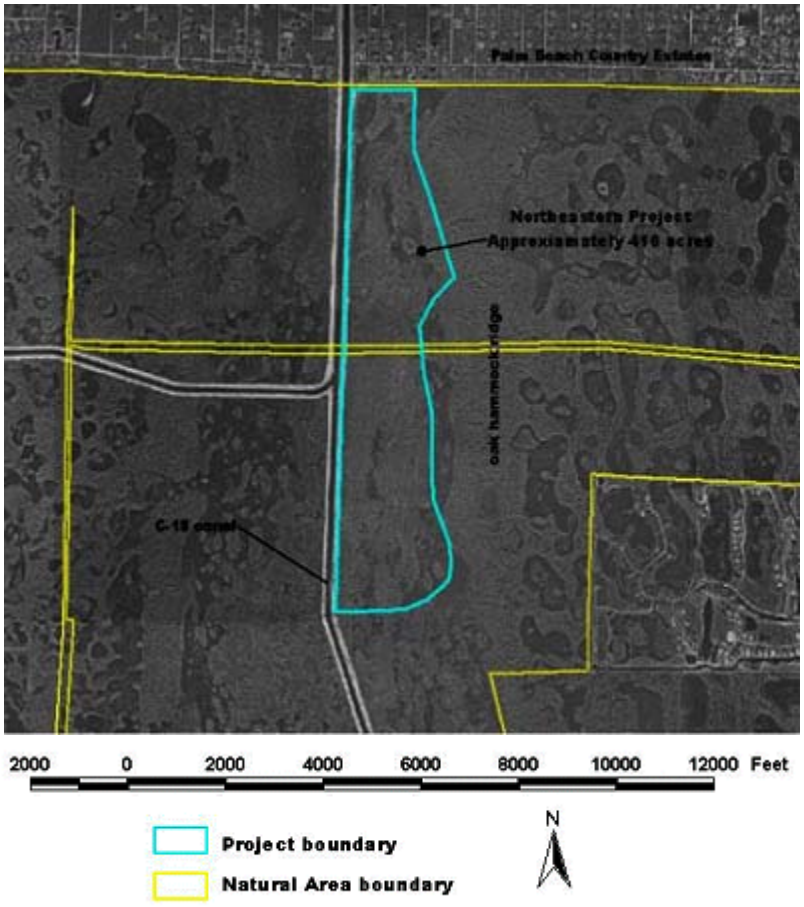
Project ID: SE-039, -041 — Project Size: 870 acres

Fiscal Year 02/03 — Project Cost: $472,079.80

Loxahatchee Slough Natural Area is an integral component of 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 wet flatwoods. Many depression marshes, cypress dome swamps, and sloughs are scattered throughout the project sites. Water flows from the site, under the Beeline Highway, through the Loxahatchee Slough, and eventually into Florida's only Federally listed Wild and Scenic River—the Loxahatchee River. There are at least three reptile, nine bird, and twenty-eight plant species recorded at Loxahatchee Slough Natural Area that are listed as rare or endangered.

The objective of this project was to provide for the post-aerial treatment of exotic plant species in the northeastern and southeastern portions of the Loxahatchee Slough Natural Area. Melaleuca and Old World climbing fern were scattered in cypress domes, sawgrass marshes, and depression marshes throughout the project area. Brazilian pepper and Australian pine were also present, mainly along the C-18 canal berm. Substantial stands of melaleuca had formed along the core area of the Slough on either side of the C-18 canal, where historically the most significant hydrological alteration occurred. These large stands were treated aerially. This project supported the work of ground crews treating the remaining melaleuca, as well as the other targeted species. The County contributed $72,079.80 toward the total project cost.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Lygodium microphyllum	Old World climbing fern	Category I	foliar	Rodeo/Roundup
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
Casuarina spp.	Australian pine	Category I	basal/cut stump	Garlon 4+Stalker
Schinus terebinthifolius	Brazilian pepper	Category I	basal/cut stump	Garlon 4+Stalker
Rhodomyrtus tomentosa	downy rose-myrtle	Category I	basal	Garlon 4+Stalker
Eugenia uniflora	Surinam-cherry	Category I	basal	Garlon 4+Stalker
Ardisia elliptica	shoebutton ardisia	Category I	hand pull	n/a
Carica papaya	papaya	n/a	basal	Garlon 4+Stalker



The northeastern portion (top) covered 416 acres, while the southeastern portion (bottom) was 454 acres.

Yamato Scrub Invasive Exotic Plant Control County: Palm Beach

PCL: Yamato Scrub Natural Area PCL Size: 217 acres

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

Project ID: SE-040 Project Size: 217 acres

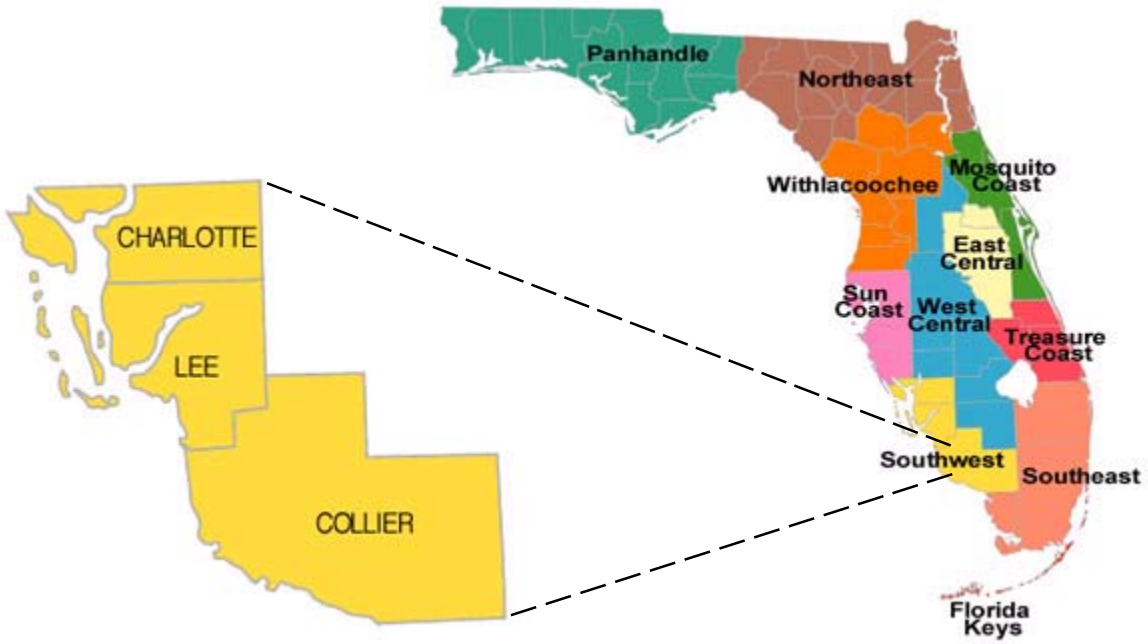
Fiscal Year 02/03 Project Cost: $97,750.68

The Yamato Scrub Natural Area is managed by Palm Beach County's Department of Environmental Resources Management. Yamato Scrub is one of the best examples of coastal scrub in southern Palm Beach County and contains important habitat for fifteen animal and nine plant species that are listed as rare or endangered. Nine of these are birds, with four reptiles, one mammal, and one arachnid. Listed plants include Curtiss' milkweed (*Asclepias curtissii*), hand fern (*Ophioglossum palmatum*), and cutthroat grass (*Panicum abscissum*). Yamato Scrub consists of a mosaic of vegetative communities, including scrub, scrubby flatwoods, drained basin marsh, mesic flatwoods, prairie hammock, and disturbed areas.

The highest concentrations of exotic species were within the drained basin marsh, containing a 7.8 acre monoculture of Brazilian pepper, and the disturbed areas along the site perimeter, containing 9.9 acres of Brazilian pepper and Australian pine monocultures. Ruderal and exotic herbs and grasses (Guinea, Natal, and St. Augustine) had colonized the sandy soils on the edges and higher spots. Most of the disturbed areas consist of spoil piles from the digging of canals and were dominated by Brazilian pepper and Australian pine. The relatively undisturbed vegetative communities were being invaded with light infestations of Brazilian Pepper, Australian pine, schefflera, carrotwood, ferns, grasses, and numerous other species.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal/cut stump	Garlon 4+Stalker
			foliar	Glypro
			mechanical	n/a
Abrus precatorius	rosary pea	Category I	foliar	Glypro
Acacia auriculiformis	earleaf acacia	Category I	basal/cut stump	Garlon 4+Stalker
Ardisia elliptica	shoebutton ardisia	Category I	basal/cut stump	Garlon 4+Stalker
			hand pull	n/a
Asparagus densiflorus	asparagus-fern	Category I	foliar	Glypro
Casuarina equisetifolia	Australian pine	Category I	mechanical	n/a
Cupaniopsis anacardioides	carrotwood	Category I	basal/cut stump	Garlon 4+Stalker
Eugenia uniflora	Surinam cherry	Category I	basal/cut stump	Garlon 4+Stalker
Psidium guajava	guava	Category I	basal/cut stump	Garlon 4+Stalker
Schefflera actinophylla	schefflera	Category I	basal/cut stump	Garlon 4+Stalker
Syzygium cumini	Java plum	Category I	basal	Garlon 4+Stalker
Tradescantia spathacea	oyster plant	Category I	basal	Garlon 4+Stalker
Rhynchelytrum repens	Natal grass	Category II	foliar	Glypro
Ricinus communis	castor bean	Category II	hand pull	n/a
Sansevieria hyacinthoides	bowstring hemp	Category II	basal	Garlon 4+Stalker
Wedelia trilobata	wedelia	Category II	foliar	Glypro
Kalanchoe daigremontiana	life plant	n/a	basal	Garlon 4+Stalker
Momordica charantia	balsam pear	n/a	foliar	Glypro
Panicum maximum	Guinea grass	n/a	foliar	Glypro
Stenotaphrum secundatum	St. Augustine grass	n/a	foliar	Glypro

Southwest Regional Working Group



The Southwest Regional Working Group liaison is Roger Clark, Lee County Parks and Recreation, 3410 Palm Beach Boulevard, Ft. Myers, Florida 33916, phone: 941-338-3343, fax: 941-257-1086, e-mail: roger@leegov.com. One longstanding partner in the Southwest region is the Office of Coastal and Aquatic Managed Areas (CAMA), also in the Department of Environmental Protection. CAMA is responsible for managing the state's aquatic and buffer preserves.

Surrounding Estero Bay, the Estero Bay State Buffer Preserve comprises mangrove forest, hydric pine flatwoods, tidal marsh, and salterns. A multi-agency effort to control melaleuca has been underway at the Preserve for several years, involving the state, the South Florida Water Management District, federal agencies, and Americorps volunteers. Two of the three projects completed at the Preserve this year (MR-005, MR-006) were funded by CAMA through federal grants. The project manager for these projects was:

Sherry Furnari
700-1 Fisherman's Wharf
Ft. Myers Beach, Florida 33931
Phone: 239-463-3240, Fax: 239-463-3634
E-mail: sherryl.furnari@dep.state.fl.us

Estero Bay Invasive Exotic Plant Maintenance Control	County: Lee
PCL: Estero Bay State Buffer Preserve	PCL Size: 9,746 acres
Project ID: SW-042	Project Size: 266 acres
Fiscal Year 02/03	Project Cost: $190,813.93

Some management units required retreatment after their initial aerial treatment in March 2001. The targeted parcels contained several acres of monoculture melaleuca stands. Although the Preserve had over one thousand acres containing some percentage of invasive plants, the initial project targeted parcels with dense levels of melaleuca or Australian pine infestation that occurred within hydric pine flatwoods, tidal marsh, cypress slough, and upland scrub communities. Approximately 500 acres were aerially treated March 26-29, 2001 with 2lb/ac of Velpar L. While treatment in most areas was effective, killing the large exotic trees in place, resprouting of melaleuca seedlings occurred in some areas. This is not uncommon with large scale treatments.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Melaleuca quinquenervia	melaleuca	Category I	aerial	Velpar L

Estero Bay Invasive Exotic Plant Control	County: Lee
PCL: Estero Bay State Buffer Preserve	PCL Size: 9,746 acres
Project ID: MR-005	Project Size: 480 acres
Fiscal Year 02/03	Project Cost: $79,348

The Estero Bay State Buffer Preserve consists of several management units that contain the principal target plant, melaleuca. The Preserve's inceptive locations (Winkler, Cow, and No Name Points) all contained dense levels of melaleuca infestation. These areas are comprised of plant communities such as mangrove forest, tidal marsh, depression marshes, salterns, and hydric pine flatwoods.

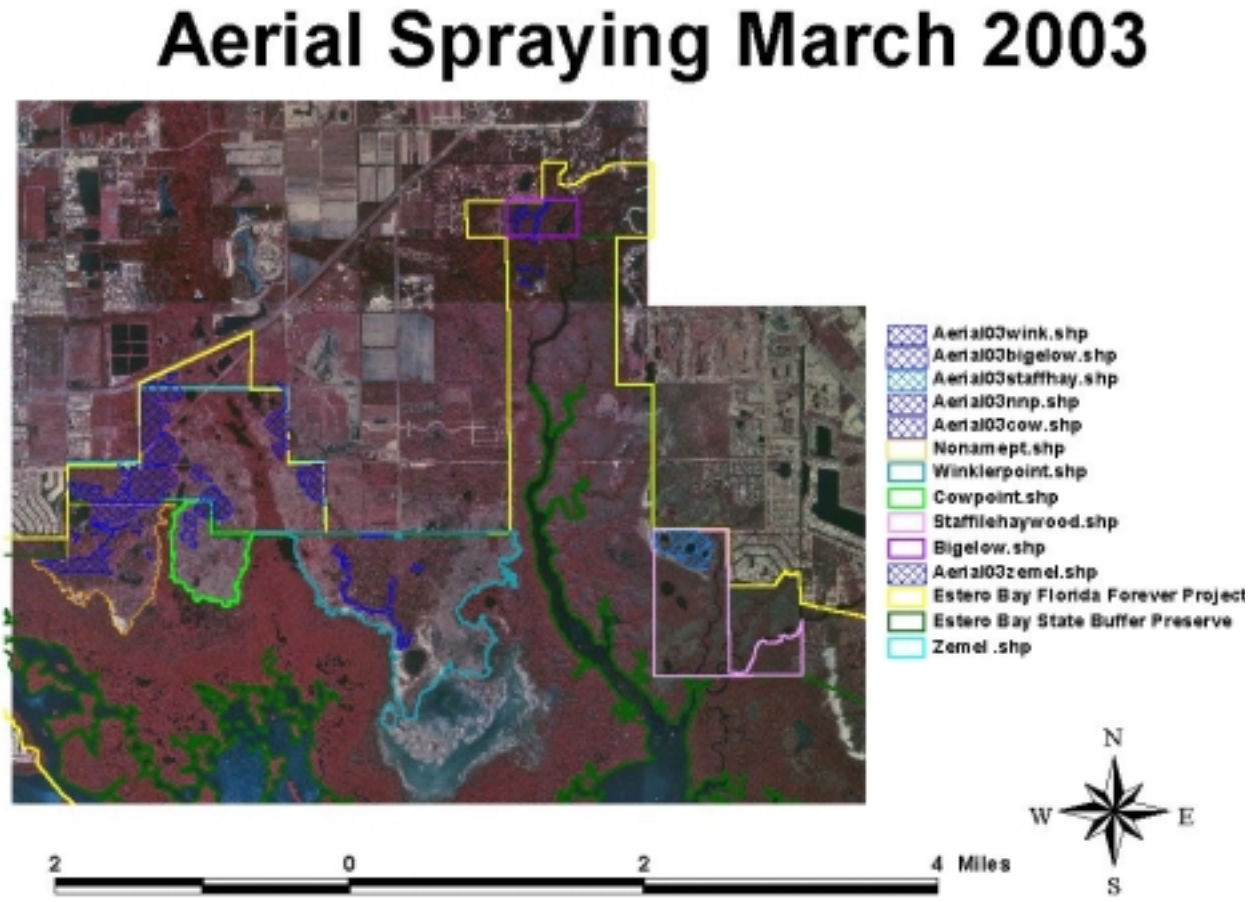
Although the Preserve had over 1,000 acres containing exotic plants, the initial aerial treatment project included only management units with dense areas of melaleuca or Australian pine. Helicopters treated ~500 acres with 2gal/ac of Velpar L during March 26-29, 2001. While the treatment was mostly successful—killing the large trees in place—sections of the treated areas experienced tremendous levels of melaleuca seedling germination. Within the past year, the Preserve has acquired an additional 1,300+ acres of land and nearly 25% was heavily infested with melaleuca. Accordingly, 480 acres of both "new & old" locations were aerially sprayed utilizing the same methodology on March 28-29, 2003.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Melaleuca quinquenervia	melaleuca	Category I	Aerial	Velpar L
Casuarina equisetifolia	Australian pine	Category I	Aerial	Velpar L

The Zemel Tract before (left) and after treatment. Treatment was divided into aerial (trees on left above) and ground control (area right of road).

Trees on the right side were treated.

Melaleuca showing more stress than Australian pines.



The above ArcView map shows the approximate AgNav map overview files provided by the contractor for aerial treatment areas. The contractor reported the following treatment results:

Preserve Unit	Acres Treated
Zemel	225
Winkler Point	25
Cow Point	20
No Name Point	150
Bigelow	25
Staffile & Haywood	35
TOTAL	**480**

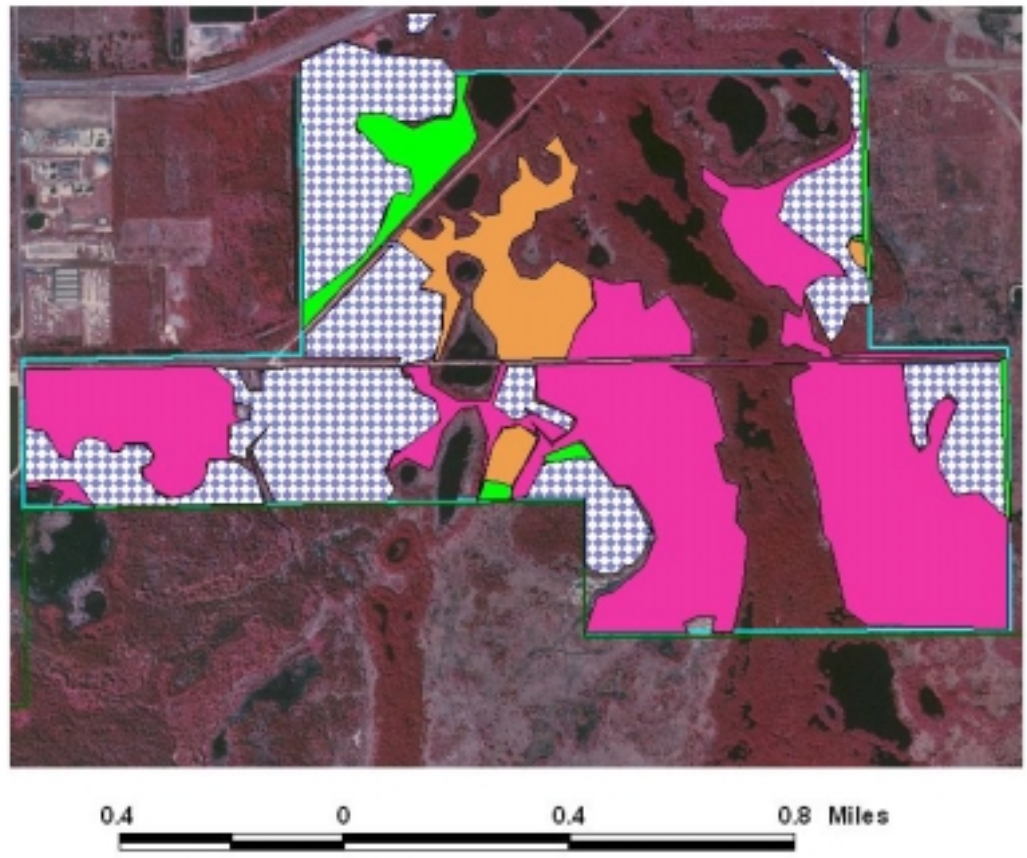
Estero Bay Invasive Exotic Plant Control	County: Lee
PCL: Estero Bay State Buffer Preserve	PCL Size: 9,746 acres
Project ID: MR-006	Project Size: 338 acres
Fiscal Year 02/03	Project Cost: $250,000

The newly acquired Zemel parcel is an estuarine marsh that is traversed by two freshwater sloughs. Nearly three-quarters of the parcel contained some level of exotic plant infestation. This project targeted the less dense areas of infestation and/or areas not aerially treated during March 2003 (MR-005) for removal by ground crews.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Melaleuca quinquenervia	Melaleuca	Category I	cut stump	Arsenal
Casuarina equisetifolia	Australian pine	Category I	cut stump	Arsenal
Schinus terebinthifolius	Brazilian pepper	Category I	Basal	Garlon 4
Cupaniopsis anacardioides	Carrotwood	Category I	Basal	Garlon 4
Acacia auriculiformis	Earleaf acacia	Category I	Cut stump	Arsenal

Melaleuca treated in a pine flatwoods (above) and in a hydric hammock (below).

Zemel Handcrew MR-006



The above ArcView map identifies the locations of the hand crew work performed by the exotic plant removal contractors.

Preserve Unit	Acres Treated
SEC/ME	257
AA	40
not completed	41
TOTAL	**338**

Bunche Beach Invasive Exotic Plant Control | County: Lee

PCL: San Carlos Bay-Bunche Beach Preserve | PCL Size: 727.1 acres

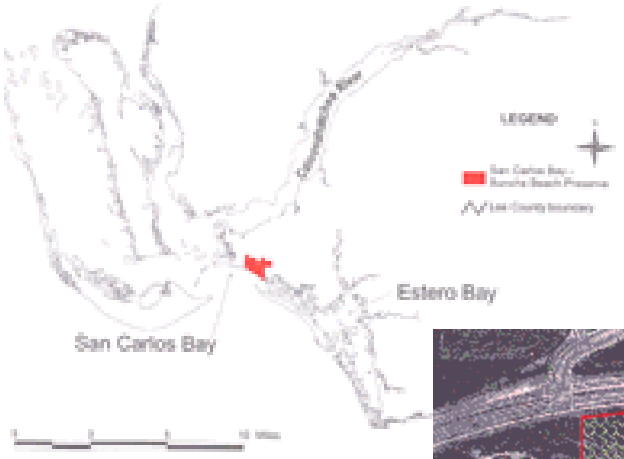
Project Manager: Lee County Department of Parks and Recreation
Roger S. Clark, Land Stewardship Manager
3410 Palm Beach Boulevard, Fort Myers, Florida 33916
Phone: 239-461-7453, Fax: 239-461-7460
Email: roger@leegov.com

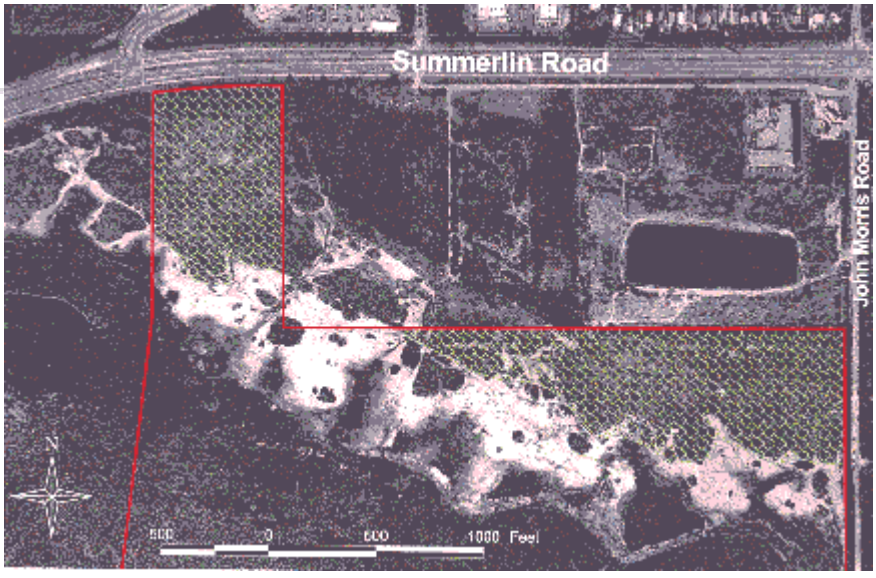
Project ID: SW-027 | Project Size: 40 acres

Fiscal Year 02/03 | Project Cost: $44,990

Bunche Beach Preserve is located in southwestern Lee County, near San Carlos Bay, and lies within the boundaries of the Estero Bay State Buffer Preserve. The project area lay within a high marsh and transitional wetland community. The western portion of the site contained a stand of Australian pine with a canopy ranging from 25% to 100% and an understory of Brazilian pepper and scattered melaleuca. Percent coverage of exotics averaged approximately 50%. The eastern portion of the site had melaleuca and Brazilian pepper in densities ranging from 25% to 100%. Percent coverage of exotics averaged approximately 30%. There were also clumps of earleaf acacia and Guinea grass, as well as scattered carrotwood.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Melaleuca quinquenervia	melaleuca	Category I	mechanical	n/a
			cut stump	Roundup
Schinus terebinthifolius	Brazilian pepper	Category I	mechanical	n/a
			cut stump	Garlon 4
Casuarina equisetifolia	Australian pine	Category I	mechanical	n/a
			cut stump	Garlon 4
Cupaniopsis anacardioides	carrotwood	Category I	cut stump	Garlon 4
			hand pull	n/a
Acacia auriculiformis	earleaf acacia	Category I	cut stump	Garlon 4
			hand pull	n/a
Panicum maximum	Guinea grass	n/a	foliar	Roundup





