

Mosquito Coast Regional Working Group

Merritt Island Invasive Exotic Plant Control Projects

County: Brevard

PCL: Merritt Island National Wildlife Refuge

PCL Size: 139,174 acres

Project Manager: U.S. Fish and Wildlife Service

Ron Hight, Refuge Manager

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Phone: 321-861-0667, Fax: 321-861-1276

E-mail: ron_hight@fws.gov

Project ID: MC-025

Project Size: 2,429 acres

Fiscal Year 01/02

Project Cost: \$28,175.44

In the early 1960s, NASA began to acquire the land east of Titusville that is now John F. Kennedy Space Center. In 1963, the acquisition was complete and NASA turned those lands not vital to the space program over to the U.S. Fish and Wildlife Service. Today, the 43-mile long barrier island is managed by the Department of the Interior as Merritt Island National Wildlife Refuge and Canaveral National Seashore. The refuge is adjacent to the Indian 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*).

Three projects were conducted on the refuge in FY01/02. This first project was primarily directed at melaleuca control. Melaleuca was initially introduced to the refuge by early homesteaders that occupied the land before it became a refuge. Like other exotics, it was planted as an ornamental, for shade, or as a wind barrier, and it escaped into the natural wetlands of the area. Melaleuca trees were scattered throughout the project area, with the majority lightly infesting swales that run north and south through the marshes.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
<i>Melaleuca quinquenervia</i>	melaleuca	Category I	cut stump	Arsenal
<i>Casuarina equisetifolia</i>	Australian pine	Category I	basal bark	Garlon 4

Project ID: MC-016

Project Size: 100 acres

Fiscal Year 01/02

Project Cost: \$245,940.00

A second project was directed specifically at controlling Brazilian pepper. Early settlers brought it to Florida to cultivate as an ornamental plant. This project controlled Brazilian pepper along approximately 41 miles of dike roads in the Moore Creek and the Jack Davis Impoundments.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
<i>Schinus terebinthifolius</i>	Brazilian pepper	Category I	mechanical	n/a

