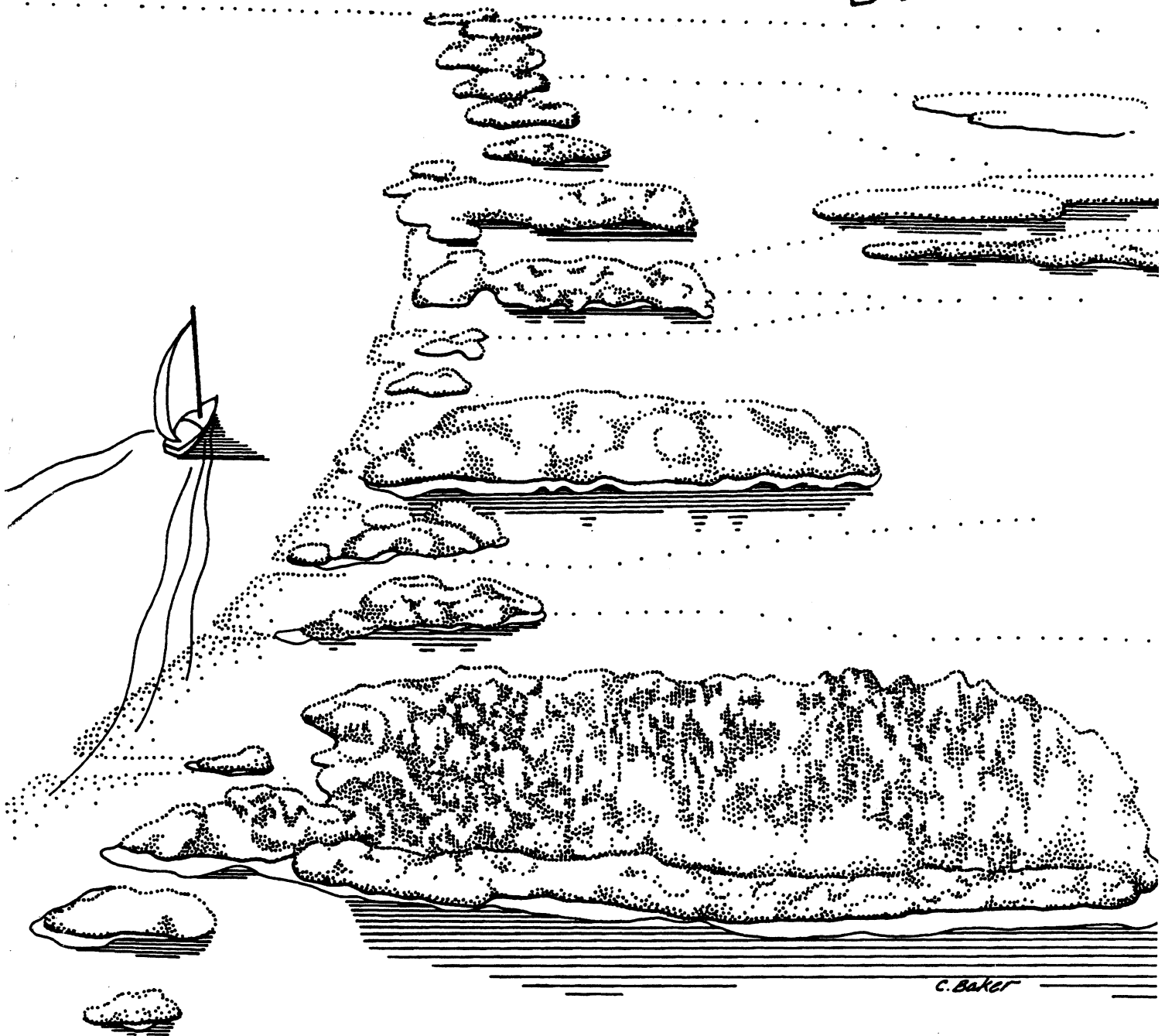


INDIAN RIVER LAGOON

SPOIL ISLAND MANAGEMENT PLAN

DRAFT



FLORIDA DEPARTMENT OF NATURAL RESOURCES

**INDIAN RIVER LAGOON
SPOIL ISLAND MANAGEMENT PLAN**

**Tom Gardner
Executive Director
Florida Department of Natural Resources**

**This plan was prepared by
Nancy Brown-Peterson and Ross W. Eames
The Bureau of Aquatic Preserves
Division of State Lands**

**Preparation of this management plan was supported by funding from
the Florida Inland Navigation District**

EXECUTIVE SUMMARY

The Indian River Lagoon Spoil Island Management Plan provides current biological data and recommends appropriate management classifications for the 137 spoil islands and natural islands that have been spoiled upon in the Indian River Lagoon. The plan is divided into four parts, representing each of the four counties that contain spoil islands. There are forty-one spoil islands in Brevard County, fifty-five in Indian River County, thirty-four in St. Lucie County and seven in Martin County. Five of the islands are owned by the United States Government, four state-owned islands have been dedicated to Martin County, ten islands are owned by private parties, one island is owned by the Florida Inland Navigation District and the remaining 117 islands are owned by the State of Florida.

A total of 262 species of plants and 205 species of animals were collected or observed on the 137 islands. The majority of the islands had seagrass beds on at least one side of the island. Floral diversity was highest in Indian River County and lowest in Brevard County. Twenty-one of the spoil islands serve as important rookeries or overwintering areas for colonial nesting water birds; no nesting occurs in St. Lucie County.

The spoil islands were divided into four management classifications based on physical structure, ecological importance and historical use. Islands in each of the management classifications occur in each of the counties. Of the 127 state or federally owned islands, twelve are recommended for active recreation, fifty-seven for passive recreation, fifty-one for conservation and nine for education. Additionally, three of the privately owned islands are recommended for recreation and seven for conservation.

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This management plan could not have been completed without the help of a number of dedicated people. We would like to thank David Rydene, Kellie Pendoley, David Singewald and Mary Crawford for their many hours of help in the field during the spoil island survey. Jane Brooks spent many hours identifying the majority of the plants collected during the survey; Dr. Roy Woodbury and Dr. Jim Haeger identified the remained of the plants. The invertebrates we collected were identified by Paul Mikkelsen and Kalani Cairns. Dr. R. Grant Gilmore provided valuable insights and confirmations of identification of the fish collections. A special thanks to Paul Mikkelsen for setting up all the computers and writing all the computer programs for this project. Without his expertise this management plan would not have been a reality. David Rydene provided valuable assistance in producing the vegetation maps and Charissa Baker drew all the cover illustrations as well as Figures 1-1, 2-1, 3-1 and 4-1. David Rydene, David Roach and Paul Mikkelsen reviewed and made helpful comments on the manuscript. Finally, a thanks to all the staff of the Indian River Lagoon Aquatic Preserves for their many helpful comments and suggestions during the course of this project. This project was funded in its entirety by the Florida Inland Navigation District through contracts with the Florida Department of Natural Resources, Bureau of Aquatic Preserves.

GENERAL INTRODUCTION

The Indian River Lagoon Spoil Island Management Plan is a comprehensive management plan covering the spoil islands and natural islands used for spoil deposition in Brevard, Indian River, St. Lucie and Martin Counties. The purpose of the plan is to provide both current, accurate biological data on all the spoil islands in the Indian River Lagoon and to recommend an appropriate use for each island based on the summarized biological data. Local city and county governments will be able to set management guidelines for spoil islands in their jurisdictions using the information provided in this plan. Additionally, these guidelines will help the Florida Marine Patrol, the staff of the Indian River Lagoon Aquatic Preserves and the State Lands enforcement personnel manage usage of the spoil islands more effectively .

The Spoil Island Management Plan has been divided into four parts, one representing each county. Each of the county plans is independent of the others and of the overall Spoil Island Management Plan. Each county plan contains all the relevant biological information and management recommendations for all the spoil islands within that county, as well as the methodology used during the surveys and important information regarding the State of Florida's management authority over spoil islands.

General Information on Indian River Lagoon Spoil Islands

The Indian River Lagoon Spoil Island Management Plan encompasses spoil islands in the 227 km portion of the Atlantic Intracoastal Waterway extending from Haulover Canal in northern Brevard County to the St. Lucie Inlet in Martin County. There are a total of

137 spoil islands, with forty-one islands in Brevard County, fifty-five islands in Indian River County, thirty-four islands in St. Lucie County, and seven islands in Martin County. Sixty of the islands are in the Malabar to Vero Beach Aquatic Preserve, thirty-five are in the Vero Beach to Ft. Pierce Aquatic Preserve, and ten islands are in the Jensen Beach to Jupiter Inlet Aquatic Preserve. The spoil islands were created between 1953 and 1961 when the Atlantic Intracoastal Waterway was dredged to twelve feet. Ten of the spoil islands are owned by private parties, five are owned by the United States Government and one is owned by the Florida Inland Navigation District. The remaining 122 islands are owned by the State of Florida; four of these islands have been dedicated to Martin County. The state and federally owned spoil islands are encumbered by a spoil disposal easement to the Florida Inland Navigation District to use the islands for the disposal of spoil material derived from maintenance of the Atlantic Intracoastal Waterway. Currently, only one island (MC7) is still actively used as a spoil disposal site. The 137 islands in the management plan were surveyed between October 6, 1987 and January 31, 1989. Additionally, 105 of the state and federally-owned spoil islands were cleaned between February 1988 and November 1989 as part of the spoil island clean-up program initiated by the Florida Inland Navigation District.

BREVARD COUNTY
SPOIL ISLAND MANAGEMENT PLAN

Tom Gardner
Executive Director
Florida Department of Natural Resources

This plan was prepared by
Nancy Brown-Peterson and Ross W. Eames
The Bureau of Aquatic Preserves
Division of State Lands

Preparation of this management plan was supported by funding from
the Florida Inland Navigation District

EXECUTIVE SUMMARY

The Brevard County Spoil Island Management Plan is part one of a four part comprehensive Indian River Lagoon Spoil Island Management Plan. The forty-one islands documented in this portion of the plan are located between Haulover Canal and Sebastian Inlet in the Indian River Lagoon. Two of these islands have been dedicated to the United States Government and the remaining thirty-nine are owned by the State of Florida. The objectives of the Brevard County Spoil Island Management Plan are to provide current biological data and recommend appropriate management classifications for all the spoil islands along the Atlantic Intracoastal Waterway in Brevard County.

The Brevard County spoil islands are not distributed evenly along the length of the Indian River Lagoon but are instead broken into two smaller chains; one in the north, extending from Haulover Canal to Cocoa, and the other in the south, beginning in Malabar and stretching to Sebastian Inlet. The islands in the northern chain are distinctly different from those in the southern chain in both their terrestrial vegetation and fish communities. The surrounding seagrass beds, however, were of essentially the same size and composition in both the northern and southern chains. Ten of the islands serve as important rookeries and over-wintering sites.

Brevard County spoil islands are divided into four management classifications based on physical structure, ecological importance, and historical use. Of the thirty-nine state-owned islands surveyed, five are recommended for active recreation; twenty-six for passive recreation, two for education, and eight for conservation.

ACKNOWLEDGEMENTS

This management plan could not have been completed without the help of a number of people. We would like to thank Kellie Pendoley, David Rydene, David Singewald and Mary Crawford Dominic for their many hours of help in the field during the spoil island survey. Jane Brooks spent many hours identifying the majority of the plants collected during the survey; Dr. Roy Woodbury and Dr. Jim Haeger identified the remainder of the plants. Thanks to all three of our botanists. The invertebrates we collected were identified by Paul Mikkelsen and Kalani Cairns. Dr. R. Grant Gilmore provided valuable insights into the fish collection. A special thanks to Paul Mikkelsen for setting up all the computers and writing all the computer programs for this project. Without his expertise this management plan would not have been a reality. Charissa Baker drew the cover illustration and Figure 1-1. Finally, a thanks to all the staff of the Indian River Lagoon Aquatic Preserves for their many helpful comments and suggestions during the course of this project. This project was funded in its entirety by the Florida Inland Navigation District through contracts with the Florida Department of Natural Resources, Bureau of Aquatic Preserves.

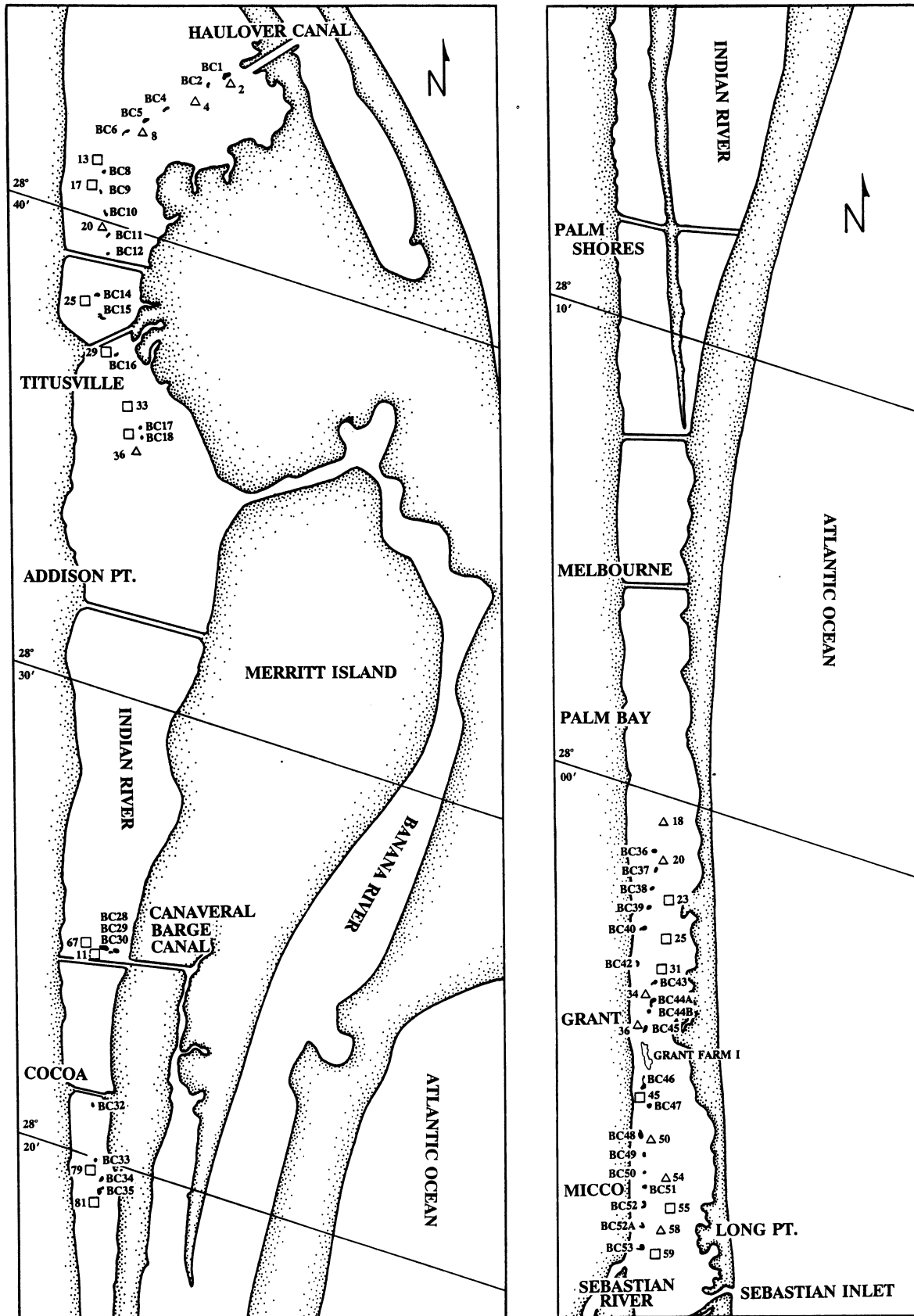
INTRODUCTION

The Brevard County Spoil Island Management Plan is one of four parts of a comprehensive Indian River Lagoon Spoil Island Management Plan. The purpose of the Spoil Island Management Plan is to provide both current, accurate biological data on all spoil islands in the Indian River Lagoon and to recommend an appropriate use for each island based on the summarized biological information. Local city and county governments will be able to set management guidelines for spoil islands in their jurisdictions using the information provided in the plan. Additionally, these guidelines will help the Florida Marine Patrol, the staff of the Indian River Lagoon Aquatic Preserves and State Lands enforcement personnel better manage public use of the spoil islands.

General Information on Brevard County Spoil Islands

The Brevard County section of the management plan encompasses spoil islands in the 106 km portion of the Atlantic Intracoastal Waterway within Brevard County. There are a total of forty-one spoil islands dispersed along the entire length of Brevard County's Indian River Lagoon from Haulover Canal in the north to Sebastian Inlet in the south (Fig. 1-1). The island chain is broken into a northern group and a southern group. The northern group consists of the twenty-two islands between Haulover Canal and Cocoa and the southern group consists of the nineteen islands between Malabar and Sebastian Inlet located within the Malabar to Vero Beach Indian River Lagoon Aquatic Preserve. The spoil islands from Haulover canal to Melbourne were created when the Atlantic Intracoastal Waterway was dredged to twelve feet in the summer and fall of 1953. The last of the

Figure 1-1. Brevard County Spoil Islands



islands are the result of waterway dredging from April 1957 through Jan 1958. Two of these islands (BC1 and BC2) have been dedicated to the United States Government for the NASA program while the remaining thirty-nine islands are the property of the State of Florida and are presently encumbered by an easement to the Florida Inland Navigation District for the disposal of dredge material derived from maintenance of the Atlantic Intracoastal Waterway. The forty-one islands in Brevard County were surveyed between November 9, 1987 and January 19, 1989. Thirty-six of the forty-one Brevard County spoil islands were cleaned in the spring of 1989 as part of the spoil island clean-up program initiated by the Florida Inland Navigation District.

Management Authority

The primary management authorities available for implementing management directives affecting Brevard County spoil islands are found in Chapters 253 and 258, Florida Statutes (F.S.). Chapter 253 concerns all state-owned submerged lands while Chapter 258 is specifically concerned with aquatic preserves. Since some of the Brevard County spoil islands are in the Malabar to Vero Beach Aquatic Preserve, both chapters are applicable. These authorities clearly establish the proprietary management role of the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund, who are variously referred to as the "Trustees" or the "Board". Furthermore, all management responsibilities assigned to the Trustees by this plan may be fulfilled directly by the Governor and Cabinet or indirectly via staff or agents of the Trustees, pursuant to delegations of authority, management agreements, or other legal mechanisms.

Chapters 18-20 and 18-21, Florida Administrative Code (F.A.C.), are two administrative rules directly applicable to the DNR's/Trustee's actions regarding allowable uses of submerged lands in general (18-21) and both aquatic preserves (18-20) and spoil islands (18-21.012) in particular. In addition, the Conceptual State Lands Management Plan, adopted on March 17, 1981 by the Trustees, contains specific policies concerning spoil islands. Where these documents address the use of spoil islands, development is prohibited unless a greater public good can be demonstrated, and such development, with few exceptions, is limited to that serving water-dependent and recreational needs.

The Indian River Lagoon Aquatic Preserve Management Plan (Malabar to Vero Beach), as adopted by the Trustees on January 21, 1986, contains program policy directives (Chapter III) that also affect the use and management of spoil islands. These directives include:

- 1) "managing all submerged lands within the aquatic preserve to ensure the maintenance of essentially natural conditions to ensure the propagation of fish and wildlife, and public recreation opportunities",
- 2) "developing a resource inventory and map natural habitat types within the aquatic preserve, with an emphasis on those habitat types utilized by threatened and/or endangered species",
- 3) "protecting and, where possible, enhancing threatened and endangered species habitat within the aquatic preserve",
- 4) "managing state-owned spoil islands within the aquatic preserve as bird rookeries and wildlife habitat areas", and

5) "encouraging public utilization of the aquatic preserve, consistent with the continued maintenance of its natural values and functions".

Thus, management of spoil islands as sovereignty submerged lands is mandated by the Trustees. This plan accomplishes the management directives as outlined above by:

- 1) providing a resource inventory and maps of vegetation and other habitats on the islands,
- 2) proposing guidelines for public use of the spoil islands that are consistent with their maintenance as essentially natural areas,
- 3) assigning a management designation to each of the islands that seeks to balance the following:
 - a) the island's value as wildlife habitat, including its function as a bird rookery,
 - b) the directive to maintain the islands in their natural state, and
 - c) the public good derived from permitting limited development on some islands for recreational purposes.

The Florida Inland Navigation District, which has a perpetual easement on many state-owned spoil islands, has consented to the use of the islands as outlined in this plan. The F.I.N.D. reserves the right to review and comment on any activities involved in implementing this plan.

Management Objectives

The Indian River Lagoon Aquatic Preserve Management Plan (Malabar to Vero Beach), as adopted by the Trustees on January 21, 1986, contains clear resource

management objectives (Chapter V) that direct ongoing activities in the preserve. Some Brevard County spoil islands, as stated above, are located within the boundaries of the Malabar to Vero Beach Aquatic Preserve, so these objectives apply to management activities on the islands as well. These objectives include:

- 1) becoming familiar with the plant and animal species and communities, and their locations,
- 2) monitoring communities for changes,
- 3) identifying areas and communities in need of restoration, and accomplishing that restoration,
- 4) coordinating efforts with other researchers, and
- 5) protecting communities from the impacts of human use.

This management plan has accomplished the first objective by providing a resource inventory and maps of vegetation and other habitats on the islands. The remaining objectives are tasks that must be part of the ongoing responsibilities of personnel assigned to implement the plan. The second objective will be accomplished by undertaking a general island inspection program that will serve to monitor communities for changes that have occurred since the first resource inventory was conducted. The third objective, community restoration, has already been started. A pilot project to restore native hammock communities on certain spoil islands was undertaken in 1988 and again in 1989. Current efforts are focusing on monitoring the areas to determine the feasibility of undertaking large scale restorations. The fourth objective, coordinating research efforts, will be accomplished by publicizing the results of completed research through publishing and public speaking, continuing to conduct appropriate research on the islands, becoming familiar with

related research both in the Indian River Lagoon and in similar estuaries, and promoting the use of the spoil islands for research by qualified persons. The fifth objective, community protection, is perhaps the most important of these goals if human use of these islands is to continue. This goal will be achieved by identifying sources of adverse human impact through the inspection program, and eliminating or minimizing them by:

- 1) notifying appropriate law enforcement officials of violations,
- 2) undertaking an information program to educate the general public about the ecology and proper use of the islands,
- 3) enlist public assistance, wherever possible, in litter control and reporting violations, and
- 4) promoting the use of management agreements whereby local government agencies and civic groups may "adopt an island" and assume responsibility for monitoring the island and implementing approved plans for its use.

Survey Methods

All of the measurements in the management plan are expressed in metric units. As an aid in converting metric units into more familiar English equivalents the following conversion table has been provided.

Metric Conversion Table

1 hectare (ha) = 2.471 acres

1 kilometer (km) = 0.62 miles

1 meter (m) = 3.25 feet

1 centimeter (cm) = 0.39 inches

The methods used for the biological survey of the spoil islands were identical for all the islands surveyed in the Indian River Lagoon to provide consistency to the data base. Each island was visited only once during the survey; thus, strong seasonal components are apparent in the flora and fauna listed for some of the islands due to the breeding seasons of birds and fishes and the flowering seasons of plants. However, the species lists included in the management plan do provide a complete list of all flora and fauna observed on each island during the day of the survey. The date that each island was surveyed is noted in the accompanying island description.

All the birds visible on an island were counted and identified to species prior to disembarking on the island. In addition, any birds noticed while working on the island were also identified. Nests or evidence of bird nests were recorded, although it was difficult to ascertain which species actually used the nests except during the breeding season. The number of birds and bird nests were estimated on rookery islands that contained greater than 100 pairs of breeding birds. While on the islands, any reptiles and

mammals observed were identified and recorded.

Ground truthing and on-site maps were made of each island to aid in producing vegetation maps and to get information for percentage of plant cover on each island. North-south and east-west transect lines were laid out and plants were recorded at each 10 m interval along the transect; all the plants directly overhead and within 1 cm of the line were recorded. In addition, the areas of the island not on the transect lines were thoroughly searched for plant species. Species occurring on the island but not on the transect line were noted for inclusion in the overall species list of the island. Unknown species or species not previously recorded during the spoil island survey were pressed, identified, mounted, and added to the spoil island herbarium collection. Vegetation maps of each island were produced using ARC/INFO GIS mapping software with 1:2400 aerial photographs of the islands and the information obtained during ground truthing.

Each end of the two terrestrial transects was extended an additional 30 m into the water in order to determine submerged bottom contours and seagrass type, if any; records were made at each 10 m interval along the transect. This information along with aerial photographs was used to determine the bottom topography and extent of seagrass beds around each island in order to determine boating accessibility. One 20 m long seine haul using a small net (4 m x 2 m with 3.2 mm mesh) was taken at each of the four locations around the perimeter of the island. All the fishes and invertebrates collected were identified to the lowest taxonomic level possible. Each species was assigned to one of the following four abundance categories: 1) rare, less than 5 individuals; 2) occasional, 5-20 individuals; 3) common, 21-50 individuals; and 4) abundant, greater than 50 individuals. Representative samples of the less common fish species were preserved in 10% formalin

and later transferred to 70% isopropanol for confirmation of identification.

The following references were used to identify wildlife:

- Fishes: Robins et. al (1980), Robins et. al (1986), Hoese and Moore (1977) and Bohlke and Chaplin (1968).
- Invertebrates: Barnes (1980).
- Birds: Farrand (1988) and Robbins et. al (1966).
- Mammals: Whitaker (1980).
- Reptiles: Behler and King (1979).
- Plants: Wunderlin (1982), Bell and Taylor (1982), Long and Lakela (1971), Stevenson (1969) and Radford et. al (1968).

The nomenclature used in wildlife identifications were those defined in the first reference listed in each category.

Criteria for Island Usage Classification

Spoil islands were assigned to one of three general usage categories based on the results of the biological survey: conservation, education, or recreation. Recreation islands were further subdivided into two categories: passive recreation and active recreation. Islands designated for passive recreation should contain no structures but use of the islands for picnics, sunbathing and primitive overnight camping would be permitted. Islands designated for active recreation could support the development of docks, picnic shelters, brick fireplaces or barbecue grills and perhaps sanitary facilities.

Criteria for classification as a conservation island include the presence of extensive seagrass beds, shallow water surrounding the island with no deep water access points, heavy

mangrove fringe and little or no open beach access, breeding bird populations, rare or threatened plant species, a high percentage of native plants and high species diversity. Some conservation islands with high soil humus quality (greater than 10 cm) were also identified as potential sites for revegetation with native tropical hammock plants. Public use of conservation islands for recreational purposes should be discouraged although occasional use for bird watching or nature study by nature or conservation oriented groups or individuals would be appropriate provided these activities are conducted outside of the breeding season.

Criteria for classification as an education island include historical use of the island for education, one or more deep water access points with open beaches, seagrass beds surrounding at least part of the island that contain high aquatic diversity, and a high plant species diversity including a healthy mangrove community and good representation of native plants. Furthermore, education islands should not have breeding bird populations. School children, scout troops and other groups desiring to learn more about the environment would be encouraged to visit islands set aside for education purposes. In the future these islands might be developed into small nature areas with interpretive trails.

Criteria for passive and active recreation islands are similar. Islands were classified for recreation if they had one or more deep water access points with open sand beaches, historical human usage, small or nonexistent seagrass beds, low species diversity, no rare or threatened species and no breeding bird populations. Passive recreation islands are small islands or densely vegetated islands that could not support the development of structures. Active recreation islands are larger islands with open areas that could support construction of permanent facilities. The general public should be encouraged to use the

islands designated for recreation for picnicking, sunbathing, swimming and primitive overnight camping.

RESOURCE INVENTORY

This section of the management plan comprises all the biological information gathered during the spoil island survey. Table 1-1 presents a complete list of all the flora and fauna collected during the spoil island survey; abundance information is also presented for those species found in Brevard County. Vegetation maps and physical and biological descriptions of each island are included along with recommended usage for each island. For a more detailed review of the management recommendations, refer to the discussion section of the plan.

The symbols for vegetation type on the maps are consistent throughout the entire management plan. Species that commonly occur together were represented by a single symbol for ease of interpretation. For instance, the symbol for mangroves represents red, black and white mangroves since these species are commonly intermixed, making them difficult to distinguish on a small scale map. The symbol for marsh represents saltwort, perennial glasswort, white and black mangrove marsh areas. The symbol for cordgrass represents both smooth cordgrass and marshhay cordgrass. Although Brazilian pepper often occurs under a canopy of Australian pine, areas such as these were coded with the Australian pine symbol when it was the dominant plant species. Sections of the maps showing Brazilian pepper usually indicate a dense, monospecific stand of that species.

Table 1-1. Species list of all plants and animals collected or observed on spoil islands from October 1987 - January 1989 with species found on Brevard County spoil islands indicated. "Undet." means the species was not determined. Plant Key: numbers are percent relative frequency of occurrence, X=present on island but not on transect line. Invertebrate/Fish Key: R=rare (1-4 individuals), O=occasional (5-20 individuals), C=common (21-50 individuals), A=abundant (>50 individuals). Bird/Reptile/Mammal Key: number of individuals seen is indicated.

1 - 16

	BREVARD COUNTY ISLAND NUMBER																
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1.											X	X	X				
2.							X										
3.																	
4.																	
5.																	
6.																	
7.																	
8.								X									
9.																	
10.																	
11.						X											
12.																	
13.		X	X			X	X	X	X	X	X	X	X	X	X	X	X
14.						X		X	X	X	X						
15.																	
16.																	
17.		X			1	X	7								X		
18.	X																
19.									1								
20.							X										
21.	X			X				1	2	2		X					
22.																	
23.	X	X	X		2	X	X					1		X			1
24.		X	X	2	5	8	X	1	4		2	2		X	X	X	3
25.																	X
26.			X		1	X									X		
26.			3		4	1	16		2	3	X	1					
27.	X				4	1	X					1				X	1
29.	X	2			X		X		2		X	1		3		2	X
30.																	
31.																	
32.			X		2					X							

1 - 18

	BREVARD COUNTY ISLAND NUMBER																
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==
33.																	
34.																	
35.																	
36.																	
37.	13	9	15	2	7	2	16	8	5	12	6	3	6	10	8	5	3
38.	X		2		X	X			1								
39.																	
40.																	
41.																	
42.						X	X			X	X			X			
43.																	
44.								1		X							
45.																	
46.																	
47.																	
48.																	
49.	X		2				X				X						
50.																	
51.																	
52.	X													2			
53.											X						
54.																	
55.												1					
56.																	
57.																	
58.																	
59.	19	27	19	19	11	12	14	8	14	16	14	21	28	21	14	28	10
60.																	
61.																	
62.																	
63.																	
64.																	
65.	X								1	X				X			
66.																	
67.																	
68.	X									X	1			2			

1 - 20

	BREVARD COUNTY ISLAND NUMBER																
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==
69.																	
70.	X	X				X	X				X	X	X			X	X
71.																	
72.																	
73.																	
74.									X		X						
75.																	
76.																	
77.																2	1
78.									1		X				1		
79.									X								
80.							X							X			
81.																	
82.																	
83.						X						X		X		2	
84.																	
85.		2									X			X			
86.	X		2	X	4	11	X		1	X	X	1		X	5	X	7
87.																	
88.									1								
89.																	
90.																	
91.							X										
92.	X							X			X	X					
93.	X								X		X		X				
94.																	
95.																	
96.																	
97.																	
98.	2	X	2		2	1	X		1	X							
99.			X		1	X						2		X			
100.																	
101.																	
102.	X				X	X	X							X	X		1
103.																	
104.			X			1											
105.																	
106.	2	X		X	1	1	X	3	1	2	X	5	14	X	X		X

		BREVARD COUNTY ISLAND NUMBER																																				
		1	2	4	5	6	8	9	10	11	12	14	15	16	17	18	28	29	30	32	33	34	35	36	37													
107.	<i>Desmanthus virgatus</i> Desmanthus																																					
108.	<i>Desmodium spp.</i> Tick trefoil																																					
109.	<i>Desmodium triflorum</i> Beggars tick																																					
110.	<i>Erythrina herbacea</i> Coral bean																																					
111.	<i>Indigofera spicata</i> Short indigofera																																					
112.	<i>Indigofera suffruticosa</i> Indigofera																																					
113.	<i>Parkinsonia aculeata</i> Mexican palo verde																																					
114.	<i>Ricinus communis</i> Castor bean																																					
115.	<i>Sophora tomentosa</i> Necklace pod																					X	X								X							
116.	<i>Vicia acutifolia</i> Vicia																																					
117.	<i>Vigna luteola</i> Cow pea	1						4	6	4	5	4	X	X								1									X							
GERANIACEAE																																						
118.	<i>Geranium spp.</i> Geranium																																					
119.	<i>Geranium carolinianum</i> Crane's bill																																					
OXALIDACEAE																																						
120.	<i>Oxalis spp.</i> Wood sorrel																															X						
RUTACEAE																																						
121.	<i>Amyris elemifera</i> Torchwood																																					
122.	<i>Zanthoxylum clava-herculis</i> Hercules club	X		1	8		3	4	X	4													X								X							
123.	<i>Zanthoxylum fagara</i> Wild lime																																					
SURIANACEAE																																						
124.	<i>Suriana maritima</i> Bay cedar																																					
BURSERACEAE																																						
125.	<i>Bursaria sinaruba</i> Gumbo limbo																														X	X						
EUPHORBIACEAE																																						
126.	<i>Chamaesyce spp.</i> Milk Spurge						5				X																											
127.	<i>Chamaesyce hirta</i> Hairy spurge																																					
128.	<i>Chamaesyce hysopifolia</i> Eye bane																																					
129.	<i>Cnidoscolus stimulosus</i> Tread softly																																					
130.	<i>Croton glandulosus</i> Glandular croton																																					
131.	<i>Croton punctatus</i> Beach tea																																					
132.	<i>Euphorbia spp.</i> Jacob's ladder																																					
133.	<i>Jatropha curcas</i> Physic nut																																					
134.	<i>Phyllanthus abnormis</i> Phyllanthus																																					
135.	<i>Poinsettia cyathophora</i> Painted leaf	X										X											X															
EMPETRACEAE																																						
136.	<i>Ceratiola ericoides</i> Rosemary																																					
ANACARDIACEAE																																						
137.	<i>Rhus copallina</i> Winged sumac																																					
139.	<i>Schinus terebinthifolius</i> Brazilian pepper	16	16	14	10	9	16	9	3	17	5	13	2	X				2	36	44	15	34	16	21	28	37												
AQUIFOLIACEAE																																						
139.	<i>Ilex cassine</i> Dahoon holly																																					
SAPINDACEAE																																						
140.	<i>Dodonaea viscosa</i> Varnish leaf																																					
141.	<i>Exothea paniculata</i> Inkwood																															X						
RHAMNACEAE																																						
142.	<i>Krugiodendron ferreum</i> Black ironwood																																					
VITACEAE																																						
143.	<i>Ampelopsis arborea</i> Pepper vine																																					
144.	<i>Parthenocissus quinquefolia</i> Virginia creeper	1			X		8	X				X											1	X						X								
145.	<i>Vitis aestivalis</i> Summer grape																														X							

	BREVARD COUNTY ISLAND NUMBER																
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
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107.																	
108.																	
109.																	
110.														X			
111.					X									X			
112.																	
113.																	
114.																	
115.	X																
116.																	
117.	X						X		X		X	X					
118.																	
119.																	
120.												1					
121.																	
122.	4	X							1		1	X	X	X		X	1
123.																	
124.																	
125.	3					1		1		X		1	X	X			
126.	X	X															
127.																	
128.																	
129.																	
130.																	
131.																	
132.																	
133.																	
134.																	
135.							X					X					
136.																	
137.																	
138.	35	43	29	28	13	22	14	45	22	18	29	18	31	28	22	23	14
139.																	
140.																	
141.																	
142.																	
143.																	
144.	X					1					1						
145.																	

		BREVARD COUNTY ISLAND NUMBER																											
		1	2	4	5	6	8	9	10	11	12	14	15	16	17	18	28	29	30	32	33	34	35	36	37				
146.	<i>Viis rotundifolia</i> Muscadine grape CAPPARACEAE				X			3	X														1	X		X			
147.	<i>Capparis cynophallophora</i> Jamaica caper tree																												
148.	<i>Capparis flexuosa</i> Limber caper MALVACEAE																												
149.	<i>Hibiscus spp.</i> Hibiscus (cultivated)																												
150.	<i>Hibiscus tiliaceus</i> Mahoe																												
151.	<i>Kosteletzkya spp.</i> Mallow																												
152.	<i>Kosteletzkya virginica</i> Saltmarsh mallow										X																		
154.	<i>Mahastrum corchorifolium</i> False mallow																												
155.	<i>Sida rhombifolia</i> Indian hemp						X	X	9			X							X				3		X				
156.	<i>Thespesia populnea</i> Seaside mahoe																												
157.	<i>Urena lobata</i> Caesar weed HYPERICACEAE				X																								
158.	<i>Hypericum hypericoides</i> St. Andrew's cross PASSIFLORACEAE											X																	
159.	<i>Passiflora incarnata</i> Passion flower CARICACEAE	1							6					X								X	X						
160.	<i>Carica papaya</i> Papaya LOASACEAE	3			X																								
161.	<i>Mentzelia floridana</i> Poorman's patch CACTACEAE								X																				
162.	<i>Cereus pteranthus</i> Snake cactus																												
163.	<i>Cereus undatus</i> Night-blooming cereus																												
164.	<i>Opuntia stricta</i> Prickly-pear cactus RHIZOPHORACEAE				X			X		X		X	4																
165.	<i>Rhizophora mangle</i> Red mangrove COMBRETACEAE																				3	X		3	X				
166.	<i>Conocarpus erecta</i> Buttonwood	1			X						X		3	6		6	7	36	6	X		X	4	3	1				
167.	<i>Laguncularia racemosa</i> White mangrove MYRTACEAE	3	16	9	1	X				X	3	X	X	X		6	4	21	2	11	5	1	3		X				
168.	<i>Eugenia axillaris</i> White stopper												X	X															
169.	<i>Eugenia foetida</i> Spanish stopper																												
170.	<i>Myrcianthes fragrans</i> Twinberry																												
171.	<i>Psidium guajava</i> Guava ONAGRACEAE										X																		
172.	<i>Gaura angustifolia</i> Gaura										X																		
173.	<i>Oenothera humifusa</i> Seaside evening primrose ARALIACEAE																												
174.	<i>Schefflera actinophylla</i> Australian umbrella tree APIACEAE																					X		X					
175.	<i>Centella asiatica</i> Coinwort											X																	
176.	<i>Oxypolis filiformis</i> Water dropwort ERICACEAE																												
177.	<i>Vaccinium stamineum</i> Deerberry MYRSINACEAE																												
178.	<i>Ardisia escallonioides</i> Marlberry																												
179.	<i>Rapanea punctata</i> Myrsine PLUMBAGINACEAE																												
180.	<i>Limonium carolinianum</i> Sea lavender	X		X		X						X							2			X	X	X					
181.	<i>Plumbago scandens</i> Wild plumbago SAPOTACEAE																												
182.	<i>Bumelia celastrina</i> Saffron plum																												

	BREVARD COUNTY ISLAND NUMBER																
	38 ==	39 ==	40 ==	42 ==	43 ==	44A ==	44B ==	45 ==	46 ==	47 ==	48 ==	49 ==	50 ==	51 ==	52 ==	52A ==	53 ==
146.	X							X	1		X						
147.																	
148.																	
149.																	
150.									X			1					
151.																	
152.									X								
154.																	
155.	X							X	X	10	2	X	2				
156.																	
157.								X									
158.																	
159.		2				X	X					1		3			
160.																	
161.																	
162.																	
163.																	
164.					1	1			1	X	1						
165.	X	X		9	2	2	2	1	2	X	1	6	2	5	4	7	14
166.	2	2	2	5	1	3			2	X	2	2	2		2	X	3
167.	X	2	2	7	4	2			2	3	2	1	2	8	10	5	10
168.													X				
169.	X											X		X			
170.																	
171.																	
172.																	
173.							4	1					X				
174.														X			
175.																	
176.									X								
177.																	
178.																	
179.																	
180.	X		X	X		2	X		1	X	4	4		X	X	2	2
181.																	
182.																	

		BREVARD COUNTY ISLAND NUMBER																											
		1	2	4	5	6	8	9	10	11	12	14	15	16	17	18	28	29	30	32	33	34	35	36	37				
183.	<i>Bumelia tenax</i> Tough bumelia																											X	
184.	<i>Mastichodendron foetidissimum</i> Mastic																												
OLEACEAE																													
185.	<i>Forestiera segregata</i> Florida privet	28	2	4	17	X	11	X	3			2	3	X								X	X	X	1				
186.	<i>Jasminum spp.</i> Jasmine																												
LOGANIACEAE																													
187.	<i>Polypremum procumbens</i> Rustweed																												
APOCYNACEAE																													
188.	<i>Allamanda cathartica</i> Golden trumpet																												
189.	<i>Catharanthus roseus</i> Madagascar periwinkle																												
190.	<i>Celtis laevigata</i> Hackberry				7						X													1					
191.	<i>Cynanchum angustifolium</i> Vine milkweed													3															
192.	<i>Nerium oleander</i> Oleander																												
193.	<i>Rhabdadenia biflora</i> Rubber vine																												
194.	<i>Sansevieria hyacinthoides</i> African bowstring hemp																												
CONVOLVUACEAE																													
195.	<i>Ipomoea spp.</i> Morning glory	X			1			X				X	X	X									X		X				
196.	<i>Ipomoea pandurata</i> Wild potato vine																												
197.	<i>Ipomoea pes-caprae</i> Railroad vine																												
BORAGINACEAE																													
198.	<i>Heliotropium angiospermum</i> Scorpion tail																							1					
199.	<i>Heliotropium curvassavicum</i> Seaside heliotrope	1					X		X		X												1						
VERBENACEAE																													
200.	<i>Callicarpa americana</i> Beauty bush																												
201.	<i>Lantana camara</i> Shrub verbena				1			X										X											
202.	<i>Lippia nodiflora</i> Carpetweed											X																X	
203.	<i>Vitex trifolia</i> Vitex																												
AVICENNIACEAE																													
204.	<i>Avicennia germinans</i> Black mangrove	11	19	7	3	9		X		X	3	2		X	11	6	X	X	3	4	5	3	3						
LAMIACEAE																													
205.	<i>Leonotis nepetaefolia</i> Lion's ear																											X	
206.	<i>Pycnanthemum spp.</i> Horsemint												15															X	
207.	<i>Trichostema dichotomum</i> Forked blue curls																												
SOLANACEAE																													
208.	<i>Lycium carolinianum</i> Christmas berry	2	7	4	2	6		X	X		X	X					X		X				X						
209.	<i>Lycopersicon esculentum</i> Tomato																												
210.	<i>Physalis viscosa</i> Ground cherry				X																								
211.	<i>Solanum americanum</i> Common nightshade	4			X					X	X		2															X	
212.	<i>Solanum elaeagnifolium</i> Potato tree																												
213.	<i>Solanum seaforthianum</i> Climbing nightshade	X															X												
SCROPHULARIACEAE																													
214.	<i>Buchnera americana</i> Blue heart											X																	
215.	<i>Capraria biflora</i> Twinsflower																												
216.	<i>Scoparia dulcis</i> Sweet broom											2																	
BIGNONIACEAE																													
217.	<i>Tecomaria capensis</i> Cape honeysuckle																												
MARTYNIACEAE																													
218.	<i>Mangifera indica</i> Mango																												
PLANTAGINACEAE																													
219.	<i>Plantago virginica</i> Southern plantain																												
RUBIACEAE																													
220.	<i>Chicococca alba</i> Snowberry																												

	BREVARD COUNTY ISLAND NUMBER																
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
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183.																	
184.																	
185.	3	2	2	X	2	1	X	3	9	2	11	3	4	X	1		
186.																	
187.																	
188.																	
189.	2							4	1		6						
190.																	
191.														X			
192.											X						
193.																	
194.																	
195.	X							1	1	X		2		2			
196.																	
197.							4			7						X	
198.							X	1			1	X					
199.									X		X						
200.																	
201.											1			X			
202.																	
203.									X		X						
204.		2	X	12	7	7	2	3	7	X	4	8	2	10	10	9	9
205.	X																
206.					1												
207.					1												
208.			X		1					X	1			2	2		1
209.																	
210.							X										
211.	2			X							X						
212.																	
213.																	
214.																	
215.																	
216.																	
217.																	
218.																	
219.																	
220.																	

BREVARD COUNTY ISLAND NUMBER																																						
	1	2	4	5	6	8	9	10	11	12	14	15	16	17	18	28	29	30	32	33	34	35	36	37														
221. <i>Ixora spp.</i> Ixora																																						
222. <i>Psychotria nervosa</i> Wild coffee																																						
223. <i>Randia aculeata</i> White indigo berry																																						
CAPRIFOLIACEAE																																						
224. <i>Sambucus canadensis</i> Elderberry					11												X						1															
CUCURBITACEAE																																						
225. <i>Cucumis melo</i> var. <i>dudaim</i> Dudaim melon				X																																		
226. <i>Melothria pendula</i> Creeping cucumber	1			X			9					1					X																					
227. <i>Momordica charantia</i> Wild balsam apple	1			X								1																										
GOODENIACEAE																																						
228. <i>Scaevola frutescens</i> Scaevola																																						
229. <i>Scaevola plumieri</i> Inkberry																																						
ASTERACEAE																																						
230. <i>Ambrosia artemisiifolia</i> Common ragweed								X		2	X										1	3		X														
231. <i>Aster spp.</i> Asters undet.																																						
232. <i>Baccharis halimifolia</i> Groundsel tree	X	X	X	X	X	5	X	X	9	3	X	27					16	X	2			X	4		X													
233. <i>Bidens alba</i> Spanish needles	X						11	X	6		X		X									4	5		1													
234. <i>Borreria frutescens</i> Sea oxeye	X	7	3	5	6	3	X	X	4	3	2	3	X				19		X	15	5	3	3	6	1													
235. <i>Chromolaena odorata</i> Eupatorium	2									3							6		X																			
236. <i>Chrysopsis spp.</i> Goldenaster										X																												
237. <i>Chrysopsis subulata</i> Goldenaster				X	X					X		14	8								1			X	X													
238. <i>Conyza canadensis</i> Dwarf horseweed																																						
239. <i>Emilia sonchifolia</i> Tassel flower																																						
240. <i>Erigeron strigosus</i> Daisy fleabane											X	X																										
241. <i>Eupatorium capillifolium</i> Dog fennel	X							X	X	X		X									X	X			X													
242. <i>Eupatorium serotinum</i> Late thoroughwort									3				1																									
243. <i>Euthamia minor</i> Goldenrod																					3																	
244. <i>Gnaphalium obtusifolium</i> Rabbit tobacco																																				X		
245. <i>Helianthus debilis</i> Beach sunflower																																						
246. <i>Hieracium gronovii</i> Hawkweed																																						
247. <i>Iva frutescens</i> Marsh elder	3	2	5	1	9		9	X	X	13	4	1	X		X		7	X	4			7																
248. <i>Iva imbricata</i> Beach elder			1																																			
249. <i>Lactuca canadensis</i> Wild lettuce	X							X													1				1													
250. <i>Lactuca graminifolia</i> Wild lettuce							X	X		2																										X		
251. <i>Liatris tenuifolia</i> Blazing star																																						
252. <i>Mikania cordifolia</i> Climbing hemp																																						
253. <i>Mikania scandens</i> Hempweed								X																X														
254. <i>Pluchea foetida</i> Marsh fleabane				4																																		
255. <i>Pluchea odorata</i> Camphor weed												1																										
256. <i>Solidago sempervirens</i> Seaside goldenrod					X							1	X																									
257. <i>Sonchus asper</i> Spiny leaved sow thistle																						X																
258. <i>Sonchus oleraceus</i> Common sow thistle																																						
259. <i>Taraxacum officinale</i> Common dandelion																																						
260. <i>Wedelia trilobata</i> Creeping oxeye																					1	X																
ANIMALIA																																						
PORIFERA																																						
261. Sponges undet. Sponge								R																														

	BREVARD COUNTY ISLAND NUMBER																
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
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221.																	
222.																	
223.																	
224.																	
225.																	
226.																	
227.	X													X			
228.																	
229.																	
230.	X		X	X	2	X	X	1		X	4	2	X	X			
231.																	
232.	X	X	X	X		X	X	1	1		4	X	X	2	X		X
233.	X	X	X		2	2	4		3		X	2		X			
234.	2		2	9	4	6	2		2	X	X	7	2	2	6	9	15
235.																	
236.																	
237.	X		7	2	4	2	5	10	6	23	1	X		X	X		
238.																	
239.																	
240.																	
241.																	
242.	X								X		X						
243.																	
244.											X						
245.										X							
246.																	
247.					2	3		1				1			2		1
248.					2	4	X		1		X	X			X	2	X
249.	2		X								X	X					
250.	X										X						
251.																	
252.																	
253.	X										X			X			X
254.																	
255.																	
256.					X	X											X
257.	X			X					X			X	X				
258.																	
259.					X												
260.																	
261.																	

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	BREVARD COUNTY ISLAND NUMBER																
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
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262.																	
263.																	
264.																	
265.																	
266.																	
267.																	
268.								R				R					
269.					R												
270.																	
271.											R						
272.																	
273.																	
274.																	
275.						R											
276.			R		O	C	C	A	A	O	A	A	R	O		R	A
277.	R			R	O	A	A	A	A	A	C	A	O	A		A	O
278.																	
279.								A									
280.						C											
281.								R									
282.								O									
283.									O					R			
284.																	
285.			O	R		R		O	O	O	O	O		R		R	R
286.																	
287.				R							R						R

		BREVARD COUNTY ISLAND NUMBER																																
		1	2	4	5	6	8	9	10	11	12	14	15	16	17	18	28	29	30	32	33	34	35	36	37									
288.	<i>Menippe mercenaria</i> Stone crab GRAPSIDAE	O			R																													
289.	<i>Arates pisonii</i> Mangrove tree crab																																	
290.	<i>Cardisoma guanhumi</i> Great land crab ECHINODERMATA CRINOIDEA																																	
291.	Crinoid undet. Echinoderms STELLEROIDEA	O																																
292.	Holothurian undet. Sea cucumber ASTEROIDEA	O																																
293.	Asteroidae undet. Starfish CHORDATA ASCIDIACEA																																	
294.	Tunicata undet. Tunicates CHONDRICHTHYES RAJIFORMES DASYATIDAE				R							R	R	R		O		R	R	R														
295.	<i>Dasyatis sabina</i> Atlantic stingray																																	
296.	<i>Gymnura micrura</i> Smooth butterfly ray OSTEICHTHYES CLUPEIFORMES CLUPEIDAE																																	
297.	<i>Opisthonema oglinum</i> Atlantic thread herring																																	
298.	<i>Sardinella aurata</i> Spanish sardine																																	
299.	<i>Brevoortia spp.</i> Menhaden ENGRAULIDAE																																	
300.	<i>Anchoa hepsetus</i> Striped anchovy																																	
301.	<i>Anchoa mitchelli</i> Bay anchovy ELOPIFORMES ELOPIDAE												A				R														O			
302.	<i>Elops saurus</i> Ladyfish BATRACHOIDIFORMES BATRACHOIDIDAE																														R	O		
303.	<i>Opsanus tau</i> Oyster toadfish ATHERINIFORMES EXOCEOTIDAE														R																			
304.	<i>Hyporhamphus unifasciatus</i> Halibreak BELONIDAE				R		R		R	R																								
305.	<i>Strongylura notata</i> Redfin needlefish CYPRINODONTIDAE				O		O			R	R										O										R			
306.	<i>Cyprinodon variegatus</i> Sheepshead minnow	R										R	R	R					R												R			
307.	<i>Floridichthys carpio</i> Goldspotted killifish	O		R			O	R	R	O	C	C	O	O	O	O	R		O	O										O	R			
308.	<i>Fundulus confluentus</i> Marsh killifish																																	
309.	<i>Fundulus grandis</i> Gulf killifish																																	
310.	<i>Fundulus majalis</i> Striped killifish																																	
311.	<i>Fundulus similis</i> Longnose killifish																																	
312.	<i>Lucania parva</i> Rainwater killifish POECILIIDAE	A	O	R	A	O	C	C	C	R	O	O	A	R	R	R				R	R	O	C	O										
313.	<i>Poecilia latipinna</i> Sailfin molly ATHERINIDAE														R		R														R			
314.	<i>Menidia beryllina</i> Inland silverside																																	
315.	<i>Menidia peninsulae</i> Tidewater silverside GASTEROSTEIFORMES SYNGNATHIDAE	C	R	O	A	C	A	C	A	O	O	A	A	A	C	O	O	A	O	A									A	C		R		
316.	<i>Hippocampus erectus</i> Lined seahorse																																	
317.	<i>Hippocampus zosterae</i> Dwarf seahorse				R																													
318.	<i>Syngnathus louisianae</i> Chain pipefish				R																													
319.	<i>Syngnathus scovelli</i> Gulf pipefish	A	O	R	C	R	C	O	O			R	R	R	R	R	C	R		O	O	O	R	R										

	BREVARD COUNTY ISLAND NUMBER																
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
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295.			R			R	R									R	
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300.																	
301.		A		R	A	O	A		R				R			A	A
302.			R	R									R	C			
303.																	
304.																	
305.			R	R			R	R	R	R	R	R		R			
306.																R	
307.									R		R		O	R		C	R
308.																	
309.																	
310.																	
311.																R	
312.						R	R	O	R	R							
313.																	
314.																	
315.	A	C	O	A	O	C	O	C	C	A	O	A	C	C		C	C
316.																	
317.						R		R	R								
318.						R		R		R			R				
319.	R		R	R		O	C	A	A	C	C	C	R	O		R	

BREVARD COUNTY ISLAND NUMBER																																				
	1	2	4	5	6	8	9	10	11	12	14	15	16	17	18	28	29	30	32	33	34	35	36	37												
PERCIFORMES																																				
CENTROPOMIDAE																																				
320. <i>Centropomus undecimalis</i> Snook																																				
CARANGIDAE																																				
321. <i>Caranx hippos</i> Jack crevalle																																				
322. <i>Oligoplites saurus</i> Leatherjacket																																				
323. <i>Trachinotus falcatus</i> Permit																																				
LUTJANIDAE																																				
324. <i>Lutjanus griseus</i> Grey snapper																																				
325. <i>Ocyurus chrysurus</i> Yellowtail snapper																																				
LOBOTIDAE																																				
326. <i>Lobotes surinamensis</i> Tripletail																																				
GERREIDAE																																				
327. <i>Diapterus auratus</i> Irish pompano																																				
328. <i>Eucinostomus spp.</i> Mojarra													O				R	R																	C	
HAEMULIDAE																																				
329. <i>Haemulon chrysargyreum</i> Small mouth grunt																																				
330. <i>Haemulon parrai</i> Sailor's choice																																				
331. <i>Orthopristis chrysoptera</i> Pigfish																																				
SPARIDAE																																				
332. <i>Archosargus probatocephalus</i> Sheepshead																																				
333. <i>Diplodus argenteus</i> Silver porgy																																				
334. <i>Lagodon rhomboides</i> Pinfish					O							R								C									R	R	R	R				
SCIAENIDAE																																				
335. <i>Bairdiella chrysoura</i> Silver perch										R		R					R																			
336. <i>Cynoscion nebulosus</i> Spotted seatrout			R														R																			
337. <i>Leiostomus xanthurus</i> Spot				O			C	A	R			A					R					R								R	A					
338. <i>Menticirrhus americanus</i> Southern kingfish																	R																			
339. <i>Micropogonias undulatus</i> Atlantic croaker				R																											A					
340. <i>Sciaenops ocellatus</i> Red drum																																				
EPHIPPIDAE																																				
341. <i>Chaetodipterus faber</i> Spadefish										R																										
MUGILIDAE																																				
342. <i>Mugil cephalus</i> Striped mullet				R			O	R	R			C		R					R										A	A			R			
343. <i>Mugil curema</i> White mullet																																				
SPHYRAENIDAE																																				
344. <i>Sphyrna barracuda</i> Greater barracuda																																				
345. <i>Sphyrna borealis</i> Northern sennet																																				
BLENNIIDAE																																				
346. <i>Chasmodes bosquianus</i> Striped blenny																																				
347. <i>Chasmodes saburrae</i> Florida blenny								R					R		R							R		R												
GOBIIDAE																																				
348. <i>Bathygobius soporator</i> Frillfin goby																																				
349. <i>Gobionellus boleosoma</i> Darter goby																																				
350. <i>Gobiosoma boscii</i> Naked goby	R	O	O	R	R	R	O					R	C	R								O	R								R					
351. <i>Gobiosoma robustum</i> Code goby	O	R				C		O		C		R		O	R	O	R		O												R					
352. <i>Microgobius gulosus</i> Clown goby																																				
STROMATEIDAE																																				
353. <i>Peprilus spp.</i> Butterfish																																				
PLEURONECTIFORMES																																				
BOTHIDAE																																				
354. <i>Citharichthys spilopterus</i> Bay whiff																																				
355. <i>Paralichthys spp.</i> Southern or summer flounder																																				
356. <i>Paralichthys albígutta</i> Gulf flounder																																				

	BREVARD COUNTY ISLAND NUMBER																
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
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320.																	
321.																	
322.																R	
323.								C	O	R						C	R
324.						R											
325.																	
326.																	
327.							R										
328.	R	C	R	C	A	C	A	C	C	O	O	R		A		O	O
329.																	
330.																	
331.	R			R				O	O		R	R					R
332.							R	O	O	O	R						
333.																	
334.	O		R	R				C	C	A	A	C	O	A		C	R
335.							R	C	A								
336.							R										
337.	R		A	R				R		R	O	A	A	A			
338.																	
339.			A			R	O					R	R	A		R	R
340.					R	C								O		O	
341.																	
342.		O	A			R						A	A	A		A	
343.																	
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345.																	
346.									R								
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350.						O	C		O		R			R		R	O
351.			R			R		O	R				R	R			
352.																	
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	BREVARD COUNTY ISLAND NUMBER																		
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53		
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357.																			
358.											R								
359.																			
360.						R	R	R											
361.																			
362.					R	R			R										
363.																			
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371.																			
372.																			
373.			1								1	1	1		1				
374.														2					
375.	2	100	3						1		3			4	70	9	8		
376.																			
377.	1	7	15	2	1			1				2	1		100	3	6		
378.									3	1		2	1	1	1				
379.																			
380.														3					
381.	2							1			3								
382.																			
383.																			
384.									2				1	1		2			
385.			1					1			3			2	4				
386.		2									1								
387.																			
388.																			
389.																			

		BREVARD COUNTY ISLAND NUMBER																											
		1	2	4	5	6	8	9	10	11	12	14	15	16	17	18	28	29	30	32	33	34	35	36	37				
390.	<i>Pandion haliaetus</i> Osprey		1		2					1		1	1										1	2	1				
CICONIIFORMES																													
ARDEODAE																													
391.	<i>Ardea herodias</i> Great blue heron		1	1					1				1			1	1		4	1	1	1	1	1					
392.	<i>Bubulcus ibis</i> Cattle egret	999			700		1																						
393.	<i>Butorides virescens</i> Green-backed heron																												
394.	<i>Casmerodius albus</i> Great egret	150			50	1		1																					
395.	<i>Dichromanassa rufescens</i> Reddish egret	2			1																								
396.	<i>Florida caerulea</i> Little blue heron																	1		1									
397.	<i>Hydranassa tricolor</i> Tricolor heron	999			999																								
398.	<i>Leucophoyx thula</i> Snowy egret	999			999	1																							
399.	<i>Nyctanassa violacea</i> Yellow-crowned night heron																												
400.	<i>Nycticorax nycticorax</i> Black-crowned night heron																					2							
CICONIIDAE																													
401.	<i>Mycteria americana</i> Wood stork	2																											
THRESKIORNITHIDAE																													
402.	<i>Ajaia ajaja</i> Roseate spoonbill	2																											
403.	<i>Eudocimus albus</i> White ibis	999		10	900	6	1																						
404.	<i>Plegadis falcinellus</i> Glossy ibis				5																								
GRUIFORMES																													
RALLIDAE																													
405.	<i>Fulica americana</i> American coot																							1					
CHARADRIIFORMES																													
HAEMATOPODIDAE																													
406.	<i>Haematopus palliatus</i> American oystercatcher																												
CHARADRIIDAE																													
407.	<i>Charadrius vociferus</i> Killdeer																												
408.	<i>Charadrius wilsonia</i> Wilson's plover																												
409.	<i>Pluvialis squatarola</i> Black bellied plover					3				1					1			1											
SCOLOPACIDAE																													
410.	<i>Actitis macularia</i> Spotted sandpiper																												
411.	<i>Arenaria interpres</i> Ruddy turnstone		3			11									1		2												
412.	<i>Calidris alba</i> Sanderling			7											8														
413.	<i>Calidris alpina</i> Dunlin			20																									
414.	<i>Calidris minutilla</i> Least sandpiper																												
415.	<i>Caotrophorus semipalmatus</i> Willet																												
416.	<i>Erolia or Ereunetes spp.</i> Sandpipers		10			15																							
417.	<i>Limnodromus griseus</i> Short-billed dowitcher		9			13																							
418.	<i>Tringa solitaria</i> Solitary sandpiper																												
LARIDAE																													
419.	<i>Hydroprogne caspia</i> Caspian tern													5		1	2					4							
420.	<i>Larus argentatus</i> Herring gull			1		8									10		15	3											
421.	<i>Larus auricilla</i> Laughing gull			1	14	999	5	2			1					17	12					10	7						
422.	<i>Larus delawarensis</i> Ring-billed gull		16	16		35								16		11	122	3				7	7	34					
424.	<i>Larus marinus</i> Lesser black-backed gull					2								4		1	6												
425.	<i>Sterna albifrons</i> Least tern					5		1														4							
426.	<i>Thalasseus maximus</i> Royal tern					500										1						8	7						
RYNCHOPIDAE																													
427.	<i>Rynchops nigra</i> Black skimmer					89										2													

	BREVARD COUNTY ISLAND NUMBER																
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
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390.	1		2		1	1	1	4			3	1	2		1	2	2
391.	2	1		1	1	1	1	2	2	1		1	1	4	6		4
392.																	
393.									2			2					
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395.																	
396.						1	1	1	1	1	2	1		1	1		
397.									1			1					
398.			1												1		
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411.		2		3							3						8
412.	9		12											10			
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414.											1						
415.					9												
416.																	
417.			1	1						1							
418.											1						
419.	1				8										1		
420.			3												1		
421.	5	2			9								2		22	6	10
422.			4		4										12	1	5
424.			2														
425.	2							7			5						
426.			21									1	4				
427.			5		6						1						

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	BREVARD COUNTY ISLAND NUMBER																
	38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
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428.	11																
429.																	
430.	.																
431.	11																
432.	212																
434.																	
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436.																	
437.	3232423312020																
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439.																	
440.	1																
441.	2																
442.																	
443.	1																
444.	12																
445.	76																
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447.	2																
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453.	2																
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457.																	
458.																	
459.	1																
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461.	115																

	BREVARD COUNTY ISLAND NUMBER																																				
	1	2	4	5	6	8	9	10	11	12	14	15	16	17	18	28	29	30	32	33	34	35	36	37													
MAMMALIA																																					
MARSUPIALIA																																					
DIDELPHINIDAE																																					
462. <i>Didelphis marsupialis</i>																																					
Opossum																																					
LAGOMORPHA																																					
LEPORIDAE																																					
463. <i>Sylvilagus palustris paludicola</i>																																					
Marsh rabbit																																					
CARNIVORA																																					
PROCYONIDAE																																					
464. <i>Procyon lotor</i>																																					
Raccoon																																					
MUSTELIDAE																																					
465. <i>Lutra canadensis</i>																																					
River otter																																					
SIRENIA																																					
TRICHECHIDAE																																					
466. <i>Trichechus manatus</i>																																					
West Indian manatee																																					
CETACEA																																					
DELPHINIDAE																																					
467. <i>Tursiops truncatus</i>																																					
Bottlenose dolphin																																					

BREVARD COUNTY ISLAND NUMBER																
38	39	40	42	43	44A	44B	45	46	47	48	49	50	51	52	52A	53
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462.

463.

464.

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467.

ISLAND NO. BC1

Date Sampled: 15 June 1988

I. Physical Description

A. Island Size: 2.940 ha

B. Height Above Mean High Water: 1 m

C. Distance from Boat Ramps: 1.5 km west of Haulover Canal

D. Distance and Direction from Channel Marker: 300 m northwest of marker 2

E. Erosion: none

F. Boating access: none

II. Biological Description

A. Dominant Terrestrial Vegetation

Florida privet (73.9%), Brazilian pepper (43.5%), black mangrove (28.3%), southern red cedar (21.7%), cabbage palm (13.0%), common nightshade (10.9%), sea blite (10.9%); 41 species total

B. Soil humus: 1-2 cm

C. Seagrasses

Shoal grass on all sides

D. Bird Usage

Nesting double-crested cormorant, reddish egret, brown pelican, snowy egret, white ibis, tricolor heron, cattle egret, great egret; also wood stork, red-bellied woodpecker, roseate spoonbill; 13 species total

E. Common Fishes and Invertebrates

Rainwater killifish, gulf pipefish, tidewater silversides; 6 species total

F. Threatened, Endangered or Species of Special Concern

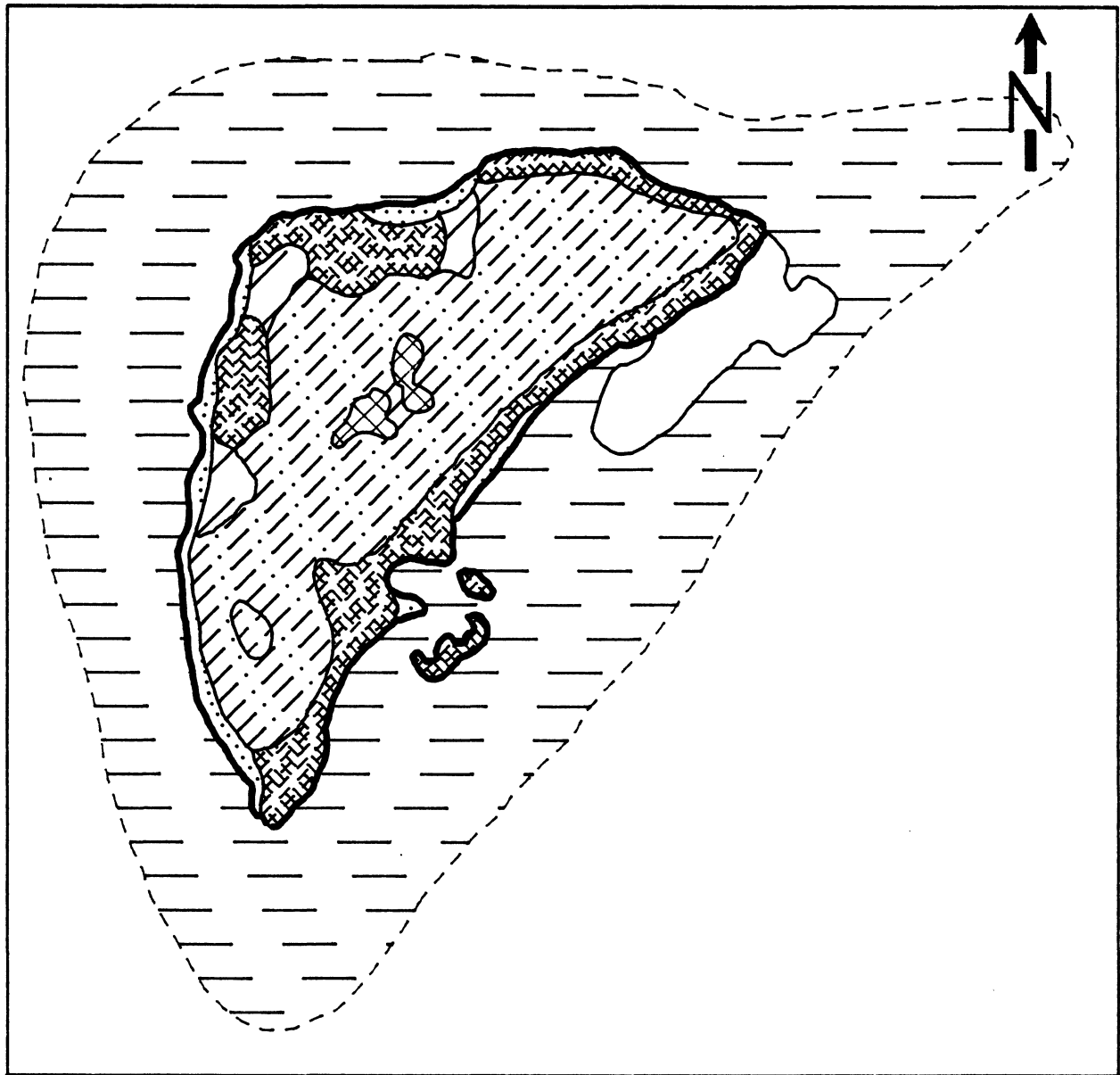
Prickly-pear cactus, roseate spoonbill, little blue heron, reddish egret, snowy egret, tricolor heron, osprey, brown pelican

III. Recommended usage: Conservation

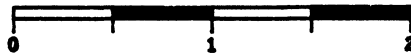
IV. Comments

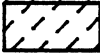
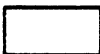
This island has been dedicated to the United States Government and is a designated bird sanctuary. It is currently off limits to all boaters.

SPOIL ISLAND BC1



1 in = 60 m



	Privet 1701 hectares		Cabbage palm 0.025 hectares
	Mangroves 0.882 hectares		Shoal grass
	Sand 0.109 hectares		Unvegetated bottom
	Marsh 0.108 hectares		< 1 m deep
	Australian pine 0.069 hectares		

ISLAND NO. BC2

Date Sampled: 30 November 1987

I. Physical Description

A. Island Size: 0.420 ha

B. Height Above Mean High Water: 1 m

C. Distance from Boat Ramps: 2.5 km west of Haulover Canal

D. Distance and Direction from Channel Marker: 1 km west of marker 2

E. Erosion: none

F. Boating access: South, 1.5 meters deep; no open beaches

II. Biological Description

A. Dominant Terrestrial Vegetation

Black mangrove (42.1%), Brazilian pepper (36.8%), white mangrove (36.8%), Australian pine (21.1%), sea oxeye (15.8%), Christmas berry (15.8%), sea purslane (10.5%); 17 species total

B. Soil humus: 1 cm

C. Seagrasses

Shoal grass and manatee grass on all sides

D. Bird Usage

Ring-billed gull, sanderling, willet; 6 species total

E. Common Fishes and Invertebrates

Gulf pipefish, rainwater killifish, tidewater silversides, naked goby; 11 species total

F. Threatened, Endangered or Species of Special Concern

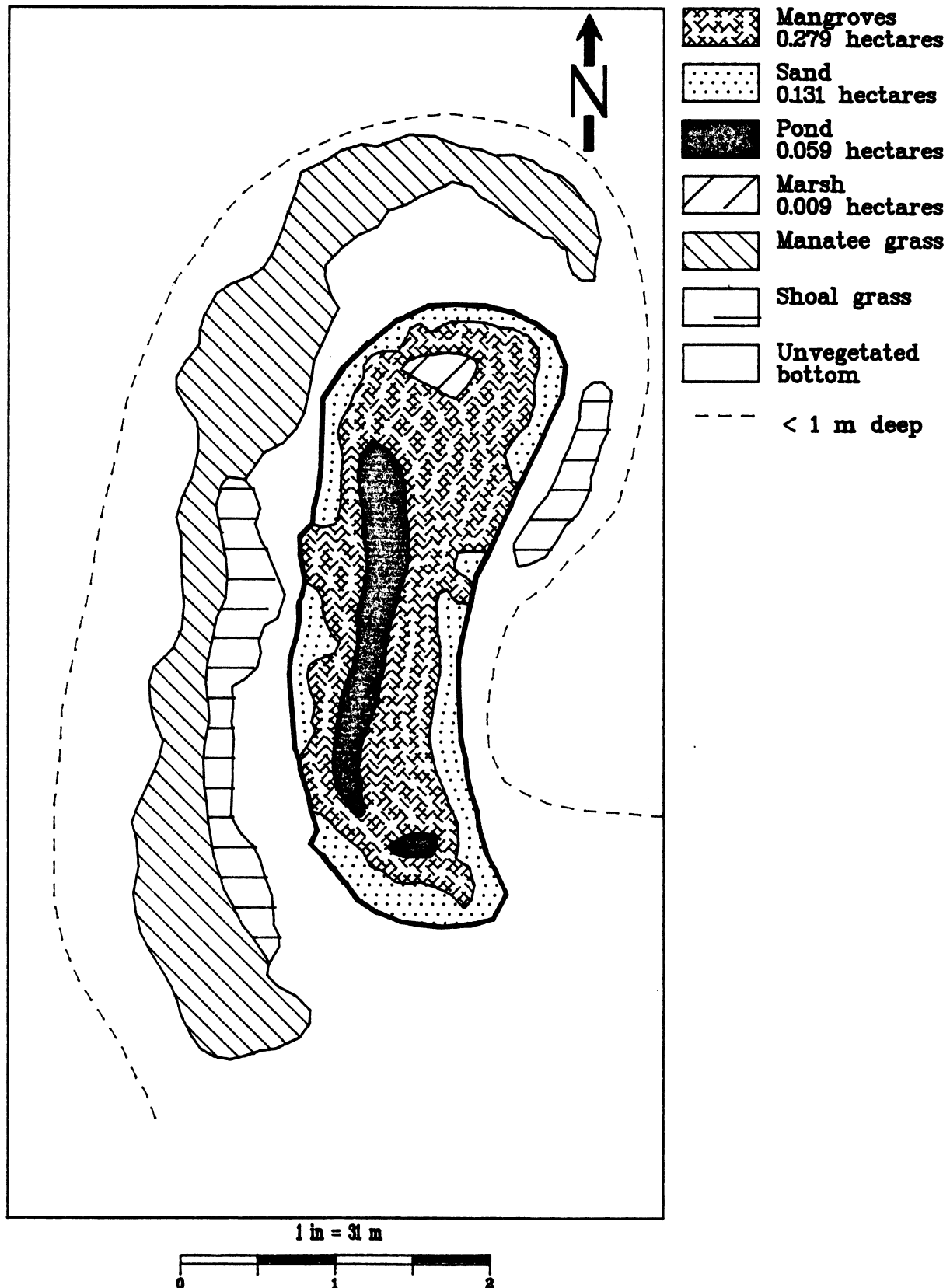
Osprey

III. Recommended usage: Passive Recreation

IV. Comments

This island has been dedicated to the United States Government. It does not have much to offer boaters; mosquitoes breed in a pond in the center and the beaches are very narrow. The only deep water access is from the south.