Cayo Costa Invasive Exotic Plant Maintenance Control | County: Lee

PCL: Cayo Costa State Park (Barrier Islands GEOpark) | PCL Size: 2,412 acres

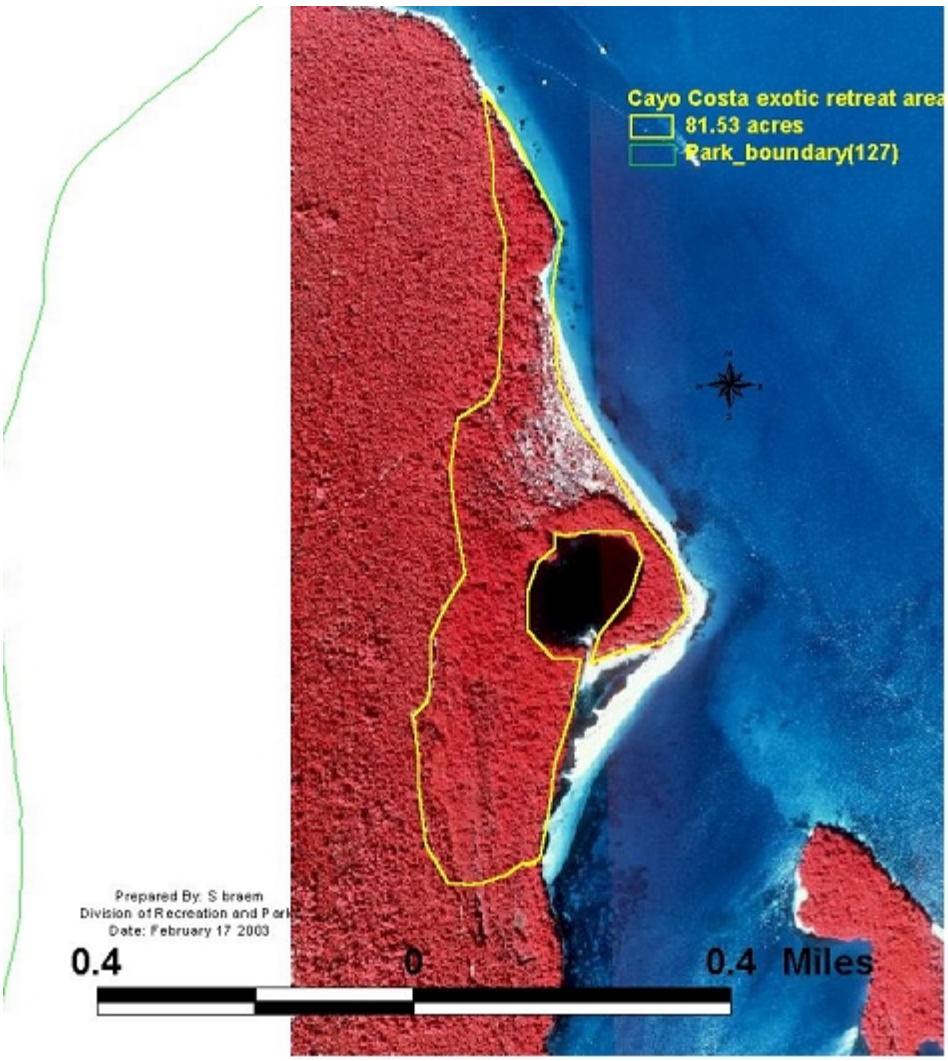
Project Manager: Florida Park Service (DEP)
Reggie C. Norman, Park Manager
880 Belcher Road, P.O. Box 1150, Boca Grande, Florida 33921
Phone: 941-964-0375, -2965, Fax: 941-964-1154
E-mail: reginald.norman@dep.state.fl.us

Project ID: SW-045 | Project Size: 81.53 acres

Fiscal Year 02/03 | Project Cost: $26,313.12

Cayo Costa State Park is managed as part of the Barrier Islands GEOpark. Natural communities of the park include Beach Dune, Coastal Grassland, Maritime Hammock, and Shell Mound. The park's beaches are sea turtle nesting habitat, and several rare plant and animal species are found in the park. The project area is the northeast portion of the park.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Casuarina equisetifolia	Australian pine	Category I	basal	Garlon 4
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
			hand pull	n/a
Scaevola sericea	beach naupaka	Category I	basal	Garlon 4
			hand pull	n/a
Leucaena leucocephala	lead tree	Category II	basal	Garlon 4
			hand pull	n/a



Billy's Creek Invasive Exotic Plant Control	County: Lee
PCL: Billy's Creek Day Camp and Nature Center	PCL Size: 35 acres
Project Manager: City of Fort Myers J.B. Schuetz, Parks Director PO Drawer 2217, Fort Myers, Florida 33902-2217 Phone: 941-332-6836, Fax: 941-332-4504 E-mail: jbschuetz@cityftmyers.com	
Project ID: SW-028	Project Size: 35 acres
Fiscal Year 02/03	Project Cost: $41,779.22

The Billy's Creek Day Camp and Nature Center is located south of State Road 80 in the area known as East Fort Myers. Billy's Creek Day Camp and Nature Center is part of Shady Oaks Park, one of Fort Myers oldest parks, consisting of older active recreation areas and undeveloped areas adjacent to Billy's Creek and south of the Billy's Creek. North of the creek is a hydric hammock exhibiting primarily live oaks, cabbage palms, and a few royal palms. Brazilian pepper (*Schinus terebinthifolius*) and air-potato (*Dioscorea bulbifera*) infested this area. Billy's Creek is brackish and mangroves and buttonwoods line the shoreline. Brazilian pepper and seaside mahoe (*Thespesia populnea*) colonized the shoreline ridge and were competing with the mangroves. The southern area is a cabbage palm hammock with very little understory. Brazilian pepper, woman's tongue (*Albizia lebbeck*), and several species that had colonized from yard waste, such as wedelia (*Wedelia trilobata*) and schefflera (*Schefflera actinophylla*), infested the periphery of this hammock

This was a cost-share project with the City of Fort Myers, which contributed $35,500 of the total project cost. The bureau paid for the tipping fees to dispose of the plant material, a cost of $1,832.23, and provided the herbicide through its Herbicide Bank, at a cost of $4,446.99.

Lovers Key Invasive Exotic Plant Maintenance Control	County: Lee
PCL: Lovers Key State Park	PCL Size: 1,616 acres
Project Manager: Florida Park Service (DEP) Paul Rice, Park Manager 8700 Estero Boulevard, Fort Myers Beach, Florida 33931 Phone: 941-463-4588, Fax: 941-463-8851 E-mail: paul.rice@dep.state.fl.us	
Project ID: SW-047	Project Size: n/a acres
Fiscal Year 02/03	Project Cost: $6,236

Lovers Key State Recreation Area is located between Bonita Beach and Ft. Myers Beach. The park consists primarily of four islands contained between New Pass to the south and Big Carlos Pass to the North. The project site was on Inner Key, which is a 52-acre barrier island consisting of disturbed coastal strand community fringed by a marine tidal swamp. The primary exotic tree (85%) was Australian pine, with the remainder being mature Brazilian pepper. This is the fourth year of retreatment and restoration. All control work was completed in the prior fiscal year (SW-015). The purpose of this project was to collect the dead trees and burn them on site.

Panther/Fakahatchee Invasive Exotic Plant Control	County: Collier
PCL: Florida Panther National Wildlife Refuge PCL: Fakahatchee Strand State Preserve	PCL Size: 26,529 acres PCL Size: 70,376 acres
Project Managers: U.S. Fish and Wildlife Service Dennis Giardina, Refuge Manager 3860 Tollgate Blvd., Suite 300, Naples, Florida 34114 Phone: 941-353-8442, Ext 27, Fax: 941-353-8640 E-mail: dennis_giardina@fws.gov	Florida Park Service (DEP) Gregg Toppin PO Box 548, Copeland, Florida 34137 Phone: 941-695-4593, Fax: 941-695-4957 Email: greg.toppin@dep.state.fl.us
Project ID: SW-029	Project Size: 1,383 acres
Fiscal Year 02/03	Project Cost: $229,000

Florida Panther National Wildlife Refuge is located approximately 20 miles east of Naples 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. This project was supplemental to a previous year project on the south border of the Refuge. The project site ran parallel to I-75 on the north and south sides, from mile marker 87 to approximately mile marker 81. 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. Florida Department of Transportation owns a small portion of the treatment area (approximately the first 80 feet north of the canal).

The project site contained approximately 600 Refuge acres and 780 Preserve acres, comprising mixed habitat types that include pine flatwoods, hardwood hammock, cypress swamp, and wet sawgrass prairie. USFWS contributed $29,000 of the total cost through a cost-share challenge grant. The Florida Park Service contributed $10,000 of the total cost.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal/foliar	Garlon 4
			lacing/cut stump	Arsenal
			hand pull	n/a
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
			hand pull	n/a
Psidium guajava	guava	Category I	basal	Garlon 4
Casuarina equisetifolia	Australian pine	Category I	basal	Garlon 4
Colocasia esculenta	wild taro	Category I	basal	Garlon 4
Lygodium microphyllum	Old World climbing fern	Category I	foliar	Rodeo
Leucaena leucocephala	lead tree	Category II	basal	Garlon 4

Florida Panther Invasive Exotic Plant Control	County: Collier
PCL: Florida Panther National Wildlife Refuge	PCL Size: 26,529 acres
Project Manager: U.S. Fish and Wildlife Service Dennis Giardina, Refuge Manager 3860 Tollgate Blvd., Suite 300, Naples, Florida 34114 Phone: 239-657-7637, Ext 29, Fax: 239-657-9037 E-mail: dennis_giardina@fws.gov	
Project ID: SW-023	Project Size: 35 acres
Fiscal Year 02/03	Project Cost: $24,423.85

This second project area contains mixed habitat types including pine flatwoods, hardwood hammock, cypress swamp, and wet sawgrass prairie. The project site, Royal Palm Hammock, contains approximately 35 acres of hardwood hammock. There was a 5-acre monoculture of Brazilian pepper and scattered pepper throughout the site.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal/foliar	Garlon 4
			hand pull	n/a
Psidium guajava	guava	Category I	basal	Garlon 4

Brush Key Invasive Exotic Plant Control — County: Collier

PCL: Rookery Bay National Estuarine Research Reserve — PCL Size: 110,000 acres

Project Manager: Office of Coastal and Aquatic Managed Areas (DEP)
Randy Penn
300 Tower Road, Naples, Florida 34113
Phone: 941-417-6310, Fax: 941-417-6315
Email: randy.penn@dep.state.fl.us

Project ID: SW-022b — Project Size: 14 acres

Fiscal Year 02/03 — Project Cost: $7,000

Rookery Bay NERR is located in Collier County ten miles southeast of Naples, with a northern boundary at Gordon Pass and a southern boundary at Camp LuLu Key in the Ten Thousand Islands. The project site was Brush Key, a 24-acre island in the Ten Thousand Island section of the NERR. The island consists of beach, dune, mangrove forests, and coastal strand communities. A number of endangered plants occur within the Ten Thousand Islands, including golden leather fern (*Acrostichum aureum*), hand fern (*Ophioglossum palmatum*), Curtiss' milkweed (*Asclepias curtissii*), pinweed (*Lechea cernua*), nodding pinweed (*Lechea cernua*), satinleaf (*Chrysophyllum olivaeforme*), several endangered "air plants" or wild pines (*Tillandsia fasciculata*), (*T. flexuosa*), (*T. utriculata*), and (*T. pruinosa*). Six islands were completed under this project in the prior fiscal year. Brush Key was the seventh island in the project, but could not be completed until the current fiscal year.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 4
Casuarina equisetifolia	Australian pine	Category I	cut stump	Garlon 4
Colubrina asiatica	lather leaf	Category I	cut stump	Garlon 4
Kalanchoe daigremontiana	life plant	n/a	foliar	Rodeo

Faka Union Canal Invasive Exotic Plant Control — County: Collier

PCL: Rookery Bay National Estuarine Research Reserve — PCL Size: 110,000 acres

Project Manager: Office of Coastal and Aquatic Managed Areas (DEP)
Randy Penn, Resource Management Specialist
300 Tower Road, Naples, Florida 34113
Phone: 941-417-6310, Fax: 941-417-6315
Email: randy.penn@dep.state.fl.us

Project ID: SW-031 — Project Size: 90 acres

Fiscal Year 02/03 — Project Cost: $91,740.35

Rookery Bay NERR is located 10 miles southeast of Naples, Florida. The 110,000-acre Reserve has a northern boundary at Gordon Pass and a southern boundary at Camp LuLu Key in the Ten Thousand Islands. The Ten Thousand Islands National Wildlife Refuge is located approximately 20 miles southeast of Naples. The 35,000-acre NWR overlays a significant portion of the Cape Romano-Ten Thousand Islands State Aquatic Preserve. The Fakahatchee Strand Preserve State Park extends east and north of the Ten Thousand Islands NWR and also overlays a portion of the Aquatic Preserve along and east of the Faka Union Canal. The project site is located along the Faka Union Canal north of the Ten Thousand Island section of the Reserve on lands managed by Rookery Bay NERR, Fakahatchee Strand Preserve SP, and Ten Thousand Island NWR. Rare and endangered species occurring in the Ten Thousand Islands area include barbed wire cactus, satinleaf, wild cotton, bay cedar, common wild pine, and giant wild pine.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
			lacing	Arsenal
			hand pull	n/a
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
			hand pull	n/a
Lygodium microphyllum	Old World climbing fern	Category I	foliar	Roundup+Escort
Leucaena leucocephala	lead tree	Category II	basal	Garlon 4

Picayune Strand Invasive Exotic Plant Maintenance Control | County: Collier

PCL: Picayune Strand State Forest | PCL Size: 65,436 acres

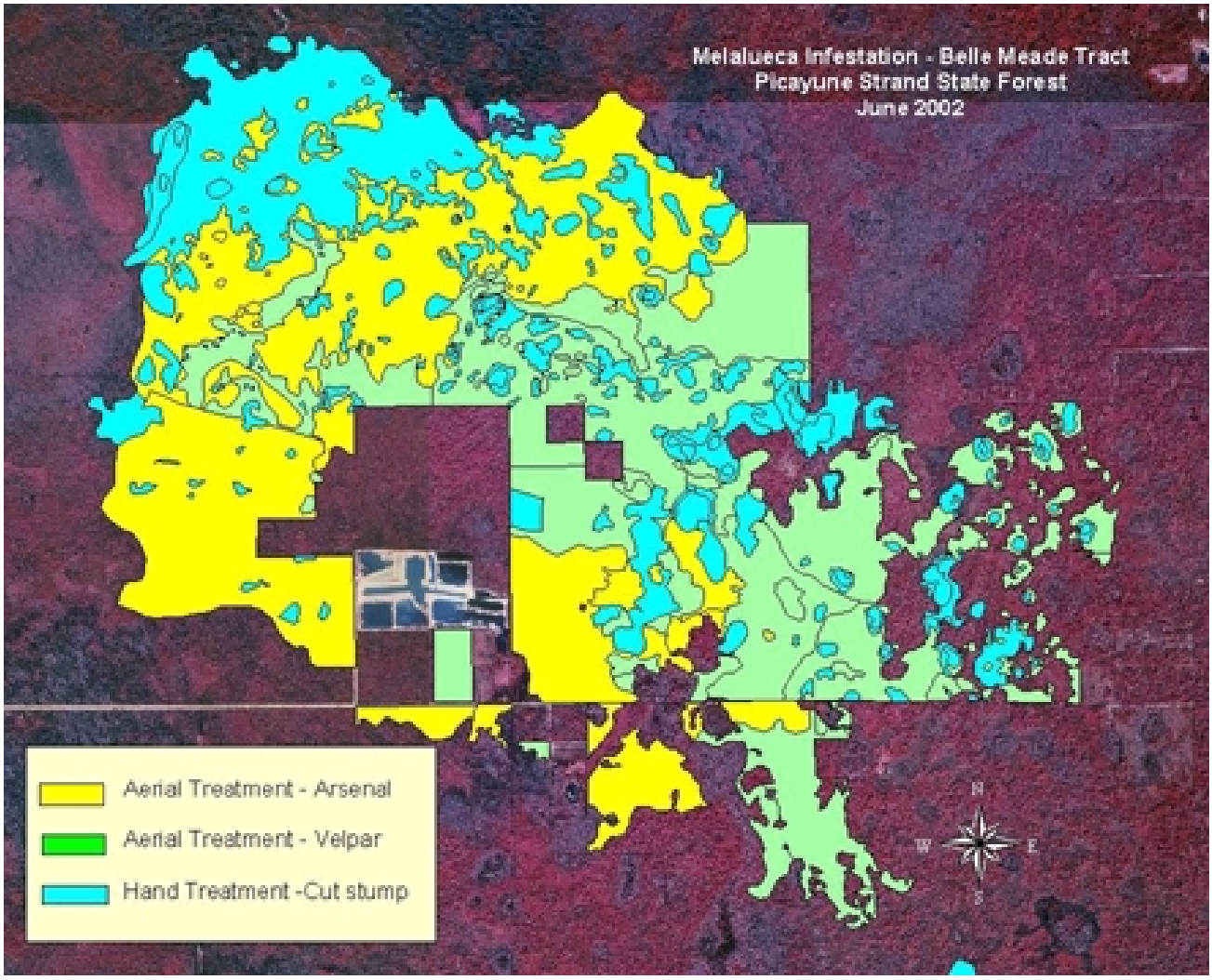
Project Manager: Division of Forestry (FDACS)
Sonja Durrwachter
710 Randall Boulevard, Naples, Florida 34120
Phone: 941-348-7557, Fax: 941-352-4212
Email: Durrwas@doacs.state.fl.us

Project ID: SW-046 | Project Size: 669 acres

Fiscal Year 02/03 | Project Cost: $3,230.67

The project area is within the Belle Meade Tract, which is a part of the Picayune Strand State Forest. The area has known populations of Florida panther, Florida black bear, and Big Cypress fox squirrel. The treatment area consists of abandoned farm fields that have been inactive for at least fifteen years. The cross-ditches previously used for irrigation of row crops remained and became infested with Brazilian pepper. There are also perimeter ditches and berms around the boundaries of each field. A low volume foliar application, or "lac ing," of Arsenal with methylated seed oil as a surfactant was used to treat the Brazilian pepper. This project was a retreatment of the area initially treated last year (SW-019).

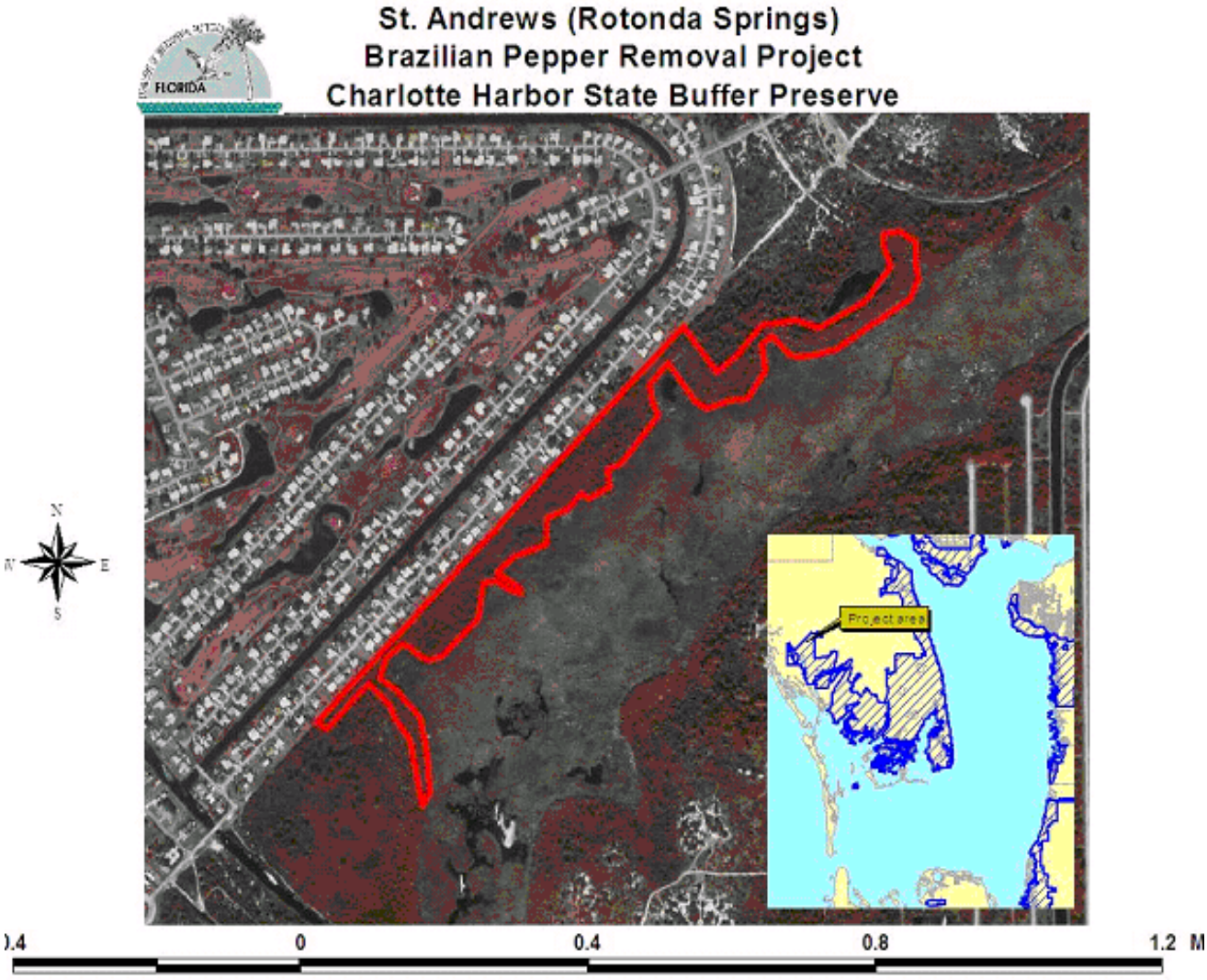
Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	lacing	Arsenal



St. Andrews Lane Invasive Exotic Plant Control	County: Charlotte, Lee
PCL: Charlotte Harbor State Buffer Preserve	PCL Size: 43,614 acres
Project Manager: Office of Coastal and Aquatic Managed Areas (DEP) Keith Laakkonen, Land Management Coordinator 122301 Burnt Store Road, Punta Gorda, Florida 33955 Phone: 941-575-5861, Fax: 941-575-5863 Email: keith.laakkonen@dep.state.fl.us	
Project ID: SW-021	Project Size: 30 acres
Fiscal Year 02/03	Project Cost: $50,078

The project area was in the Rotonda unit of the Buffer Preserve where the majority (50-80%) of the vegetative coverage was Brazilian pepper, especially along the ecotones. The eastern portion of the project area is oak scrub, mesic flatwoods and estuarine tidal marsh sloping down to the west branch of Coral Creek a and immediately south of St. Andrews Lane. This matrix of habitats benefits many species; American alligators use the wetland portions, gopher tortoises have been documented in the area, and the habitat exists for eastern indigo snake, Florida scrub jay, and other listed wildlife species. Florida coontie (*Zamia pumila*) has also been documented at this site. Restoring the shoreline of Coral Creek will provide foraging habitat for listed wading birds.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump/basal bark	Garlon 4



Project ID: SW-048	Project Size: 461 acres
Fiscal Year 02/03	Project Cost: $78,072.84

Additional control work conducted at the preserve involved aerial treatment of Brazilian pepper and melaleuca. The pepper was in areas where the hydrology had been highly altered by drainage and mosquito ditching, thus making ideal conditions for the invasion of pepper. The habitats occupied by the pepper were historically wetlands, mostly isolated with some marshes and sloughs with very little understory vegetation. Melaleuca was rapidly spreading in pine flatwoods, high coastal marsh, and buttonwood/mangrove forest. The understory was comprised of highly stressed *Juncus* and buttonwood. Land clearing and canal dredging in the 1960s affected the areas currently invaded by melaleuca, before the state halted further westward development in Cape Coral. In at least two of the sites, melaleuca was spreading rapidly into pine flatwoods due to a wildfire five years ago that released seeds from scattered "outlier" trees. Herbicide was provided for ground control work through the bureau's Herbicide Bank.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Melaleuca quinquenervia	melaleuca	Category I	aerial	Velpar
Schinus terebinthifolius	Brazilian pepper	Category I	aerial	Velpar
			basal	Garlon 4

Don Pedro Land Base Invasive Exotic Plant Control — County: Charlotte

PCL: Don Pedro State Park (Barrier Islands GEOpark) — PCL Size: 230 acres

Project Manager: Florida Park Service (DEP)
Reggie C. Norman, Park Manager
880 Belcher Road, P.O. Box 1150, Boca Grande, Florida 33921
Phone: 941-964-0375, -2965, Fax: 941-964-1154
E-mail: reginald.norman@dep.state.fl.us