Project ID: MC-017

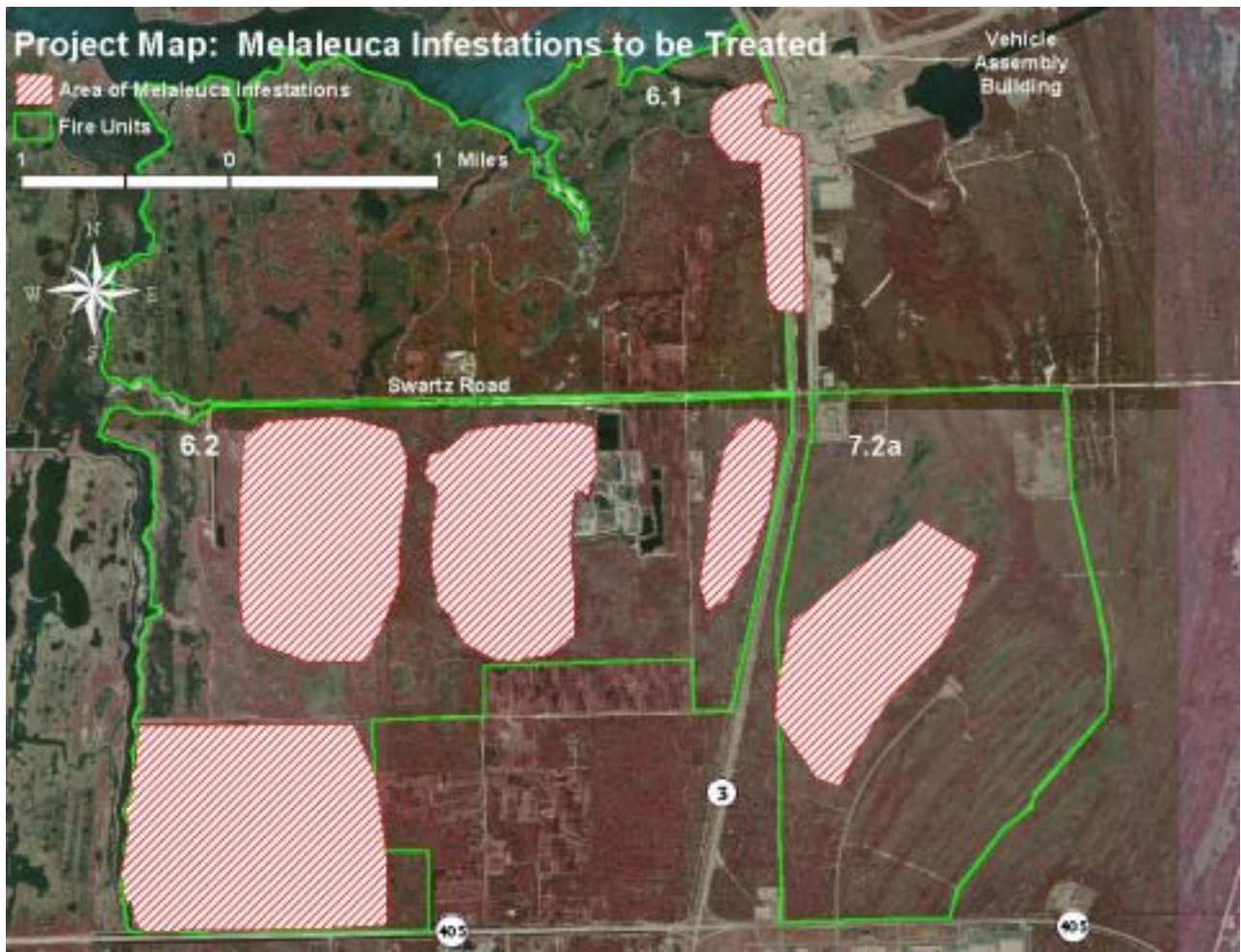
Project Size: 109 acres

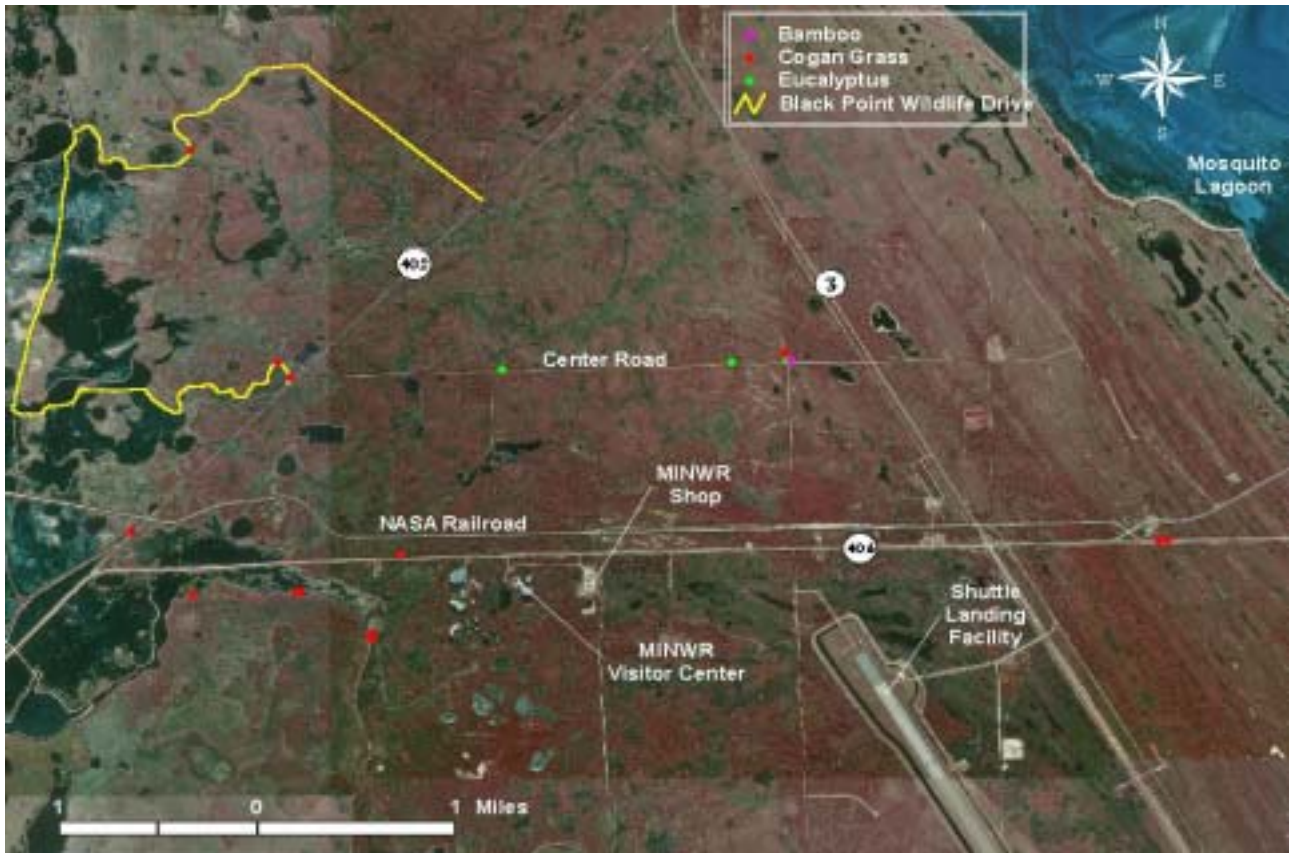
Fiscal Year 01/02

Project Cost: \$174,236.88

This third project primarily controlled Australian pine, with other species including bamboo, eucalyptus, and other exotics found north of the NASA security area on the refuge.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
<i>Casuarina equisetifolia</i>	Australian pine	Category I	basal/girdle/cut stump/foliar	Garlon 4
			hand pull	n/a
<i>Schinus terebinthifolius</i>	Brazilian pepper	Category I	basal	Garlon 4/Arsenal
<i>Albizia julibrissin</i>	mimosa	Category I	basal/girdle	Garlon 4
<i>Eucalyptus</i> spp.	eucalyptus	n/a	basal/cut stump/girdle	Garlon 4
<i>Bambusa</i> spp.	bamboo	n/a	cut stump	Garlon 4/Roundup







Melaleuca lurking in the woods.