SPOIL ISLAND BC2



ISLAND NO. BC4

Date Sampled: 11 February 1988

I. Physical Description

A. Island Size: 0.507 ha

B. Height Above Mean High Water: 1 m

C. Distance from Boat Ramps: 4.5 km west of Haulover Canal

D. Distance and Direction from Channel Marker: 1 km west of marker 4

E. Erosion: none

F. Boating access: South, 1.5 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (28.2%), sea purslane (28.2%), white mangrove (17.9%), black mangrove (15.4%), cabbage palm (12.8%), Australian pine (10.3%), marsh elder (10.3%); 20 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N and E

D. Bird Usage

Ring-billed gull, double-crested cormorant, white ibis, sanderling; 7 species total

E. Common Fishes and Invertebrates

Spot, tidewater silversides, striped mullet; 9 species total

F. Threatened, Endangered or Species of Special Concern

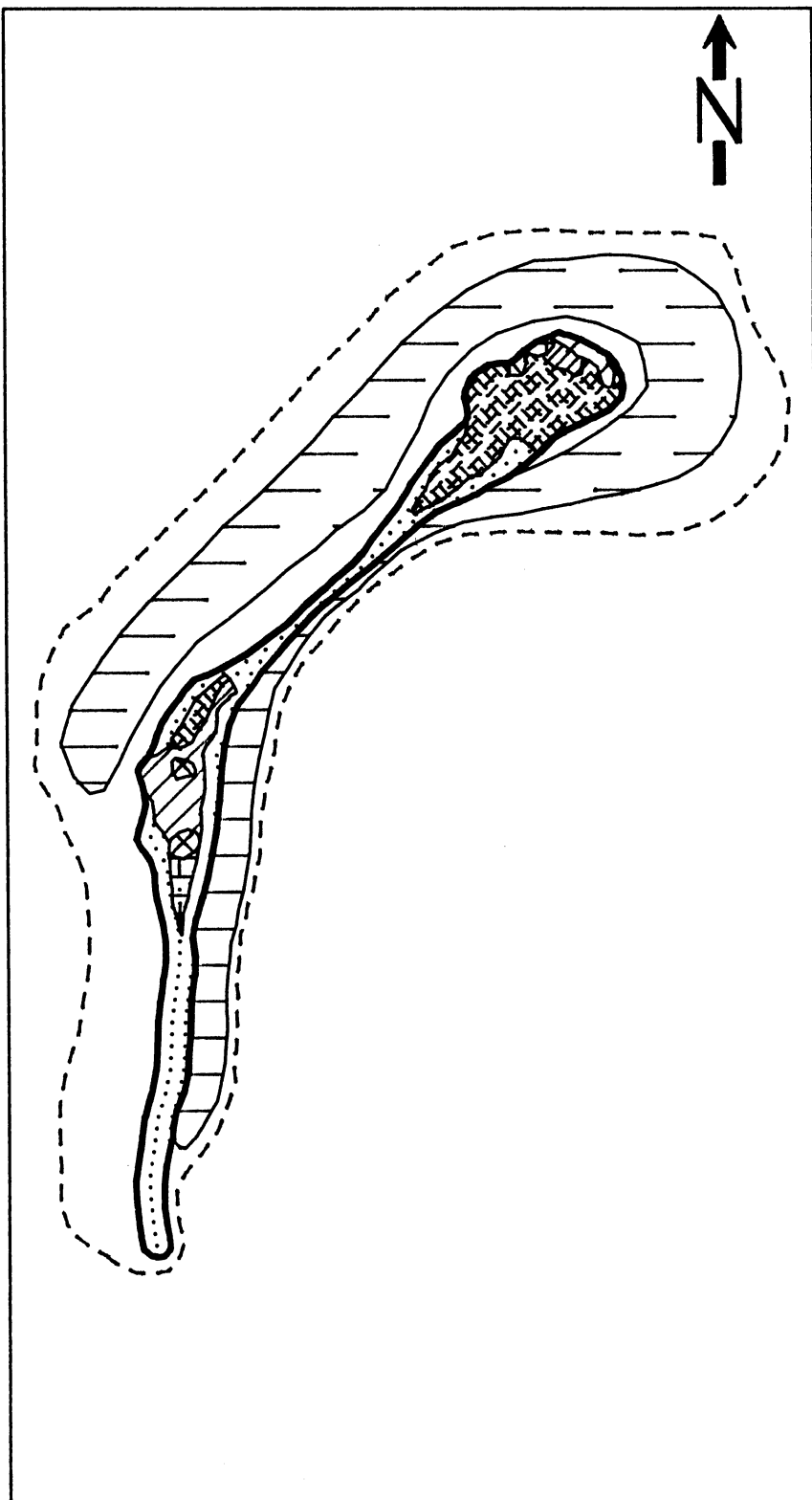
none

III. Recommended usage: Passive Recreation

IV. Comments

This island is not large enough for any construction of recreational facilities. There is deep water access from the south side only. The long sand spit on the west end serves as a day resting area for shore birds but no nesting sites were apparent.

SPOIL ISLAND BC4



	Sand
	0.261 hectares
	Mangrove
	0.144 hectares
	Brazilian pepper
	0.053 hectares
	Sea purslane
	0.016 hectares
	Grass
	0.012 hectares
	Australian pine
	0.011 hectares
	Marsh elder
	0.008 hectares
	Christmas berry
	0.003 hectares
	Shoal grass
	Unvegetated bottom
	< 1 m deep

1 in = 50 m



ISLAND NO. BC5

Date Sampled: 15 June 1988

I. Physical Description

A. Island Size: 1.412 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 5.5 km west of Haulover Canal

D. Distance and Direction from Channel Marker: 100 m north of marker 8

E. Erosion: Slight; low cliff on N

F. Boating access: No deep water; sand beach on S

II. Biological Description

A. Dominant Terrestrial Vegetation

Florida privet (61.0%), rouge plant (55.6%), elderberry (38.9%), Brazilian pepper (36.1%), hercules club (27.8%), cabbage palm (25.0%), hackberry (25.0%), sea oxeye (16.7%), marsh fleabane (13.9%), black mangrove (11.1%); 35 species total

B. Soil humus: 1-5 cm

C. Seagrasses

Shoal grass and on N, W

D. Bird Usage

Nesting snowy egret, white ibis, tricolor heron, cattle egret, great egret, osprey; also reddish egret, glossy ibis; 10 species total

E. Common Fishes and Invertebrates

Tidewater silversides, gulf pipefish, rainwater killifish; 7 species total

F. Threatened, Endangered or Species of Special Concern

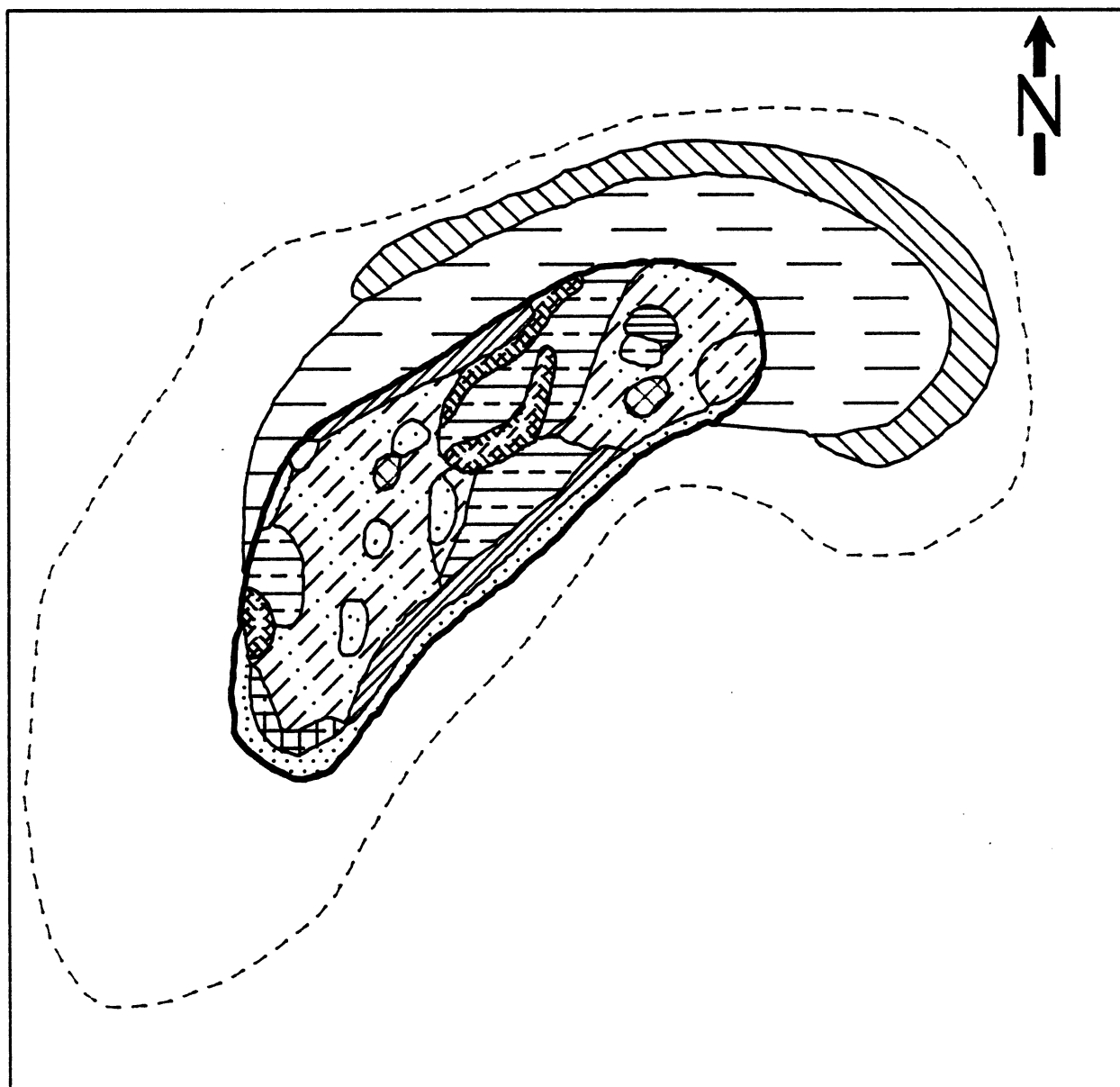
Osprey, snowy egret, tricolor heron, reddish egret

III. Recommended usage: Conservation

IV. Comments

This island is a designated bird sanctuary and is densely vegetated. It is off limits to all boaters.

SPOIL ISLAND BC5



1 in = 57 m



	Privet 0.573 hectares		Cabbage palm 0.061 hectares		Hercules club 0.011 hectares
	Sea oxeye 0.272 hectares		Hackberry 0.049 hectares		Manatee grass
	Sand 0.149 hectares		Sea purslane 0.030 hectares		Shoal grass
	Marsh elder 0.125 hectares		Australian pine 0.021 hectares		Unvegetated bottom
	Mangroves 0.104 hectares		Florida elder 0.016 hectares		< 1 m deep

ISLAND NO. BC6

Date Sampled: 15 June 1988

I. Physical Description

A. Island Size: 0.306 ha

B. Height Above Mean High Water: 1 m

C. Distance from Boat Ramps: 5.5 km west of Haulover Canal

D. Distance and Direction from Channel Marker: 100 m west of marker 8

E. Erosion: Slight; low cliff on N

F. Boating access: West, 1.0 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Lamb's quarter (43.8%), seashore saltgrass (37.5%), black mangrove (18.8%), Brazilian pepper (18.8%), marsh elder (18.8%), sea blite (12.5%), sea oxeye (12.5%), samphire (12.5%), Christmas berry (12.5%); 19 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N, E

D. Bird Usage

Nesting royal tern, laughing gull, black skimmer; also brown pelican, white pelican, least tern, greater black-backed gull, short-billed dowitcher, white ibis, snowy egret, peregrine falcon; 19 species total

E. Common Fishes and Invertebrates

Code goby, tidewater silversides, rainwater killifish; 6 species total

F. Threatened, Endangered or Species of Special Concern

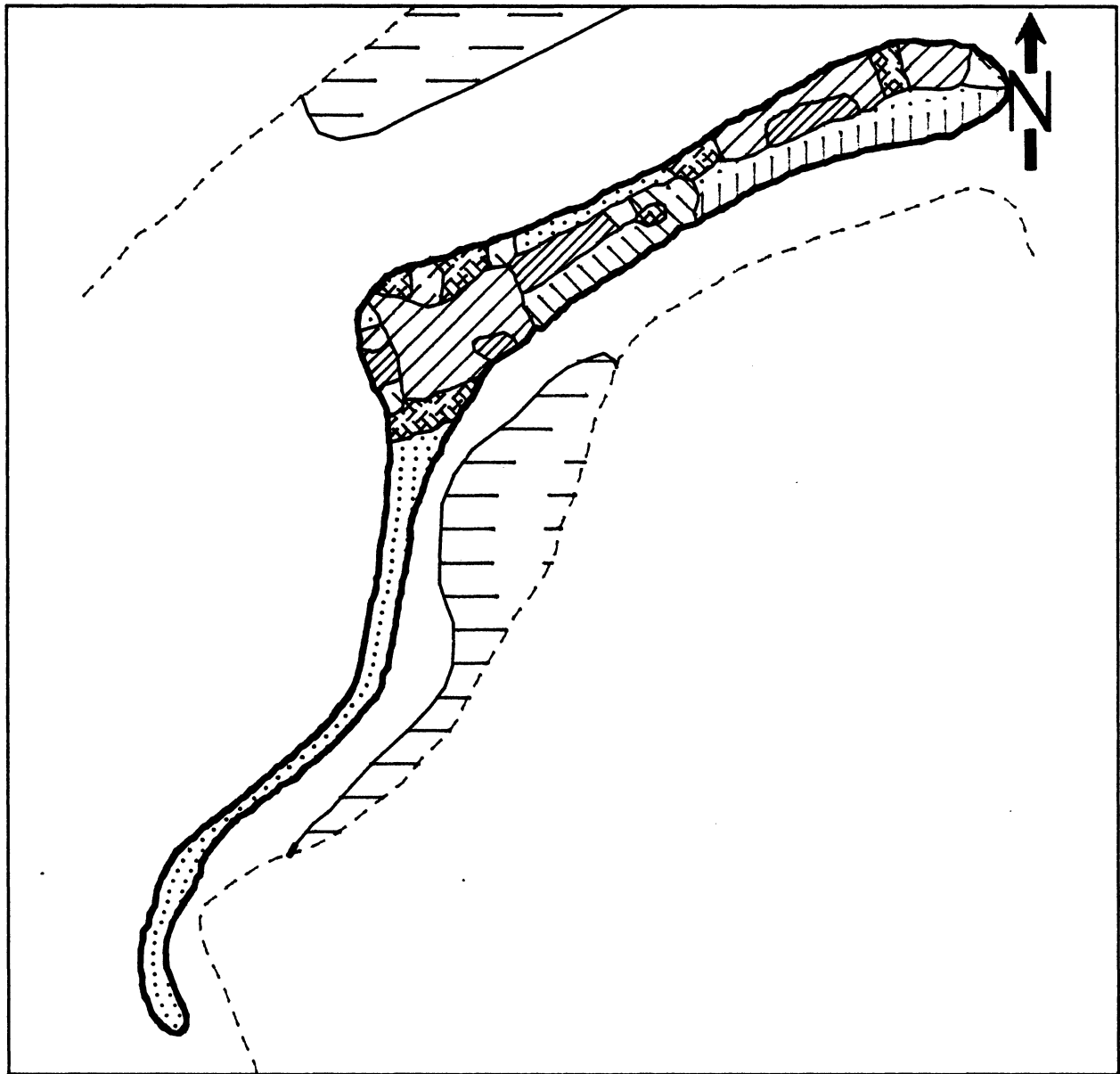
Osprey, brown pelican, least tern, peregrine falcon

III. Recommended usage: Conservation

IV. Comments

This island is covered with nesting terns and gulls throughout most of the year and should be left undisturbed.

SPOIL ISLAND BC6



1 m = 33 m



	Sand 0.078 hectares		Seashore saltgrass 0.028 hectares		Unvegetated bottom
	Brazilian pepper 0.075 hectares		Christmas berry 0.011 hectares		< 1 m deep
	Lamb's quarter 0.046 hectares		Cabbage palm 0.005 hectares		
	Mangroves 0.031 hectares		Privet 0.002 hectares		
	Marsh elder 0.029 hectares		Shoal grass		

ISLAND NO. BC8

Date Sampled: 31 May 1988

I. Physical Description

A. Island Size: 0.340 ha

B. Height Above Mean High Water: 1 m

C. Distance from Boat Ramps: 7.5 km west of Haulover Canal

D. Distance and Direction from Channel Marker: 500 m southeast of marker 13

E. Erosion: none

F. Boating access: Southwest, 1.0 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (40.0%), Florida privet (26.7%), Spanish needles (26.7%), sea blite (20.0%), Virginia creeper (20.0%), Australian pine (13.3%), groundsel tree (13.3%), cabbage palm (13.3%), milk spurge (13.3%); 19 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N, S, W; manatee grass on N

D. Bird Usage

White ibis, cattle egret: 4 species total

E. Common Fishes and Invertebrates

Tidewater silversides, spot, gulf pipefish, rainwater killifish, goldspotted killifish; 9 species total

F. Threatened, Endangered or Species of Special Concern

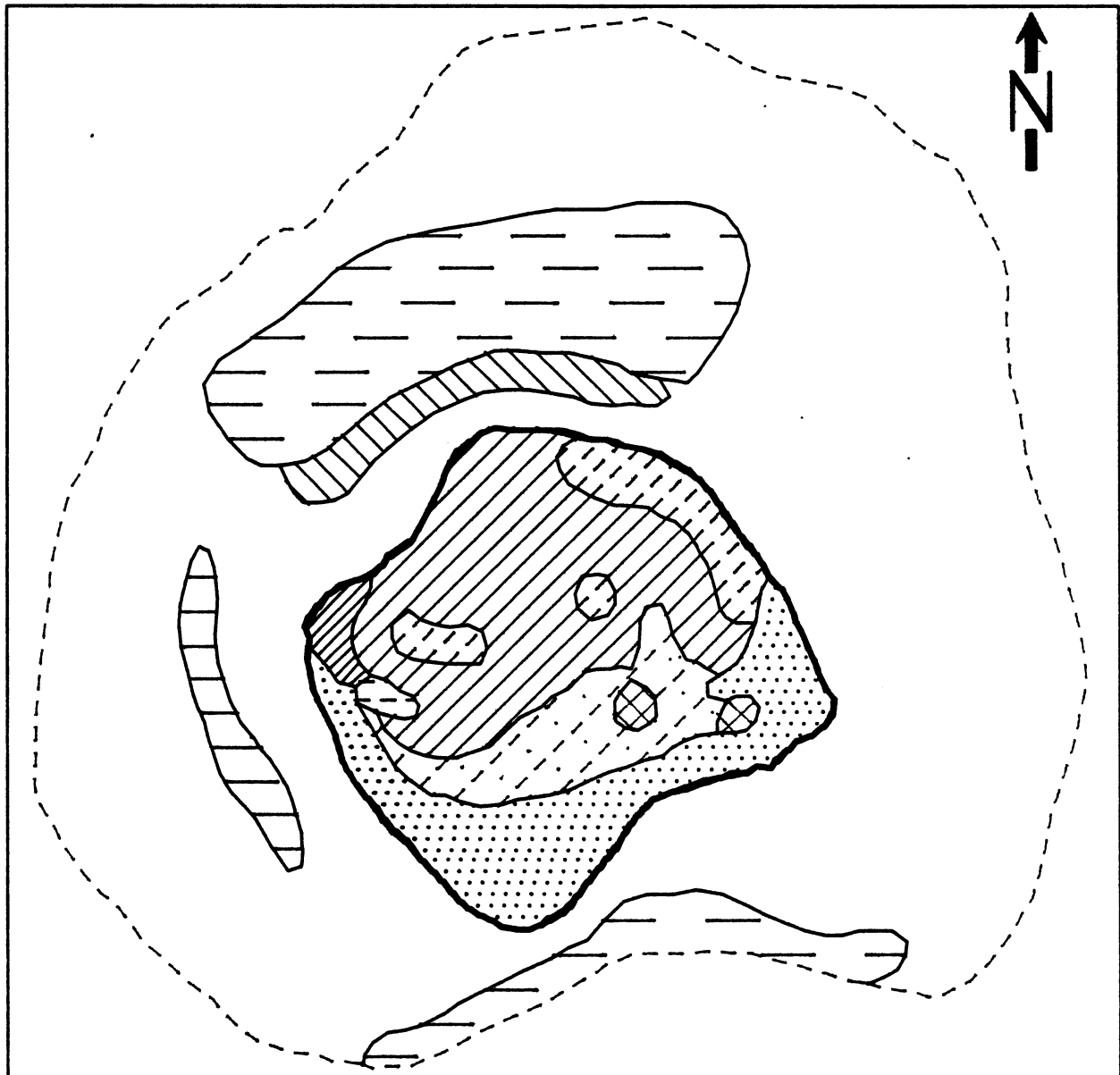
none

III. Recommended usage: Passive Recreation

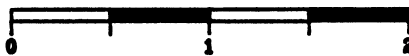
IV. Comments

This is a small, isolated island which offers no deep water access and would, therefore, be a poor selection for construction of recreational facilities.

SPOIL ISLAND BC8



1 in = 28 m



	Sand 0.182 hectares		Hercules club 0.004 hectares	--- < 1 m deep
	Brazilian pepper 0.099 hectares		Australian pine 0.003 hectares	
	Grass 0.038 hectares		Manatee grass	
	Marsh elder 0.007 hectares		Shoal grass	
	Cabbage palm 0.006 hectares		Unvegetated bottom	

ISLAND NO. BC9

Date Sampled: 20 April 1988

I. Physical Description

A. Island Size: 0.533 ha

B. Height Above Mean High Water: 1 m

C. Distance from Boat Ramps: 6.5 km north of Rt. 402

D. Distance and Direction from Channel Marker: 400 m east of marker 17

E. Erosion: none

F. Boating access: West, 2.0 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Seashore saltgrass (53.8%), cabbage palm (23.1%), Brazilian pepper (15.4%), creeping cucumber (15.4%), marsh elder (15.4%); 30 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N, S, E

D. Bird Usage

Nesting mallard duck; brown pelican, great egret, least tern; 6 species total

E. Common Fishes and Invertebrates

Spot, tidewater silversides, gulf pipefish, rainwater killifish, naked goby, code goby; 9 species total

F. Threatened, Endangered or Species of Special Concern

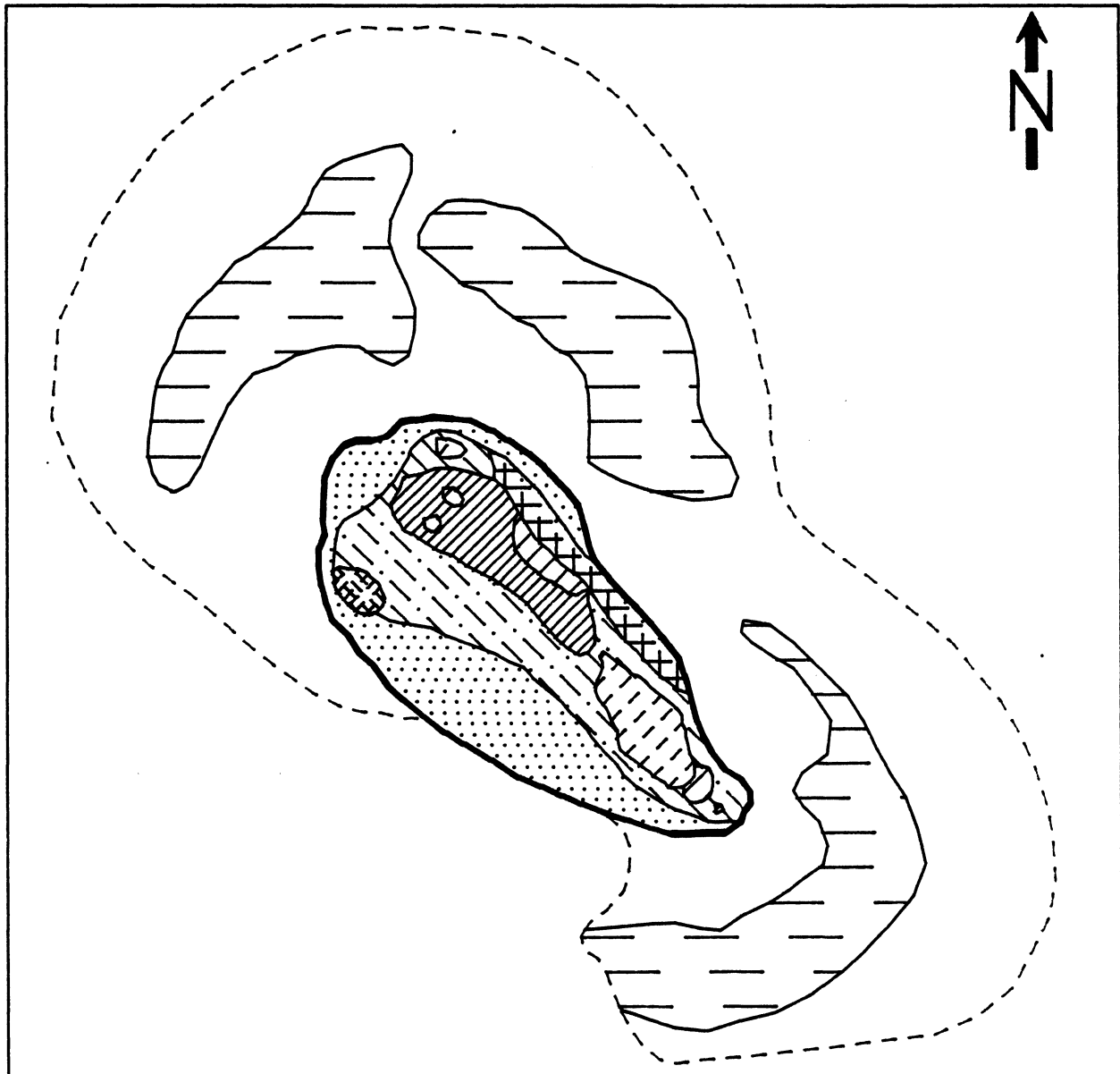
Brown pelican, least tern, prickly-pear cactus

III. Recommended usage: Passive Recreation

IV. Comments

This island is too small for recreational construction, however, it has deep water access and a large beach on the west shore which is ideal for picnicking. Visitors should keep an eye out for ducks nesting in the tall grass behind the beach.

SPOIL ISLAND BC9



1 in = 40 m



	Sand 0.195 hectares		Brazilian pepper 0.015 hectares
	Seashore saltgrass 0.162 hectares		Mangroves 0.009 hectares
	Marsh elder 0.066 hectares		Shoal grass
	Cabbage palm 0.042 hectares		Unvegetated bottom
	Sea purslane 0.040 hectares		< 1 m deep

ISLAND NO. BC10

Date Sampled: 18 May 1988

I. Physical Description

A. Island Size: 0.233 ha

B. Height Above Mean High Water: 1 m

C. Distance from Boat Ramps: 5.5 km north of Rt. 402

D. Distance and Direction from Channel Marker: 1 km north of marker 20

E. Erosion: none

F. Boating access: West, 1.0 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Seashore saltgrass (46.2%), sea purslane (30.8%), cabbage palm (23.1%), dock (23.1%), Indian hemp (23.1%), cow pea (15.4%), passion flower (15.4%), Spanish needles (15.4); 26 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N and E; manatee grass on E

D. Bird Usage

Nesting fish crow; 1 species total

E. Common Fishes and Invertebrates

Tidewater silversides, rainwater killifish; 9 species total

F. Threatened, Endangered or Species of Special Concern

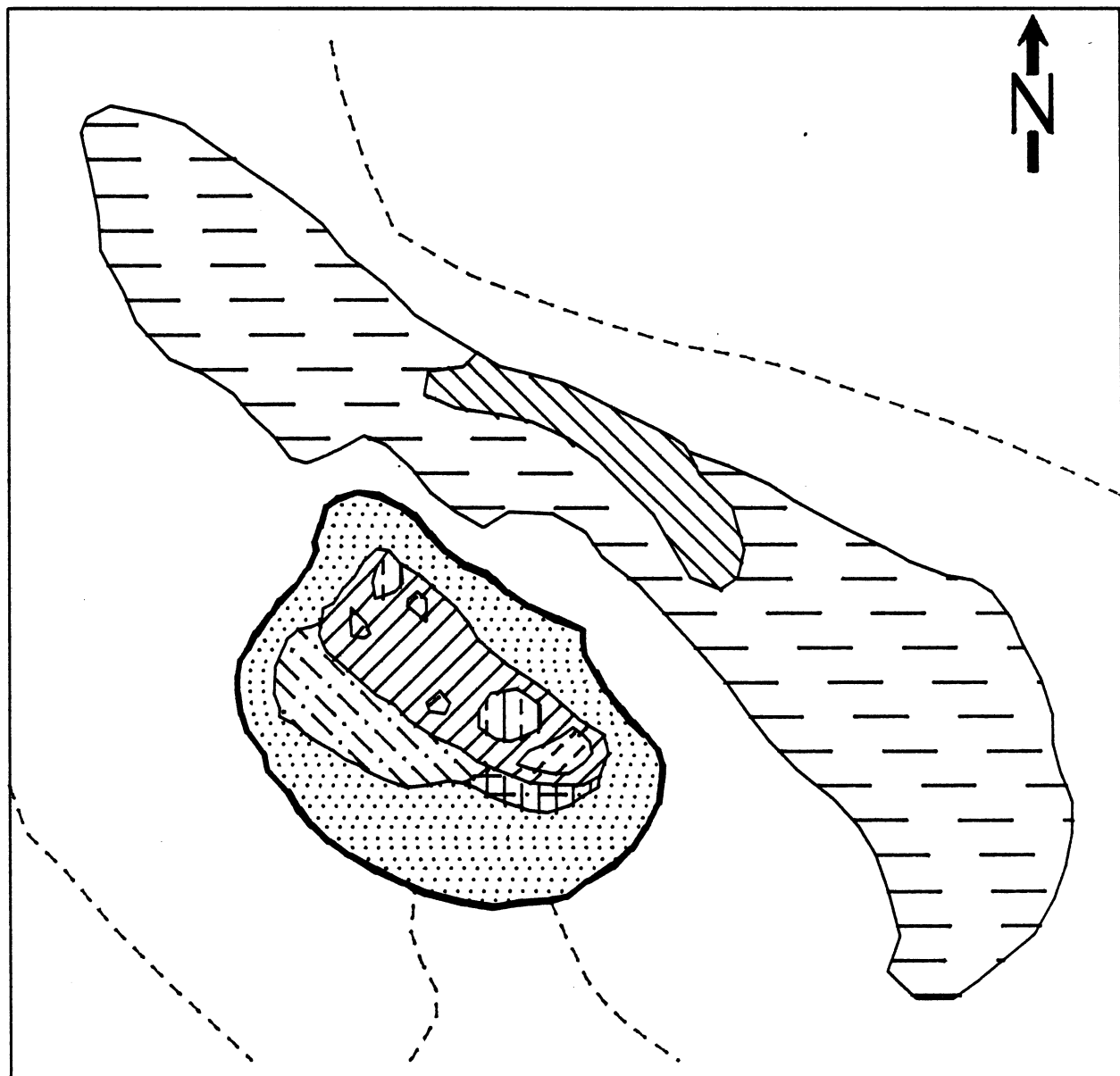
none

III. Recommended usage: Passive Recreation

IV. Comments

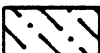
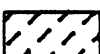
This island is too small for construction of recreational facilities, however, large sand beaches make it attractive for picnicking.

SPOIL ISLAND BC10



1 in = 25 m



	Sand 0.133 hectares		Sea purslane 0.006 hectares
	Brazilian pepper 0.051 hectares		Manatee grass
	Seashore saltgrass 0.030 hectares		Shoal grass
	Wax myrtle 0.007 hectares		Unvegetated bottom
	Cabbage palm 0.006 hectares		< 1 m deep

ISLAND NO. BC11

Date Sampled: 2 November 1988

I. Physical Description

A. Island Size: 0.160 ha

B. Height Above Mean High Water: < 1 m

C. Distance from Boat Ramps: 4.5 km north of Rt. 402

D. Distance and Direction from Channel Marker: 500 m east of marker 20

E. Erosion: none

F. Boating access: Southeast, 1.5 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (36.4%), cabbage palm (36.4%), seashore saltgrass (36.4%),
groundsel tree (18.2%); 16 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N, E, W

D. Bird Usage

Great blue heron, osprey; 6 species total

E. Common Fishes and Invertebrates

Tidewater silversides, code goby, goldspotted killifish, chain pipefish; 7 species
total

F. Threatened, Endangered or Species of Special Concern

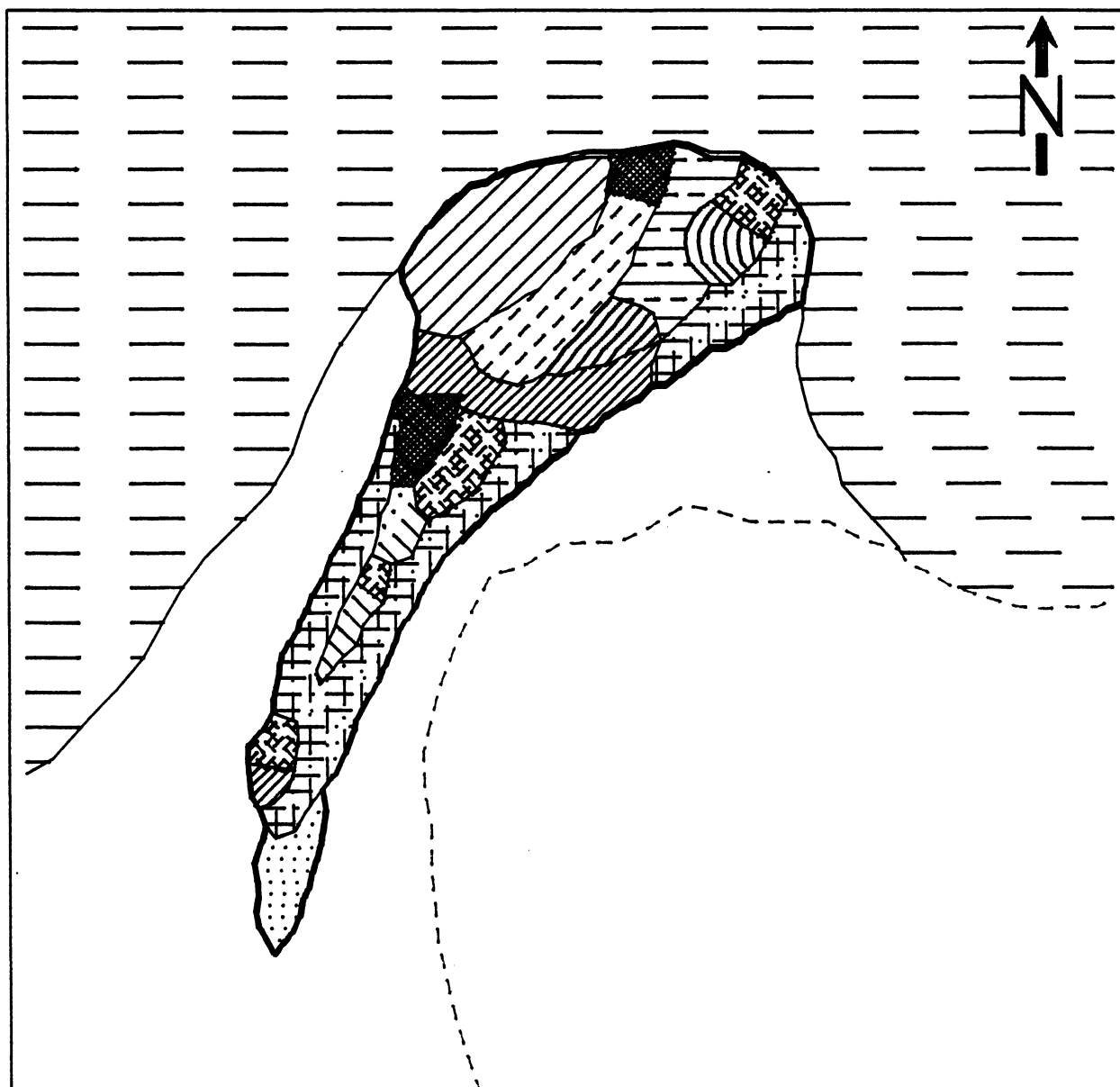
Osprey

III. Recommended usage: Passive Recreation

IV. Comments

This island is very small with no area suitable for picnicking or camping.

SPOIL ISLAND BC11



1 in = 19 m



	Sea purslane 0.045 hectares		Sea oxeye 0.012 hectares		Shoal grass
	Brazilian pepper 0.028 hectares		Buttonwood 0.010 hectares		Unvegetated bottom
	Cabbage palm 0.016 hectares		Groundsel tree 0.008 hectares		< 1 m deep
	Marsh elder 0.016 hectares		Sand 0.007		
	Mangroves 0.014 hectares		Seashore saltgrass 0.006 hectares		

ISLAND NO. BC12

Date Sampled: 13 October 1988

I. Physical Description

A. Island Size: 0.134 ha

B. Height Above Mean High Water: <1 m

C. Distance from Boat Ramps: 4.0 km north of Rt. 402

D. Distance and Direction from Channel Marker: 1 km southeast of marker 20

E. Erosion: none

F. Boating access: South 3.0 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Marsh elder (38.5%), sea purslane (30.8%), Australian pine (23.1%), seashore saltgrass (23.1%), dock (23.1%), sea blite (23.1%), sedge (23.1%), Brazilian pepper (15.4%), cow pea (15.4%); 34 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on E

D. Bird Usage

Double-crested cormorant, fish crow, belted kingfisher; 4 species total

E. Common Fishes and Invertebrates

Goldspotted killifish, tidewater silversides, rainwater killifish; 9 species total

F. Threatened, Endangered or Species of Special Concern

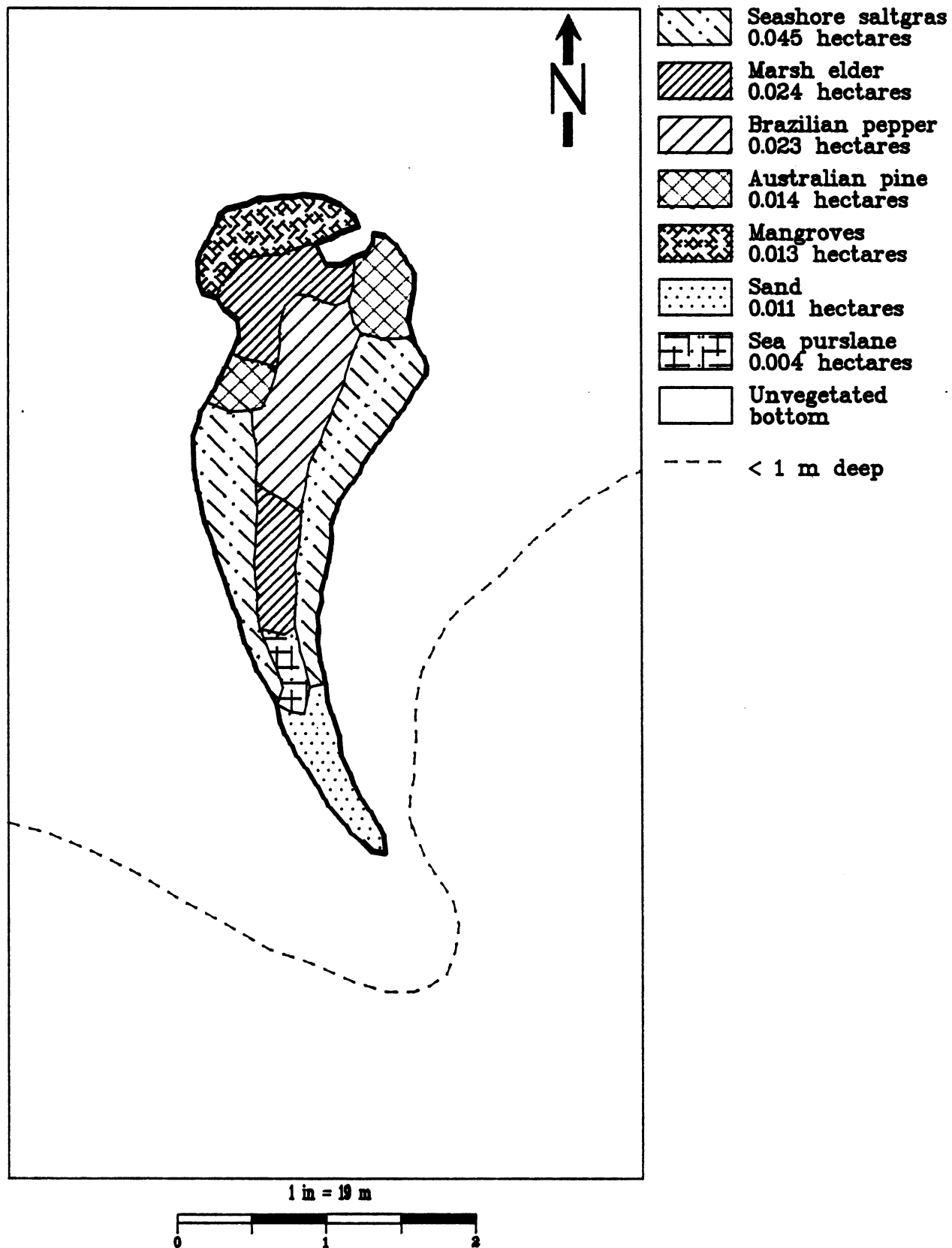
none

III. Recommended usage: Passive Recreation

IV. Comments

A very small island with few open areas for picnicking or camping.

SPOIL ISLAND BC12



ISLAND NO. BC14

Date Sampled: 23 March 1988

I. Physical Description

A. Island Size: 0.531 ha

B. Height Above Mean High Water: 1 m

C. Distance from Boat Ramps: 2.0 km north of Rt 402

D. Distance and Direction from Channel Marker: 600 m northeast of marker 25

E. Erosion: Slight; low cliff on N

F. Boating access: South, 1.0 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Seashore saltgrass (38.1%), Brazilian pepper (33.3%), cabbage palm (23.8%), sand atirplex (19.0%), finger grass (14.3%), wax myrtle (14.3%); 38 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N, E, W

D. Bird Usage

Nesting red-winged blackbird; also fish crow, osprey, laughing gull; 4 species total

E. Common Fishes and Invertebrates

Spot, tidewater silversides, striped mullet, rainwater killifish, gulf pipefish, goldspotted killifish; 10 species total

F. Threatened, Endangered or Species of Special Concern

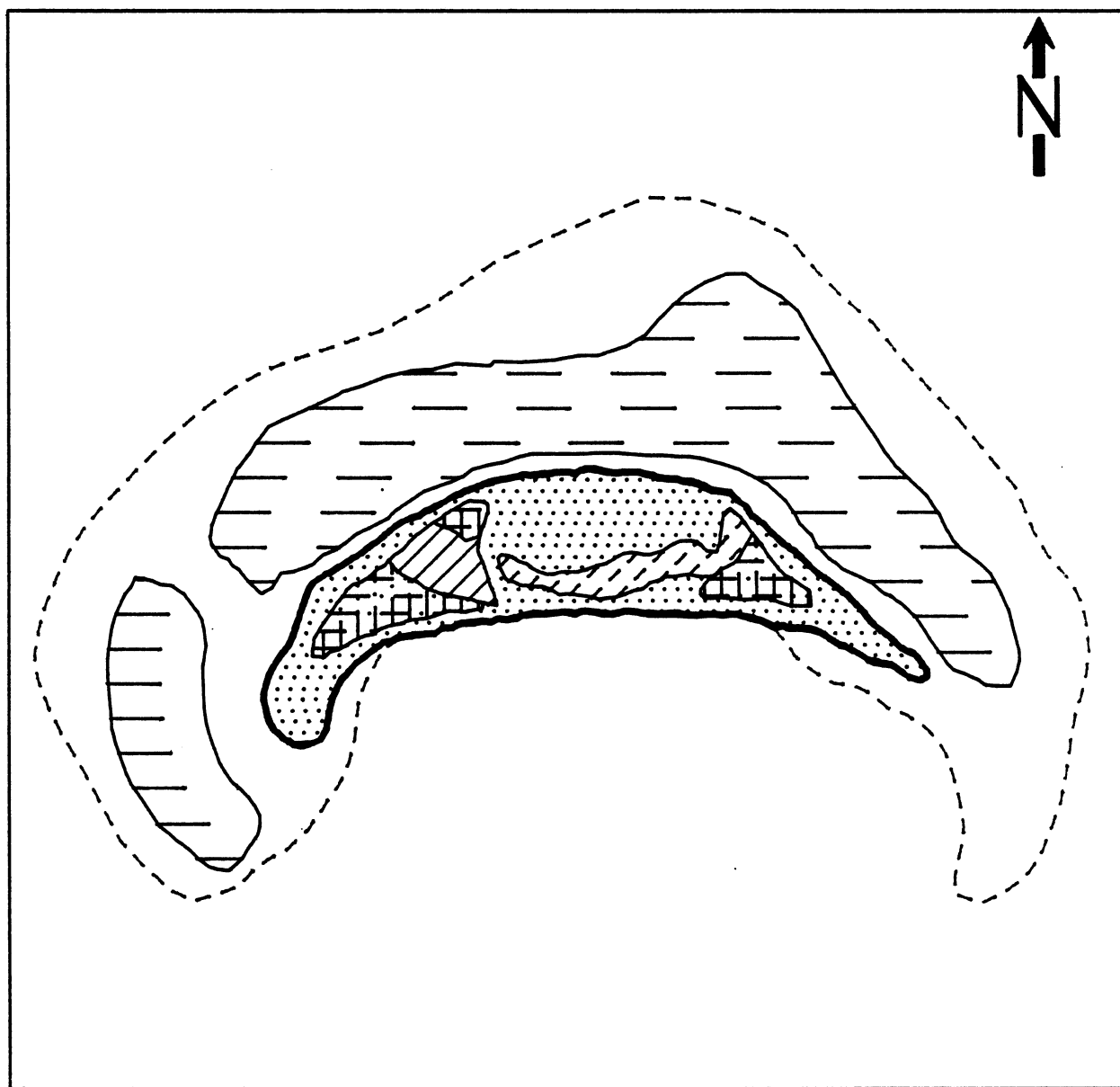
Osprey, prickly-pear cactus

III. Recommended usage: Passive Recreation

IV. Comments

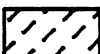
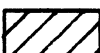
The deep water access on the south, large open areas, and proximity to a boat ramp make this an ideal island for picnicking and other day uses.

SPOIL ISLAND BC14



1 in = 47 m



	Sand 0.354 hectares		Unvegetated bottom
	Sea purslane 0.085 hectares		< 1 m deep
	Cabbage palm 0.055 hectares		
	Brazilian pepper 0.038 hectares		
	Shoal grass		

ISLAND NO. BC15

Date Sampled: 16 November 1987

I. Physical Description

A. Island Size: 1.630 ha

B. Height Above Mean High Water: 1 m

C. Distance from Boat Ramps: 1.0 km north of Rt 402

D. Distance and Direction from Channel Marker: 1 km southeast of marker 25

E. Erosion: Slight; low cliff on E

F. Boating access: West, 1.0 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Groundsel tree (65.0%), horsemint (35.0%), golden aster (32.5%), cabbage palm (10.0%), prickly-pear cactus (10.0%); 29 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on E, S, W; manatee grass on W

D. Bird Usage

Osprey; 1 species total

E. Common Fishes and Invertebrates

Tidewater silversides, rainwater killifish, naked goby, mojarra, goldspotted killifish, bay anchovy; 12 species total

F. Threatened, Endangered or Species of Special Concern

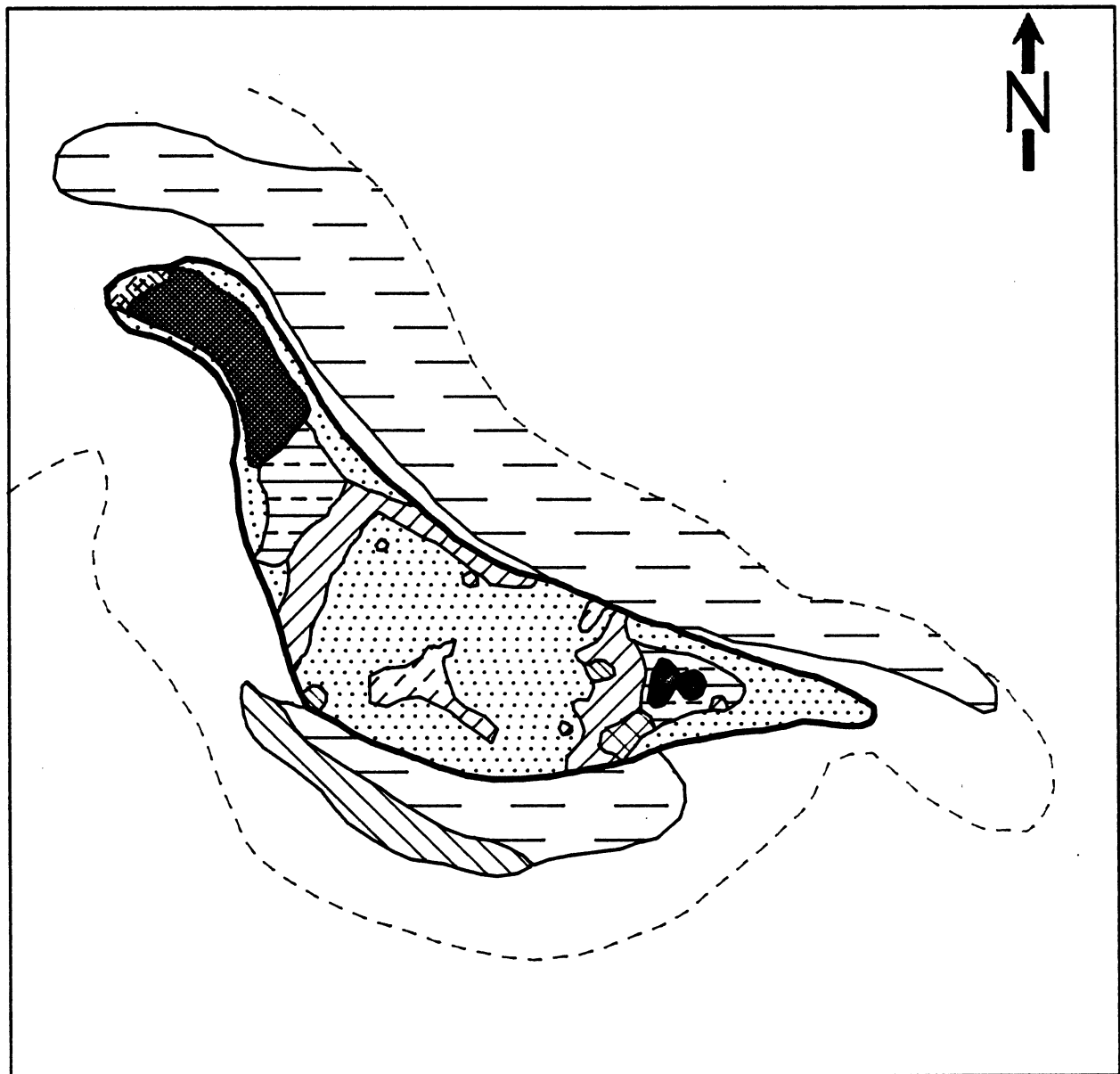
Osprey, prickly-pear cactus

III. Recommended usage: Passive Recreation

IV. Comments

This island has deep water access on the west side, an open area in the middle, and is very close to a boat ramp, making it ideal for picnicking or overnight camping. There is, however, a marsh in the northern half of the island in which mosquitoes periodically breed.

SPOIL ISLAND BC15



1 in = 62 m



 Sand 0.960 hectares	 Australian pine 0.023 hectares	 Shoal grass
 Brazilian pepper 0.223 hectares	 Mangroves 0.021 hectares	 Unvegetated bottom
 Groundsel tree 0.173 hectares	 Pond 0.017 hectares	 < 1 m deep
 Sea oxeye 0.149 hectares	 Red cedar 0.012 hectares	
 Cabbage palm 0.068 hectares	 Manatee grass	

ISLAND NO. BC16

Date Sampled: 14 January 1988

I. Physical Description

A. Island Size: 0.411 ha

B. Height Above Mean High Water: 2 m

C. Distance from Boat Ramps: 1.0 km south of Rt. 402

D. Distance and Direction from Channel Marker: 500 m east of marker 29

E. Erosion: Slight; low cliff on N

F. Boating access: No deep water access; sand spit on E

II. Biological Description

A. Dominant Terrestrial Vegetation

Seashore saltgrass (42.3%), golden aster (11.5%), cabbage palm (11.5%); 25 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on S

D. Bird Usage

Barn owl, American kestrel, Caspian tern, brown pelican, greater black-backed gull; 10 species total

E. Common Fishes and Invertebrates

Tidewater silversides, goldspotted killifish, code goby; 7 species total

F. Threatened, Endangered or Species of Special Concern

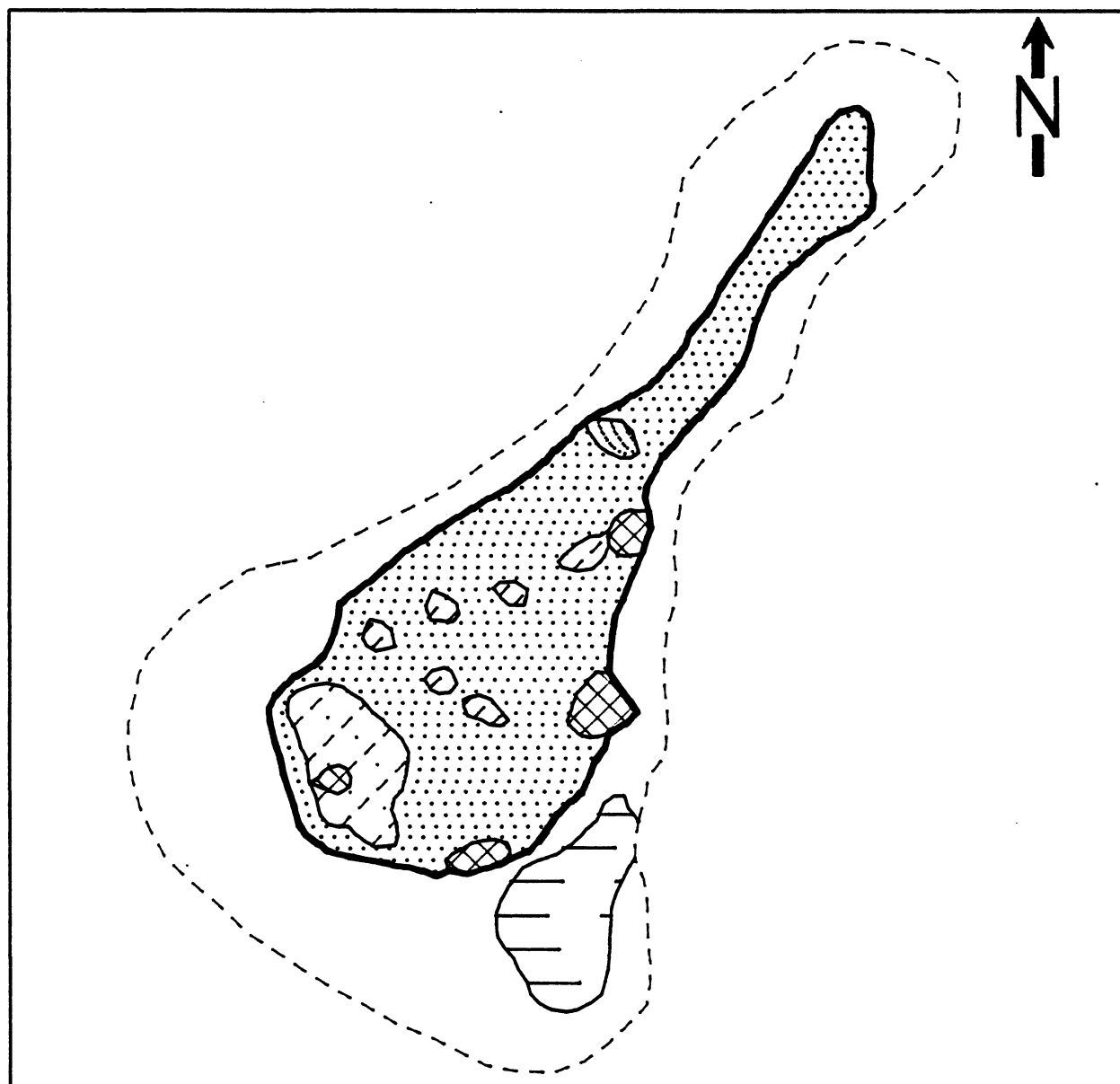
Brown pelican

III. Recommended usage: Passive Recreation

IV. Comments

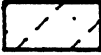
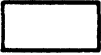
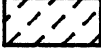
This island is open and has grass beds only on the south making it ideal for day picnicking and overnight camping. It is, however, small and has no deep water access.

SPOIL ISLAND BC16



1 in = 31 m



	Sand 0.333 hectares		Shoal grass
	Grass 0.038 hectares		Unvegetated bottom
	Australian pine 0.021 hectares		< 1 m deep
	Cabbage palm 0.015 hectares		
	Buttonwood 0.004 hectares		

ISLAND NO. BC17

Date Sampled: 1 December 1988

I. Physical Description

- A. Island Size: 0.089 ha
- B. Height Above Mean High Water: <1 m
- C. Distance from Boat Ramps: 3.0 km south of Rt. 402
- D. Distance and Direction from Channel Marker: 300 m northeast of marker 35
- E. Erosion: Slight; long sand spit on SE
- F. Boating access: Southwest, 2.0 meters deep; sand spit

II. Biological Description

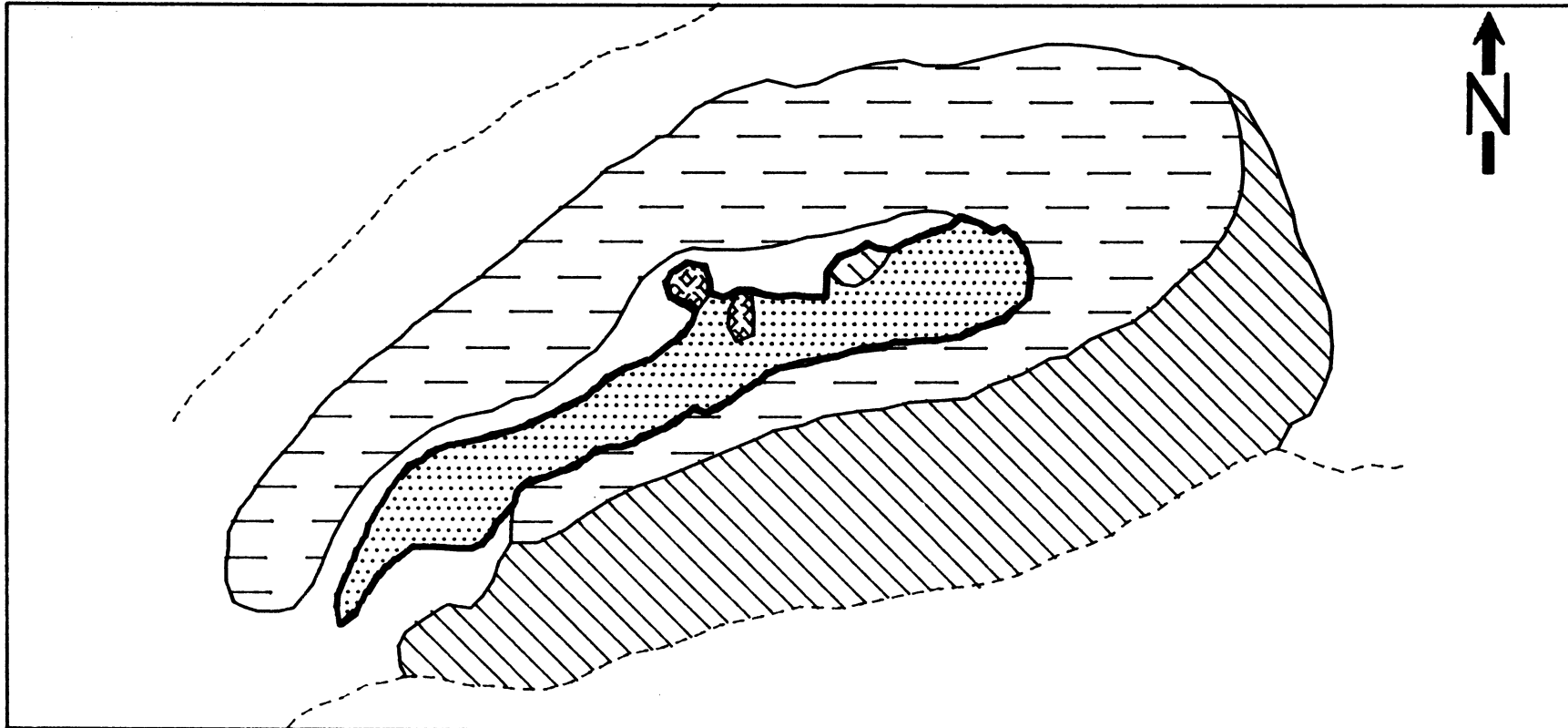
- A. Dominant Terrestrial Vegetation
Black mangrove (10.0%); 2 species total
- B. Soil humus: none
- C. Seagrasses
Shoal grass on N, S, E
- D. Bird Usage
Black-bellied plover, herring gull; 3 species total
- E. Common Fishes and Invertebrates
Tidewater silversides, goldspotted killifish, code goby; 8 species total
- F. Threatened, endangered or species of special concern
none

III. Recommended usage: Passive Recreation

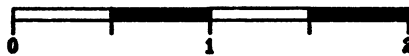
IV. Comments

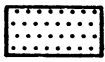
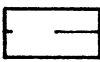
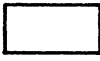
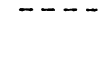
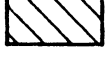
This island is too small and open to be used comfortably for anything besides fishing.

SPOIL ISLAND BC17



1 in = 2 m



	Sand 0.082 hectares		Shoal grass
	Mangroves 0.004 hectares		Unvegetated bottom
	Seashore saltgrass 0.002 hectares		< 1 m deep
	Manatee grass		

ISLAND NO. BC18

Date Sampled: 1 December 1988

I. Physical Description

A. Island Size: 0.221 ha

B. Height Above Mean High Water: <1 m

C. Distance from Boat Ramps: 4.0 km south of Rt. 402

D. Distance and Direction from Channel Marker: 700 m southeast of marker 35

E. Erosion: Slight; long sand spit on SW

F. Boating access: Southwest, 2.0 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Cattail (33.3%), seashore saltgrass (25.0%); 8 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on all sides

D. Bird Usage

Brown pelican, black skimmer, great blue heron, royal tern, Caspian tern; 9 species total

E. Common Fishes and Invertebrates

Gulf pipefish, goldspotted killifish, chain pipefish, code goby; 6 species total

F. Threatened, endangered or species of special concern

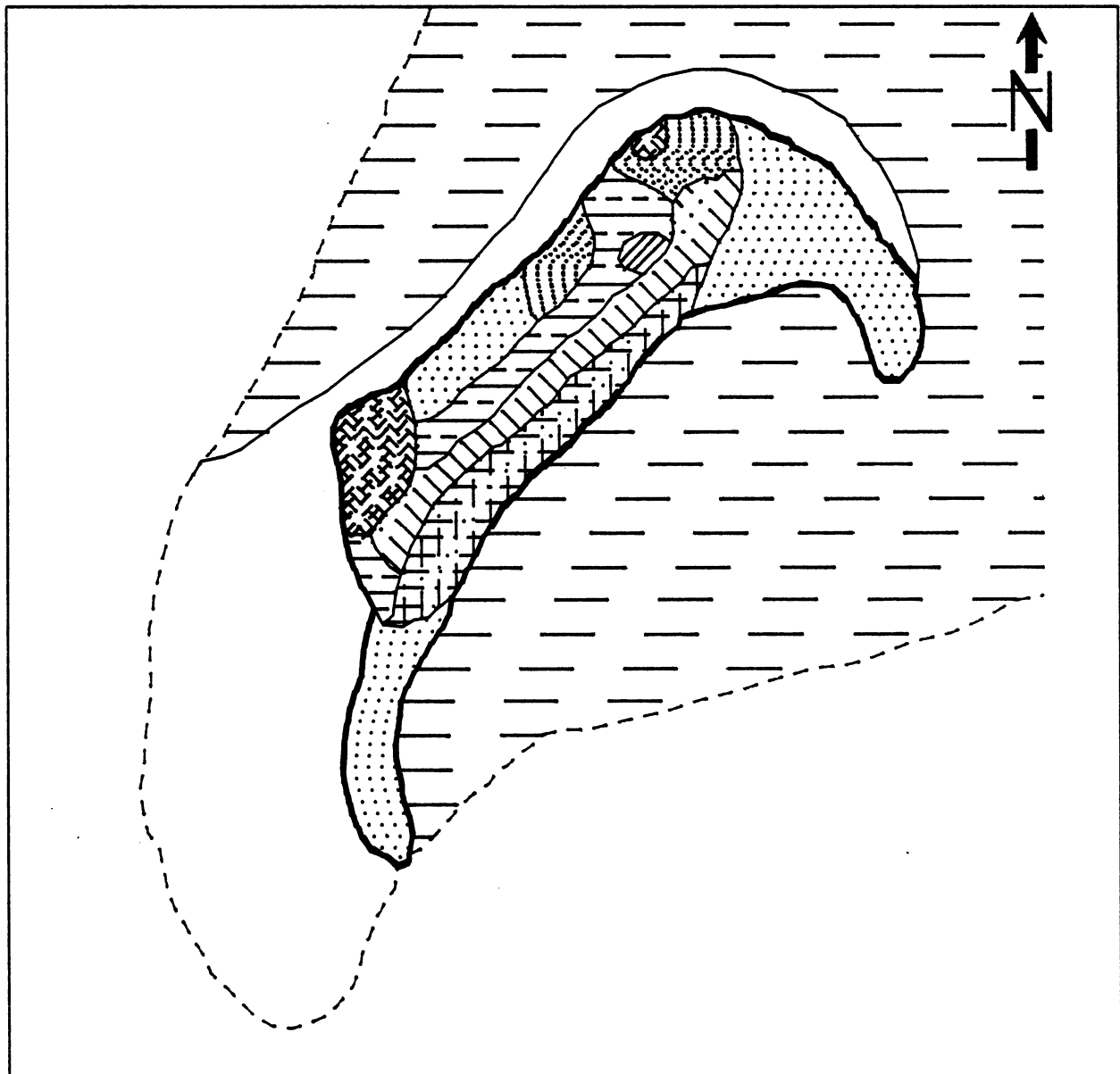
Brown pelican

III. Recommended usage: Passive Recreation

IV. Comments

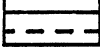
This island is too small and open to be used comfortably for anything besides fishing.

SPOIL ISLAND BC18



1 in = 23 m



	Sand 0.084 hectares		Mangroves 0.018 hectares
	Sea purslane 0.035 hectares		Marsh elder 0.002 hectares
	Seashore saltgrass 0.032 hectares		Shoal grass
	Sea oxeye 0.031 hectares		Unvegetated bottom
	Buttonwood 0.019 hectares		< 1 m deep

ISLAND NO. BC28

Date Sampled: 14 December 1988

I. Physical Description

A. Island Size: 2.638 ha

B. Height Above Mean High Water: 1-4 m

C. Distance from Boat Ramps: 6.0 km north of SR 520

D. Distance and Direction from Channel Marker: 400 m east of marker 67

E. Erosion: Severe; high cliff on N

F. Boating access: South, 2.0 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Sea oxeye (31.0%), perennial glasswort (27.6%), groundsel tree (25.9%), buttonwood (12.1%), thoroughwort (10.3%), saltwort (10.3%), wax myrtle (10.3%); 21 species total

B. Soil humus: 1-4 cm

C. Seagrasses

Shoal grass on N

D. Bird Usage

Brown pelican, little blue heron, great blue heron, greater black-backed gull, Caspian tern, yellow-throated warbler, yellow-rumped warbler; 17 species total

E. Common Fishes and Invertebrates

Tidewater silversides, gulf pipefish; 10 species total

F. Threatened, endangered or species of special concern

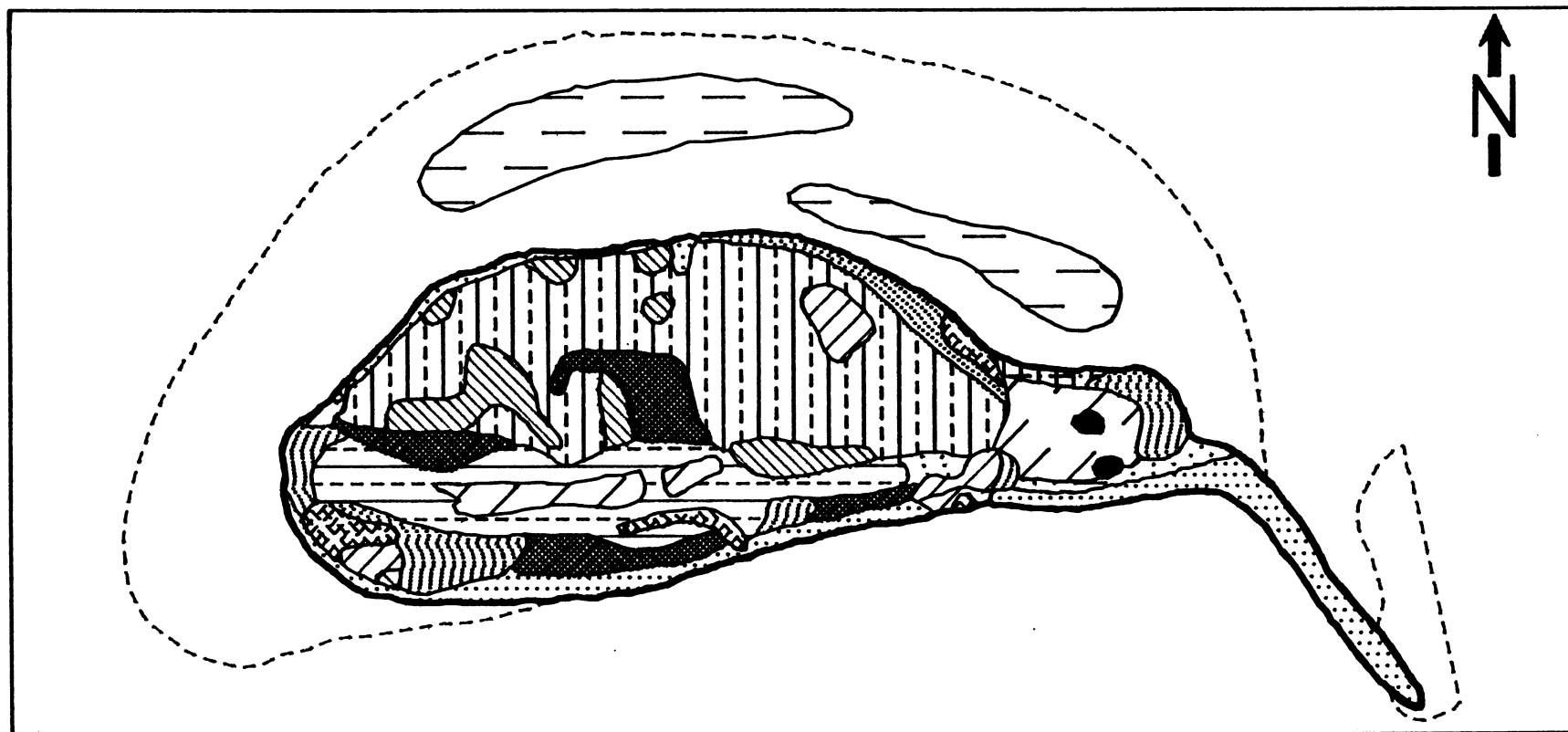
Brown pelican

III. Recommended usage: Education

IV. Comments

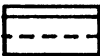
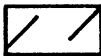
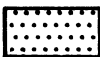
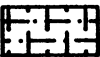
This is a large island located along the Barge Canal in Cape Canaveral. It is an overwintering site for various migratory birds. It also has interesting native vegetation and bird life and will make an excellent education island.