Project ID: SW-030 — Project Size: 10 acres

Fiscal Year 02/03 — Project Cost: $57,089.74

The Don Pedro Island Landbase is part of Don Pedro Island State Park, which is itself managed as part of the Barrier Islands GEOpark. The natural communities of the project area comprise 99.3 acres of which approximately 55 acres is mesic pine flatwoods. The remainder is tidal mangrove swamp and tidal marsh, with an additional 10 acres infested with Australian pine and Brazilian pepper. This area also has scattered melaleuca seedlings and some mature trees.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
			cut stump	Arsenal
			hand pull	n/a
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
			hand pull	n/a
Casuarina equisetifolia	Australian pine	Category I	basal	Garlon 4
			cut stump	Arsenal

10,000 Islands Invasive Exotic Plant Control — County: Collier

PCL: Ten Thousand Islands National Wildlife Refuge — PCL Size: 19,650 acres

Project Manager: U.S. Fish and Wildlife Service
Jim Krakowski, Refuge Manager
3860 Tollgate Boulevard, Suite 300, Naples, Florida 34114
Phone: 239-657-7637 ext 27, Fax: 239-657-9037
E-mail: jim_krakowski@fws.gov

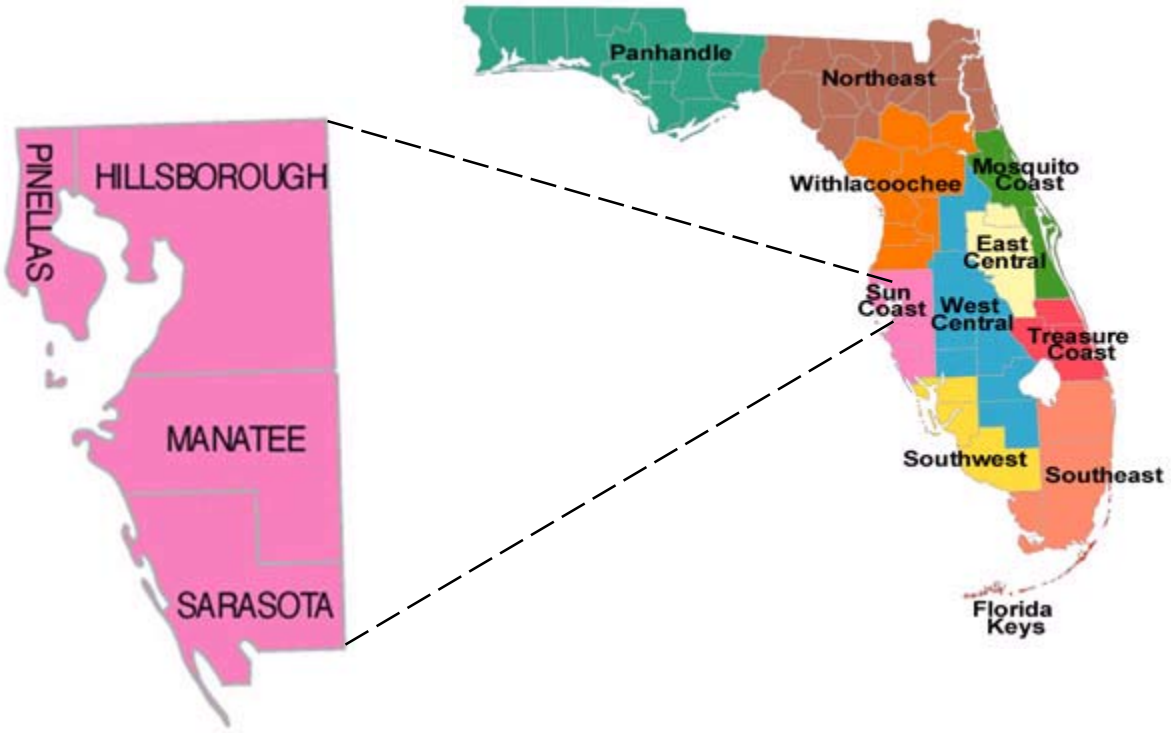
Project ID: SW-049 — Project Size: 50 acres

Fiscal Year 02/03 — Project Cost: $1,541.70

Ten Thousand Islands National Wildlife Refuge is located 12 miles southeast of Naples, contiguous with Rookery Bay National Estuarine Research Reserve. The project area contained coastal marsh invaded by Brazilian pepper. BIPM purchased only the herbicide for this project through its Herbicide Bank.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
			hand pull	n/a

Sun Coast Regional Working Group

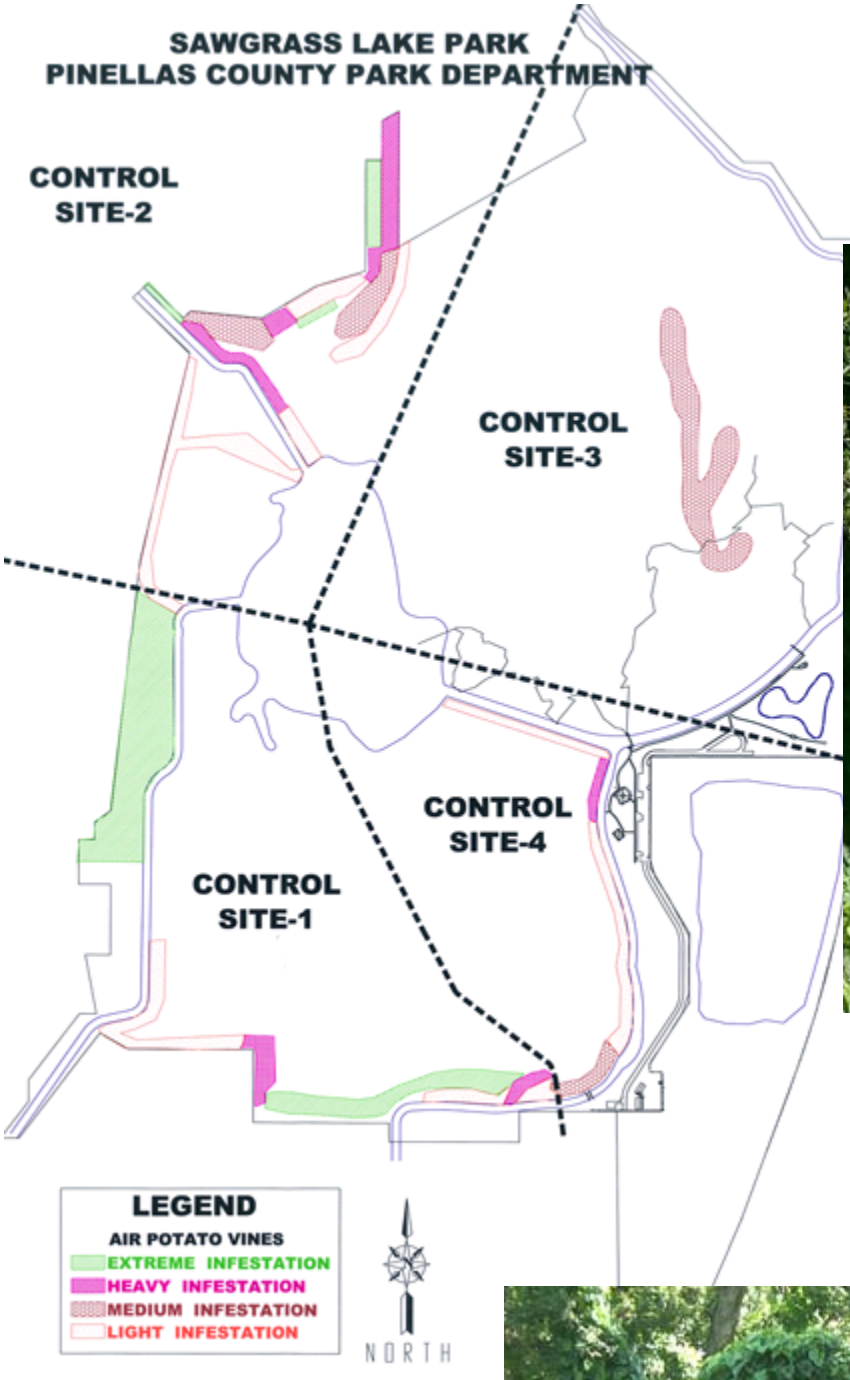


The Sun Coast Regional Working Group liaison is Ms. Debbie Chayet, Pinellas County Parks Department, 631 Chestnut Street, Clearwater, Florida 33756, phone: 727-464-3347, fax: 727-464-3379, e-mail: dchayet@co.pinellas.fl.us. Six of the fourteen projects completed in this region were partnerships with Pinellas County. Ms. Chayet was the project manager for the following five projects.

Sawgrass Lake Invasive Exotic Plant Control	County: Pinellas
PCL: Sawgrass Lake Park	PCL Size: 400 acres
Project ID: SC-015	Project Size: 55.5 acres
Fiscal Year 02/03	Project Cost: $131,214.39

Sawgrass Lake Park is owned by the Southwest Florida Water Management District, with the park operated and maintained by the Pinellas County Park Department for passive recreational use. The Anderson Environmental Education Center located at the park is staffed by an instructor from the Pinellas County School Board and offers a wide range of environmental education programs. Air-potato vines of varying densities, ranging from light to extreme (15%-90%), infested approximately 50 acres of oak hammock, maple swamp, and ecotonal areas. There were four control sites, ranging from 5 to 20 acres in size.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Dioscorea bulbifera	air-potato	Category I	foliar	Glypro
Colocasia esculenta	wild taro	Category I	foliar	Glypro
Lygodium spp.	climbing fern	Category I	foliar	Glypro
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Psidium guajava	guava	Category I	basal/cut stump	Garlon 4
Urena lobata	Caesar's weed	Category II	foliar	Glypro

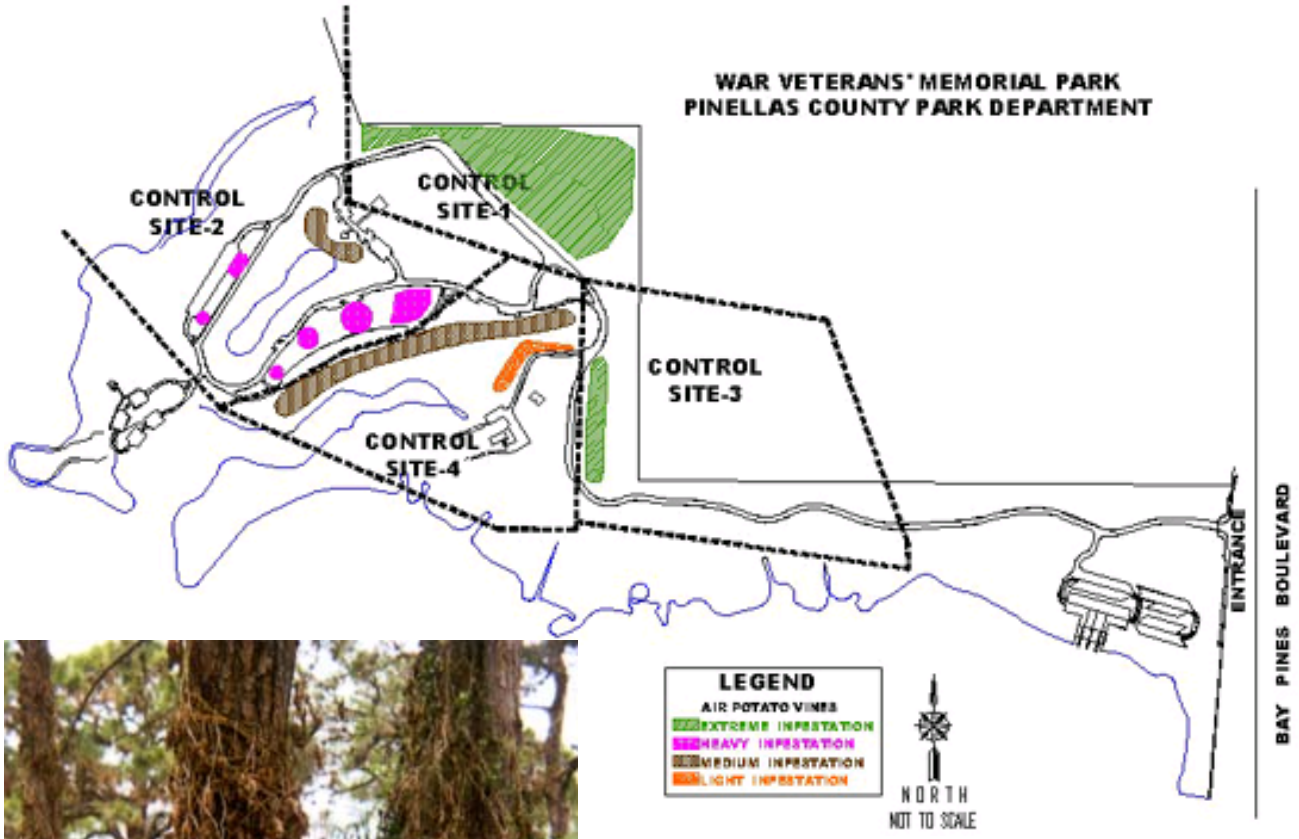

SAWGRASS LAKE PARK
PINELLAS COUNTY PARK DEPARTMENT
CONTROL SITE-2
CONTROL SITE-3
CONTROL SITE-4
CONTROL SITE-1
LEGEND
AIR POTATO VINES
EXTREME INFESTATION
HEAVY INFESTATION
MEDIUM INFESTATION
LIGHT INFESTATION
NORTH

Air-potato, like other problem vines, smothers native vegetation with a thick blanket of leaves (above). A properly conducted control operation kills the pest, without affecting the native greenery (below).

War Veterans Invasive Exotic Plant Control	County: Pinellas
PCL: War Veterans Memorial Park	PCL Size: 122 acres
Project ID: SC-014	Project Size: 40 acres
Fiscal Year 02/03	Project Cost: $50,853.76

War Veterans' Memorial Park, adjacent to Boca Ciega Bay and Bay Pines National Cemetery, contains pine flatwoods, mangrove fringe, and upland hardwood hammock vegetative communities. A population of the protected *Habenaria* occurs in the work area. Air-potato vines of varying densities, ranging from light to extreme (40%-90%), infested approximately 40 acres of primarily pine flatwoods and hammock. Air-potato vines also encroached on the edges of the mangrove habitat. There were four control sites, ranging from 4 to 21 acres in size. The overall project involved the Girl and Boy Scouts, 4-H Club, and other volunteers.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Dioscorea bulbifera	air-potato	Category I	foliar	Rodeo
Abrus precatorius	rosary pea	Category I	foliar	Rodeo
Urena lobata	Caesar's weed	Category II	foliar	Rodeo



Weedon Island Invasive Exotic Plant Control	County: Pinellas
PCL: Weedon Island Preserve	PCL Size: 3,000 acres
Project ID: SC-019	Project Size: 350 acres
Fiscal Year 02/03	Project Cost: $34,700

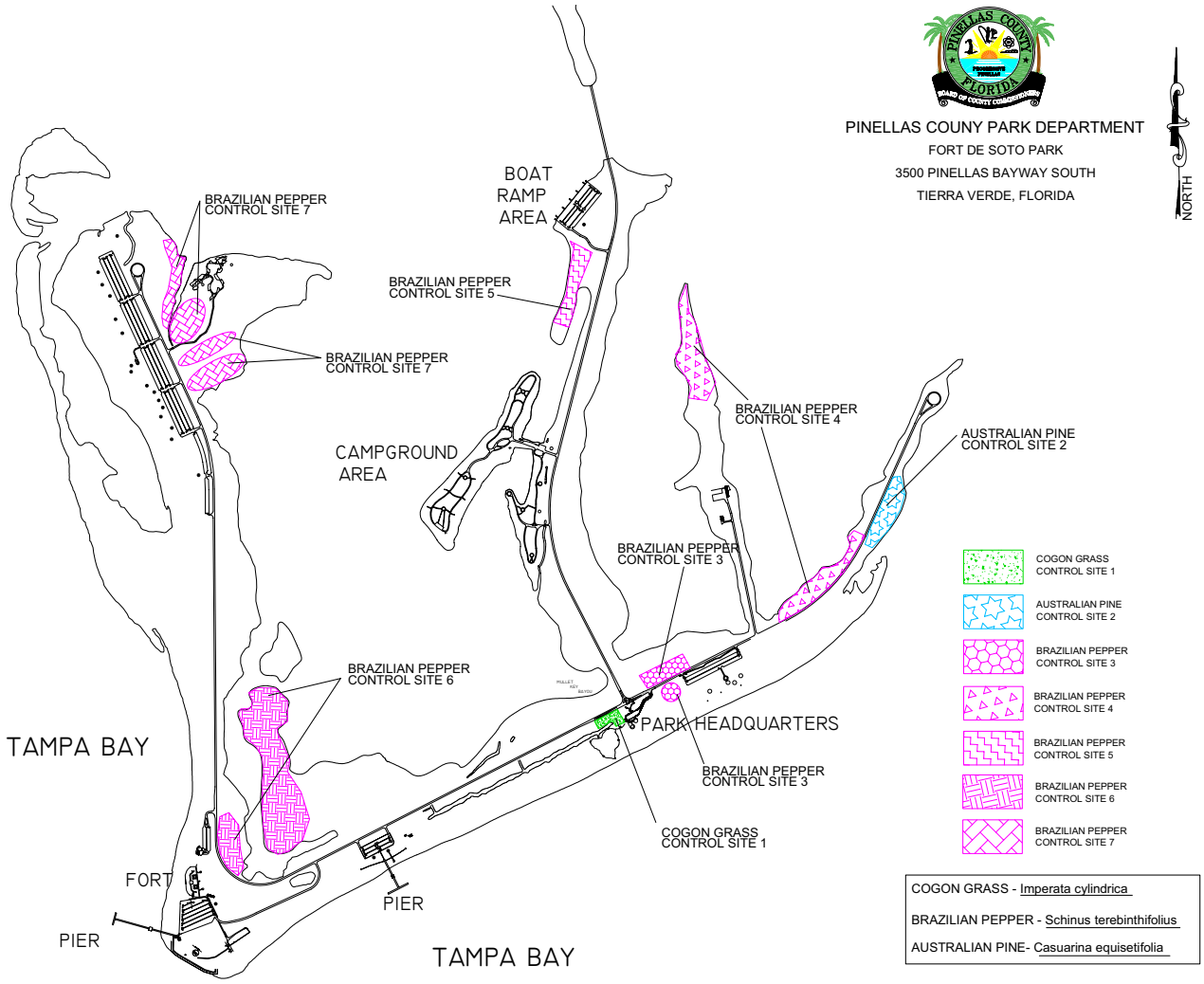
Weedon Island Preserve is one of the largest natural areas remaining in Pinellas County and provides habitats for a great diversity of flora and fauna. Natural communities include tidal marsh, pine flatwoods, and xeric hammock. Due to past construction of roads and mosquito ditches, nonnative plants flourished around the entrance area. Control operations in this particular area will heighten public awareness of invasive exotic plants and the need for their removal.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Casuarina equisetifolia	Australian pine	Category I	basal/girdle/cut stump	Garlon 4
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Cupaniopsis anacardioides	carrotwood	Category I	basal/foliar	Garlon 4
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
Abrus precatorius	rosary pea	Category I	foliar	Garlon 4
Leucaena leucocephala	lead tree	Category II	foliar/cut stump	Garlon 4

Ft. De Soto Invasive Exotic Plant Maintenance Control	County: Pinellas
PCL: Ft. De Soto Park	PCL Size: 1,136 acres
Project ID: SC-041	Project Size: 86 acres
Fiscal Year 02/03	Project Cost: $38,607.82

Ft. De Soto Park provides passive recreation including camping, fishing, and nature trails. The park includes over seven miles of nationally-ranked beaches. Natural communities include scrub, pine flatwoods, coastal dunes, mangrove swamps, and oak hammock. This project consisted of re-treatment of Brazilian pepper and Australian pine on six sites, along with initial treatment of one acre of cogon grass. Infestations were light to moderate with only small specified areas needing heavier control. Control and maintenance operations are ongoing on the Park, with the areas originally treated by BIPM being prioritized. Park staff also expanded their control efforts into an additional 75 acres of Brazilian pepper and Australian pine. Control, maintenance, and monitoring of cogon grass is also a high priority. Control efforts include park staff that conduct mechanical and chemical removal, as well as prescribed burning, and *Pepperbuster* volunteer assistance from local groups.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Casuarina equisetifolia	Australian pine	Category I	basal	Garlon 4
Cupaniopsis anacardioides	carrotwood	Category I	basal	Garlon 4
Imperata cylindrica	cogon grass	Category I	foliar	Rodeo
Phoenix reclinata	Senegal date palm	Category II	basal	Garlon 4
Eucalyptus spp.	eucalyptus	n/a	basal	Garlon 4



Brazilian pepper covers over 700,000 acres and is the most widespread of invasive species in Florida. Its dense thickets crowd out native plant species, while offering no benefits to native wildlife. Several counties have efforts directed specifically at controlling this alien menace.

Patience has its rewards. Four to six weeks after a basal bark application of Garlon 4, the Australian pine trees are dead and the Brazilian pepper is looking not at all healthy (it may linger on for up to another six weeks).

Lake Seminole II Invasive Exotic Plant Control | County: Pinellas

PCL: Lake Seminole Park | PCL Size: 255

Project ID: SC-022 | Project Size: 100 acres

Fiscal Year 02/03 | Project Cost: $43,243.40

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. Air-potato vines infested approximately 100 acres of pine flatwoods in varying densities ranging from moderate to severe. Additionally, small pockets of natural vegetation throughout the more heavily used area of the park were succumbing to air-potato infestation.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Dioscorea bulbifera	air-potato	Category I	basal/cut stem	Garlon 4

Brooker Creek Invasive Exotic Plant Control | County: Pinellas

PCL: Brooker Creek Preserve | PCL Size: 8,500 acres

Project Manager: Pinellas County Department of Environmental Management
Lisa Baltus, Senior Environmental Specialist
1001 Lora Lane, Tarpon Springs, Florida 34688
Phone: 727-943-4637, Fax: 727-943-4002
E-mail: lbaltus@co.pinellas.fl.us

Project ID: SC-028 | Project Size: 95 acres

Fiscal Year 02/03 | Project Cost: $21,375

Brooker Creek Preserve, located in northeast Pinellas County, was established to provide for preservation of natural water resources, conservation and restoration of native habitats and wildlife, passive recreational opportunities, and the development of a natural resources education program. Natural communities within the Preserve include predominantly cypress strands and domes, interspersed within a matrix of hydric and mesic pine flatwoods. Drier areas occur at the north end of the Preserve, where patches of xeric oak, sandhills, and flatwoods are present. Several rare plant species have been observed within the Preserve including Catesby's lily (*Lilium catesbaei*) and several terrestrial orchids (*Calopogon* spp., *Spiranthes* spp., *Platanthera nivea*). The five control sites ranged from 2 to 65 acres and were located in the southwest corner of the preserve within disturbed upland and wetland habitats. Cover of exotics varied from light (2%) to heavy (60%), depending upon the species.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Dioscorea bulbifera	air-potato	Category I	foliar	Roundup+Escort
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Roundup+Escort
Abrus precatorius	rosary pea	Category I	foliar	Roundup+Escort
Imperata cylindrica	cogon grass	Category I	foliar	Roundup+Arsenal
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Melia azedarach	Chinaberry	Category I	basal	Garlon 4
Enterolobium contortisiliquum	ear-pod tree	n/a	basal	Garlon 4

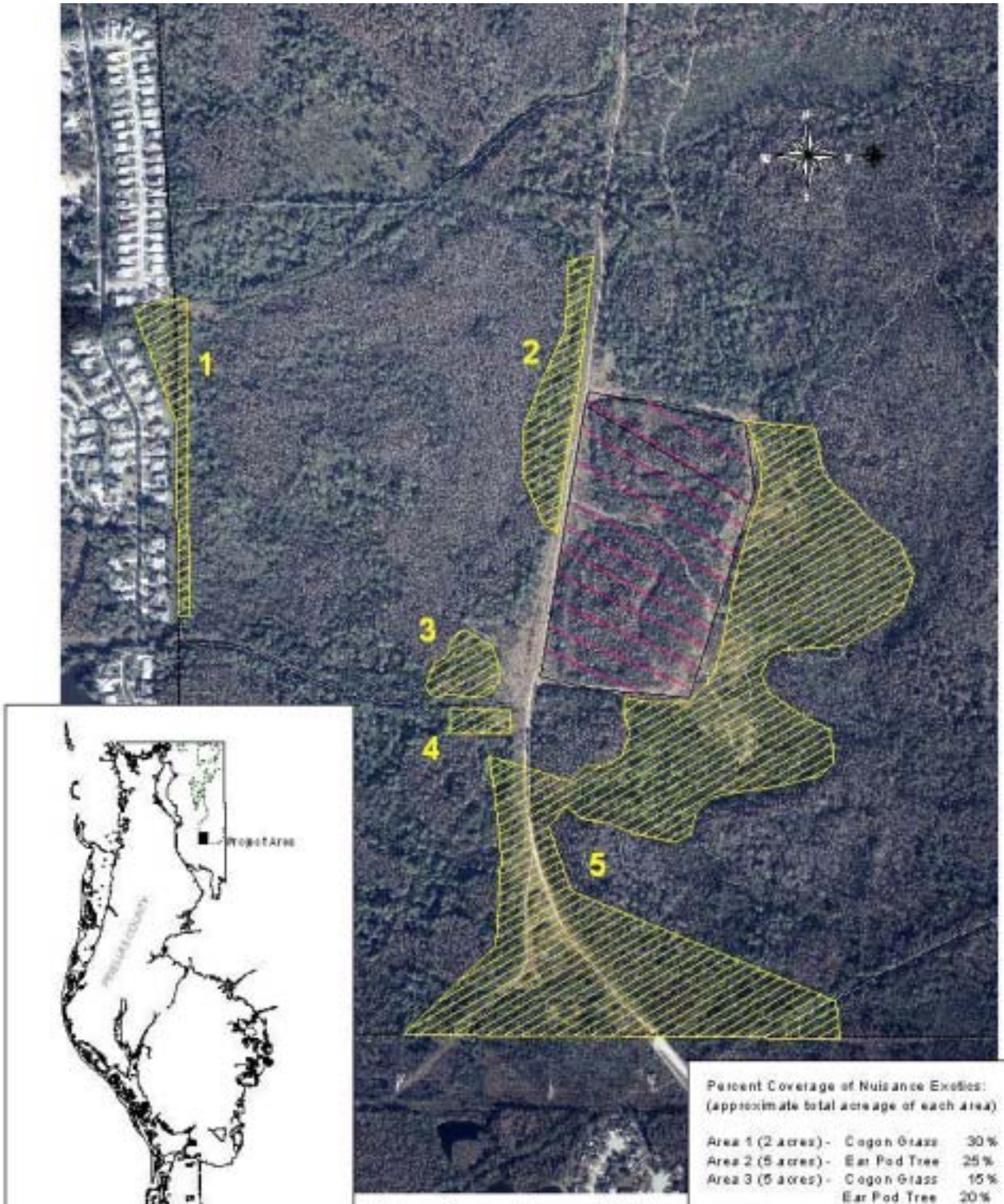


Figure 1
Brooker Creek Preserve
Project Location Map
Mount Brooker Area Nuisance Exotics