Not fish bones—toppled melaleuca trunks.





A dike road almost swallowed by Brazilian pepper.

The heavy equipment rolls in...





Don't get carried away, Mr. Pepper-tree. *Oops, too late!*



...and the way is clear!



An army of Australian pine advances on NASA!



Fortunately, killing exotics is not rocket science.

Pine Island Phase II Invasive Exotic Plant Control

County: Brevard

PCL: Pine Island Conservation Area

PCL Size: 879 acres

Project Manager: Brevard County Parks & Recreation

Scott Taylor, EEL Central Region Land Manager

2725 Judge Fran Jamieson Way, Bldg. B, Viera, Florida 32940

Phone: 321-633-2046, Fax: 321-633-2198

E-mail: staylor@brevardparks.com

Project ID: MC-019

Project Size: 65 acres

Fiscal Year 01/02

Project Cost: \$43,872.68

The 879± acre Pine Island Conservation Area (PICA) is located on North Merritt Island. The Merritt Island National Wildlife Refuge adjoins the north boundary of the PICA. The PICA was jointly purchased by the Brevard County and the St. Johns River Water Management District in 1996. The pine flatwoods “island” for which this conservation land is historically named is regionally unique in that large areas grade directly into the Indian River Lagoon and other areas exhibit rapid transitions to isolated freshwater marshes and impounded estuarine marsh and mangrove forest habitats that are fringing the Indian River Lagoon and embedded open water natural ponds and channels. Development activities on the PICA during the 1960s in support of sand mining and mosquito control operations significantly altered the hydrologic regime and structural integrity of the expansive estuarine marsh system historically characterizing this property. These land disturbances provided conditions that were exploited by invasive exotic pest plants, primarily Brazilian pepper, which is estimated to cover as much as 250 acres of the conservation area.

This proposal targets removal of mainly Brazilian pepper and melaleuca from 65± acres of Indian River Lagoon shoreline, native mesic pine flatwoods, hydric hammock, fringing estuarine marsh, and mangrove forest natural community types located in the southwest quadrant of the conservation property. Brazilian pepper is found throughout most of the project area with the exception of the central core of the pine flatwoods. The densest concentrations of Brazilian pepper occur along the Indian River Lagoon shoreline and within the transitional and wet habitat types: hydric hammock, fringing estuarine marsh, and mangrove forest. Melaleuca is found primarily on a raised hammock embedded within the salt marsh community. A site assessment determined that approximately 35 acres of Brazilian pepper and 0.25 acre of melaleuca occur within the project area.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
<i>Schinus terebinthifolius</i>	Brazilian pepper	Category I	basal/cut stump	Garlon 4
			girdle/cut stump	Arsenal
			hand pull	n/a
<i>Melaleuca quinquenervia</i>	melaleuca	Category I	cut stump	Arsenal



Brazilian pepper forms dense thickets (left). The fruits (above) are readily eaten by birds and widely dispersed.

**PINE ISLAND CONSERVATION AREA
EXOTIC INVASIVE PLANT TREATMENT AREAS**



LEGEND

% Exotic Plant Coverage

-  - 80%
-  - 50%
-  - 20%

Treatment Method -
Basal Bark

<u>Mgt. Units</u>	<u>Acres</u>
1	1.90
2	4.10
3	13.70
4	24.10
5	7.80
6	48.20

Satellite Beach Invasive Exotic Plant Control

County: Brevard

PCL: Satellite Beach Oceanfront Wildlife and Habitat Preservation Site

PCL Size: 18.3 acres

Project Manager: City of Satellite Beach Recreation Department
 Tiffany Farrell, Environmental Education Coordinator
 1089 South Patrick Drive, Satellite Beach, Florida 32937
 Phone: 321-773-6458, Fax: 321-777-5207
 E-mail: recreation@satellitebeach.org

Project ID: MC-020

Project Size: 18.3 acres

Fiscal Year 01/02

Project Cost: \$12,785.01

The Satellite Beach site was acquired through the Florida Communities Trust. This site is composed of two tracts of undeveloped land separated by a 100-foot wide parking area comprising Hightower Beach Park. The two tracts encompass 18.3 acres with a total ocean frontage of 2,840 feet. The park is owned by Brevard County and is jointly managed by the County and the City. Natural communities consist of Beach Dune, Coastal Grassland, and Coastal Strand.