SPOIL ISLAND BC28



1 cm = 50 m



	Wax myrtle 0.850 hectares		Groundsel tree 0.223 hectares		Mangroves 0.074 hectares		Australian pine 0.004 hectares
	Sea oxeye 0.332 hectares		Marsh 0.210 hectares		Thoroughwort 0.051 hectares		Shoal grass
	Sand 0.322 hectares		Red cedar 0.186 hectares		Sea purslane 0.017 hectares		Unvegetated bottom
	Buttonwood 0.274 hectares		Brazilian pepper 0.094 hectares		Pond 0.012 hectares		< 1 m deep

ISLAND NO. BC29

Date Sampled: 14 December 1988

I. Physical Description

- A. Island Size: 0.648 ha
- B. Height Above Mean High Water: <1 m
- C. Distance from Boat Ramps: 6.5 km north of SR 520
- D. Distance and Direction from Channel Marker: 1 km east of marker 67
- E. Erosion: Slight; low cliff on N
- F. Boating access: South, 1.0 meters deep; sand beach

II. Biological Description

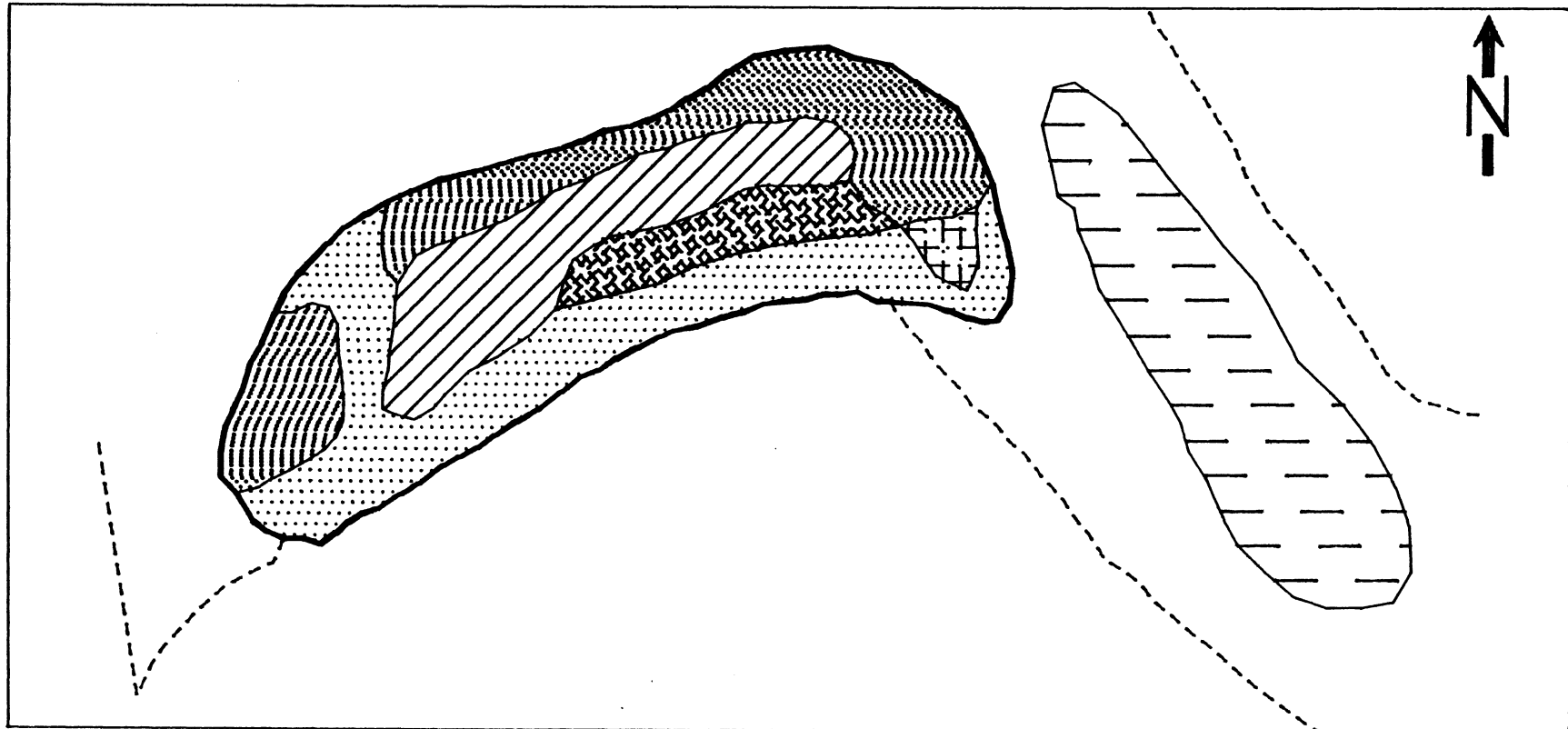
- A. Dominant Terrestrial Vegetation
Brazilian pepper (62.5%), buttonwood (62.5%), white mangrove (37.5%), marsh elder (12.5%); 8 species total
- B. Soil humus: none
- C. Seagrasses
Shoal grass on E
- D. Bird Usage
Black-bellied plover, herring gull; 3 species total
- E. Common Fishes and Invertebrates
Tidewater silversides, mojarra; 2 species total
- F. Threatened, endangered or species of special concern
none

III. Recommended usage: Passive Recreation

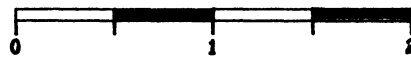
IV. Comments

This island is too small for any recreational construction. It is, however, adjacent to island BC28, making it potentially useful during educational activities.

SPOIL ISLAND BC29



1 in = 32 m



	Sand 0.223 hectares		Sea purslane 0.013 hectares
	Buttonwood 0.201 hectares		Shoal grass
	Brazilian pepper 0.152 hectares		Unvegetated bottom
	Mangroves 0.059 hectares		< 1 m deep

ISLAND NO. BC30

Date Sampled: 19 January 1989

I. Physical Description

A. Island Size: 1.675 ha

B. Height Above Mean High Water: 1-3 m

C. Distance from Boat Ramps: 7.0 km north of SR 520

D. Distance and Direction from Channel Marker: 1.5 km east of marker 67

E. Erosion: Moderate; slight cliff on N

F. Boating access: South, 1.0 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (84.4%), wax myrtle (50.0%), buttonwood (12.5%), southern red cedar (12.5%); 17 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N, S

D. Bird Usage

Great blue heron, belted kingfisher; 2 species total

E. Common Fishes and Invertebrates

Pinfish, gulf pipefish, code goby, goldspotted killifish; 7 species total

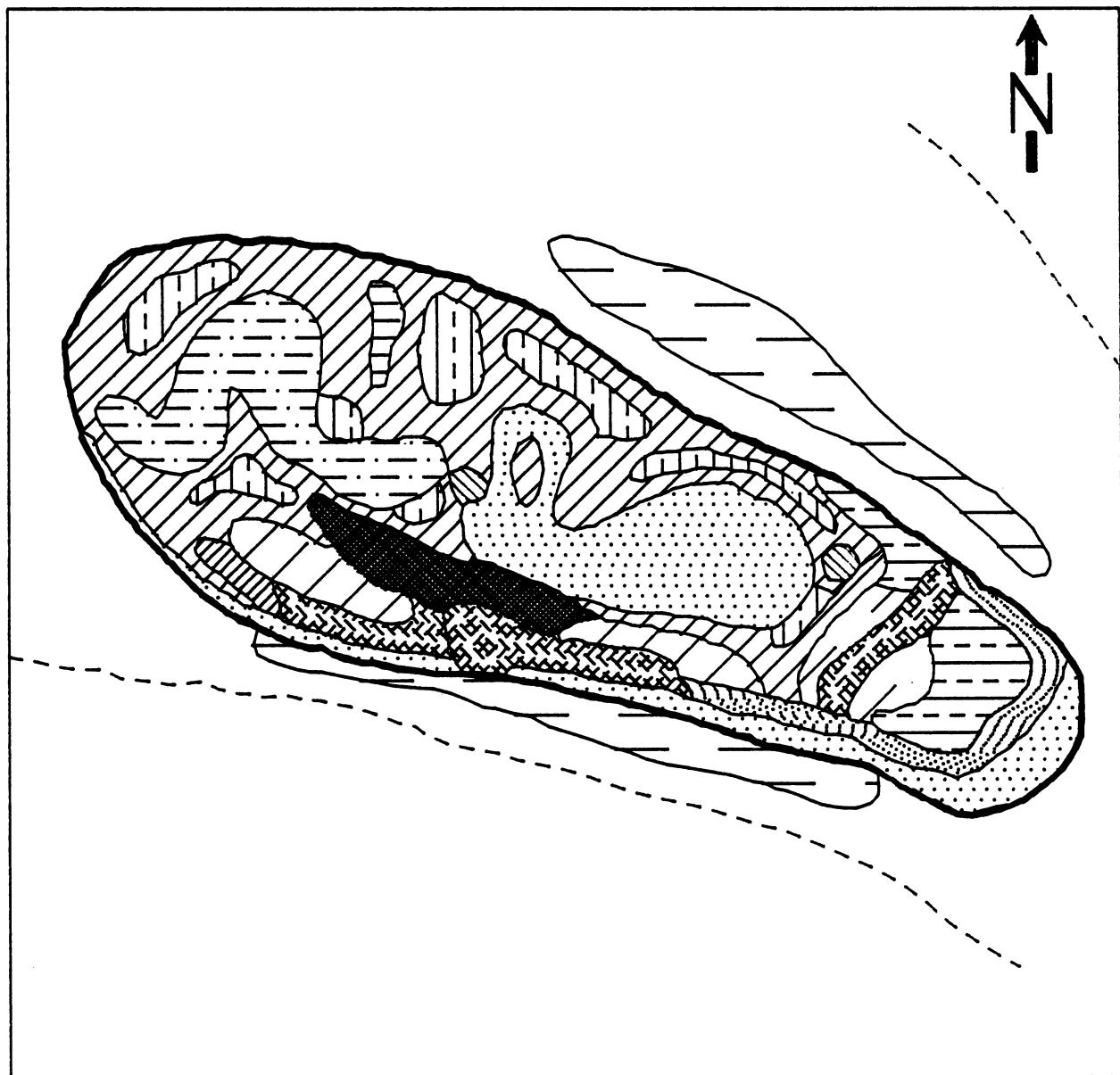
F. Threatened, endangered or species of special concern
none

III. Recommended usage: Passive Recreation

IV. Comments

This island has open areas and sand beaches ideal for picnicking or camping. It is directly adjacent to the Barge Canal, making boat access simple.

SPOIL ISLAND BC30



1 in = 42 m



	Brazilian pepper 0.571 hectares		Mangroves 0.135 hectares		Red cedar 0.012 hectares
	Sand 0.378 hectares		Sea oxeye 0.105 hectares		Shoal grass
	Rocks 0.222 hectares		Buttonwood 0.080 hectares		Unvegetated bottom
	Wax myrtle 0.162 hectares		Groundsel tree 0.077 hectares		< 1 m deep
	Marsh 0.138 hectares		Marsh elder 0.016 hectares		

ISLAND NO. BC32

Date Sampled: 7 January 1988

I. Physical Description

A. Island Size: 0.339 ha

B. Height Above Mean High Water: <1 m

C. Distance from Boat Ramps: 1.0 km east of SR 520

D. Distance and Direction from Channel Marker: 2 km northwest of marker 79

E. Erosion: none

F. Boating access: Northeast, 2.0 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Australian pine (50.0%), seashore saltgrass (41.7%), Brazilian pepper (33.3%), sea oxeye (33.3%), white mangrove (25.0%); 12 species total

B. Soil humus : none

C. Seagrasses
none

D. Bird Usage
Anhinga, great blue heron, fish crow; 3 species total

E. Common Fishes and Invertebrates
Tidewater silversides, redfin needlefish, gulf pipefish; 5 species total

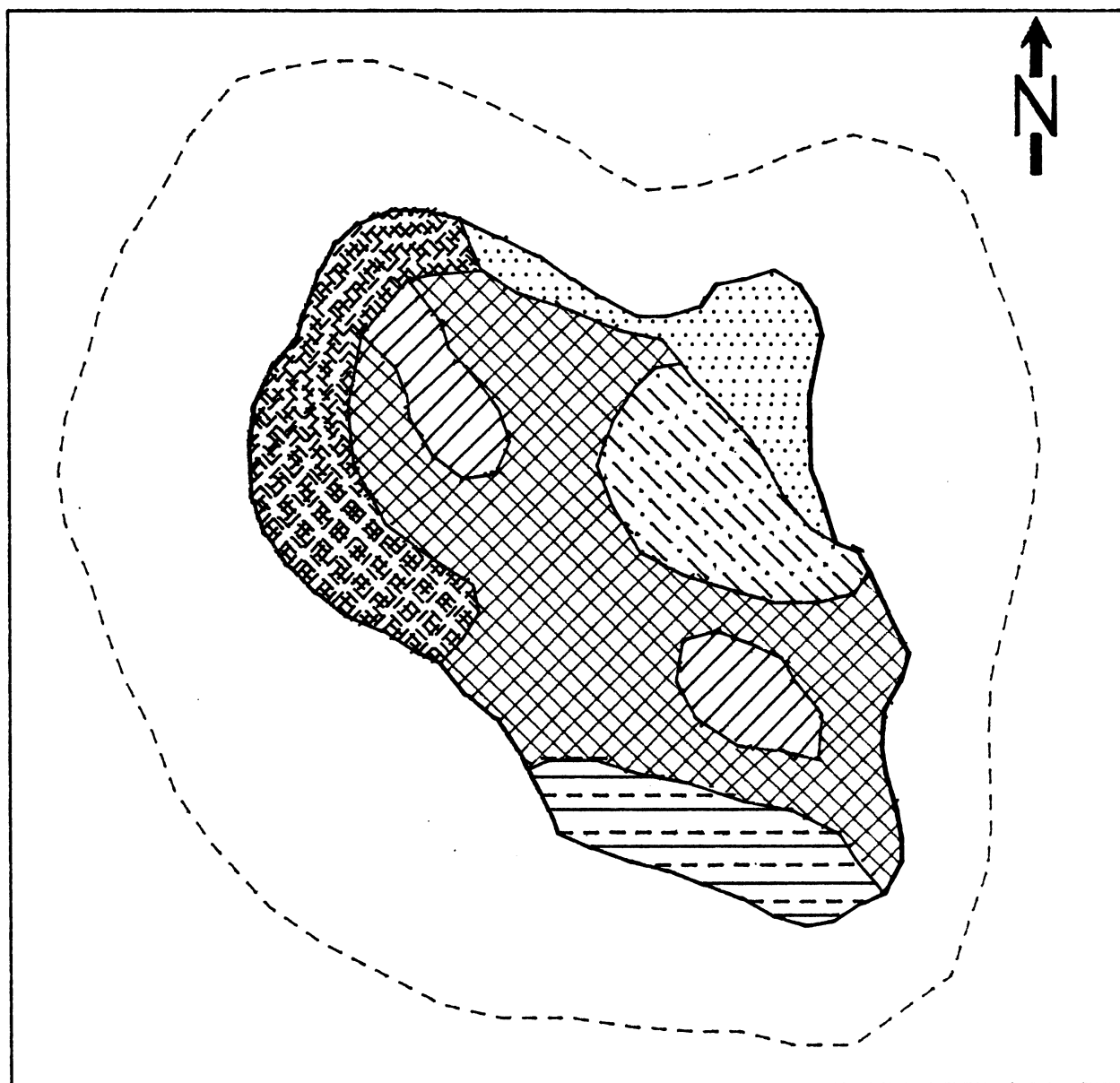
F. Threatened, Endangered or Species of Special Concern
none

III. Recommended usage: Passive Recreation

IV. Comments

A small island with Australian pine cover heavily used for picnicking.

SPOIL ISLAND BC32



1 in = 11 m



	Australian pine 0.054 hectares		Brazilian pepper 0.010 hectares
	Mangroves 0.019 hectares		Unvegetated bottom
	Seashore saltgrass 0.014 hectares		< 1 m deep
	Sand 0.012 hectares		
	Sea oxeye 0.012 hectares		

ISLAND NO. BC33

Date Sampled: 13 November 1987

I. Physical Description

A. Island Size: 1.323 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 3.5 km south of SR 520

D. Distance and Direction from Channel Marker: 600 m northeast of marker 79

E. Erosion: Moderate; low cliff on N

F. Boating access: No deep water; sand spit on E

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (86.7%), cabbage palm (73.3%), seaside bean (13.3%), black mangrove (13.3%), sea oxeye (13.3%), white mangrove (13.3%); 12 species total

B. Soil humus: 5-10 cm

C. Seagrasses

Caulerpa algae on all sides; shoal grass on E

D. Bird Usage

Black-crowned night heron, belted kingfisher, great blue heron; 6 species total

E. Common Fishes and Invertebrates

Gulf pipefish, dwarf seahorse, naked goby; 7 species total

F. Threatened, Endangered or Species of Special Concern

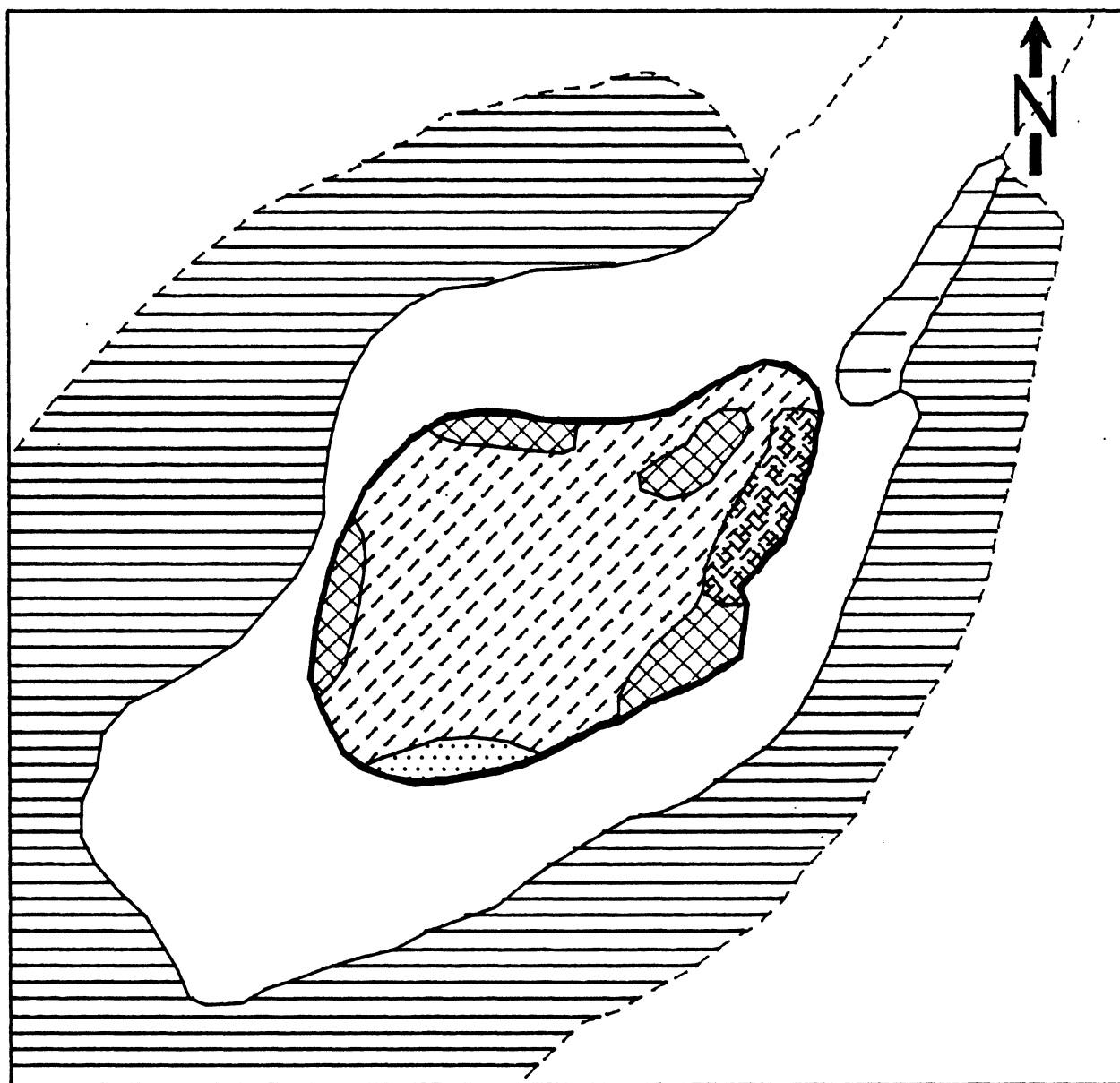
none

III. Recommended usage: Passive Recreation

IV. Comments

This island is too small for construction of recreational facilities and too densely vegetated for overnight camping, however, it does provide areas for picnicking and day visiting. There are also some foot trails around the island and some interesting botanical species.

SPOIL ISLAND BC33



1 in = 23 m



	Cabbage palm 0.189 hectares		Shoal grass
	Australian pine 0.040 hectares		Unvegetated bottom
	Mangroves 0.019 hectares		< 1 m deep
	Sand 0.009 hectares		
	Caulerpa algae		

ISLAND NO. BC34

Date Sampled: 13 April 1988

I. Physical Description

A. Island Size: 0.496 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 4.5 km south of SR 520

D. Distance and Direction from Channel Marker: 600 m west of marker 79

E. Erosion: Extensive; 2 m cliff on north

F. Boating access: Southeast, 1.0 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Cabbage palm (56.0%), Brazilian pepper (48.0%), Guinea grass (40.0%), seaside bean (28.0%), Spanish needles (12.0%); 47 species total

B. Soil humus: none

C. Seagrasses

Caulerpa algae on S, W

D. Bird Usage

Royal tern, Caspian tern, least tern, osprey, lesser scaup, mallard duck, great blue heron; 12 species total

E. Common Fishes and Invertebrates

Goldspotted killifish, tidewater silversides, striped mullet, rainwater killifish; 9 species total

F. Threatened, Endangered or Species of Special Concern

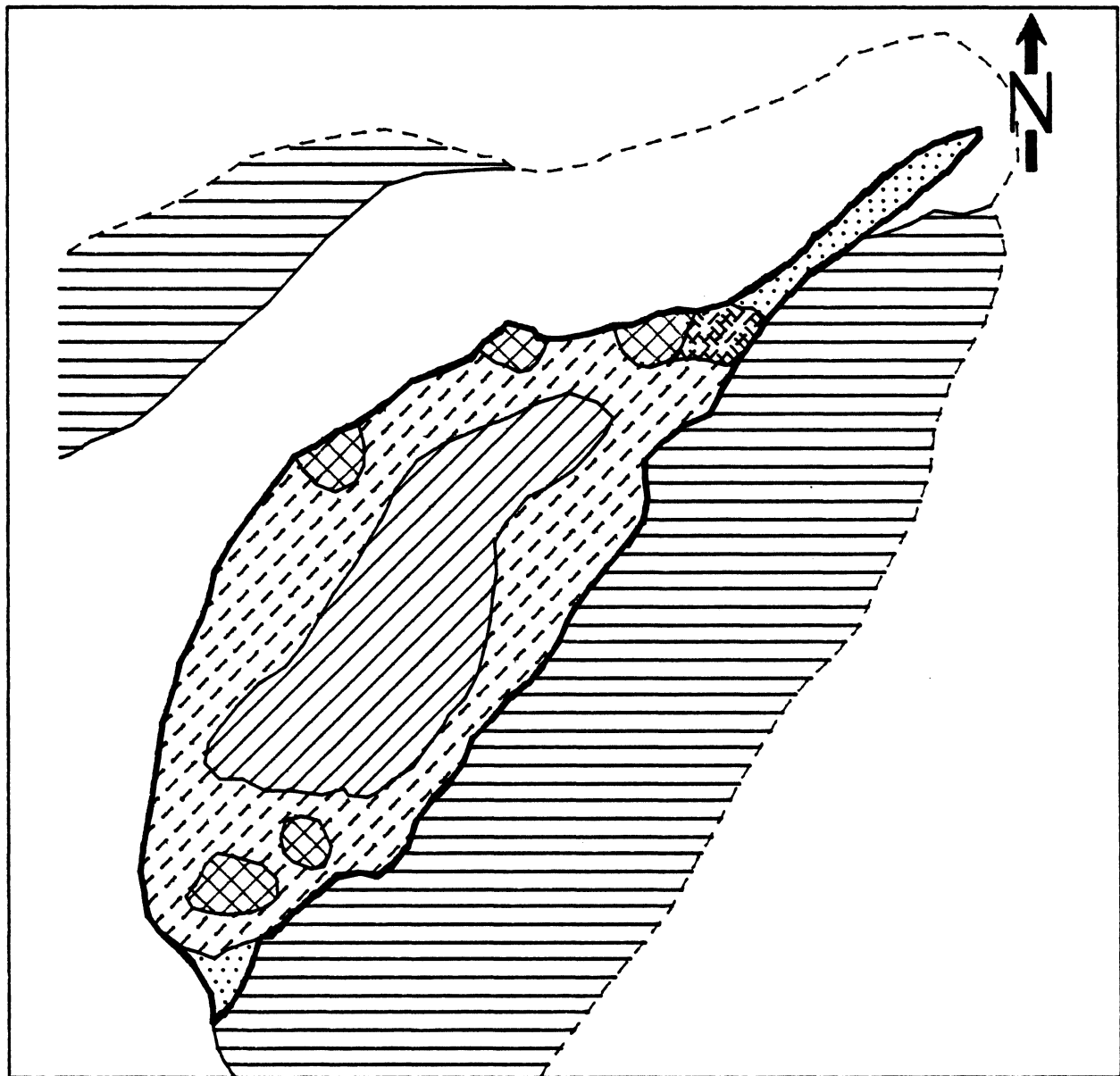
Least tern, osprey

III. Recommended usage: Passive Recreation

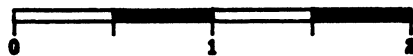
IV. Comments

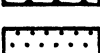
This island is small and densely vegetated with cabbage palms and Brazilian peppers which are becoming overgrown with beach bean vines. There are foot trails around the island and areas suitable for picnics, however, none are large enough to support recreational facilities.

SPOIL ISLAND BC34



1 m = 27 m



	Cabbage palm 0.297 hectares		Caulerpa algae
	Brazilian pepper 0.129 hectares		Unvegetated bottom
	Australian pine 0.034 hectares		< 1 m deep
	Sand 0.026 hectares		
	Mangroves 0.009 hectares		

ISLAND NO. BC35

Date Sampled: 3 March 1988

I. Physical Description

A. Island Size: 1.321 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 4.5 km south of SR 520

D. Distance and Direction from Channel Marker: 500 m north of marker 82

E. Erosion: Slight, low cliff on S

F. Boating access: East, 2.0 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (45.7%), Australian pine (25.7%), Guinea grass (22.9%), cabbage palm (20.0%), marsh elder (14.3%), Spanish needles (11.4%); 48 species total

B. Soil humus: 5 cm

C. Seagrasses
none

D. Bird Usage

Brown pelican, royal tern, belted kingfisher, American coot, great blue heron, mallard duck; 9 species total

E. Common Fishes and Invertebrates

Tidewater silversides, striped mullet, Atlantic croaker, bay anchovy, rainwater killifish; 10 species total

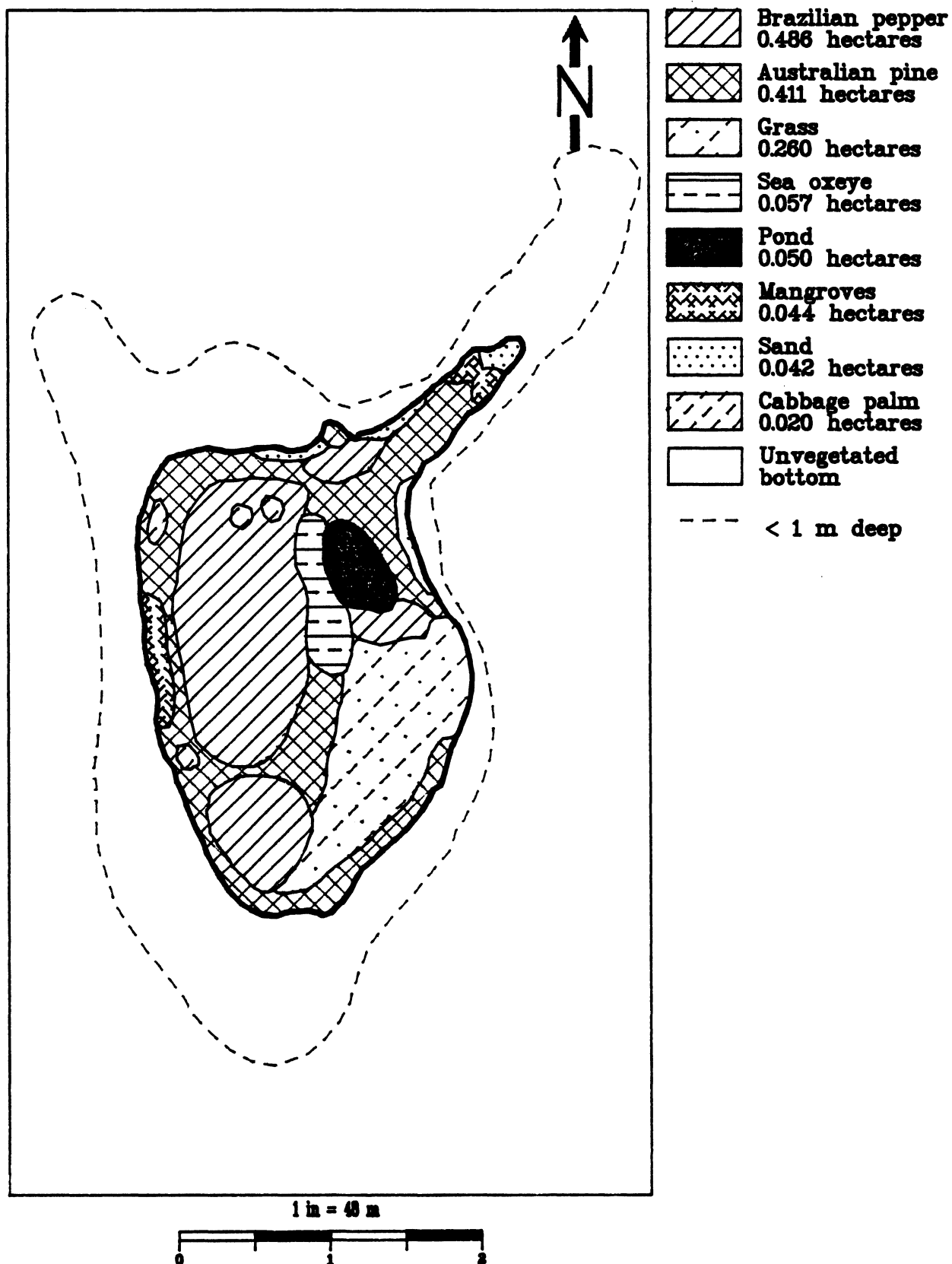
F. Threatened, Endangered or Species of Special Concern
Brown pelican

III. Recommended usage: Active Recreation

IV. Comments

This island is large enough to support construction of recreational facilities. Deep water access beaches, open areas for camping and picnicking, an artesian spring, foot trails around the island, and a diverse floral community make this an excellent island for public recreation and education.

SPOIL ISLAND BC35



ISLAND NO. BC36

Date Sampled: 4 February 1988

I. Physical Description

A. Island Size: 0.719 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 7.0 km north of Grant public ramp

D. Distance and Direction from Channel Marker: 700 m northwest of marker 20

E. Erosion: Slight, low cliff on N

F. Boating access: Southwest, 2.0 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (50.0%), Australian pine (45.0%), cabbage palm (30.0%), sea oxeye (10.0%); 16 species total

B. Soil humus: none

C. Seagrasses
none

D. Bird Usage

Osprey, great blue heron, fish crow, ring-billed gull; 4 species total

E. Common Fishes and Invertebrates

Ladyfish larvae, spot, naked goby, pinfish; 4 species total

F. Threatened, Endangered or Species of Special Concern

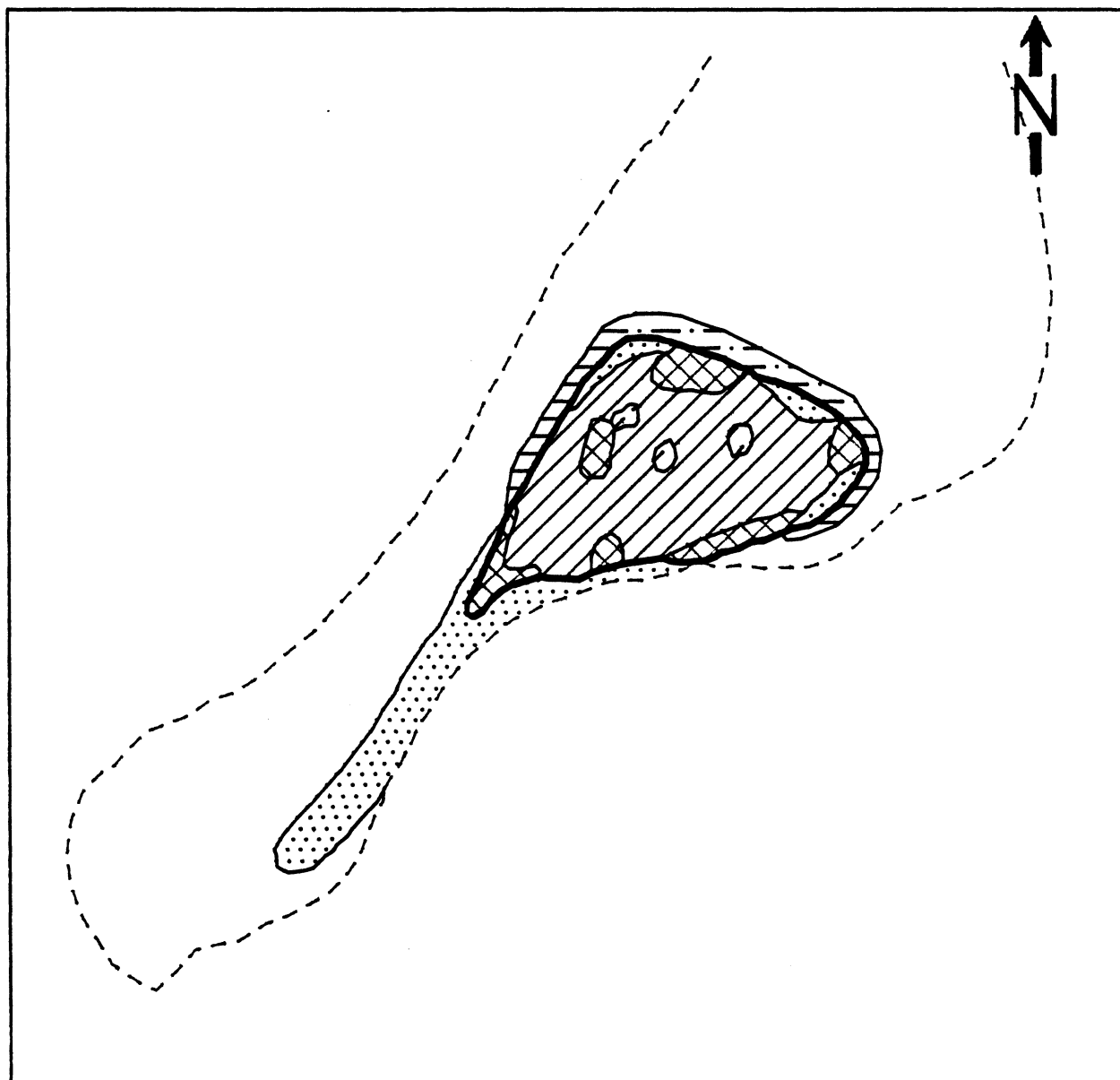
Osprey

III. Recommended usage: Passive Recreation

IV. Comments

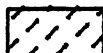
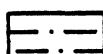
This island is located within the Indian River Lagoon Aquatic Preserve and shows little promise for construction of recreational facilities. However, it does provide picnic areas shaded by Australian pine along the beaches and a long sand spit on the west. It is presently heavily used for picnicking and fishing.

SPOIL ISLAND BC36



1 in = 52 m



- | | | | |
|---|------------------------------------|---|-----------------------|
|  | Brazilian pepper
0.382 hectares |  | Unvegetated
bottom |
|  | Sand
0.217 hectares |  | < 1 m deep |
|  | Cabbage palm
0.015 hectares | | |
|  | Australian pine
0.105 hectares | | |
|  | Rocks | | |

ISLAND NO. BC37

Date Sampled: 30 March 1988

I. Physical Description

- A. Island Size: 1.334 ha
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 6.5 km north of Grant public ramp
- D. Distance and Direction from Channel Marker: 300 m south of marker 20
- E. Erosion: Slight; low cliff on N
- F. Boating access: Southwest, 1.5 meters deep; sand spit

II. Biological Description

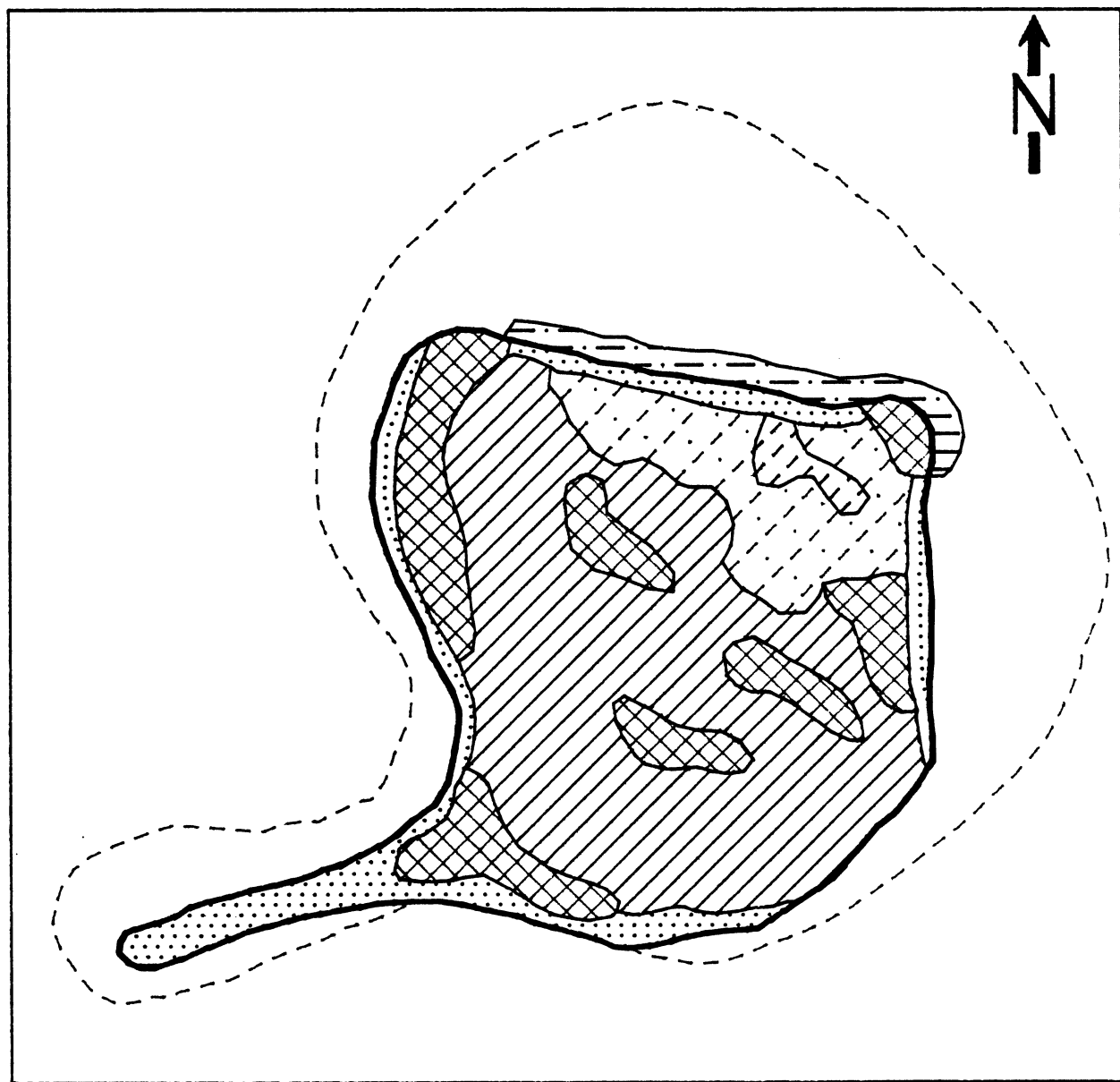
- A. Dominant Terrestrial Vegetation
Brazilian pepper (76.5%), Australian pine (70.6%), cabbage palm (11.8%), coin vine (11.8%); 44 species total
- B. Soil humus: none
- C. Seagrasses
none
- D. Bird Usage
Short-billed dowitcher, fish crow; 2 species total
- E. Common Fishes and Invertebrates
Tidewater silversides, mojarra, spot, striped mullet, pinfish; 5 species total
- F. Threatened, Endangered or Species of Special Concern
none

III. Recommended usage: Passive Recreation

IV. Comments

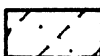
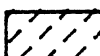
This island is located within the Indian River Lagoon Aquatic Preserve and is heavily used for picnicking and fishing. It has open beaches and areas with Australian pine cover suitable for cook-outs and overnight camping and deep water along the shore for fishing.

SPOIL ISLAND BC37



1 in = 37 m



	Brazilian pepper 0.669 hectares		Rocks
	Australian pine 0.269 hectares		Unvegetated bottom
	Sand 0.202 hectares		< 1 m deep
	Grass 0.172 hectares		
	Cabbage palm 0.022 hectares		

ISLAND NO. BC38

Date Sampled: 27 April 1988

I. Physical Description

A. Island Size: 1.517 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 5.5 km north of Grant public ramp

D. Distance and Direction from Channel Marker: 700 m northwest of marker 23

E. Erosion: Slight; low cliff on N

F. Boating access: West, 1.5 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (70.6%), Australian pine (38.2%), cabbage palm (26.5%); 49 species total

B. Soil humus: none

C. Seagrasses
none

D. Bird Usage

Osprey, brown pelican, black-bellied plover, great blue heron, Caspian tern, least tern, catbird, mallard duck; 12 species total

E. Common Fishes and Invertebrates

Tidewater silversides, pinfish; 6 species total

F. Threatened, Endangered or Species of Special Concern

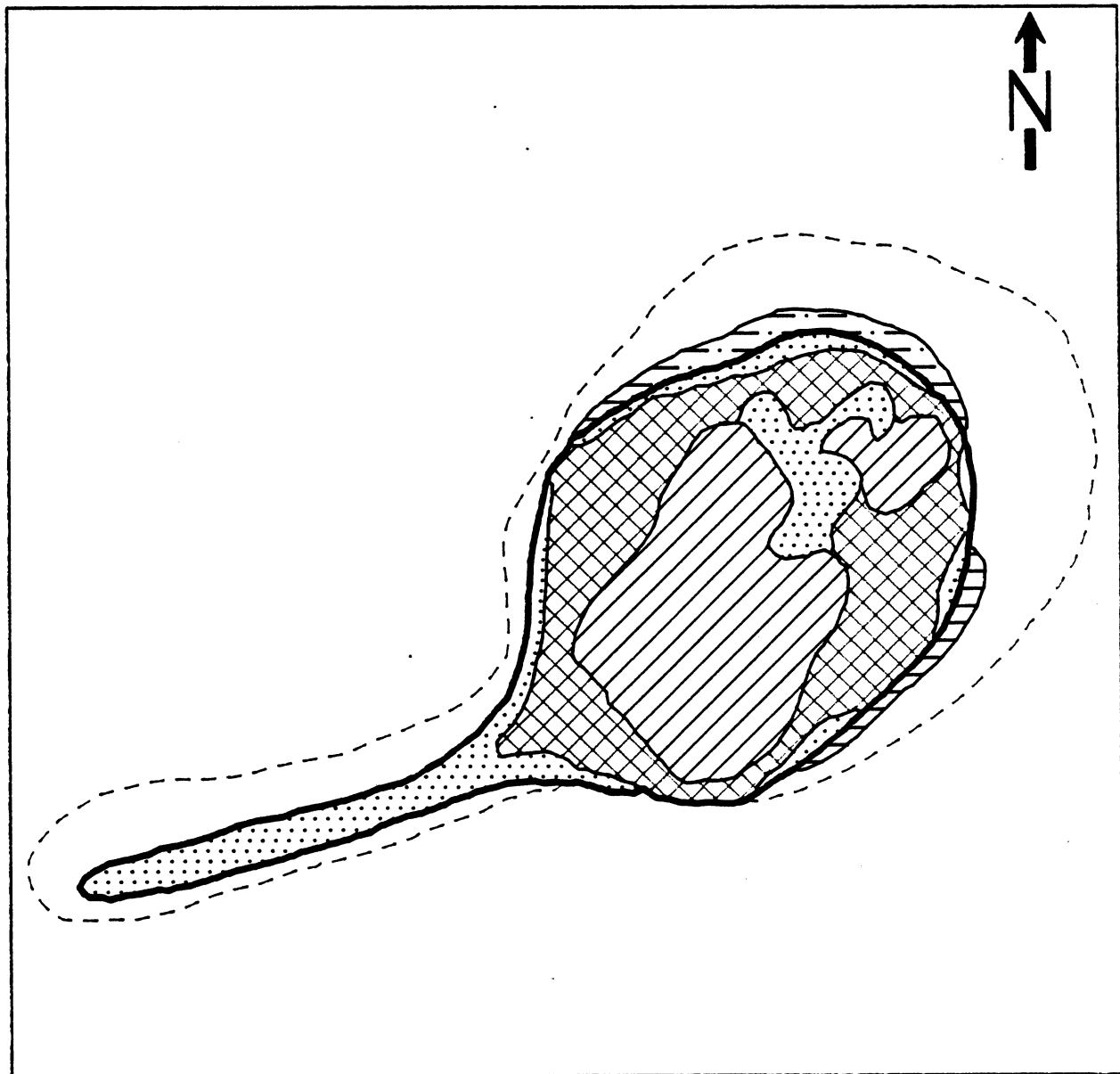
Osprey, brown pelican

III. Recommended usage: Passive Recreation

IV. Comments

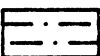
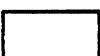
This island is located within the Indian River Lagoon Aquatic Preserve. It has ample deep water access and sand beaches with Australian pine cover making this island popular for activities such as picnicking, fishing, and overnight camping.

SPOIL ISLAND BC38



1 in = 49 m



-  Australian pine
0.584 hectares
-  Brazilian pepper
0.552 hectares
-  Sand
0.380 hectares
-  Rocks
-  Unvegetated
bottom

--- < 1 m deep

ISLAND NO. BC39

Date Sampled: 28 October 1988

I. Physical Description

A. Island Size: 0.704 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 4.5 km north of Grant public ramp

D. Distance and Direction from Channel Marker: 300 m southwest of marker 23

E. Erosion: Extreme; high cliff on E

F. Boating access: Southwest, 3.0 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (90.5%), Australian pine (57.1%), cabbage palm (19.0%); 21 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N

D. Bird Usage

Nesting brown pelican, double-crested cormorant, white ibis, cattle egret, snowy egret; also ruddy turnstone, belted kingfisher, great blue heron; 9 species total

E. Common Fishes and Invertebrates

Tidewater silversides, mojarra, striped mullet, bay anchovy; 4 species total

F. Threatened, Endangered or Species of Special Concern

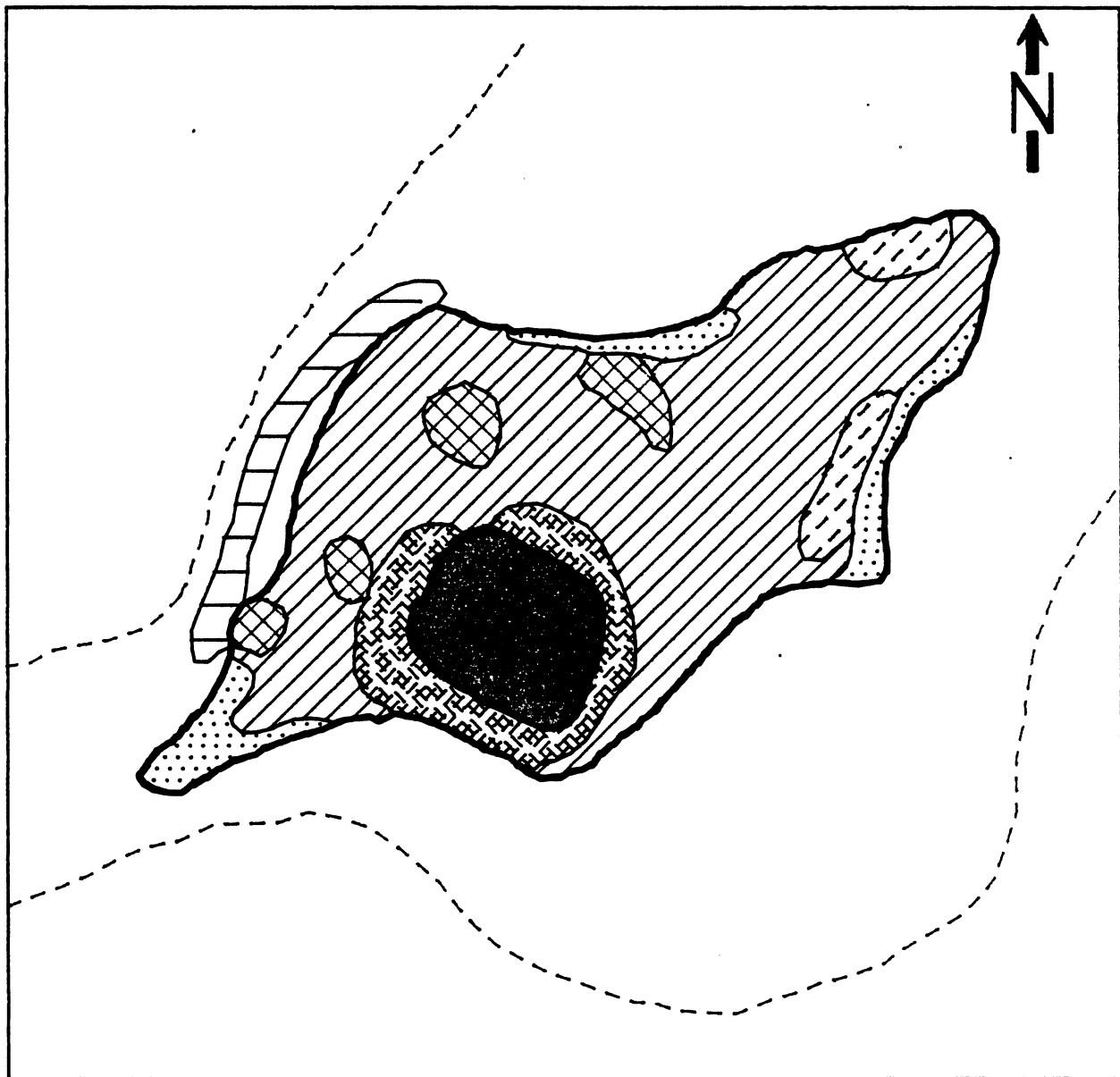
Brown pelican, snowy egret

III. Recommended usage: Conservation

IV. Comments

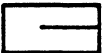
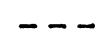
This island is located within the Indian River Lagoon Aquatic Preserve and serves as a rookery for bird species of special concern. Its trees are usually covered with nesting brown pelicans and egrets and should not be disturbed by boaters for any reason.

SPOIL ISLAND BC39



1 in = 30 m



	Brazilian pepper 0.476 hectares		Cabbage palm 0.036 hectares
	Pond 0.087 hectares		Shoal grass
	Mangroves 0.084 hectares		Unvegetated bottom
	Sand 0.063 hectares		< 1 m deep
	Australian pine 0.045 hectares		

ISLAND NO. BC40

Date Sampled: 9 March 1988

I. Physical Description

A. Island Size: 1.063 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 4.0 km north of Grant public ramp

D. Distance and Direction from Channel Marker: 500 m west of marker 25

E. Erosion: Severe; high cliffs on N, E

F. Boating access: West, 1.5 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (51.5%), Australian pine (33.3%), cabbage palm (27.3%), golden aster (12.1%); 25 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on E

D. Bird Usage

Brown pelican, greater black-backed gull, royal tern, black skimmer, osprey, sanderling, common loon, herring gull; 15 species total

E. Common Fishes and Invertebrates

Striped mullet, spot, tidewater silversides, mojarra, Atlantic croaker; 10 species total

F. Threatened, Endangered or Species of Special Concern

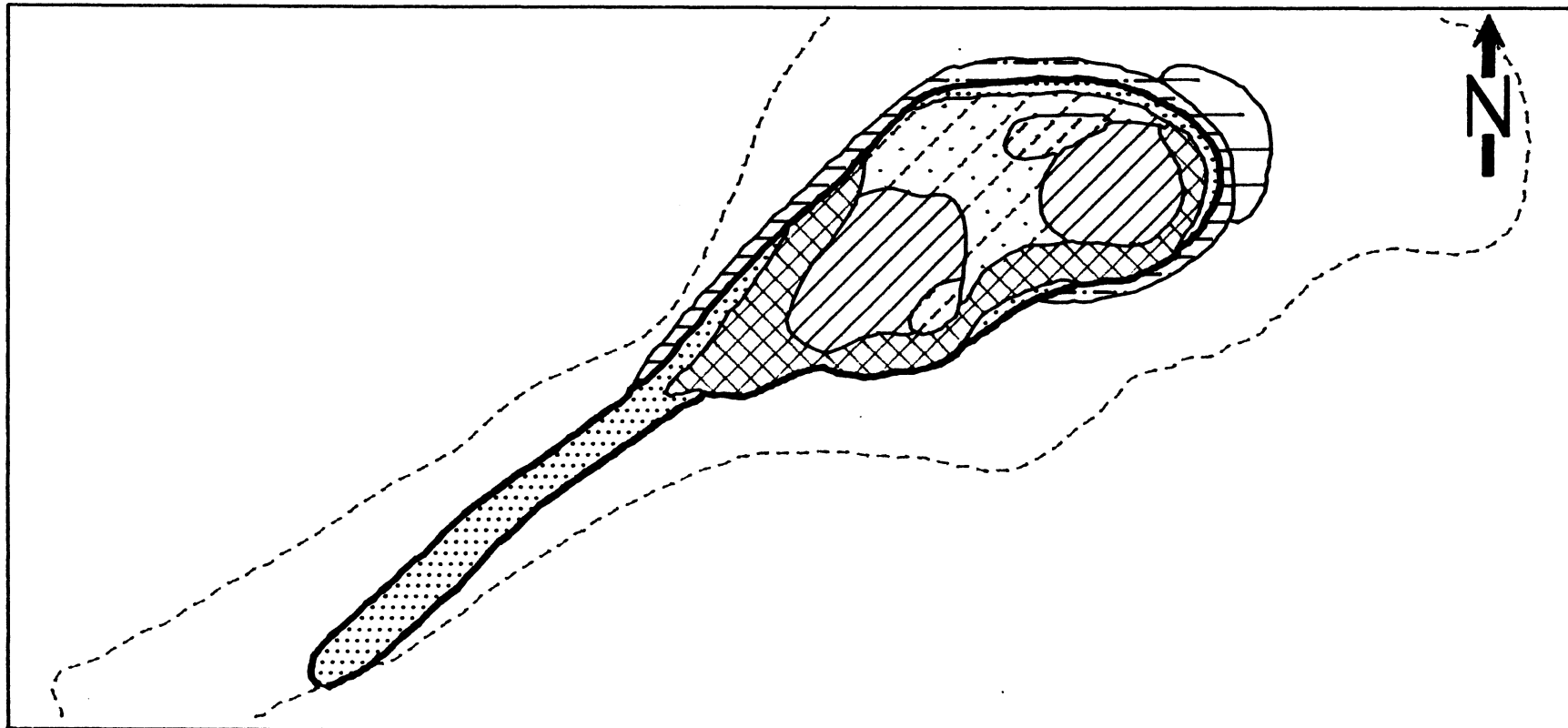
Osprey, brown pelican

III. Recommended usage: Passive Recreation

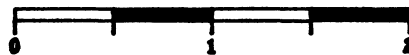
IV. Comments

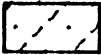
This island is located within the Indian River Lagoon Aquatic Preserve. Australian pines along the sand beaches provide shade cover for picnicking or overnight camping and there is deep water along the shore for fishing.

SPOIL ISLAND BC40



1 in = 52 m



	Brazilian pepper 0.290 hectares		Cabbage palm 0.044 hectares	----- < 1 m deep
	Australian pine 0.266 hectares		Rocks	
	Sand 0.262 hectares		Shoal grass	
	Grass 0.201 hectares		Unvegetated bottom	

ISLAND NO. BC42

Date Sampled: 11 May 1988

I. Physical Description

A. Island Size: 0.284 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 2.0 km north of Grant public ramp

D. Distance and Direction from Channel Marker: 800 m northwest of marker 31

E. Erosion: Severe; high cliff on E

F. Boating access: West, 3.0 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (80.0%), Australian pine (53.3%), black mangrove (33.3%), red mangrove (26.7%), sea oxeye (26.7%), white mangrove (20.0%), buttonwood (13.3%); 20 species total

B. Soil humus: none

C. Seagrasses
none

D. Bird Usage

Nesting fish crow; also ruddy turnstone, American oystercatcher, great blue heron; 6 species total

E. Common Fishes and Invertebrates

Tidewater silversides, mojarra; 9 species total

F. Threatened, Endangered or Species of Special Concern

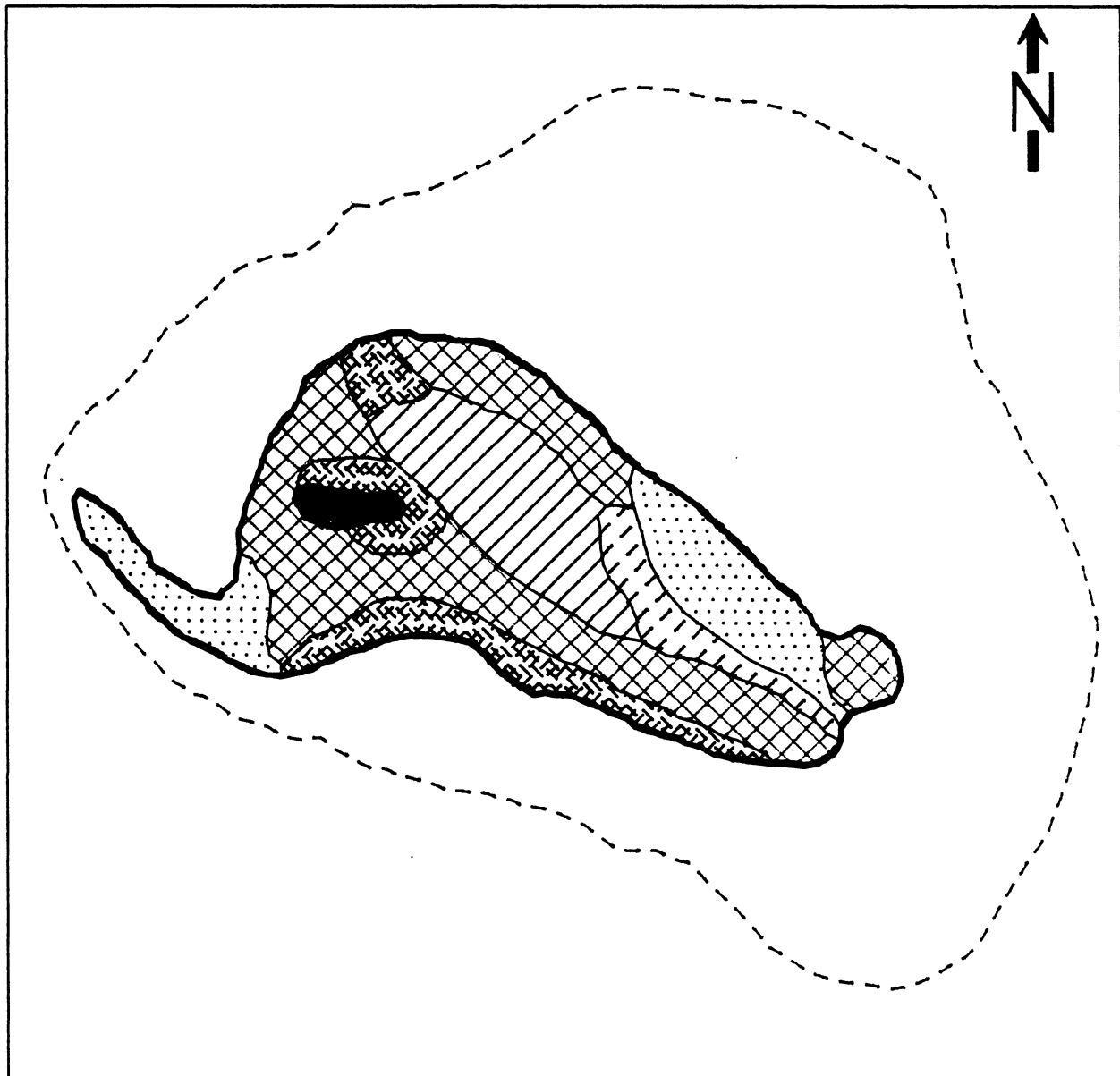
American oystercatcher

III. Recommended usage: Passive Recreation

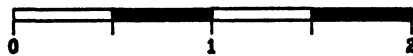
IV. Comments

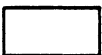
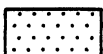
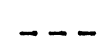
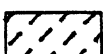
This small island is located within the Indian River Lagoon Aquatic Preserve. It is covered primarily with Brazilian pepper and has a pond in the western end in which mosquitos breed. A combination of the small size and large mosquito population makes this island undesirable for recreational purposes.

SPOIL ISLAND BC42



1 in = 22 m



	Australian pine 0.117 hectares		Pond 0.007 hectares
	Brazilian pepper 0.053 hectares		Unvegetated bottom
	Sand 0.051 hectares		< 1 m deep
	Mangroves 0.044 hectares		
	Cabbage palm 0.019 hectares		

ISLAND NO. BC43

Date Sampled: 8 December 1987

I. Physical Description

A. Island Size: 1.090 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 2.0 km northeast of Grant public ramp

D. Distance and Direction from Channel Marker: 400 m southeast of marker 31

E. Erosion: Extreme; high cliff on N

F. Boating access: East, 1.5 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (37.9%), Australian pine (31.0%), black mangrove (20.7%), cabbage palm (20.7%), seashore saltgrass (13.8%), golden aster (10.3%), natal grass (10.3%), sea purslane (10.3%), sea oxeye (10.3%), marshhay cordgrass (10.3%), white mangrove (10.3%); 35 species total

B. Soil humus: none

C. Seagrasses
none

D. Bird Usage

Caspian tern, sanderling, black skimmer, belted kingfisher, great blue heron, osprey; 10 species total

E. Common Fishes and Invertebrates

Bay anchovy, tidewater silversides, mojarra, redfin needlefish, red drum, southern puffer; 6 species total

F. Threatened, Endangered or Species of Special Concern

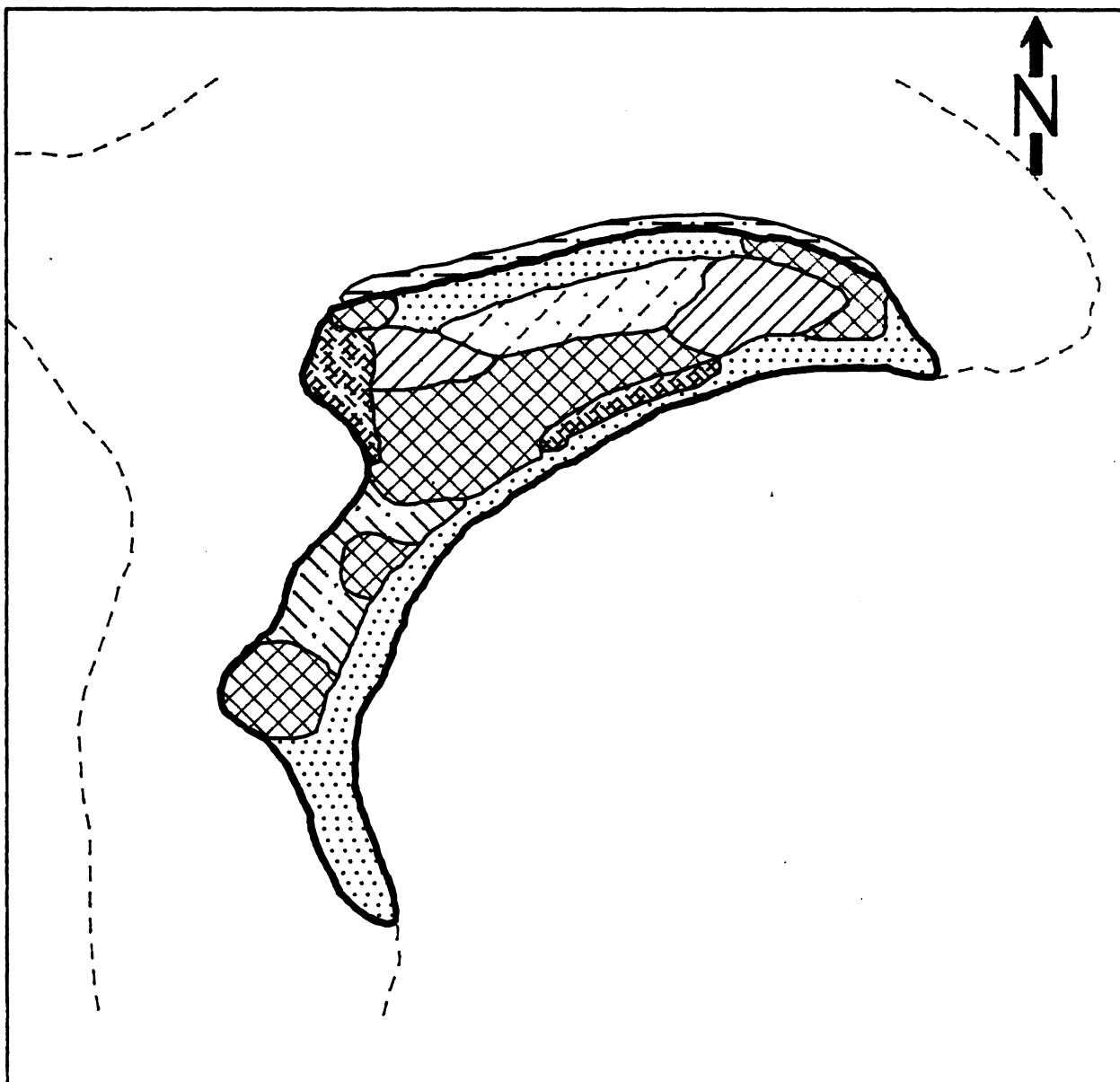
Osprey, prickly-pear cactus

III. Recommended usage: Passive Recreation

IV. Comments

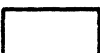
This island is located within the Indian River Lagoon Aquatic Preserve. Australian pine cover, deep water along the shore for fishing and open areas along the cliff to the north well above the water make this an excellent recreational island.

SPOIL ISLAND BC43



1 in = 47 m



	Australian pine 0.356 hectares		Seashore saltgrass 0.090 hectares
	Sand 0.336 hectares		Rocks
	Brazilian pepper 0.127 hectares		Unvegetated bottom
	Mangroves 0.077 hectares		< 1 m deep
	Grass 0.104 hectares		

ISLAND NO. BC44A

Date Sampled: 24 November 1987

I. Physical Description

- A. Island Size: 1.847 ha
- B. Height Above Mean High Water: 1-3 m
- C. Distance from Boat Ramps: 1.0 km east of Grant public ramp
- D. Distance and Direction from Channel Marker: 300 m east of marker 34
- E. Erosion: Extreme; high cliff on N
- F. Boating access: East, 1.0 meters deep; sand beach

II. Biological Description

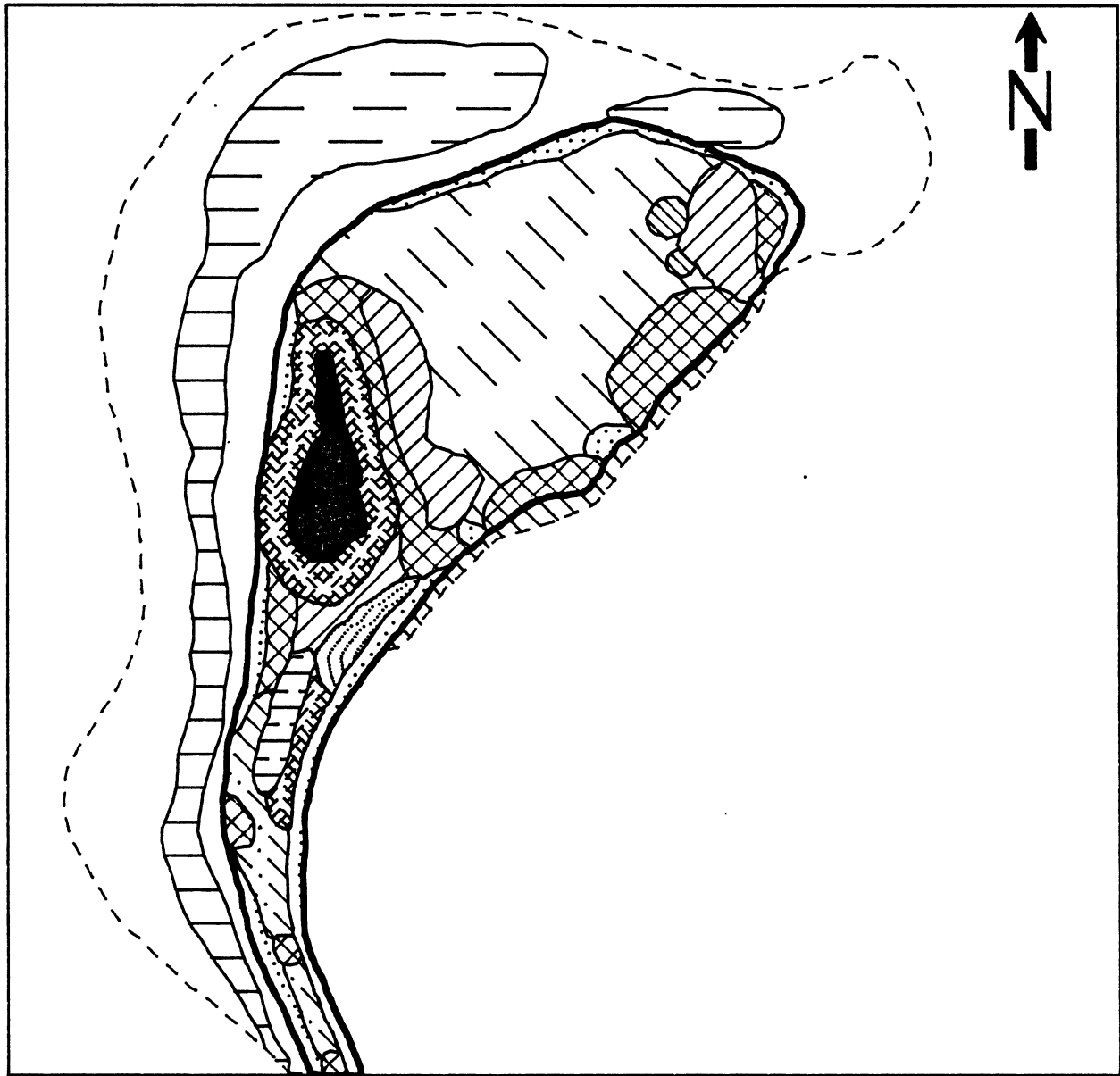
- A. Dominant Terrestrial Vegetation
Brazilian pepper (60.4%), Australian pine (33.3%), sea purslane (29.3%), seashore saltgrass (22.9%), black mangrove (18.8%), sea oxeye (16.7%), beach elder (10.4%); 38 species total
- B. Soil humus: none
- C. Seagrasses
Shoal grass on N, E, W; manatee grass on S
- D. Bird Usage
Nesting great blue heron; also little blue heron, osprey; 43 species total
- E. Common Fishes and Invertebrates
Tidewater silversides, gulf pipefish, mojarra, code goby, red drum; 15 species
- F. Threatened, Endangered or Species of Special Concern
Osprey, prickly-pear cactus

III. Recommended usage: Passive Recreation

IV. Comments

This large island is located within the Indian River Lagoon Aquatic Preserve. Australian pines provide plenty of cover for camping and picnicking. The open areas above the cliff are also suitable for camping. There is a large, mangrove fringed pond along the west edge of the island where mosquitoes breed actively.