Pam Callahan/Rocky Creek Invasive Exotic Plant Control County: Hillsborough

PCL: Pam Callahan Nature Preserve PCL Size: 97 acres
PCL: Rocky Creek Nature Preserve PCL Size: 250 acres

Project Manager: Hillsborough County Parks and Recreation
Richard Sullivan, Environmental Scientist
3709 Gulf City Road, Ruskin, Florida 33579
Phone: 813-671-7754, Fax: 813-671-7758
E-mail: HCPRDELAPP@aol.com

Project ID: SC-031 Project Size: 140 acres

Fiscal Year 02/03 Project Cost: $52,127.61

These two county nature preserves lie in northwestern Hillsborough County and are located within close proximity (<1 mile) to each other. The Pam Callahan and Rocky Creek Nature Preserves are two of the few undeveloped parcels remaining along Upper Tampa Bay and were acquired by the county in 1993 and 1992, respectively. Habitats on Pam Callahan include pine and cabbage palm flatwoods in the northeastern portion of the site, but the majority of the site consists of tidal flats, tidal marsh, and mangrove swamp. Salterns and a small freshwater marsh are also present. Peppermound Creek is a tidally influenced stream that runs through the property. The berms along the creek were infested with Brazilian pepper, covering 40 acres with medium density. Rocky Creek is mostly wetlands with mangrove swamps, salt marshes, salterns, and a freshwater blackrush and leatherfern marsh. The uplands consist of low-lying coastal hammocks dominated by live oak, cabbage palm, and slash pine. The total acreage of invasives was 100 acres with medium density. This was a cost-share project with Hillsborough County providing $11,500 of the total project cost.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
			cut stump	Arsenal
			hand pull	n/a
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Garlon 4
			cut stump	Arsenal
Melia azedarach	Chinaberry	Category I	cut stump	Garlon 4
Sapium sebiferum	Chinese tallow	Category I	basal	Garlon 4
Dioscorea bulbifera	air-potato	Category I	basal	Garlon 4
Colocasia esculenta	wild taro	Category I	basal	Garlon 4
Podocarpus spp.	podocarpus	n/a	basal	Garlon 4
Callistemon viminale	bottlebrush	n/a	basal	Garlon 4

Pam Callahan and Rocky Creek Nature Preserves

Pam Callahan/Rocky Creek

Alafia River Phases II-IV Invasive Exotic Plant Control | County: Hillsborough

PCL: Alafia River Corridor Preserve | PCL Size: 4,047 acres

Project Manager: Hillsborough County Parks and Recreation
Richard Sullivan, Environmental Scientist
3709 Gulf City Road, Ruskin, Florida 33579
Phone: 813-671-7754, Fax: 813-671-7758
E-mail: HCPRDELAPP@aol.com

Project ID: SC-030 | Project Size: 300 acres

Fiscal Year 02/03 | Project Cost: $166,180.82

The Alafia River Corridor is located on the north prong of the Alafia River from Alderman's Ford Park to the Polk County Line, and the south prong of the Alafia River, southeast of Alderman's Ford Park. Natural communities within the preserve include pine flatwoods, dry prairie, hardwood hammock, pine forest, and riverine swamp hardwood forest. This project addressed primarily skunk vine and Japanese climbing fern, which occurred in medium to high density on the site. The three phases of this project allowed the County to completely remove these exotics from the 1,005-acre Knight parcel of the Alafia River Corridor. This also prevented the spread of these exotics to other parcels.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Roundup+Escort
Paederia foetida	skunk vine	Category I	foliar	Roundup+Escort
Imperata cylindrica	cogon grass	Category I	foliar	Roundup+Escort
Melia azedarach	camphor tree	Category I	foliar	Roundup+Escort
Sapium sebiferum	Chinese tallow	Category I	foliar	Roundup+Escort

The use of photopoints and dated pictures helps to document the history of control efforts on a site.

Egmont Key Invasive Exotic Plant Control — County: Hillsborough

PCL: Egmont Key National Wildlife Refuge — PCL Size: 350

Project Manager: U.S. Fish and Wildlife Service
James G. Kraus, Project Leader
1502 SE Kings Bay Drive, Crystal River, Florida 34429
Phone: 352-563-2088, Fax: 352-795-7961
E-mail: jim_kraus@fws.gov

Project ID: SC-027 — Project Size: 176 acres

Fiscal Year 02/03 — Project Cost: $41,574.75

Egmont Key National Wildlife Refuge is a barrier island located in Hillsborough County in Tampa Bay. The refuge was established in 1974 to preserve and protect barrier island habitat and historical structures of national significance. The U.S. Fish and Wildlife Service owns the island and has a cooperative agreement with the Florida Park Service to manage public use on the island. Egmont Key is one of three Tampa Bay refuges, which also include Passage Key, just south of Egmont, and the mangrove islands of Pinellas Refuge. Due to a lack of predators, Egmont Key has an unusually abundant population of Florida box turtle (*Terrapene carolina baurii*).

Brazilian pepper occurs throughout the interior of Egmont Key interspersed with cabbage palms, red cedar, wax myrtle, and strangler fig. There is an ongoing control program for Brazilian pepper on the island. The pepper is being systematically removed from individual units beginning at the southern end of the island where the wildlife sanctuary is located. USFWS staff, Florida Park Service staff, and volunteers from the Egmont Key Alliance continue to remove seedlings from areas where pepper was previously treated. This project controlled Brazilian pepper on four sites within the Refuge.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4

Duette Park Invasive Exotic Plant Control — County: Manatee

PCL: Duette Regional Park — PCL Size: 24,000 acres

Project Manager: Manatee County
Danny Smith, Conservation Lands Division Manager
2649 Rawls Road, Duette, Florida 33834
Phone: 941-776-2295, Fax: 941-721-6898
E-mail: danny.smith@co.manatee.fl.us

Project ID: SC-029 — Project Size: 424 acres

Fiscal Year 02/03 — Project Cost: $43,214.94

Duette Park is located in northeastern Manatee County in the eastern portion of the Lake Manatee watershed. The property is managed by the Conservation Lands Management Division of Manatee County. Land uses such as citrus production and vegetable farming were abandoned upon purchase of the property. Current land uses include silviculture, passive recreation, wildlife and ecosystem management, and well field operations. Cogon grass primarily occurred in the areas previously utilized for vegetable production. The importance of this park is its many undisturbed prairies, scrub, and flatwoods. This project not only protected these natural communities from invasion, but will lead to the restoration of the invaded areas. There are fourteen natural communities found in the park, including Dry Prairie, Pine Flatwoods, Xeric Oak Scrub, Sand Pine Scrub, Sandhill, Hardwood Swamp, Hardwood Hammock, and Cypress Swamp.

Manatee County provided $100,000 for exotics removal on this park in the two previous fiscal years.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Imperata cylindrica	cogon grass	Category I	foliar	Roundup

Frog Creek Invasive Exotic Plant Maintenance Control | County: Manatee

PCL: Terra Ceia State Buffer Preserve | PCL Size: 1424.08 acres

Project Manager: Office of Coastal and Aquatic Managed Areas (DEP)
Lee Hughes, Park Service Specialist
3804 Coconut Palm Avenue, Tampa, Florida 33619
Phone: 813-744-6100 x429, Fax: 813-744-6090
E-mail: lee.hughes@dep.state.fl.us

Project ID: SC-042 | Project Size: 17 acres

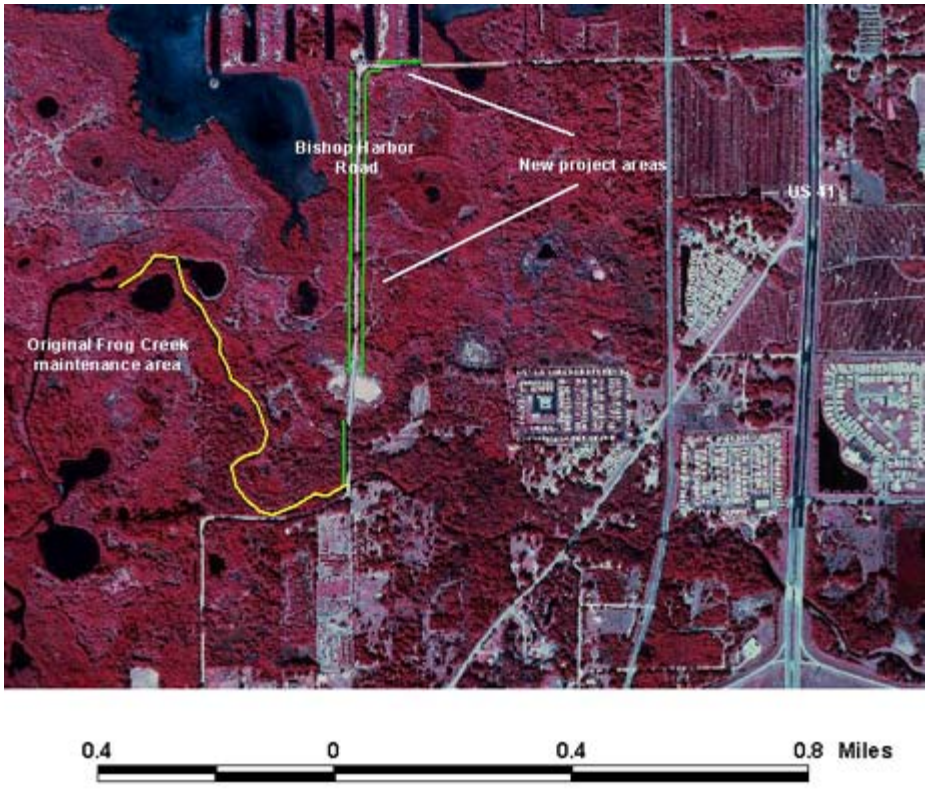
Fiscal Year 02/03 | Project Cost: $37,382.09

Frog Creek is a blackwater stream that runs through the Terra Ceia State Buffer Preserve (TCBP) and empties into Terra Ceia Bay. The state endangered prickly apple (*Cereus gracilis*), Tampa vervain (*Glandularia tampensis*), wild cotton (*Gossypium hirsutum*), and hand fern (*Ophioglossum palmatum*), and the federally endangered Florida golden aster (*Chrysopsis floridana*) are found on TCPB. The project area is an approximately 1-mile stretch of the creek. The area to be treated consisted of a mix of native vegetation and Brazilian pepper. A fairly abrupt vegetative change occurs on the creek, which shifts from upland hammock to mangroves. The upland hammock consists primarily of live oak and cabbage palm, but also includes southern red cedar. The hammock area had a considerable amount of Brazilian pepper.

The goal of this maintenance project was to remove dead Brazilian pepper that was treated during the previous fiscal year along the banks of Frog Creek. The pepper was cut and stacked on site by hand, as the banks of the creek would not support the use of large machinery. This project also encompassed a portion of a hiking trail project, which will provide better public access to Frog Creek, and create more areas for bank fishing. Replanting of the areas around the trail previously occupied by pepper with native species will occur soon after the mulching is completed.

Staff has been successful in eradicating large areas of exotic vegetation using Americorps and organized volunteer groups. USFWS staff and Americorps have to date put in over 200 hours on clearing the hiking trail of exotics. The U.S. Fish and Wildlife Service provided $5,950 in matching funds for this project. The Florida Park Service contributed $10,000 toward the total project cost.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 4



Myakka State Forest Invasive Exotic Plant Control — County: Sarasota

PCL: Myakka State Forest — PCL Size: 8,532 acres

Project Manager: Florida Division of Forestry (FDACS)
Duane Weis, Senior Forester
4723 53rd Avenue E, Bradenton, Florida 34203
Phone: 941-480-3145, Fax: 941-480-3146
E-mail: weisd@doacs.state.fl.us

Project ID: SC-018 — Project Size: 1,457 acres

Fiscal Year 02/03 — Project Cost: $106,047

The natural communities of My akka State Forest (Forest) are primarily depression marsh and mesic flatwoods association, with some areas of improved pasture on site. Rare species on the Forest include the threatened golden leather fern and yellow-flowered butterwort. Following state acquisition of the property, the Southwest Florida Water Management District spent $17,000 for initial control efforts on melaleuca infestations. The DOF exotic plant control program on the Forest was initiated in 2001. Initial efforts have focused on identification and mapping of infestations.

The Forest is divided into two main tracts located east and west of the Myakka River. The western tract was the project area. Brazilian pepper infested approximately 1,235 acres of the tract. The infestations were generally moderately dense to very dense with cover ranging from 10-100%. The infestations were located primarily on the areas of improved pasture scattered throughout the property, but were observed spreading into the mesic flatwoods, depression marshes, and other surrounding intact natural areas. Melaleuca infested approximately 220 acres in three locations with moderate density. One identified infestation of Old World climbing fern w as slightly less than one acre in size. The infestation was moderately dense, growing on shrubs and small trees, but had not yet grown into the tree canopy. Australian pine occurred in two locations with the total size of both infestations approximately one acre in light to moderate density.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal+Roundup
			hand pull	n/a
Casuarina equisetifolia	Australian pine	Category I	cut stump	Arsenal+Roundup
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Lygodium microphyllum	Old World climbing fern	Category I	foliar	Roundup+Escort
Tradescantia fluminensis	tradescantia	Category I	foliar	Roundup+Escort
Leucaena leucocephala	lead tree	Category II	basal	Garlon 4

Lemon Bay Invasive Exotic Plant Control — County: Sarasota

PCL: Lemon Bay Park — PCL Size: 205 acres

Project Manager: Sarasota County Parks and Recreation
Kathi Rader-Gibson, Park Naturalist
3900 Shamrock Drive, Venice, Florida 34293
Phone: 941-474-3065
E-mail: krgibson@co.sarasota.fl.us

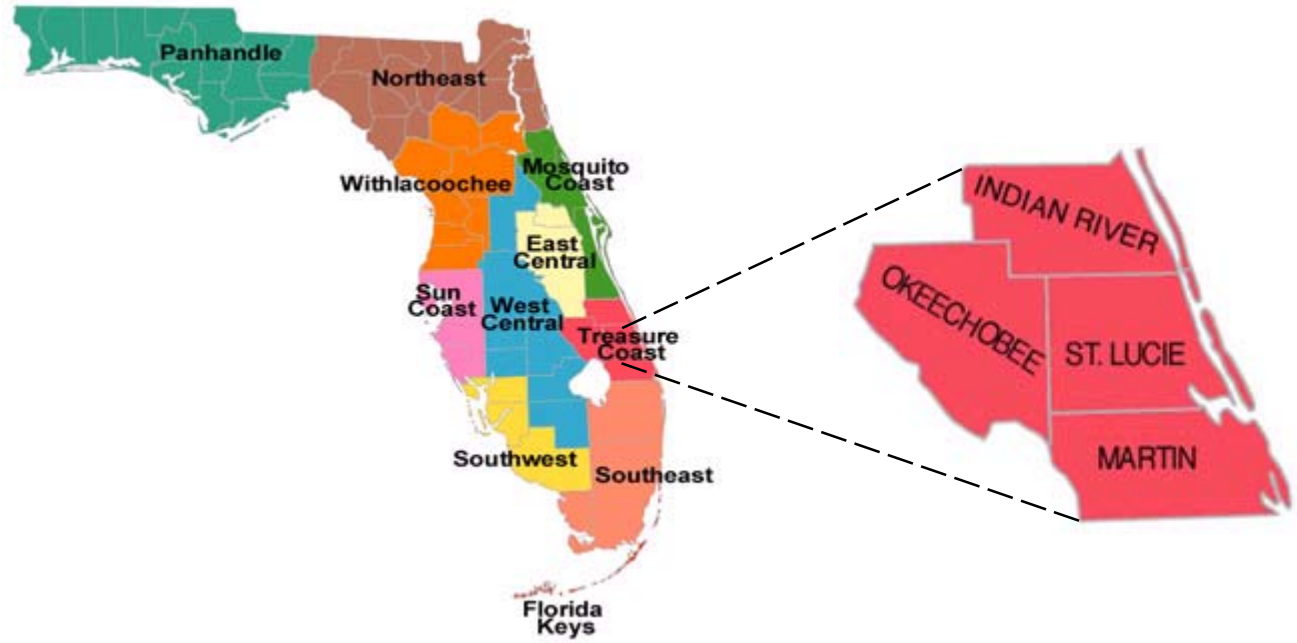
Project ID: SC-043 — Project Size: 205 acres

Fiscal Year 02/03 — Project Cost: $22,976.15

Lemon Bay Park and Environmental Center is a 205-acre tract of pine flatwoods, mangrove estuary, and freshwater swamp. The park is contiguous with the Lemon Bay State Aquatic Preserve and shares approximately one mile of shoreline.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal/cut stump	Garlon 4
Cupaniopsis anacardioides	carrotwood	Category I	cut stump	Garlon 4
Dioscorea bulbifera	air-potato	Category I	cut stump	Rodeo
Ludwigia peruviana	primrose willow	n/a	cut stump	Rodeo

Treasure Coast Regional Working Group



The Treasure Coast Regional Working Group liaison is Ms. Jackie Smith, DEP Bureau of Invasive Plant Management, 311 B-13 Fortune Way, Wellington, Florida 33414, phone: 561-791-4720, fax: 561-791-4722, e-mail: jackie.smith@dep.state.fl.us. Six of the ten projects completed in this region were located in Martin County, with the remaiming four located in St. Lucie County.

Hungryland Invasive Exotic Plant Control — County: Martin, Palm Beach

PCL: Hungryland Wildlife and Environmental Area — PCL Size: 10,294 acres

Project Manager: Florida Fish and Wildlife Conservation Commission
Beth Morford, Biological Scientist III
8535 Northlake Boulevard, West Palm Beach, Florida 33412
Phone: 561-625-5122, ext. 142, Fax: 561-625-5129
E-mail: morforb@fwc.state.fl.us

Project ID: TC-037 — Project Size: 950 acres

Fiscal Year 02/03 — Project Cost: $217,809.26

Hungryland Wildlife and Environmental Area (HWEA) is located in southern Martin County and northern Palm Beach County. The natural communities of HWEA are comprised primarily of mesic and wet flatwoods, interspersed with depression marshes and wet prairies. The South Florida Water Management District and DEP purchased this property as part of the Pal-Mar CARL/SOR project. *Florida Conservation Lands 2001* describes HWEA (i.e., Pal Mar) as "one of the highest quality pine flatwoods in south Florida."

Three disjunct parcels separated by private lands make up the HWEA. Area 1, the project area, consisted of 9,415 acres and was the only area surveyed for exotic plants. A combination of aerial and ground surveys identified approximately 950 acres infested by melaleuca, Brazilian pepper, *Lygodium*, and Australian pine. This project included two phases, the first targeting the entire project area with large scale aerial application in addition to ground crews. The second phase targeted approximately 13 acres of Brazilian pepper with a cover of 30-75% located on the northeasternmost corner (along the east side of the ditch inside Gate 1) and along the east end of the northernmost canal (Canal 3) of the HWEA.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	mechanical	n/a
			basal	Garlon 4
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Garlon 3A
Lygodium spp.	climbing fern	Category I	foliar	Roundup+Escort

Using a helicopter to reach remote infestations is an efficient and cost effective method of treatment. This melaleuca was killed with an aerial application of Velpar®.

Hungryland WEA

Old World climbing fern (*Lygodium microphyllum*) has surpassed all other species as the worst invasive plant in Florida. Hurricane Andrew dispersed spores of this fern across millions of acres of the Everglades. Aerial application of herbicide is effective, as pictured on this page; unfortunately, the plant is difficult to detect until it has overgrown the tree canopy and a great deal of damage has already been done to native plant communities.

Jonathan Dickinson NW Invasive Exotic Plant Control | County: Martin

PCL: Jonathan Dickinson State Park | PCL Size: 11,480 acres

Project Manager: Florida Park Service (DEP)
Philip Myers, District Biologist
13798 SE Federal Highway, Hobe Sound, Florida 33455
Phone: 772-546-0900, Fax: 772-223-2591
E-mail: philip.myers@dep.state.fl.us

Project ID: TC-036, -039 | Project Size: 507 acres

Fiscal Year 02/03 | Project Cost: $152,656

This project consisted of two sites located near the northwestern boundary of JDSP in two units, Zones E-1 and E-2. Zones E-1 and E-2 are close to the introduction point of downy rose-myrtle into JDSP and therefore were the most heavily infested areas in the park. The natural communities in Zone E-1 are mostly pine flatwoods and cypress slough, with some wet prairie. This zone also contained a large amount of melaleuca. Zone E-2 is an integral component of a 2,600-acre State Wilderness Preserve in JDSP where human-related influences are kept to a minimum. This zone is composed of pine flatwoods and cypress slough. Overall, the project was designed to remove Old World climbing fern and downy rose-myrtle from the tributaries of the Loxahatchee River located in the northwest section of the park. Another project underway at the same time was the mechanical removal of 10 acres of Brazilian pepper and melaleuca with a Brontosaurus mower (shown below).