The beach dune of the northern tract contains a significant patch of beach star (*Cyperus maritima*), shown in the *Atlas of Florida Vascular Plants* to be present in only five counties, with Brevard not being one of them. Smaller sections of coastal mock vervain (*Glandularia maritima*) exist in several locations. Both of these plant species are listed as endangered by the state. Additionally, the state threatened shell-mound pricklypear cactus (*Opuntia stricta*) is present in small patches. The beach along this site is an important sea turtle nesting site, and is the longest stretch of undisturbed beach between the Archie Carr Wildlife Refuge to the south and Canaveral National Seashore to the north. This project controlled Brazilian pepper and other exotic plants, which were scattered throughout the site.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
<i>Schinus terebinthifolius</i>	Brazilian pepper	Category I	basal, cut stump	Garlon 4
<i>Sansevieria trifasciata</i>	snake plant	n/a	cut stump	Garlon 4
<i>Carissa macrocarpa</i>	natal plum	n/a	cut stump	Garlon 4
<i>Kalanchoe daigremontiana</i>	life plant	n/a	foliar, hand pull	Roundup

**18.3 Acre
City, County, and State
Conservation Tract in
Brevard County, Florida**



Patrick Drive


SR A1A

Hightower Park

Exotic Species

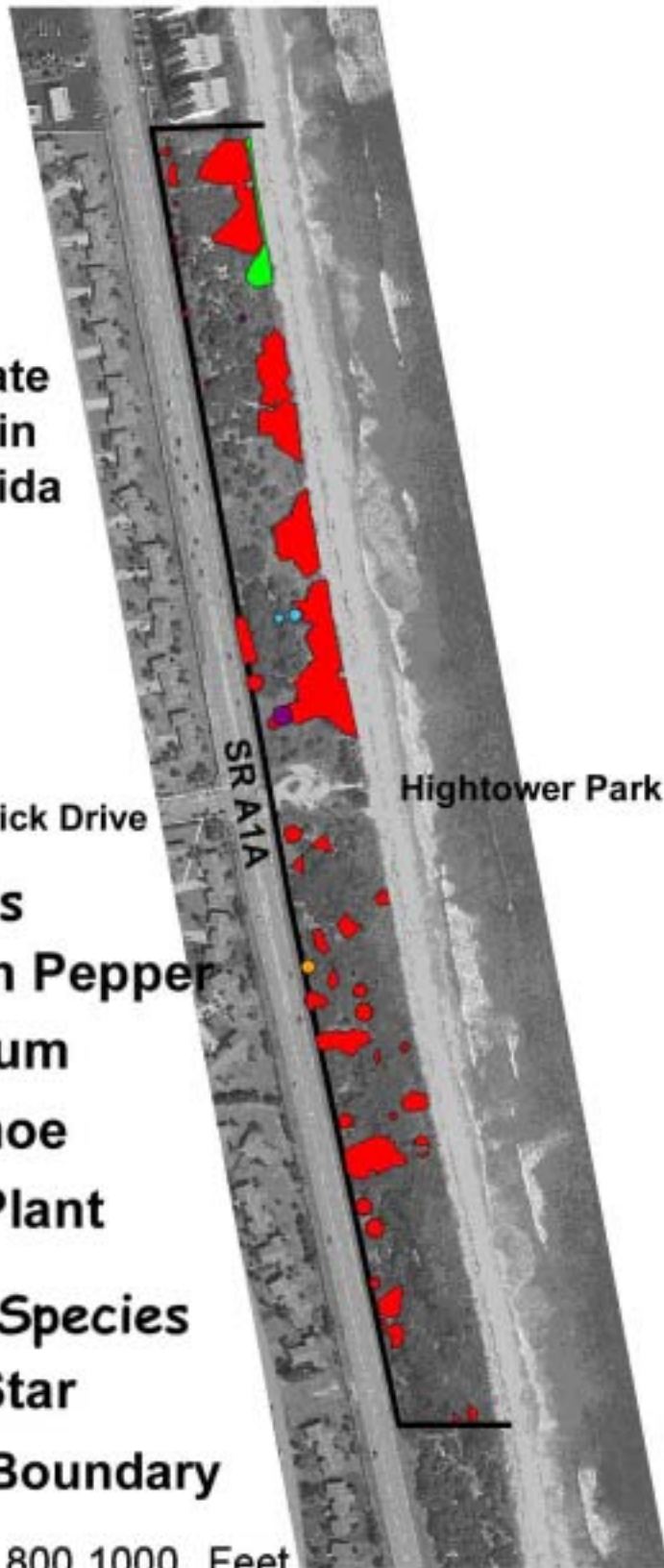
-  Brazilian Pepper
-  Natal Plum
-  Kalanchoe
-  Snake Plant