SPOIL ISLAND BC44A



1 in = 53 m



	Open sand, palms 0.723 hectares		Seashore saltgrass 0.091 hectares		Manatee grass
	Australian pine 0.288 hectares		Pond 0.086 hectares		Shoal grass
	Sand 0.232 hectares		Sea oxeye 0.040 hectares		Unvegetated bottom
	Brazilian pepper 0.214 hectares		Buttonwood 0.035 hectares		< 1 m deep
	Mangroves 0.207 hectares		Red cedar 0.017 hectares		

ISLAND NO. BC44B

Date Sampled: 9 November 1987

I. Physical Description

A. Island Size: 2.055 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 1.0 km east of Grant public ramp

D. Distance and Direction from Channel Marker: 500 m northwest of marker 34

E. Erosion: Moderate; cliffs on N and W

F. Boating access: Northeast, 1.5 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Cabbage palm (30.0%), natal grass (30.0%), Australian pine (26.7%), Brazilian pepper (26.7%), golden aster (10.0%); 37 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N, E, S

D. Bird Usage

Osprey, great blue heron, little blue heron; 3 species total

E. Common Fishes and Invertebrates

Tidewater silversides, gulf pipefish, bay anchovy, mojarra, redfin needlefish, naked goby; 13 species total

F. Threatened, Endangered or Species of Special Concern

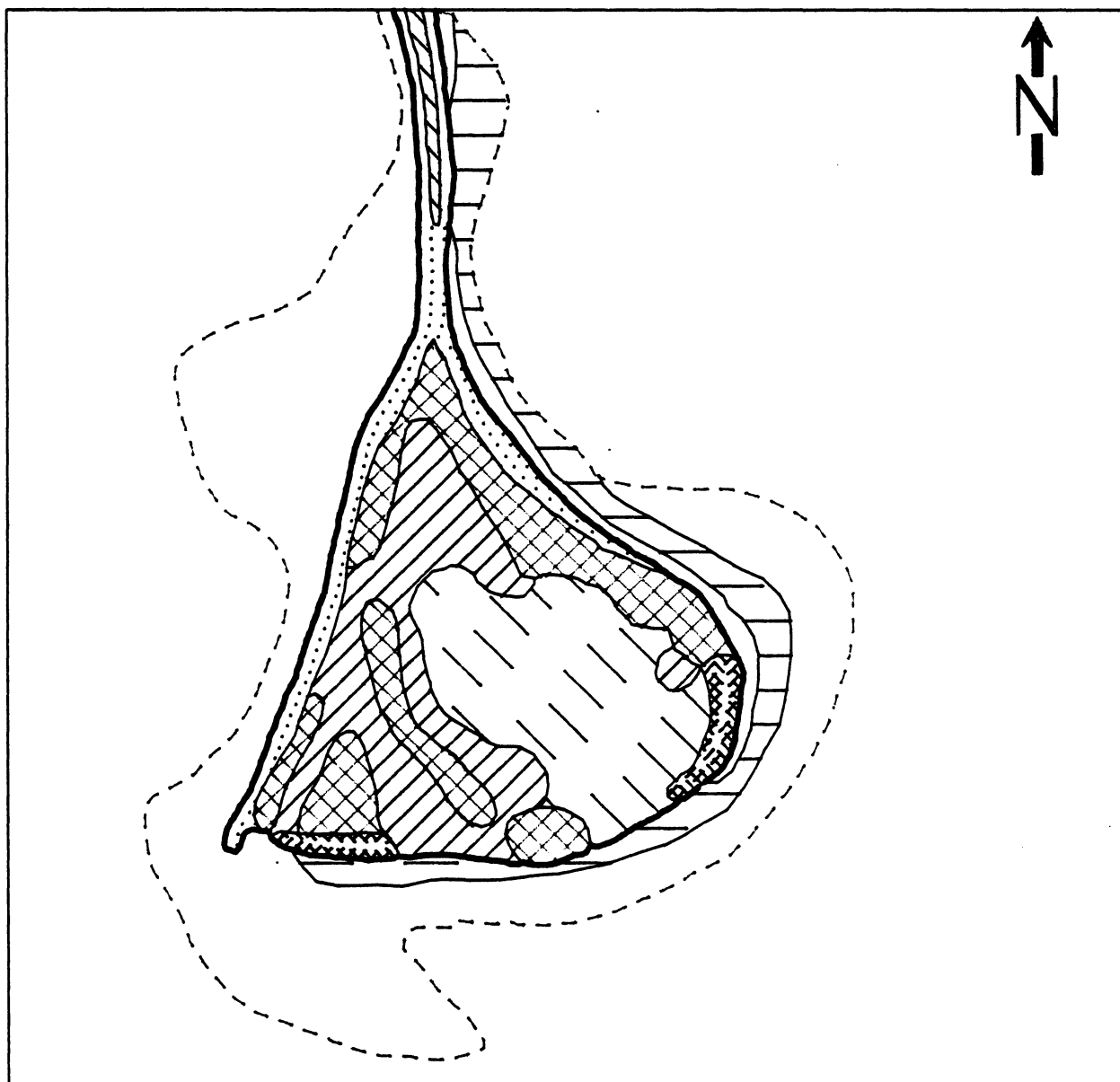
Osprey

III. Recommended usage: Active Recreation

IV. Comments

This island is located within the Indian River Lagoon Aquatic Preserve. It is high and large enough for construction of camping and picnicking facilities. It has ample deep water access and open beaches along the Intracoastal Waterway. The Grant public boat ramp is located directly across the waterway. This is an excellent island for recreational improvement.

SPOIL ISLAND BC44B



1 in = 60 m



	Open sand, palms 0.591 hectares		Seashore saltgrass 0.031 hectares
	Brazilian pepper 0.529 hectares		Shoal grass
	Australian pine 0.523 hectares		Unvegetated bottom
	Sand 0.296 hectares		Mangroves 0.085 hectares
			< 1 m deep

ISLAND NO. BC45

Date Sampled: 9 June 1988.

I. Physical Description

A. Island Size: 4.688 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 1.0 km south of Grant public ramp

D. Distance and Direction from Channel Marker: 200 m east of marker 36

E. Erosion: Moderate; low cliff on N

F. Boating access: West, 1.5 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (76.7%), golden aster (16.3%), Australian pine (14.0%), cabbage palm (14.0%); 24 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on west; manatee grass on east

D. Bird Usage

Nesting great blue heron and osprey; also little blue heron, brown pelican, red-bellied woodpecker, least tern; 8 species total

E. Common Fishes and Invertebrates

Gulf pipefish, silver perch, pinfish, mojarra, tidewater silversides; 9 species total

F. Threatened, endangered or species of special concern

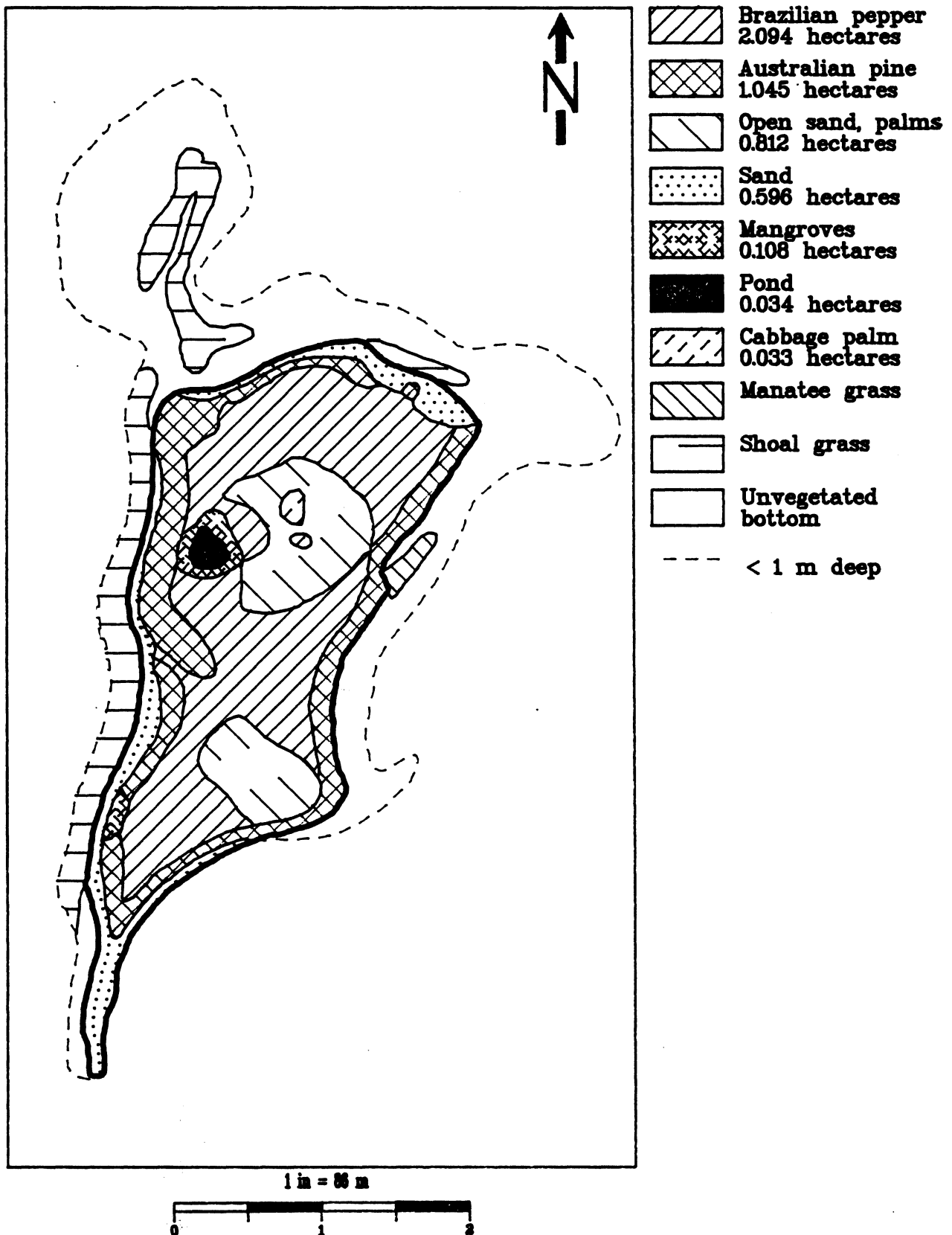
Osprey, least tern, prickly-pear cactus

III. Recommended usage: Active Recreation

IV. Comments

This island is located within the Indian River Lagoon Aquatic Preserve. It is high and large enough for construction of camping and picnicking facilities. It has ample boat access and open sand beaches along the Intracoastal Waterway near the Grant public boat ramp. The only ecological concern is the nesting osprey pair on the south end of the island.

SPOIL ISLAND BC45



ISLAND NO. BC46

Date Sampled: 29 August 1988

I. Physical Description

A. Island Size: 3.881 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 3.5 km south of Grant public ramp

D. Distance and Direction from Channel Marker: 300 m north of marker 45

E. Erosion: Slight on N

F. Boating access: West, 1.5 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (53.6%), Australian pine (34.8%), Florida privet (21.7%), black mangrove (15.9%), golden aster (14.5%), cabbage palm (11.6%), seashore saltgrass (10.1%); 42 species total

B. Soil humus: none

C. Seagrasses

Shoal grass and manatee grass on E and W

D. Bird Usage

Nesting mallard duck and green-backed heron; also great blue heron, little blue heron, tricolor heron, brown pelican; 10 species total

E. Common Fishes and Invertebrates

Mojarra, tidewater silversides, gulf pipefish, silver perch, pinfish; 20 species total

F. Threatened, endangered or species of special concern

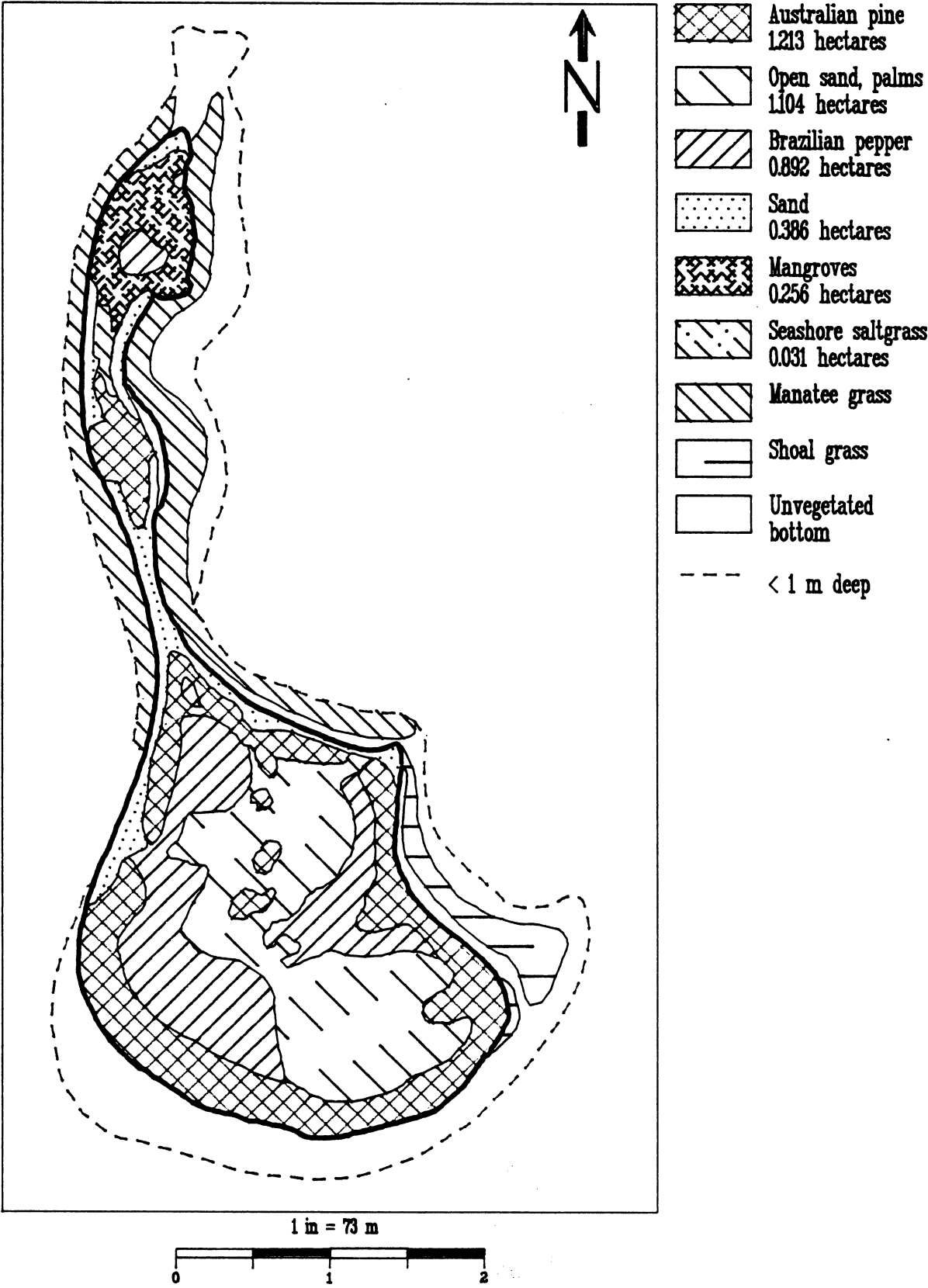
Brown pelican, little blue heron, tricolor heron, prickly-pear cactus

III. Recommended usage: Active Recreation

IV. Comments

This island is located within the Indian River Lagoon Aquatic Preserve and is currently kept up by the Brevard County Division of Parks and Recreation as a public recreation facility. There are picnic shelters, bathroom facilities and a small wading pool in the southern half of the island. Boat access is from the west, along the Intracoastal Waterway.

SPOIL ISLAND BC46



ISLAND NO. BC47

Date Sampled: 25 May 1988

I. Physical Description

- A. Island Size: 2.103 ha
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 4.5 km south of Grant public ramp
- D. Distance and Direction from Channel Marker: 700 m northwest of marker 45
- E. Erosion: Severe; high cliff on N
- F. Boating access: West, 1.5 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Golden aster (37.8%), Brazilian pepper (29.7%), Australian pine (27.0%), cabbage palm (18.9%), Indian hemp (16.2%), railroad vine (10.8%); 28 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N, E; manatee grass on N, E, S

D. Bird Usage

Great blue heron, little blue heron, brown pelican, red-bellied woodpecker; 8 species total

E. Common Fishes and Invertebrates

Gulf pipefish, tidewater silversides, pinfish; 11 species total

F. Threatened, endangered or species of special concern

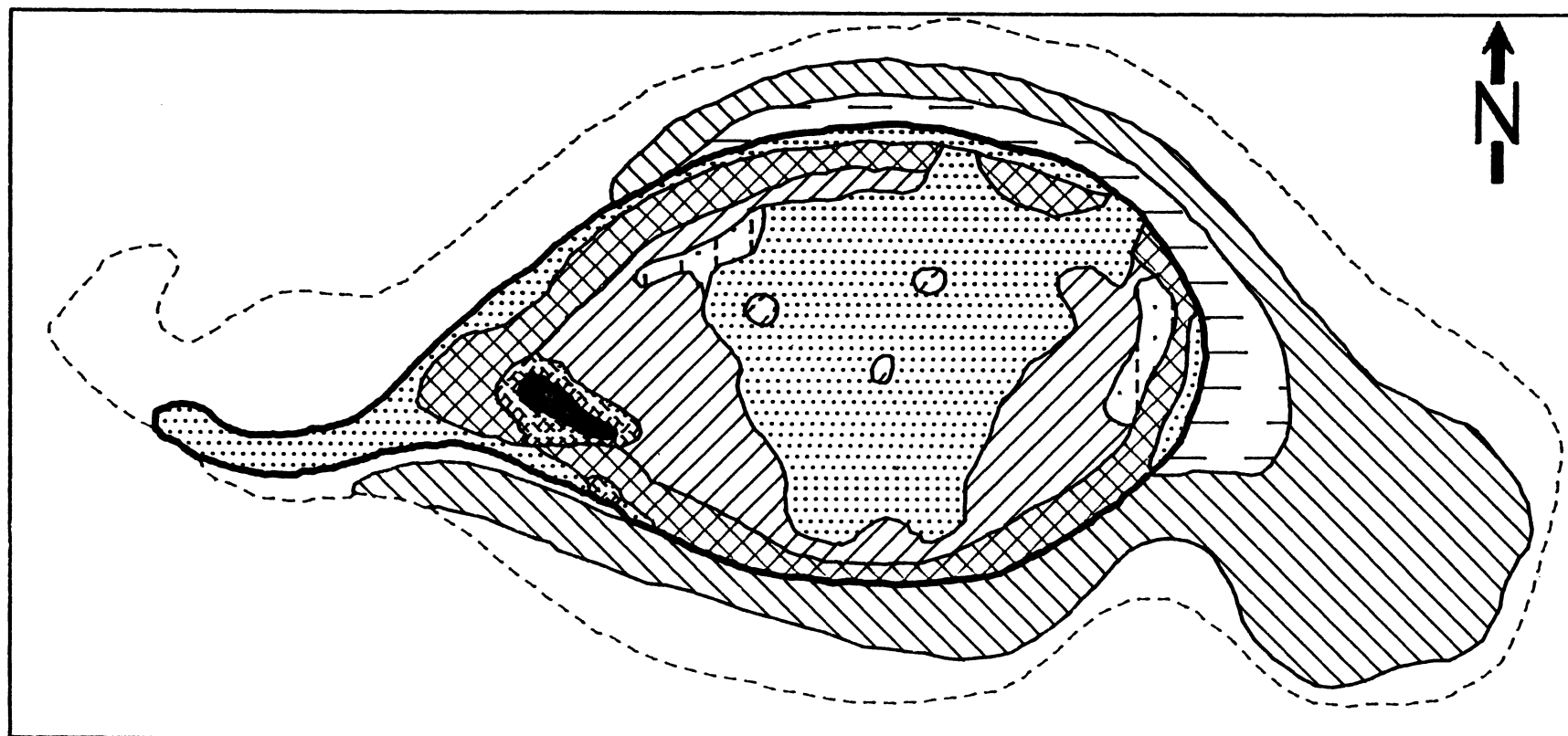
Little blue heron, prickly-pear cactus

III. Recommended usage: Active Recreation

IV. Comments

This island is located within the Indian River Lagoon Aquatic Preserve. It is large and high enough to support construction of recreational facilities. Deep water access and open sand beaches are located on the west shore, along the Intracoastal Waterway.

SPOIL ISLAND BC47



1 in = 40 m



 Sand 1.002 hectares	 Mangroves 0.054 hectares	 Shoal grass
 Brazilian pepper 0.535 hectares	 Pond 0.016 hectares	 Unvegetated bottom
 Australian pine 0.433 hectares	 Cabbage palm 0.015 hectares	 < 1 m deep
 Coin vine 0.065 hectares	 Manatee grass	

ISLAND NO. BC48

Date Sampled: 25 April 1988

I. Physical Description

- A. Island Size: 4.775 ha
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 5.0 km south of Grant public ramp
- D. Distance and Direction from Channel Marker: 300 m west of marker 50
- E. Erosion: Slight; low cliff on NE
- F. Boating access: North, 2.0 meters deep; docks in cove

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (53.6%), Australian pine (26.1%), Florida privet (20.3%), cabbage palm (11.6%), Madagascar periwinkle (11.6%); 49 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N, S; manatee grass on E

D. Bird Usage

American oystercatcher, osprey, least tern, little blue heron, brown pelican, black skimmer, black-throated blue warbler, black and white warbler, red-bellied woodpecker; 24 species total

E. Common Fishes and Invertebrates

Pinfish, mojarra, gulf pipefish, tidewater silversides; 10 species total

F. Threatened, endangered or species of special concern

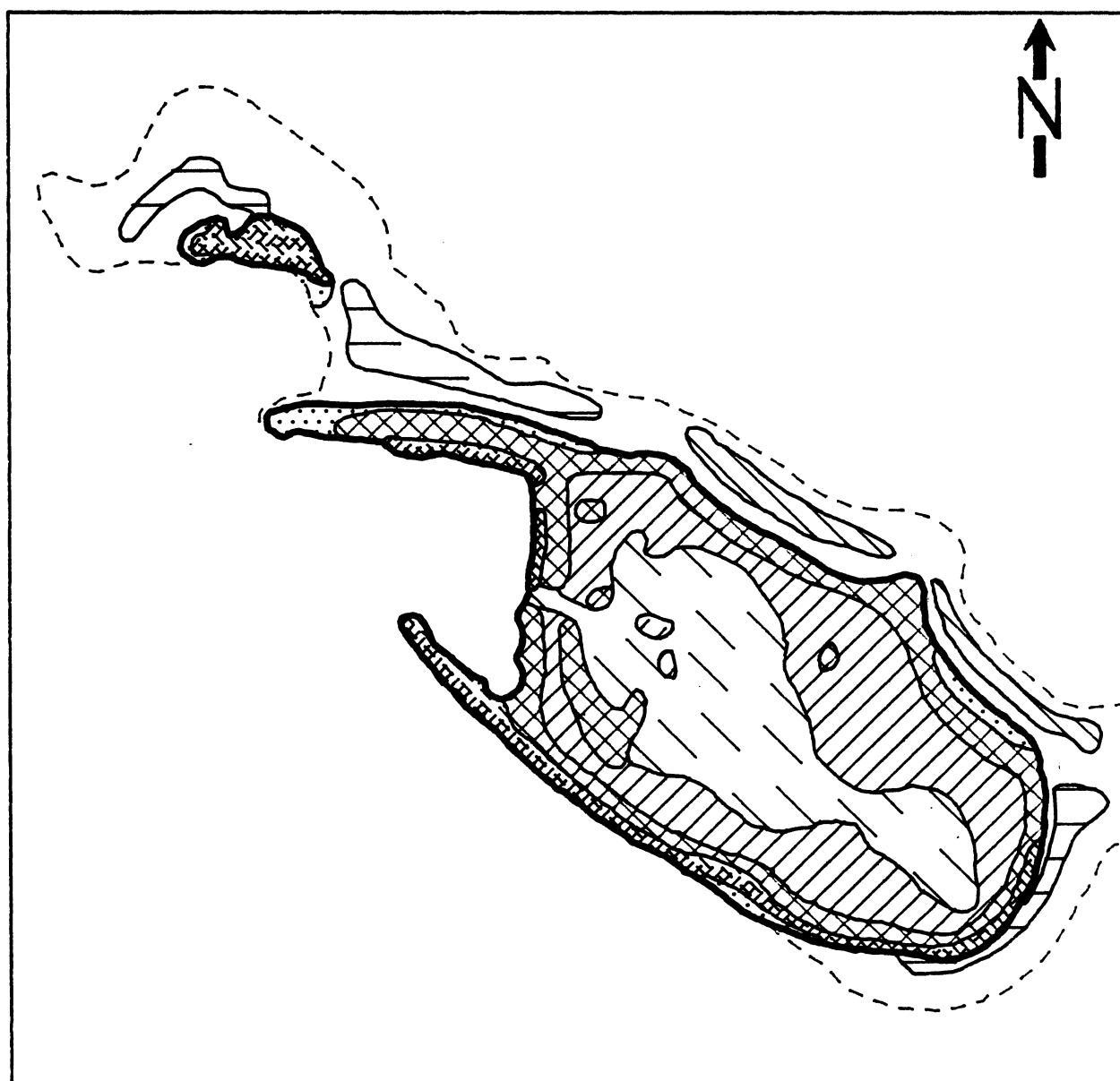
Osprey, brown pelican, least tern, little blue heron, American oystercatcher, prickly-pear cactus

III. Recommended usage: Education/Active Recreation

IV. Comments

This island is located within the Indian River Lagoon Aquatic Preserve and is maintained by the Brevard County Division of Parks and Recreation. There are both picnicking and boating facilities available. The diversity of wildlife species, especially birds, and ease of access makes this island ideal for both camping/picnicking and educational field trips.

SPOIL ISLAND BC48



1 in = 84 m



	Brazilian pepper 1620 hectares		Cabbage palm 0.024 hectares
	Open sand, palms 1354 hectares		Manatee grass
	Australian pine 1057 hectares		Shoal grass
	Mangroves 0.501 hectares		Unvegetated bottom
	Sand 0.219 hectares		< 1 m deep

ISLAND NO. BC49

Date Sampled: 6 April 1988

I. Physical Description

A. Island Size: 1.857 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 4.0 km north of Long Point Park

D. Distance and Direction from Channel Marker: 1 km northwest of marker 54

E. Erosion: Slight; low cliff on E

F. Boating access: Southwest, 1.5 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Australian pine (63.9%), Brazilian pepper (55.6%), black mangrove (25.0%), sea oxeeye (22.2%), red mangrove (16.7%), coin vine (13.9%), sea lavender (11.1%); 44 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on all sides

D. Bird Usage

Nesting great blue heron, mallard duck, green-backed heron; also osprey, royal tern, tricolor heron, little blue heron, black-crowned night heron, brown pelican; 15 species total

E. Common Fishes and Invertebrates

Spot, striped mullet, pinfish, gulf pipefish; 11 species total

F. Threatened, endangered or species of special concern

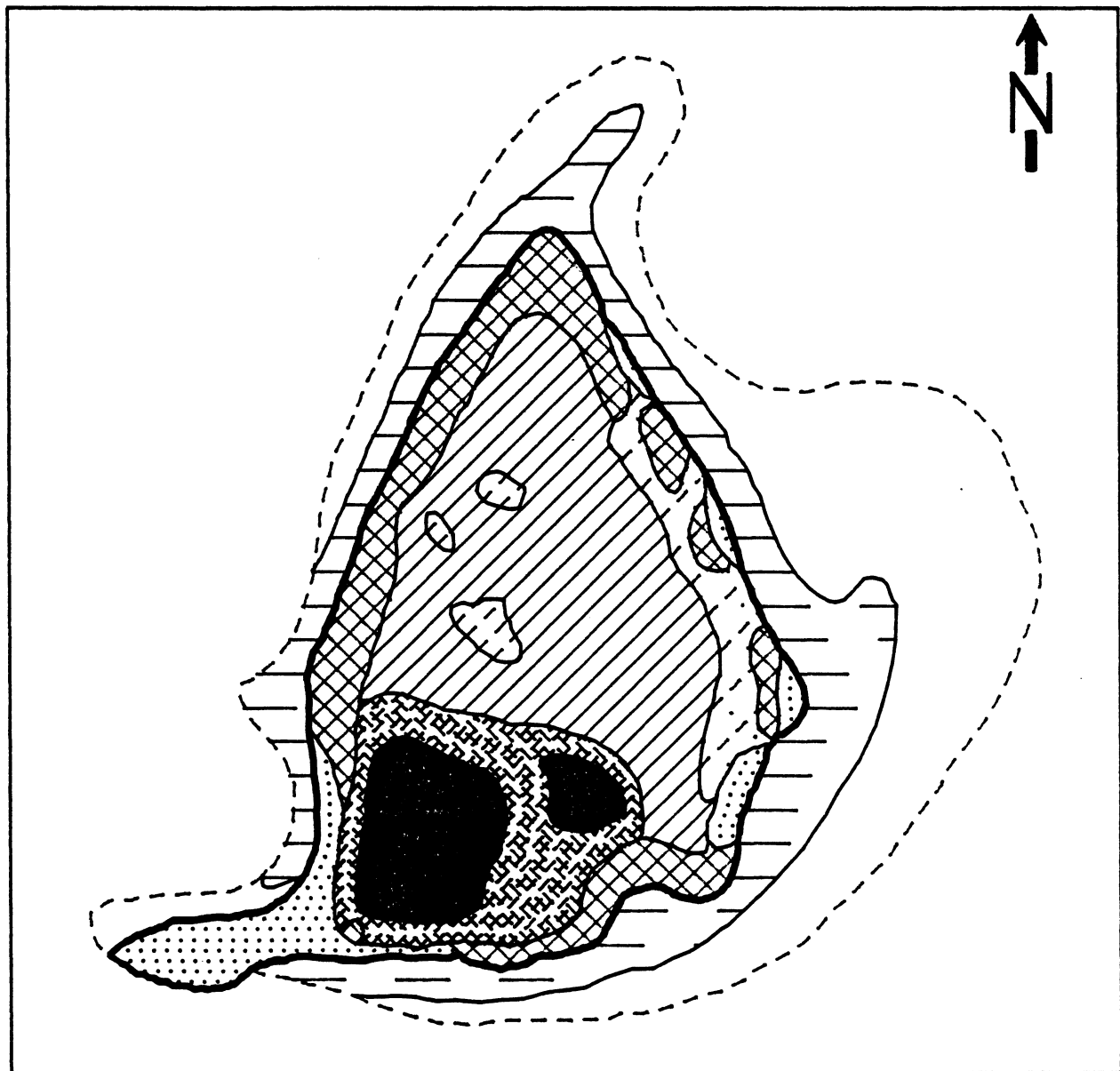
Osprey, little blue heron, tricolor heron

III. Recommended usage: Conservation

IV. Comments

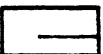
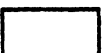
This island is located within the Indian River Lagoon Aquatic Preserve. It contains two mangrove fringed ponds that provide nesting habitat for Brown pelicans, egrets, herons and other shore birds. Consequently, it should be posted off limits to boaters to minimize disturbance of these nesting birds.

SPOIL ISLAND BC49



1 in = 40 m



	Brazilian pepper 0.802 hectares		Grass 0.129 hectares
	Australian pine 0.399 hectares		Cabbage palm 0.039 hectares
	Mangroves 0.238 hectares		Shoal grass
	Pond 0.205 hectares		Unvegetated bottom
	Sand 0.204 hectares		< 1 m deep

ISLAND NO. BC50

Date Sampled: 15 March 1988

I. Physical Description

A. Island Size: 0.824 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 3.5 km north of Long Point Park

D. Distance and Direction from Channel Marker: 400 m west of marker 54

E. Erosion: Moderate; low cliff on E

F. Boating access: Southwest, 1.5 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (72.7%), Australian pine (63.6%), coin vine (31.8%), cabbage palm (13.6%); 21 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N, E, S

D. Bird Usage

Nesting mourning dove; also great blue heron, royal tern, osprey, brown pelican; 9 species total

E. Common Fishes and Invertebrates

Tidewater silversides, striped mullet, spot, pinfish; 11 species total

F. Threatened, endangered or species of special concern

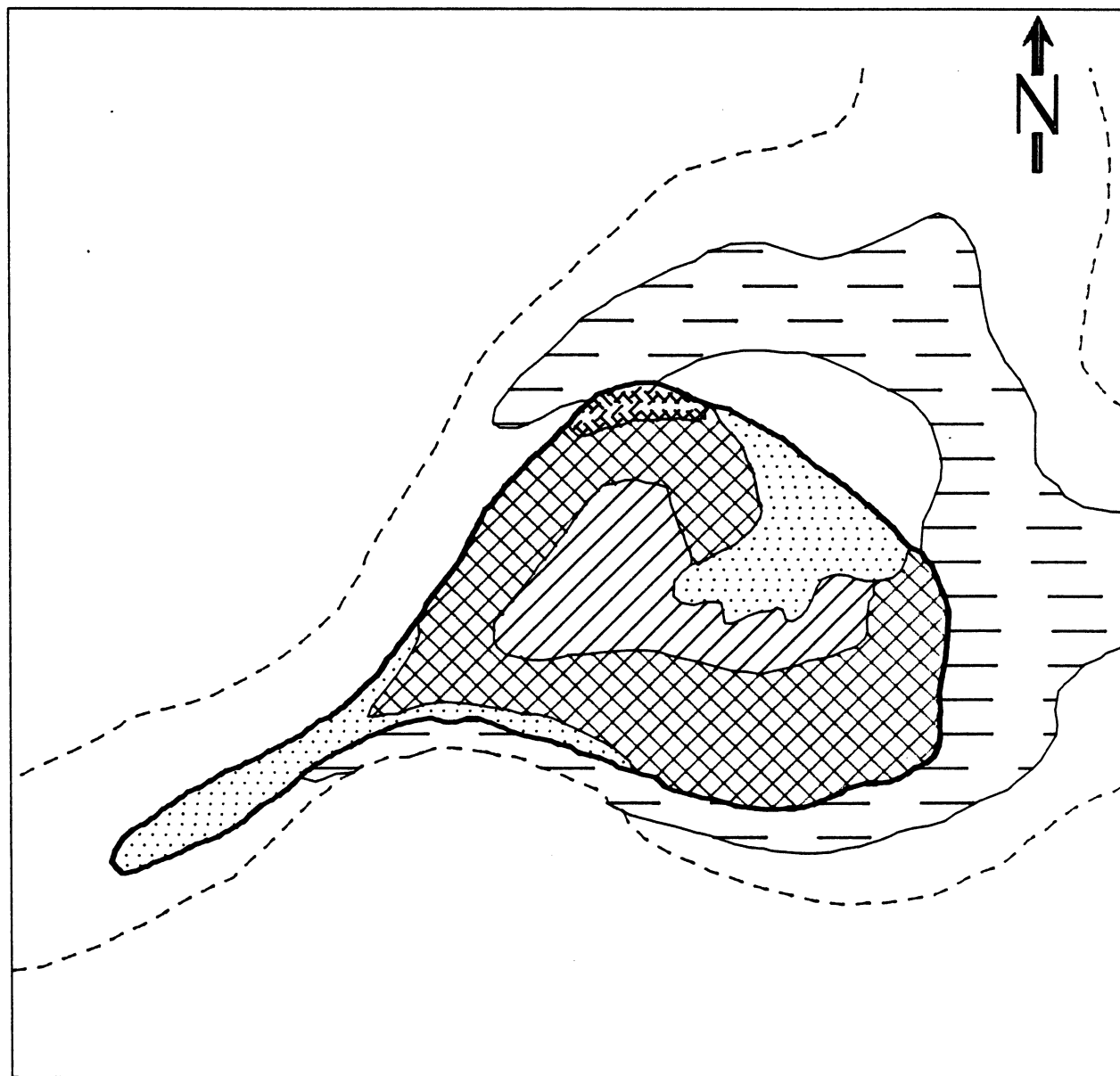
Osprey

III. Recommended usage: Passive Recreation

IV. Comments

This island is located within the Indian River Lagoon Aquatic Preserve. It has Australian pines along the shorelines making excellent picnicking and camping areas.

SPOIL ISLAND BC50



1 in = 37 m



 Australian pine
0.445 hectares

 Sand
0.192 hectares

 Brazilian pepper
0.166 hectares

 Mangroves
0.020 hectares

 Shoal grass

 Unvegetated
bottom

--- < 1 m deep

ISLAND NO. BC51

Date Sampled: 25 February 1988

I. Physical Description

A. Island Size: 0.570 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 3.0 km north of Long Point Park

D. Distance and Direction from Channel Marker: 900 m south of marker 54

E. Erosion: Moderate; low cliff on E

F. Boating access: Southwest, 1.5 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (77.3%), Australian pine (59.1%), black mangrove (27.3%), cabbage palm (27.3%), white mangrove (22.7%), red mangrove (13.6%); 40 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on E

D. Bird Usage

Nesting great blue heron; also brown pelican, least tern, little blue heron, black-crowned night heron; 15 species total

E. Common Fishes and Invertebrates

Mojarra, tidewater silversides, pinfish, spot, ladyfish, striped mullet, gulf pipefish, Atlantic croaker; 13 species total

F. Threatened, endangered or species of special concern

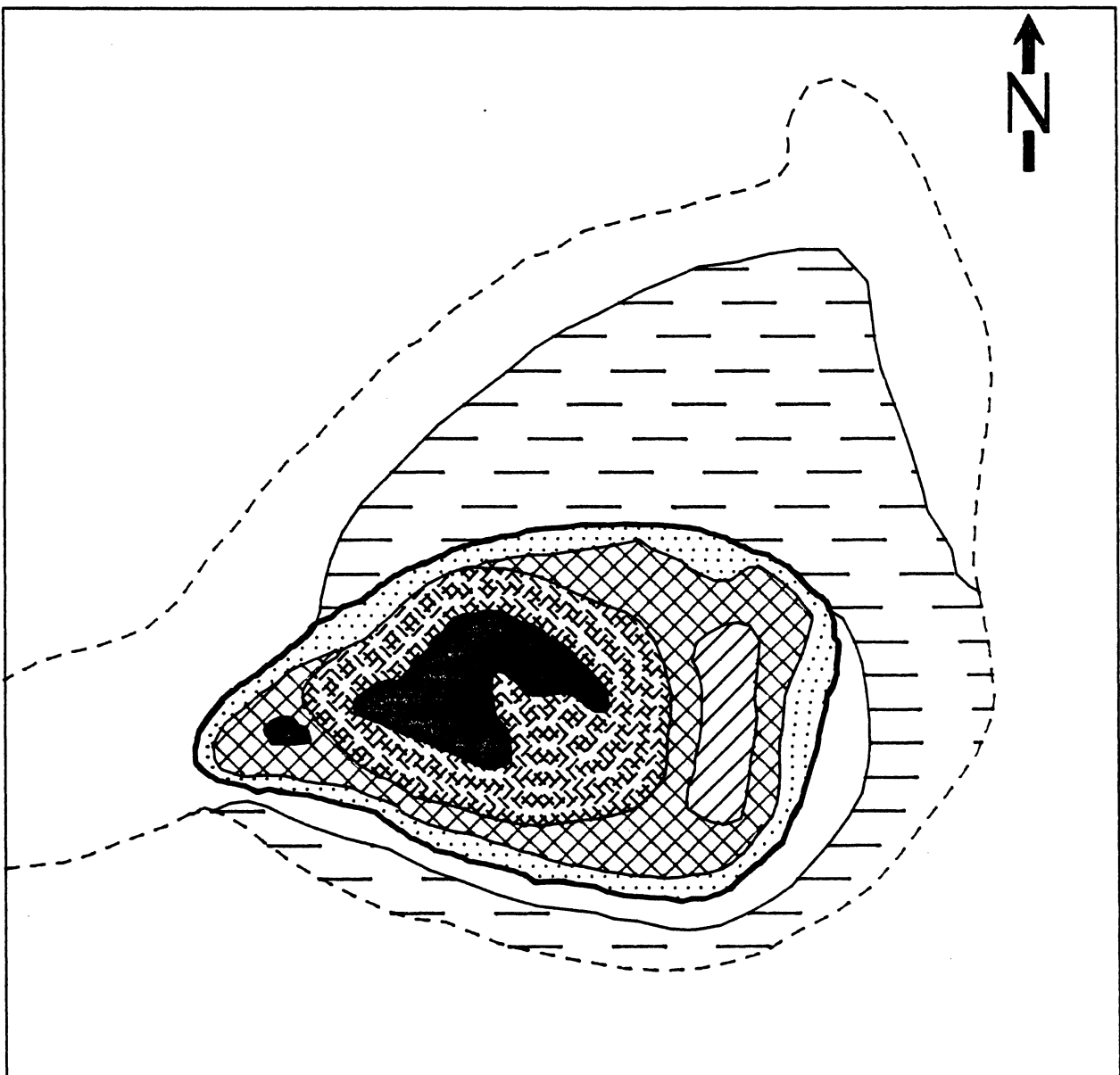
Least tern, brown pelican

III. Recommended usage: Conservation

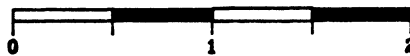
IV. Comments

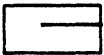
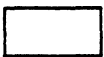
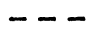
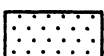
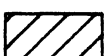
This island is located within the Indian River Lagoon Aquatic Preserve and is used extensively as a nesting site by brown pelicans, herons and egrets and as a overwintering site by migratory birds. Consequently, it should be posted off limits to boaters to minimize disturbance to these birds.

SPOIL ISLAND BC51



1 in = 35 m



	Australian pine 0.293 hectares		Shoal grass
	Mangroves 0.179 hectares		Unvegetated bottom
	Pond 0.066 hectares		< 1 m deep
	Sand 0.054 hectares		
	Brazilian pepper 0.042 hectares		

ISLAND NO. BC52

Date Sampled: 20 January 1988

I. Physical Description

- A. Island Size: 0.612 ha
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 2.5 km west of Long Point Park
- D. Distance and Direction from Channel Marker: 400 m west of marker 55
- E. Erosion: Slight; low cliff on E
- F. Boating access: Southwest, 1.0 meters deep; sand spit

II. Biological Description

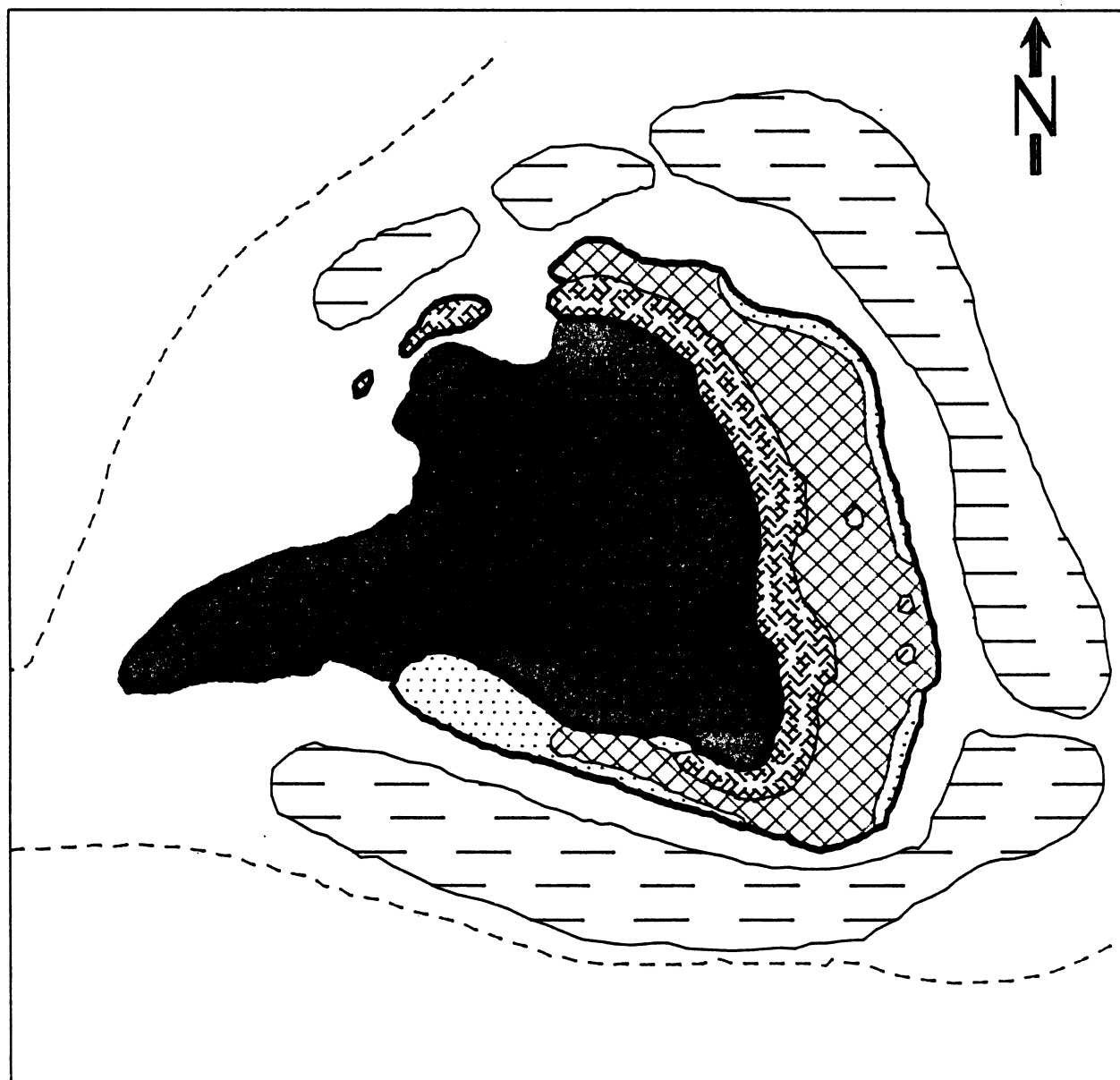
- A. Dominant Terrestrial Vegetation
Brazilian pepper (63.6%), Australian pine (38.6%), black mangrove (27.3%), white mangrove (27.3%), cabbage palm (22.7%), sea oxeye (18.2%), sea purslane (13.6%), red mangrove (11.4%); 22 species total
- B. Soil humus: 1-2 cm
- C. Seagrasses
Shoal grass on N, E, S
- D. Bird Usage
Nesting great blue heron; also snowy egret, little blue heron, black-crowned night heron, great egret, brown pelican, American oystercatcher, Caspian tern; 19 species total
- E. Common Fishes and Invertebrates
Tidewater silversides, goldspotted killifish, mojarra, red drum, pinfish; 11 species total
- F. Threatened, endangered or species of special concern
Little blue heron, snowy egret, American oystercatcher, brown pelican

III. Recommended usage: Conservation

IV. Comments

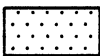
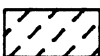
This island is located within the Indian River Lagoon Aquatic Preserve. A cove on its west shore is fringed with mangroves that provide nesting sites for brown pelicans, herons and egrets. Consequently, it should be posted off limits to boaters to minimize disturbance to the birds.

SPOIL ISLAND BC52



1 in = 39 m



- | | | | |
|---|-----------------------------------|---|-----------------------|
|  | Australian pine
0.325 hectares |  | Shoal grass |
|  | Mangroves
0.170 hectares |  | Unvegetated
bottom |
|  | Sand
0.113 hectares |  | < 1 m deep |
|  | Cabbage palm
0.004 hectares | | |
|  | Deep cove | | |

ISLAND NO. BC52A

Date Sampled: 26 November 1987

I. Physical Description

A. Island Size: 0.371 ha

B. Height Above Mean High Water: 1 m

C. Distance from Boat Ramps: 2.0 km west of Long Point Park

D. Distance and Direction from Channel Marker: 400 m west of marker 58

E. Erosion: Moderate; low cliff on NE

F. Boating access: North, 2.5 meters deep; sand beach

II. Biological Description

A. Dominant Terrestrial Vegetation

Australian pine (70.6%), Brazilian pepper (58.8%), black mangrove (23.5%), sea oxeeye (23.5%), red mangrove (17.6%), cabbage palm (11.8%), white mangrove (11.8%); 19 species total

B. Soil humus: none

C. Seagrasses

Shoal grass on N, E, S

D. Bird Usage

Osprey, brown pelican, little blue heron; 8 species total

E. Common Fishes and Invertebrates

Permit, tidewater silversides, bay anchovy, mojarra, red drum, striped mullet; 9 species total

F. Threatened, endangered or species of special concern

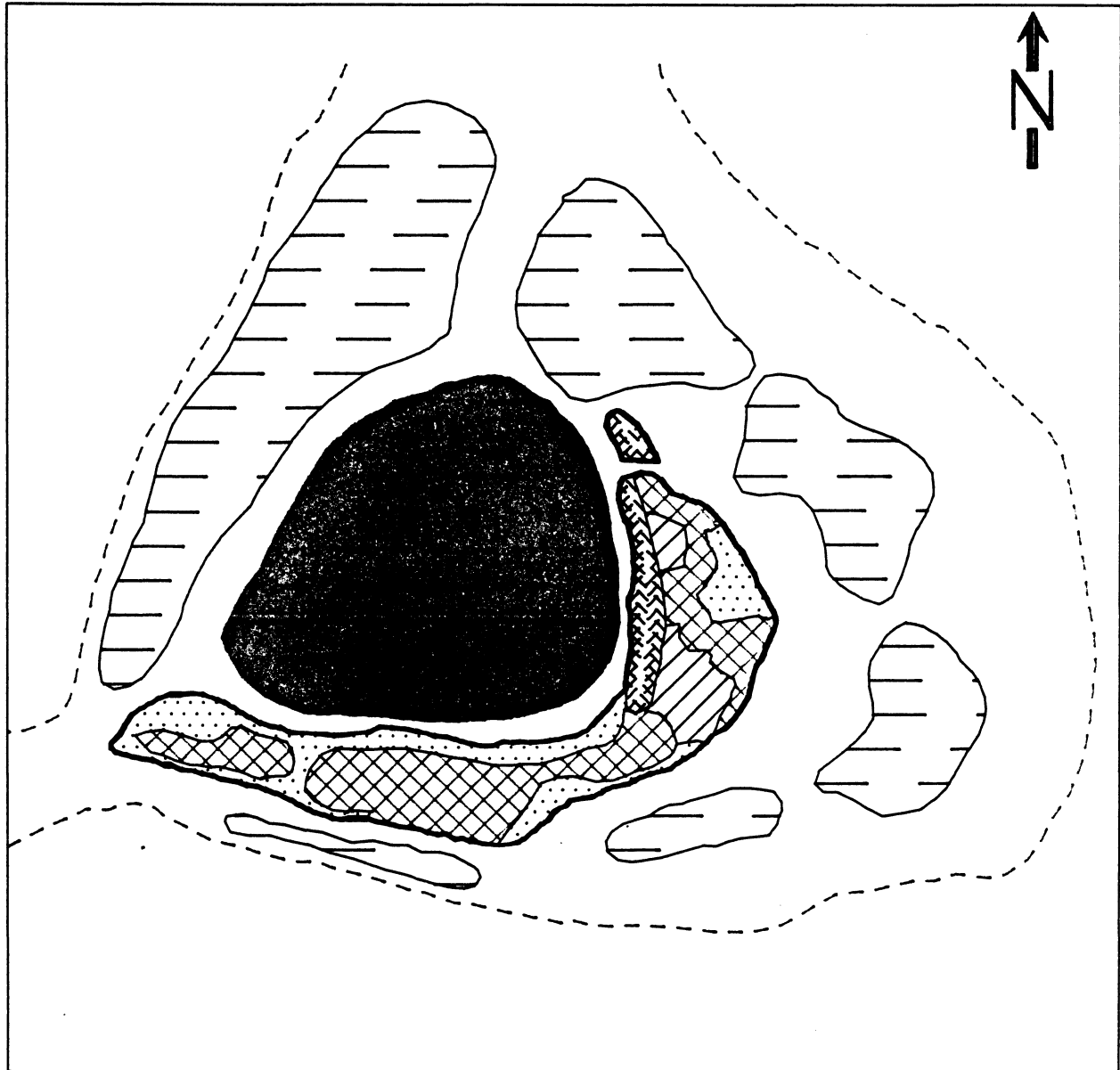
Osprey, little blue heron

III. Recommended usage: Passive Recreation

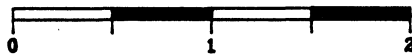
IV. Comments

This island is located within the Indian River Lagoon Aquatic Preserve. It is small but has open areas for picnicking and camping.

SPOIL ISLAND BC52A



1 in = 33 m



	Australian pine 0.180 hectares		Shoal grass
	Sand 0.113 hectares		Unvegetated bottom
	Brazilian pepper 0.039 hectares		< 1 m deep
	Mangroves 0.039 hectares		
	Deep cove		

ISLAND NO. BC53

Date Sampled: 17 November 1987

I. Physical Description

A. Island Size: 0.686 ha

B. Height Above Mean High Water: 1-2 m

C. Distance from Boat Ramps: 2.0 km southwest of Long Point Park

D. Distance and Direction from Channel Marker: 500 m northwest of marker 59

E. Erosion: Slight; low cliff on E

F. Boating access: Southwest, 1.5 meters deep; sand spit

II. Biological Description

A. Dominant Terrestrial Vegetation

Sea oxeye (41.2%), Brazilian pepper (38.2%), red mangrove (38.2%), Australian pine (26.5%), white mangrove (26.5%), black mangrove (23.5%), sea purslane (17.6%); 26 species total

B. Soil humus: 1-5 cm

C. Seagrasses

Shoal grass on N, E, S

D. Bird Usage

Nesting great blue heron; also brown pelican, osprey; 7 species total

E. Common Fishes and Invertebrates

Bay anchovy, mojarra, tidewater silversides, naked goby; 10 species total

F. Threatened, endangered or species of special concern

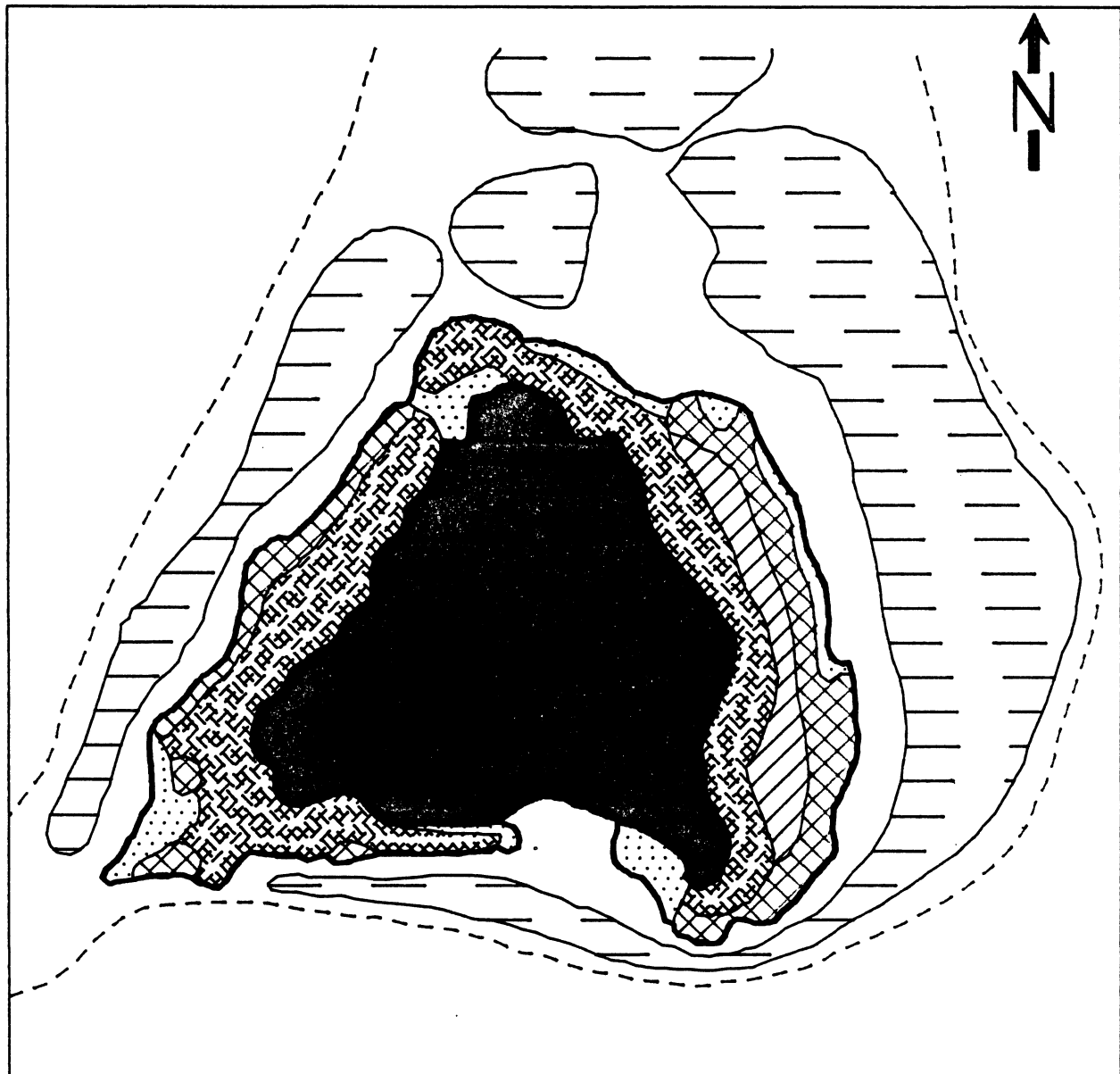
Osprey, brown pelican

III. Recommended usage: Conservation

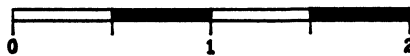
IV. Comments

This island is located within the Indian River Lagoon Aquatic Preserve and contains a mangrove fringed cove which provides nesting habitat for brown pelicans, herons and egrets. Consequently, it should be posted off limits to boaters to minimize disturbance to these birds.

SPOIL ISLAND BC53



1 in = 37 m



- | | | | |
|---|------------------------------------|---|-----------------------|
|  | Mangroves
0.365 hectares |  | Shoal grass |
|  | Australian pine
0.157 hectares |  | Unvegetated
bottom |
|  | Sand
0.096 hectares |  | < 1 m deep |
|  | Brazilian pepper
0.068 hectares | | |
|  | Deep cove | | |

DISCUSSION

Spoil islands extend the entire length of Brevard county's Indian River Lagoon, from Haulover Canal to Sebastian Inlet. The islands located in the northern and southern portions of the lagoon are distinctly different in their terrestrial vegetation and marine fauna. The vegetative differences are evident at first glance when approaching an island. A boater in the Titusville area will see low islands, nearly devoid of tall trees, in particular the Australian pines which grow so profusely on the mainland. These islands are situated in a large, open bay which provides little protection from strong winds and waves and as a result few of the northern islands have established dense thickets like those Brazilian pepper stands so common on their southern counterparts. The areas which would be covered by these thickets in the south, are instead left barren, with only a low cover of asters, purslanes, and grasses. These islands are too far north for red mangroves to survive and only the largest of the islands support forests of native trees such as black and white mangroves, buttonwoods, privets, wax myrtles, and red cedars. In fact, most of the birds seen in this area are found nesting and loafing in the privets and mangroves of the four large islands, BC1, BC5, BC28, and BC30. Two of these (BC1 and BC5) are covered with thousands of nesting egrets and ibises throughout most of the year.

Not surprisingly, the fish communities around these northern islands have a lower diversity than those in the south. Though the grassbeds surrounding these islands are similar to those near Sebastian Inlet, 100 km away, they are essentially physically isolated from the ocean's influence. The most abundant resident fish species around these islands are the cyprinodontid killifishes and pipefishes. Spotted seatrout are plentiful, but the number of transient species is limited, with tidewater silversides, redfin needlefish, and

young migrating striped mullet and spot making up the majority.

The islands of the southern chain, on the other hand, are characterized by mangrove fringes along the shore, Australian pine forests behind the mangroves, and dense Brazilian pepper thickets in the island's center. These islands are generally larger and taller than those in the north; the Indian River Lagoon is much narrower in this area, limiting the wind speed and wave size. Red mangroves are abundant, as well as the heartier black and white mangroves, having become established on nearly every island.

Great blue herons nesting in the Australian pines and brown pelicans and egrets nesting in the mangroves are a common sight on many of the islands. Five of the islands harbor concentrated rookeries and are designated for conservation.

Though the surrounding grassbeds are equivalent to those in the north, the fish communities utilizing them are considerably different. The killifishes and silversides make up a much lower percentage of the population than do the seasonal migrating juveniles of pigfish, Atlantic croaker, red drum, pinfish, sheepshead, and mojarra. Shrimp and blue crabs are also captured in higher densities. Multitudes of offshore species use these areas as nursery grounds; juveniles of southern and gulf flounders, gag groupers, trunkfish, scorpionfish, and sargassumfish are often captured in seines around these islands.

Overall, Brevard county islands have high faunal and moderately high floral diversities; 170 invertebrate, fish, reptile, bird, and mammal species (83% of the total animal species) and 146 plant species (55% of the total plant species) were found in Brevard county. In addition these islands support 23 animal and 13 plant species that were not found in any other county. Animals observed only on Brevard islands include the peregrine falcon, American kestrel, pintail duck, greater and lesser scaup, American coot, barn owl, glossy

ibis, black-throated blue warbler, yellow throated warbler, oyster toadfish, sea cucumber, horseshoe crab and spiny lobster. Plant species observed only on Brevard islands include southern red cedar, cattail, hackberry, dudaim melon, tough bumelia, rabbit bells, summer grape, saltmarsh mallow, lion's ear, and blue heart. The high diversities found in Brevard county may be due, in part, to the habitat differences between the northern and southern island groups.

In an effort to determine the feasibility of enhancing the floral diversity further, pilot scale revegetation projects have taken place on some Indian River Lagoon spoil islands. The earliest projects were done in Indian River County. Island IR38 was revegetated in September 1983 by the Florida Game and Freshwater Fish Commission (Fernald *et. al* 1985), using 300 plants representing 20 species of upland hammock trees. Another island was revegetated in February 1989 with 600 plants representing 10 species as part of a Boy Scout eagle project. Four Indian River County islands were revegetated by staff of the Bureau of Aquatic Preserves in October 1988 as a part of the spoil island study. Four hundred plants representing 22 different species of upland hammock trees were planted under a canopy of Australian pines on each island. In 1989, the project was expanded to include islands in Brevard, St. Lucie, and Martin Counties. Plant species that showed promise for high survival in 1988 were chosen again; substitutions were made for the remainder. The islands, including three in Brevard County (BC49, BC51, AND BC52), were each revegetated with 400 plants representing 23 upland hammock species in October of 1989. Present staff efforts are focused on monitoring growth and survival of the plants for both the 1988 and 1989 projects. Survival of the plants has varied by island and by species, but at present, establishment of small native tropical hammocks on several spoil

islands looks promising. Many trees on island IR38, the earliest planting, have grown six meters or more in the six years since they have been planted. The establishment of native tropical hammocks on these islands will increase bird and wildlife utilization of the islands, provide excellent opportunities for education and research and increase the aesthetic value of the islands.

Two previous spoil island surveys have included some of the Brevard county islands. Lewis and Lewis (1978) surveyed plants on both spoil islands and natural islands from Haulover canal to Sebastian inlet and reported data on eight of the spoil islands (BC5, BC6, BC28, BC30, BC34, BC35, BC51, and BC53). All eight of the islands have undergone an increase in the number of plant species (31-124%) over the 11 year time span between their study and the present one.

Schreiber and Schreiber (1978) surveyed sea and wading bird colonies on both spoil islands and natural islands from Haulover canal and Sebastian inlet and found many of the same nesting and roosting sites as this study. However, they found no brown pelicans, laughing gulls, or royal terns nesting on Brevard county spoil islands whereas the present study did recognize two islands used as nesting sites by the brown pelican (BC1 and BC39) and one by the laughing gull and royal tern (BC6). The 1978 study noted least terns nesting on BC48 and on the sandy spit between BC44A and BC44B, however, no such nesting sites were observed during this study, although least terns were commonly seen around many islands. Black skimmers were observed roosting on islands in the northern group by Schreiber and Schreiber but none were reported to be nesting. Black skimmers were seen nesting on island BC6, however, during this study in June of 1988.

Management Recommendations

Since the spoil islands of Brevard County are divided into two smaller chains separated by a considerable distance, they need to be managed as separate island groups. Each group is located in the vicinity of a population center; Titusville in the north and Melbourne and Grant in the south. Boaters in one area are not likely to be willing (or able) to travel the entire length of Brevard county to visit a specially designated island (conservation, education and active recreation) if it is located in the other area. In order to alleviate this problem, the specialty designations were assigned to islands in both the northern and southern areas. Table 1-2 lists all Brevard County spoil islands, their ownership, and recommended classifications.

Table 1-2. Recommended management classifications of Brevard County Spoil Islands

Island Number	Ownership	Classification
BC1	USA	Conservation
BC2	USA	Passive Recreation
BC4	State	Passive Recreation
BC5	State	Conservation
BC6	State	Conservation
BC8	State	Passive Recreation
BC9	State	Passive Recreation
BC10	State	Passive Recreation
BC11	State	Passive Recreation
BC12	State	Passive Recreation
BC14	State	Passive Recreation
BC15	State	Passive Recreation
BC16	State	Passive Recreation
BC17	State	Passive Recreation
BC18	State	Passive Recreation
BC28	State	Education
BC29	State	Passive Recreation
BC30	State	Passive Recreation
BC32	State	Passive Recreation
BC33	State	Passive Recreation

BC34	State	Passive Recreation
BC35	State	Active Recreation
BC36	State	Passive Recreation
BC37	State	Passive Recreation
BC38	State	Passive Recreation
BC39	State	Conservation
BC40	State	Passive Recreation
BC42	State	Passive Recreation
BC43	State	Passive Recreation
BC44A	State	Passive Recreation
BC44B	State	Active Recreation
BC45	State	Active Recreation
BC46	State	Active Recreation
BC47	State	Active Recreation
BC48	State	Education/Active Recreation
BC49	State	Conservation
BC50	State	Passive Recreation
BC51	State	Conservation
BC52	State	Conservation
BC52A	State	Passive Recreation
BC53	State	Conservation

The northern group consists of twenty-two islands, most of which are much smaller than those in the south. Only four of the islands (BC1, BC5, BC28, and BC35) are of sufficient size to support recreational or educational facilities. Of these, two (BC1 and BC5) are important bird rookeries and should be avoided during the breeding season from February to August. In fact these islands should remain off limits to boaters altogether. Of the two remaining islands, one has been recommended for active recreation (BC35) and one for education (BC28). Both of these islands have deep water access and open sand beaches, as well as camping, picnicking and hiking areas; BC35 even harbors a fresh water spring. The remaining seventeen islands have been designated passive recreation and have essentially no restrictions on them.

The southern chain consists of nineteen islands, all large enough for some kind of human activity and most are easily accessed by boat. Of these nineteen islands, five were designated for conservation, four for active recreation, one for education, and the remaining nine for passive recreation. The five conservation islands (BC39, BC49, BC51, BC52, and BC53) are important bird rookeries and should be avoided during February to August breeding season, if not altogether. The four islands designated for active recreation (BC44B, BC45, BC46, and BC47) are all very large, contain deep water access along the Atlantic Intracoastal Waterway, and have open areas suitable for camping and limited construction. Two of the islands (BC46 and BC48) are presently managed by the Brevard County Division of Parks and Recreation. These islands already have picnicking and sanitary facilities available on them and are known as the Geil Grange Islands North and South. The island BC48 has been classified as an education island for two reasons. First, it already has covered picnic areas, grills, bathroom facilities, and a newly constructed boat dock, all provided by the Brevard County Division of Parks and Recreation. Second, it has a diverse flora and fauna, including large grassbeds in shallow water plus associated fish communities, native plant species (red, black, and white mangroves), exotic nuisance plant species (Brazilian peppers and Australian pines), and dozens of resident and migratory bird species. The remaining nine islands have been designated passive recreation.

These initial management recommendations can be expanded in the future as actual management of the islands becomes a reality. For instance, developing docks and an interpretive trail on the designated education island would provide greater access and educational opportunities to the public. Many of the islands designated for active recreation have dense Brazilian pepper stands in the central portion which could be cleared

and replanted with native vegetation or used as picnic or camping areas. Strategies such as these would both enhance the spoil islands and provide greater public access to relatively underutilized state lands.

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INDIAN RIVER COUNTY
SPOIL ISLAND MANAGEMENT PLAN

Tom Gardner
Executive Director
Florida Department of Natural Resources

This plan was prepared by
Nancy Brown-Peterson and Ross W. Eames
The Bureau of Aquatic Preserves
Division of State Lands

Preparation of this management plan was supported by funding from
the Florida Inland Navigation District

EXECUTIVE SUMMARY

The Indian River County Spoil Island Management Plan is one of four parts of a comprehensive Indian River Lagoon Spoil Island Management Plan. The fifty-five islands included in this portion of the plan are located between Sebastian Inlet and the Indian River/St. Lucie County line in the Indian River Lagoon. Three of the islands are owned by the United States Government, eight are owned by private parties, one island is owned by the Florida Inland Navigation District and the remaining forty-four islands are owned by the State of Florida. The objectives of the Indian River County Spoil Island Management Plan are to provide current biological data and recommend appropriate management classifications for all the islands in Indian River County.

A total of 174 species of plants and 136 species of animals were collected or observed on the fifty-five islands. The majority of the islands had seagrass beds on at least one side of the island. In general, both floral and faunal diversity is high on Indian River County islands. Twenty-six species of plants and twelve species of animals were found exclusively on Indian River County islands. Nine of the islands serve as important bird rookeries and over-wintering sites.

Indian River County spoil islands were divided into four management classifications based on physical structure, ecological importance and historical use. Of the forty-seven state and federally owned islands surveyed, three are recommended for active recreation, fourteen for passive recreation, four for education and twenty-six for conservation. Additionally, three of the privately owned islands are recommended for recreation while five are recommended for conservation.

ACKNOWLEDGEMENTS

This management plan could not have been completed without the help of a number of people. We would like to thank Kellie Pendoley, David Rydene, David Singewald and Mary Crawford Dominic for their many hours of help in the field during the spoil island survey. Jane Brooks spent many hours identifying the majority of the plants collected during the survey; Dr. Roy Woodbury and Dr. Jim Haeger identified the remainder of the plants. Thanks to all three of our botanists. The invertebrates we collected were identified by Paul Mikkelsen and Kalani Cairns. Dr. R. Grant Gilmore provided valuable insights into the fish collection. A special thanks to Paul Mikkelsen for setting up all the computers and writing all the computer programs for this project. Without his expertise this management plan would not have been a reality. Charissa Baker drew the cover illustration and Figure 2-1. David Rydene and Paul Mikkelsen reviewed and made helpful comments on the manuscript. Finally, a thanks to all the staff of the Indian River Lagoon Aquatic Preserves for their many helpful comments and suggestions during the course of this project. This project was funded in its entirety by the Florida Inland Navigation District through contracts with the Florida Department of Natural Resources, Bureau of Aquatic Preserves.