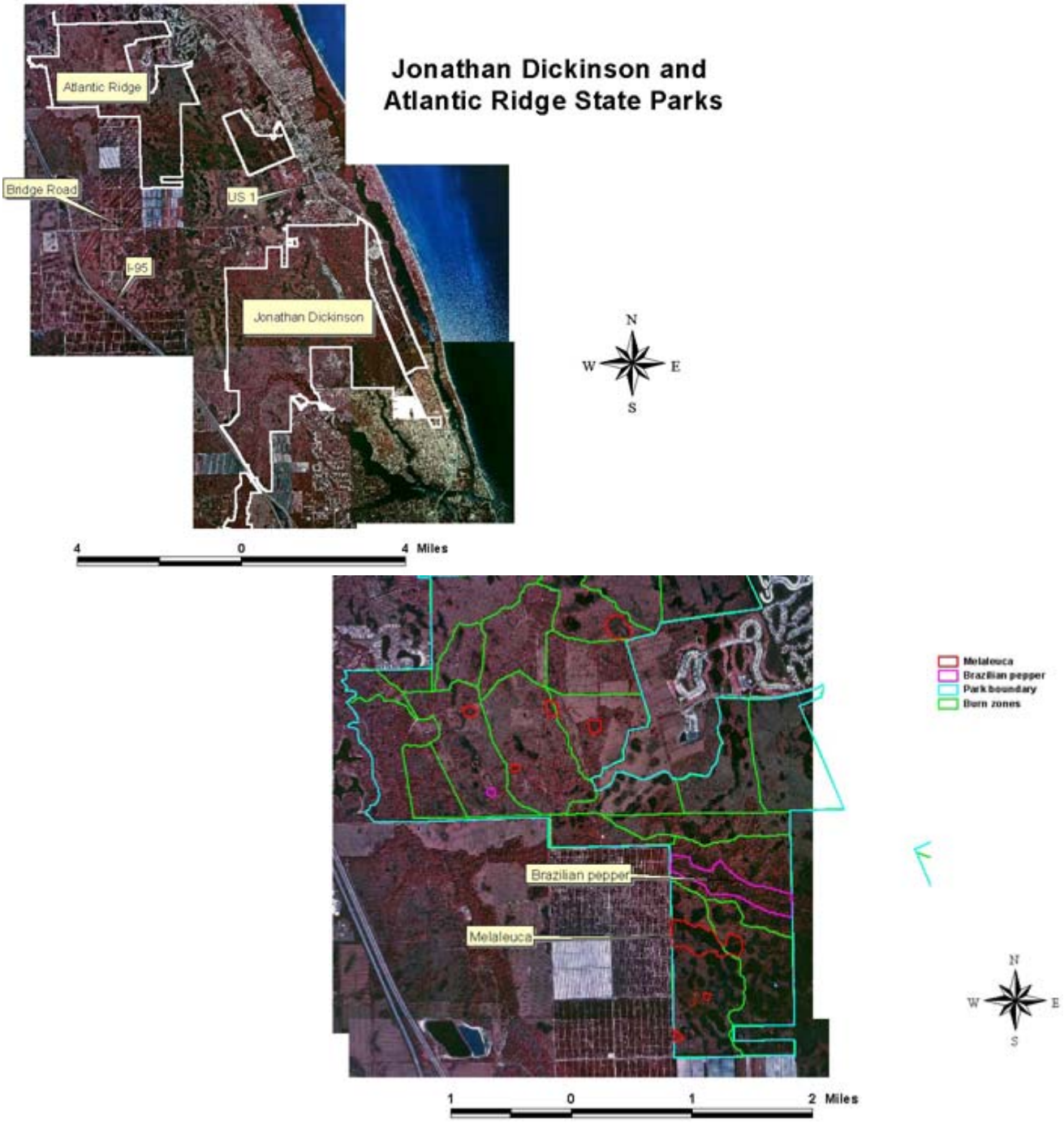
The Park Service funded a separate project (RP-026) to continue the ongoing work to remove Old World climbing fern from along the Loxahatchee River.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Lygodium microphyllum	Old World climbing fern	Category I	foliar	Rodeo/Glypro
Dioscorea bulbifera	air-potato	Category I	foliar	Rodeo
Rhodomyrtus tomentosa	downy rose-myrtle	Category I	cut stump	Garlon 4
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
			mechanical	n/a
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
			mechanical	n/a

Atlantic Ridge Invasive Exotic Plant Control	County: Martin
PCL: Atlantic Ridge State Park	PCL Size: 5,650 acres
Project ID: TC-035	Project Size: 400 acres
Fiscal Year 02/03	Project Cost: $135,802.13

Atlantic Ridge lies slightly north of Jonathan Dickinson State Park and is managed out of the same park office. Philip Myers, District Biologist, was the project manager for this project also. Natural communities within the park include high quality wet prairie, pine flatwoods, and scrub. In addition to the contracted control operation, the park also received nearly $50,000 of herbicide from the bureau's Herbicide Bank.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4



Allapattah Flats Invasive Exotic Plant Control | County: Martin

PCL: Allapattah Conservation Area | PCL Size: 20,000 acres

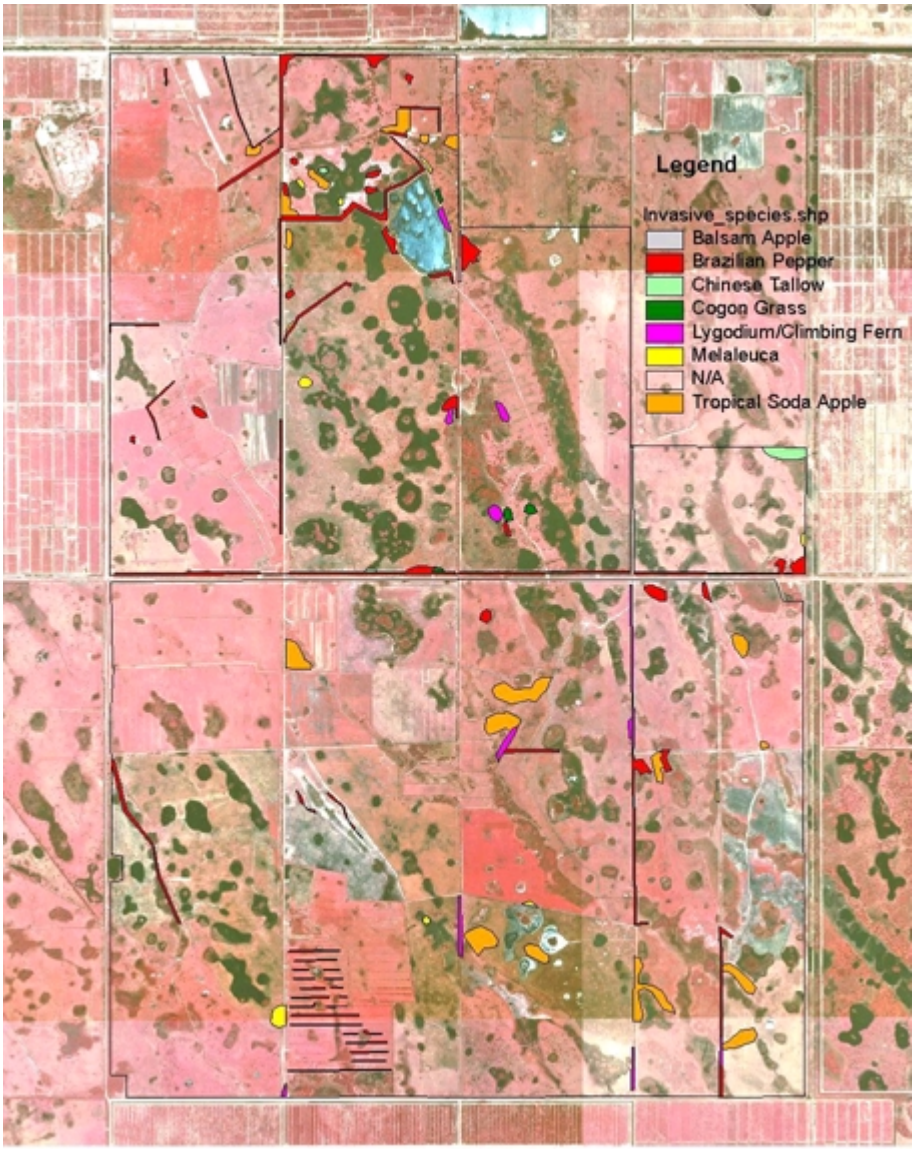
Project Manager: Bureau of Invasive Plant Management (DEP)
Jackie Smith, Regional Biologist
311 B-13 Fortune Way, Wellington, Florida 33414
Phone: 561-791-4720, Fax: 561-791-4722
E-mail: jackie.smith@dep.state.fl.us

Project ID: TC-035 | Project Size: 3,321 acres

Fiscal Year 02/03 | Project Cost: $82,842.83

Allapattah Flats was once a vast expanse of marshes and flatwoods that extended from the St. Lucie River headwaters to the Upper Basin of the St. Johns River. While mostly former cattle ranches and citrus groves, the Allapattah Conservation Area protects remnant South Florida slash pine flatwoods and depression marshes. This project was the initiation of control efforts on the conservation area.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Psidium guajava	guava	Category I	basal	Garlon 4
Lygodium microphyllum	Old World climbing fern	Category I	foliar	Rodeo



Hobe Sound Invasive Exotic Plant Control — County: Martin

PCL: Hobe Sound National Wildlife Refuge — PCL Size: 980 acres

Project Manager: U.S. Fish and Wildlife Service
Margo Stahl, Refuge Manager
13640 SE Federal Highway, Hobe Sound, Florida 33455
Phone: 561-546-6141, Fax: 561-545-7572
E-mail: Margo_Stahl@fws.gov

Project ID: TC-032 — Project Size: 120 acres

Fiscal Year 02/03 — Project Cost: $7,972.03

Hobe Sound National Wildlife Refuge is comprised of two separate and distinct tracts of land: the 232-acre mainland tract located between US Highway 1 and the Indian River Lagoon, and the 735-acre island tract located on Jupiter Island. This project addressed invasive exotics on the Jupiter Island tract and was a follow up to work done in the same area during the previous fiscal year. The project area covered approximately 120 acres of low to moderate infestation of Australian pine.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Casuarina equisetifolia	Australian pine	Category I	cut stump	Garlon 4

Walton Scrub Invasive Exotic Plant Control — County: St. Lucie

PCL: Walton Scrub — PCL Size: 33 acres

Project Manager: St. Lucie County
Steven Fousek, Environmental Lands Specialist
2300 Virginia Avenue, Ft. Pierce, Florida 34954-0760
Phone: 561-462-1513, Fax: 561-462-1940
E-mail: stevef@stlucieco.gov

Project ID: TC-033 — Project Size: 9 acres

Fiscal Year 01/02 — Project Cost: $11,990.22

Walton Scrub is located in Port St. Lucie and is adjacent to the Indian River Lagoon Aquatic Preserve and Savannas State Park. Walton Scrub consists primarily of Scrub and Maritime Hammock communities. The majority of exotics have become established within the Maritime Hammock community, affecting native plants including the endangered satinleaf (*Chrysophyllum oliviforme*) and fragrant prickly cactus (*Cereus eriophorus*). Several of these endangered plants are located within the proposed treatment area. Surinam cherry and bowstring hemp are the dominant exotic species present on the site. *Sansevieria* is extremely dense within the project area, consisting of a monotypic understory in many areas (~150,000 stems/acre). *Eugenia* in many areas is a dominant in the shrub layer, with densities ranging from 400-2,000 stems per acre. This project is a continuation of work begun in the previous fiscal year in the same project area.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Eugenia uniflora	Surinam cherry	Category I	basal bark	Garlon 4
Sansevieria hyacinthoides	bowstring hemp	Category II	cut stump	Garlon 4

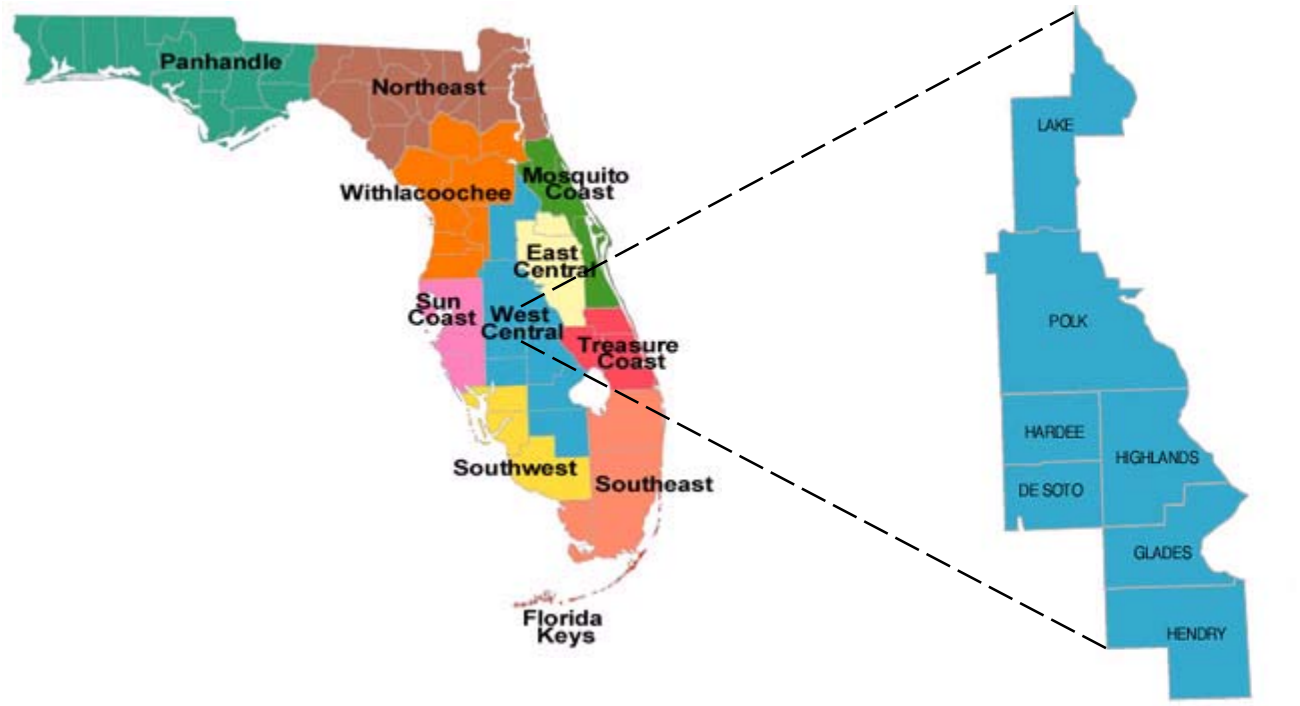
North Fork Invasive Exotic Plant Maintenance Control	County: St. Lucie
PCL: North Fork St. Lucie River State Buffer Preserve	PCL Size: 987 acres
Project Manager: Southeast Florida Aquatic Preserves (DEP) Jeff Beal, Environmental Specialist II 9737 Gumbo Limbo Lane, Jensen Beach, Florida 34957 Phone: 772-873-6590, Fax: 772-873-6599 E-mail: jeffbeal@hotmail.com	
Project ID: TC-038, -046, -047	Project Size: 823 acres
Fiscal Year 02/03	Project Cost: $127,108.79

This project includes those lands from the original Preserve purchase that lie from Prima Vista Boulevard south for 5 miles, and north for 2 miles, and three specific parcels north of Prima Vista Boulevard. The treatment site forms an 8-mile long corridor consisting of about 500 acres of wetlands and 125 acres of uplands. Typical vegetation communities on the preserve include sand pine scrub, mesic and scrubby flatwoods, hydric hammock, floodplain forest, estuarine tidal swamp, and basin marsh. Rare species present include giant leather fern (*Acrostichum danaeifolium*), shoestring fern (*Vittaria lineata*), red wild pine (*Tillandsia fasciculata*), and green wild pine (*T. utriculata*), and possibly hand fern (*Cheiroglossa palmata*).

BIPM conducted the initial control of this project area. Overall, results from the original treatment were successful; however, a combination of new occurrences, re-sprouts, overlooked pockets, and maintenance control created a need for re-treatment of the area. All target species were scattered throughout the project area, with spoil banks continuing to be most heavily impacted by some species. Brazilian pepper and other exotics had an estimated coverage of 5-10%.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 4
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
Ardisia elliptica	shoebutton ardisia	Category I	basal	Garlon 4
Psidium cattleianum	strawberry guava	Category I	basal	Garlon 4
Abrus precatorius	rosary pea	Category I	foliar	Garlon 4
Urena lobata	Caesar's weed	Category II	foliar	Garlon 4

West Central Regional Working Group



The West Central Regional Working Group liaison is Mr. Matt Phillips, DEP Bureau of Invasive Plant Management, 2001 Homeland Garfield Road, Bartow, Florida 33830, phone: 941-534-7074, fax: 941-534-7143, e-mail: matt.phillips@dep.state.fl.us. Seven projects were completed in this region, three of which were in Lake County, three in Polk County, and one in Hendry Country.

Okaloacoochee Slough Invasive Exotic Plant Control — County: Hendry, Collier

PCL: Okaloacoochee Slough State Forest — PCL Size: 32,039 acres

Project Manager: Florida Division of Forestry
Kevin Podkowka, Senior Forester
10941 Palm Beach Boulevard, Ft. Myers, Florida 33905
Phone: 863-612-0776, Fax: 863-612-0780
E-mail: podkowk@doacs.state.fl.us

Project ID: WC-019 — Project Size: 2,142 acres

Fiscal Year 02/03 — Project Cost: $207,768.07

The Okaloacoochee Slough State Forest was purchased in 1998 as a single contiguous tract without inholdings. The forest is generally hydric in nature, with approximately 11,000 acres of mesic flatwoods and oak-cabbage palm hammocks persisting on the driest sites. The remaining two-thirds of the area is made up of a variety of plant communities such as dome swamps, swale, depression marshes, and swamps. The targeted exotic species affected all of the plant community types on the forest.

The project area was historically used for timber and cattle operations. Areas of exotic vegetation were found throughout the forest, except within the Okaloacoochee Slough itself. The total area needing control was approximately 19,000 acres. This area was broken down into blocks ranging from 30 to 500 acres to allow for a phased project approach. Within blocks, the infested acres are not contiguous and the concentrations of targeted species vary from only a few plants over the block, to potentially thousands. No areas were known to contain more than 1 acre of contiguous infestation; instead, most blocks had scattered infestations of the target species.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal/cut stump	Garlon 4
Psidium guajava	guava	Category I	cut stump	Garlon 4

One of the most common treatment methods is a basal bark application of herbicide using a handheld sprayer. A trained crew can treat thousands of trees each day—one stump at a time.

Crew composition is limited to eight applicators for each crew chief, to ensure proper supervision of work, safety procedures, and control methods.

Lake Louisa Invasive Exotic Plant Control | County: Lake

PCL: Lake Louisa State Park | PCL Size: 4,450 acres

Project Manager: Florida Park Service (DEP)
Rosi Mulholland, District Biologist
12549 State Park Drive, Clermont, Florida 34711
Phone: 352-394-3436, Fax: 352-394-1318
E-mail: rosi.mulholland@dep.state.fl.us

Project ID: WC-009 | Project Size: 531 acres

Fiscal Year 02/03 | Project Cost: $12,100

Much of the uplands of the park are former sandhills that were converted to orange groves. The citrus froze out in the late 1980s, prior to state acquisition. Rosary pea and lantana occur throughout the park, primarily growing over sour citrus shrubs. The project area included sandhill lake margins along an area where partial restoration of the former sandhill community had begun. The estimated coverage of rosary pea and lantana was 25-35%, following the old orange grove rows.

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 the Ecobank private mitigation site. The park lies within the Green Swamp Area of Critical State Concern.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Lantana camara	lantana	Category I	foliar	Garlon 3A
Abrus precatorius	rosary pea	Category I	foliar	Garlon 3A
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 3A

LCWA Invasive Exotic Plant Control | County: Lake

PCL: *various* (see below) | PCL Size: *various*

Project Manager: Lake County Water Authority
R. D. VanderBleek, Land Management Specialist
107 N. Lake Avenue, Tavares, Florida 32778
Phone: 352-343-3777, Fax: 352-343-4259
E-mail: deanv@lcwa.org

Project ID: WC-026 | Project Size: 78.1 acres

Fiscal Year 02/03 | Project Cost: $1,847.58

The Oklawaha Basin Recreation and Water Conservation and Control Authority, commonly called the Lake County Water Authority (LCWA), was created by state law in 1953. The LCWA has acquired over 6,000 acres for protection through its Land Preservation Program. An active and expanded invasive plant control program is integral to LCWA's land management goals.

The Bourlay Historic Nature Park is an 83-acre property located on the southwest shore of Lake Griffin that includes a planted pine forest and 1930s era house. The former owner collected and grew a wide variety of exotic tropical plant species on the site. The property slopes gradually from the pine plantation to the shoreline, with transitional hardwood hammock species giving way to statuesque bald cypress. The 68-acre Sabal Bluff Preserve is located on the southeast shore of Lake Griffin and contained planted pine with a lantana understory, an isolated 10-acre marsh, and an abandoned orange grove.

The occurrences of nuisance species are relatively small areas scattered on the Preserves. There are no large acreages completely dominated by the invasive species, rather pervasive populations intermixed with native species. There were a total of 15 different species targeted, ranging from 0.25 acres to 40 acres. The bureau provided herbicide for initial and maintenance control through its Herbicide Bank.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Lantana camara	lantana	Category I	basal	Garlon 4
			foliar	Roundup/Rodeo
Melia azedarach	Chinaberry	Category I	basal	Garlon 4
			foliar	Roundup
Dioscorea bulbifera	air-potato	Category I	foliar	Garlon 4/Roundup
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Garlon 4/Roundup
Imperata cylindrica	cogon grass	Category I	foliar	Garlon 4
Abrus precatorius	rosary pea	Category I	foliar	Roundup/Rodeo
Cinnamomum camphora	camphor tree	Category I	basal	Garlon 4
Psidium guajava	guava	Category I	basal	Garlon 4
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Urena lobata	Caesar's weed	Category II	foliar	Garlon 4/Roundup
Rhynchelytrum repens	Natal grass	Category II	foliar	Roundup
Koelreuteria elegans	flamegold tree	Category II	foliar	Roundup
Alternanthera philoxeroides	alligator weed	Category II	foliar	Rodeo
Ricinus communis	castor bean	Category II	basal	Garlon 4
Sorghum halepense	Johnson grass	n/a	basal	Garlon 4
			foliar	Roundup

Haines Creek Invasive Exotic Plant Control | County: Lake

PCL: Haines Creek Park | PCL Size: 36 acres

Project Manager: Lake County Parks and Recreation
John M. Bringard, Parks Services Supervisor
P. O. Box 7800, Tavares, Florida 32778
Phone: 352-742-0597, Fax: 352-742-4543
E-mail: jblakecounty@aol.com

Project ID: WC-010 | Project Size: 36 acres

Fiscal Year 02/03 | Project Cost: $18,950.04

Haines Creek Park consists of disturbed and natural wetlands adjacent to Haines Creek, which is part of the Ocklawaha River Basin. The treatment area is a wetland island that is accessed by a small bridge in the park. A man-made berm was created on the western and southern edges of the island by dredging for an adjacent canal many years ago. This disturbed land allowed a foothold for exotics to move in. The County recently discovered that it held a deed to this property.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Sapium sebiferum	Chinese tallow	Category I	girdle/basal	Garlon 4
			hand pull	n/a
Cinnamomum camphora	camphor tree	Category I	girdle/basal	Garlon 4
			hand pull	n/a
Melia azedarach	Chinaberry	Category I	basal bark	Garlon 4

Avon Park/Kissimmee Lygodium Invasive Exotic Plant Control | County: Polk, Highlands

PCL: Avon Park Air Force Range | PCL Size: 106,110 acres

Project Manager: Department of Defense, U. S. Air Force
Steve Orzell, OLA, DET 1, 347 OG/CEVN
29 South Blvd, Avon Park Air Force Range, Florida 33825-5700
Phone: 941-452-4119 Ext 317, Fax: 941-452-4161
E-mail: steve.orzell@avonpark.macdill.af.mil

Project ID: WC-016 | Project Size: 1,333.4 acres

Fiscal Year 02/03 | Project Cost: $198,601.10

Avon Park Air Force Range (APAFR) is the largest parcel of natural land in the Greater Arbuckle Ecosystem. Its numerous natural communities include the 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. Controlling invasive exotic plants at APAFR assists in preventing the spread of exotics into adjacent or nearby natural areas and endangered species habitats such as Kissimmee Prairie State Preserve, Kissimmee River WMD properties, Lake Wales Ridge State Forest, and Lake Arbuckle State Park, among others.

This project provided ground-based maintenance control for Japanese climbing fern and Old World climbing fern that infested approximately 3,100 acres of cypress and hardwood swamps at APAFR and on adjacent SFWMD lands in the Kissimmee River Valley. Avon Park Air Force Range received $50,000 in Department of Defense funds that were contracted out for herbicide control of the climbing ferns. In addition, a student intern through the Student Conservation Association is employed at a cost of $16,000 to continue an on-going survey for the ferns on APAFR. SFWMD budgeted $100,000 for exotic plant control in the Kissimmee River Valley for fiscal year 2003 (October 1st 2002-September 30th 2003). These funds were used primarily for *Lygodium* control. One contractor was used for ground application and another for aerial spraying. In addition, SFWMD provided two part-time employees to serve as ground crew for additional *Lygodium* treatment.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Rodeo/Glypro
Lygodium microphyllum	Old World climbing fern	Category I	foliar	Rodeo/Glypro

Hilochee Osprey Unit Invasive Exotic Plant Control | County: Polk

PCL: Hilochee Wildlife Management Area | PCL Size: 6,100 acres

Project Manager: Florida Fish and Wildlife Conservation Commission
Cyndi A. Gates, Area Biologist
12932 CR 474, Clermont, Florida 34711
Phone: 352-241-8501, Fax: 352-242-4478
E-mail: gatesc@fwc.state.fl.us

Project ID: WC-018 | Project Size: 20 acres

Fiscal Year 02/03 | Project Cost: $7,521

The Osprey Unit of Hilochee WMA is located in northeastern Polk County. The property extends along both sides of Interstate 4 from County Road 557 east nearly to U.S. Highway 27. Important habitat features include cypress strands and bottomland hardwood forests. Cutthroat grass occurs on the site. The area rates very high as a "biodiversity hot spot" (seven or more focal species) with very high species richness. The property formerly supported relatively high densities of nesting Florida sandhill cranes. Other listed species known to occur on the property include the gopher tortoise, wood stork, bald eagle, little blue heron, and white ibis. This site is among the southernmost locations for the rare spotted turtle.

The project site consists of improved pasture, abandoned citrus groves, pine flatwoods, cypress swamp, and freshwater marsh. Sand mining, land clearing, and improved pasture have affected parts of the site. Most of the site was used for cattle grazing up until January 2002. Approximately 20 acres of citrus grove and roadways were infested with cogon grass. In addition to the contracted control work, the land manager also received approximately $3,000 of herbicide from the bureau's Herbicide Bank.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Imperata cylindrica	cogon grass	Category I	foliar	Roundup+Arsenal

Cogon grass is a common roadside weed believed to be spread through contaminated roadfill material. Unfortunately, this nonnative grass has been leaving the roadsides and invading adjacent natural communities. It is a fire-adapted species, which makes it a particular problem for Florida. Some experts have named cogon grass "the world's worst weed."