Endangered Species

-  Beach Star

 Project Boundary

0 200 400 600 800 1000 Feet



South Beaches Phase IV Invasive Exotic Plant Control

PCL: Archie Carr National Wildlife Refuge

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-022

Fiscal Year 01/02

County: Brevard

PCL Size: 162.4 acres

Project Size: 69.04 acres

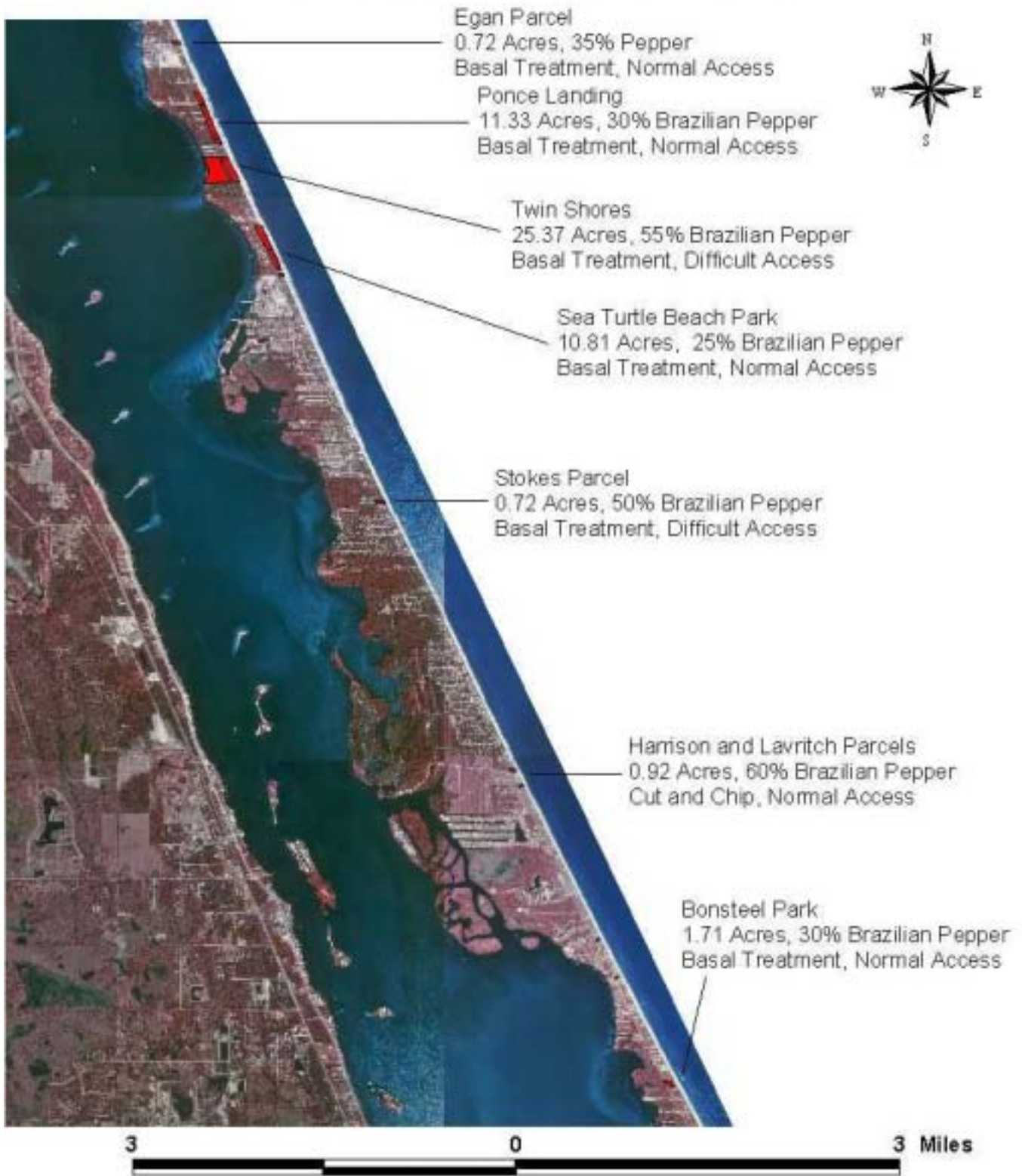
Project Cost: \$48,367.50

The South Beaches project is a cooperative effort between several partners, including federal, state, and local agencies. The project includes several parcels of publicly owned conservation lands on the South Beaches of Brevard County. All of the property is located within the 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 of Brevard County. The Environmentally Endangered Lands Program, a department within the Parks and Recreation Department, submitted the previous three phases. This proposal called for the removal of Brazilian pepper with an average coverage of 43% on three parcels of land.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
<i>Schinus terebinthifolius</i>	Brazilian pepper	Category I	basal, cut stump, hand pull	Garlon 4
<i>Casuarina equisetifolia</i>	Australian pine	Category I	basal, girdle, cut stump	Garlon 4