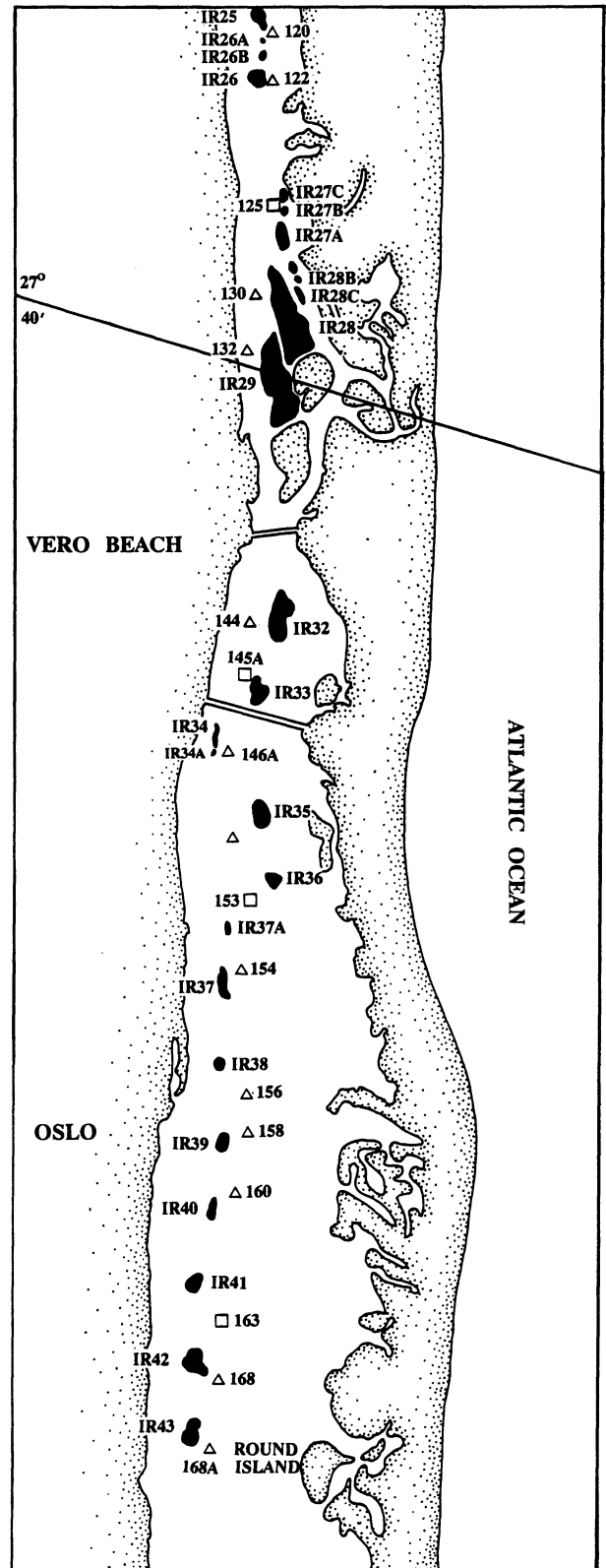
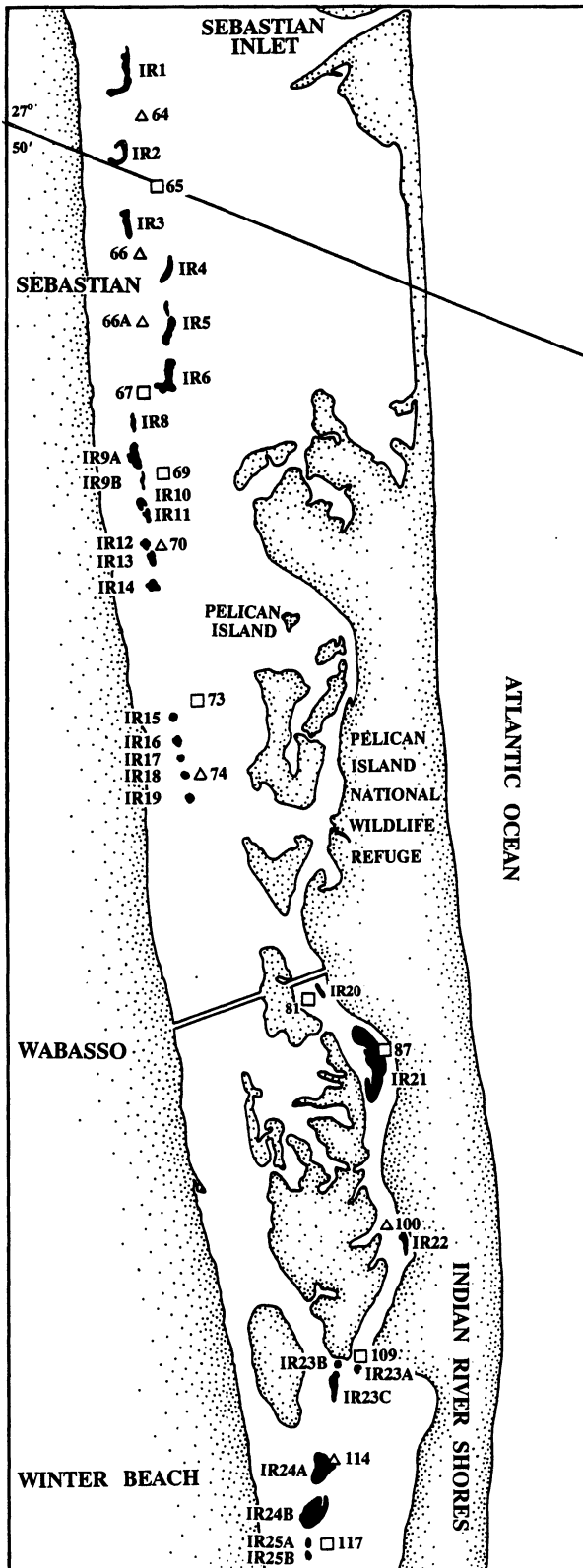
INTRODUCTION

The Indian River County Spoil Island Management Plan is one of four parts of a comprehensive Indian River Lagoon Spoil Island Management Plan. The purpose of the Spoil Island Management Plan is to provide both current, accurate biological data on all spoil islands in the Indian River Lagoon and to recommend an appropriate use for each island based on the summarized biological information. Local city and county governments will be able to set management guidelines for spoil islands in their jurisdictions using the information provided in the plan. Additionally, these guidelines will help the Florida Marine Patrol, staff of the Indian River Lagoon Aquatic Preserves and State Lands enforcement personnel more effectively manage public use of the spoil islands.

General Information on Indian River County Spoil Islands

The Indian River County section of the management plan encompasses spoil islands in the 38.7 km portion of the Atlantic Intracoastal Waterway within Indian River County. There are a total of 55 spoil islands in Indian River County, occurring throughout the county from the Brevard to the St. Lucie county lines (Fig. 2-1). The 41 northern islands are in the Malabar to Vero Beach Indian River Lagoon Aquatic preserve, while the ten southern islands are in the Vero Beach to Ft. Pierce Indian River Lagoon Aquatic Preserve. Islands IR20, IR21, IR24A, IR24B, IR27A, IR27B, IR27C, IR28, and IR29 and some portions of islands IR23C, IR32 and IR33 were present prior to 1951. The islands north of Wabasso were created when the Atlantic Intracoastal Waterway was dredged to 12 feet

Figure 2-1. Indian River County spoil islands.



between April 1957 and January 1958; the remainder of the islands were created by dredging between October of 1958 and June 1960 (U.S. Army Corps of Engineers, pers. comm.). All of the islands in Indian River County are owned by the State of the Florida with the exception of six islands owned by the Lost Tree Village Corporation (IR23A, IR23B, IR28, IR28B, IR28C and the northern half of IR29), two islands privately owned by individuals (IR20 and IR28A), three islands owned by the United States government (IR27A, IR27B and IR27C) and one island owned by the Florida Inland Navigation District (the southern half of IR29). In addition, the Vero Beach Boat Club is pursuing a management agreement with the State of Florida for the management of island IR25. The state and federally owned spoil islands are encumbered by an easement to the Florida Inland Navigation District to use the islands for the disposal of dredge material derived from maintenance of the Atlantic Intracoastal waterway. The 55 islands in Indian River County were surveyed between November 4, 1987 and January 31, 1989. Additionally, 38 of the state-owned islands were cleaned between May and October of 1988 as part of the spoil island clean-up program initiated by the Florida Inland Navigation District.

Management Authority

The primary management authorities available for implementing management directives affecting Indian River County spoil islands are found in Chapters 253 and 258, Florida Statutes (F.S.). Chapter 253 concerns all state-owned submerged lands while Chapter 258 is specifically concerned with aquatic preserves. Since all but four of the Indian River County spoil islands are in either the Malabar to Vero Beach Aquatic Preserve or the Vero Beach to Fort Pierce Aquatic Preserve, both chapters are applicable.

These authorities clearly establish the proprietary management role of the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund, who are variously referred to as the "Trustees" or the "Board". Furthermore, all management responsibilities assigned to the Trustees by this plan may be fulfilled directly by the Governor and Cabinet or indirectly via staff or agents of the Trustees, pursuant to delegations of authority, management agreements, or other legal mechanisms.

Chapters 18-20 and 18-21, Florida Administrative Code (F.A.C.), are two administrative rules directly applicable to the DNR's/Trustee's actions regarding allowable uses of submerged lands in general (18-21) and both aquatic preserves (18-20) and spoil islands (18-21.012) in particular. In addition, the Conceptual State Lands Management Plan, adopted on March 17, 1981 by the Trustees, contains specific policies concerning spoil islands. Where these documents address the use of spoil islands, development is prohibited unless a greater public good can be demonstrated, and such development, with few exceptions, is limited to that serving water-dependent and recreational needs.

The Indian River Lagoon Aquatic Preserve Management Plan (Vero Beach to Fort Pierce), as adopted by the Trustees on January 22, 1985, and the Indian River Lagoon Aquatic Preserves Management Plan (Malabar to Vero Beach), as adopted by the Trustees on January 21, 1986, both contain program policy directives (Chapter III) that also affect the use and management of spoil islands. These directives include:

- 1) "managing all submerged lands within the aquatic preserve to ensure the maintenance of essentially natural conditions to ensure the propagation of fish and wildlife, and public recreation opportunities",

- 2) "developing a resource inventory and map natural habitat types within the aquatic preserve, with an emphasis on those habitat types utilized by threatened and/or endangered species",
- 3) "protecting and, where possible, enhancing threatened and endangered species habitat within the aquatic preserve",
- 4) "managing state-owned spoil islands within the aquatic preserve as bird rookeries and wildlife habitat areas", and
- 5) "encouraging public utilization of the aquatic preserve, consistent with the continued maintenance of its natural values and functions".

Thus, management of spoil islands as sovereignty submerged lands is mandated by the Trustees. This plan accomplishes the management directives as outlined above by:

- 1) providing a resource inventory and maps of vegetation and other habitats on the islands,
- 2) proposing guidelines for public use of the spoil islands that are consistent with their maintenance as essentially natural areas,
- 3) assigning a management designation to each of the islands that seeks to balance the following:
 - a) the island's value as wildlife habitat, including its function as a bird rookery,
 - b) the directive to maintain the islands in their natural state, and
 - c) the public good derived from permitting limited development on some islands for recreational purposes.

The Florida Inland Navigation District, which has a perpetual easement on many state-owned spoil islands, has consented to the use of the islands as outlined in this plan. The F.I.N.D. reserves the right to review and comment on any activities involved in implementing this plan.

Management Objectives

The Indian River Lagoon Aquatic Preserve Management Plan (Vero Beach to Fort Pierce), as adopted by the Trustees on January 22, 1985, and the Indian River Lagoon Aquatic Preserves Management Plan (Malabar to Vero Beach), as adopted by the Trustees on January 21, 1986, both contain clear resource management objectives (Chapter V) that direct ongoing activities in the preserve. As stated above, all but four of the Indian River County spoil islands are located within the boundaries of one of these two preserves, so these objectives apply to management activities on the islands as well. The objectives include:

- 1) becoming familiar with the plant and animal species and communities, and their locations,
- 2) monitoring communities for changes,
- 3) identifying areas and communities in need of restoration, and accomplishing that restoration,
- 4) coordinating efforts with other researchers, and
- 5) protecting communities from the impacts of human use.

This management plan has accomplished the first objective by providing a resource inventory and maps of vegetation and other habitats on the islands. The remaining

objectives are tasks that must be part of the ongoing responsibilities of personnel assigned to implement the plan. The second objective will be accomplished by undertaking a general island inspection program that will serve to monitor communities for changes that have occurred since the first resource inventory was conducted. The third objective, community restoration, has already been started. A pilot project to restore native hammock communities on certain spoil islands was undertaken in 1988 and again in 1989. Current efforts are focusing on monitoring the areas to determine the feasibility of undertaking large scale restorations. The fourth objective, coordinating research efforts, will be accomplished by publicizing the results of completed research through publishing and public speaking, continuing to conduct appropriate research on the islands, becoming familiar with related research both in the Indian River Lagoon and in similar estuaries, and promoting the use of the spoil islands for research by qualified persons. The fifth objective, community protection, is perhaps the most important of these goals if human use of these islands is to continue. This goal will be achieved by identifying sources of adverse human impact through the inspection program, and eliminating or minimizing them by:

- 1) notifying appropriate law enforcement officials of violations,
- 2) undertaking an information program to educate the general public about the ecology and proper use of the islands,
- 4) enlist public assistance, wherever possible, in litter control and reporting violations, and
- 3) promoting the use of management agreements whereby local government agencies and civic groups may "adopt an island" and assume responsibility for monitoring the island and implementing approved plans for its use.

Survey Methods

All of the measurements in the management plan are expressed in metric units. As an aid in converting metric units into more familiar English equivalents the following conversion table has been provided.

Metric Conversion Table

1 hectare (ha) = 2.49 acres

1 kilometer (km) = 0.62 miles

1 meter (m) = 3.25 feet

1 centimeter (cm) = 0.39 inches

The methods used for the biological survey of the spoil islands were identical for all the islands surveyed in the Indian River Lagoon to provide consistency to the data base. Each island was visited only once during the survey; thus, strong seasonal components are apparent in the flora and fauna listed for some of the islands, due to the breeding seasons of birds and fishes and the flowering seasons of plants. However, the species lists included in the management plan do provide a complete list of all flora and fauna observed on each island during the day of the survey. The date that each island was surveyed is noted in the accompanying island description.

All the birds visible on an island were counted and identified to species prior to disembarking on the island. In addition, any birds noticed while working on the island were also identified. Nests or evidence of bird nests were recorded although it was difficult to ascertain which species actually used the nests except during the breeding season. The

number of birds and bird nests were estimated on rookery islands that contained greater than 100 pairs of breeding birds. Any reptiles and mammals observed while on the islands were identified and recorded.

Ground truthing and on-site maps were made of each island to aid in producing vegetation maps and to get information for percentage of plant cover on each island. One north-south and one east-west transect line was laid out on each island and all plants within 1 cm and directly overhead of the line were recorded at each 10 m interval along the line. In addition, the areas of the island not on the transect lines were thoroughly searched for plant species. Species occurring on the island but not on the transect line were noted for inclusion in the overall species list of the island. Unknown species or species not previously recorded during the spoil island survey were pressed, identified and mounted for inclusion in the spoil island herbarium collection. Vegetation maps of each island were produced using ARC/INFO GIS mapping software with 1:2400 aerial photographs of the islands and the information obtained during ground truthing.

Each end of the two terrestrial transects was extended an additional 30 m into the water in order to determine submerged bottom contours and seagrass type, if any; records were made at each 10 m interval along the transect. This information along with aerial photographs was used to determine the extent of the seagrass beds around each island in order to determine boating accessibility. One 20 m long seine haul using a small net (4 m x 2 m with 3.2 mm mesh) was taken at each of the four locations around the perimeter of the island. All the fishes and invertebrates collected were identified to the lowest taxonomic level possible. Each species was assigned to one of four abundance categories: 1) rare, less than 5 individuals; 2) occasional, 5-20 individuals; 3) common, 21-50

individuals; and 4) abundant, greater than 50 individuals. Representative samples of the less common fish species in the survey were preserved in 10% formalin and later transferred to 70% isopropanol for confirmation of identification. The following references were used to identify species found on spoil islands:

Plants: Wunderlin (1982), Bell and Taylor (1982), Long and Lakela (1971), Stevenson (1969) and Radford *et. al* (1968).

Invertebrates: Barnes (1980).

Fishes: Robins *et. al* (1980), Robins *et. al* (1986), Hoese and Moore (1977) and Bohlke and Chaplin (1968).

Reptiles: Behler and King (1979).

Birds: Farrand (1988) and Robbins *et. al* (1966).

Mammals: Whitaker (1980).

Nomenclature follows the first reference listed for each category.

Criteria for Island Usage Classification

Spoil islands were assigned to one of three general usage categories based on the results of the biological survey: conservation, education, or recreation. Recreation islands were further subdivided into two categories: passive recreation and active recreation. Islands designated for passive recreation should contain no structures but use of the islands for picnics, sunbathing and primitive overnight camping would be permitted. Islands designated for active recreation could support the development of docks, picnic shelters, brick fireplaces or barbecue grills and perhaps sanitary facilities.

Criteria for classification as a conservation island include the presence of extensive seagrass beds, shallow water surrounding the island with no deep water access points, heavy mangrove fringe and little or no open beach access, breeding bird populations, rare or threatened plant species, a high percentage of native plants and high species diversity. Some conservation islands with high soil humus quality (greater than 10 cm) were also identified as potential sites for revegetation with native tropical hammock plants. Public use of conservation islands for recreational purposes should be discouraged although occasional use for bird watching or nature study by nature or conservation oriented groups or individuals would be appropriate, provided these activities are conducted outside of the breeding season.

Criteria for classification as an education island include historical use of the island for education, one or more deep water access points with open beaches, seagrass beds surrounding at least part of the island that contain high aquatic diversity, and a high plant species diversity including a healthy mangrove community and good representation of native plants. Furthermore, education islands should not have breeding bird populations. School children, scout troops and other groups desiring to learn more about the environment would be encouraged to visit islands set aside for education purposes. In the future these islands might be developed into small nature areas with interpretive trails.

Criteria for passive and active recreation islands are similar. Islands were classified for recreation if they had one or more deep water access points with open sand beaches, historical human usage, small or nonexistent seagrass beds, low species diversity, no rare or threatened species and no breeding bird populations. Passive recreation islands are small islands or densely vegetated islands that could not support the development of

structures. Active recreation islands are larger islands with open areas that could support construction of permanent facilities. The general public should be encouraged to use the islands designated for recreation for picnicking, sunbathing, swimming and primitive overnight camping.

RESOURCE INVENTORY

This section of the management plan comprises all the biological information gathered during the spoil island survey. Table 2-1 presents a complete list of all the flora and fauna collected during the spoil island survey; abundance information is presented for those species found in Indian River County. Vegetation maps and physical and biological descriptions of each island are included along with recommendations for the best use for each island. For a more detailed review of the management recommendations, see the discussion section of the plan.

The symbols for vegetation type on the maps are consistent throughout the entire management plan. Species that commonly occur together were represented by using one symbol for ease of interpretation. For instance, the symbol for mangroves includes red, black and white mangroves as well as buttonwood; these species are commonly intermixed, making them difficult to distinguish on a small scale map. The symbol for marsh represents saltwort, perennial glasswort, white and black mangrove marsh areas. The symbol for cordgrass represents both smooth cordgrass and marshhay cordgrass. Although Brazilian pepper often occurs under a canopy of Australian pine, areas such as these were coded with the Australian pine symbol when it was the dominant plant species. Sections of the maps showing Brazilian pepper usually indicate a dense, monospecific stand of that species.

Table 2-1. Species list of all plants and animals collected or observed on spoil islands from October 1987 - January 1989 with species found on Indian River County spoil islands indicated. "Undet." means the species was not determined. Plant Key: numbers are percent relative frequency of occurrence, X=present on island but not on transect line. Invertebrate/Fish Key: R=rare (1-4 individuals), O=occasional (5-20 individuals), C=common (21-50 individuals), A=abundant (>50 individuals). Bird/Reptile/Mammal Key: number of individuals seen is indicated.

		INDIAN RIVER COUNTY ISLAND NUMBER																											
		1	2	3	4	5	6	8	9A	9B	10	11	12	13	14	15	16	17	18	19	20	21	22	23A	23B	23C	24A	24B	
FUNGI																													
1.	Bracket fungus undet.		X		X			X			X								X		X	X			X		X	X	
	Bracket fungus																								X				
2.	Mushrooms					X																						X	
	Mushrooms																												
PLANTAE																													
CHLOROPHYTA																													
SIPHONALES																													
CAULERPACEAE																													
3.	<i>Caulerpa</i> spp.																												
	<i>Caulerpa</i> algae																												
RHODOPHYTA																													
FLORIDEOPHYCIDAE																													
GIGARTINALES																													
GRACILARIACEAE																													
4.	<i>Gracilaria</i> spp.																												
	Drift algae																												
PTERIDOPHYTA																													
POLYPODIACEAE																													
5.	<i>Phlebodium aureum</i>																												
	Golden polypody																												
6.	<i>Polypodium polypodioides</i>																												
	Resurrection fern																												
DAVALLIACEAE																													
7.	<i>Nephrolepis cordifolia</i>																												
	Boston fern																												
PTERIDACEAE																													
8.	<i>Acrostichum danaeifolium</i>																												
	Giant leather fern																												
9.	<i>Pteris vittata</i>																												
	Ladder brake																												
GYMNOSPERMAE																													
CONIFERAE																													
ARAUCARIACEAE																													
10.	<i>Araucaria excelsa</i>																												
	Norfolk Island pine																												
CUPRESSACEAE																													
11.	<i>Juniperus silicicola</i>																												
	Southern red cedar																												
ANGIOSPERMAE																													
MONOCOTYLEDONAE																													
TYPHACEAE																													
12.	<i>Typha latifolia</i>																												
	Common cattail																												
CYMODOCEACEAE																													
13.	<i>Halodule wrightii</i>	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X			X	X	X	X	X	X	X	X	
	Shoal grass																												
14.	<i>Syringodium filiforme</i>																												
	Manatee grass																												
HYDROCHARITACEAE																													
15.	<i>Halophila johnsonii</i>																												
	Johnson's sea grass																												
16.	<i>Thalassia testudinum</i>																												
	Turtle grass																												
POACEAE																													
17.	Grasses undet.	X	1			X	X	X		X			X																
	Unidentified grasses																												
18.	<i>Andropogon glomeratus</i>	X																											
	Bushy bluestem																												
19.	<i>Andropogon virginicus</i>																												
	Broom sedge																												
20.	<i>Cenchrus incertus</i>																												
	Coast sandspur																												
21.	<i>Chloris</i> spp.																												
	Finger grass																												
22.	<i>Cortaderia selloana</i>																												
	Pampas grass																												
23.	<i>Dactyloctenium aegyptium</i>	1	X		X	X				X		X												X					
	Crow's foot grass																												
24.	<i>Distichlis spicata</i>	4	5	1	X	X		17	X	X	X		X	X	X	3		X							X	X			
	Saltgrass																												
25.	<i>Panicum maximum</i>																												
	Guinea grass																												
26.	<i>Paspalum</i> spp.	X				X	X																						
	Bahia grass																												
27.	<i>Rhynchelytrum repens</i>		X		X								X																
	Natal grass																												
28.	<i>Spartina alterniflora</i>		X	1				X		X												X					X	1	
	Saltmarsh cordgrass																												
29.	<i>Spartina patens</i>	X	X	X		X	X	2					X																
	Saltmeadow cordgrass																												
30.	<i>Sporobolus</i> spp.																												
	Sporobolus grass																												
31.	<i>Uniola paniculata</i>																												
	Sea oats																												
CYPERACEAE																													
32.	<i>Cyperus ligularis</i>	1				X							3	X	X														
	Sedge																												
ARECACEAE																													
33.	<i>Chamaedorea</i> spp.																												
	Dwarf cluster palm																												

	INDIAN RIVER COUNTY ISLAND NUMBER																												
	25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	40	41	42	43	
1.			X			X								X	X		X		X				X		X	X	1	X	
2.			X									X							X									X	
3.																													
4.																													
5.																													
6.										X																			
7.										2				0.1															
8.										0.1																			
9.										1																			
10.																													
11.																													
12.																													
13.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X	X	
14.						X																		X	X	X	X	X	
15.																													
16.			X			X					X			X	X								X						
17.						X					X												X					X	
18.										0.1																			
19.														0.1															
20.																													
21.														1												X		X	
22.																													
23.														X	X							X							
24.			X							X								X				X				X		X	
25.																													
26.																													
27.																													
28.							X			2				1								X	X	X			X	X	X
29.																													
30.	X																												
31.																													
32.										X				X												X		X	
33.																													

		INDIAN RIVER COUNTY ISLAND NUMBER																											
		1	2	3	4	5	6	8	9A	9B	10	11	12	13	14	15	16	17	18	19	20	21	22	23A	23B	23C	24A	24B	
34.	<i>Cocos nucifera</i> Coconut palm																												
35.	<i>Phoenix spp.</i> Date palm																												
36.	<i>Phoenix canariensis</i> Canary Island date palm																												
37.	<i>Sabal palmetto</i> Cabbage palm	11	5	7	2	3	X	2	9			X	X	X	X	9	X	4					X	X			2	X	
38.	<i>Serenoa repens</i> Saw palmetto			1					X																				
39.	<i>Washingtonia robusta</i> Washington palm																												
ARACEAE																													
40.	<i>Monstera spp.</i> Arrowhead vine																												
BROMELIACEAE																													
41.	<i>Tillandsia fasciculata</i> Cardinal air plant																												
42.	<i>Tillandsia recurvata</i> Ball moss	X		X		X	2		X		X	X		X	X	X					2	2	X	2	2	6	X	X	
43.	<i>Tillandsia usneoides</i> Spanish moss		X																			0.1	X	X	2	3	1		
44.	<i>Tillandsia utriculata</i> Pineapple air plant					X	X														X	8	X	2		11	X	X	
COMMELINACEAE																													
45.	<i>Commelina elegans</i> Dayflower																												
46.	<i>Rhoeo spathacea</i> Oyster-plant																												
47.	<i>Tradescantia fluminensis</i> Wandering jew																												
LILIACEAE																													
48.	<i>Aloe vera</i> Aloe																												
SMILACACEAE																													
49.	<i>Smilax spp.</i> Smilax																												
50.	<i>Smilax rotundifolia</i> Greenbrier																												
AGAVACEAE																													
51.	<i>Agave spp.</i> Century plant																												
52.	<i>Yucca aloifolia</i> Spanish dagger			X																									
AMARYLLIDACEAE																													
53.	<i>Amaryllis spp.</i> Amaryllis																												
54.	<i>Crinum spp.</i> Crinum lily																												
55.	<i>Hymenocallis spp.</i> Spider lily																												
IRIDACEAE																													
56.	<i>Sisyrinchium atlanticum</i> Blue-eyed grass																												
ORCHIDACEAE																													
57.	<i>Encyclia tampensis</i> Butterfly orchid																												
58.	<i>Habenaria odontopetala</i> Habenaria orchid																												
DICOTYLEDONAE																													
CASUARINACEAE																													
59.	<i>Casuarina spp.</i> Australian pine	30	31	30	33	44	56	17	23	23	36	52	33	30	42	21	27	29	4	4	18	30	37	23	12	3	11	13	
SALICACEAE																													
60.	<i>Salix caroliniana</i> Carolina willow																												
MYRICACEAE																													
61.	<i>Myrica cerifera</i> Wax myrtle																												
FAGACEAE																													
62.	<i>Quercus laurifolia</i> Laurel oak																												
63.	<i>Quercus virginiana</i> Live oak																												
ULMACEAE																													
64.	<i>Celtis laevigata</i> Hackberry																												
MORACEAE																													
65.	<i>Ficus spp.</i> Exotic fig tree																												
66.	<i>Ficus aurea</i> Strangler fig																												
67.	<i>Ficus nitida</i> Retus fig																												
68.	<i>Morus rubra</i> Red mulberry																												
URTICACEAE																													
69.	<i>Boehmeria cylindrica</i> False nettle																												
70.	<i>Parietaria floridana</i> Parietaria																												

	INDIAN RIVER COUNTY ISLAND NUMBER																											
	25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	40	41	42	43
34.																												
35.																												
36.																												
37.														0.1	X					X						X		3
38.																												
39.										0.1																		
40.																												
41.																												
42.	3	X	X			X	X	3	6		2	X		1	1		X			X		X		X	X	X	1	X
43.							X		2		X	3		X														
44.	3	3	X				X			0.1	2	X		X											X	X	1	X
45.																				X								
46.																												
47.																												
48.																												
49.														X														
50.																			5									
51.																												
52.																												
53.																												
54.														0.1														
55.																	X											
56.																												
57.																												
58.														X														
59.	37	13	21	31	9	30	12	9	2	16	17	10	13	10	47	26	24	13	35	53	14	29	49	31	44	34	42	33
60.																												
61.										2																		
62.																												
63.										0.1				2	X									X			1	
64.																												
65.																												
66.		2			3	2				1	X			1	8			1					X		1	1	4	X
67.																												
68.																												
69.																												
70.		X			X									X	X			X						X		X	X	

		INDIAN RIVER COUNTY ISLAND NUMBER																											
		1	2	3	4	5	6	8	9A	9B	10	11	12	13	14	15	16	17	18	19	20	21	22	23A	23B	23C	24A	24B	
POLYGONACEAE																													
71.	<i>Coccoloba diversifolia</i> Pigeon plum																												
72.	<i>Coccoloba uvifera</i> Sea grape		X	X	2		X	X		X	2		X	X		X	3	X	X	X	4		X	X	X		3		
73.	<i>Rumex</i> spp. Dock																												
74.	<i>Rumex hastatulus</i> Hastate-leaved dock																												
75.	<i>Rumex verticillatus</i> Swamp dock																												
CHENOPODIACEAE																													
76.	<i>Atriplex pentandra</i> Sand atriplex	2	X				2						X		X	X													
77.	<i>Chenopodium album</i> Lambsquarter	1	X										X																
78.	<i>Chenopodium ambrosioides</i> Mexican tea																												
79.	<i>Salicornia virginica</i> Perennial glasswort	X		X			X		X	X	X					X			X				1			2		10	X
80.	<i>Suaeda linearis</i> Sea blite	2	X				X					X			X	X	X										X		
AMARANTHACEAE																													
81.	<i>Blutaparon vermiculare</i> Samphire		2	2																			X						
82.	<i>Iresine diffusa</i> Bloodleaf	X	1																										
NYCTAGINACEAE																													
83.	<i>Boerhavia diffusa</i> Red spiderling	X		X												X													
84.	<i>Guapira discolor</i> Blolly															3				X	4								
BATACEAE																													
85.	<i>Batis maritima</i> Saltwort				X					X		X			X	X		X	X	2				X			16	1	
PHYTOLACCACEAE																													
86.	<i>Phytolacca americana</i> Pokeberry		X									X			X													X	
87.	<i>Rivina humilis</i> Rouge plant					X				X						X		9	9		2	X						1	
AIZOACEAE																													
88.	<i>Sesuvium portulacastrum</i> Sea purslane	1	3	2	X	1	X	8	X	2		X	X	X	X	3					X		X		X	2		X	
PORTULACACEAE																													
89.	<i>Portulaca oleracea</i> Purslane		X																										
90.	<i>Portulaca pilosa</i> Pink purslane																												
CARYOPHYLLACEAE																													
91.	<i>Stellaria media</i> Common chickweed																												
92.	<i>Stipulicida setacea</i> Stipulicida																												
MENISPERMACEAE																													
93.	<i>Cissampelos pareira</i> Moonseed																												
BRASSICACEAE																													
94.	<i>Cakile lanceolata</i> Sea rocket												X																
95.	<i>Lepidium virginicum</i> Poor man's pepper												X																
CRASSULACEAE																													
96.	<i>Kalanchoe pinnata</i> Life plant																												
97.	<i>Kalanchoe tubiflora</i> Chandelier plant																											X	
CHRYSOBALANACEAE																													
98.	<i>Chrysobalanus icaco</i> Coco-plum																												
FABACEAE																													
99.	<i>Abrus precatorius</i> Crab's eye																												
100.	<i>Canavalia rosea</i> Seaside bean	3	X	X	X	X		X				3	X	X	X								X						
101.	<i>Cassia</i> spp. Cassia																										X		
102.	<i>Cassia chamaecrista</i> Partridge pea																												
103.	<i>Cassia coluteoides</i> Cassia			X									3		X														
104.	<i>Caesalpinia bonduc</i> Gray nicker	X			X	X	X		X	2	X			X	X	9	X			4	X	1	X	X	X	X	1	X	1
105.	<i>Cassia marilandica</i> Wild senna																												
106.	<i>Crotalaria pallida</i> Rattlebox																												
107.	<i>Crotalaria rotundifolia</i> Rabbit bells																												
108.	<i>Dalbergia ecastophyllum</i> Coin vine	1	X	X				X		2							X							X	X			2	

	INDIAN RIVER COUNTY ISLAND NUMBER																											
	25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	40	41	42	43
71.																							X					
72.	3		X	X		1	X	X	X		X			X			X	X		X			X			X	1	X
73.																												X
74.																									X			
75.																									X			
76.																												
77.																										1	X	X
78.																												
79.	X		X		3		1		X	1	X	X	X	2	1		X					X		X	X	X	X	X
80.	X													X											X	4	X	X
81.	X								2	X			X								X							
82.			1							X																		
83.																												
84.										X	X		0.1				X						X					
85.			1				1	9	2	2	9	X	1	4	2		X							X	X			X
86.									X																	X		X
87.							X	3	X			5	5		0.1												X	
88.				X					X	0.1		X				1	X			5					X	X	X	
89.																												
90.																												
91.																												
92.									X					X													X	
93.																												
94.																												
95.																												
96.																												
97.																												
98.																												
99.																												
100.														X									X					
101.														1														X
102.																												
103.										1					0.1													
104.			1	3	X	X	1	3	2		X	X	1	1	2	X		X	X	X		X	X		X		X	
105.																												
106.																												
107.																												
108.		X					X															X	X			X	X	3

		INDIAN RIVER COUNTY ISLAND NUMBER																											
		1	2	3	4	5	6	8	9A	9B	10	11	12	13	14	15	16	17	18	19	20	21	22	23A	23B	23C	24A	24B	
109.	<i>Desmanthus virgatus</i> Desmanthus																												
110.	<i>Desmodium spp.</i> Tick trefoil																												
111.	<i>Desmodium triflorum</i> Beggars tick																												
112.	<i>Erythrina herbacea</i> Coral bean																												
113.	<i>Indigofera spicata</i> Short indigofera							X																					
114.	<i>Indigofera suffruticosa</i> Indigofera																												
115.	<i>Parkinsonia aculeata</i> Mexican palo verde																												
116.	<i>Ricinus communis</i> Castor bean																												
117.	<i>Sophora tomentosa</i> Necklace pod	X							X	4		X		X			3												
118.	<i>Vicia acutifolia</i> Vicia																						X						
119.	<i>Vigna luteola</i> Cow pea		X							2			X			X					X				X				
GERANIACEAE																													
120.	<i>Geranium spp.</i> Geranium																												
121.	<i>Geranium carolinianum</i> Crane's bill																												
OXALIDACEAE																													
122.	<i>Oxalis spp.</i> Wood sorrel																												
RUTACEAE																													
123.	<i>Amyris elemifera</i> Torchwood																												
124.	<i>Zanthoxylum clava-herculis</i> Hercules club																												
125.	<i>Zanthoxylum fagara</i> Wild lime																												
SURIANACEAE																													
126.	<i>Suriana maritima</i> Bay cedar																												
BURSERACEAE																													
127.	<i>Bursera simaruba</i> Gumbo limbo			X	2			X				X				X				1	X				1	X			
EUPHORBIACEAE																													
128.	<i>Chamaesyce spp.</i> Milk Spurge	1	X	2			X			2	X	X		5	X	X	X												
129.	<i>Chamaesyce hirta</i> Hairy spurge																												
130.	<i>Chamaesyce hysopifolia</i> Eye bane																												
131.	<i>Cnidoscolus stimulosus</i> Tread softly																												
132.	<i>Croton glandulosus</i> Glandular croton																												
133.	<i>Croton punctatus</i> Beach tea																												
134.	<i>Euphorbia spp.</i> Jacob's ladder																												
135.	<i>Jatropha curcas</i> Physic nut																												
136.	<i>Phyllanthus abnormis</i> Phyllanthus																												
137.	<i>Poinsettia cyathophora</i> Painted leaf																												
EMPETRACEAE																													
138.	<i>Ceratiola ericoides</i> Rosemary																												
ANACARDIACEAE																													
139.	<i>Rhus copallina</i> Winged sumac																												
140.	<i>Schinus terebinthifolius</i> Brazilian pepper	28	17	27	7	34	35	13	35	7	30	26	23	37	36	33	36	42	55	54	16	10	4	7	20	10	19	31	
AQUIFOLIACEAE																													
141.	<i>Ilex cassine</i> Dahoon holly																												
SAPINDACEAE																													
142.	<i>Dodonaea viscosa</i> Varnish leaf																												
143.	<i>Exothea paniculata</i> Inkwood																												
RHAMNACEAE																													
144.	<i>Krugiendendron ferreum</i> Black ironwood																												
VITACEAE																													
145.	<i>Ampelopsis arborea</i> Pepper vine																												
146.	<i>Parthenocissus quinquefolia</i> Virginia creeper																												
147.	<i>Vitis aestivalis</i> Summer grape																												

	INDIAN RIVER COUNTY ISLAND NUMBER																												
	25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	40	41	42	43	
109.										X																			
110.																													
111.																													
112.							X																						
113.																													
114.																													
115.															1		X												
116.																													
117.						X	X	X			2	X	1	X									X						
118.																													
119.									X					X											X	1		1	
120.																													
121.																													
122.																													
123.																													
124.			3			1				1							X						X		X	X	X	X	
125.							3				X			X									2						
126.																													
127.			X			1	X					X										X	1	X			X	X	
128.						X							X															X	
129.																													
130.																													
131.																													
132.																													
133.																													
134.							X																						
135.																													
136.																													
137.										1				X									5						
138.																													
139.										0.1																X		1	
140.			16	8	25	9	39	12	6	8	41	5	8	13	35	7	21	8	13	45	22	9	9	13	12	12	33	39	32
141.			X																								X		
142.																											1	3	
143.																													
144.			1				1																X						
145.																												1	
146.														X						4						X	X	X	
147.																													

		INDIAN RIVER COUNTY ISLAND NUMBER																											
		1	2	3	4	5	6	8	9A	9B	10	11	12	13	14	15	16	17	18	19	20	21	22	23A	23B	23C	24A	24B	
148.	<i>Vitis rotundifolia</i> Muscadine grape												X									X					X	2	
CAPPARACEAE																													
149.	<i>Capparis cynophallophora</i> Jamaica caper tree																											X	
150.	<i>Capparis flexuosa</i> Limber caper																					X				1			
MALVACEAE																													
151.	<i>Hibiscus</i> spp. Hibiscus cultivated)																												
152.	<i>Hibiscus tiliaceus</i> Mahoe				X								X		X														
153.	<i>Kosteletzkya</i> spp. Mallow																												
154.	<i>Kosteletzkya virginica</i> Saltmarsh mallow																												
155.	<i>Malvastrum corychorifolium</i> False mallow																												
156.	<i>Sida acuta</i> Broomweed																												
157.	<i>Sida rhombifolia</i> Indian hemp			X	X								5	7	X														
158.	<i>Thespesia populnea</i> Seaside mahoe																												
159.	<i>Urena lobata</i> Caesar weed																											1	
HYPERICACEAE																													
160.	<i>Hypericum hypericoides</i> St. Andrew's cross																												
PASSIFLORACEAE																													
161.	<i>Passiflora incarnata</i> Passion flower		X	X								X		X						X		X							
CARICACEAE																													
162.	<i>Carica papaya</i> Papaya																					1						1	
LOASACEAE																													
163.	<i>Mentzelia floridana</i> Poorman's patch																												
CACTACEAE																													
164.	<i>Cereus pteranthus</i> Snake cactus																										4		
165.	<i>Cereus undatus</i> Night-blooming cereus																										X		
166.	<i>Opuntia stricta</i> Prickly-pear cactus			X		X	X						X	X		3					X	X	X		3		X		
RHIZOPHORACEAE																													
167.	<i>Rhizophora mangle</i> Red mangrove	1	2	4	X	7	X	10	X	18	7	3		X	X	X	X	X	X	4	29	10	18	12	22	7	10	9	
COMBRETACEAE																													
168.	<i>Conocarpus erecta</i> Buttonwood	X	1	2		X	3	4	X	5	X	X	3	X	2	3	3	X		X	4	1	7	11	10	4	1	2	
169.	<i>Laguncularia racemosa</i> White mangrove	2	3	7	5	1	2	2	3	23	5	3	3	2	2	X	3	X	X	4	8	2	7	7	7	3	4	2	
MYRTACEAE																													
170.	<i>Eugenia axillaris</i> White stopper										2	3					6	X				5	X	4		2	X		
171.	<i>Eugenia foenida</i> Spanish stopper										X			X			3				X	3	1	X		4		1	
172.	<i>Myrcianthes fragrans</i> Twinberry																												
173.	<i>Psidium guajava</i> Guava																												
ONAGRACEAE																													
174.	<i>Gaura angustifolia</i> Gaura																												
175.	<i>Oenothera humifusa</i> Seaside evening primrose			X									X																
ARALIACEAE																													
176.	<i>Schefflera actinophylla</i> Australian umbrella tree																				X		1						
APIACEAE																													
177.	<i>Centella asiatica</i> Coinwort																												
178.	<i>Oxypolis filiformis</i> Water dropwort																												
ERICACEAE																													
179.	<i>Vaccinium stamineum</i> Deerberry													X															
MYRSINACEAE																													
180.	<i>Ardisia escallonioides</i> Marlberry																												
181.	<i>Rapanea punctata</i> Myrsine																					X				1			
PLUMBAGINACEAE																													
182.	<i>Limonium carolinianum</i> Sea lavender	1	X	1	X	1	2	X	X	2	2	X	X	2	X		X				X	2	1		5	X	3	2	2
183.	<i>Plumbago scandens</i> Wild plumbago																												
SAPOTACEAE																													
184.	<i>Bumelia celastrina</i> Saffron plum																												

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	INDIAN RIVER COUNTY ISLAND NUMBER																											
	25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	40	41	42	43
185.	X	X	8	6	3	10	12	X	2	6	5	3	X	6	1	1	X	X	1	3	X	X	2	X		1	2	X
186.																												
187.																												
188.																												
189.																												
190.																												
191.							1	1														X						
192.																												
193.																												
194.																												
195.																												
196.																												
197.																												
198.																												
199.																												
200.	X						X	X					X	0.1												X		X
201.																												
202.																												
203.																												
204.																												
205.																												
206.	7	19	12	13	33		17	21	16	3	21	20	17	8	9	31	19	13	2	6	14	12	13	11	11	4	2	5
207.																												
208.																												
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220.																												
221.																												
222.																												

		INDIAN RIVER COUNTY ISLAND NUMBER																											
		1	2	3	4	5	6	8	9A	9B	10	11	12	13	14	15	16	17	18	19	20	21	22	23A	23B	23C	24A	24B	
223.	<i>Ixora</i> spp. <i>Ixora</i>																												
224.	<i>Psychotria nervosa</i> Wild coffee																					0.1	X			4	X	X	
225.	<i>Randia aculeata</i> White indigo berry																												
CAPRIFOLIACEAE																													
226.	<i>Sambucus canadensis</i> Elderberry																											X	
CUCURBITACEAE																													
227.	<i>Cucumis melo</i> var. <i>dudaim</i> Dudaim melon																												
228.	<i>Melothria pendula</i> Creeping cucumber			1			X																X						
229.	<i>Momordica charantia</i> Wild balsam apple					X	X		X					2								X							
GOODENIACEAE																													
230.	<i>Scaevola frutescens</i> Scaevola																												
231.	<i>Scaevola plumieri</i> Inkberry		1	X				2																					
ASTERACEAE																													
232.	<i>Ambrosia artemisiifolia</i> Common ragweed			1		X	X	X		X			X	X	X													1	
233.	<i>Aster</i> spp. <i>Aster</i> undet.																												
234.	<i>Baccharis halimifolia</i> Groundsel tree	X	1	X		X			X		X		X		X					X		X			X	X	1	X	
235.	<i>Bidens alba</i> Spanish needles			X		X						X	5		X														
236.	<i>Borrchia frutescens</i> Sea oxeye	1	3	4	4	1	X	6	X	5		3	X	X	2	6	X			X	2	0.1	1	5	10		X	X	
237.	<i>Chromolaena odorata</i> Eupatorium							X							2														
238.	<i>Chrysopsis</i> spp. Goldenaster																												
239.	<i>Chrysopsis subulata</i> Goldenaster	1		1	2	X					X	X		X	X													1	
240.	<i>Conyza canadensis</i> Dwarf horseweed																												
241.	<i>Emilia sonchifolia</i> Tassel flower				X	X							X																
242.	<i>Erigeron strigosus</i> Daisy fleabane																												
243.	<i>Eupatorium capillifolium</i> Dog fennel			X																									
244.	<i>Eupatorium serotinum</i> Late thoroughwort																											X	
245.	<i>Euthamia minor</i> Goldenrod																												
246.	<i>Gnaphalium obtusifolium</i> Rabbit tobacco		X										X		X														
247.	<i>Helianthus debilis</i> Beach sunflower			X																									
248.	<i>Hieracium gronovii</i> Hawkweed																												
249.	<i>Iva frutescens</i> Marsh elder								X		X	X		X															
250.	<i>Iva imbricata</i> Beach elder	1	X	X		X		2	X	X			X		X	X													
251.	<i>Lactuca canadensis</i> Wild lettuce		1		2								3		X								X						
252.	<i>Lactuca graminifolia</i> Wild lettuce															X													
253.	<i>Liatris tenuifolia</i> Blazing star																												
254.	<i>Mikania cordifolia</i> Climbing hemp																												
255.	<i>Mikania scandens</i> Hempweed		X		X								X															1	
256.	<i>Pluchea foetida</i> Marsh fleabane																												
257.	<i>Pluchea odorata</i> Camphor weed																												
258.	<i>Solidago sempervirens</i> Seaside goldenrod					X																							
259.	<i>Sonchus asper</i> Spiny leaved sow thistle														X	X													
260.	<i>Sonchus oleraceus</i> Common sow thistle		X																										
261.	<i>Taraxacum officinale</i> Common dandelion					X			X																				
262.	<i>Wedelia trilobata</i> Creeping oxeye																												

	INDIAN RIVER COUNTY ISLAND NUMBER																											
	25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	40	41	42	43
223.																												
224.									0.1				0.1										X			X	X	
225.																							X					
226.		X																										
227.																												
228.																		2								X		
229.		4							1				1										X			X		X
230.																												
231.																												
232.					X				1				1	X											X	X		1
233.																												
234.	X	1		3	X	1			2	3	X		2				X								X		X	X
235.																												X
236.	X	9	1	X			1	9	2	1		3	12	0.1			7	8			14	4	X	1	X	3	X	1
237.			5							4				X														
238.																												X
239.			12							1				X					X									
240.																												
241.										0.1																		X
242.																												
243.					X					0.1				0.1											X	X		
244.			5																							X		X
245.																												
246.																												
247.										0.1																		X
248.						3																						
249.														X								X					X	1
250.																												
251.						X								X												X	X	X
252.																											X	X
253.																												
254.						X																						
255.	3		X							3				2												1	X	X
256.															X													
257.														X	X					X								
258.																												
259.										X																		
260.																												
261.																												
262.																												

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	INDIAN RIVER COUNTY ISLAND NUMBER																											
	25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	400	41	42	43
263.	R										R	R	R								R							
264.																			C									
265.																												
266.											O																A	
267.																												
268.																					R							
269.																												
270.														O														
271.	R			O														C			R							
272.																												
273.														R														
274.																												
275.																												
276.																												
277.																												
278.	C	C		R			O	O	R		A		R	O	C	C		O	O		O			C	O	O	O	O
279.	C	C		C			A		R		A	R	A	A	A	A		O	C		R		A	A	A	A	A	A
280.																		R										
281.									R		R													C		R		R
282.		C			R		R	O	R		A		C	O		C					R			C		A		R
283.																												
284.		R		R	R				R		O	R	O	R		O		R			O			R		O	R	R
285.																								R	O	R		R
286.																												
287.	R			R	R				R	R	O	O		C	R	R		R										
288.	O			R																				R	C	R	R	O

	INDIAN RIVER COUNTY ISLAND NUMBER																											
	1	2	3	4	5	6	8	9A	9B	10	11	12	13	14	15	16	17	18	19	20	21	22	23A	23B	23C	24A	24B	

XANTHIDAE																												
289. Xanthidae undet. Mud crabs			R	O		R																R						
290. <i>Menippe mercenaria</i> Stone crab																												

GRAPSIDAE																												
291. <i>Arates pisonii</i> Mangrove tree crab																				30		3				8		
292. <i>Cardisoma guanhumi</i> Great land crab																										5		

ECHINODERMATA																												
CRINOIDEA																												
293. Echinodermata Echinoderms																												

STELLEROIDEA																												
294. Holothurian Sea cucumber																												

ASTEROIDEA																												
295. Asteroidea Starfish																												

CHORDATA																												
ASCIDIACEA																												
296. Tunicata undet. Tunicates						O														R						O		

CHONDRICHTHYSES																												
RAJIFORMES																												
DASYATIDAE																												
297. <i>Dasyatis sabina</i> Atlantic stingray						R				R													R					
298. <i>Gymnura micrurus</i> Smooth butterfly ray																												

OSTEICHTHYSES																												
CLUPEIFORMES																												
CLUPEIDAE																												
299. <i>Brevoortia</i> spp. Menhaden				A		A		R																				
300. <i>Opisthonema oglinum</i> Atlantic thread herring																												
301. <i>Sardinella aurita</i> Spanish sardine																												

ENGRAULIDAE																												
302. <i>Anchoa hepsetus</i> Striped anchovy																												
303. <i>Anchoa mitchelli</i> Bay anchovy	A	C		A	A	O	C	R				R		C	A	A	A	O	O	A			A	A	R	R	O	

ELOPIFORMES																												
ELOPIDAE																												
304. <i>Elops saurus</i> Ladyfish				A						R	R		O	R														
305. <i>Megalops atlanticus</i> Tarpon																												

BATRACHOIDIFORMES																												
BATRACHOIDIDAE																												
306. <i>Opsanus tau</i> Oyster toadfish																												

ATHERINIFORMES																												
EXOCOETIDAE																												
307. <i>Hyporhamphus unifasciatus</i> Halfbeak																												

BELONIDAE																												
308. <i>Strongylura notata</i> Redfin needlefish			O									R		R	R							R				R		

CYPRINODONTIDAE																												
309. <i>Cyprinodon variegatus</i> Sheepshead minnow																					R							
310. <i>Floridichthys carpio</i> Goldspotted killifish										R			R								C		R					
311. <i>Fundulus confluentus</i> Marsh killifish																												
312. <i>Fundulus grandis</i> Gulf killifish																												
313. <i>Fundulus majalis</i> Striped killifish				R	R																							
314. <i>Fundulus similis</i> Longnose killifish				R																			R					
315. <i>Lucania parva</i> Rainwater killifish																										C		

POECILIIDAE																												
316. <i>Poecilia latipinna</i> Sailfin molly																R										R		

ATHERINIDAE																												
317. <i>Menidia beryllina</i> Inland silverside																												
318. <i>Menidia peninsulae</i> Tidewater silverside	R	O	C		C		O	R	R	O	O	C	O	O	A		R				O	A	A	A	A	C	R	

GASTEROSTEIFORMES																												
SYNGNATHIDAE																												
319. <i>Hippocampus erectus</i> Lined seahorse																												
320. <i>Hippocampus zostereae</i> Dwarf seahorse																												

	INDIAN RIVER COUNTY ISLAND NUMBER																											
	25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	40	41	42	43
289.																			R					R	R	R	R	O
290.																										R		
291.																												7
292.																	4											
293.																												
294.																												
295.																												
296.																												
297.																						R						
298.																									R			
299.																			O					O				
300.																												
301.																												
302.																			R									
303.	A	A		A	C		A				R	R	R	A	A	A		R	A	A	O			A	A	O	R	
304.	O			O						R											R							
305.																												
306.																												
307.																										R		
308.										R														R	R	R	R	R
309.							R	O																				
310.			R					R		O										R			R		R	R		
311.								O																				
312.																												
313.																												
314.	R			R				R																				
315.	R			R						O	R	R	R	R	R	R												
316.																												R
317.																												
318.	O			C	R			C	C		A	R	C		R	O		R	O				R	C	O	C	A	R
319.																												
320.																												

		INDIAN RIVER COUNTY ISLAND NUMBER																											
		1	2	3	4	5	6	8	9A	9B	10	11	12	13	14	15	16	17	18	19	20	21	22	23A	23B	23C	24A	24B	
321.	<i>Syngnathus louisianae</i> Chain pipefish	R				R		R						R				R			R	R	R	R	R	R	R		
322.	<i>Syngnathus scovelli</i> Gulf pipefish	O	O	R	R	O		O		R	R	R	O	R	R	O	R	R			R	O			R	R	O	C	O
PERCIFORMES																													
CENTROPOMIDAE																													
323.	<i>Centropomus undecimalis</i> Snook																												
CARANGIDAE																													
324.	<i>Caranx hippos</i> Jack crevalle			R																									
325.	<i>Oligoplites saurus</i> Leatherjacket			R															R										
326.	<i>Trachinotus falcatus</i> Permit	R		R		R		R	R				R																
LUTJANIDAE																													
327.	<i>Lutjanus griseus</i> Grey snapper																		R										
328.	<i>Ocyurus chrysurus</i> Yellowtail snapper																												
LOBOTIDAE																													
329.	<i>Lobotes surinamensis</i> Tripletail																												
GERREIDAE																													
330.	<i>Diapterus auratus</i> Irish pompano								R											R				O	R				
331.	<i>Eucinostomus spp.</i> Mojarra	C	O	O	O	A	A	O	A	A	C	A	O	C	O	R	C	A	C	C	O	C	O	A	A	O	R	O	
HAEMULIDAE																													
332.	<i>Haemulon chrysargyreum</i> Small mouth grunt																												
333.	<i>Orthopristis chrysoptera</i> Pigfish		R	O		R	R	R					C	R	R	O	R	R				R		R	C	R			
SPARIDAE																													
334.	<i>Archosargus probatocephalus</i> Sheepshead	R											R			R									R	R			
335.	<i>Diplodus argenteus</i> Silver porgy	R		O										R	R														
336.	<i>Lagodon rhomboides</i> Pinfish	A	A	O		R	C		C	C	C	A	A	A	A	A	A	R	R		A	A	R		C	A	A		
SCIAENIDAE																													
337.	<i>Bairdiella chrysoura</i> Silver perch																								O				
338.	<i>Cynoscion nebulosus</i> Spotted seatrout							R																					
339.	<i>Leiostomus xanthurus</i> Spot		O	R	A						C	R	R	C	O	R						R			R	O	A		
340.	<i>Menticirrhus americanus</i> Southern kingfish																												
341.	<i>Micropogonias undulatus</i> Atlantic croaker	C				R		R	C	R	O						C	A			A	A					R		
342.	<i>Sciaenops ocellatus</i> Red drum	O			O			R	R				R				O						C						
EPHIPPIDAE																													
343.	<i>Chaetodipterus faber</i> Spadefish					R																							
MUGILIDAE																													
344.	<i>Mugil cephalus</i> Striped mullet				A					A	A	A		A			A	A			R	R			R		O		
345.	<i>Mugil curema</i> White mullet			O			R		R				C			R											R		
SPHYRAENIDAE																													
346.	<i>Sphyraena barracuda</i> Greater barracuda																												
347.	<i>Sphyraena borealis</i> Northern sennet	R																		R									
BLENNIIDAE																													
348.	<i>Chasmodes bosquianus</i> Striped blenny																												
349.	<i>Chasmodes saburrae</i> Florida blenny																												
GOBIIDAE																													
350.	<i>Bathygobius soporator</i> Frillfin goby												R																
351.	<i>Gobionellus boleosoma</i> Darter goby						R										R	R			R	R							
352.	<i>Gobiosoma boscii</i> Naked goby	O								R	R							R						R					
353.	<i>Gobiosoma robustum</i> Code goby	R								R					R		O	R			C	O		O					
354.	<i>Microgobius gulosus</i> Clown goby																		R		O	R		R			R	R	
STROMATEIDAE																													
355.	<i>Peprilus spp.</i> Butterfish																												
PLEURONECTIFORMES																													
BOTHIDAE																													
356.	<i>Citharichthys spilopterus</i> Bay whiff																												
357.	<i>Paralichthys spp.</i> Southern or summer flounder																												

	INDIAN RIVER COUNTY ISLAND NUMBER																												
	25A ==	25B ==	25 ==	26A ==	26B ==	26 ==	27A ==	27B ==	27C ==	28 ==	28A ==	28B ==	28C ==	29 ==	32 ==	33 ==	34 ==	34A ==	35 ==	36 ==	37A ==	37 ==	38 ==	39 ==	40 ==	41 ==	42 ==	43 ==	
321.			R				R	R	R		R				R	R			R					R		R	R	R	
322.	R	R		O			R	R			O	R	R	C	O	O			R	R				R	A	C	C	O	O
323.																													
324.																													
325.															O														
326.																										R	R		
327.																													
328.															R										R				
329.																													
330.	O			O	O		O	R		R			O		R			R											
331.	A	C		A	A		C	A	A		A	A	O	A	A	A		O	A	A	O		A	C	A	C	C	O	
332.																													
333.	R									O														O		O	O	R	
334.												R	R		R									O		O	O	R	
335.																												R	
336.	A	O		R						A	R		A		R					C			C	A	A	A	C		
337.																													
338.											R				O									O					
339.	A			A						C			R							O			O	A		O			
340.																													
341.	O	O		A	O		R	O	O		O	R		R				R				R		R					
342.	R	R		R				R	R					R															
343.																													
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351.		R								R																		R	
352.	R					O				R				A						R		O	R	R	O		R		
353.	R	O		R			O	R		R	O	R	O		C											R	R	R	
354.	O	R		O	O		R	R		O	R		C	C	C			A											
355.																													
356.																													
357.																													

		INDIAN RIVER COUNTY ISLAND NUMBER																											
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358.	<i>Paralichthys albigutta</i> Gulf flounder																												
SOLEIDAE																													
359.	<i>Trinectes maculatus</i> Hogchoker																												
CYNOGLOSSIDAE																													
360.	<i>Symphurus plagiata</i> Blackcheek tonguefish																												
TETRAODONTIFORMES																													
BALISTIDAE																													
361.	<i>Aluterus scriptus</i> Scrawled filefish																												
362.	<i>Monacanthus hispidus</i> Planehead filefish						O	R													R								
OSTRACIIDAE																													
363.	<i>Lactophrys triqueter</i> Smooth trunkfish																												
TETRAODONTIDAE																													
364.	<i>Sphoeroides nephelus</i> Southern puffer									R			R					O											
365.	<i>Sphoeroides spengleri</i> Bandtail puffer											R															R		
366.	<i>Sphoeroides testudineus</i> Checkered puffer																												
DIODONTIDAE																													
367.	<i>Chilomycterus antillarum</i> Web burrfish																												
368.	<i>Chilomycterus schoepfi</i> Striped burrfish																		R										
REPTILIA																													
SQUAMATA																													
IGUANIDAE																													
369.	<i>Anolis carolinensis carolinensis</i> Green anole		2							1														1			1	1	
370.	<i>Anolis sagrei</i> Brown anole																												
371.	<i>Sceloporus woodi</i> Florida scrub lizard																												
SCINCIDAE																													
372.	<i>Eumeces fasciatus</i> Five lined skink																												
COLUBRIDAE																													
373.	<i>Crotalus constrictor priapus</i> Southern black racer																												
374.	<i>Elaphe obsoleta quadrivittata</i> Yellow rat snake																												
AVES																													
GAVIIFORMES																													
GAVIIDAE																													
375.	<i>Gavia immer</i> Common Loon		1									1																	
PELECANIFORMES																													
PELECANIDAE																													
376.	<i>Pelecanus erythrorhynchos</i> White pelican		3								1																		
377.	<i>Pelecanus occidentalis</i> Brown pelican		8	1	46	13	1	1		5	7		1							1						1	2	2	
FREGATIDAE																													
378.	<i>Fregata magnificens</i> Magnificent frigate bird																											1	
PHALACROCORACIDAE																													
379.	<i>Phalacrocorax auritus</i> Double-crested cormorant			3	12	1	1			1					2						2								
ANHINGIDAE																													
380.	<i>Anhinga anhinga</i> Anhinga																						1						
ANSERIFORMES																													
ANATIDAE																													
381.	<i>Anas acuta</i> Pintail																												
382.	<i>Anas carolinensis</i> Green-winged teal																												
383.	<i>Anas platyrhynchos</i> Mallard			2																									
384.	<i>Aythya affinis</i> Lesser scaup																												
385.	<i>Aythya marila</i> Greater scaup																												
386.	<i>Mergus serrator</i> Red-breasted merganser												3															1	
FALCONIFORMES																													
CATHARTIDAE																													
387.	<i>Cathartes aura</i> Turkey vulture		1									2											1						
388.	<i>Coragyps atratus</i> Black vulture																												
ACCIPITRIDAE																													
389.	<i>Falco peregrinus</i> Peregrine falcon																												
390.	<i>Falco sparverius</i> American kestrel																												

	INDIAN RIVER COUNTY ISLAND NUMBER																											
	25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	40	41	42	43
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359.	R			R														R										
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378.																												
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		INDIAN RIVER COUNTY ISLAND NUMBER																											
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391.	<i>Haliaeetus leucocephalus</i> Bald eagle																												
392.	<i>Pandion haliaetus</i> Osprey	2				2	2		1	1	1		1	1					1			3				1	1	2	
CICONIIFORMES																													
ARDEODAE																													
393.	<i>Ardea herodias</i> Great blue heron	1		18	1	1	3		1	1	1	1			4	1	1				1			2	1		6	1	
394.	<i>Bubulcus ibis</i> Cattle egret																4	4	4	4									
395.	<i>Butorides virescens</i> Green-backed heron			1				1								2						1				1	1		
396.	<i>Casmerodius albus</i> Great egret			1									1						2			1					1		
397.	<i>Dichromanassa rufescens</i> Reddish egret																			2									
398.	<i>Florida caerulea</i> Little blue heron			1		1	1		1		1	1				2	2	2	2	2							2	1	
399.	<i>Hydranassa tricolor</i> Tricolor heron	1														2	2	4	4	2							1	1	
400.	<i>Leucophox thula</i> Snowy egret															2	2	2	4										
401.	<i>Nyctanassa violacea</i> Yellow-crowned night heron										1																		
402.	<i>Nycticorax nycticorax</i> Black-crowned night heron															2				3									
CICONIIDAE																													
403.	<i>Mycteria americana</i> Wood stork															4													
THRESKIORNITHIDAE																													
404.	<i>Ajaia ajaja</i> Roseate spoonbill																												
405.	<i>Eudocimus albus</i> White ibis		1	1													4	2	2	4								1	
406.	<i>Plegadis falcinellus</i> Glossy ibis																												
GRUIFORMES																													
RALLIDAE																													
407.	<i>Fulica americana</i> American coot																												
CHARADRIIFORMES																													
HAEMATOPODIDAE																													
408.	<i>Haematopus palliatus</i> American oystercatcher										2	1	2		2														
CHARADRIIDAE																													
409.	<i>Charadrius vociferus</i> Killdeer																												
410.	<i>Charadrius wilsonia</i> Wilson's plover																												
411.	<i>Pluvialis squatarola</i> Black bellied plover																												
SCOLOPACIDAE																													
412.	<i>Actitis macularia</i> Spotted sandpiper																												
413.	<i>Arenaria interpres</i> Ruddy turnstone	4	3			1														8		1							
414.	<i>Calidris alba</i> Sanderling										6																		
415.	<i>Calidris alpina</i> Dunlin																												
416.	<i>Calidris minutilla</i> Least sandpiper																												
417.	<i>Catoptrophorus semipalmatus</i> Willet		1												1														
418.	<i>Erolia or Ereunetes spp.</i> Sandpipers	20				11											1						1		2				
419.	<i>Limnodromus griseus</i> Short-billed dowitcher																												
420.	<i>Tringa solitaria</i> Solitary sandpiper		2																										
LARIDAE																													
421.	<i>Hydroprogne caspia</i> Caspian tern	6			1																								
422.	<i>Larus argentatus</i> Herring gull	1			2																								
423.	<i>Larus atricilla</i> Laughing gull																								1				
424.	<i>Larus delawarensis</i> Ring-billed gull	23		1	10	1																							
425.	<i>Larus marinus</i> Lesser black-backed gull				1																								
426.	<i>Sterna albifrons</i> Least tern		11					3								6												2	
427.	<i>Thalasseus maximus</i> Royal tern			1																									
RYNCHOPIDAE																													
428.	<i>Rynchops nigr</i> Black skimmer			2																									

	INDIAN RIVER COUNTY ISLAND NUMBER																											
	25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	40	41	42	43
391.										1					1													
392.				1		1			1	3		1	1	4	3		2		2		1	2	1		1	1	1	1
393.	1	1		1	3	2		1	1	5	1			3	4	3	2	1	1		3	1	2	1	3	2	1	
394.																												
395.							3																					
396.						2			2														1		1			
397.																												
398.	1		2	1	1	1	3	1				1		2	1	1					1	1	2		1		1	
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	INDIAN RIVER COUNTY ISLAND NUMBER																											
	25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	40	41	42	43
429.		1											3												1			1
430.																												
431.										1																		4
432.		2	1		1	3	1	1	2			1	3	3	1	1		3	1		1	1				1		
433.		4							2														1	1	2	2	2	
434.																												
435.													1															
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437.	1				2				5			1		10				60	5			2	1	1	1	3		
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		INDIAN RIVER COUNTY ISLAND NUMBER																																			
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MAMMALIA																																					
MARSUPIALIA																																					
DIDELPHINIDAE																																					
462.	<i>Didelphis marsupialis</i>																																				
Opossum																																					
LAGOMORPHA																																					
LEPORIDAE																																					
463.	<i>Sylvilagus palustris paludicola</i>																																				
Marsh rabbit																																					
CARNIVORA																																					
PROCYONIDAE																																					
464.	<i>Procyon lotor</i>																							1		1											
Raccoon																																					
MUSTELIDAE																																					
465.	<i>Lutra canadensis</i>																						1														
River otter																																					
SIRENIA																																					
TRICHECHIDAE																																					
466.	<i>Trichechus manatus</i>																																				
West Indian manatee																																					
CETACEA																																					
DELPHINIDAE																																					
467.	<i>Tursiops truncatus</i>																																				
Bottlenose dolphin																																					

INDIAN RIVER COUNTY ISLAND NUMBER																											
25A	25B	25	26A	26B	26	27A	27B	27C	28	28A	28B	28C	29	32	33	34	34A	35	36	37A	37	38	39	40	41	42	43

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ISLAND NO. IR1

Date Sampled: 14 December 1987

I. Physical Description

- A. Island Size: 2.22 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 3.0 km N of Sebastian City boat ramp
- D. Distance and Direction from Channel Marker: 700 m northwest of marker 64
- E. Erosion: Moderate; low cliff on east
- F. Boating access: West; sand beaches, 1.5 m deep

II. Biological Description

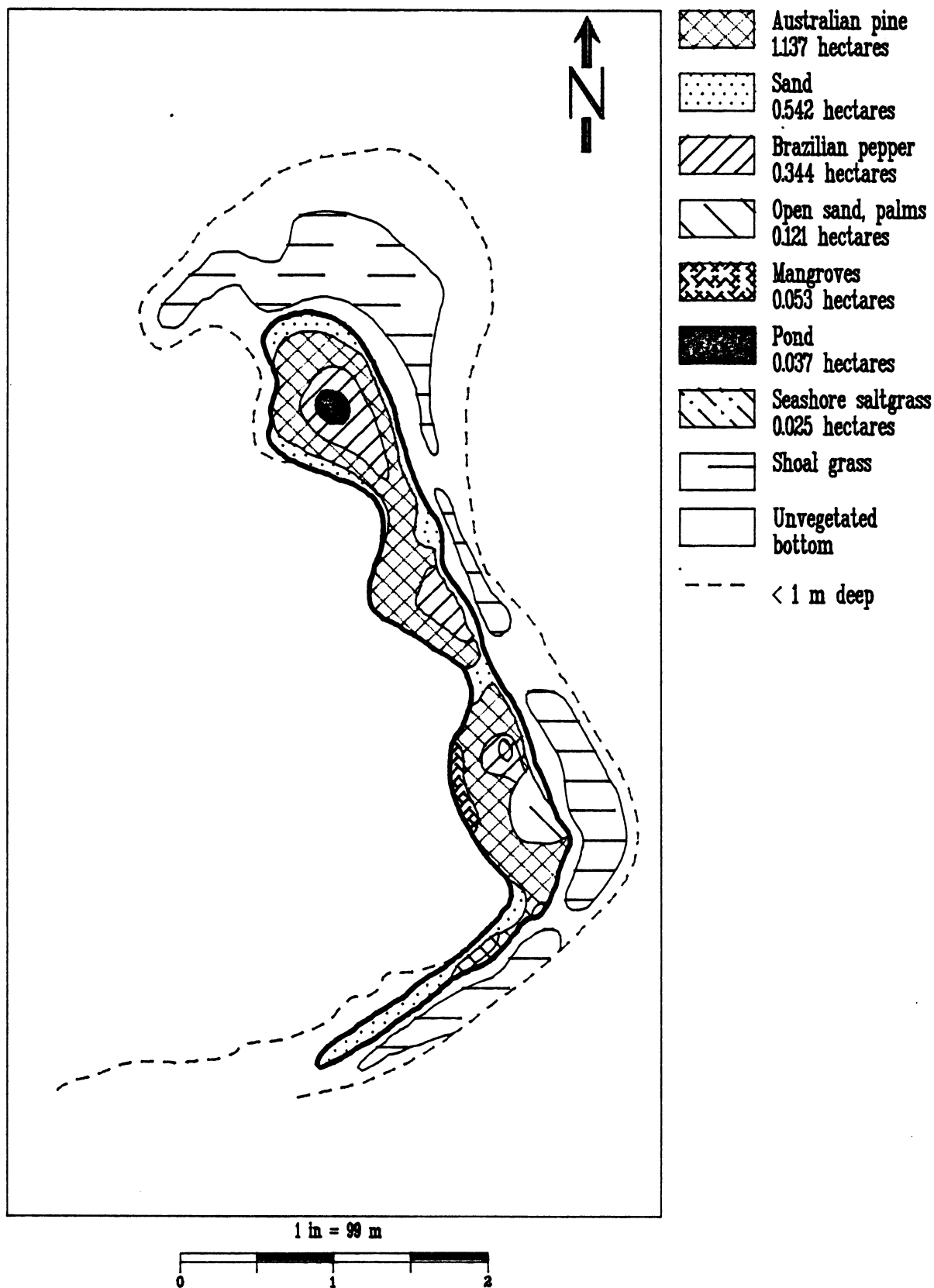
- A. Dominant Terrestrial Vegetation
Australian pine (57.5%), Brazilian pepper (54.9%), cabbage palm (21.1%); 33 species total
- B. Soil humus: 5-6 cm
- C. Seagrasses
Shoal grass on north, east and west
- D. Bird Usage
White and brown pelicans, ring-billed gull, sanderling, Caspian tern, great blue heron, belted kingfisher, tricolor heron, osprey; 13 species total
- E. Common Fishes and Invertebrates
Gulf pipefish, bay anchovy, Atlantic croaker, red drum, code goby, tidewater silversides, mojarra, 11 fish species total; 4 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Special concern: Brown pelican, osprey, tricolor heron

III. Recommended usage: Active Recreation

IV. Comments

This island is located in the Malabar to Vero Beach Aquatic Preserve. It is used extensively on weekends by picnickers, campers, and fishermen. It offers open sand beaches with deep water access all along the west side and is located close to Sebastian Inlet. This island is one of the more heavily used islands and would, therefore, be a top choice for selected recreational construction.