Bridgewater Invasive Exotic Plant Maintenance Control | County: Polk

PCL: Tenoroc Fish Management Area | PCL Size: 7,348 acres

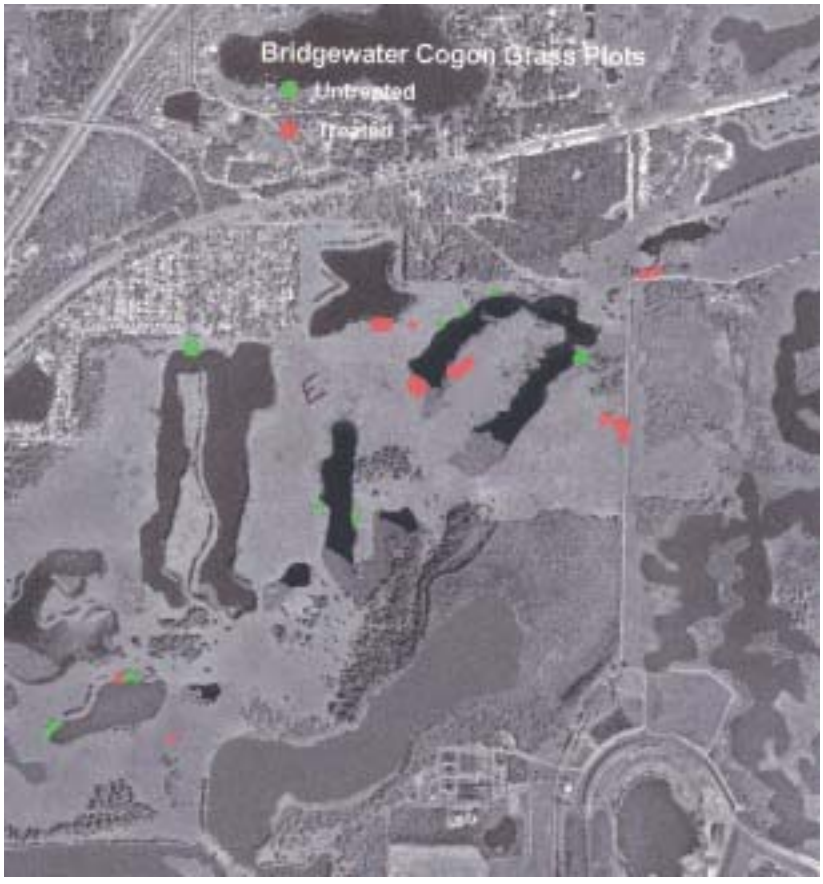
Project Manager: Fish and Wildlife Conservation Commission
Eric Johnson
3829 Tenoroc Mine Road, Lakeland, Florida 33805
Phone: 863-499-2421, Fax: 863-499-2692
E-mail: eric.johnson@fwc.state.fl.us

Project ID: WC-022 | Project Size: 75.3 acres

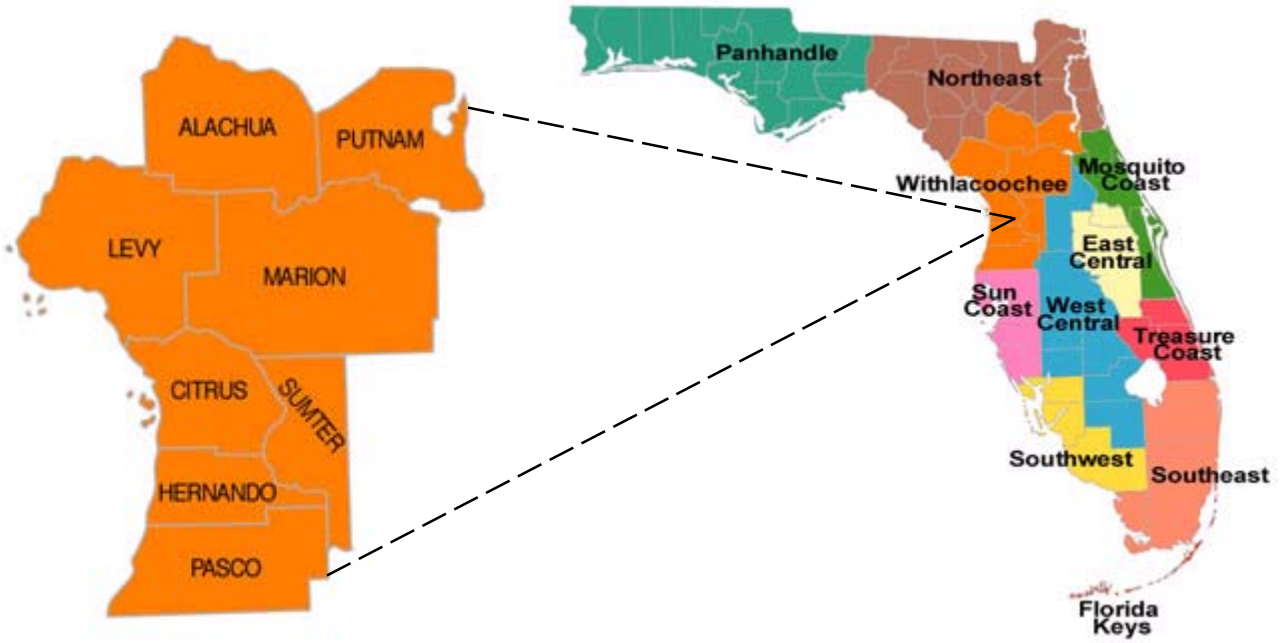
Fiscal Year 02/03 | Project Cost: $17,000

The Tenoroc Fish Management Area (TFMA) is located two miles northeast of Lakeland. TFMA consists of reclaimed phosphate mining lands from the mid-1970s that are now used for fishing and other recreation. The project site is a newly acquired land tract known as the Bridgewater Tract, which lies on western side of Tenoroc, adjacent to Lake Parker. The Bridgewater Tract is actually composed of two parcels totaling 969 acres. Bridgewater is a reclaimed phosphate mining land site consisting of lakes, wetlands, and uplands. Areas of invasive exotic vegetation were found scattered throughout the site and were somewhat concentrated around the lakes in particular. Exotic vegetation treatment was previously funded by BIPM in 2001 resulting in approximately 80% treatment coverage. The fact that exotics remained scattered throughout the site, often obscured by taller vegetation, made it difficult to canvass the entire site. Several treated exotics species showed signs of re-growth and seedlings from some previously treated plants were prevalent. Routine exotic plant maintenance activities involving multiple searches/treatments are required to obtain optimal control, especially with species such as cogon grass, which has a high re-infestation potential. Exotic plant coverage was estimated at less than 1%.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Imperata cylindrica	cogon grass	Category I	cut foliar	Glypro+Arsenal
Solanum viarum	tropical soda apple	Category I	foliar	Glypro+Arsenal
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Glypro+Arsenal
Sapium sebiferum	Chinese tallow	Category I	basal	Glypro+Arsenal



Withlacoochee Regional Working Group



The Withlacoochee Regional Working Group liaison is Ms. Andrea VanLoan, FDACS Division of Forestry, P.O. Box 147100, Gainesville, Florida 32614, phone: 352-372-3505, fax: 352-334-0737, e-mail: vanloaa@doacs.state.fl.us. Nine projects were completed in five of the counties within this region.

Colclough Pond Invasive Exotic Plant Control — County: Alachua

PCL: Colclough Pond City Nature Park — PCL Size: 5 acres

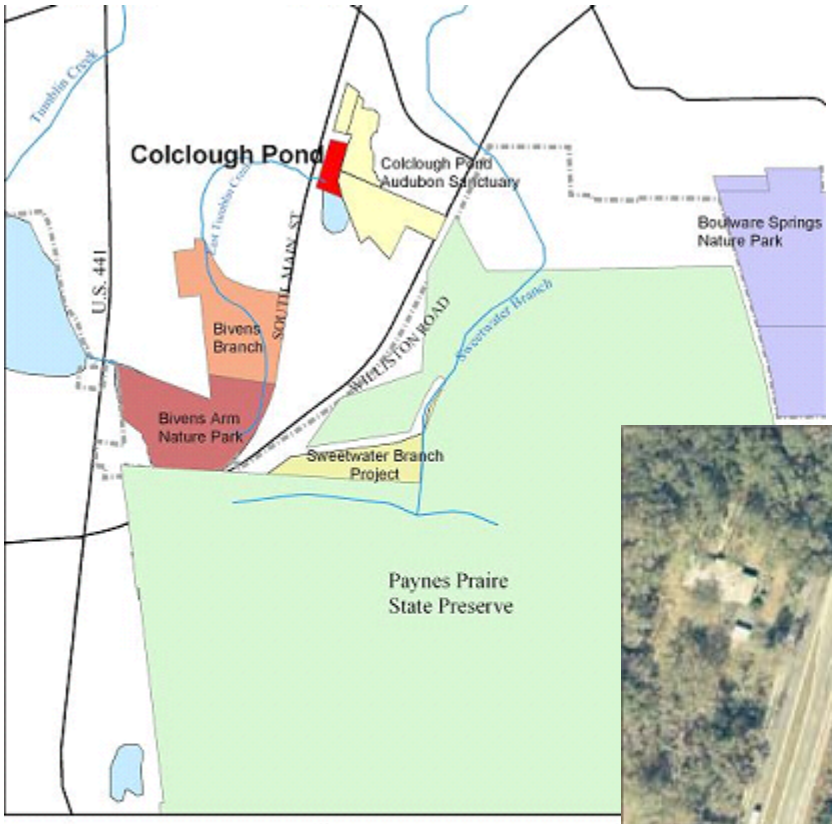
Site Manager: City of Gainesville Recreation and Parks
Geoff Parks
1024 NE 14th Street, Building A, Gainesville, Florida 32602
Phone: 352-334-2231, Fax: 352-334-2234
E-mail: parksgr@ci.gainesville.fl.us

Project ID: WR-031 — Project Size: 4 acres

Fiscal Year 02/03 — Project Cost: $858.19

Colclough Pond Nature Park is contiguous with the Colclough Pond Audubon Sanctuary. Colclough Pond Nature Park comprises upland mixed forest surrounding a portion of one of the City's only examples of a clastic upland lake. The goal of this project was to control populations of air potato on 1.5 acres with 90% coverage and sword fern on 0.10 acres with 100% coverage, in addition to numerous other exotics scattered across the project site with coverages of 1-25%, as well as to prevent the spread of these species to new sites on conservation lands. BIPM provided the herbicide only for this project through its Herbicide Bank.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Ardisia crenata	coral ardisia	Category I	basal	Garlon 4
Cinnamomum camphora	camphor tree	Category I	basal	Garlon 4
Sapium sebiferum	Chinese tallow	Category I	basal	Garlon 4
Albizia julibrissin	mimosa	Category I	basal	Garlon 4
Lantana camara	lantana	Category I	basal	Garlon 4
Nandina domestica	heavenly bamboo	Category I	basal	Garlon 4
Ligustrum spp.	privet	Category I	basal	Garlon 4
Nephrolepis cordifolia	sword fern	Category I	foliar	Garlon 4
Broussonetia papyrifera	paper mulberry	Category II	basal	Garlon 4
Koelreuteria elegans	golden rain tree	Category II	basal	Garlon 4
Urena lobata	Caesar's weed	Category II	basal	Garlon 4
Eriobotrya japonica	loquat	n/a	basal	Garlon 4


Tumblin Creek
Colclough Pond
Colclough Pond Audubon Sanctuary
Boulware Springs Nature Park
U.S. 441
SOUTH MAIN ST
WHIDDON ROAD
Bivens Branch
Sweetwater Branch
Bivens Arm Nature Park
Sweetwater Branch Project
Paynes Praire State Preserve


1
2

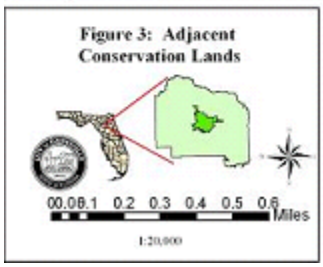
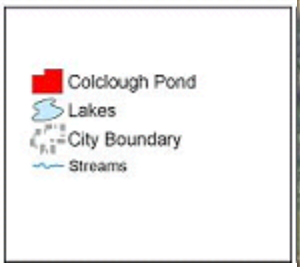


Figure 3: Adjacent Conservation Lands
0 0.05 0.1 0.2 0.3 0.4 0.5 0.6 Miles
1:20,000


Colclough Pond
Lakes
City Boundary
Streams


Colclough Pond
Trails/Rooms

Paynes Prairie Invasive Exotic Plant Control | County: Alachua

PCL: Paynes Prairie Preserve State Park | PCL Size: 20,945 acres

Project Manager: Florida Park Service (DEP)
James Weimer, Preserve Biologist
100 Savannah Boulevard, Micanopy, Florida 32667
Phone: 352-466-8081, Fax: 352-466-4297
E-mail: jim.weimer@dep.state.fl.us

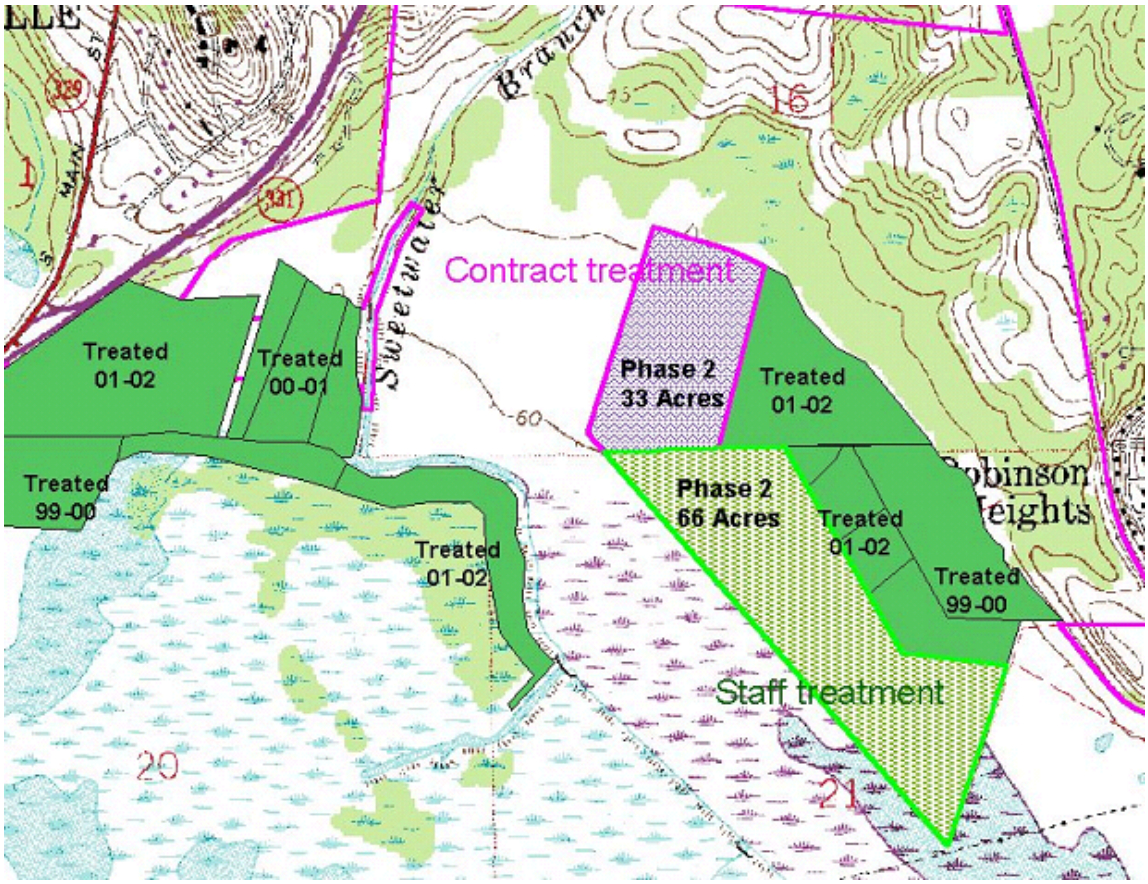
Project ID: WR-032 | Project Size: 99 acres

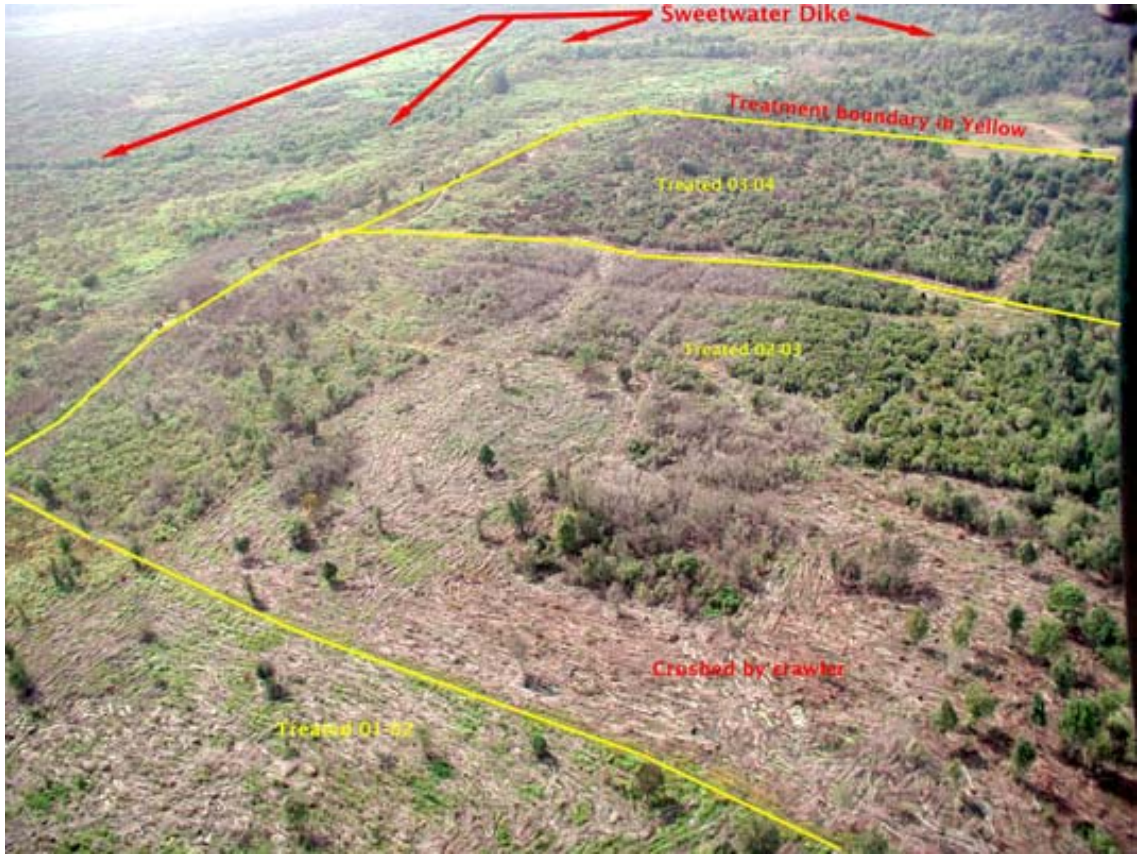
Fiscal Year 02/03 | Project Cost: $19,832.78

Paynes Prairie Preserve State Park has a national reputation for the abundance and diversity of its plants and animals. The vertebrate list exceeds three hundred species and the vascular floral contains half of the species found in north central Florida. With its large size, the park is the central piece in the Orange Creek Corridor of public lands, which stretches over forty miles, extending from the Santa Fe River in the north to the Ocklawaha River to the southeast. The total project area was 312 acres; however, the project was divided into four phases with one phase each for four years. Each year the project site is divided into two parcels, one parcel treated by a contractor and the second parcel treated by park staff as an in-kind contribution. The total project area is divided into 120 acres to be contracted and 192 acres to be treated by staff. The area treated this year included 33 acres under contract and 66 acres treated by staff. Most of the project area was covered with a practically impenetrable thicket of small trees, shrubs, briars, and vines. The high density of the vegetation virtually precluded normal access. To facilitate contractor access and to initiate restoration of the site, staff used heavy equipment (chopper and tree cutter) to cut paths through the project site. After treatment of exotics, the site will receive additional chopping and a prescribed burn to facilitate community restoration. As the site is opened up by exotics control and chopping, wetter spots along drainage channels are expected to be invaded by wild taro (*Colocasia esculenta*). Wild taro is a Category I invasive exotic and will be treated by staff as needed. Prior experience with wet prairie restoration indicates that the soil seed bank will prove adequate to restore native vegetation and a revegetation program will not be necessary.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Sapium sebiferum	Chinese tallow	Category I	basal	Garlon 4
			foliar	Garlon 4

Paynes Prairie





Loblolly Woods Phase III Invasive Exotic Plant Control — County: Alachua

PCL: Loblolly Woods Nature Park — PCL Size: 130 acres

Site Manager: City of Gainesville Recreation and Parks
Geoffrey Parks
1024 NE 14th Street, Building A, Gainesville, Florida 32602
Phone: 352-334-2227, Fax: 352-334-2234
E-mail: parksgr@ci.gainesville.fl.us

Project ID: WR-045 — Project Size: 48 acres

Fiscal Year 02/03 — Project Cost: $16,857.81

The primary goal of this project was to control emerging populations of small-leaf spiderwort and sweet autumn virginsbower in the park. The secondary goal of this project was to prevent the spread of these species to new sites within the Hogtown Creek watershed. Loblolly Woods is contiguous with over 600 acres of additional greenway properties. These and other city properties have direct connections to Alachua County's conservation property at Kanapaha Prairie. The City of Gainesville manages Loblolly Woods to protect and restore natural communities, maintain the floodplains, provide passive recreation outdoors, and to serve as a connection to other conservation properties that comprise the Hogtown Creek Greenway. Loblolly Woods contains Seepage Stream, Floodplain Forest, Upland Mixed Forest, and Bottomland Forest natural communities. Phase III was the completion of work on this site. The city paid all of the project cost except $1,294.81 for herbicide, which was provided by the bureau's Herbicide Bank.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Tradescantia fluminensis	small-leaf spiderwort	Category I	foliar	Roundup+Scythe
Dioscorea bulbifera	air-potato	Category I	foliar	Garlon 4/Roundup+Scythe
Clematis terniflora	sweet autumn virginsbower	n/a	foliar	Garlon 4

Withlacoochee Invasive Exotic Plant Control — County: Hernando

PCL: Withlacoochee State Forest — PCL Size: 155,270 acres

Project Manager: Division of Forestry (DACS)
Colleen Werner, Biologist
Withlacoochee Forest Center
15019 Broad Street, Brooksville, Florida 34601
Phone: 352-754-6777, x125, Fax: 352-754-6751
E-mail: wernerc@doacs.state.fl.us

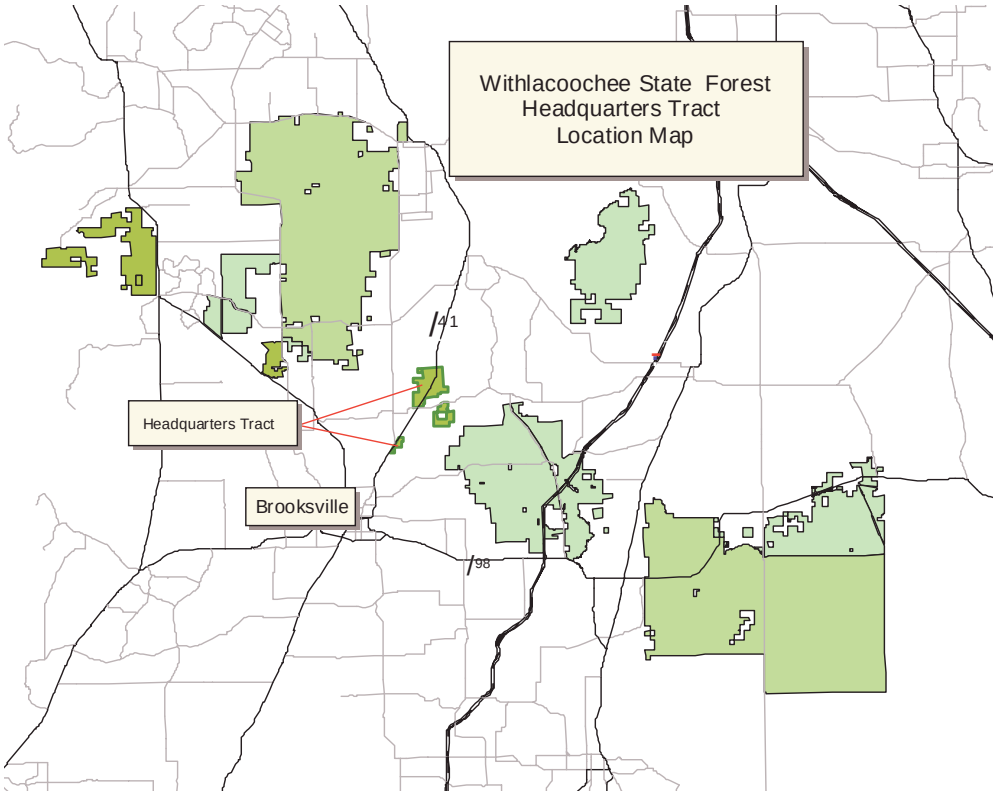
Project ID: WR-033, -043 — Project Size: 74.4 acres

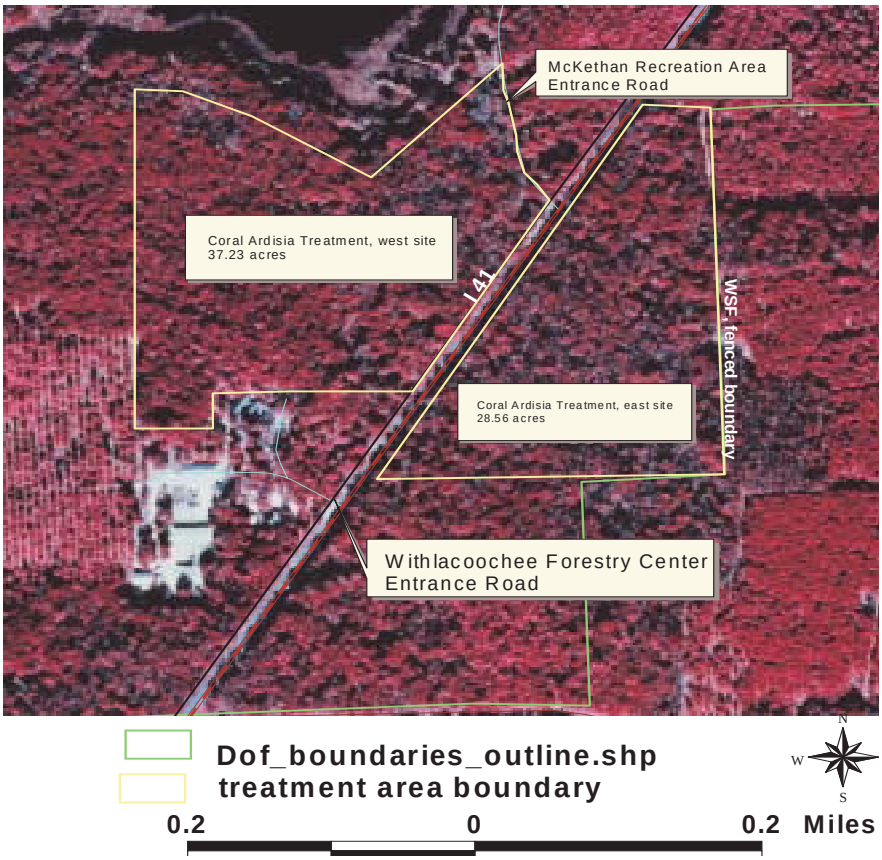
Fiscal Year 02/03 — Project Cost: $21,480

The Withlacoochee State Forest is divided among seven different tracts. The Headquarters Tract is in the north portion of Hernando County and is approximately 1,390 acres. This tract consists mostly of sandhill and mesic hammock, with a few depression marshes and a single small lake. Three coral ardisia sites occurred on the northern parcel of the Headquarters Tract, within the mesic and flood plain hammock that surrounds the McKethan Lake Recreational Area. One site adjacent to the McKethan Lake Nature Trail threatened a population of the federally endangered Cooley's water willow (*Justicia cooleyi*). The coral ardisia within this site was controlled with hand removal and herbicide treatment by in-house staff.