Brevard County Parks and Recreation Save Our Coast Sites



Sykes Creek Phase III Invasive Exotic Plant Control

County: Brevard

PCL: Sykes Creek Headwaters Mitigation Area

PCL Size: 500 acres

Project Manager: Brevard County Parks & Recreation

Scott Taylor, EEL Central Region Land Manager

2725 Judge Fran Jamieson Way, Bldg. B, Viera, Florida 32940

Phone: 321-633-2046, Fax: 321-633-2198

E-mail: staylor@brevardparks.com

Project ID: MC-026

Project Size: 38.8 acres

Fiscal Year 01/02

Project Cost: \$45,356.04

This is the final step in the ongoing effort to remove invasive, exotic plants from the Sykes Creek Headwaters Mitigation Area. The area to be addressed in this project is the remaining 38.8 acres of the 188 acres of the SCHMA that require treatment. The entire Sykes Creek Headwaters Mitigation Area (SCHMA) includes two large land tracts (referred to as Phase I and II) on Merritt Island. Phase II (the southern tract) includes approximately 300 acres of salt marsh that are bordered by mosquito control impoundment dykes. The natural communities in Phase II include a mixture of bottomland forests, hydric hammocks, depression and tidal marshes and disturbed uplands. Both phases (I and II) are connected together through large culverts placed under Hall Road. Additionally, Phase II communicates with the Indian River Lagoon via culverts to the Barge Canal. Both Phase I and II comprise portions of what was once the original headwaters of Sykes Creek and are adjacent to the Merritt Island National Wildlife Refuge (MINWR) and included within the Indian River Blueway CARL project.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
<i>Schinus terebinthifolius</i>	Brazilian pepper	Category I	basal bark	Garlon 4
			girdle	Arsenal
			hand pull	n/a
<i>Casuarina equisetifolia</i>	Australian pine	Category I	girdle	Garlon 4