SPOIL ISLAND IR1



ISLAND NO. IR2

Date Sampled: 22 April 1988

I. Physical Description

- A. Island Size: 0.967 hectares
- B. Height Above Mean High Water: 2.5 m
- C. Distance from Boat Ramps: 770 m north of Sebastian City boat ramp
- D. Distance and Direction from Channel Marker: 605 m northwest of marker 65
- E. Erosion: Yes, on east side
- F. Boating access: West side; 1 m deep, open beach

II. Biological Description

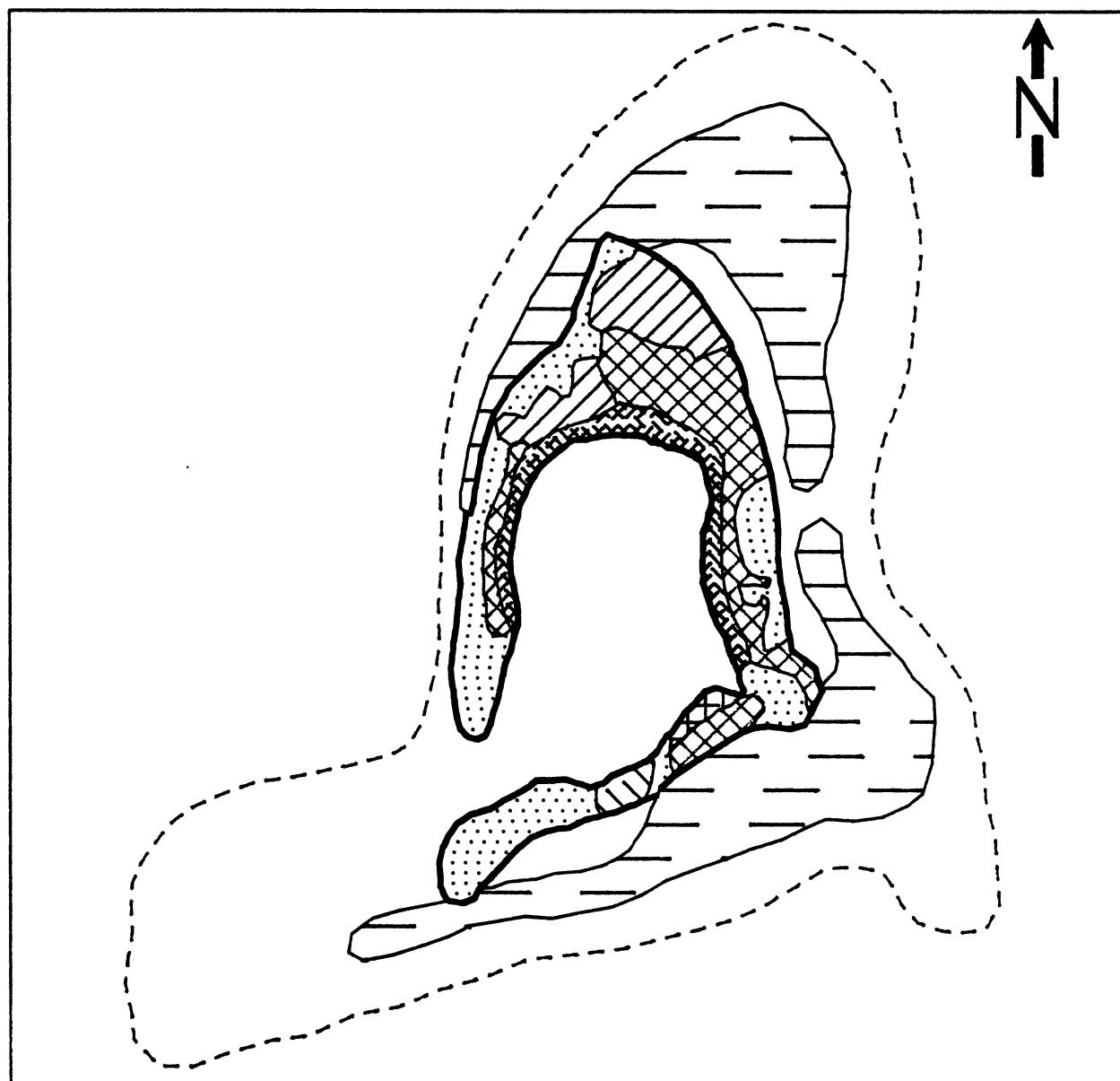
- A. Dominant Terrestrial Vegetation
Australian pine (30%), Brazilian pepper (17%), black mangrove (4.5%), cabbage palm (4.5%), saltgrass (4.5%); 47 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on all sides
- D. Bird Usage
Least tern, ruddy turnstone most common; 9 species total, no nests
- E. Common Fishes and Invertebrates
Pinfish, Gulf pipefish, 9 fish species total; grass, humpback and penaeid shrimps common; 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: least tern; Special concern: brown pelican

III. Recommended usage: Passive Recreation

IV. Comments

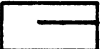
This island is in the Malabar to Vero Beach Aquatic Preserve. Although there is a high plant species diversity on the island and large seagrass beds, there is access for boaters. Additionally, this island has been traditionally used for recreation and this use should continue. However, if the threatened least tern begins to use the sand areas of this island for nesting this island should be closed to human use during the nesting season.

SPOIL ISLAND IR2



1 in = 58 m



	Shoal grass 1.18 hectares		Saltgrass 0.02 hectares
	Sand 0.38 hectares		Silverhead 0.016 hectares
	Australian pine 0.27 hectares		Unvegetated 3.15 hectares
	Brazilian pepper 0.15 hectares		< 1 m deep
	Mangroves 0.122 hectares		

ISLAND NO. IR3

Date Sampled: 13 June 1988

I. Physical Description

- A. Island Size: 1.169 hectares
- B. Height Above Mean High Water: 1-3 m
- C. Distance from Boat Ramps: 2.0 km north of Sebastian City boat ramp
- D. Distance and Direction from Channel Marker: 200 m west of marker 66
- E. Erosion: Moderate: 2 m cliff on east
- F. Boating access: West side; open beaches, 1.5 m deep

II. Biological Description

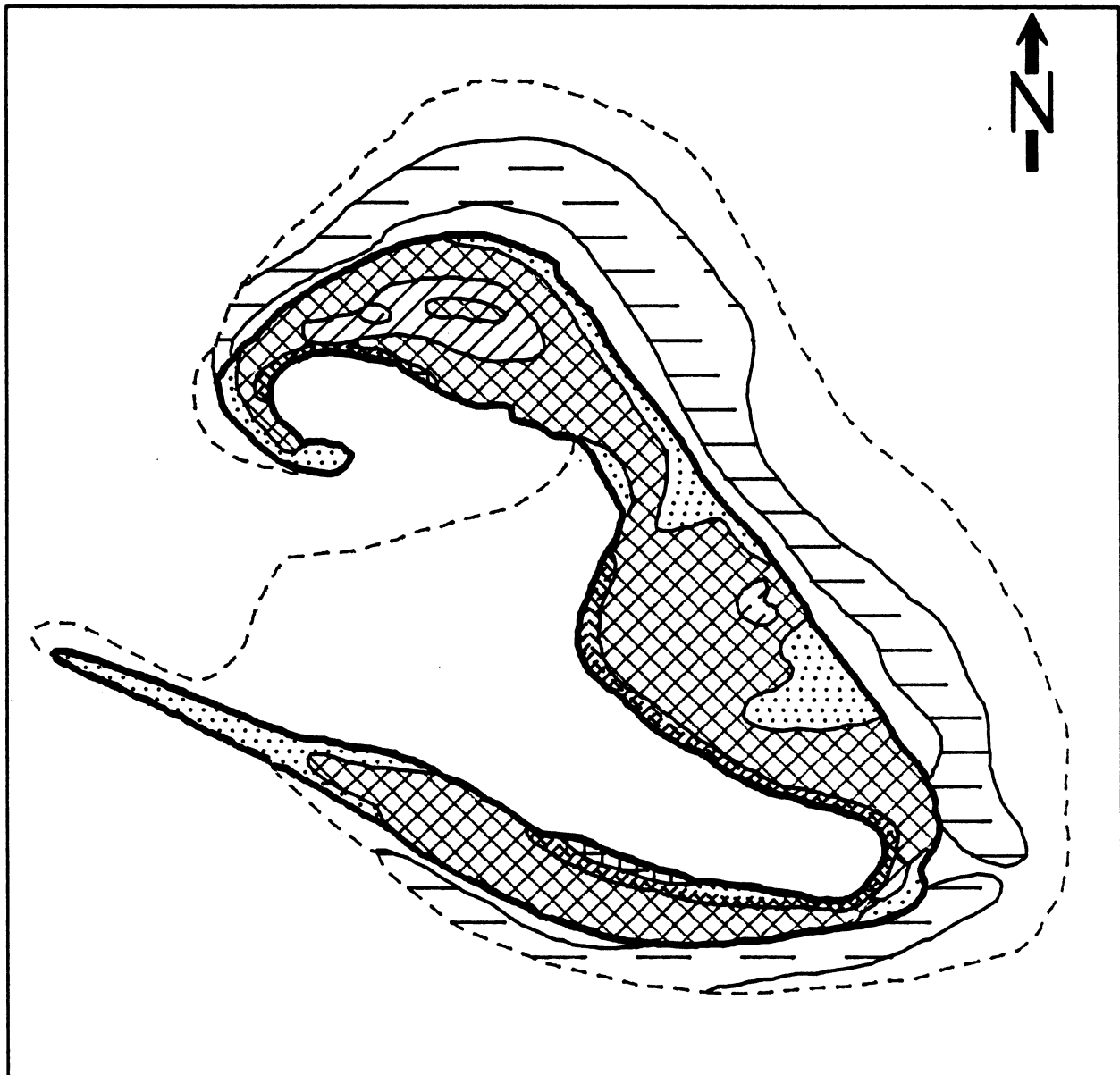
- A. Dominant Terrestrial Vegetation
Australian pine (59.4%), Brazilian pepper (53.6%), cabbage palm (13.0%), white mangrove (13.0%); 49 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north and east
- D. Bird Usage
Nesting great blue heron; also little blue heron, brown pelican, royal tern, great egret, white ibis, green-backed heron; 11 fish species total
- E. Common Fishes and Invertebrates
Bay anchovy, pigfish, redfin needlefish, pinfish, striped mullet, tidewater silversides, mojarra, 12 fish species total; 6 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Special concern: Brown pelican, little blue heron. Threatened: prickly-pear cactus

III. Recommended usage: Conservation

IV. Comments

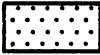
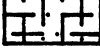
This island is located in the Malabar to Vero Beach Aquatic Preserve. It is located a stone's throw from a busy marina, making it an ideal recreation island. However, there have been as many as twenty occupied great blue heron nests observed at one time during the winter and spring breeding season, so this island will be recommended for conservation only.

SPOIL ISLAND IR3



1 in = 45 m



	Australian pine 0.742 hectares		Cabbage palm 0.012 hectares
	Sand 0.228 hectares		Shoal grass
	Mangroves 0.098 hectares		Unvegetated bottom
	Brazilian pepper 0.076 hectares		< 1 m deep
	Sea purslane 0.015 hectares		

ISLAND NO. IR4

Date Sampled: 18 February 1988

I. Physical Description

- A. Island Size: 0.396 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 1.0 km north of Sebastian City boat ramp
- D. Distance and Direction from Channel Marker: 300 m east of marker 66
- E. Erosion: Moderate; 1-2 m cliff on east
- F. Boating access: South end; sand spit, 1.5 m deep

II. Biological Description

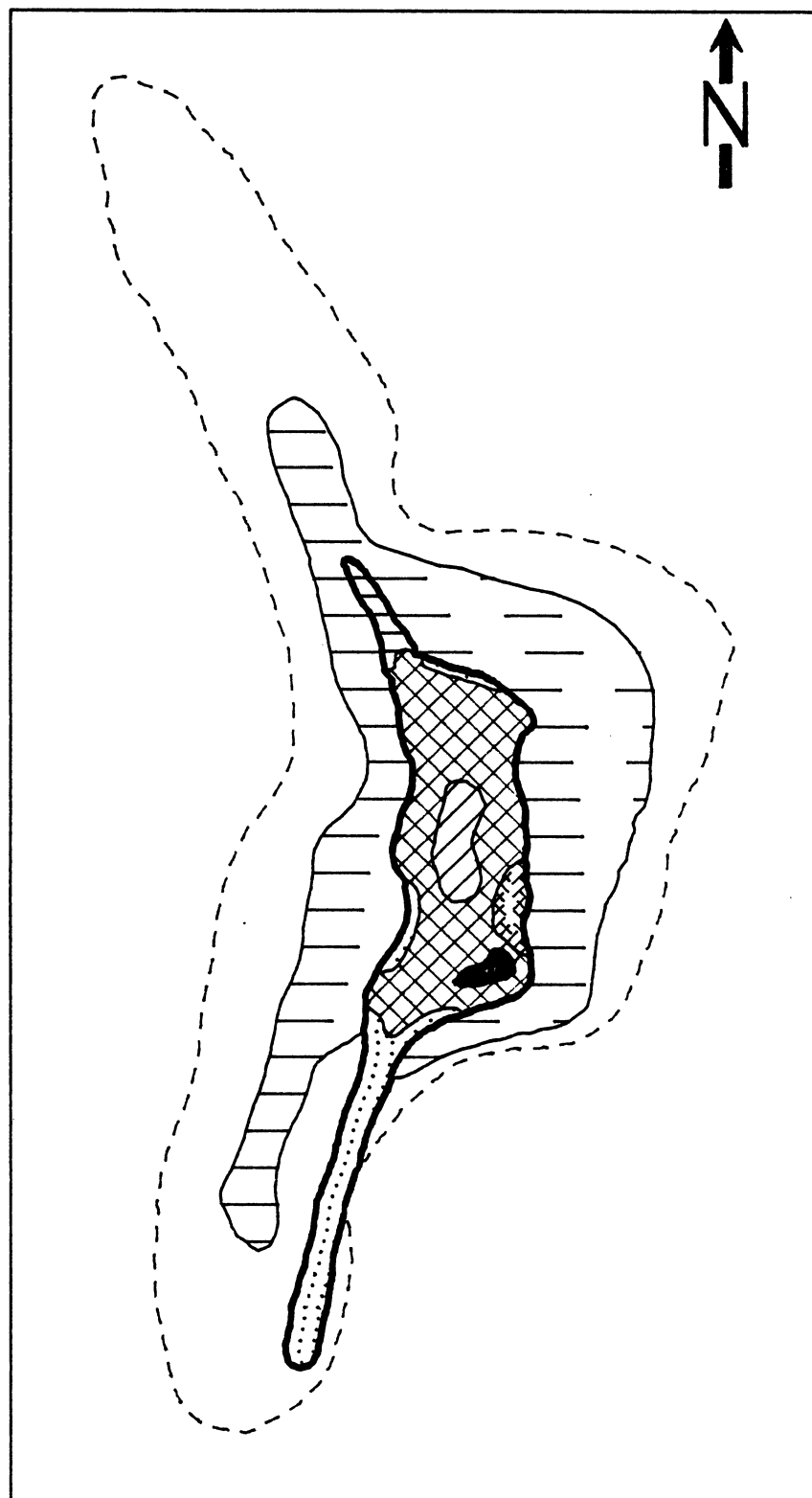
- A. Dominant Terrestrial Vegetation
Australian pine (42.9%); 25 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on east and west
- D. Bird Usage
Nesting great blue heron; also brown pelican, double-crested cormorant, Caspian tern, black skimmer; 9 species total
- E. Common Fishes and Invertebrates
Ladyfish, pinfish, silver porgy, spot, striped mullet, 10 fish species total; 5 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Special concern: Brown pelican

III. Recommended usage: Passive Recreation

IV. Comments

This island is located in the Malabar to Vero Beach Aquatic Preserve. It is situated along the Atlantic Intracoastal Waterway and has deep water access and a long sand spit on the south. It is not large enough to support construction.

SPOIL ISLAND IR4



-  Australian pine
0.246 hectares
-  Sand
0.098 hectares
-  Brazilian pepper
0.033 hectares
-  Mangroves
0.018 hectares
-  Pond
0.009 hectares
-  Rocks
-  Shoal grass
-  Unvegetated bottom
-  < 1 m deep

1 in = 50 m



ISLAND NO. IR5

Date Sampled: 11 November 1987

I. Physical Description

- A. Island Size: 1.939 hectares
- B. Height Above Mean High Water: 1.5 m
- C. Distance from Boat Ramps: 1.2 km east of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 275 m east of marker 66A
- E. Erosion: Yes; sand spits on north and south, cliff on north and east
- F. Boating access: West side; 1.6 m deep, open beach

II. Biological Description

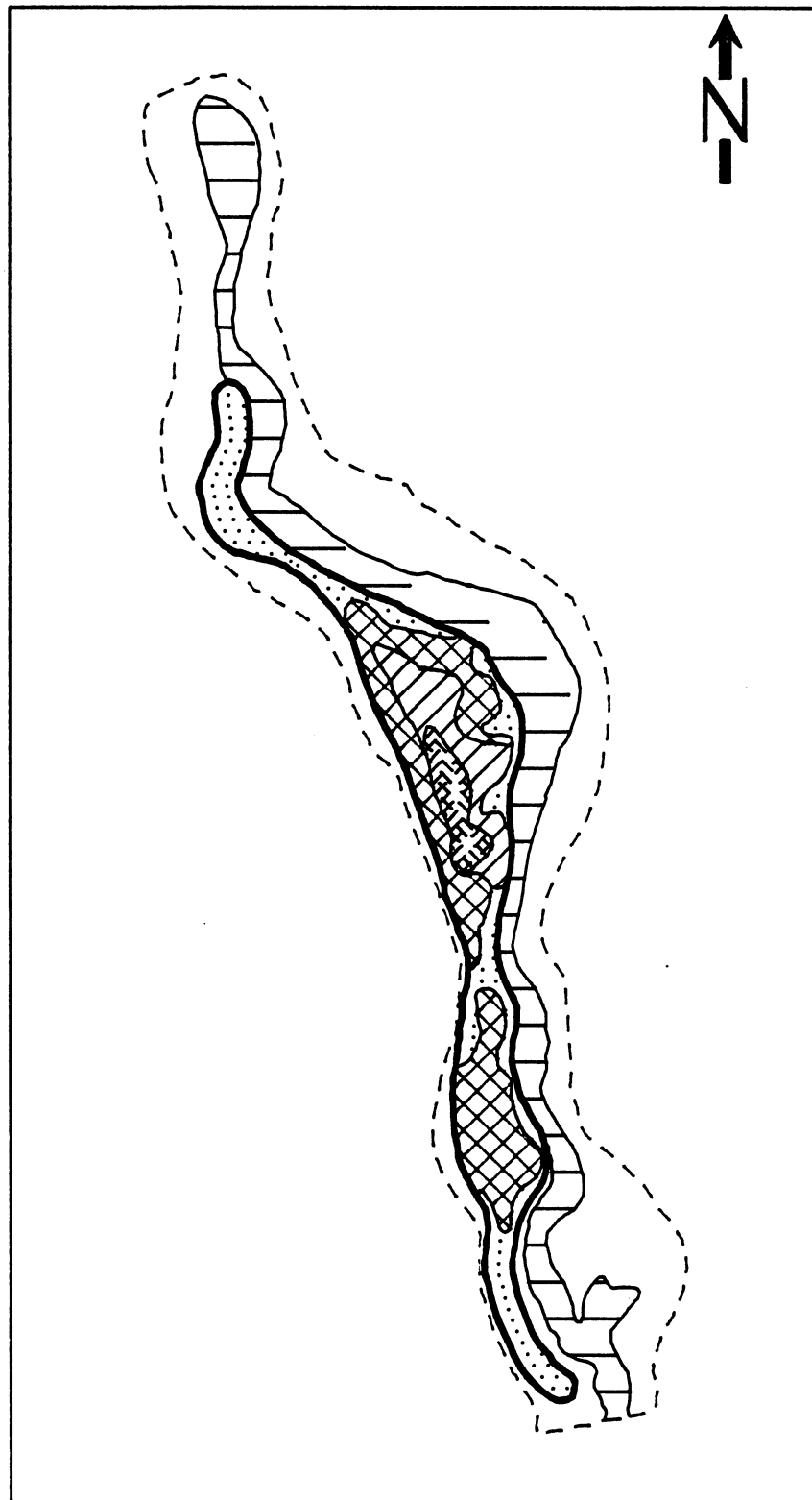
- A. Dominant Terrestrial Vegetation
Australian pine (44%), Brazilian pepper (34%), red mangrove (7%), black mangrove (4%); 42 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north, south and east sides
- D. Bird Usage
Sandpipers, fish crow, kingfisher and osprey common; 10 species total, 1 nest
- E. Common Fishes and Invertebrates
Mojarra, menhaden and bay anchovy common, 11 fish species total; 2 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus. Special concern: osprey, brown pelican, little blue heron

III. Recommended usage: Passive Recreation

IV. Comments

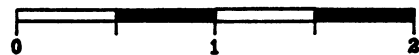
This island is in the Malabar to Vero Beach Aquatic Preserve and the Pelican Island National Wildlife Refuge. Although there is fairly high plant species diversity on the island, human use will not adversely affect the plant community. This island receives heavy human usage and should remain a recreation island.

SPOIL ISLAND IR5



-  Shoal grass
1.65 hectares
-  Australian pine
0.77 hectares
-  Sand
0.766 hectares
-  Brazilian pepper
0.27 hectares
-  Mangroves
0.13 hectares
-  Unvegetated
3.197 hectares
-  < 1 m deep

1 in = 102 m



ISLAND NO. IR6

Date Sampled: 5 November 1987

I. Physical Description

- A. Island Size: 2.682 hectares
- B. Height Above Mean High Water: 1.5 m
- C. Distance from Boat Ramps: 1.2 km east of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 100 m east of marker 67
- E. Erosion: Moderate on south side
- F. Boating access: South and west sides; 1 m, open beaches

II. Biological Description

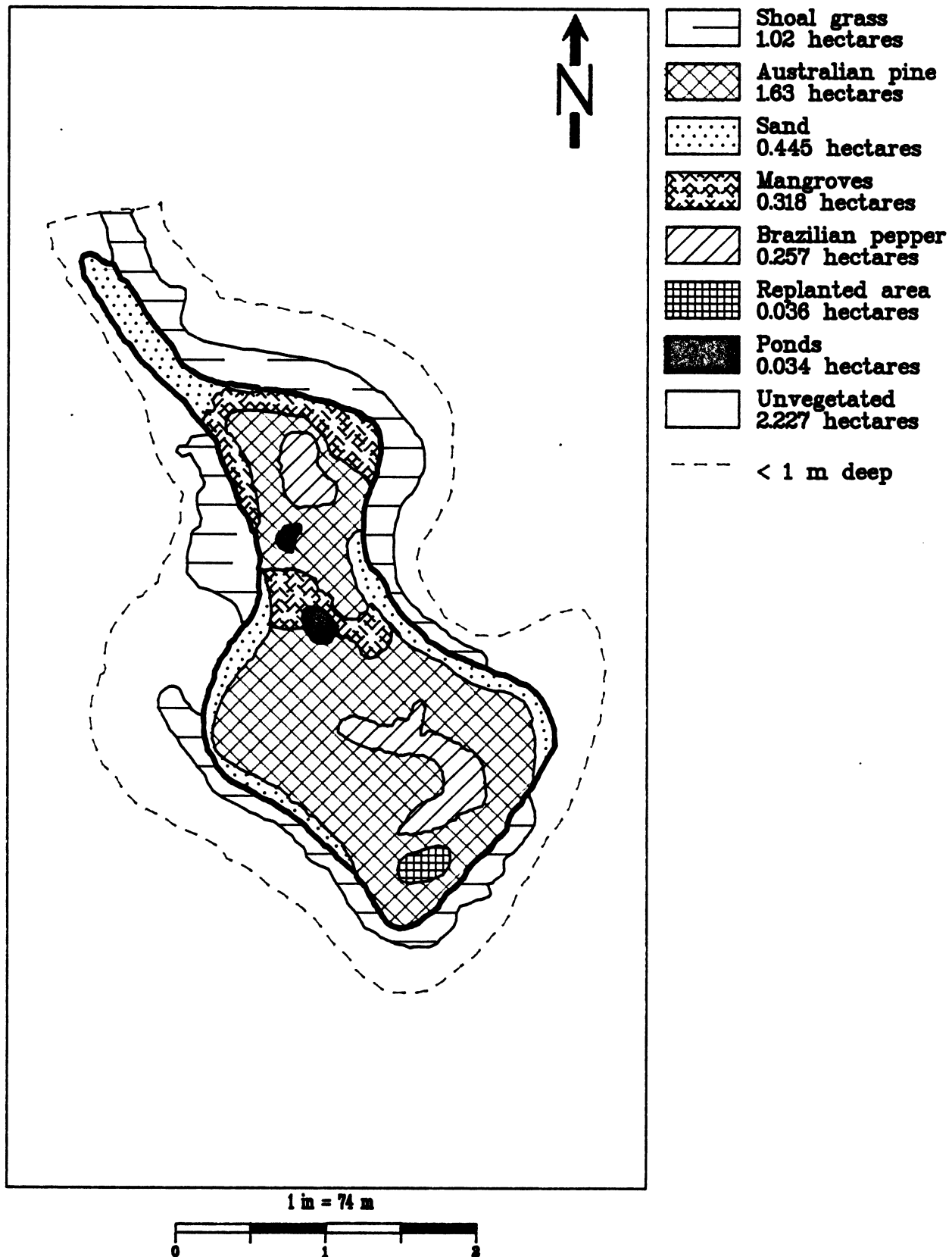
- A. Dominant Terrestrial Vegetation
Australian pine (56%), Brazilian pepper (34%), buttonwood (3%); 33 species total
- B. Soil humus: 7 cm
- C. Seagrasses
Shoal grass on southwest and west sides
- D. Bird Usage
Great blue heron, osprey and kingfisher most common; 6 species, 1 nest
- E. Common Fishes and Invertebrates
Mojarra and bay anchovy most common, 9 fish species total; grass shrimp and tunicates most common, 6 invertebrate species total.
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus. Special concern: osprey, little blue heron, brown pelican

III. Recommended usage: Education/Passive Recreation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve and the Pelican Island National Wildlife Refuge. The southern portion of IR6 has been replanted with native tropical hammock vegetation and provides an excellent opportunity for education. Since this island receives heavy human use, we recommend it be designated for passive recreation with all usage confined to the beach areas. Educational usage, however, can include the interior portions of the island.

SPOIL ISLAND IR6



ISLAND NO. IR8

Date Sampled: 5 July 1988

I. Physical Description

- A. Island Size: 0.368 hectares
- B. Height Above Mean High Water: < 1 m
- C. Distance from Boat Ramps: 0.5 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 500 m south of marker 67
- E. Erosion: none
- F. Boating access: West side; sand beaches, 2.0 m deep

II. Biological Description

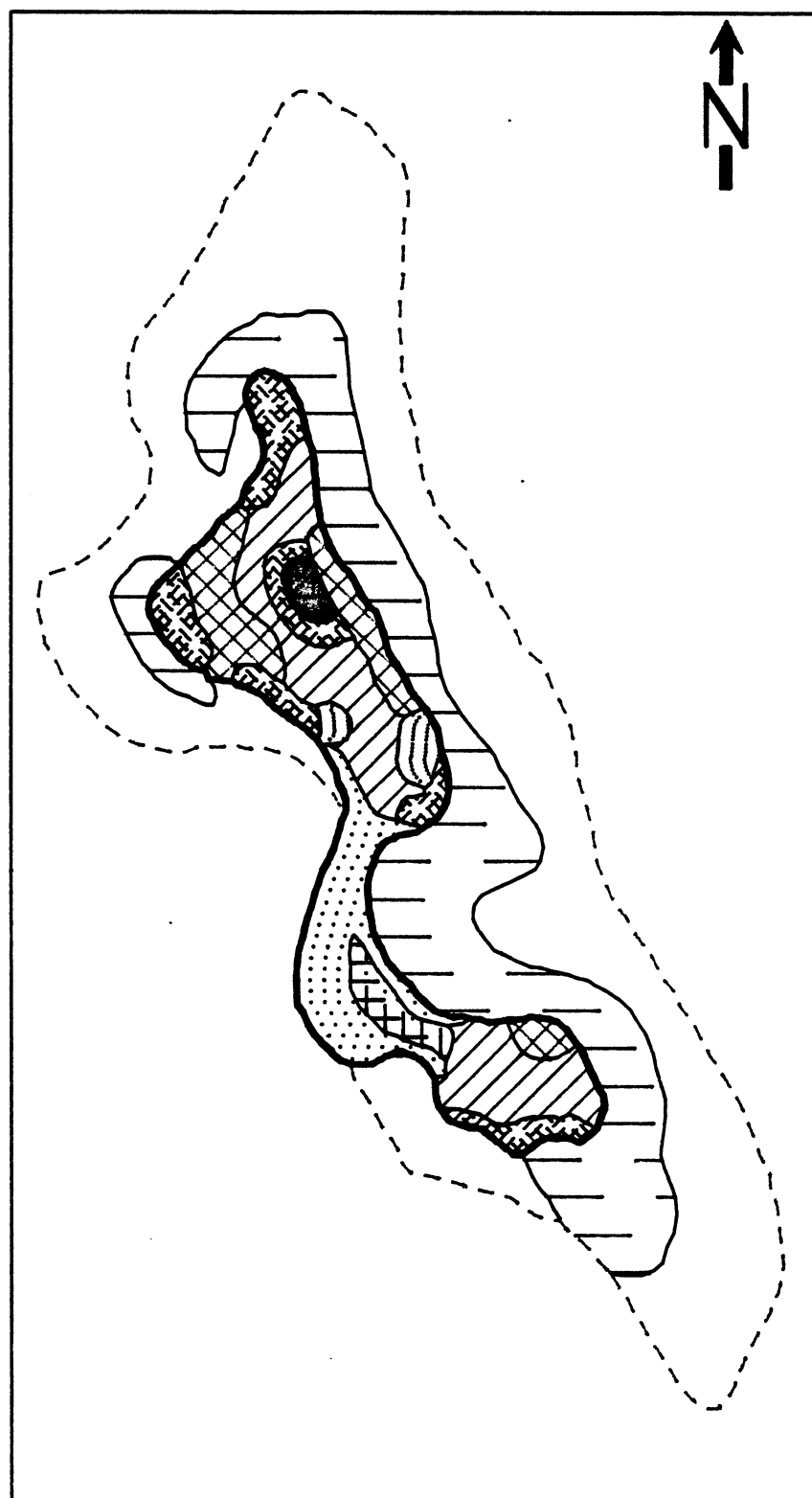
- A. Dominant Terrestrial Vegetation
Australian pine (40.0%), seashore saltgrass (40.0%), Brazilian pepper (30.0%), red mangrove (25.0%), sea purslane (20.0%), sea oxeye (15.0%), black mangrove (10.0%), buttonwood (10.0%); 24 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north, east and west
- D. Bird Usage
Least tern, green-backed heron; 2 species total
- E. Common Fishes and Invertebrates
Gulf pipefish, pinfish, mojarra, tidewater silversides, bay anchovy, 9 fish species total; 5 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Threatened: Least tern

III. Recommended usage: Conservation

IV. Comments

This island is located within the Malabar to Vero Beach Aquatic Preserve. Five recently abandoned bird nests were discovered in the pines and mangroves. Taking into account its small size and importance as a rookery, this island has been recommended for conservation.

SPOIL ISLAND IR8



-  Brazilian pepper
0.121 hectares
-  Mangroves
0.077 hectares
-  Sand
0.073 hectares
-  Australian pine
0.065 hectares
-  Sea purslane
0.017 hectares
-  Buttonwood
0.015 hectares
-  Pond
0.009 hectares
-  Shoal grass
-  Unvegetated bottom
-  < 1 m deep

1 cm = 37 m



ISLAND NO. IR9A

Date Sampled: 23 November 1987

I. Physical Description

- A. Island Size: 2.32 hectares
- B. Height Above Mean High Water: 3 m
- C. Distance from Boat Ramps: 1.2 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 275 m northwest of marker 69
- E. Erosion: Cliffs on north and east sides, sand spit on west side
- F. Boating access: Southwest side; 2 m, small sand beach

II. Biological Description

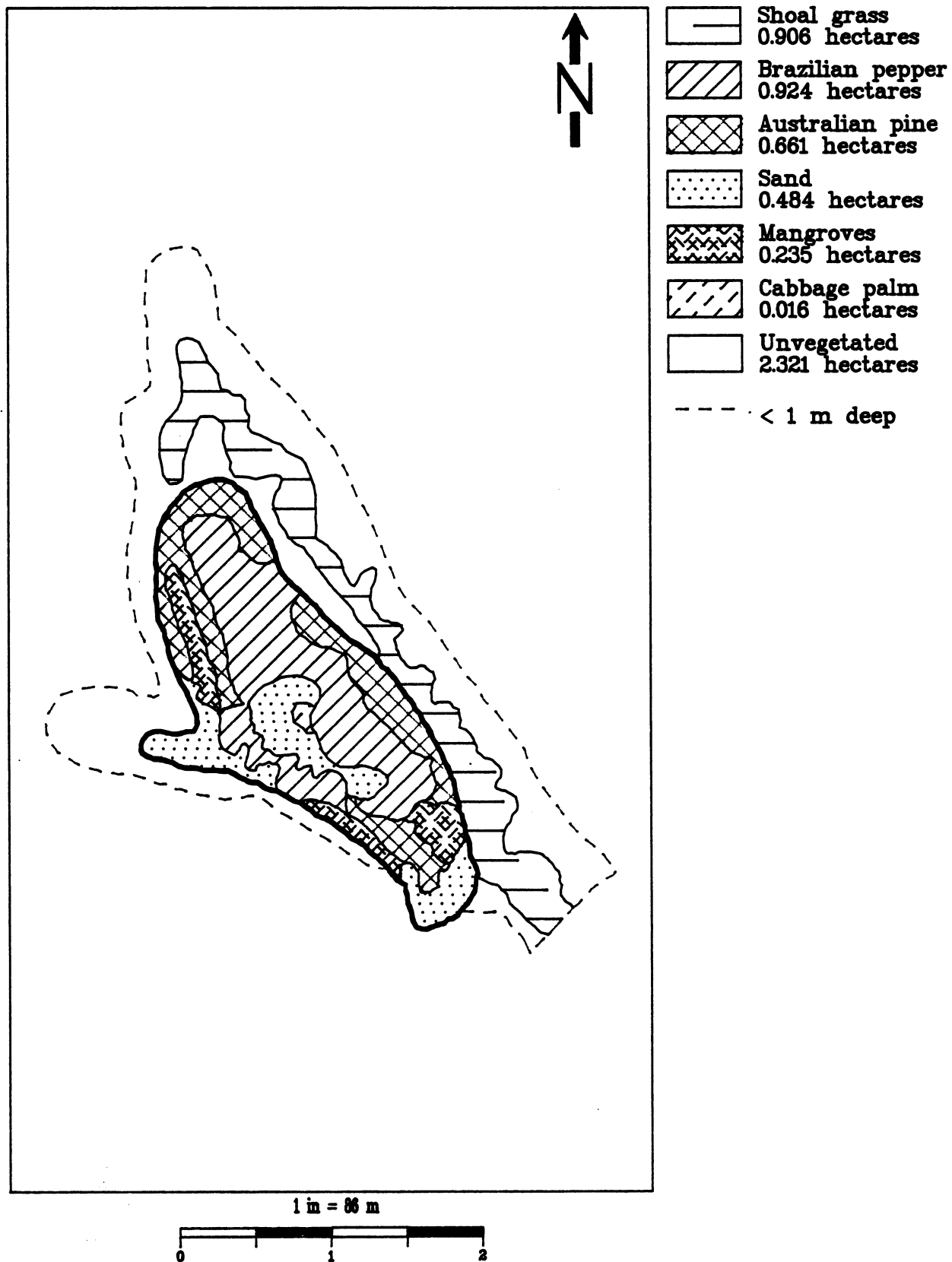
- A. Dominant Terrestrial Vegetation
Brazilian pepper (35%), Australian pine (23%), cabbage palm (9%); 29 species total.
- B. Soil humus: 6.5 cm
- C. Seagrasses
Shoal grass on north and east sides
- D. Bird Usage
Brown pelican most common; 8 species total, no nests
- E. Common Fishes and Invertebrates
Mojarras and bay anchovy, 9 fish species total, oysters around northern end
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus. Special concern: osprey, little blue heron, pelican

III. Recommended usage: Active Recreation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve. It has deep water access, open beaches and a lack of sensitive flora and nesting birds. The center of the island is sparsely vegetated and is sufficiently elevated to allow construction of picnic pavilions and fireplaces. Furthermore, the southwest side of the island has deep water and open beach access, where docks might be permitted. Therefore, it is recommended that this island be designated for active recreation.

SPOIL ISLAND IR9A



ISLAND NO. IR9B

Date Sampled: 12 January 1988

I. Physical Description

- A. Island Size: 0.561 hectares
- B. Height Above Mean High Water: <1 m
- C. Distance from Boat Ramps: 1.7 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 270 m west of marker 69
- E. Erosion: Slight on east side
- F. Boating access: West side; 1.5 m deep, open beach

II. Biological Description

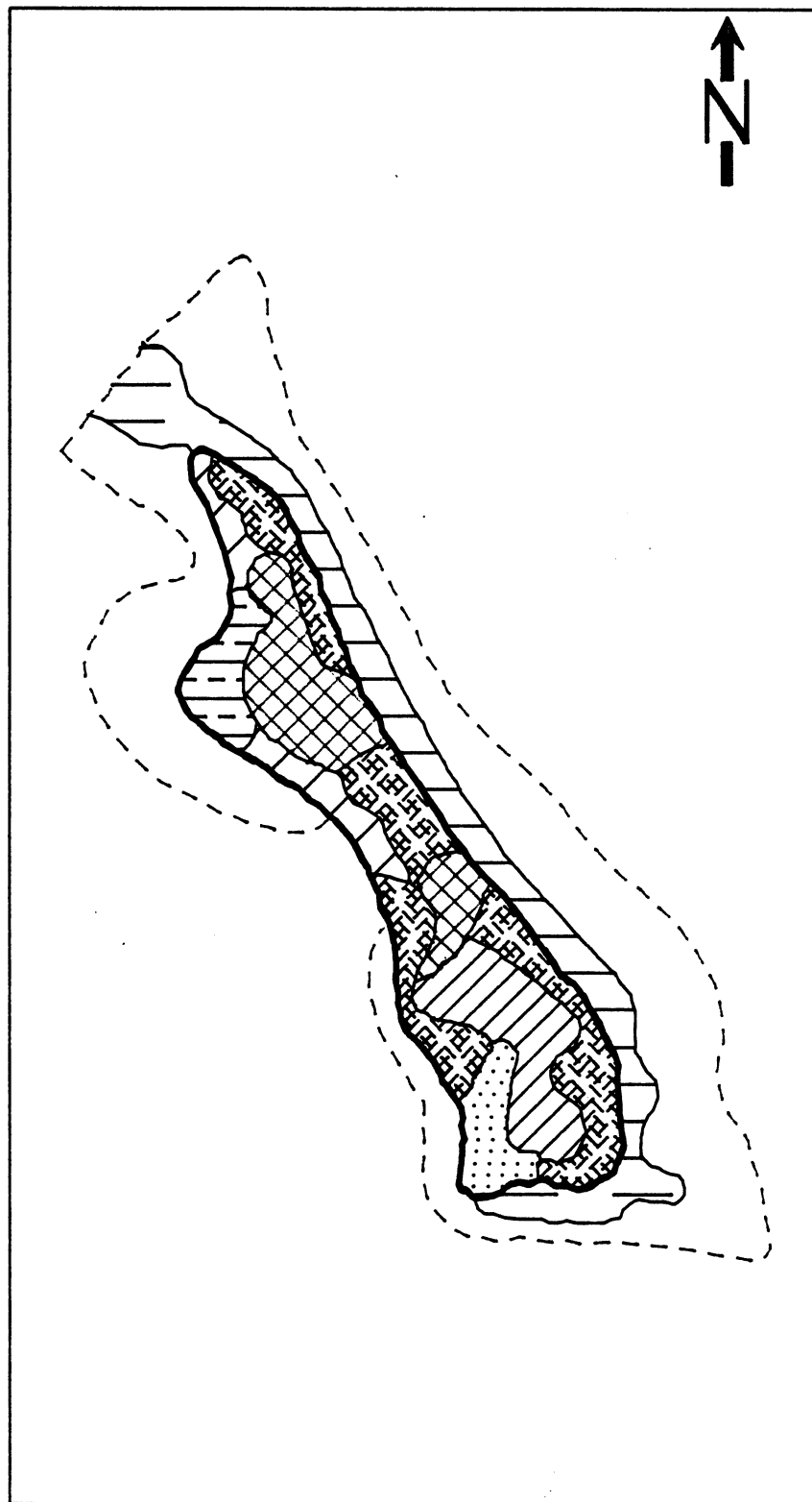
- A. Dominant Terrestrial Vegetation
Australian pine (23%), white mangrove (23%), red mangrove (18%), black mangrove (7%), Brazilian pepper (7%); 25 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north, east and south sides
- D. Bird Usage
Brown pelican and American oystercatcher common; 5 species total, 1 great blue heron nest
- E. Common Fishes and Invertebrates
Striped mullet, mojarra, pinfish and Atlantic croaker common, 11 fish species total; grass and arrow shrimps common, 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: osprey, brown pelican

III. Recommended usage: Passive Recreation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve. The island is relatively small, has open beaches and deep water access and contains no sensitive or threatened vegetation. One pair of great blue herons uses the island for nesting. The island has received human usage historically and should remain available for passive recreation uses. It is, however, too small to support recreational construction.

SPOIL ISLAND IR9B



	Shoal grass 0.242 hectares
	Mangroves 0.206 hectares
	Australian pine 0.119 hectares
	Brazilian pepper 0.096 hectares
	Marsh 0.055 hectares
	Sea oxeye 0.043 hectares
	Sand 0.042 hectares
	Unvegetated 0.703 hectares
	< 1 m deep

1 in = 44 m



ISLAND NO. IR10

Date Sampled: 5 February 1988

I. Physical Description

- A. Island Size: 0.755 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 1.5 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 500 m southeast of marker 69
- E. Erosion: Slight; low cliff on north
- F. Boating access: Southwest side, open beach, 1.5 m deep

II. Biological Description

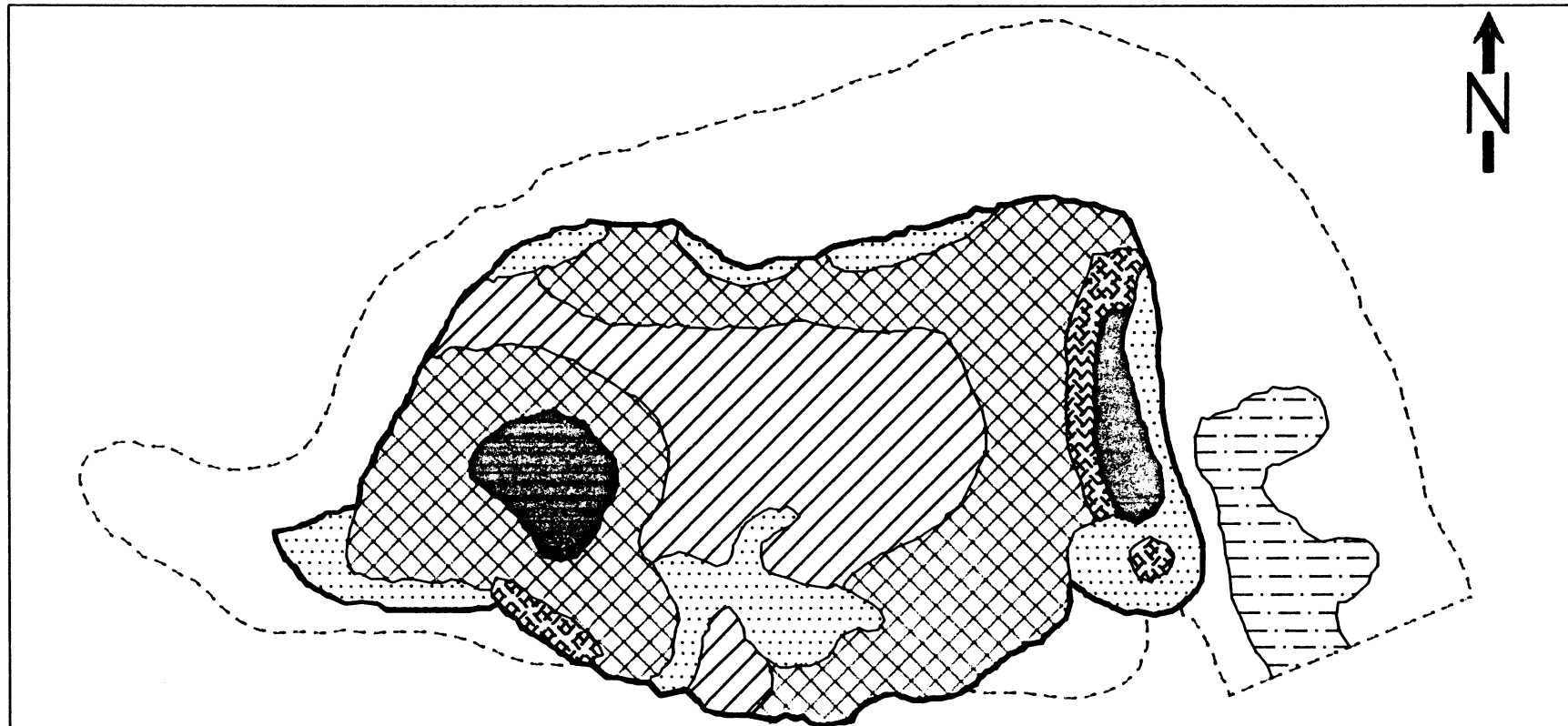
- A. Dominant Terrestrial Vegetation
Australian pine (72.7%), Brazilian pepper (59.1%), black mangrove (13.6%), red mangrove (13.6%); 22 species total
- B. Soil humus: 1 cm
- C. Seagrasses
none
- D. Bird Usage
Osprey, great blue heron, little blue heron, American oystercatcher, yellow-crowned night heron; 9 species total
- E. Common Fishes and Invertebrates
Mojarra, spot, tidewater silversides, pinfish, striped mullet, goldspotted killifish, 11 fish species total; 4 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Special concern: Osprey, little blue heron, American oystercatcher

III. Recommended usage: Passive Recreation

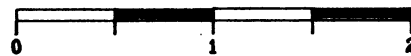
IV. Comments

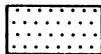
This island is located in the Malabar to Vero Beach Aquatic Preserve. It is too small to support recreational construction, however, it does provide ample open spaces for picnicking and overnight camping.

SPOIL ISLAND IR10



1 in = 27 m



	Australian pine 0.379 hectares		Mangroves 0.034 hectares
	Brazilian pepper 0.216 hectares		Rocks
	Sand 0.125 hectares		Unvegetated bottom
	Pond 0.055 hectares		< 1 m deep

ISLAND NO. IR11

Date Sampled: 7 March 1988

I. Physical Description

- A. Island Size: 0.569 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 1.5 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 600 m northwest of marker 70
- E. Erosion: Low; slight cliff on northeast
- F. Boating access: Northwest and southwest; open beaches, 2.0 m deep

II. Biological Description

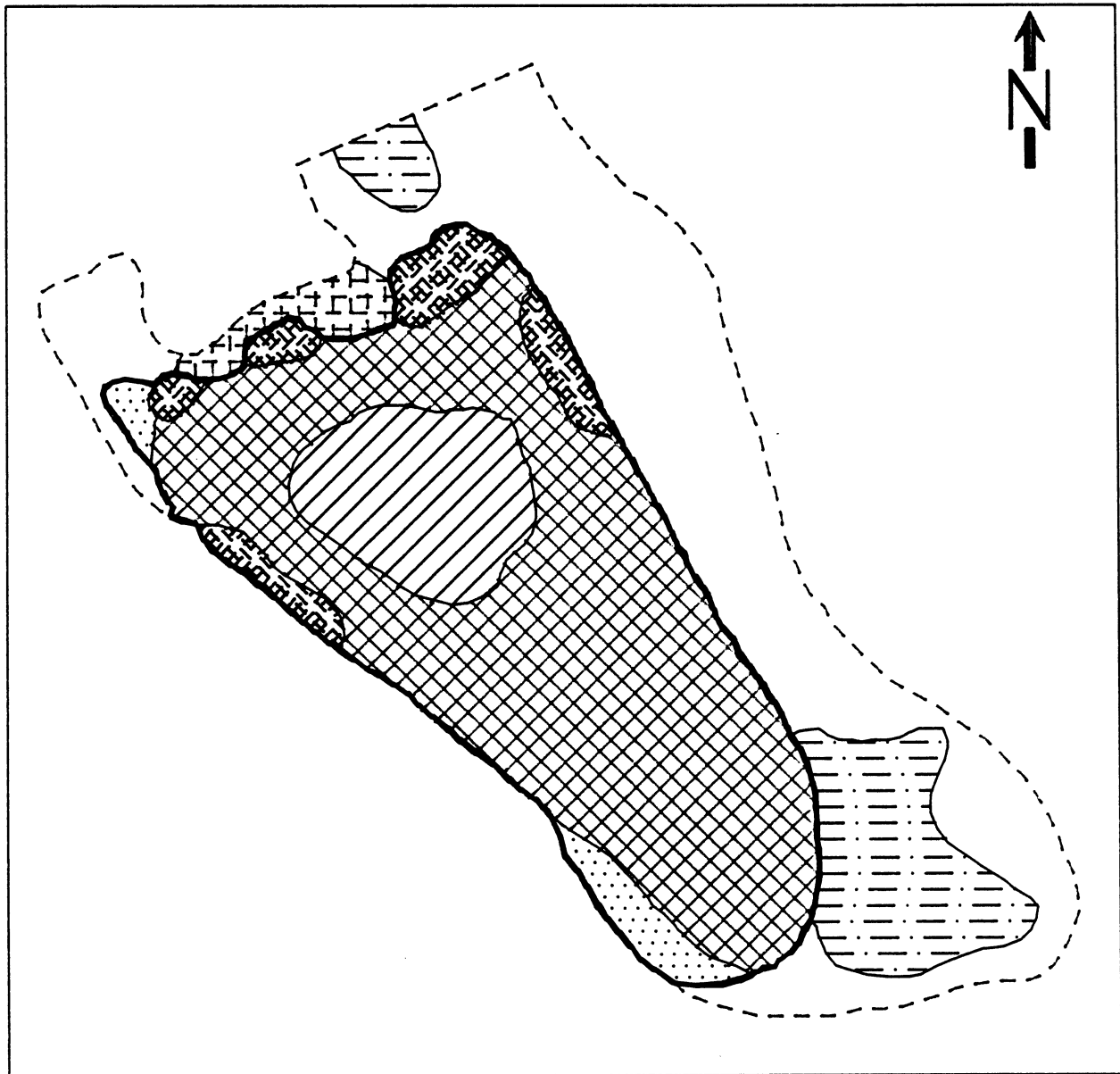
- A. Dominant Terrestrial Vegetation
Australian pine (88.9%), Brazilian pepper (44.4%); 28 species total
- B. Soil humus: 0 cm
- C. Seagrasses
none
- D. Bird Usage
Nesting great blue heron; also American oystercatcher, brown pelican, little blue heron; 5 species total
- E. Common Fishes and Invertebrates
Striped mullet, pinfish, mojarra, Atlantic croaker, tidewater silversides, 9 fish species total; 5 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Special concern: American oystercatcher, little blue heron, brown pelican

III. Recommended usage: Passive Recreation

IV. Comments

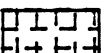
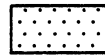
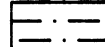
This island is located in the Malabar to Vero Beach Aquatic Preserve. Although small, it provides an open sand beach and areas ideal for picnicking, fishing, and overnight camping.

SPOIL ISLAND IR11



1 in = 28 m



	Australian pine 0.409 hectares		Oysters
	Brazilian pepper 0.083 hectares		Unvegetated bottom
	Mangroves 0.050 hectares		< 1 m deep
	Sand 0.026 hectares		
	Rocks		

ISLAND NO. IR12

Date Sampled: 23 May 1988

I. Physical Description

- A. Island Size: 0.664 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 2.0 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 200 m southwest of marker 70
- E. Erosion: Severe; 2-3 m cliff on north
- F. Boating access: West and south sides; open beaches, 1.5 m deep

II. Biological Description

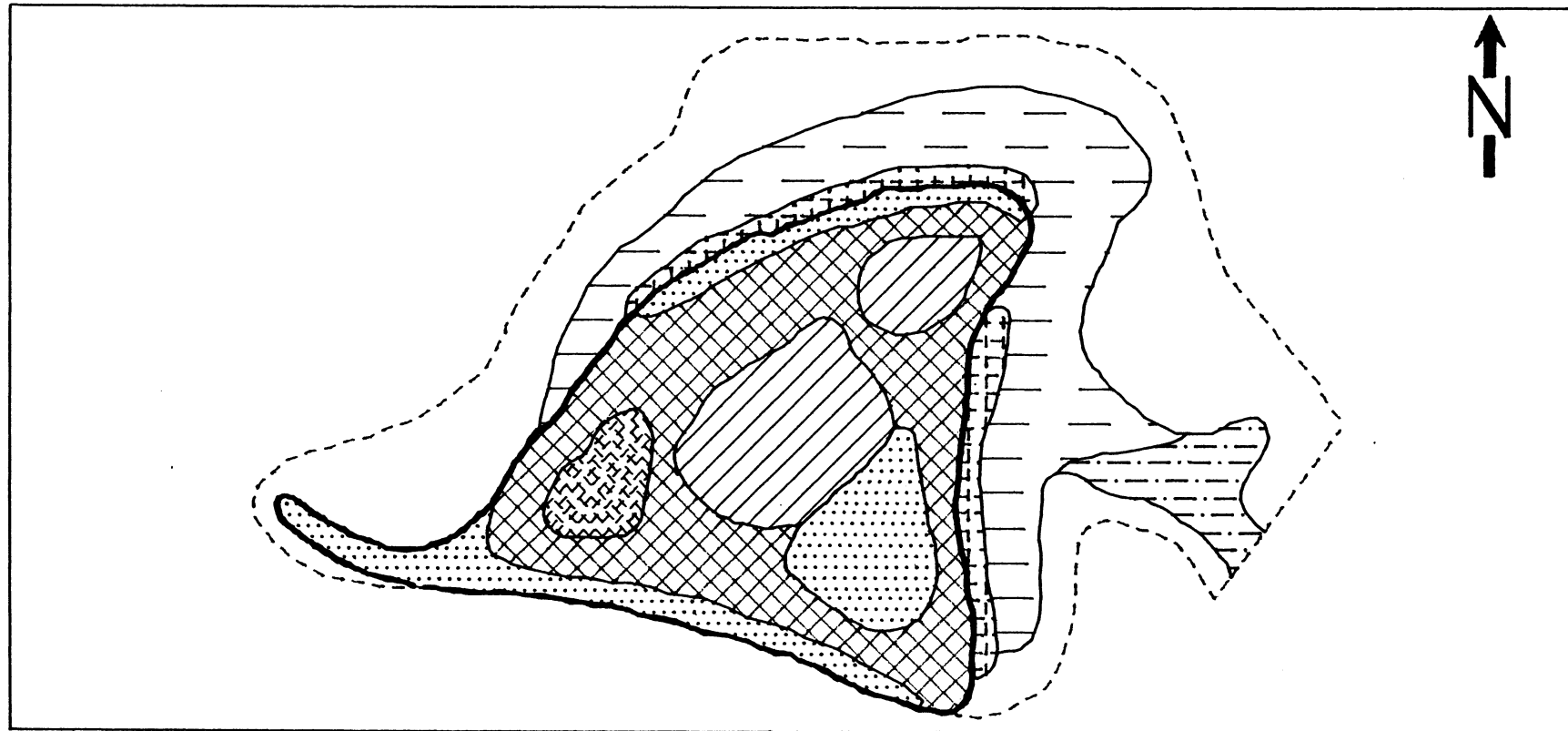
- A. Dominant Terrestrial Vegetation
Australian pine (56.5%), Brazilian pepper (39.1%); 44 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on all sides
- D. Bird Usage
Great egret, red-bellied woodpecker, osprey; 6 species total
- E. Common Fishes and Invertebrates
Pinfish, pigfish, gulf pipefish, striped mullet, tidewater silversides, mojarra, 11 fish species total; 5 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Threatened: prickly-pear cactus. Special concern: osprey

III. Recommended usage: Passive Recreation

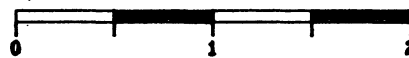
IV. Comments

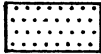
This island is located in the Malabar to Vero Beach Aquatic Preserve. Though it is too small to support recreational facilities, this island makes an exceptional daily activity site for fishermen, picnickers, and overnight campers. Deep water access and open sand beaches are available all along the southern shore.

SPOIL ISLAND IR12



1 in = 33 m



	Australian pine 0.324 hectares		Rocks
	Sand 0.169 hectares		Oysters
	Brazilian pepper 0.137 hectares		Shoal grass
	Mangroves 0.034 hectares		Unvegetated bottom

--- < 1 m deep

ISLAND NO. IR13

Date Sampled: 21 March 1988

I. Physical Description

- A. Island Size: 0.83 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 2.0 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 100 m south of marker 70
- E. Erosion: Slight; low cliff on west
- F. Boating access: South side; open sand beach, 2.0 m deep

II. Biological Description

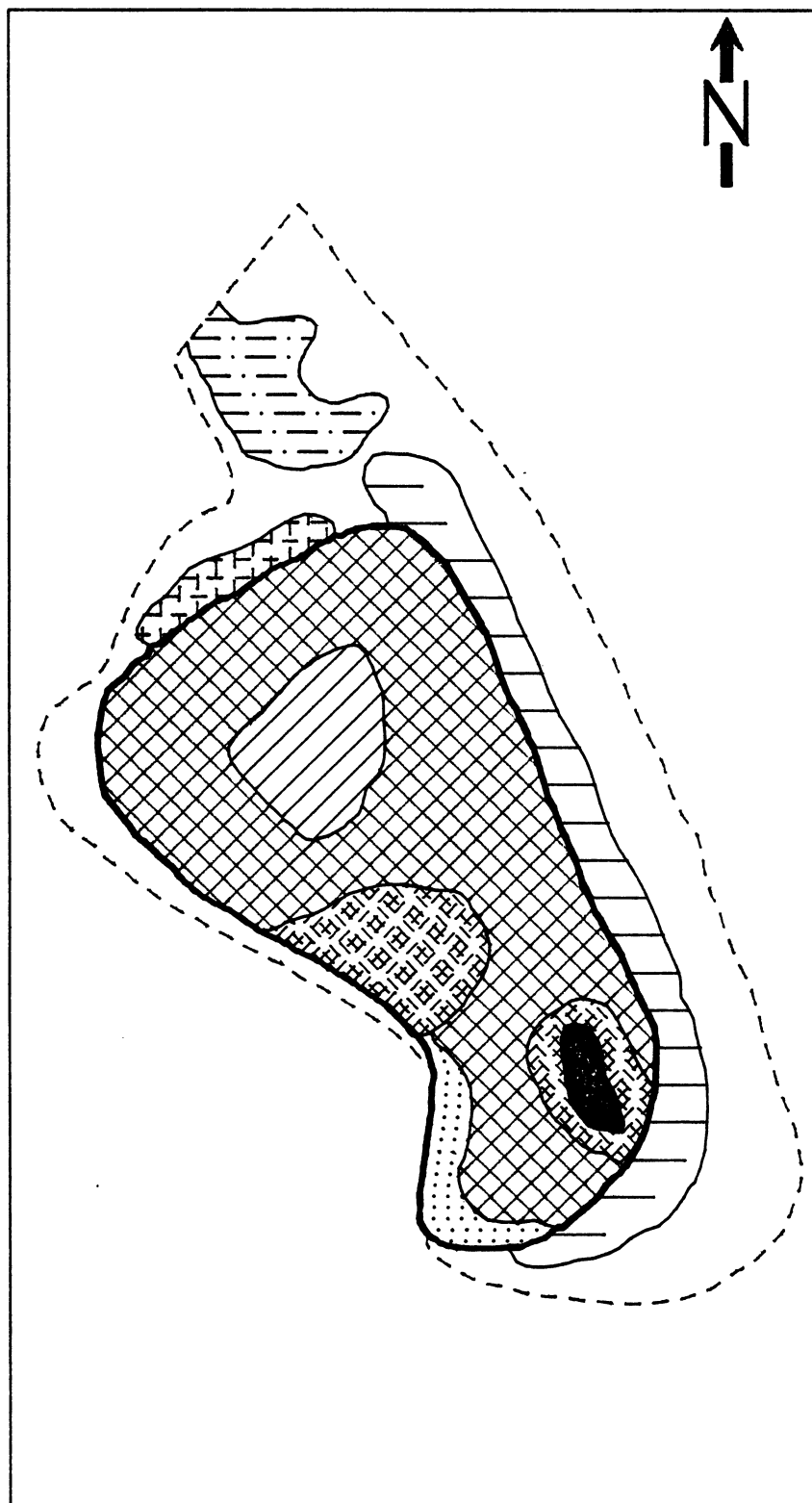
- A. Dominant Terrestrial Vegetation
Brazilian pepper (72.7%), Australian pine (59.1%), Florida privet (27.3%); 37 species total
- B. Soil humus: 9 cm
- C. Seagrasses
Shoal grass on east, south and west
- D. Bird Usage
Osprey, red-bellied woodpecker, blue-gray gnatcatcher, fish crow; 4 species total
- E. Common Fishes and Invertebrates
Pinfish, tidewater silversides, ladyfish, mojarra, striped mullet, spot, 13 fish species total; 6 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Threatened: prickly-pear cactus; Special concern: osprey

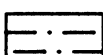
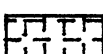
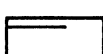
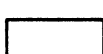
III. Recommended usage: Passive Recreation

IV. Comments

This island is located in the Malabar to Vero Beach Aquatic Preserve. It is small and offers little promise for recreational construction. It does have adequate deep water along the west and south shores, ideal for fishing. The only open area is the sand beach on the south.

SPOIL ISLAND IR13



-  Australian pine
0.594 hectares
-  Mangroves
0.117 hectares
-  Brazilian pepper
0.079 hectares
-  Sand
0.040 hectares
-  Pond
0.016 hectares
-  Rocks
-  Oysters
-  Shoal grass
-  Unvegetated bottom
-  < 1 m deep

1 in = 37 m



ISLAND NO. IR14

Date Sampled: 8 April 1988

I. Physical Description

- A. Island Size: 0.90 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 2.5 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 600 m south of marker 70
- E. Erosion: Moderate; 1 m cliff on northeast
- F. Boating access: South, 2.0 m deep; sand spit on west

II. Biological Description

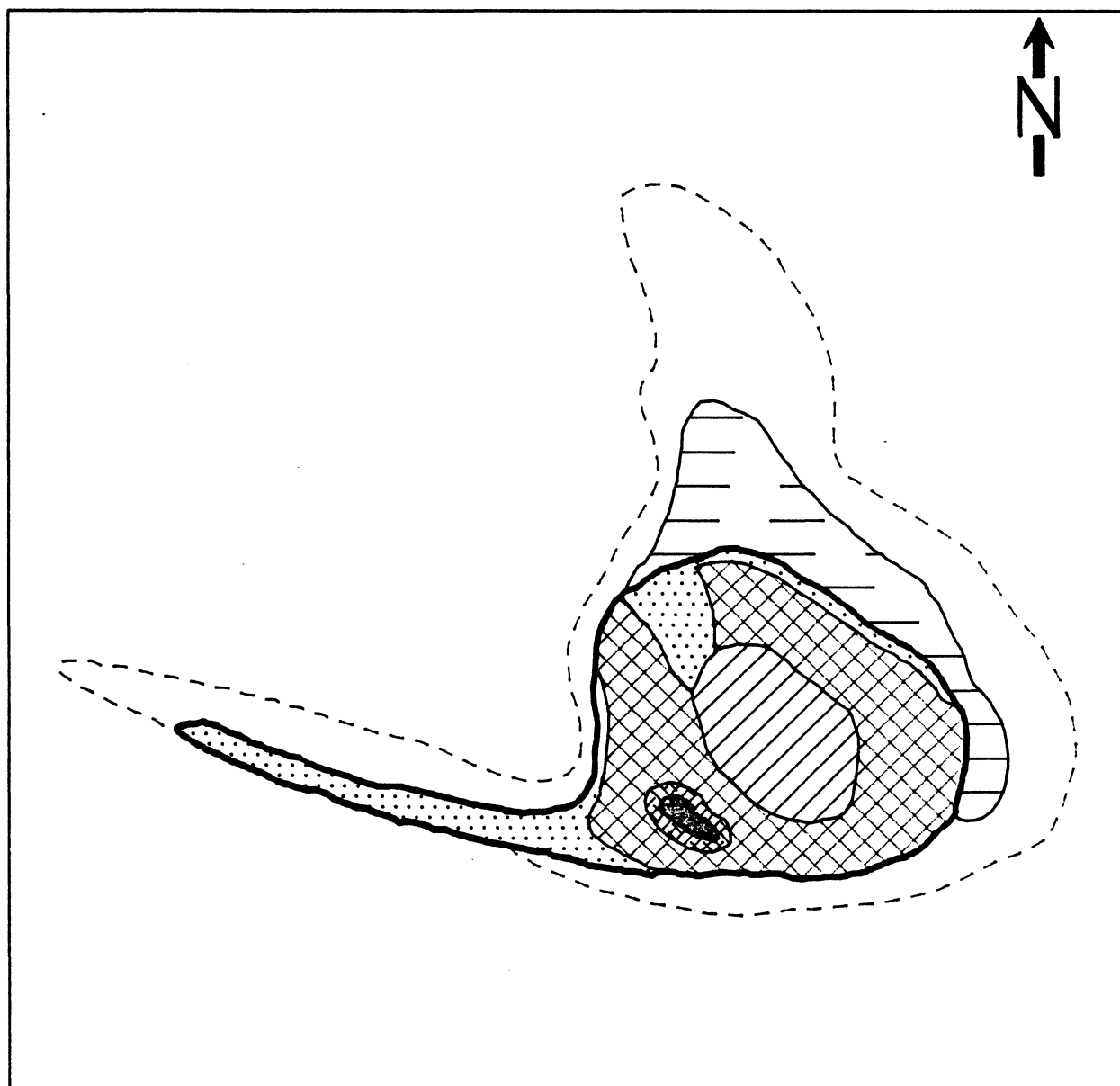
- A. Dominant Terrestrial Vegetation
Australian pine (95.5%), Brazilian pepper (81.8%), Florida privet (31.8%); 37 species total
- B. Soil humus: 2 cm
- C. Seagrasses
Shoal grass on north and east
- D. Bird Usage
Nesting great blue heron; also American oystercatcher, willet, blue-gray gnatcatcher; 7 species total
- E. Common Fishes and Invertebrates
Pinfish, tidewater silversides, spot, mojarra, 10 fish species total; 5 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Special concern: American oystercatcher

III. Recommended usage: Passive Recreation

IV. Comments

This island is located in the Malabar to Vero Beach Aquatic Preserve. It is too small to support recreational construction, however, it does offer excellent fishing, picnicking, and overnight camping sites.

SPOIL ISLAND IR14



1 in = 49 m



	Australian pine 0.492 hectares		Shoal grass
	Sand 0.216 hectares		Unvegetated bottom
	Brazilian pepper 0.170 hectares		< 1 m deep
	Mangroves 0.021 hectares		
	Pond 0.010 hectares		

ISLAND NO. IR15

Date Sampled: 5 May 1988

I. Physical Description

- A. Island Size: 0.288 hectares
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 4.5 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 400 m southwest of marker 73
- E. Erosion: Slight; low cliff on east
- F. Boating access: South, 1.5 m deep, sand beach on west

II. Biological Description

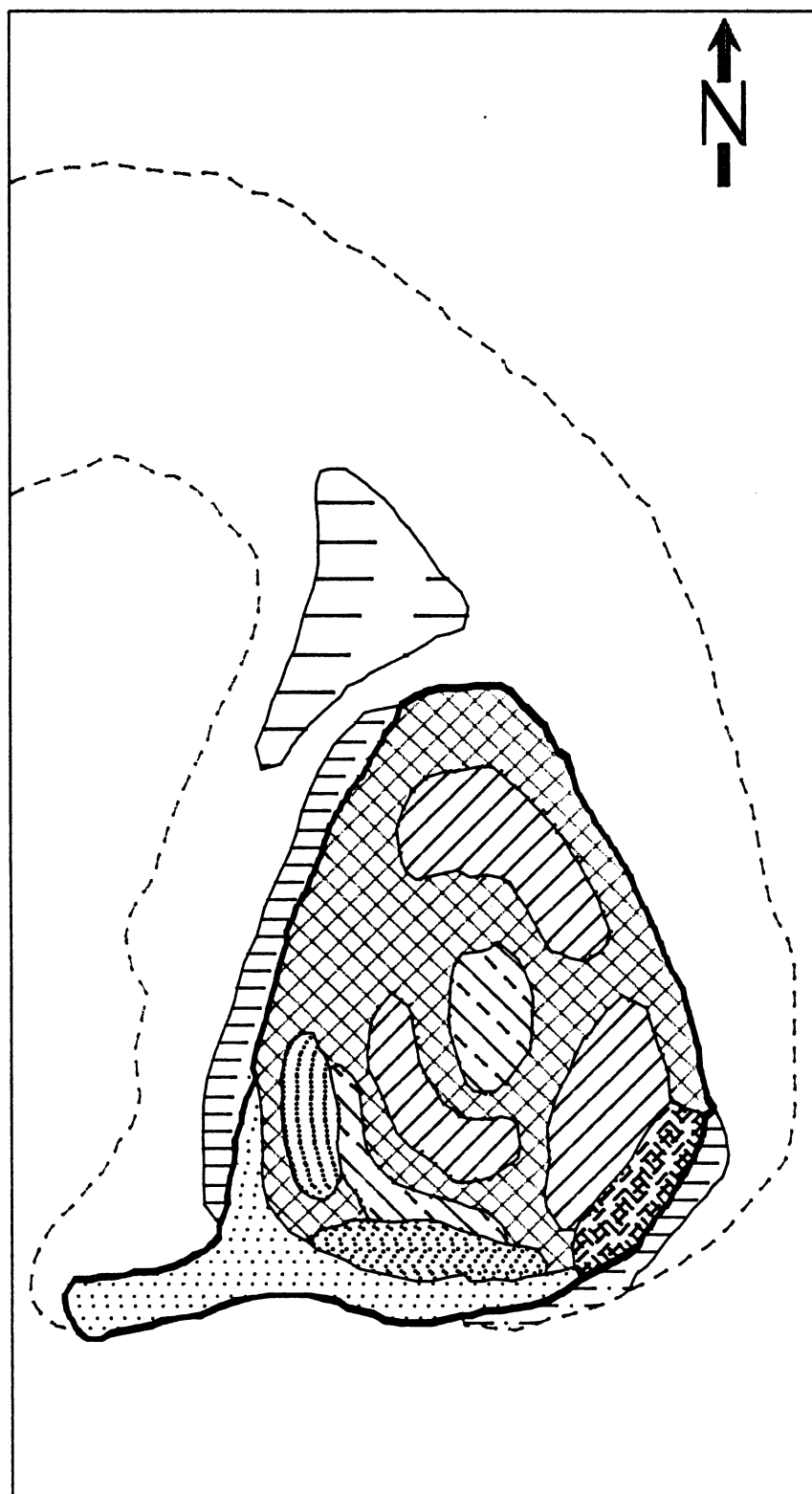
- A. Dominant Terrestrial Vegetation
Brazilian pepper (78.6%), Australian pine (50.0%), cabbage palm (21.4%), gray nicker (21.4%), sea oxeye (14.3%); 26 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north, east and west; manatee grass on north
- D. Bird Usage
Nesting green-backed heron, tricolor heron, black-crowned night heron; also little blue heron, wood stork, least tern, snowy egret, great blue heron; 9 species total
- E. Common Fishes and Invertebrates
Tidewater silversides, bay anchovy, pigfish, pinfish, gulf pipefish, 9 fish species total; 4 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Threatened: Least tern, prickly-pear cactus; Special concern: little blue heron, snowy egret, tricolor heron

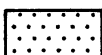
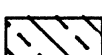
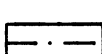
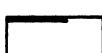
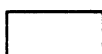
III. Recommended usage: Conservation

IV. Comments

This island is located in the Malabar to Vero Beach Aquatic Preserve. Despite its small size, this island serves as an important bird rookery throughout most of the year. It should be posted off limits to all boaters.