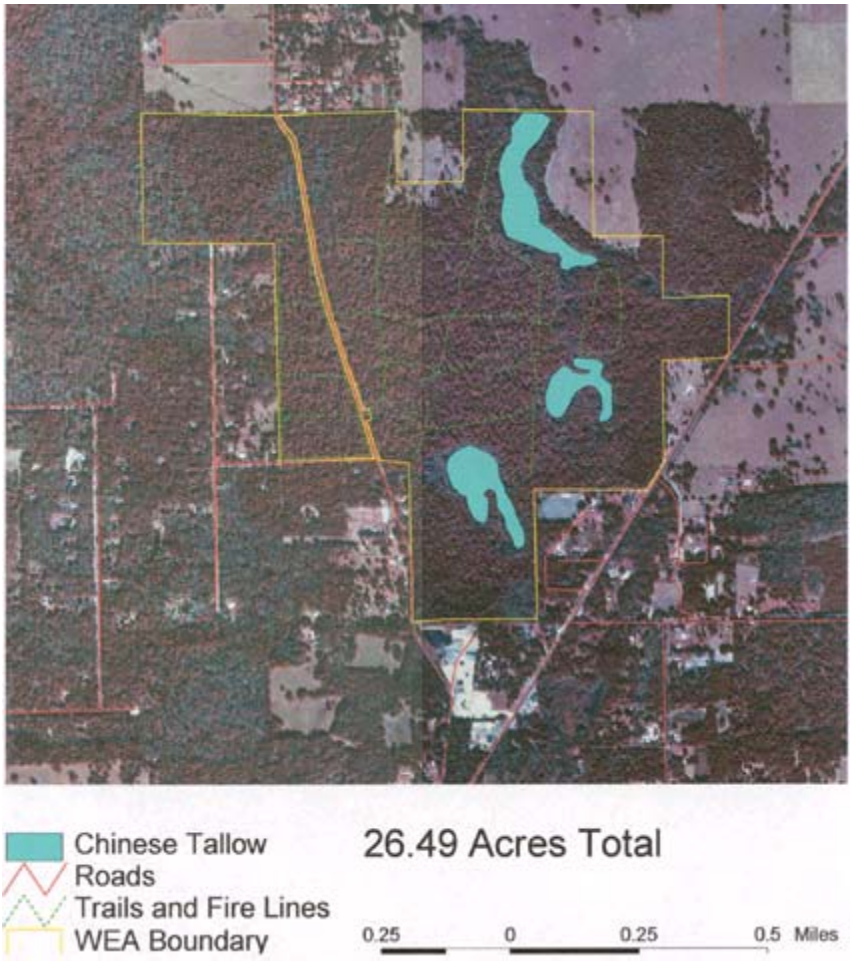
A Chinese tallow infestation occurred on the southernmost parcel of the Headquarters Tract in the Colonel Robins Recreational Area. The tallow was in a 32-acre sandhill habitat that was clear-cut due to a southern pine beetle outbreak. Most of the tallow trees were saplings, with individual plants widely scattered throughout the site. A few mature tallow trees existed along the east border of the site. Rosary pea occurred on the same site as the tallow, growing along a fence that runs along the east border of the tract. A second project targeted 30.4 acres of cogon grass on the Croom Tract. Four of the sites treated were in sandhills and another two sites were located in former mine pits.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Ardisia crenata	coral ardisia	Category I	foliar	2,4-D+Garlon 3A
Abrus precatorius	rosary pea	Category I	foliar	2,4-D+Garlon 3A
Sapium sebiferum	Chinese tallow	Category I	foliar	Roundup+Arsenal
Imperata cylindrica	cogon grass	Category I	foliar	Roundup+Arsenal


Withlacoochee State Forest
Headquarters Tract
Location Map
Headquarters Tract
Brooksville
41
98


McKethan Recreation Area
Entrance Road
Coral Ardisia Treatment, west site
37.23 acres
I-41
WSF, fenced boundary
Coral Ardisia Treatment, east site
28.56 acres
Withlacoochee Forestry Center
Entrance Road
Dof_boundaries_outline.shp
treatment area boundary
N
W
S
0.2
0
0.2 Miles

Withlacoochee State Forest



Rosary pea was one of the species invading the forest.

Chinsegut Invasive Exotic Plant Control County: Hernando

PCL: Chinsegut Wildlife Environmental Area PCL Size: 828 acres

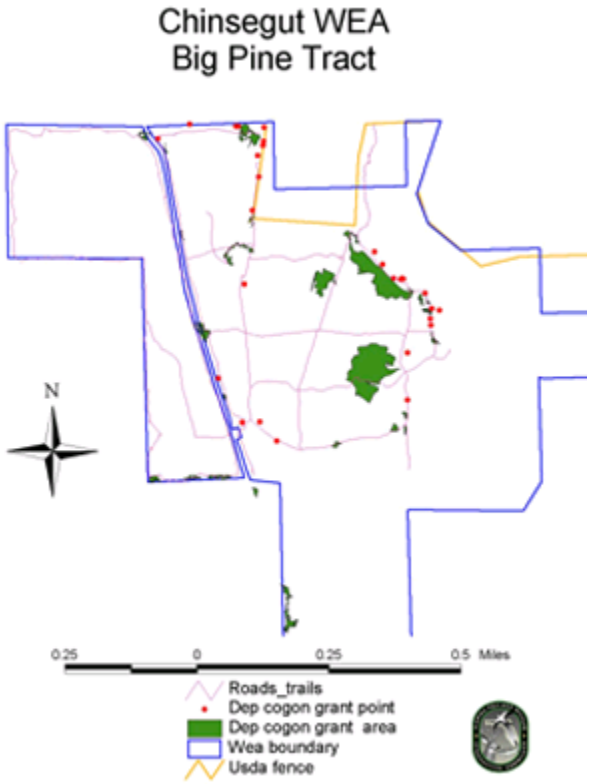
Project Manager: Fish and Wildlife Conservation Commission
Kristin Wood, Biological Scientist II
23212 Lake Lindsey Rd., Brooksville, Florida 34601
Phone: 352-754-6722, Fax: 352-540-6032
E-mail: kristin.wood@fwc.state.fl.us

Project ID: WR-041 Project Size: 16 acres

Fiscal Year 02/03 Project Cost: $3,600

The Chinsegut WEA consists of the Big Pine Tract and the Chinsegut Nature Center. The CWEA is dominated by sandhill, xeric hammock, upland mixed forest, basin marsh, and depression marsh. The Big Pine Tract is believed to be the second-largest stand of contiguous old-growth longleaf pine in Florida, with many longleaf pines over 200 years old. The cogon grass occurred on both tracts, mainly along firebreaks and in disturbed areas. In some areas it extended well into the adjacent natural communities.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Imperata cylindrica	cogon grass	Category I	foliar	Glypro+Arsenal



Waccasassa Bay Invasive Exotic Plant Control | County: Levy

PCL: Waccasassa Bay Preserve State Park | PCL Size: 32,500 acres

Project Manager: Florida Park Service (DEP)
Jeff DiMaggio
P.O. Box 187, Cedar Key, Florida
Phone: 352-543-5567, Fax: 352-543-6315
E-mail: jeffrey.dimaggio@dep.state.fl.us

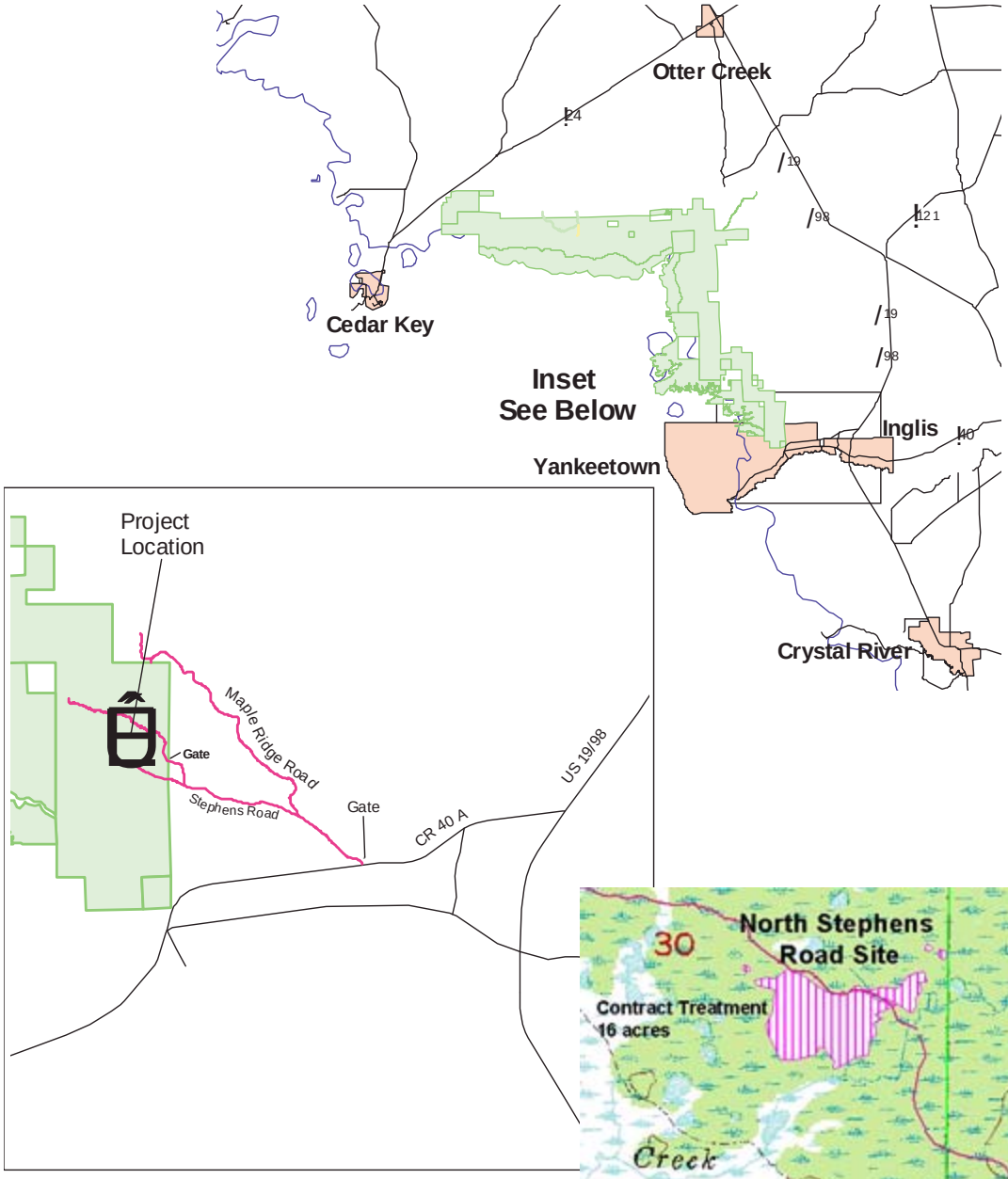
Project ID: WR-034 | Project Size: 30 acres

Fiscal Year 02/03 | Project Cost: $6,800

Waccasassa Bay Preserve State Park is located within the once vast Gulf Hammock. The bulk of Gulf Hammock, known as one of the largest hydric hammocks in the state (approximately 100,000 acres), is largely owned by timber companies. Waccasassa Bay Preserve is the only portion of Gulf Hammock that is under public ownership. Gulf Hammock continues to undergo profound changes as timber companies convert diverse hardwood forests to pine plantations. Gulf Hammock and Waccasassa Bay Preserve host a variety of rare plants and animals; at least 16 listed or tracked plant species and at least 28 listed or tracked animal species. Cogon grass in the hydric hammock threatened the rare corkwood, pinewoods dainties, or Florida pinkroot.

Cogon grass was found on sites that were logged in 1997 to control an outbreak of the Southern Pine Beetle and was presumably introduced on the logging equipment. The project area was divided into two treatment sites, one to be treated by contractors and the other by park staff. The North Stephens Site grades from mesic flatwoods to hydric hammock with a heavy coastal influence. Salt marsh bounds the site to the south and a wet, usually freshwater drain bounds the site to the east. Small freshwater wetlands are numerous within the site. Cogon grass coverage over these 16 acres was mostly continuous and typically dense (100% cover) on drier, open sites to somewhat sparse (25%cover or less) in wetter, shadier sites. Three isolated patches of cogon also occurred at this site. The Pole Timber Site, also logged during the same period, was also infested by cogon grass, but to a lesser extent. Nine acres of the 14 acres cut were surveyed and eleven patches of cogon grass were found, ranging from 0.25 acres to less than 0.01 acres. Because of the scattered nature of the infestation and the extensive search time required to find the patches, staff treated this infestation as an in-kind match, along with providing $3,200 of the total project cost.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Imperata cylindrica	cogon grass	Category I	foliar	Gly-Pro+Arsernal


Otter Creek
Cedar Key
Inset
See Below
Inglis
Yankeetown
Crystal River
Project
Location
Gate
Maple Ridge Road
Stephens Road
Gate
CR 40 A
US 19/98
North Stephens
Road Site
Contract Treatment
16 acres
30
Creek
YANKEETOWN
Pole Timber
Site
Staff Treatment
14 acres
31
N

Goethe State Forest Invasive Exotic Plant Control | County: Levy, Alachua

PCL: Goethe State Forest | PCL Size: 45,212 acres

Project Manager: Division of Forestry (DACS)
Libby Zimmerman, Robin Boughton
8250 SE CR 336, Dunnellon, Florida 34431
Phone: 352-447-2202, Fax: 352-447-1358
E-mail: zimmere@doacs.state.fl.us, boughtr@doacs.state.fl.us

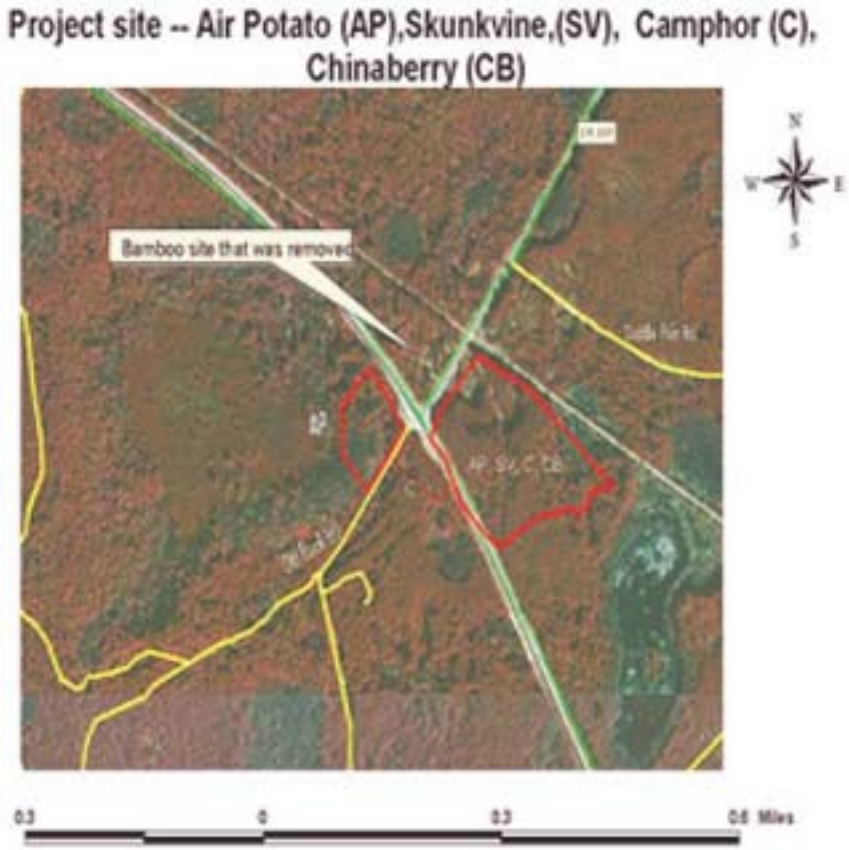
Project ID: WR-039 | Project Size: 26.7 acres

Fiscal Year 02/03 | Project Cost: $14,568.28

Goethe State Forest has more than fifteen different natural communities, including Sandhill, Mesic Flatwoods, Hydric Hammock, Scrubby Flatwoods, Wet Flatwoods, Dome Swamp, and Basin Swamp. The forest may contain the largest tract of contiguous, old-growth, longleaf pine flatwoods in the state. This extensive old-growth flatwoods has one of the largest red-cockaded woodpecker populations in Florida. Other rare animal species found on the forest include the Florida black bear, gopher tortoise, Sherman's fox squirrel, and bald eagle. Rare plants include the hooded pitcher plant, greenfly orchid, and coontie.

This project is divided into three exotic control areas: New Acquisition North (NAN), New Acquisition South (NAS), and Watermelon Pond East (WPE). Air-potato and mimosa were found within 8 acres total of NAN with 5% cover. Camphor tree and air-potato occupied 10 acres of NAS with 20% and 90% cover, respectively. Japanese climbing fern occurred in WPE over 8.7 acres with a 45% cover.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Cinnamomum camphora	camphor tree	Category I	basal bark	Garlon 4
Melia azedarach	Chinaberry	Category I	basal bark	Garlon 4
Albizia julibrissin	mimosa	Category I	basal bark	Garlon 4
			foliar	Roundup+Escort
Dioscorea bulbifera	air-potato	Category I	foliar	Roundup+Escort
Paederia foetida	skunk vine	Category I	foliar	Roundup+Escort
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Roundup+Escort



Silver River Cogon Grass Invasive Exotic Plant Control — County: Marion

PCL: Silver River State Park — PCL Size: 4,230 acres

Site Manager: Florida Park Service (DEP)
Bob LaMont, Park Manager
1425 NE 58th Avenue, Ocala, Florida 34470
Phone: 352-236-7152, Fax: 352-236-7150
E-mail: sl-river@atlantic.net

Project ID: WR-038 — Project Size: 39 acres

Fiscal Year 02/03 — Project Cost: $5,250

Silver River is a first magnitude spring-fed stream that flows into the Ocklawaha River. The park encompasses the river and over fourteen natural community types. Cogon grass occured throughout the pine flatwoods and was invading high quality endangered sandhill.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Imperata cylindrica	cogon grass	Category I	foliar	Roundup

Crystal River Invasive Exotic Plant Control — County: Citrus

PCL: Crystal River Preserve State Park — PCL Size: 38,000 acres

Project Manager: Florida Park Service (DEP)
Nick Robbins, Preserve Manager
3266 N. Sailboat Avenue, Crystal River, Florida 34428
Phone: 352-563-0450
E-mail: nicholas.robbins@dep.state.fl.us

Project ID: WR-042 — Project Size: 27 acres

Fiscal Year 02/03 — Project Cost: $3,618

The park includes much of the land between the Homosassa and Crystal Rivers and encompasses marine tidal marsh and swamp, with hundreds of islands of various size located in the Gulf. Other natural communities include hydric hammock, upland mixed forest, scrub, and sandhill. The bureau provided the herbicide only for this project through its Herbicide Bank.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump	Garlon 4+Stalker

---

Salt Springs Invasive Exotic Plant Control — County: Pasco

PCL: Werner-Boyce Salt Springs State Park — PCL Size: 3,400 acres

Site Manager: Florida Park Service (DEP)
Toby Brewer, Assistant Park Manager
#1 Causeway Boulevard, Dunedin, Florida 34698
Phone: 727-816-1890, Fax: 727-816-1888
E-mail: toby.brewer@dep.state.fl.us

Project ID: WR-048 — Project Size: 150 acres

Fiscal Year 02/03 — Project Cost: $6,860.39

The natural communities of Salt Springs include pine flatwoods, coastal strand, saltwater marsh, freshwater marsh, and hydric hardwood hammocks. This project contined in-house eradication and control of Brazilian pepper, cogon grass, Chinese tallow, air-potato, and lead tree that were found in the southern region of the park. Exotics in this area were concentrated in areas of prior disturbance. Several large stormwater ditches run through this area and many exotics were found along the edges. While Brazilian pepper was the most abundant, cogon grass appeared in several patchy areas within the project area. Chinese tallow, lead tree, and air-potato were scattered in minimal amounts. The bureau provided the herbicide only for this project through its Herbicide Bank.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Sapium sebiferum	Chinese tallow	Category I	basal	Garlon 4
Dioscorea bulbifera	air-potato	Category I	basal	Garlon 4
Imperata cylindrica	cogon grass	Category I	foliar	Roundup

National Park Service Working Group

The Florida Exotic Plant Management Team Partnership

National Park Service (NPS) units in Florida have been actively controlling invasive exotic plants since the 1960s. In 2000, NPS established four Exotic Plant Management Teams (EPMT) to control invasive exotic plants on federal conservation lands. The EPMT are modeled after the "strike teams" used by the U.S. Forest Service to fight forest wildfires. Each highly trained, mobile strike force of plant management specialists stands ready to assist the national parks in the control of invasive exotic plants. The EPMT were created through NPS' Natural Resource Challenge. The Florida Exotic Plant Management Team (FLEPMT) is a partnership between the NPS and Florida's Department of Environmental Protection, Bureau of Invasive Plant Management (BIPM). Through this partnership, BIPM matches each Challenge dollar spent to control exotic plants in Florida's eleven National Park units. While other EPMT rely on in-house crews, the efforts in Florida reflect the flexibility of the EPMT concept. Exotic plant control work in Florida is conducted under contractual agreement with private companies, allowing for reduced cost and increased efficiency, resulting in "*More Protection, Less Process*."

Since its establishment in FY 2000, the FLEPMT has provided for the initial treatment of invasive plants on over 11,000 acres. Funding for the control has been provided by the NPS (Natural Resource Challenge) and is matched by BIPM (FY 2000-2003 NPS: $1.74M, BIPM: $1.58M). All control projects have been successful at controlling invasive plants and have also been very cost effective. Invasive plant control projects have been undertaken at Big Cypress NP, Biscayne NP, Canaveral NS, DeSoto NM, Dry Tortugas NP, Everglades NP, Fort Matanzas NM, and Gulf Islands NS. On four of these NPS units (Desoto NM, Dry Tortugas NP, Gulf Islands NS, and Fort Matanzas NM), initial treatment of all of the most invasive plant species has been completed. Significant strides have been made in the other parks receiving funding.

In FY 2003, the FLEPMT expanded its efforts to reign in the uncontrolled expansion of invasive plants, while maintaining a primary focus on initial treatment of invasive plants in Florida NPS areas. In Florida, eight projects were selected for funding in FY 2003, totaling over 2,000 acres of invasive species controlled (NPS $475K, BIPM $405K). Everglades NP received funds to assist in the initial treatment of *Melaleuca* and *Casuarina*. Timucuan EHP received funds to treat Chinese tallow on acquisition property. Biscayne NP received funds to complete the initial treatment of coastal barrier islands, and funds to start on mainland control projects. Canaveral NS expanded its Brazilian pepper treatments.

The continued success of the EPMT concept relies upon building public and private partnerships to efficiently prevent, control, and manage damaging exotic species now and into the future. Exotic weeds recognize no boundaries and cooperative efforts are critical to addressing invasive species and protecting public natural areas. The Florida Partnership EPMT is involved with over 100 federal, state, regional, and local cooperators, and is broadening its participation to others, including outside of Florida. The Florida EPMT partnered with the University of Florida (UF) in addressing invasive plant problems in the U.S. Virgin Islands. Through this partnership the Florida EPMT provided additional funding to assist UF in implementing a project entitled: "Impacts of Invasive non-native Agricultural Plants in U.S. Virgin Islands Natural Areas". This project integrated science-based efforts to reduce the ecological and economic impacts of invasive non-native plant species in natural areas with local social structure and educational mechanisms. This effort was primarily funded by the United States Department of Agriculture.