Operation Pepper Sweep Invasive Exotic Plant Control

County: Volusia

PCL: *see below*

PCL Size: various

Project Manager: Volusia County Public Works

David Farr

123 W. Indiana Avenue, Deland, Florida 32720

Phone: 386-424-2920, Fax: 386-424-2924

E-mail: dfarr@co.volusia.fl.us

Project ID: MC-024

Project Size: 3,681 acres

Fiscal Year 01/02

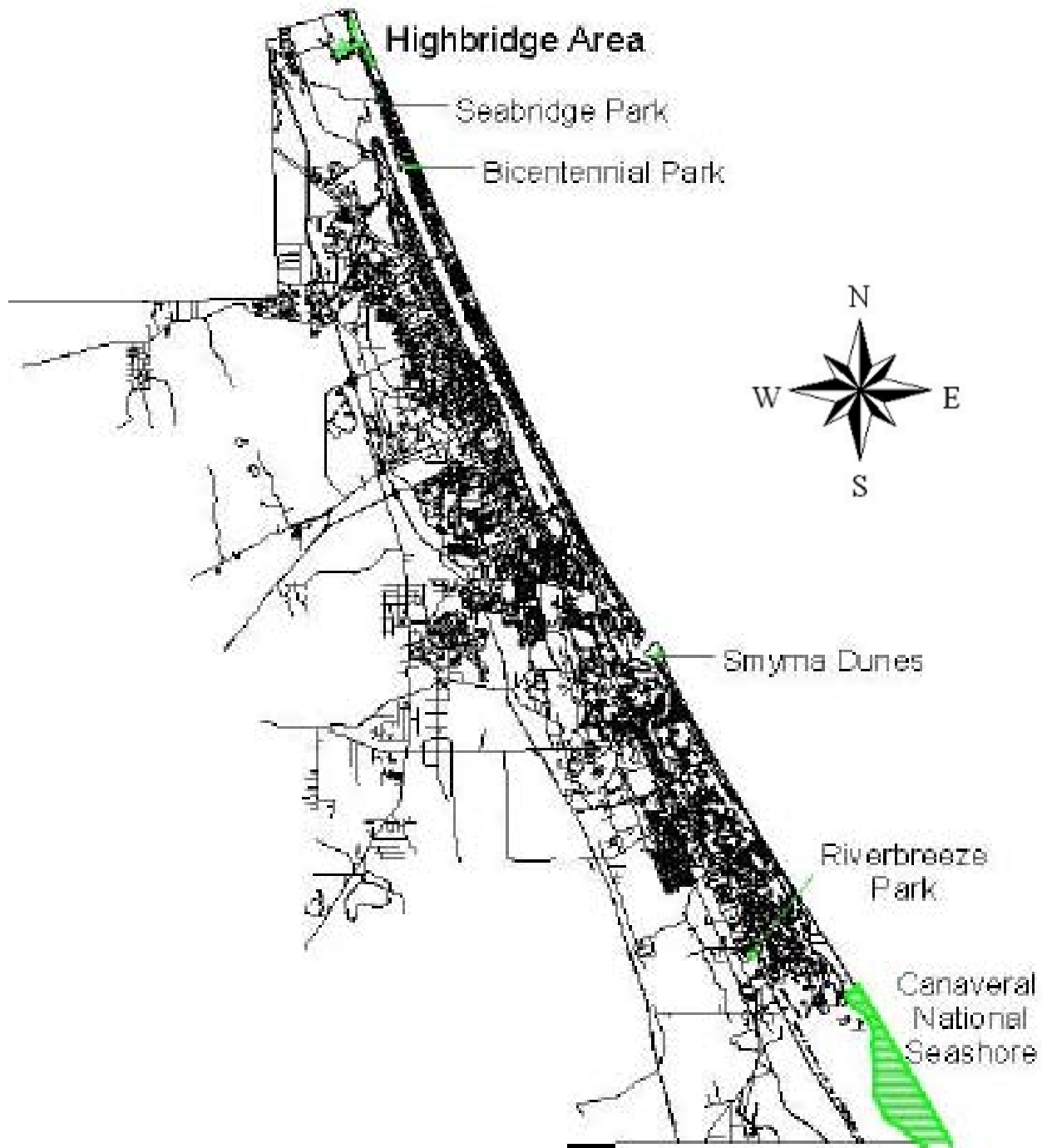
Project Cost: \$98,578.64

This project encompasses several federal, state, and county conservation lands: Canaveral National Seashore, Bulow Creek and North Peninsula State Parks, and Highbridge, Seabridge, Bicentennial, Riverbreeze, and Smyrna Dunes County Parks. The Mound Grove property was acquired for conservation purposes in 1985 and added to Bulow Creek State Park, which presently contains 5,117 acres. Bulow Creek State Park is managed as part of Tomoka Basin Geopark. After the citrus groves were abandoned in the mid-1900s, the uplands at Mound Grove reverted to Upland Mixed Forest. Brazilian pepper is locally common, particularly in the hammock-marsh transition area on the east side of Mound Grove and along the right-of-way on the north side of the Highbridge Road. Other natural communities include Estuarine Tidal Marsh and Shell Mound, which support populations of locally rare subtropical plants such as wild coffee (*Psychotria nervosa*), soapberry (*Sapindus marginatus*), and snowberry (*Chiococca alba*). The tidal marshes and wetland-upland transition zone at Mound Grove are important habitats for wetland dependent species.

The natural communities of Canaveral National Seashore and other conservation lands in the project include Coastal Dune, Coastal Strand, Oak Scrub, Hardwood Hammock, Maritime Hammock, Mangrove Swamp, Salt Marsh, and Freshwater Marsh. Brazilian pepper totals about 114.5 acres in sparse to dense stands throughout the project area. The County provided in-kind contributions of \$48,906.70 for this project.

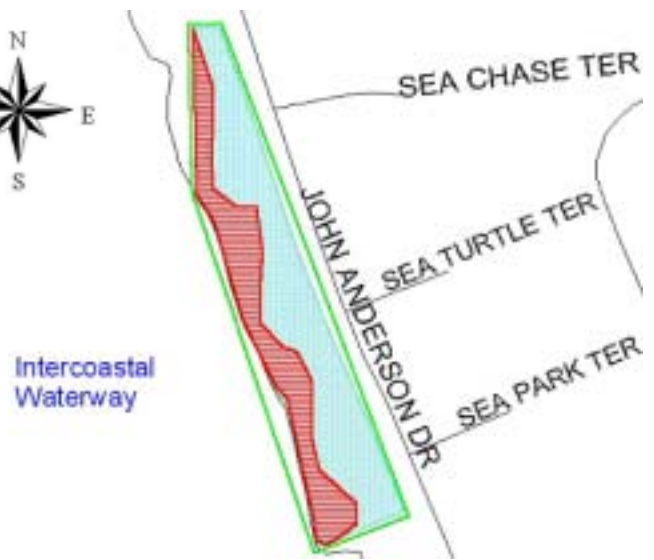
Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
<i>Schinus terebinthifolius</i>	Brazilian pepper	Category I	basal, cut stump	Garlon 4
<i>Dioscorea bulbifera</i>	air-potato	Category I	basal bark	Garlon 4
<i>Paederia foetida</i>	skunk vine	Category I	basal bark	Garlon 4