SPOIL ISLAND IR15



-  Australian pine
0.131 hectares
-  Brazilian pepper
0.063 hectares
-  Sand
0.037 hectares
-  Buttonwood
0.023 hectares
-  Prickly pear cactus
0.022 hectares
-  Mangroves
0.013 hectares
-  Rocks
-  Shoal grass
-  Unvegetated bottom
-  < 1 m deep

1 in = 21 m



ISLAND NO. IR16

Date Sampled: 9 January 1989

I. Physical Description

- A. Island Size: 0.309 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 4.5 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 700 m south of marker 73
- E. Erosion: Slight; low cliff on east
- F. Boating access: North and west; rock beaches, 1.5 m deep

II. Biological Description

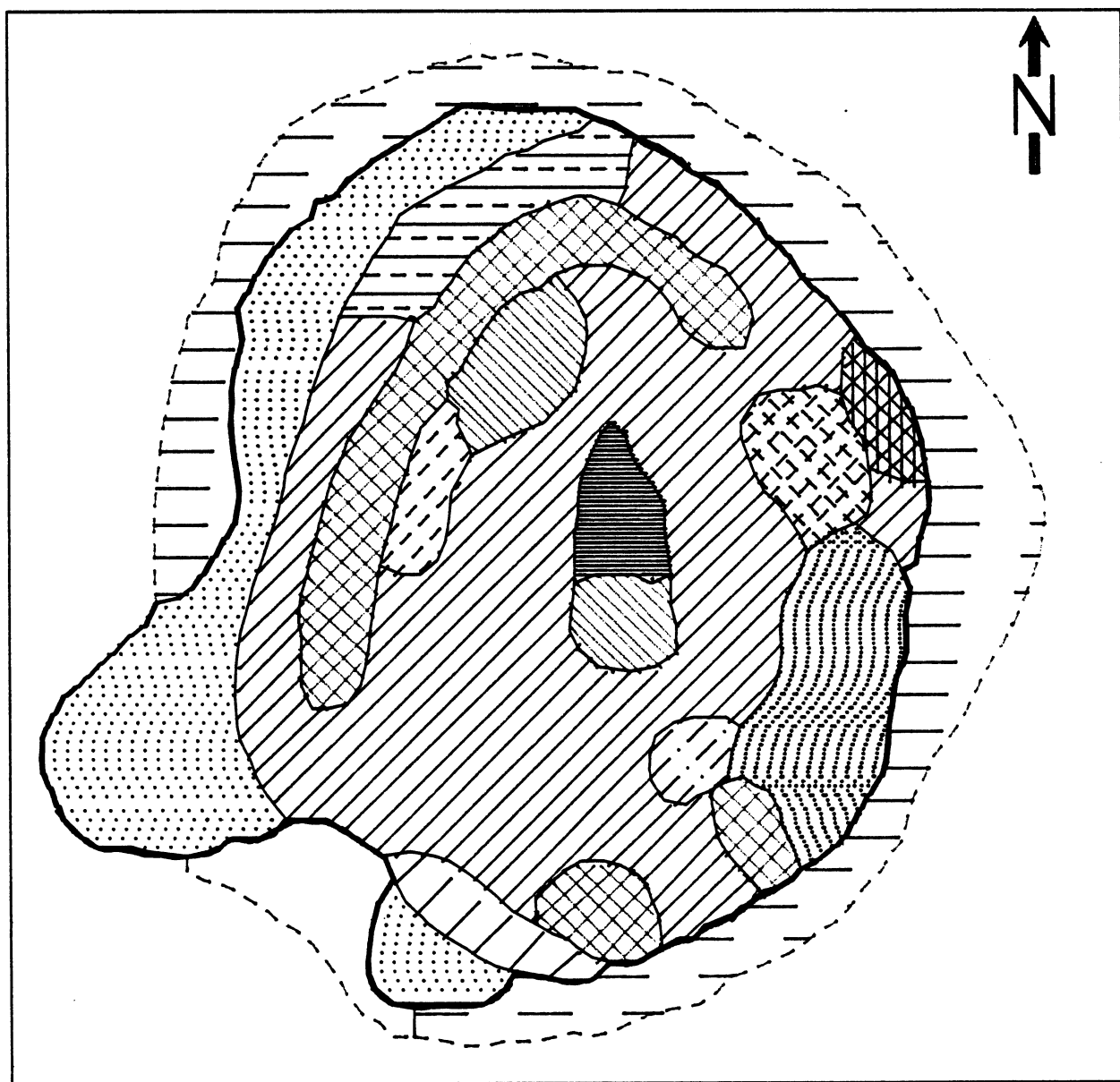
- A. Dominant Terrestrial Vegetation
Brazilian pepper (85.7%), Australian pine (64.3%), white stopper (14.3%); 23 species total
- B. Soil humus: 2 cm
- C. Seagrasses
Shoal grass on north, south and east
- D. Bird Usage
Nesting snowy egret, cattle egret, tricolor heron, white ibis, great egret; 8 species total
- E. Common Fishes and Invertebrates
Pinfish, mojarra, Atlantic croaker, striped mullet, code goby, bay anchovy, 9 fish species total; 6 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Special concern: Little blue heron, snowy egret, tricolor heron

III. Recommended usage: Conservation

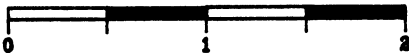
IV. Comments

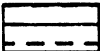
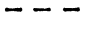
This island is located in the Malabar to Vero Beach Aquatic Preserve. Despite its extremely small size, this island serves as an important bird rookery throughout most of the year. It should be posted off limits to all boaters.

SPOIL ISLAND IR16



1 in = 14 m



	Brazilian pepper 0.138 hectares		Blolly 0.009 hectares		Privet 0.004 hectares
	Sand 0.052 hectares		Wild Poinsetta 0.009 hectares		Sea grape 0.004 hectares
	Australian pine 0.039 hectares		Marsh 0.007 hectares		Shoal grass
	Buttonwood 0.022 hectares		Cabbage palm 0.005 hectares		Unvegetated bottom
	Sea oxeye 0.013 hectares		Stopper 0.005 hectares		< 1 m deep

ISLAND NO. IR17

Date Sampled: 9 January 1989

I. Physical Description

- A. Island Size: 0.148 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 5.0 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 300 m west of marker 74
- E. Erosion: Slight; low cliff on east
- F. Boating access: West and south; 1.5 m deep, no beaches

II. Biological Description

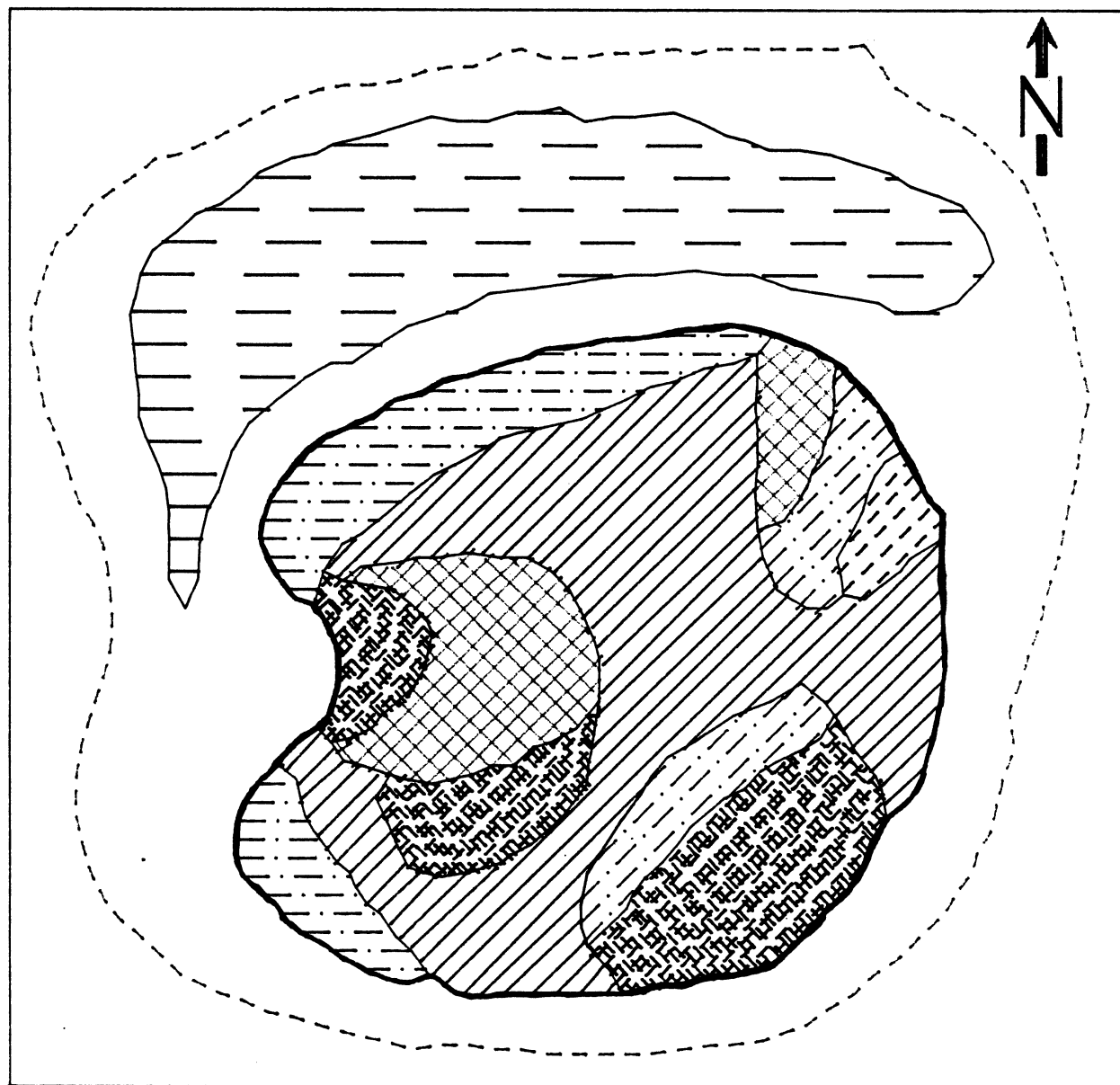
- A. Dominant Terrestrial Vegetation
Brazilian pepper (90.9%), Australian pine (63.6%), Florida privet (27.3%), black mangrove (18.2%); 14 species total
- B. Soil humus: 2 cm
- C. Seagrasses
Shoal grass on north, south and east
- D. Bird Usage
Nesting snowy egret, cattle egret, tricolor heron, white ibis, great egret; 10 species total
- E. Common Fishes and Invertebrates
Bay anchovy, Atlantic croaker, pinfish, mojarra, red drum, striped mullet, 15 fish species total; 5 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Special concern: Little blue heron, snowy egret, tricolor heron

III. Recommended usage: Conservation

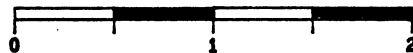
IV. Comments

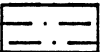
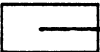
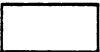
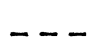
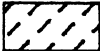
This island is located in the Malabar to Vero Beach Aquatic Preserve. Despite its extremely small size, this island serves as an important bird rookery throughout most of the year. It should be posted off limits to all boaters.

SPOIL ISLAND IR17



1 m = 12 m



	Brazilian pepper 0.072 hectares		Rocks
	Mangroves 0.033 hectares		Shoal grass
	Australian pine 0.024 hectares		Unvegetated bottom
	Privet 0.016 hectares		< 1 m deep
	Cabbage palm 0.004 hectares		

ISLAND NO. IR18

Date Sampled: 9 November 1988

I. Physical Description

- A. Island Size: 0.229 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 5.0 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 200 m southwest of marker 74
- E. Erosion: Slight; low cliff on east
- F. Boating access: West and south; 1.5 m deep, no beaches

II. Biological Description

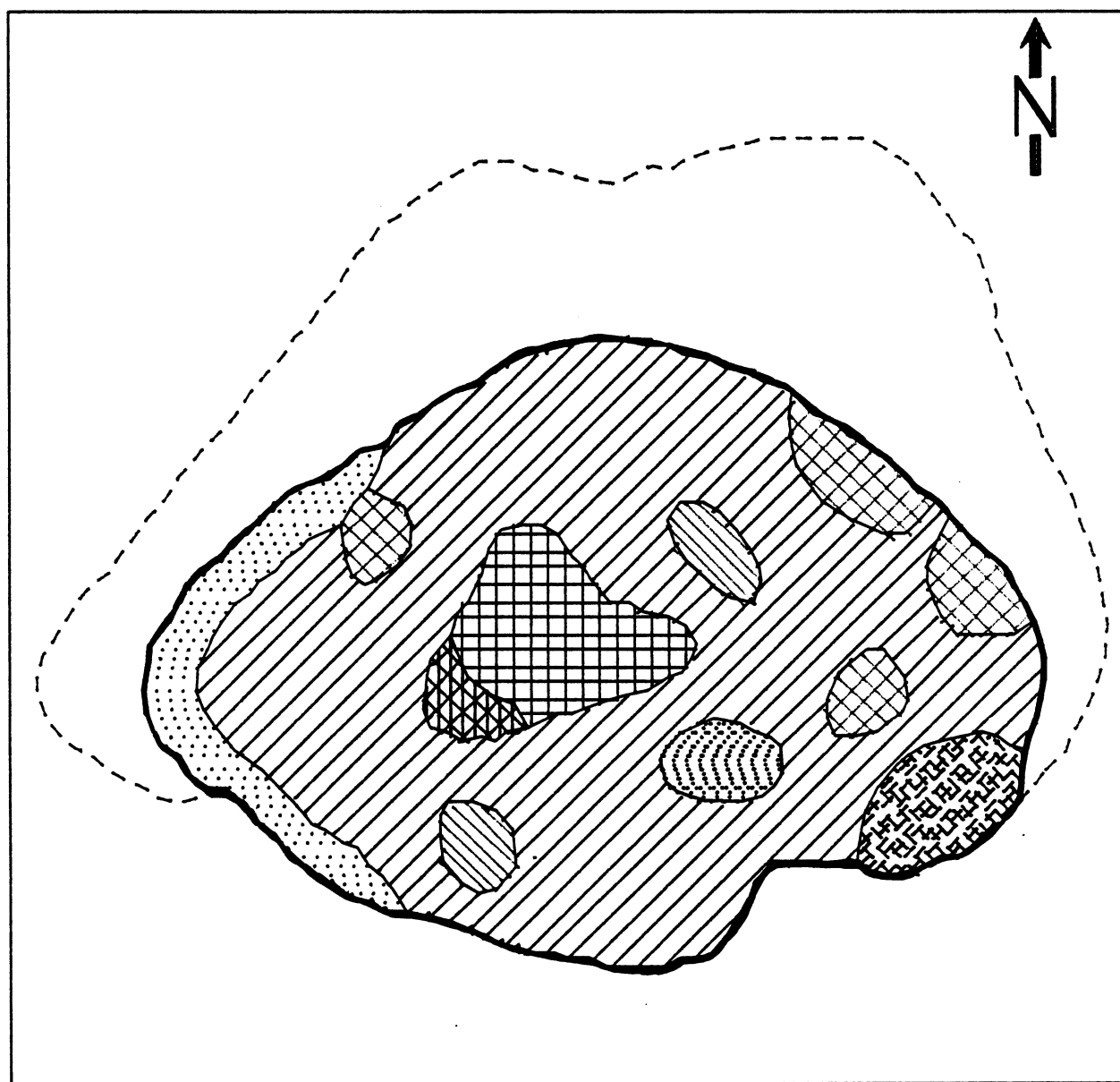
- A. Dominant Terrestrial Vegetation
Brazilian pepper (85.7%), black mangrove (21.4%), Florida privet (21.4%),
rouge plant (14.3%); 16 species total
- B. Soil humus: 2 cm
- C. Seagrasses
none
- D. Bird Usage
Nesting snowy egret, cattle egret, tricolor heron, great egret, white ibis; 12
species total
- E. Common Fishes and Invertebrates
Bay anchovy, mojarra, 6 fish species total; 3 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Special concern: Little blue heron, snowy egret, tricolor heron, osprey

III. Recommended usage: Conservation

IV. Comments

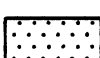
This island is located in the Malabar to Vero Beach Aquatic Preserve. Despite its extremely small size, this island serves as an important bird rookery throughout most of the year. It should be posted off limits to all boaters.

SPOIL ISLAND IR18



1 in = 13 m



	Brazilian pepper 0.156 hectares		Blolly 0.006 hectares
	Rouge plant 0.017 hectares		Buttonwood 0.005 hectares
	Australian pine 0.016 hectares		Sea grape 0.003 hectares
	Sand 0.016 hectares		Unvegetated bottom
	Mangroves 0.009 hectares		< 1 m deep

ISLAND NO. IR19

Date Sampled: 9 November 1988

I. Physical Description

- A. Island Size: 0.193 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 5.5 km south of Sebastian Yacht Club
- D. Distance and Direction from Channel Marker: 500 m south of marker 74
- E. Erosion: Slight; low cliff on east
- F. Boating access: South and west; 2.0 m deep, no beaches

II. Biological Description

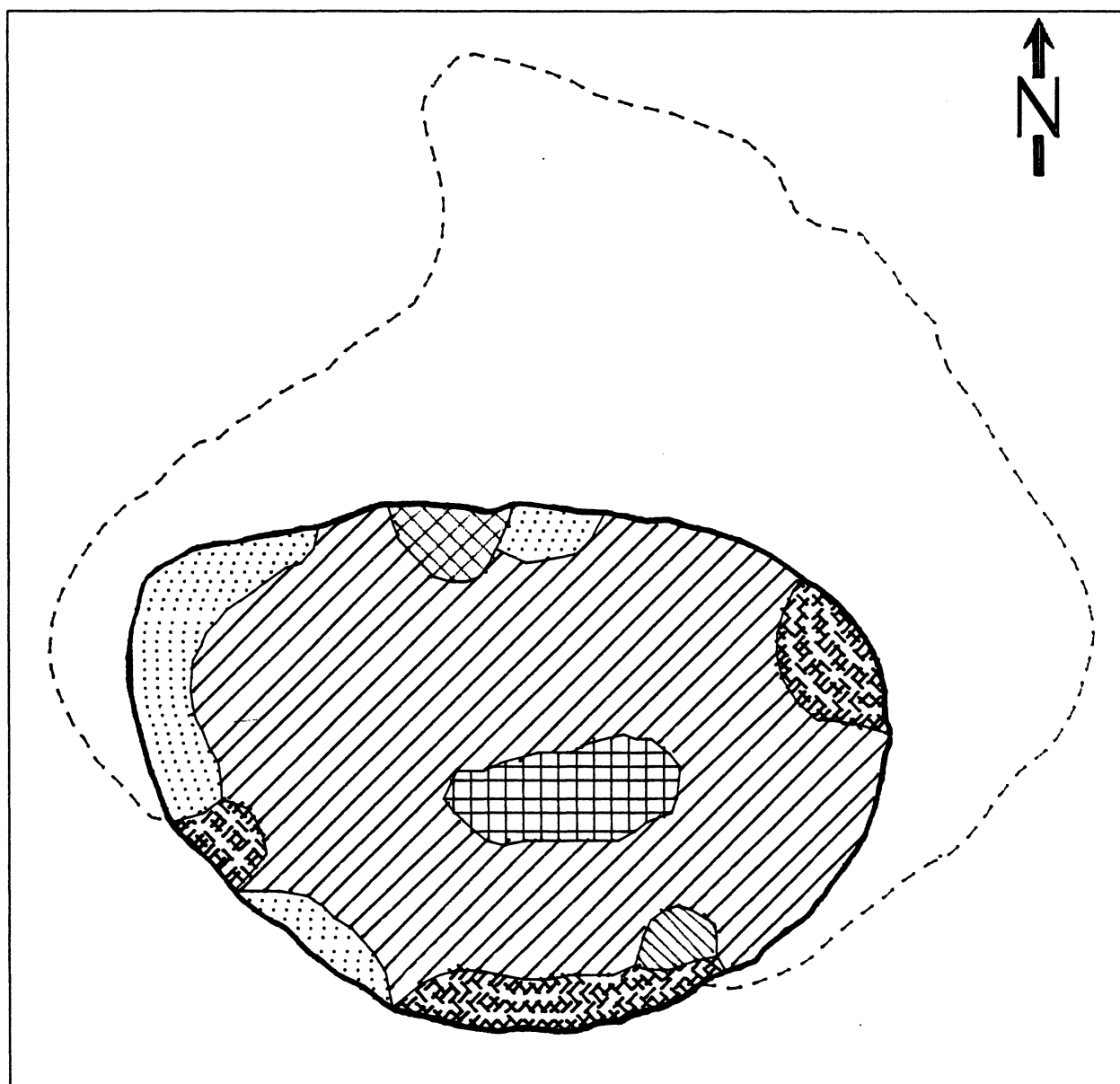
- A. Dominant Terrestrial Vegetation
Brazilian pepper (92.3%), rouge plant (15.4%); 20 species total
- B. Soil humus: 2 cm
- C. Seagrasses
none
- D. Bird Usage
Nesting snowy egret, cattle egret, tricolor heron, great egret, white ibis; 11 species total
- E. Common Fishes and Invertebrates
Bay anchovy, mojarra, 5 fish species total; 2 invertebrate species total
- F. Threatened, Endangered or Species of Special Concern
Special concern: Little blue heron, reddish egret, snowy egret, tricolor heron, brown pelican

III. Recommended usage: Conservation

IV. Comments

This island is located in the Malabar to Vero Beach Aquatic Preserve. Despite its extremely small size, this island serves as an important bird rookery throughout most of the year. It should be posted off limits to all boaters.

SPOIL ISLAND IR19



1 m = 14 m



	Brazilian pepper 0.137 hectares		Blolly 0.002 hectares
	Sand 0.020 hectares		Unvegetated bottom
	Mangroves 0.018 hectares		< 1 m deep
	Rouge plant 0.012 hectares		
	Australian pine 0.004 hectares		

ISLAND NO. IR20

Date Sampled: 12 December 1988

I. Physical Description

- A. Island Size: 0.654 hectares
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 1 km southeast of Wabasso Causeway
- D. Distance and Direction from Channel Marker: 50 m northeast of marker 81
- E. Erosion: None
- F. Boating access: No open beaches; 1.6 m deep on north side

II. Biological Description

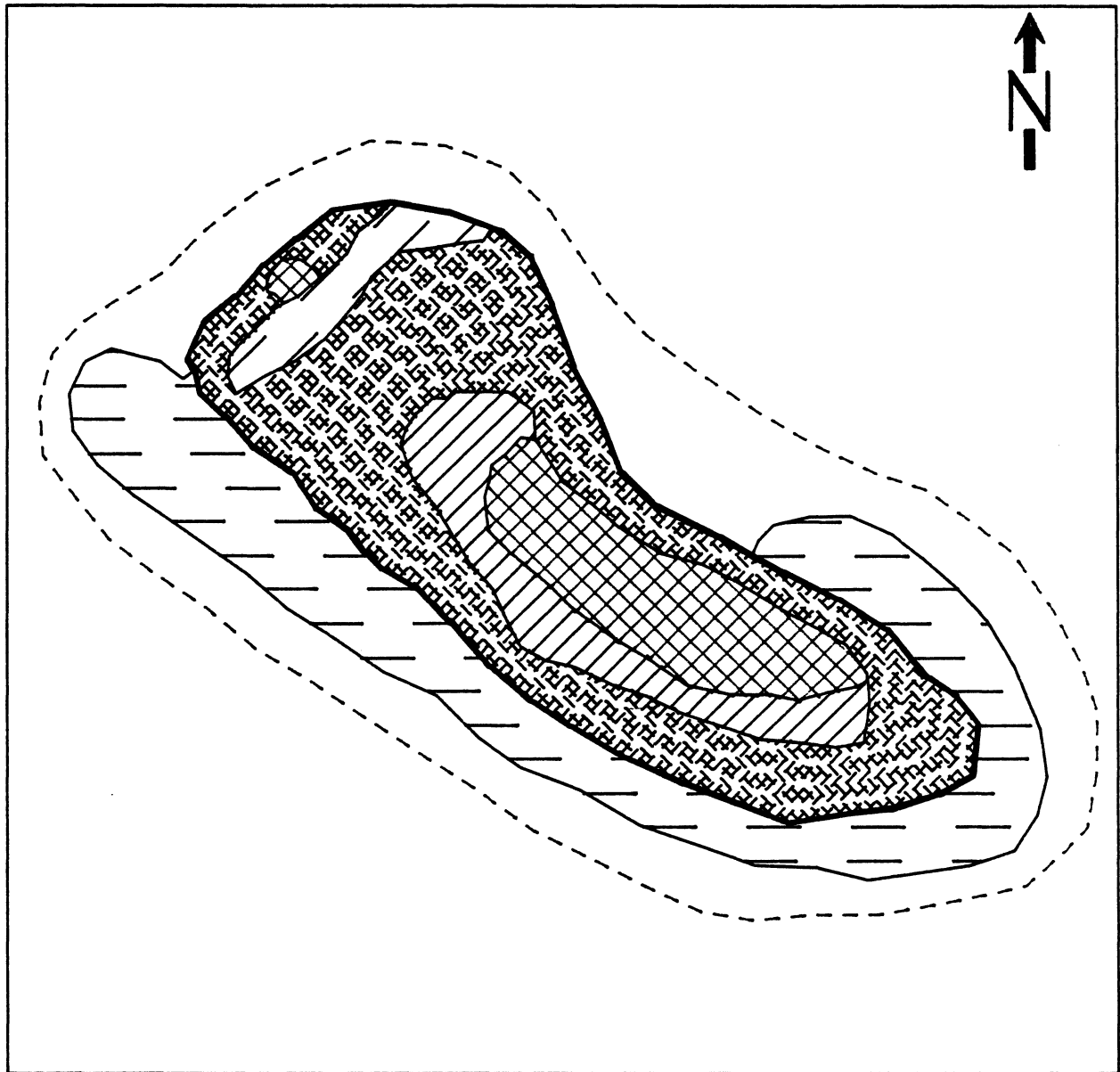
- A. Dominant Terrestrial Vegetation
Red mangrove (28%), Australian pine (18%), black mangrove (18%), Brazilian pepper (16%), white mangrove (8%); 18 species total
- B. Soil humus: 1 cm
- C. Seagrasses
Shoal grass on west and south sides
- D. Bird Usage
Double-crested cormorants common, 4 species total, no nests
- E. Common Fishes and Invertebrates
Atlantic croaker, code goby, mojarra, clown goby, 15 fish species total; humpback shrimp and penaeid shrimps, 6 species total
- F. Threatened, endangered or species of special concern
Threatened: Prickly-pear

III. Recommended usage: Conservation

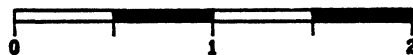
IV. Comments

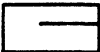
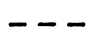
This island is in the Malabar to Vero Beach Aquatic Preserve and is privately owned by J.W. Michael, M.V. Michael and J.M. Lier. The island is ringed by mangroves, has a marsh at the northern end and is an important nursery area for fishes and invertebrates. The upland area in the center of the island is too small for development and is infested with mosquitoes. Therefore, we recommend that the owners allow this island to remain undeveloped for conservation purposes.

SPOIL ISLAND IR20



1 in = 30 m



	Shoal grass 0.345 hectares		Unvegetated 0.478 hectares
	Mangroves 0.392 hectares		< 1 m deep
	Australian pine 0.123 hectares		
	Brazilian pepper 0.099 hectares		
	Marsh 0.040 hectares		

ISLAND NO. IR21

Date Sampled: 4 January 1989

I. Physical Description

- A. Island Size: 20.773 hectares
- B. Height Above Mean High Water: 2 m in spoil areas
- C. Distance from Boat Ramps: 1.6 km south of Wabasso Causeway
- D. Distance and Direction from Channel Marker: 100 m south of marker 87
- E. Erosion: None
- F. Boating access: No open beaches; 1.2 m deep on east side

II. Biological Description

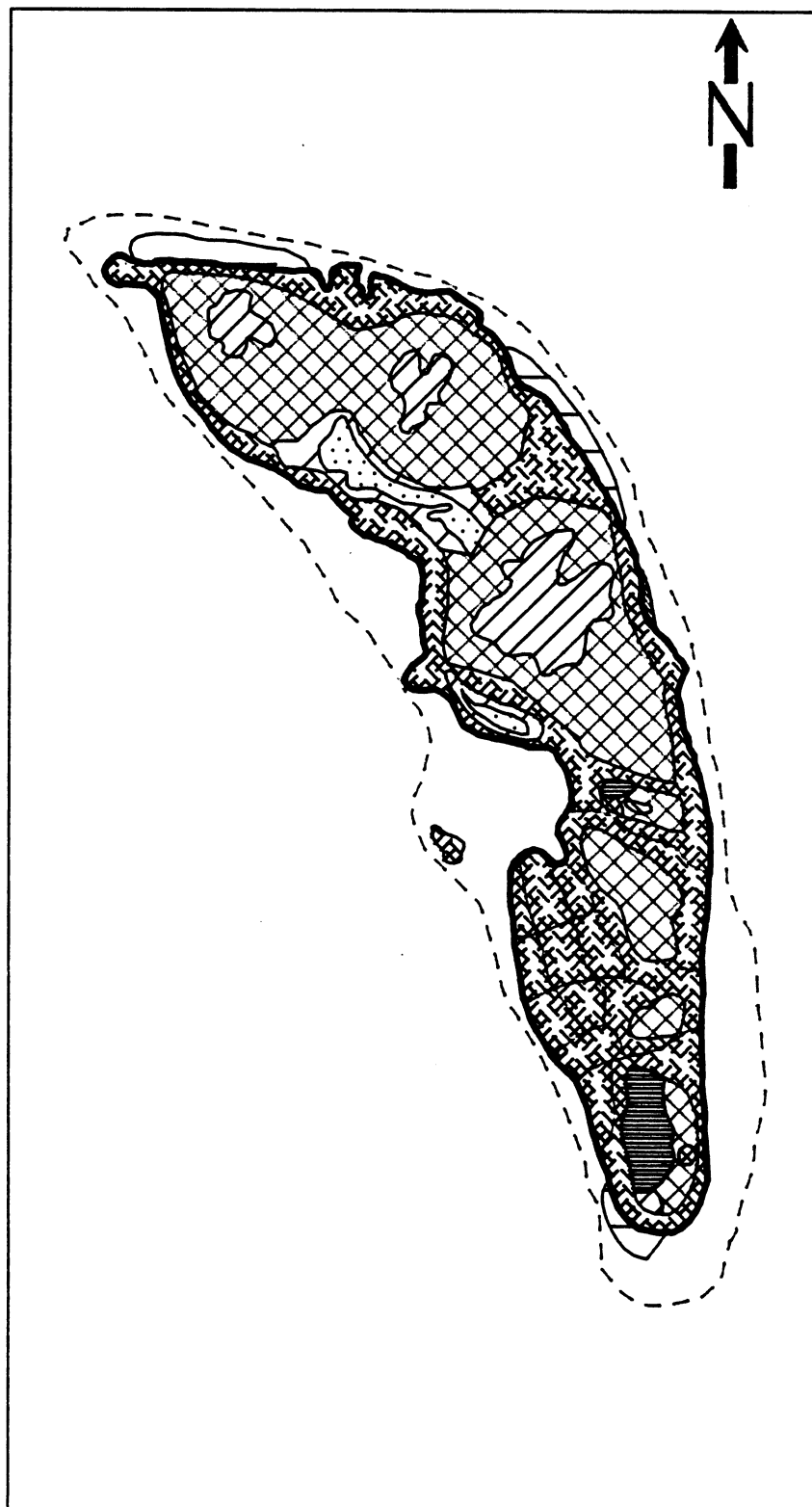
- A. Dominant Terrestrial Vegetation
Australian pine (30%), red mangrove (10%), Brazilian pepper (10%), black mangrove (10%), pineapple air plant (8%), white stopper (4.5%); 47 species total
- B. Soil humus: 10 cm
- C. Seagrasses
Shoal grass on north, northeast and southwest sides
- D. Bird Usage
Belted kingfisher, osprey, blue-gray gnatcatcher, fish crow common, 12 species total, no nests
- E. Common Fishes and Invertebrates
Atlantic croaker, pinfish, bay anchovy, 12 fish species total; penaeid and grass shrimps, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear, butterfly orchid; Special concern: osprey

III. Recommended usage: Conservation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve. The southern portion of the island has been channeled for mosquito control. The southern portion has abundant mangroves, large stands of native tropical hardwood species and two threatened plant species. The island has no open beaches and limited deep water access. For these reasons, the designation for this island should be conservation.

SPOIL ISLAND IR21



	Shoal grass 0.643 hectares
	Mangroves 5.751 hectares
	Australian pine 5.685 hectares
	Brazilian pepper 1.194 hectares
	Marsh 0.525 hectares
	Sand 0.385 hectares
	Stoppers 0.368 hectares
	Strangler fig 0.037 hectares
	Cordgrass 0.027 hectares
	Snowberry 0.016 hectares
	< 1 m deep
	Canals

1 in = 153 m



ISLAND NO. IR22

Date Sampled: 29 April 1988

I. Physical Description

- A. Island Size: 1.277 hectares
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 6.9 km south of Wabasso Causeway
- D. Distance and Direction from Channel Marker: 165 m southeast of marker 100
- E. Erosion: None
- F. Boating access: East side, 1.7 m, no open beaches

II. Biological Description

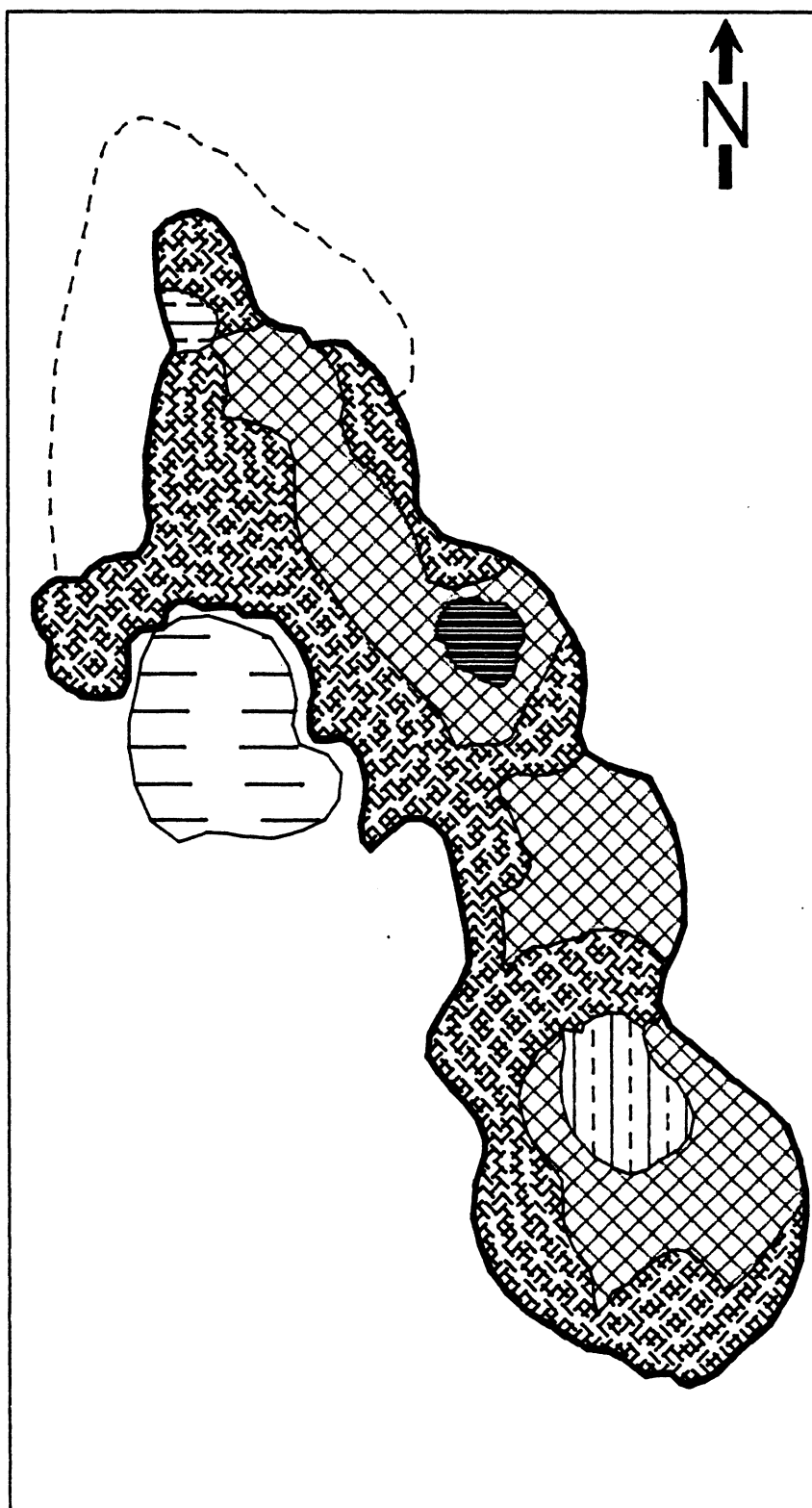
- A. Dominant Terrestrial Vegetation
Australian pine (93%), red mangrove (47%), black mangrove (40%),
buttonwood (17%), white mangrove (17%), 34 species total
- B. Soil humus: 11 cm
- C. Seagrasses
Shoal grass on west side
- D. Bird Usage
Black and white warbler, ovenbird and mourning dove common; 8 species total;
1 nest
- E. Common Fishes and Invertebrates
Tidewater silverside, pinfish, 7 fish species total; 4 invertebrate species total,
none common
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus, butterfly orchid

III. Recommended usage: Conservation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve and contains many native tropical hammock plants such as black ironwood, snowberry, wild coffee, Spanish and white stopper, torchwood and butterfly orchid. Additionally, this island is ringed by mangroves and is important for migrating birds and river otters. For these reasons, this island should be set aside for conservation.

SPOIL ISLAND IR22



	Shoal grass 0.177 hectares
	Mangroves 0.82 hectares
	Australian pine 0.34 hectares
	Wax myrtle 0.075 hectares
	Stoppers 0.028 hectares
	Sea oxeye 0.014 hectares
	Unvegetated 0.312 hectares
	< 1 m deep

1 in = 41 m



ISLAND NO. IR23A

Date Sampled: 31 October 1988

I. Physical Description

- A. Island Size: 0.623 hectares
- B. Height Above Mean High Water: 1 m in center
- C. Distance from Boat Ramps: 3.6 km south of Wabasso Causeway
- D. Distance and Direction from Channel Marker: 34 m south of marker 109
- E. Erosion: Slight on west side
- F. Boating access: West side; 1.3 m deep, open beach

II. Biological Description

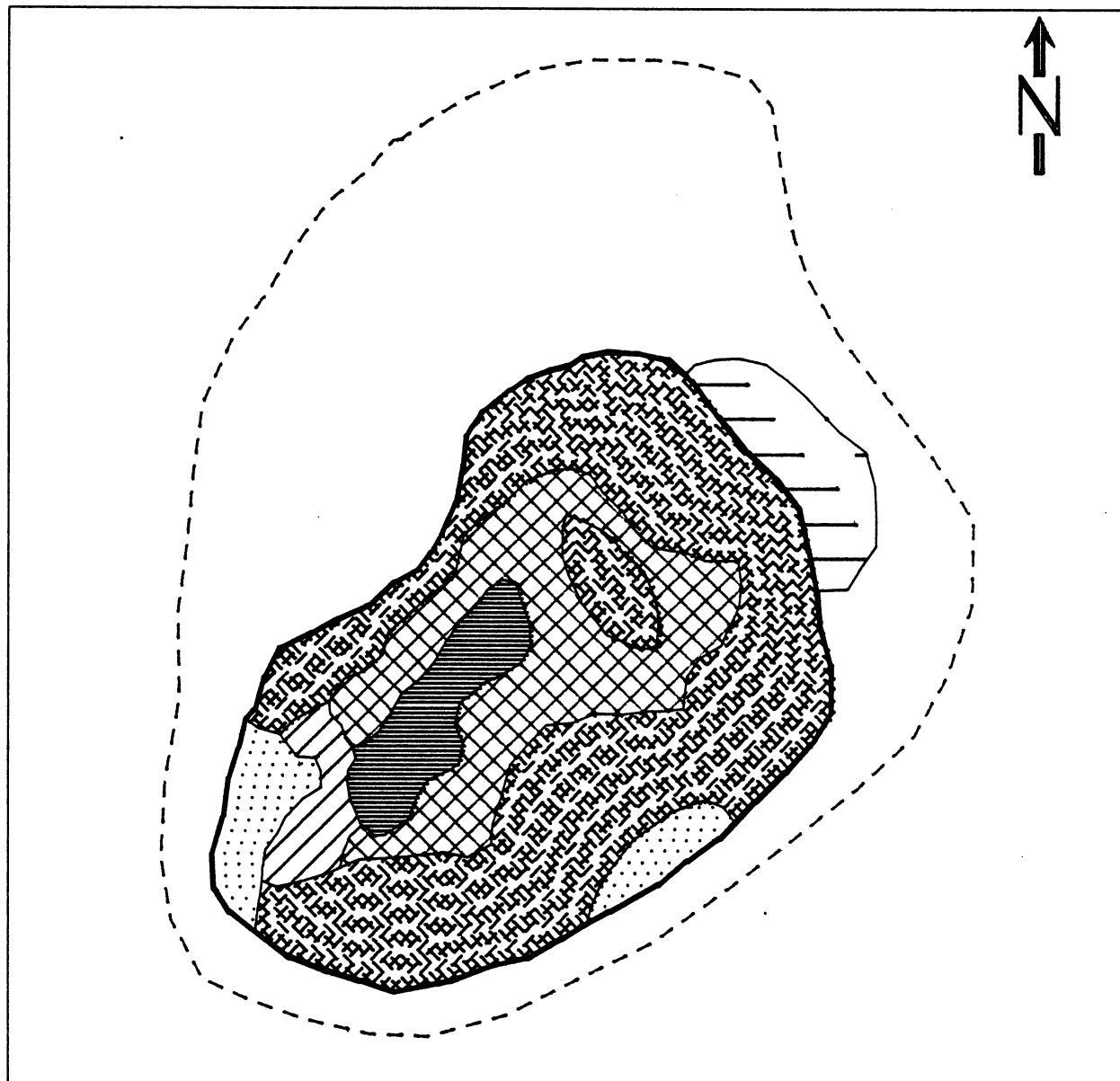
- A. Dominant Terrestrial Vegetation
Australian pine (23%), black mangrove (17%), red mangrove (12%), buttonwood (10%), Brazilian pepper (7%); 21 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on south and east sides
- D. Bird Usage
Great blue heron common; 2 species, 1 nest
- E. Common Fishes and Invertebrates
Mojarra, tidewater silverside, bay anchovy, red drum common, 15 fish species total; swimming crabs and grass shrimp common, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Passive Recreation, beach area only

IV. Comments

This island is privately owned by Lone Tree Village Corporation, the developers of John's Island and is in the Malabar to Vero Beach Aquatic Preserve. The interior of the island contains mangroves, salt marsh and some native tropical plants as well as a nesting area for a great blue heron. The beach area has good deep water access and provides adequate area for sunbathing or fishing. Therefore, the interior of this island should remain for conservation while passive recreation with no development could be permitted on the beach area.

SPOIL ISLAND IR23A



1 in = 27 m



Shoal grass
0.048 hectares

Mangroves
0.364 hectares

Australian pine
0.146 hectares

Sand
0.045

Stoppers
0.044 hectares

Brazilian pepper
0.024 hectares

Unvegetated
0.737

--- < 1 m deep

ISLAND NO. IR23B

Date Sampled: 31 October 1988

I. Physical Description

- A. Island Size: 0.193 hectares
- B. Height Above Mean High Water: < 1 m
- C. Distance from Boat Ramps: 3.7 km south of Wabasso Causeway
- D. Distance and Direction from Channel Marker: 100 m south of marker 109
- E. Erosion: None
- F. Boating access: Only deep water access (1.5 m) on east side, only open beach on southwest side

II. Biological Description

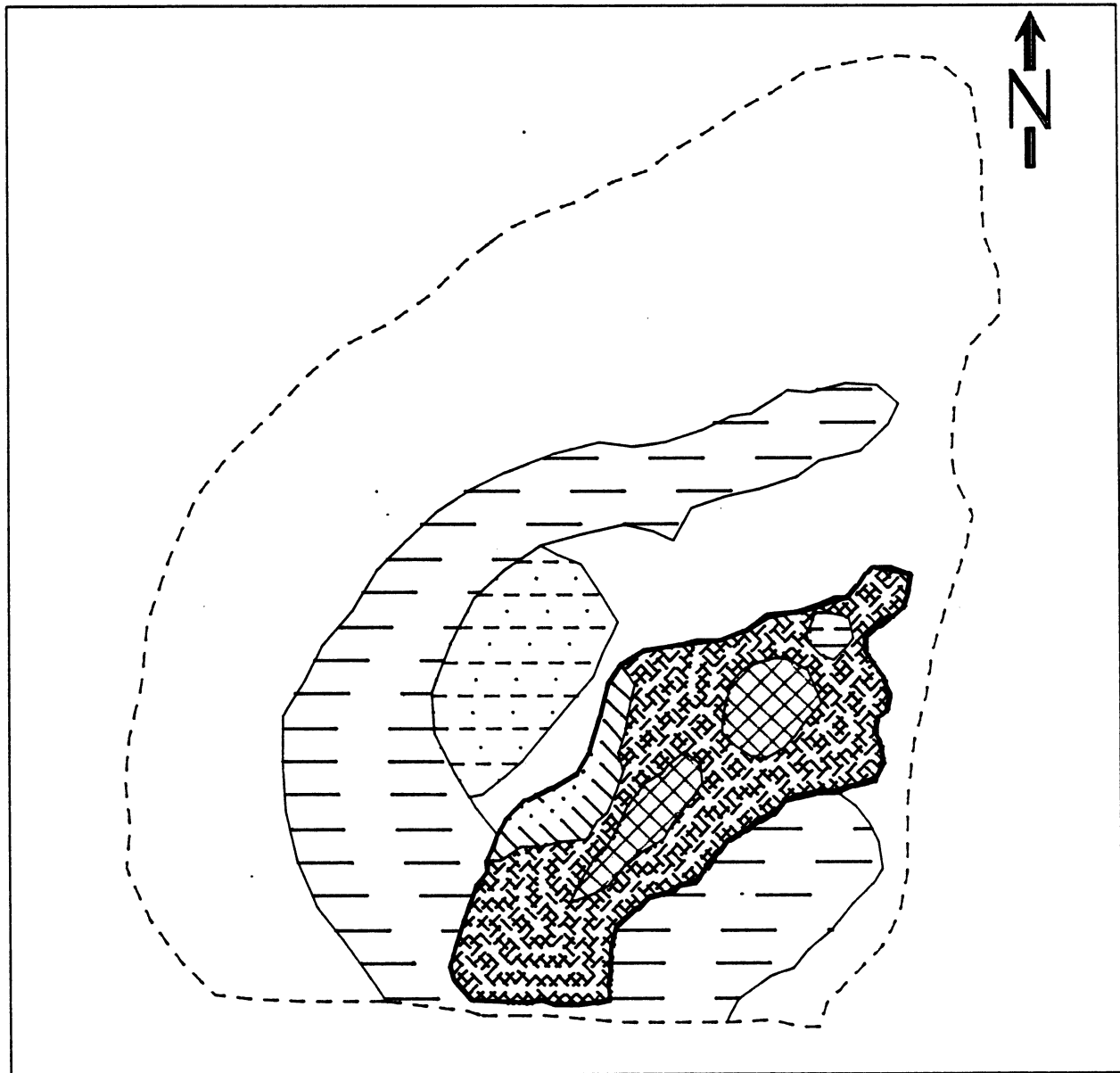
- A. Dominant Terrestrial Vegetation
Red mangrove (22%), Brazilian pepper (20%), Australian pine (12%), buttonwood (10%), sea oxeye (10%); 18 species total
- B. Soil humus: 2-3 cm
- C. Seagrasses
Shoal grass on east, west and south sides, turtle grass on west side
- D. Bird Usage
Sandpipers common, 4 species, no nests
- E. Common Fishes and Invertebrates
Mojarra, tidewater silverside, bay anchovy, 8 fish species total; no invertebrate species
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Conservation

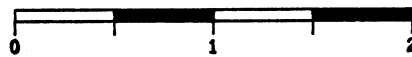
IV. Comments

This island is privately owned by the Lone Tree Village Corporation, the developers of John's Island and is in the Malabar to Vero Beach Aquatic Preserve. The island has no beach access and is extensively covered by mangroves. The upland areas are too small for any sort of development. Therefore, this island should be considered for conservation by the owners.

SPOIL ISLAND IR23B



1 in = 25 m



	Shoal grass 0.303 hectares
	Turtle grass 0.061 hectares
	Mangroves 0.142 hectares
	Australian pine 0.029
	Saltgrass 0.020 hectares

	Sea oxeye 0.004 hectares
	Unvegetated 0.776 hectares
	< 1 m deep

ISLAND NO. IR23C

Date Sampled: 8 June 1988

I. Physical Description

- A. Island Size: 1.227 hectares
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 8.5 km south of Wabasso Causeway
- D. Distance and Direction from Channel Marker: 150 m south of marker 109
- E. Erosion: Minimal
- F. Boating access: East; 2.7 meters deep, small beach

II. Biological Description

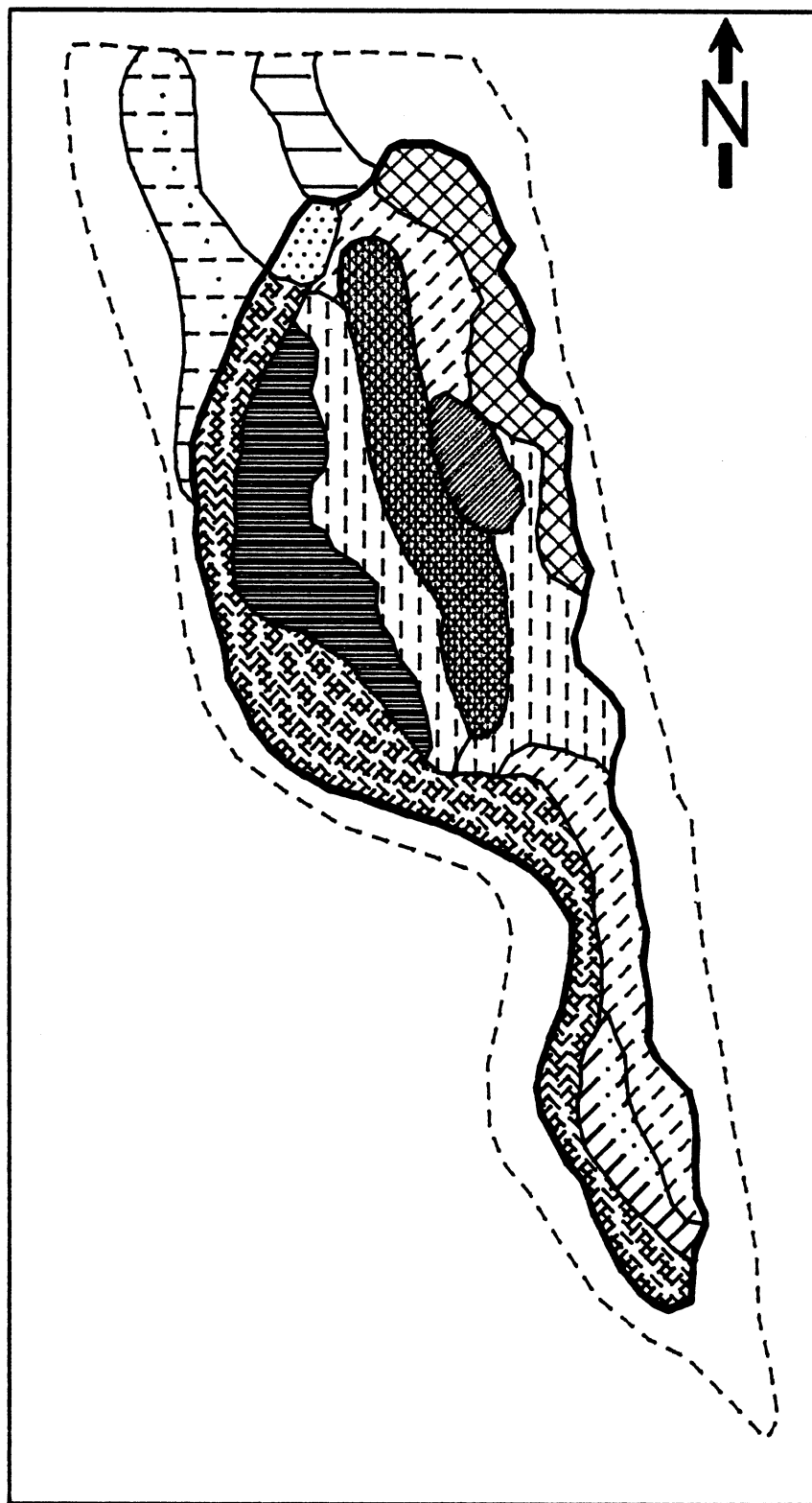
- A. Dominant Terrestrial Vegetation
Pineapple air plant (56%), Brazilian pepper (52%), red mangrove (37%)
Florida privet (33%), ball moss (30%), live oak (26%), buttonwood (22%), wild
coffee (22%), Spanish stopper (18%), 45 species total
- B. Soil humus: 5-8 cm
- C. Seagrasses
Shoal grass on north side, turtle grass on west side
- D. Bird Usage
Red-bellied woodpecker is common, 6 species total; no nests
- E. Common Fishes and Invertebrates
Tidewater silverside, pinfish, pigfish, 11 fish species total; humpback shrimp, 5
invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus, giant leather fern; Special concern: brown
pelican, osprey

III. Recommended usage: Conservation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve. It has a diverse flora and well developed tropical hammock and is one of the few islands not dominated by Australian pine or Brazilian pepper. This island represents one of the few remaining natural tropical hammock areas and the designation should therefore be conservation.

SPOIL ISLAND IR23C



	Turtle grass 0.113 hectares
	Shoal grass 0.045 hectares
	Mangroves 0.310 hectares
	Wild coffee 0.214 hectares
	Cabbage palm 0.175 hectares
	Live oak 0.154 hectares
	Stoppers 0.148 hectares
	Australian pine 0.116 hectares
	Florida privet 0.052 hectares
	Gumbo limbo 0.039 hectares
	Sand 0.018 hectares
	Unvegetated 0.769 hectares
	< 1 m deep

1 km = 40 m

ISLAND NO. IR24A

Date Sampled: 9 May 1988

I. Physical Description

- A. Island Size: 5.722 hectares
- B. Height Above Mean High Water: 1-1.5 m in northern half of island
- C. Distance from Boat Ramps: 9.9 km north of Vero Beach public boat ramps
- D. Distance and Direction from Channel Marker: 1000 m south of marker 114
- E. Erosion: Low
- F. Boating access: East side; 1.8 m, no open beaches

II. Biological Description

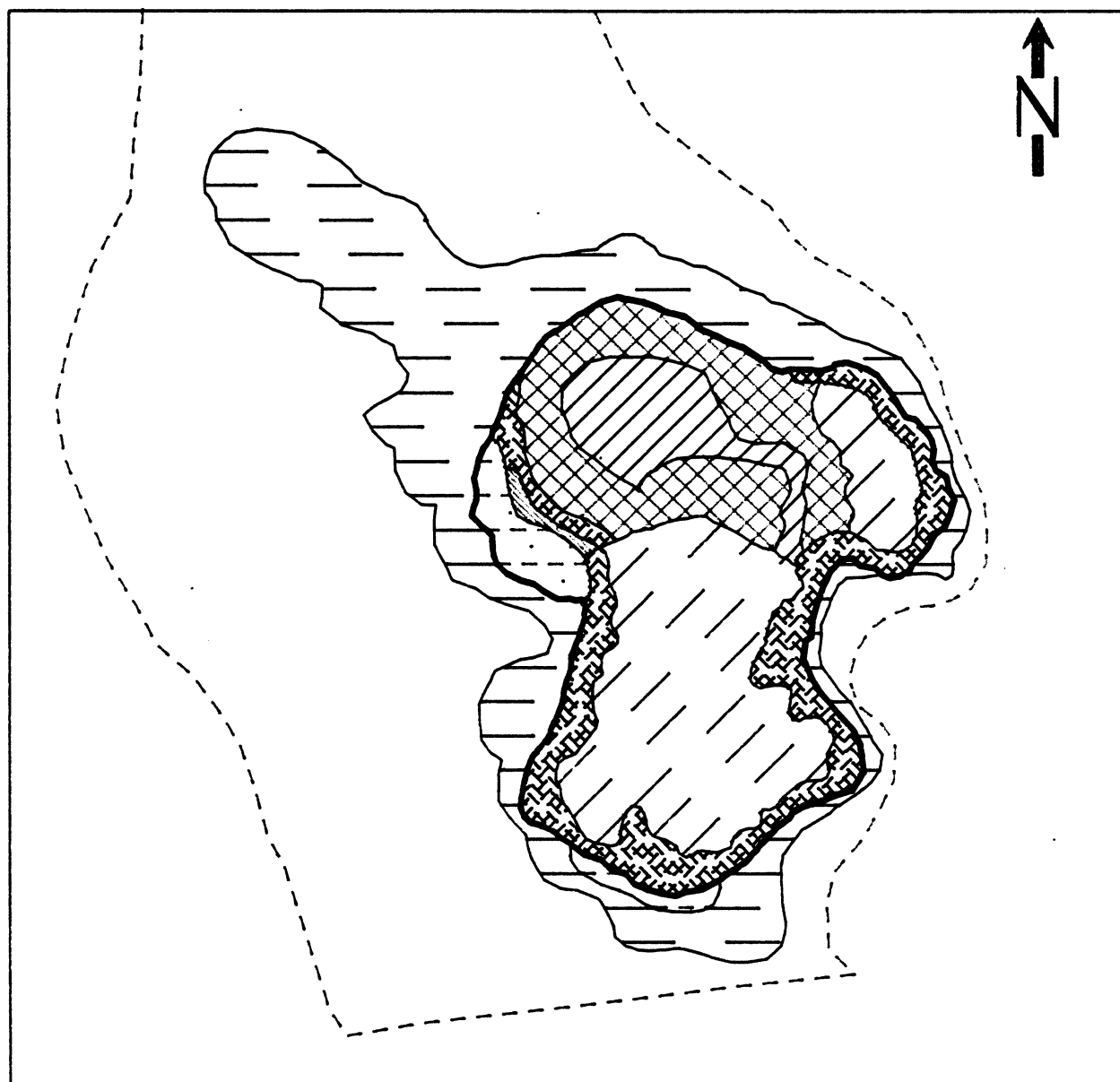
- A. Dominant Terrestrial Vegetation
Brazilian pepper (44%), saltwort (37%), black mangrove (32%), Australian pine (26%), red mangrove (23%), perennial glasswort (23%), Florida privet (13%), 29 species total
- B. Soil humus: 10 cm on northern half of island
- C. Seagrasses
Shoal grass on all sides of island, turtle grass on west side of island
- D. Bird Usage
Great blue heron, brown pelican, fish crow, little blue heron, red-bellied and hairy woodpeckers common, 12 species total; 4 nests
- E. Common Fishes and Invertebrates
Pinfish, gulf pipefish, tidewater silverside, rainwater killifish, 12 fish species total; grass and penaeid shrimps, 7 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: least tern; Special concern: osprey, brown pelican, tricolor heron, little blue heron

III. Recommended usage: Conservation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve and is an important habitat for breeding birds. The southern half of the island is a mangrove marsh and the island is surrounded on three sides by dense, productive grassbeds. This island should therefore be reserved for conservation.

SPOIL ISLAND IR24A



1 in = 100 m



	Shoal grass 3.921 hectares		Brazilian pepper 0.642 hectares
	Turtle grass 0.364 hectares		Cordgrass 0.055 hectares
	Marsh 2.37 hectares		Unvegetated 21.552 hectares
	Australian pine 1.359 hectares		< 1 m deep
	Mangroves 1.295 hectares		

ISLAND NO. IR24B

Date Sampled: 28 March 1988

I. Physical Description

- A. Island Size: 7.403 hectares
- B. Height Above Mean High Water: 1-1.5 m
- C. Distance from Boat Ramps: 8.5 km north of Vero Beach public boat ramps
- D. Distance and Direction from Channel Marker: 300 m northwest of marker 117
- E. Erosion: Low
- F. Boating access: East; 2 meters deep, very small beach

II. Biological Description

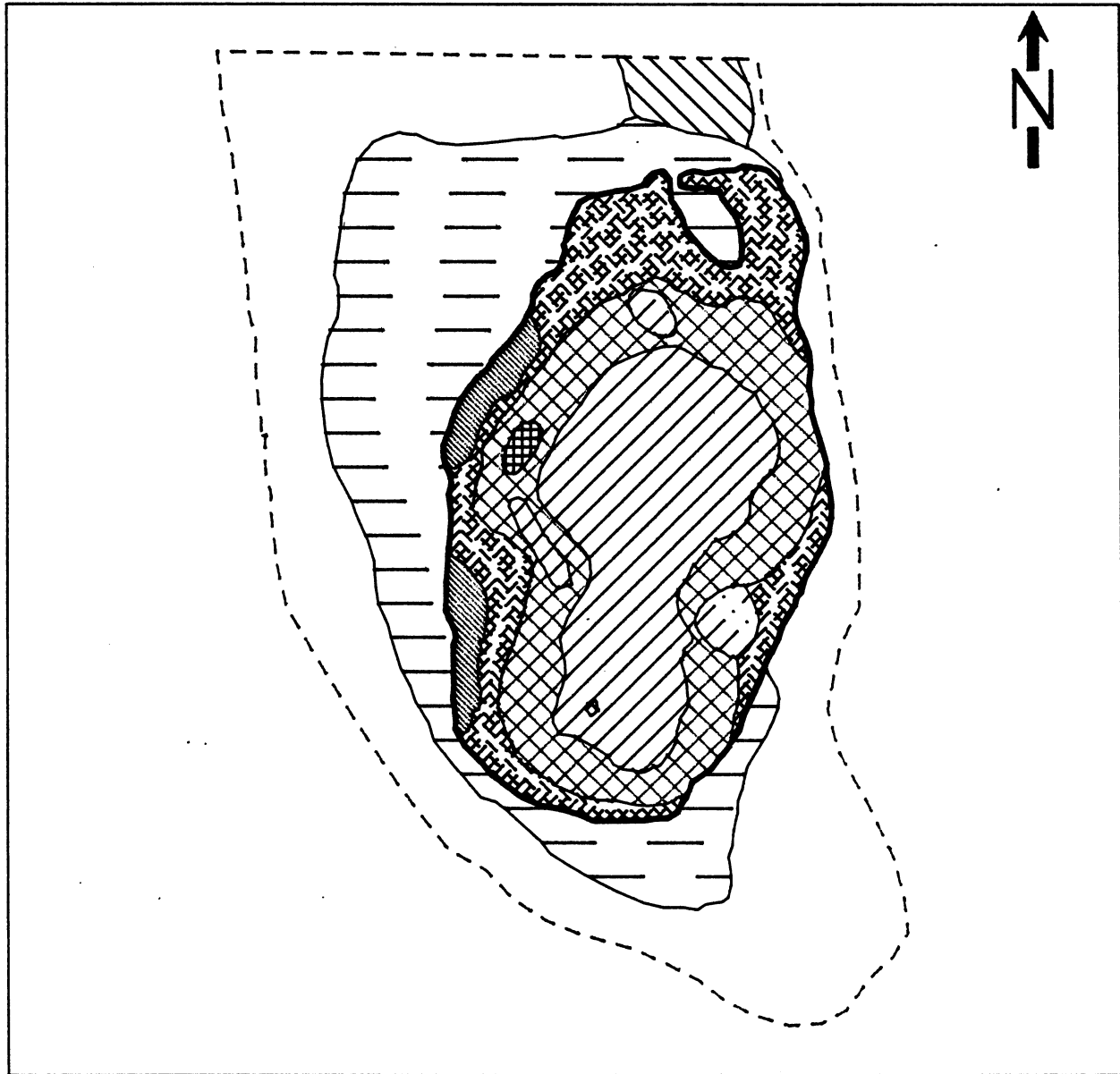
- A. Dominant Terrestrial Vegetation
Brazilian pepper (74%), Australian pine (30%), Florida privet (25%), strangler fig (22%), red mangrove (20%), black mangrove (16%), 38 species total
- B. Soil humus: 10 cm
- C. Seagrasses
Shoal grass on north, south and west sides, manatee grass on north side
- D. Bird Usage
Osprey, fish crow, brown pelican and red-bellied woodpecker common, 10 species total; 1 nest
- E. Common Fishes and Invertebrates
Pinfish, spot, 11 fish species total; grass shrimp, 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: giant leather fern, prickly-pear cactus; Special concern: osprey, brown pelican, little blue heron, tricolor heron

III. Recommended usage: Conservation/Education

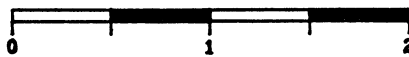
IV. Comments

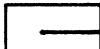
This island is in the Malabar to Vero Beach Aquatic Preserve and has been revegetated with native tropical hammock plants. The extensive seagrass beds are an important nursery area and deep water and open beach access are limited around most of the island. This island should be designated a dual education/conservation island and recreation should be discouraged.

SPOIL ISLAND IR24B



1 in = 100 m



	Shoal grass 4.49 hectares		Cordgrass 0.393 hectares	--- < 1 m deep
	Manatee grass 0.348 hectares		Florida privet 0.268 hectares	
	Brazilian pepper 2.366 hectares		Replanting area 0.052 hectares	
	Australian pine 2.363 hectares		Strangler fig 0.005 hectares	
	Mangroves 1.957 hectares		Unvegetated 6.775 hectares	

ISLAND NO. IR25A

Date Sampled: 9 December 1988

I. Physical Description

- A. Island Size: 0.587 hectares
- B. Height Above Mean High Water: < 1 m
- C. Distance from Boat Ramps: 3.2 km north of Vero Beach public ramps
- D. Distance and Direction from Channel Marker: 100 m southwest of marker 117
- E. Erosion: Slight on south side
- F. Boating access: Southwest side; 1.3 m deep, open beach

II. Biological Description

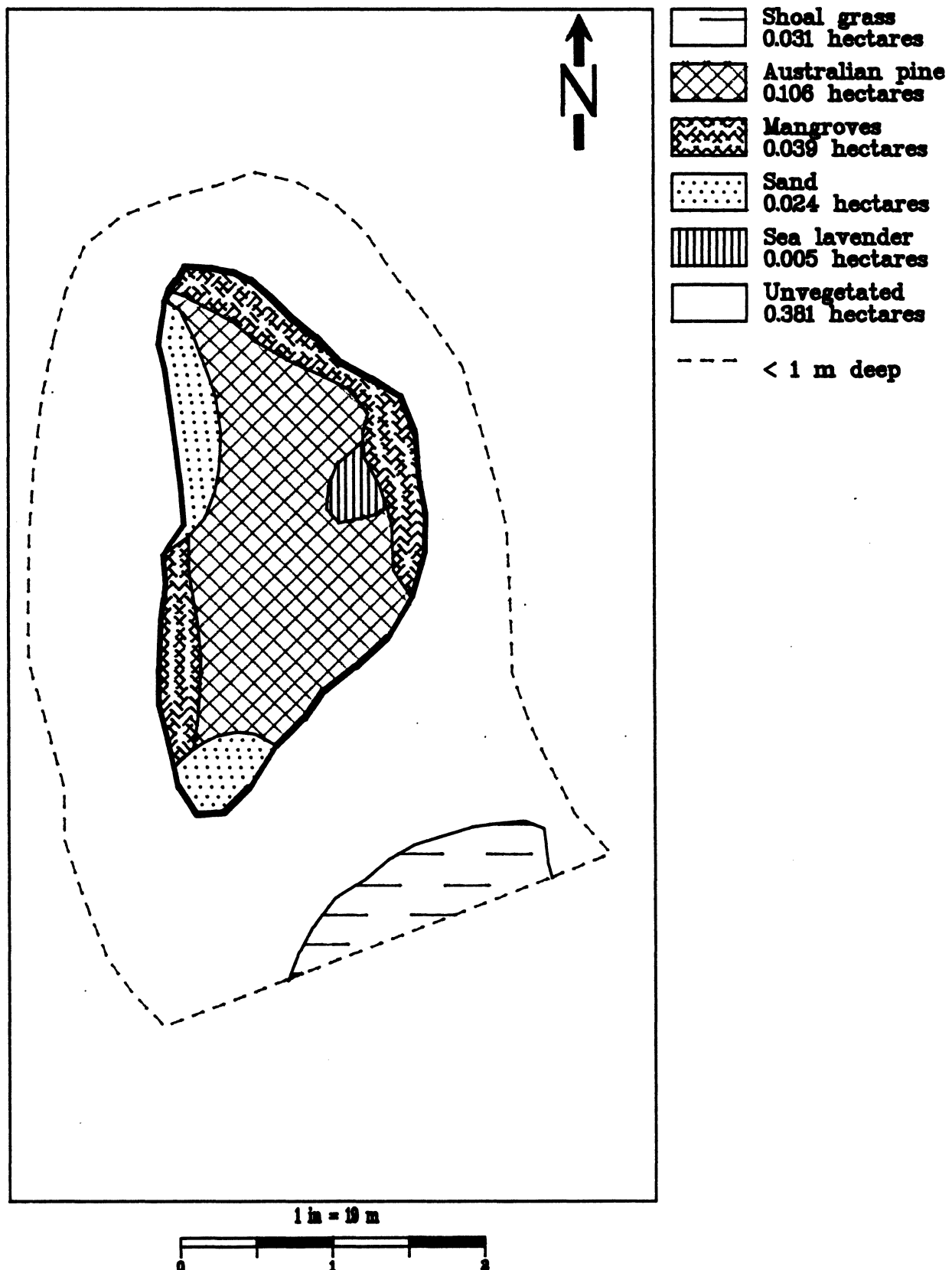
- A. Dominant Terrestrial Vegetation
Australian pine (36%), white mangrove (23%), black mangrove (7%); 20 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on southern side
- D. Bird Usage
Sanderlings common, 4 species total, no nests
- E. Common Fishes and Invertebrates
Mojarra, bay anchovy common, 11 fish species total; penaeid and grass shrimps common, 3 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus; Special concern: little blue heron

III. Recommended usage: Passive Recreation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve and has historically received light usage as a recreation island. There is good boating access to the island and open areas suitable for recreation. The island is too small to allow construction of any facilities, however, so use should be passive only.

SPOIL ISLAND IR25A



ISLAND NO. IR25B

Date Sampled: 9 December 1988

I. Physical Description

- A. Island Size: 0.505 hectares
- B. Height Above Mean High Water: < 1 m
- C. Distance from Boat Ramps: 3.1 km north of Vero Beach public ramps
- D. Distance and Direction from Channel Marker: 100 m southwest of marker 117
- E. Erosion: None
- F. Boating access: None; no open beaches, 1 m deep or less around island

II. Biological Description

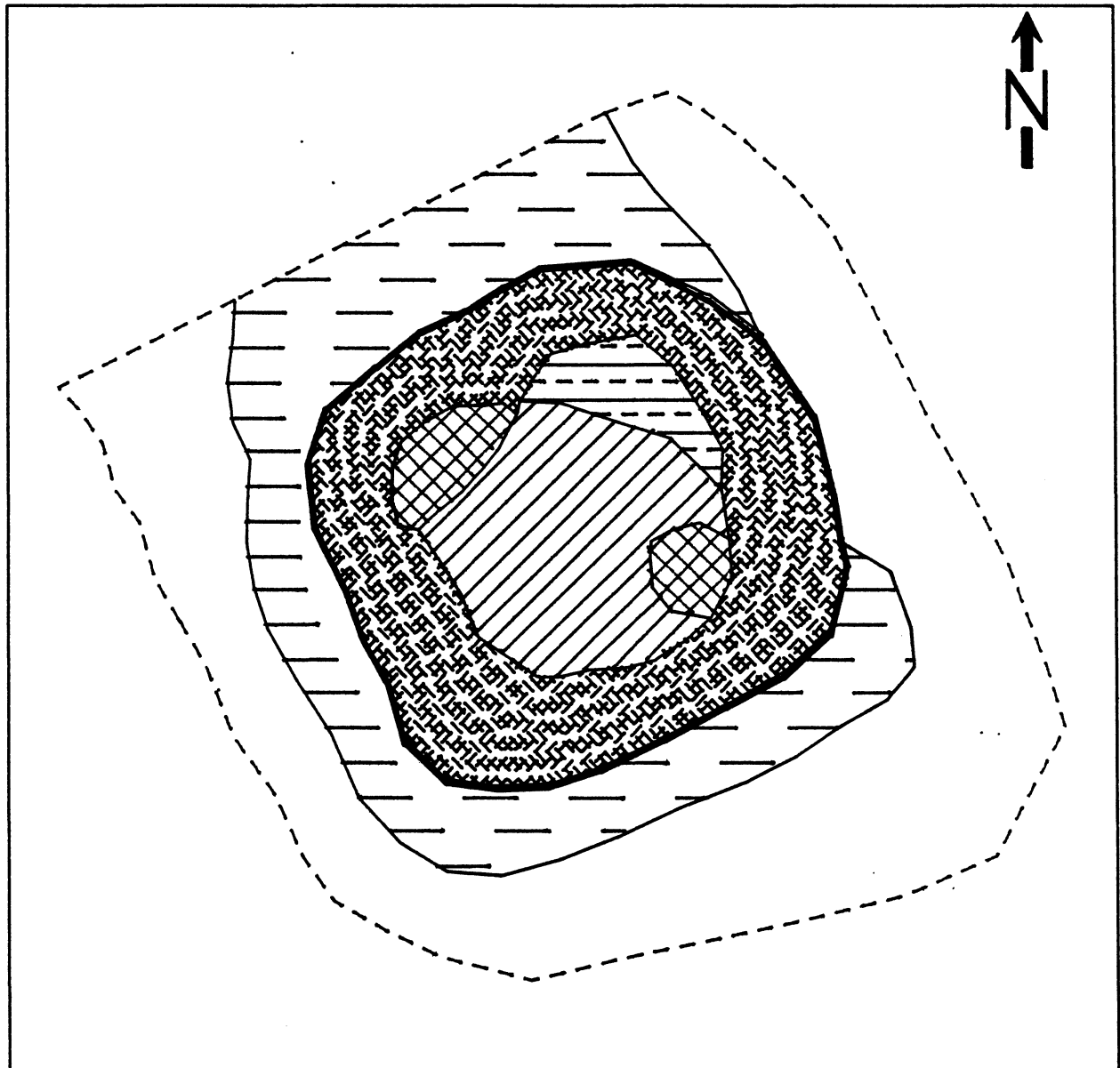
- A. Dominant Terrestrial Vegetation
Red mangrove (25%), black mangrove (19%), Brazilian pepper (15%);
Australian pine (12%); 12 species total
- B. Soil humus: 5 cm in center of island
- C. Seagrasses
Shoal grass on north side
- D. Bird Usage
The only bird seen on the island was 1 great blue heron; no nests
- E. Common Fishes and Invertebrates
Bay anchovy, mojarra, 10 fish species total; penaeid, grass and humpback
shrimps, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Conservation

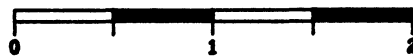
IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve. The island is dominated by mangroves and access to the island is difficult. Although there are no threatened species and the floral and faunal diversity is low, the inaccessibility of the island along with the dominance of mangroves make this an excellent island for conservation.