More information can be found at the NPS EPMT web site: http://www.nature.nps.gov/epmt

The FEPMT liaison is Mr. Tony Pernas, Exotic Plant Management Specialist, National Park Service, 40001 SR 9336, Homestead, Florida 33034, phone: 305-242-7846, e-mail: tony_pernas@nps.gov. Eight projects were completed in FY 2003 on four national parks, with four of the projects contracted through BIPM. The first two of these projects were at Canaveral National Seashore. The project manager for both projects was:

John Stiner
308 Julia Street, Titusville, Florida 32796
Phone: 321-267-1110, Fax: 321-264-2906
E-mail: john_stiner@nps.gov

Canaveral National Seashore is located in southeast Volusia County and northeast Brevard County, on a long barrier island adjacent to the Mosquito Lagoon. Natural communities within the project area include coastal dune, coastal strand, oak scrub, mangrove forest, salt marsh, and palm and oak hammocks. The area consists of a typical coastal lowland environment in which seasonal flooding, perennially wet marshes, and swamps predominate. Several dikes extend into the water and swale areas. Slightly elevated areas contain cabbage palm and live oak hammocks.

South Barrier Island Invasive Exotic Plant Control	County: Brevard, Volusia
PCL: Canaveral National Seashore	PCL Size: 57,662 acres
Project ID: NP-015	Project Size: 1,894 acres
Fiscal Year 02/03	Project Cost: $99,043.54

The target area is in the southern barrier island portion of the Seashore, extending a distance of 12 miles from the south boundary of the park to the Brevard County line. The western half of the island is jointly managed by the Seashore and the adjacent Merritt Island National Wildlife Refuge. The two agencies are working together to restore wetlands and eliminate Brazilian pepper and Australian pine from the Park and Refuge. This portion of the barrier island ranges from 100 yards to one-half mile in width. On the east side are an undeveloped sandy beach with a single dune ridge averaging 12 feet in height. Dense stands of saw palmetto grow on the backside of the dune with interspersed areas of grassy vegetation. The west side of the island, adjacent to Mosquito Lagoon, consists of impounded marshes and occasional hammocks of live oak and cabbage palm. Mangroves are common along the shoreline of the lagoon. Brazilian pepper occurred primarily along the dikes, lagoon shoreline, an entrance road, and several public viewing areas, ranging from 15% to 100% coverage in the project area.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal bark	Garlon 4
			cut stump	Arsenal
			hand pull	n/a

Bio Lab Road Invasive Exotic Plant Control	County: Brevard, Volusia
PCL: Canaveral National Seashore	PCL Size: 57,662 acres
Project ID: NP-016	Project Size: 4,058 acres
Fiscal Year 02/03	Project Cost: $117,423.94

This project controlled Brazilian pepper along a 4.25-mile stretch of Bio Lab Road located in the southwest corner of the park. The project area included both sides of the road for the entire 4.25-mile stretch, ranging in width from100 feet to 250 feet. Brazilian pepper ranged from 15% to 100% cover in the project area.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	basal bark	Garlon 4
			cut stump	Arsenal

Brazilian pepper control (left) and the return of the natives (right).

Clearing long stretches of Brazilian pepper along roadsides is a lengthy process.

Biscayne Mainland Invasive Exotic Plant Control | County: Miami-Dade, Monroe

PCL: Biscayne National Park | PCL Size: 172,924 acres

Project Manager: National Park Service
Toby Obenauer
9700 SW 328th Street, Homestead, Florida 33033
Phone: 305-230-1144 x3016, Fax: 305-230-1190
E-mail: toby_obenauer@nps.gov

Project ID: NP-038, 039 | Project Size: 4,936.33 acres

Fiscal Year 02/03 | Project Cost: $188,493.30

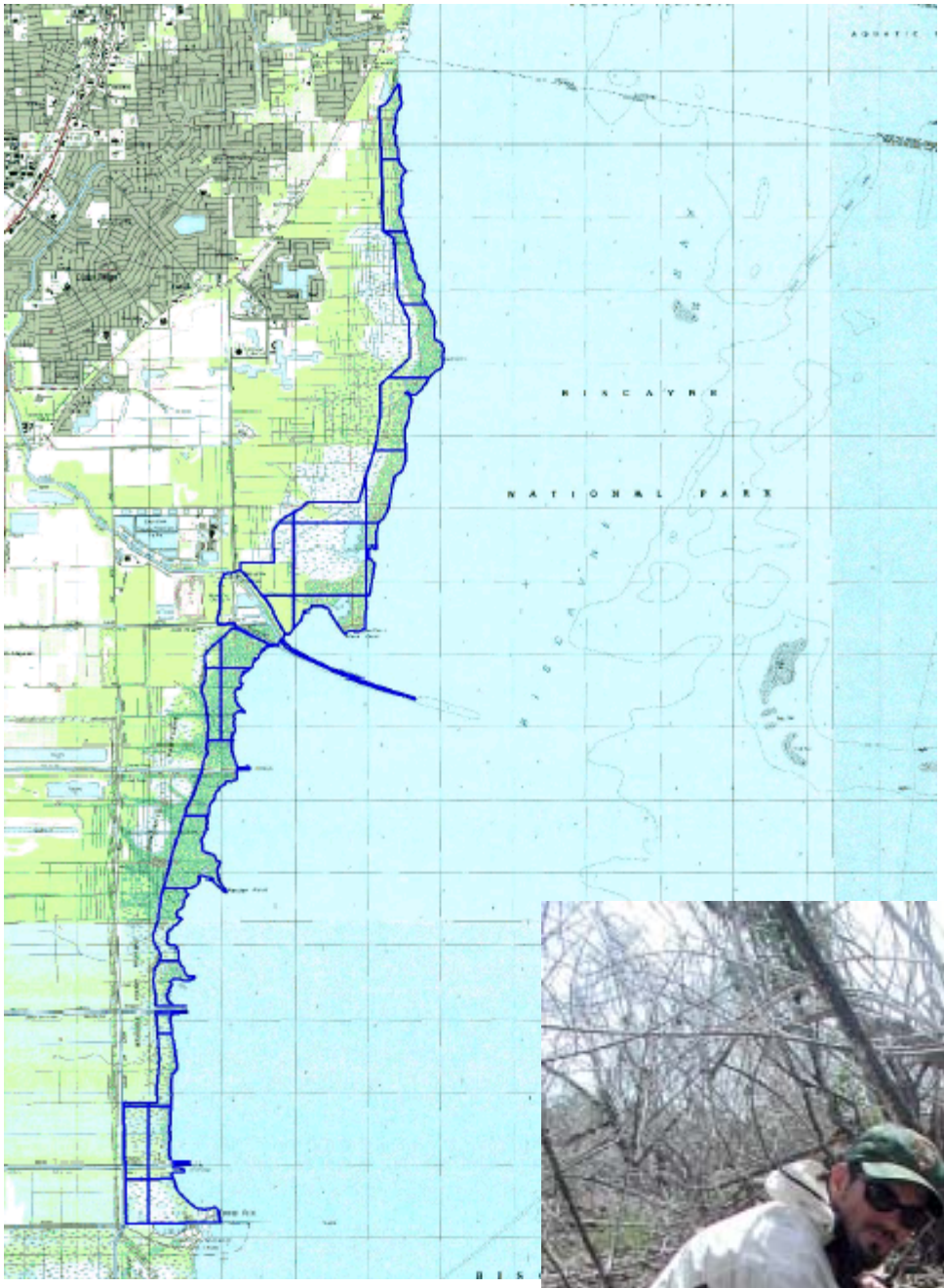
Mangroves dominate the mainland of Biscayne National Park, with scattered hardwood hammocks also present. There are four developed zones within the area; Turkey Point Nuclear Power Plant, Homestead Bayfront Park, Black Point Park, and Convoy Point. Several disturbed sites, mosquito ditches, and old canal banks are also found on the Park, providing areas for higher populations of exotics. The majority of the exotic infestations occurred in the developed areas, disturbed sites, and around the hammocks. The mainland hosts a number of state threatened and endangered species, including West Indian mahogany (*Swietenia mahogani*) and satinleaf (*Chrysophyllum oliviforme*).

Invasive exotic plants along the coastal area primarily included lather leaf, Brazilian pepper, Hawaiian half-flower or beach naupaka, bowstring hemp, and seaside mahoe. The interior exotic species were primarily sapodilla, sisal hemp or century plant (*Agave sisalana*), and Burma reed. Levels of infestation varied, but the average cover of exotics over the entire project area was estimated at 10-15%.

Plants Treated	Common Name	FLEPPC Rank	Treatment	Herbicide
Neyraudia reynaudiana	Burma reed	Category I	cut foliar	Garlon 4
Schinus terebinthifolius	Brazilian pepper	Category I	basal bark	Garlon 4
			hand pull	n/a
Casuarina equisetifolia	Australian pine	Category I	basal/hack & squirt	Garlon 4
Thespesia populnea	seaside mahoe	Category I	basal/hack & squirt	Garlon 4
Colubrina asiatica	lather leaf	Category I	basal/hack & squirt	Garlon 4
			hand pull	n/a
Scaevola sericea	beach naupaka	Category I	hand pull	n/a

Hacking through a lather leaf thicket.

Applying herbicide to the cut stumps of seaside mahoe.



Mangrove seedlings sprouted after the dense mahoe was removed.

Other state agencies and other divisions within DEP receive funding to conduct land management activities, which may include exotic species control, on properties where they are designated as the manager by the state Board of Trustees of the Internal Improvement Trust Fund. The Bureau provides free assistance to these agencies by offering the use of its established contract procedures and contractors to perform exotics control projects, thus avoiding a duplication of effort. The Bureau handles all of the processing of these projects except for the actual release of funds, which are disbursed from the managing agency.

In FY03, three projects received funding through the DEP Office of Coastal and Aquatic Managed Areas. These projects, on Estero Bay State Buffer Preserve and Rookery Bay National Estuarine Research Reserve, are discussed under the Southwest Regional Working Group section (*see* MR-005, MR-006, SW-022b). The DEP Division of Recreation and Parks (Florida Park Service (DRP)) funded six state park projects, with BIPM overseeing the contractual arrangements. The total of DRP funds expended through the Uplands Program for invasive plant control in FY03 was $257,484.27

Lovers Key State Park was the site of two DRP-funded projects and one working group project (*see* SW-047). The project manager for these projects was:

Paul Rice, Park Manager
8700 Estero Boulevard, Fort Myers Beach, Florida 33931
Phone: 941-463-4588, Fax: 941-463-8851
E-mail: paul.rice@dep.state.fl.us

Black Island Trail Invasive Exotic Plant Control	County: Lee
PCL: Lovers Key State Park	PCL Size: 1,665 acres
Project ID: RP-023	Project Size: 39.48 acres
Fiscal Year 02/03	Project Cost: $43,380

Lovers Key State Park consists primarily of four islands contained between New Pass to the south and Big Carlos Pass to the North. The park entrance and most of the facilities are located on Black Island. The project site was on Black Island, a 293-acre barrier island consisting of disturbed coastal strand community fringed by a marine tidal swamp. Developers dredged the island in the 1970s to create water front properties, which created a serpentine canal system isolating several 'fingers' of land.

The project area was on two sections of the island, both having Australian pine, Brazilian pepper, and lead tree, with the main project area being mostly pepper. There are two small fresh water ponds where the embankments were previously cleared of mature exotics on 50% of each. There were also mature Australian pine and Brazilian pepper along the edges of the canals and in large stands on the island.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump/basal	Garlon 4
Casuarina equisetifolia	Australian pine	Category I	cut stump/basal/girdle	Garlon 4
Leucaena leucocephala	lead tree	Category II	cut stump/basal	Garlon 4
			foliar	Escort

Lovers Key Phase II Invasive Exotic Plant Control	County: Lee
Project ID: RP-025	Project Size: 27.8 acres
Fiscal Year 02/03	Project Cost: $89,854.08

This project site was also on Black Island.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Schinus terebinthifolius	Brazilian pepper	Category I	cut stump/basal	Garlon 4
			hand pull	n/a
Casuarina equisetifolia	Australian pine	Category I	cut stump/basal	Garlon 4
			hand pull	n/a
Melaleuca quinquenervia	melaleuca	Category I	cut stump	Arsenal
			cut stump	Garlon 4
Leucaena leucocephala	lead tree	Category II	cut stump/basal	Garlon 4
			foliar	Roundup+Escort
			hand pull	n/a
Hibiscus tiliaceus	mahoe	Category II	cut stump	Garlon 4

Washington Oaks Sword Fern Invasive Exotic Plant Control — County: Flagler

PCL: Washington Oaks Gardens State Park — PCL Size: 414 acres

Project Manager: Florida Park Service (DEP)
Doug Carter, Park Manager
6400 N Oceanshore Boulevard, Palm Coast, Florida 32173
Phone: 386-446-6780
E-mail: douglas.carter@dep.state.fl.us

Project ID: RP-027 — Project Size: 5 acres

Fiscal Year 02/03 — Project Cost: $7,400

The exotic tuberous sword fern (*Nephrolepis cordifolia*) was first discovered in Florida in 1938. It was planted and maintained ornamentally at Washington Oaks Gardens State Park by the previous landowners from about 1940 through 1964 as part of their Ornamental Gardens. Because of the invasive nature of this plant, it has spread beyond the boundaries of the Formal Gardens and into the natural areas of the park. The Division of Recreation and Parks has been working to remove this plant from all areas within the park, including the Formal Gardens. This project consisted of hand pulling sword fern in three separate areas of the park. The fern occurred in scattered patches throughout the project area. Park staff continue to conduct monthly surveys and follow up treatment of fern regrowth.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Nephrolepis cordifolia	sword fern	Category I	hand pull	n/a

Maclay Gardens Invasive Exotic Plant Control — County: Leon

PCL: Maclay Gardens State Park — PCL Size: 1,779 acres

Project Manager: Florida Park Service
Beth Weidner, Park Manager
3540 Thomasville Road, Tallahassee, Florida 32304
Phone: 850-487- 4115, Fax: 850-487-8808
E-mail: beth.weidner@dep.state.fl.us

Project ID: RP-024 — Project Size: 200 acres

Fiscal Year 02/03 — Project Cost: $30,000

Maclay Gardens State Park is located on US Highway 319 in Tallahassee. 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. Coral ardisia is the most widely spread exotic species throughout the project area, with stem counts generally exceeding 1,000 stems per acre, and prioritized sections near the park's sinkholes having stem counts approaching 10,000 stems per acre. Additionally, nandina, Chinese tallow, and camphor tree are abundant throughout the project area, particularly around the sinkholes. 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. A maintenance control project was also completed at the park (*see* PH-023).

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Lygodium japonicum	Japanese climbing fern	Category I	foliar	Glyphosate+Escort
Albizia julibrissin	mimosa	Category I	basal	Garlon 4
Ardisia crenata	coral ardisia	Category I	basal	Garlon 4
Cinnamomum camphora	camphor tree	Category I	basal	Garlon 4
Ligustrum lucidum	glossy privet	Category I	basal	Garlon 4
Lonicera japonica	Japanese honeysuckle	Category I	basal	Garlon 4
Nandina domestica	heavenly bamboo	Category I	basal	Garlon 4
Sapium sebiferum	Chinese tallow	Category I	basal	Garlon 4
Aleurites fordii	tung oil tree	Category II	basal	Garlon 4
Elaeagnus pungens	silverthorn	Category II	basal	Garlon 4
Wisteria sinensis	Chinese wisteria	Category II	basal	Garlon 4
Bambusa spp.	bamboo	n/a	basal	Garlon 4

Loxahatchee River Invasive Exotic Plant Control — County: Martin, Palm Beach

PCL: Jonathan Dickinson State Park — PCL Size: 11,480 acres

Project Manager: Florida Park Service (DEP)
Richard Roberts, Biologist II
13798 SE Federal Highway, Hobe Sound, Florida 33455
Phone: 772-546-0900
E-mail: richard.roberts@dep.state.fl.us

Project ID: RP-026 — Project Size: 265.7 acres

Fiscal Year 02/03 — Project Cost: $75,593.27

Overall, this project was designed to remove Old World climbing fern and other invasive exotics from the Loxahatchee River where it flows through the state park, thus continuing the work that had been ongoing on the SFWMD Loxahatchee River property. Natural communities within the park are mostly composed of Pine Flatwoods and Cypress Slough, but with some Wet Prairies. A large number of different exotics exist on the property, so the project was divided into eight treatment zones. Initial work was concentrated on the east side of the Loxahatchee River, with climbing fern outside of the river floodplain the highest priority.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Lygodium microphyllum	Old World climbing fern	Category I	foliar	Rodeo
Urena lobata	Caesar's weed	Category II	foliar	Rodeo
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Cinnamomum camphora	camphor tree	Category I	basal	Garlon 4
Syzygium cumini	Java plum	Category I	basal	Garlon 4
Psidium cattleianum	strawberry guava	Category I	basal	Garlon 4

Ft. Pierce Inlet Invasive Exotic Plant Control — County: St. Lucie

PCL: Ft. Pierce Inlet State Park — PCL Size: 1,141 acres

Project Manager: Florida Park Service (DEP)
Perry Smith, Park Manager
905 Shorewinds Drive, Ft. Pierce, Florida 34949
Phone: 561-468-4007, Fax: 561-460-3646
E-mail: perry.j.smith@dep.state.fl.us

Project ID: RP-022 — Project Size: 100 acres

Fiscal Year 02/03 — Project Cost: $11,256.92

The park is a barrier island with natural communities that include Beach, Dune, and Coastal Hammock. The project consists of removing Brazilian pepper and Australian pine from along A1A to the north, Atlantic Beach Boulevard to the east into the mosquito impoundment to the south. Infestation of Brazilian pepper is heavy, while Australian pine is moderate to heavy along the mosquito impoundment and moderate inside the impoundment. This work was the completion of a $100,000 project from the previous fiscal year.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
Casuarina equisetifolia	Australian pine	Category I	basal/girdle	Garlon 4
Schinus terebinthifolius	Brazilian pepper	Category I	basal	Garlon 4
Cupaniopsis anacardioides	carrotwood	Category I	basal	Garlon 4
Psidium cattleianum	strawberry guava	Category I	basal	Garlon 4

Herbicide was ordered for maintenance control purposes for those projects in the Upland Exotic Plant Management Program where initial control work was completed in Fiscal Year 2001-2002. Herbicide was also ordered for initial control projects where land managers chose to do exotic removal in-house and requested only herbicide funding through the Uplands Program. An Access database was created to organize and keep track of all the Herbicide Bank information, including amounts and costs.

Calculations for the amount of herbicide ordered for projects were based on 25% or 50% of the original use summaries. Twenty-five percent of original usage was calculated for treatments including trees and/or shrubs, while fifty percent of original usage was given when treatment included vines and/or grasses. The amounts of surfactant ordered for treatment were based on the herbicide ordered. In most cases the herbicide ordered was Garlon 4 and thus the amount of surfactant ordered was based on a 22% ratio of herbicide to surfactant. Garlon was ordered in 2.5-gallon jugs and surfactant (Diluent Blue) in 11.25 gallon drums. Upon request, amounts of herbicide and surfactant were ordered based on a lower percentage of mixture, usually 10%. For herbicides other than Garlon 4 surfactant ordered was based on label recommendations.

The type of herbicide ordered was based on the daily project reports completed by the contractors. Generally, the herbicide ordered for re-treatment was the same as that initially applied by the contractor. Different herbicides were ordered only on request and when the need seemed evident, such as a high non-target kill. For requests of herbicides different from the original treatment, amount ordered was based on equal cost.

The following is a summary of Herbicide Bank maintenance control projects for FY 2003:

Total Gallons of Herbicide Ordered	3,778 gallons
Total Cost of Herbicide Ordered	$109,885
Total Number of Maintenance Control Projects	84 projects
Total Acres Treated by Maintenance Control Projects	12,064 acres

The following is a summary of Herbicide Bank initial control projects for FY 2003:

Total Gallons of Herbicide Ordered	3,229 gallons
Total Cost of Herbicide Ordered	$95,012
Total Number of Initial Control Projects	13 projects
Total Acres Treated by Initial Control Projects	2,887 acres

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. Trees were planted on low-lying islands immediately lakeward of the levee to protect the levee system from 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 to the Department of Environmental Protection (DEP) for the specific purpose of melaleuca control. 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 by BIPM as the Melaleuca Program, has resulted in over $20 million of melaleuca control to date. BIPM has expanded upon the contractual arrangement with SFWMD to provide melaleuca control on non-district lands, as well as control of other invasive plant species on public conservation lands in south Florida. At the current level of funding, melaleuca could be eliminated from the Everglades Water Conservation Areas and Lake Okeechobee 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 (ENP), Big Cypress National Preserve (BCNP), Lake Okeechobee (Lake O), and the Water Conservation Areas (WCA), including the Loxahatchee National Wildlife Refuge (LOX). The National Park Service (NPS) 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 LOX (a.k.a. WCA 1) prior to 1987 and 6,755 acres from 1987 to 1998. The South Florida Water Management (SFWMD) assisted with these early efforts, as well as treating Lake O and the WCAs.

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 WCAs (`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. In 2002, the SFWMD aerially treated 5,460 acres of melaleuca at an average cost per acre of $125. 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 2002, the SFWMD treated 7,285 acres of low density melaleuca with ground crews at an average per acre cost of $300.

In 1993, the SFWMD estimated there were 252,008 acres of melaleuca within its boundaries (melaleuca also occurs outside the District). Of these total acres, 52% were on public lands and 48% on private lands. In 2002, the estimated acreage was 154,423 acres, of which 22% were on public lands—a decrease of 97,071 acres through Florida's dedicated funding for melaleuca control.

State and District efforts to control melaleuca, along with those of other governmental agencies and private groups, are containing its spread within the Everglades Water Conservation Areas (WCAs) and the marsh of Lake Okeechobee. 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—To be effective, the 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 Holiday Park in Ft. Lauderdale in April 1997. The insect spread and, along with additional releases, is now successfully established within melaleuca populations throughout South Florida. A second insect, a sap-sucking psyllid (*Boreioglycaspis melaleucae*), was released in November 2002 and has also become well established. These two control agents have been observed to severely curtail flowering and new growth of melaleuca in areas within their ranges.

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 desiccation, fire, frost, physical damage, or herbicide application. Once released, 15-20% of the seeds will germinate. These 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 new 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 navigational 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. This phase focuses on the elimination of all mature trees and seedlings present in an area.

Phase II. Previously treated sites are revisited 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. This phase entails the long-term management of melaleuca: surveillance and inspection of previously treated sites to monitor the effectiveness of the melaleuca control program 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% Arsenal®, 25% Rodeo® and 50% 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. Acceptable results have been obtained using 3 quarts of Rodeo® and 3 quarts of Arsenal® with 4 quarts of methylated seed-oil surfactant in 20 gallons total volume per acre, in large-scale applications.

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—BIPM provided funding of $1,295,705 for melaleuca control in fiscal year 2003. Of this total, $487,039 went to maintenance control operations on Lake O and the WCAs. The remaining funds were used for ground work at J.W. Corbett Wildlife Management Area ($100,000) and aerial control (both initial and maintenance treatments) at Charlotte Harbor State Buffer Preserve ($67,219), Loxahatchee National Wildlife Refuge ($52,064), Estero Bay State Buffer Preserve ($190,814), Picayune Strand State Forest ($367,644), and Palm Beach County's Loxahatchee Slough and Pal-Mar Natural Areas ($84,967).

Dead melaleuca (and Old World climbing fern) after an aerial treatment at Pal-Mar Natural Area in Palm Beach County, Florida.

Uplands Operations Summary 1997-2003

(Acres Controlled, Cost/Acre, and Cost Range include all contractual control operations. Operational data derived only from projects for which Daily Progress Reports were submitted.)

2002-2003					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	16036	$329	$36-$19678	9.20	0.68
Vines	3776	$318	$150-$7577	21.36	1.60
Shrubs-Grasses	3040	$237	$23-$1480	21.88	1.55
TOTALS	22852	$315	$23-$19678	13.72	1.01

2001-2002					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	17521	$350	$93-$21667	21.91	0.99
Vines	1776	$408	$234-$12997	14.40	0.80
Shrubs-Grasses	3092	$187	$19-$3158	8.39	0.26
TOTALS	22389	$322	$19-$21667	17.73	0.80

2000-2001					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	11503	$228	$17-$4918	4.91	0.30
Vines	985	$472	$98-$5082	7.05	0.16
Shrubs-Grasses	494	$534	$35-$1786	13.98	1.07
TOTALS	12982	$258	$17-$5082	5.39	0.31

1999-2000					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	1964	$727	$60-$5576	18.75	1.14
Vines	744	$675	$344-$5186	13.67	1.15
Shrubs-Grasses	390	$808	$517-$2256	13.81	1.44
TOTALS	3098	$725	$60-$5576	16.42	1.19

1998-1999					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	1677	$489	$32-$2696	18.01	1.03
Vines	804	$354	$149-$1832	15.41	0.42
Shrubs-Grasses	597	$154	$54-$730	7.66	0.55
TOTALS	3078	$389	$32-$2696	15.32	0.78

1997-1998					
	Acres Controlled	Cost/Acre	Cost Range	Hours/Acre	Gal Product/Acre
Trees	1112	$486	$422-$1167	25.25	0.39