Total Project Area

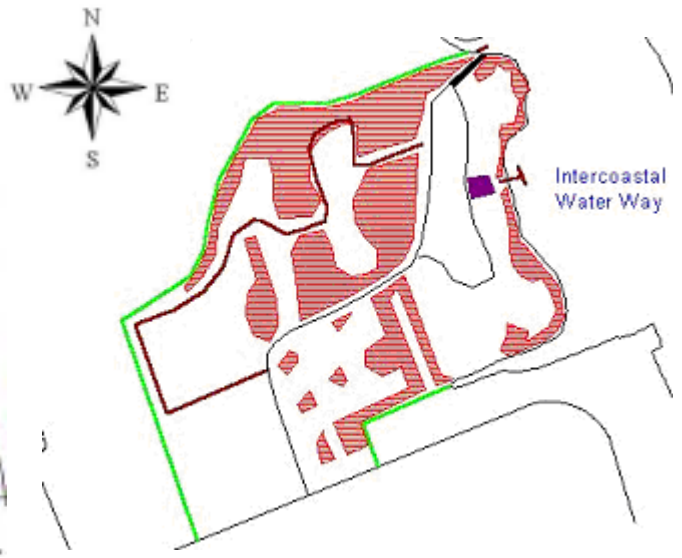




Highbridge Park and surrounding conservation lands. Areas in red are exotic plant control areas.

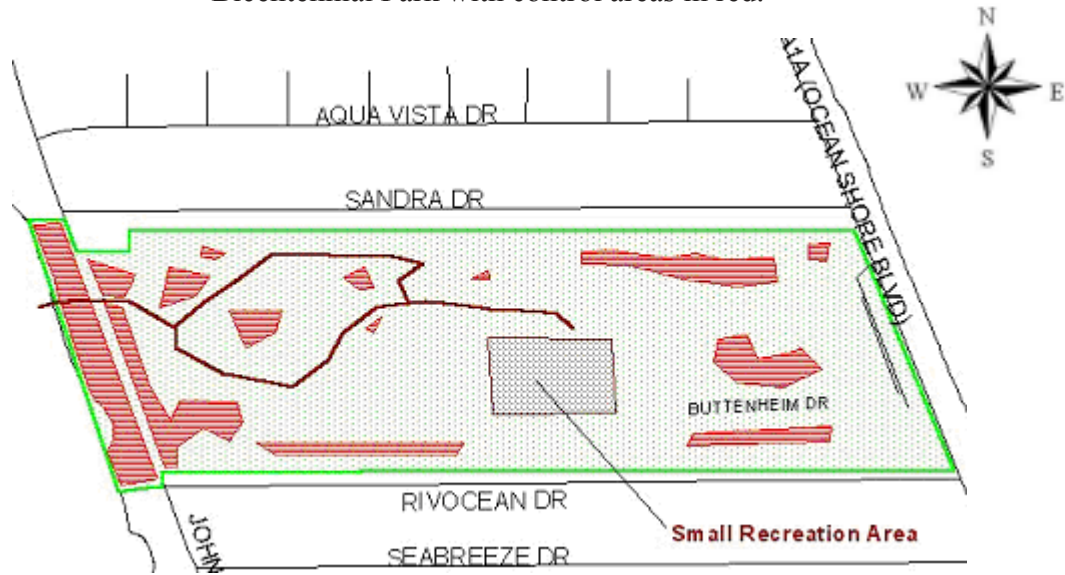


Seabridge Park and control area.



Smyrna Dunes (left) and Riverbreeze Park (right) with control areas in red.

Bicentennial Park with control areas in red.



Canaveral National Seashore (outlined in green) with exotic control areas (in red).



Canaveral National Seashore Invasive Exotic Plant Control

County: Volusia

PCL: Canaveral National Seashore

PCL Size: 57,661.69 acres

Project Manager: Volusia County Public Works

David Farr

123 W. Indiana Avenue, Deland, Florida 32720

Phone: 386-424-2920, Fax: 386-424-2924

E-mail: dfarr@co.volusia.fl.us

Project ID: MC-023

Project Size: 995 acres

Fiscal Year 01/02

Project Cost: \$37,777.39

Canaveral National Seashore (CNS) is located in southeast Volusia County and northeast Brevard County. The property is situated on a long barrier island adjacent to the Mosquito Lagoon, an Outstanding Florida Water. Natural communities within the project area include coastal dune, coastal strand, oak scrub, mangrove forest, salt marsh, and palm and oak hammocks. This project will control Brazilian pepper, Australian pine, and cogon grass found scattered across the project area. Brazilian pepper totals about 25 acres in stands ranging from 0.25 acres to 4 acres in size, as well as scattered single trees. Australian pine occurs in three stands totaling 1.1 acres. About 1.5 acres of cogon grass occurs along an access road.

Target Plants	Common Name	FLEPPC Rank	Treatment	Herbicide
<i>Casuarina equisetifolia</i>	Australian pine	Category I	basal, cut stump	Garlon 4
<i>Imperata cylindrica</i>	cogon grass	Category I	foliar	Rodeo
<i>Schinus terebinthifolius</i>	Brazilian pepper	Category I	basal, cut stump	Garlon 4



- Barrier Island-South
- Barrier Island-North
- Canaveral NS
- South Barrier Island
- South Mosquito Lagoon