SPOIL ISLAND IR25B



1 in = 16 m



-  Shoal grass
0.12 hectares
-  Mangroves
0.111 hectares
-  Brazilian pepper
0.47
-  Australian pine
0.014 hectares
-  Sea oxeye
0.011 hectares

-  Unvegetated
0.202 hectares
-  < 1 m deep

ISLAND NO. IR25

Date Sampled: 11 March 1988

I. Physical Description

- A. Island Size: 5.195 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 8 km north of Vero Beach public boat ramps
- D. Distance and Direction from Channel Marker: 110 m northwest of marker 120
- E. Erosion: Low
- F. Boating access: Southwest corner; 1.5 meters deep, docking facilities

II. Biological Description

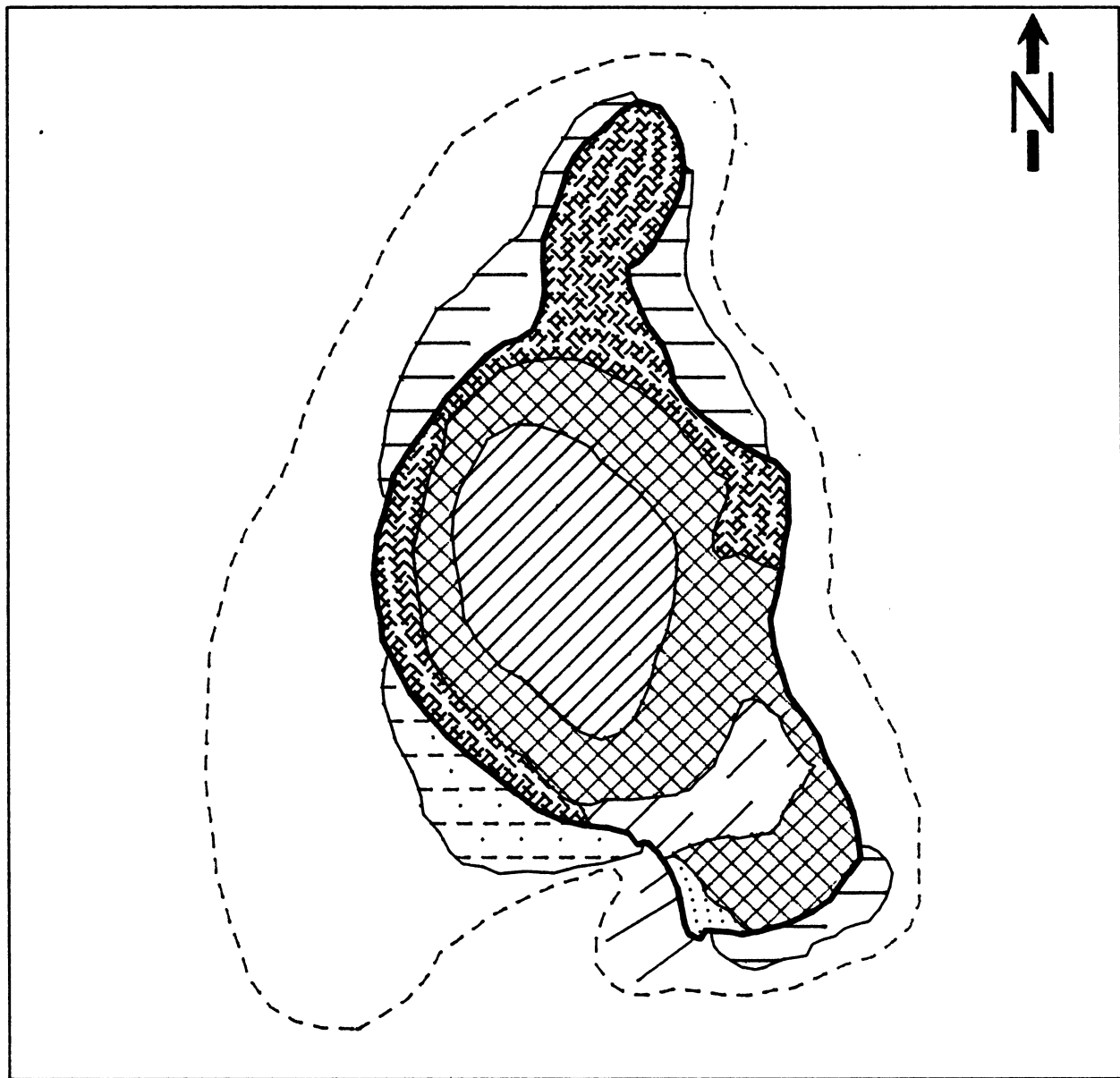
- A. Dominant Terrestrial Vegetation
Australian pine (46%), golden aster (25%), black mangrove (25%), Brazilian pepper (18%), Florida privet (18%), late thoroughwort (11%), wild balsam apple (11%), 37 species total
- B. Soil humus: 5 cm
- C. Seagrasses
Shoal grass on all sides, manatee grass on west side, turtle grass on north and west sides
- D. Bird Usage
Double crested cormorant, red-bellied woodpecker, yellow-bellied sapsucker and white ibis common, 11 species total, no nests
- E. Common Fishes and Invertebrates
Pinfish, striped mullet, spot, Atlantic croaker, 14 fish species total; grass and penaeid shrimps, 4 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: brown pelican, little blue heron

III. Recommended usage: Active Recreation

IV. Comments

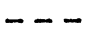
This island is in the Malabar to Vero Beach Aquatic Preserve and is actively used by the Vero Beach Boat Club. The club maintains docking, picnic, barbecue and sanitary facilities on the southern portion of the island and is pursuing a management agreement for active recreation. However, further expansion of the upland facilities is not recommended because of the adjacent mangrove and marsh area.

SPOIL ISLAND IR25



1 in = 86 m



	Shoal grass 0.965 hectares		Marsh 0.377 hectares
	Turtle grass 0.445 hectares		Sand 0.067 hectares
	Australian pine 2.123 hectares		Unvegetated 5.071 hectares
	Mangroves 1.385 hectares		< 1 m deep
	Brazilian pepper 1.244 hectares		

ISLAND NO. IR26A

Date Sampled: 5 December 1988

I. Physical Description

- A. Island Size: 0.674 hectares
- B. Height Above Mean High Water: < 1 m
- C. Distance from Boat Ramps: 2.9 km North of Vero Beach public ramps
- D. Distance and Direction from Channel Marker: 69 m southwest of marker 120
- E. Erosion: None
- F. Boating access: Southwest corner; 1.5 m deep, small beach

II. Biological Description

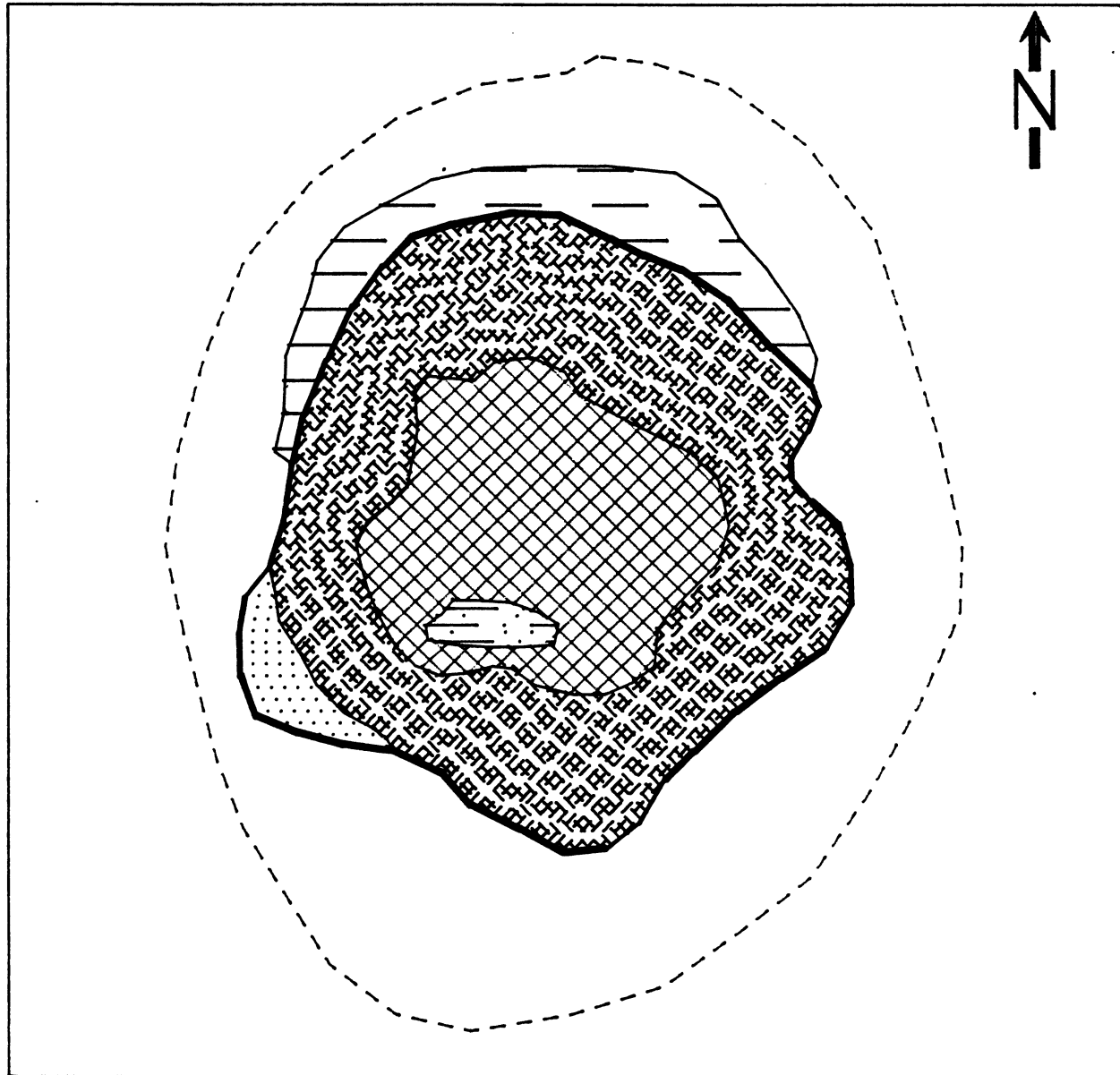
- A. Dominant Terrestrial Vegetation
Australian pine (31%), Brazilian pepper (25%), black mangrove (12%), red mangrove (9%); 11 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north and west sides
- D. Bird Usage
Brown pelicans common, 6 species total; 1 nest
- E. Common Fishes and Invertebrates
Mojarra, Atlantic croaker, bay anchovy, tidewater silverside, 14 fish species total; grass shrimp, oysters (north side), 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: brown pelican, osprey, little blue heron

III. Recommended usage: Conservation

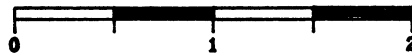
IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve. The island is ringed by mangroves and is an important roosting area for brown pelicans. Furthermore, there is a diverse aquatic community surrounding the island. Therefore, this island should be set aside for conservation, particularly since there are no clear areas for recreation on the island.

SPOIL ISLAND IR26A



1 in = 10 m



Shoal grass
0.044 hectares

Mangroves
0.200 hectares

Australian pine
0.095 hectares

Sand
0.012 hectares

Grey nicker
0.006 hectares

Unvegetated
0.318 hectares

-- < 1 m deep

ISLAND NO. IR26B

Date Sampled: 5 December 1988

I. Physical Description

- A. Island Size: 0.626 hectares
- B. Height Above Mean High Water: < 0.5 m
- C. Distance from Boat Ramps: 2.8 km north of Vero Beach public ramps
- D. Distance and Direction from Channel Marker: 100 m south of marker 120
- E. Erosion: Slight on southwest corner
- F. Boating access: Southwest corner; 1.5 m deep, small beach

II. Biological Description

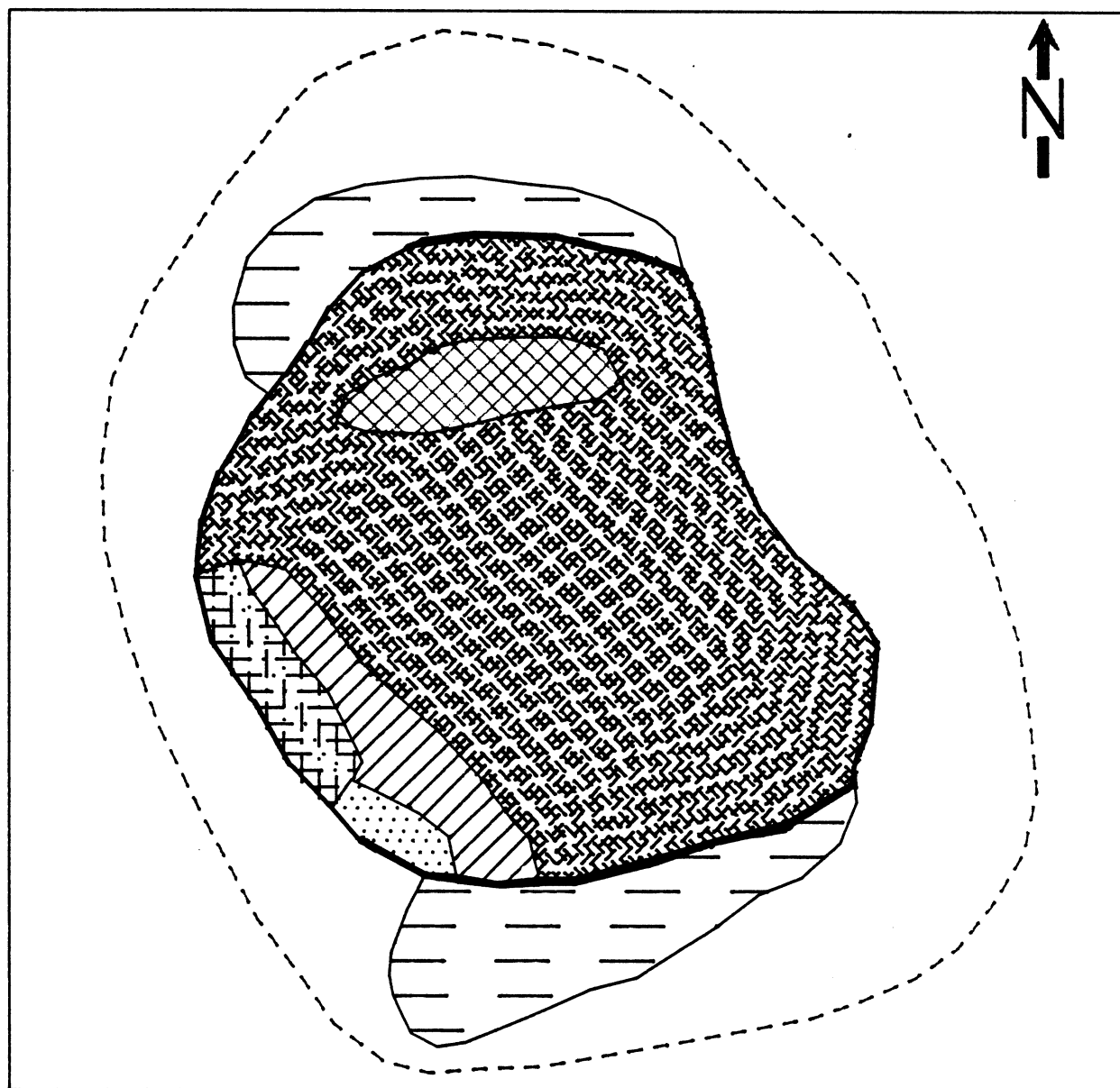
- A. Dominant Terrestrial Vegetation
Black mangrove (33%), red mangrove (30%), Australian pine (9%), Brazilian pepper (9%); 15 species total
- B. Soil humus: 1-2 cm
- C. Seagrasses
Shoal grass on north and southeast sides
- D. Bird Usage
Yellow-crowned night heron and great blue heron common, 4 species total; 5 nests
- E. Common Fishes and Invertebrates
Mojarra and bay anchovy, 7 fish species total; mud snail and oysters (north side), 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: little blue heron

III. Recommended usage: Conservation

IV. Comments

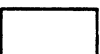
This island is in the Malabar to Vero Beach Aquatic Preserve and is used by yellow-crowned night herons and great blue herons as a breeding area. Mangroves dominate the terrestrial vegetation and most of the island is at or below sea level. Although there is access to a small beach, the island is not suited for recreation and its designation, therefore, should be conservation.

SPOIL ISLAND IR26B



1 in = 16 m



	Shoal grass 0.072 hectares		Sand 0.005 hectares
	Mangroves 0.221 hectares		Unvegetated 0.278 hectares
	Brazilian pepper 0.021 hectares		Australian pine 0.016 hectares
	Sea purslane 0.014 hectares		< 1 m deep

ISLAND NO. IR26

Date Sampled: 23 February 1988

I. Physical Description

- A. Island Size: 2.697 hectares
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 6.7 km north of Vero Beach public boat ramps
- D. Distance and Direction from Channel Marker: 150 m west of marker 122
- E. Erosion: Minimal
- F. Boating access: North; 1.1 meters deep, small beach

II. Biological Description

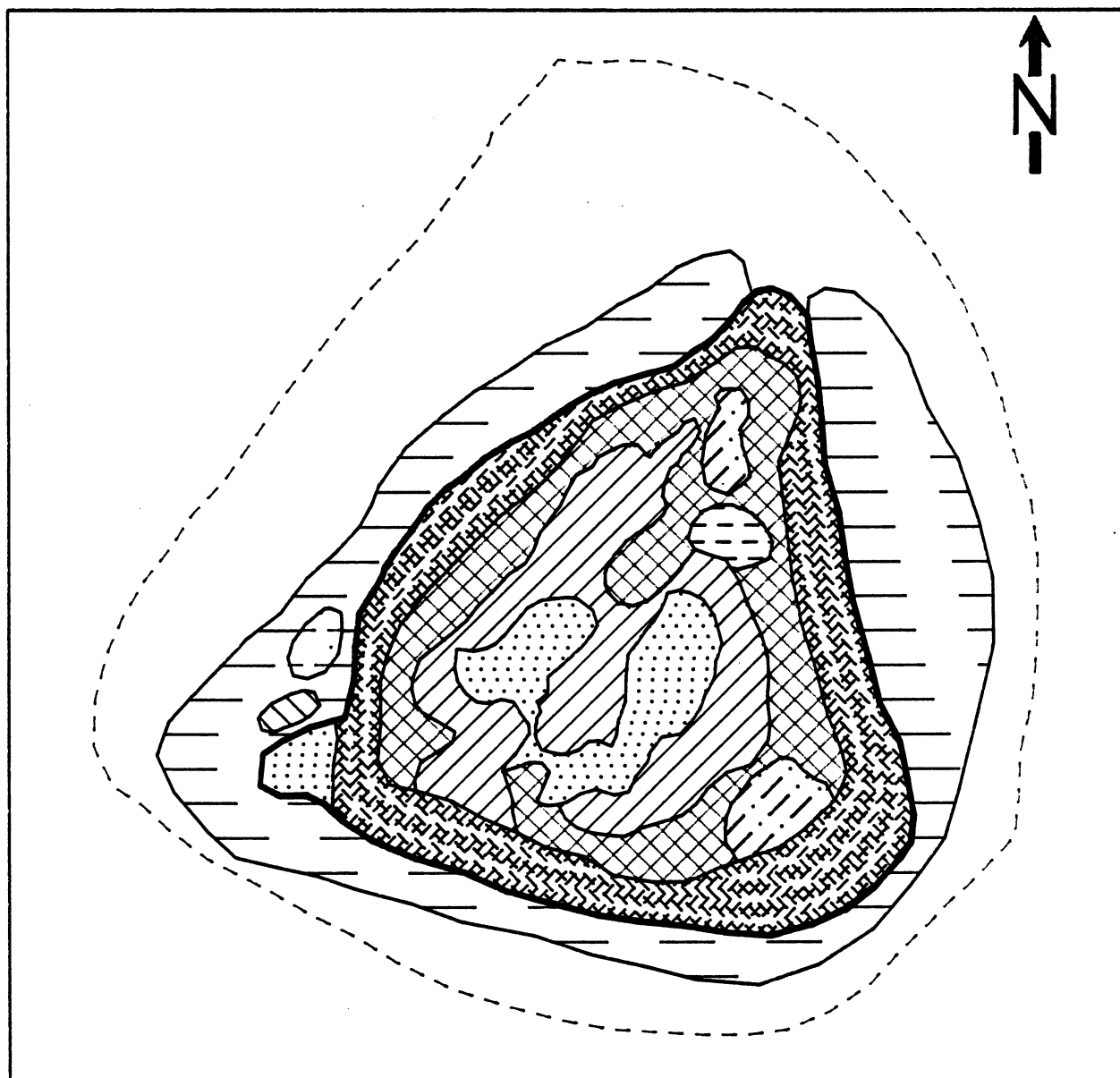
- A. Dominant Terrestrial Vegetation
Brazilian pepper (75%), Australian pine (58%), Florida privet (20%), buttonwood (10%), 28 species total
- B. Soil humus: 2 cm
- C. Seagrasses
Shoal grass on all sides, manatee grass and turtle grass on south side
- D. Bird Usage
Great blue heron, brown pelican, white ibis, yellow-crowned night heron common, 10 species total; 3 great blue heron nests
- E. Common Fishes and Invertebrates
Pinfish, striped mullet, spot, Atlantic croaker, mojarra, 11 fish species total; grass and penaeid shrimps, 4 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus; Special concern: little blue heron, osprey, brown pelican

III. Recommended usage: Conservation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve and supports a diverse avian fauna that includes nesting birds. Additionally, the only opossum observed during the study was found on this island. The seagrass beds are an important and productive nursery area. Access to this island is only easily gained from one point which is very close to nesting birds and could easily disturb them. The designation, therefore, should be conservation, and use should be discouraged.

SPOIL ISLAND IR26



1 in = 56 m



	Shoal grass 1.518 hectares
	Turtle grass 0.028 hectares
	Manatee grass 0.016 hectares
	Mangroves 0.922 hectares
	Australian pine 0.680 hectares

	Brazilian pepper 0.627 hectares
	Sand 0.317 hectares
	Florida privet 0.110 hectares
	Hercules club 0.04 hectares
	Unvegetated 2.539 hectares

--- < 1 m deep

ISLAND NO. IR27A

Date Sampled: 10 December 1987

I. Physical Description

- A. Island Size: 3.305 hectares
- B. Height Above Mean High Water: 4 m
- C. Distance from Boat Ramps: 1.9 km north of Vero Beach public boat ramps
- D. Distance and Direction from Channel Marker: 100 m north of marker 125
- E. Erosion: None
- F. Boating access: 2 m along western shore, no open beaches

II. Biological Description

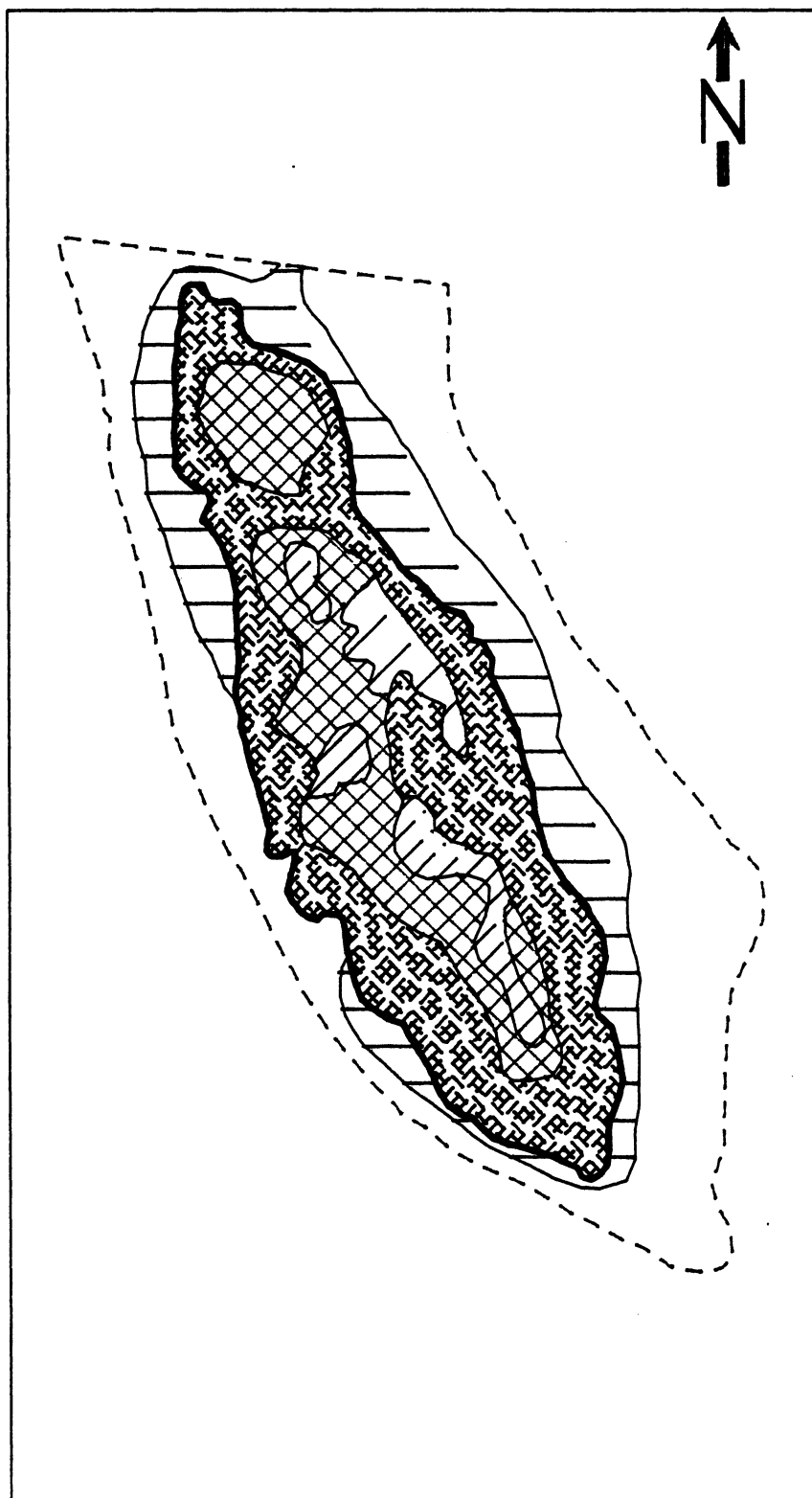
- A. Dominant Terrestrial Vegetation
Red mangrove (19%), black mangrove (17%), Brazilian pepper (12%), Australian pine (12%), Florida privet (12%); 36 species total
- B. Soil humus: 10 cm in elevated portions of island
- C. Seagrasses
Shoal grass on north, south and east sides
- D. Bird Usage
Green heron, belted kingfisher and little blue heron common, 7 species total; 1 nest
- E. Common Fishes and Invertebrates
Bay anchovy, mojarra, naked goby, 8 fish species total; grass shrimp, oysters (northern end), 3 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus; Species of special concern: little blue heron, tricolor heron

III. Recommended usage: Conservation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve and is owned by the United States government. The island is difficult to access, has a diverse floral component, including mangroves, salt marsh and native tropical hammock vegetation and is a habitat for the green heron, a species not commonly seen on spoil islands. Thus, the designation for this island should be conservation.

SPOIL ISLAND IR27A



-  Shoal grass
1.349 hectares
-  Mangroves
1.954 hectares
-  Australian pine
0.941 hectares
-  Florida privet
0.205 hectares
-  Marsh
0.150 hectares
-  Brazilian pepper
0.055 hectares
-  Unvegetated
2.556 hectares
-  < 1 m deep

1 in = 80 m



ISLAND NO. IR27B

Date Sampled: 2 December 1988

I. Physical Description

- A. Island Size: 1.041 hectares
- B. Height Above Mean High Water: < 1 m
- C. Distance from Boat Ramps: 1.9 km north of Vero Beach public ramps
- D. Distance and Direction from Channel Marker: 70 m southeast of marker 125
- E. Erosion: None
- F. Boating access: None; < 1 m deep all around island, no beaches

II. Biological Description

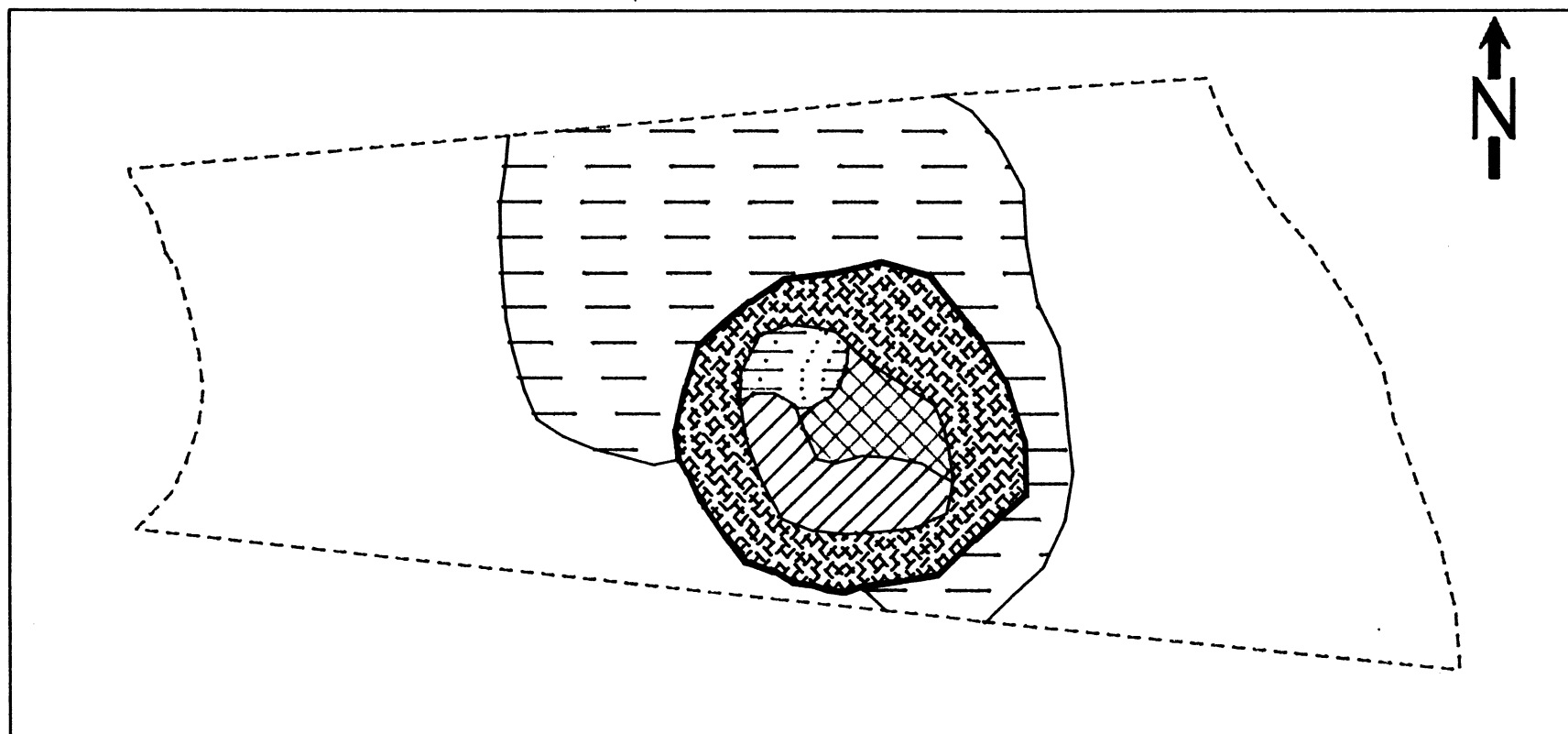
- A. Dominant Terrestrial Vegetation
Black mangrove (23%), red mangrove (18%), Australian pine (8%), buttonwood (9%), saltwort (9%); 16 species total
- B. Soil humus: 4 cm in center of island
- C. Seagrasses
Shoal grass on north, west and south sides
- D. Bird Usage
3 species, no nests
- E. Common Fishes and Invertebrates
Mojarra, tidewater silverside, 10 fish species total; 4 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: little blue heron

III. Recommended usage: Conservation

IV. Comments

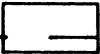
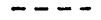
This island is in the Malabar to Vero Beach Aquatic Preserve and is owned by the United States Government. The island is ringed with mangroves and there are large shallow grassbeds surrounding much of the island, making access difficult. The island does not have a particularly well developed flora or fauna, but given the difficulty of access, the island is recommended for conservation.

SPOIL ISLAND IR27B



1 in = 24 m



	Shoal grass 0.253 hectares		Grey nicker 0.012 hectares
	Mangroves 0.097 hectares		Unvegetated 0.631 hectares
	Brazilian pepper 0.029 hectares		< 1 m deep
	Australian pine 0.019 hectares		

ISLAND NO. IR27C

Date Sampled: 2 December 1988

I. Physical Description

- A. Island Size: 1.338 hectares
- B. Height Above Mean High Water: < 1 m; much of the island underwater
- C. Distance from Boat Ramps: 2 km north of Vero Beach public boat ramps
- D. Distance and Direction from Channel Marker: 75 m east of marker 125
- E. Erosion: Some on northeast point
- F. Boating access: Northeast point; 1.2 m deep, small beach

II. Biological Description

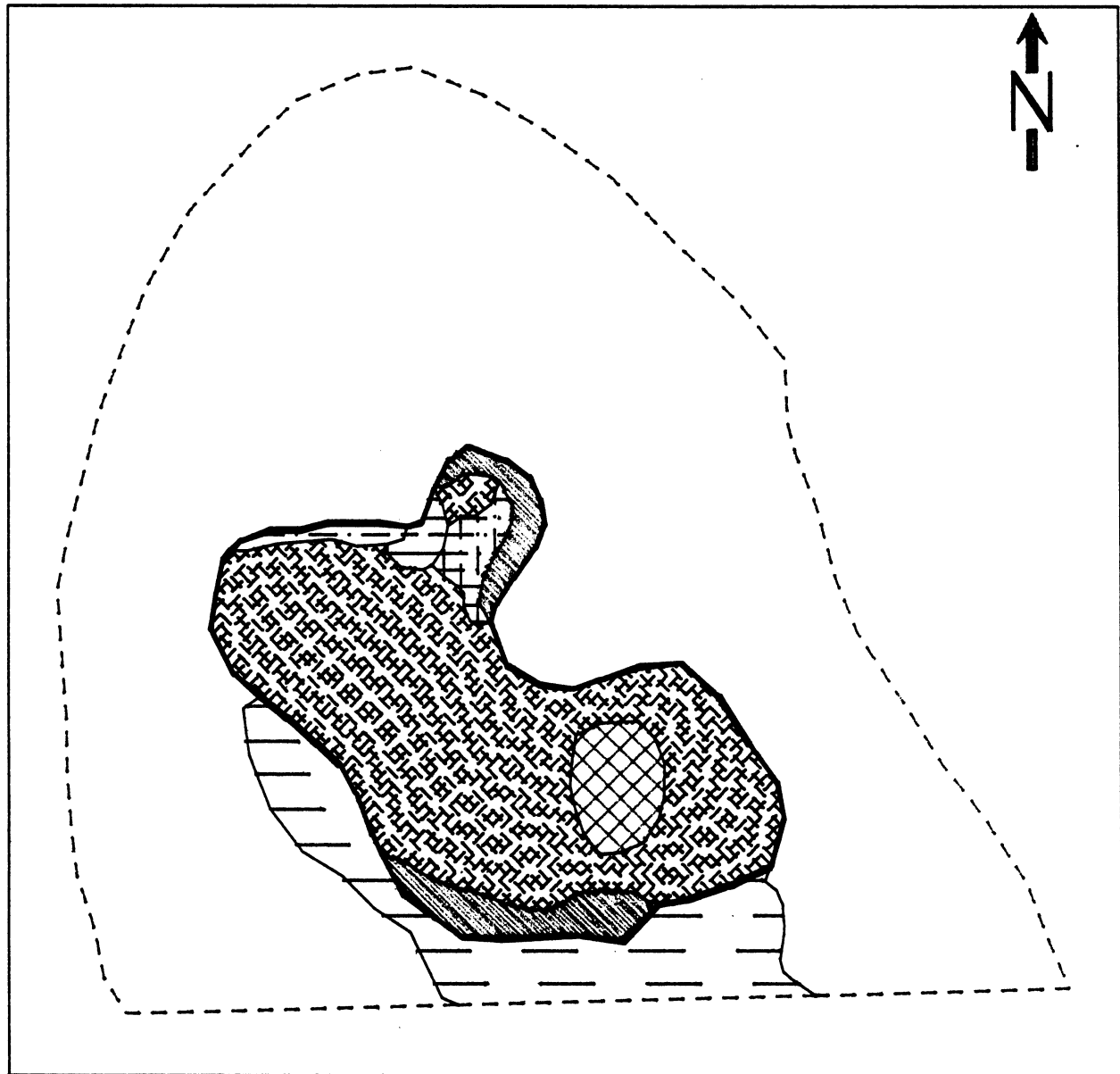
- A. Dominant Terrestrial Vegetation
Red mangrove (25%), white mangrove (20%), black mangrove (16%), Brazilian pepper (8%); 22 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on south side
- D. Bird Usage
4 species total, no nests
- E. Common Fishes and Invertebrates
Mojarra, tidewater silverside, 11 fish species total; 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: Osprey

III. Recommended usage: Conservation

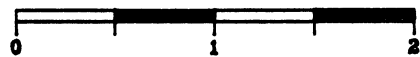
IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve and is owned by the United States Government. The island is dominated by mangroves and much of the area is under water. Although the aquatic fauna is not exceptionally diverse, members of the fish family Cyprinodontidae are better represented on this island than most other spoil islands. Although this island is accessible to boaters, the small beach area and dominance by mangroves severely limit this island for recreational uses. Therefore, this island should be kept for conservation.

SPOIL ISLAND IR27C



1 in = 24 m



Shoal grass
0.092 hectares

Rocks
0.006 hectares

Mangroves
0.235 hectares

Cordgrass
0.032 hectares

Australian pine
0.021 hectares

Silverhead
0.01 hectares

Sea oxeye
0.005 hectares

Unvegetated
0.938 hectares

--- < 1 m deep

ISLAND NO. IR28

Date Sampled: 31 January 1989

I. Physical Description

- A. Island Size: 29.64 hectares
- B. Height Above Mean High Water: 2 m in center
- C. Distance from Boat Ramps: 1.5 km north of Vero Beach public boat ramps
- D. Distance and Direction from Channel Marker: 69 m east of marker 130
- E. Erosion: None
- F. Boating access: Northeast side, 1.5-2 m deep at Joe Earman Park

II. Biological Description

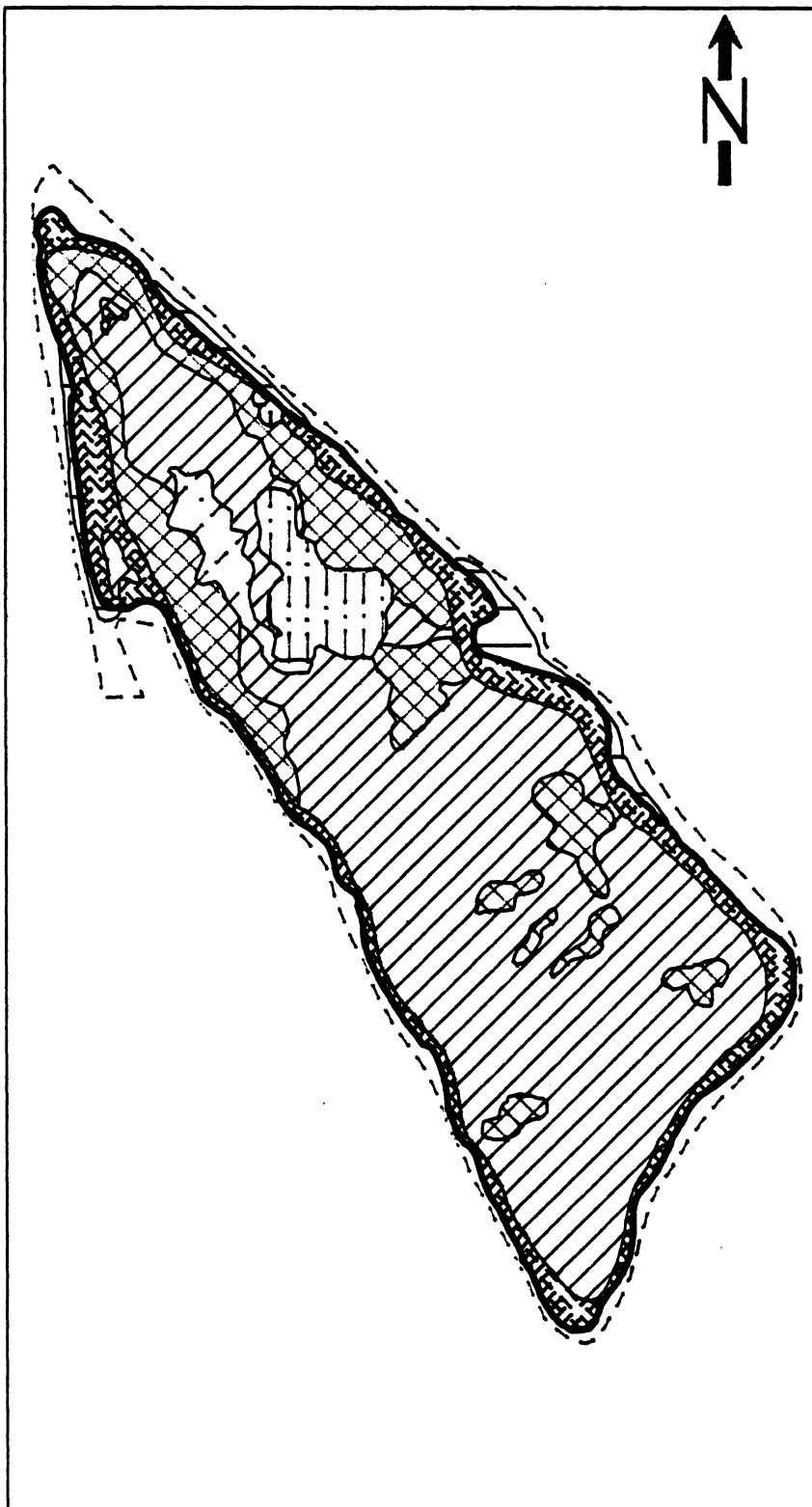
- A. Dominant Terrestrial Vegetation
Brazilian pepper (41%), Australian pine (16%), Florida privet (6%); 51 species total
- B. Soil humus: 7.5 cm in non-spoil areas
- C. Seagrasses
Shoal grass on north, northeast and west sides
- D. Bird Usage
American robin and brown pelican common, 14 species total
- E. Common Fishes and Invertebrates
Mojarra, pinfish, tidewater silverside, 16 fish species total; penaeid, humpback and grass shrimps, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
Endangered: bald eagle; Threatened: giant leather fern, prickly-pear cactus;
Species of special concern: brown pelican, osprey, tricolor heron, snowy egret

III. Recommended usage: Active Recreation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve and is privately owned by the Lone Tree Village Corporation. Joe Earman Park on the northeast portion of this island has already been developed for active recreation. Recreational development could be expanded westward from this site without negatively impacting existing flora. However, the mangrove and salt marsh vegetation in the western portion of the island should not be disturbed by further development.

SPOIL ISLAND IR28



	Shoal grass 0.978 hectares
	Brazilian pepper 17.302 hectares
	Australian pine 5.540 hectares
	Mangroves 4.532 hectares
	Boston fern 1.337 hectares
	Meadow 0.750 hectares
	Marsh 0.114 hectares
	Earman Park 0.047 hectares
	Sea oxeye 0.016 hectares
	Unvegetated 3.537 hectares
	< 1 m deep

1 in = 186 m



ISLAND NO. IR28A

Date Sampled: 19 December 1988

I. Physical Description

- A. Island Size: 0.854 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 1.5 km north of Vero Beach public boat ramps
- D. Distance and Direction from Channel Marker: No channel markers
- E. Erosion: None
- F. Boating access: 2.5 m deep on west side; no open beaches

II. Biological Description

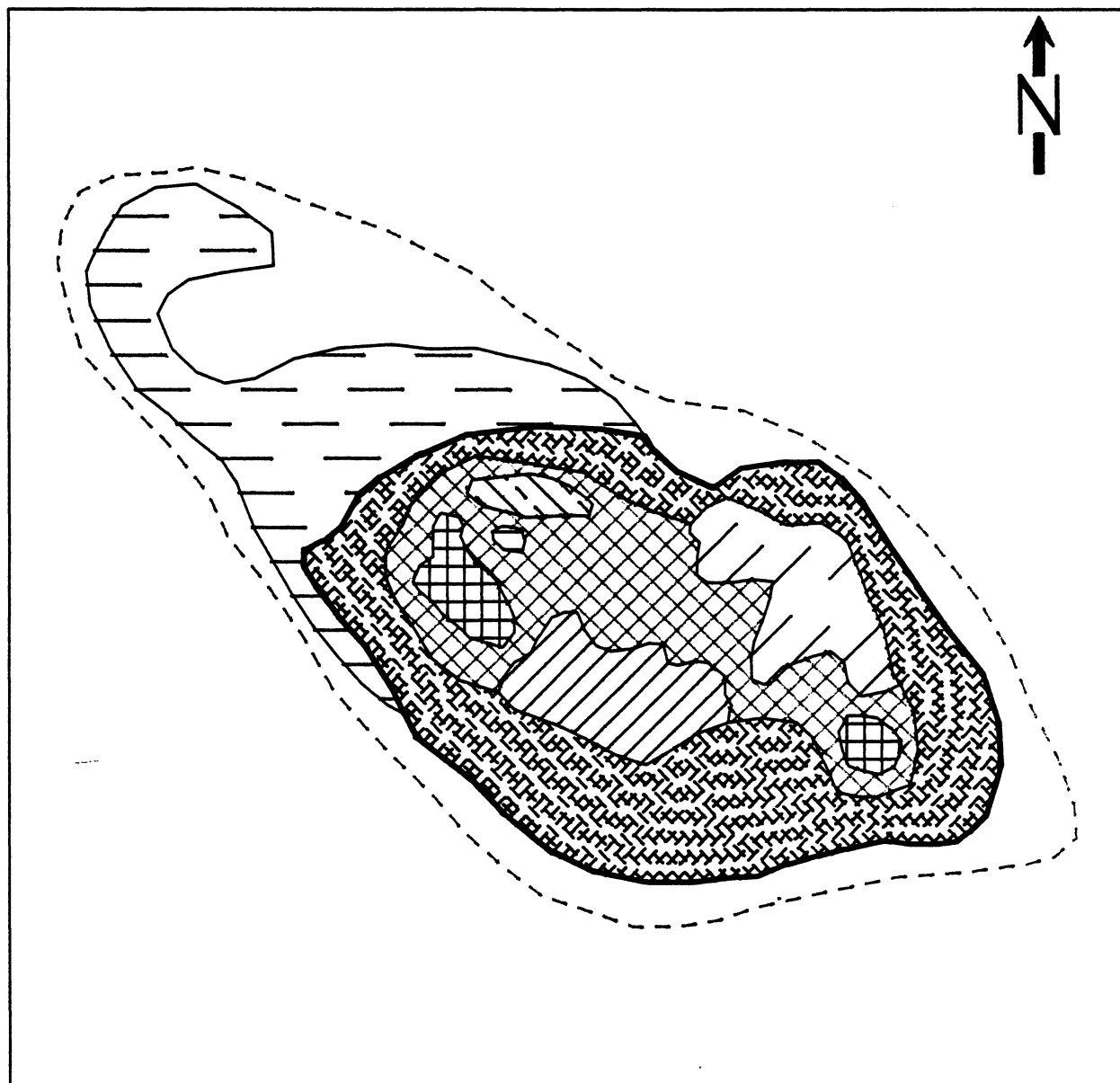
- A. Dominant Terrestrial Vegetation
Black mangrove (21%), Australian pine (17%), red mangrove (15%), saltwort (9%), white mangrove (9%); 25 species total
- B. Soil humus: 17 cm
- C. Seagrasses
Shoal grass and turtle grass on northern end
- D. Bird Usage
3 bird species total; no nests
- E. Common Fishes and Invertebrates
Mojarra, 7 fish species total; humpback shrimp, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus

III. Recommended usage: Conservation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve and is privately owned by J.E. Tuerk. The island is surrounded by mangroves and has a well developed salt marsh on the southeastern side. Furthermore, several native tropical hammock plant species are well established on the island. The island has no open beach access and limited area for development in the interior. Therefore, the owner should consider designating this island for conservation.

SPOIL ISLAND IR28A



1 in = 34 m



	Shoal grass 0.279 hectares		Rouge plant 0.037 hectares
	Mangroves 0.423 hectares		Prickly pear cactus 0.015 hectares
	Australian pine 0.219 hectarea		Necklacepod 0.002 hectares
	Marsh 0.081 hectares		Unvegetated 0.448 hectares
	Brazilian pepper 0.077 hectares		< 1 m deep

ISLAND NO. IR28B

Date Sampled: 19 December 1988

I. Physical Description

- A. Island Size: 0.265 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 1.46 km north of Vero Beach public boat ramps
- D. Distance and Direction from Channel Marker: No channel markers
- E. Erosion: None
- F. Boating access: 1.9 m deep at north end; no open beaches

II. Biological Description

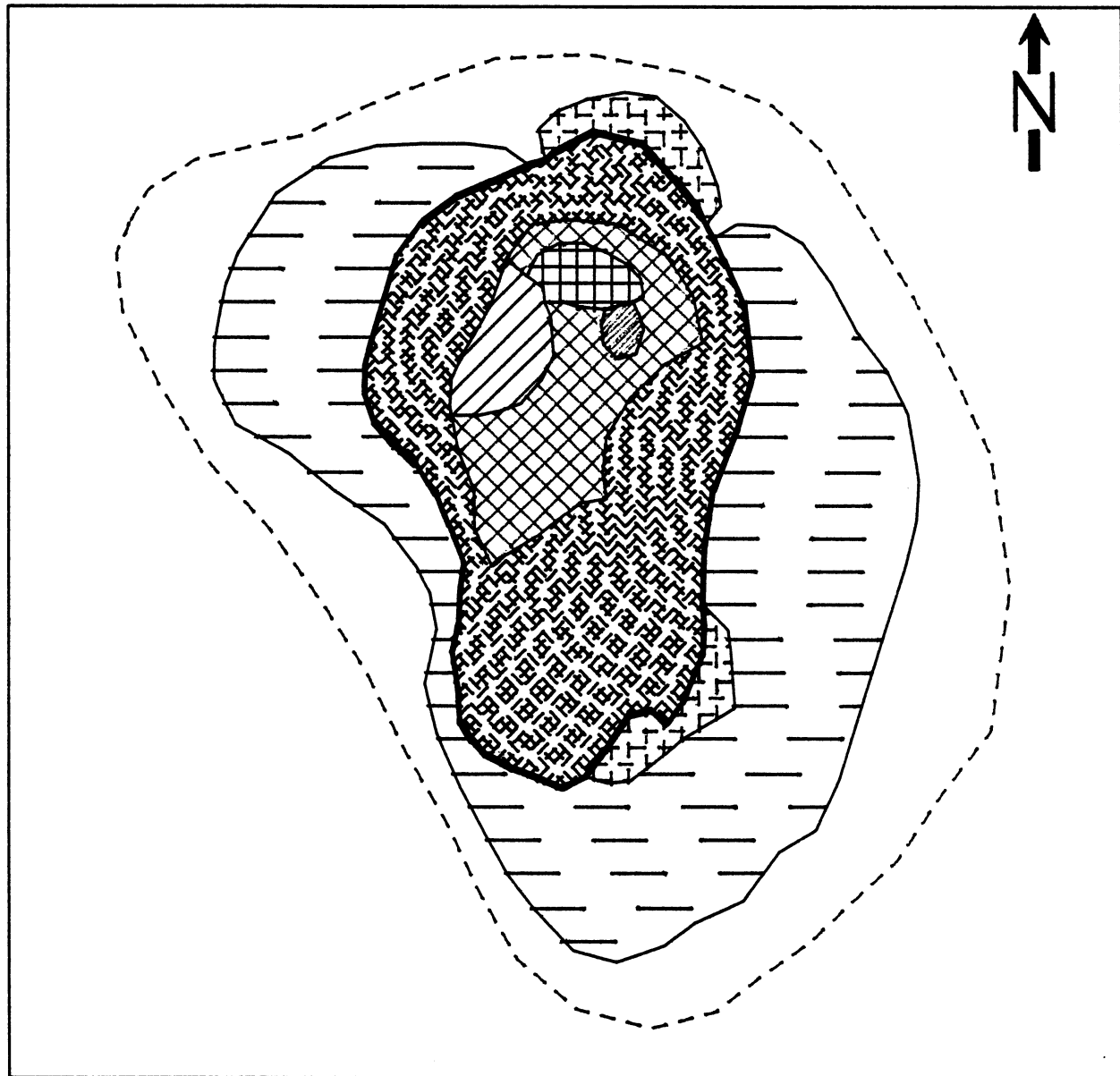
- A. Dominant Terrestrial Vegetation
Black mangrove (20%), red mangrove (20%), white mangrove (17%), Australian pine (10%); 28 species total
- B. Soil humus: 7 cm in center
- C. Seagrasses
Shoal grass surrounds the island
- D. Bird Usage
2 bird species, no nests
- E. Common Fishes and Invertebrates
Mojarra, code goby, 10 fish species total; oysters (north and southeast sides) ladder horn shell, swimming crabs, 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: osprey, little blue heron

III. Recommended usage: Conservation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve and is privately owned by Lone Tree Village Corporation. The island is dominated by mangroves and some native tropical hammock species are well established in the center of the island. Additionally, the island is surrounded by extensive seagrass beds. The portion of the island above mean high water is too small for any type of development. Given the small size of the island, the lack of open beach access and the well developed floral community, the owners should consider this island for conservation.

SPOIL ISLAND IR28B



1 in = 20 m



	Shoal grass 0.276 hectares
	Oysters 0.024 hectares
	Mangroves 0.168 hectares
	Australian pine 0.049 hectares
	Brazilian pepper 0.014 hectares

	Rouge plant 0.008 hectares
	Gumbo limbo 0.002 hectares
	Unvegetated 0.263 hectares
	< 1 m deep

ISLAND NO. IR28C

Date Sampled: 19 December 1988

I. Physical Description

- A. Island Size: 0.62 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 1.4 km north of Vero Beach public boat ramps
- D. Distance and Direction from Channel Marker: No channel markers
- E. Erosion: None
- F. Boating access: Northeast; 1.4 m deep, small beach

II. Biological Description

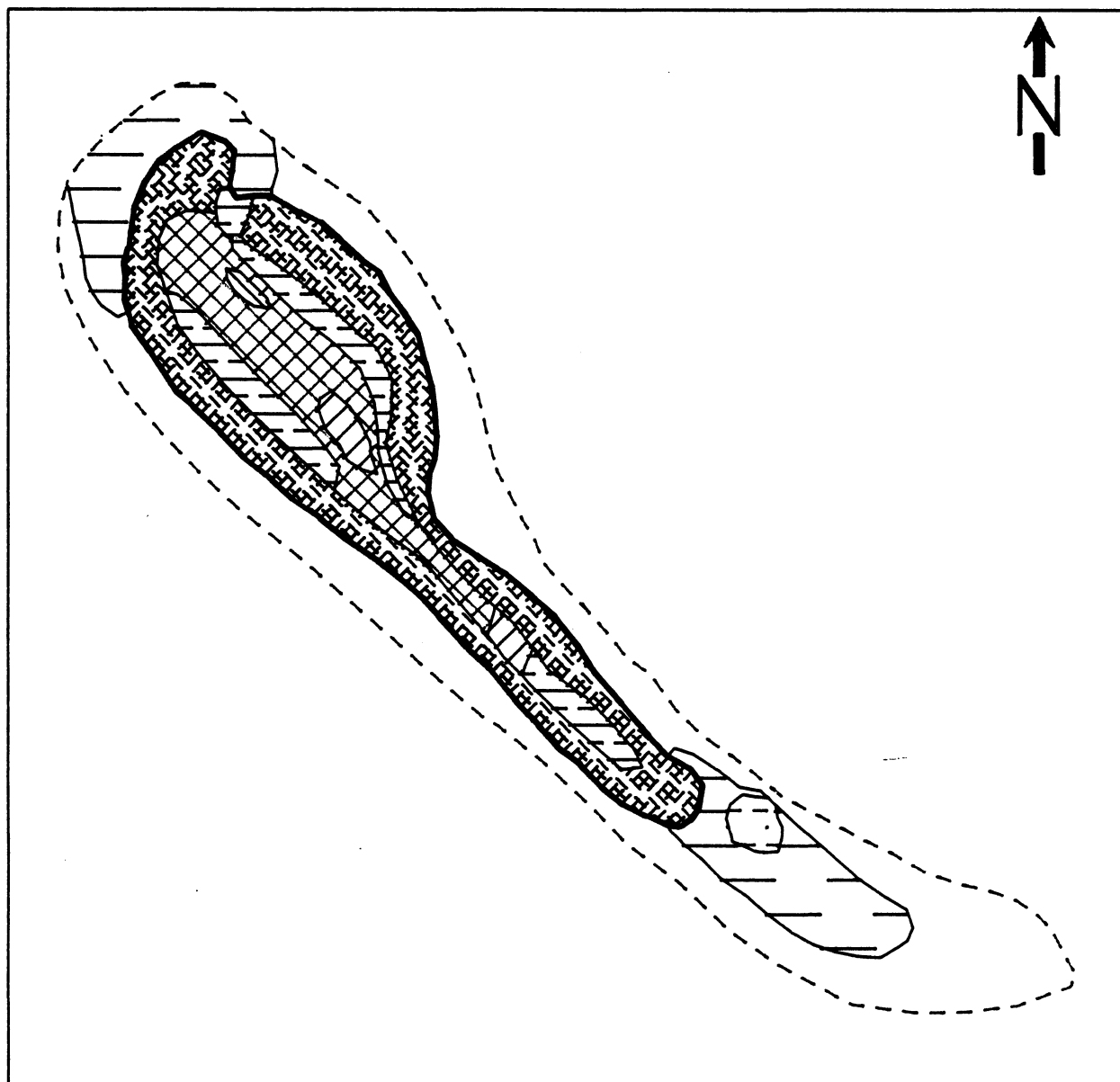
- A. Dominant Terrestrial Vegetation
Black mangrove (17%), red mangrove (16%), Australian pine (13%), Brazilian pepper (13%), sea oxeye (12%); 19 species total
- B. Soil humus: 12 cm in center
- C. Seagrasses
Shoal grass on north and south sides, turtle grass on south end
- D. Bird Usage
3 bird species, no nests
- E. Common Fishes and Invertebrates
Striped mullet, tidewater silverside, 8 fish species total; oysters (north end), grass and humpback shrimps, 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus. Species of special concern: osprey

III. Recommended usage: Conservation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve and is owned by the Lost Tree Village Corporation, the developers of John's Island. The island is dominated by mangroves and has a large stand of the threatened prickly-pear cactus. The potential for development is low because of the small size of the island, low elevation and difficulty of access, therefore, the owners should consider designating this island for conservation.

SPOIL ISLAND IR28C



1 in = 42 m



Shoal grass
0.208 hectares

Turtle grass
0.015 hectares

Mangroves
0.347 hectares

Australian pine
0.140 hectares

Sea oxeye
0.107 hectares

Brazilian pepper
0.022 hectares

Prickly pear cactus
0.005 hectares

Unvegetated
0.572 hectares

--- < 1 m deep

ISLAND NO. IR29

Date Sampled: 7 January 1989

I. Physical Description

- A. Island Size: 25.26 hectares
- B. Height Above Mean High Water: 2 m
- C. Distance from Boat Ramps: 1 km north of Vero Beach Public boat ramps
- D. Distance and Direction from Channel Marker: 100 m east of marker 132
- E. Erosion: None
- F. Boating access: North, 1.9 m deep and south, 2.4 m deep; no open beaches

II. Biological Description

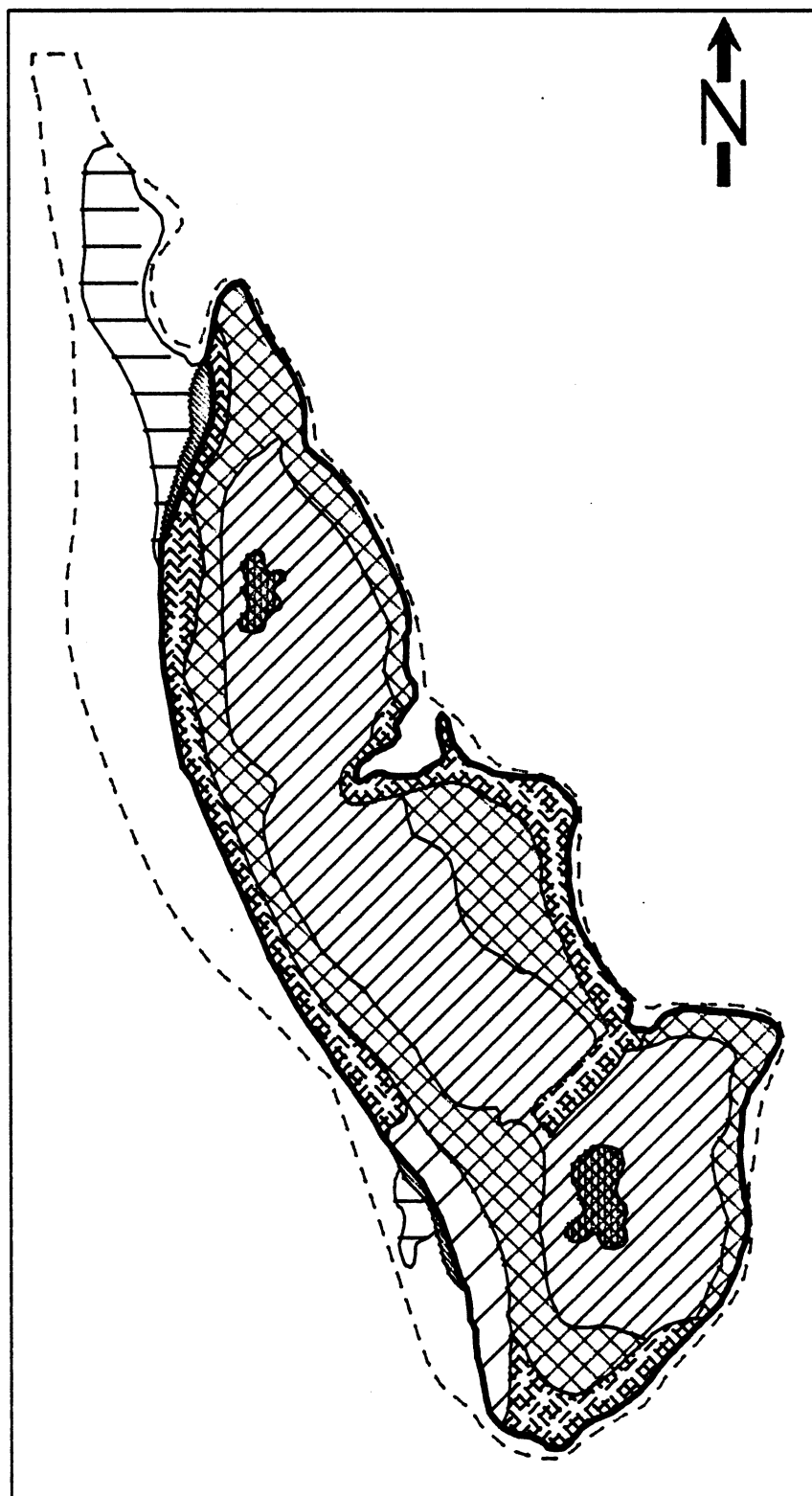
- A. Dominant Terrestrial Vegetation
Brazilian pepper (35%), red mangrove (10%), Australian pine (10%), black mangrove (8%), Florida privet (6%); 61 species total
- B. Soil humus: 9.5 cm in non-spoil areas
- C. Seagrasses
Shoal grass on north and west sides
- D. Bird Usage
Osprey, great blue heron and belted kingfisher common; 13 species, no nests
- E. Common Fishes and Invertebrates
Mojarra, bay anchovy, pinfish, 14 fish species total; grass shrimp and swimming crabs, 7 invertebrate species total
- F. Threatened, endangered or species of special concern
Endangered: bald eagle. Threatened: prickly-pear. Special concern: osprey, brown pelican, little blue heron

III. Recommended usage: Active Recreation

IV. Comments

This island is in the Malabar to Vero Beach Aquatic Preserve. The northern half is owned by the Lost Tree Village Corporation, while the southern half is owned by the Florida Inland Navigation District. The center portion of the island could be used as a spoil deposition area or developed for active recreation. However, the southern and western edges of the island contain mangrove marshes which should not be disturbed by development.

SPOIL ISLAND IR29



	Shoal grass 1.851 hectares
	Brazilian pepper 11.520 hectares
	Australian pine 7.593 hectares
	Mangroves 4.222 hectares
	Marsh 1.049 hectares
	Live oak 0.570 hectares
	Cordgrass 0.311 hectares
	Unvegetated 8.566 hectares
	< 1 m deep

1 in = 172 m



ISLAND NO. IR32

Date Sampled: 19 November 1987

I. Physical Description

- A. Island Size: 6.664 hectares
- B. Height Above Mean High Water: 1 meter
- C. Distance from Boat Ramps: 550 m west of Riverside Park boat ramps
- D. Distance and Direction from Channel Marker: 150 m east of marker 144
- E. Erosion: None
- F. Boating access: Poor; 0.8 m on west side, small open beach

II. Biological Description

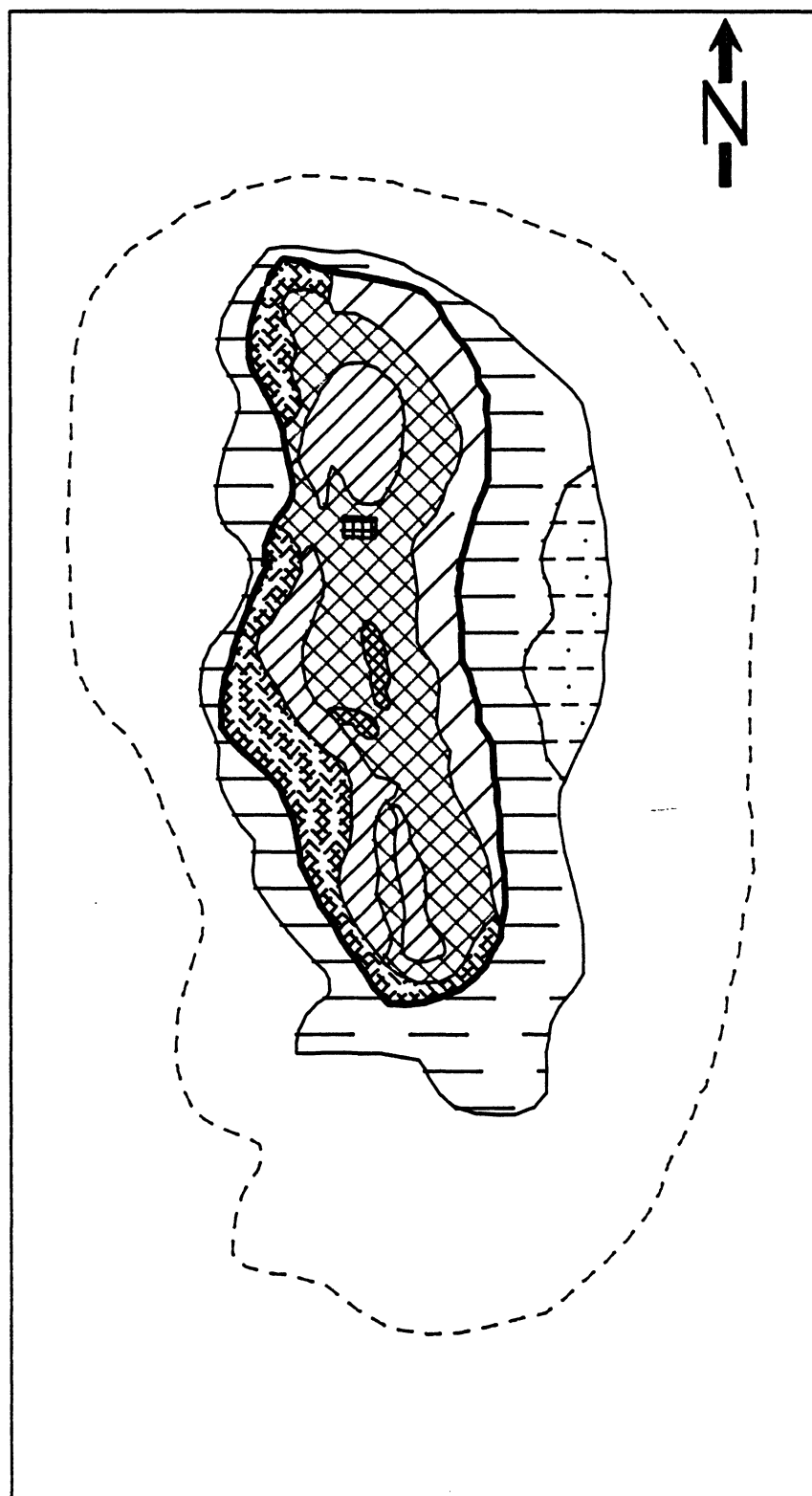
- A. Dominant Terrestrial Vegetation
Australian pine (47%), black mangrove (9%), strangler fig (7.5%), Brazilian pepper (7%), buttonwood (6%), white mangrove (6%); 22 species total
- B. Soil humus: 5.5 cm
- C. Seagrasses
Shoal grass on east, south and west sides; turtle grass on east side
- D. Bird Usage
Brown pelicans and great blue herons common, 7 species total; 5 great blue heron nests
- E. Common Fishes and Invertebrates
Bay anchovy, mojarra, naked goby, clown goby common, 8 fish species total; grass shrimp common, 3 invertebrates total
- F. Threatened, endangered or species of special concern
Species of special concern: osprey, brown pelican

III. Recommended usage: Conservation

IV. Comments

This island is within the Vero Beach City limits. Access to the island is limited by shallow water and extensive grassbeds. The island is an important breeding area for great blue herons, supports a large number of birds and has been revegetated with native tropical hammock plants. For these reasons, this island should be reserved for conservation.

SPOIL ISLAND IR32



-  Shoal grass
4.709 hectares
-  Turtle grass
0.761 hectares
-  Australian pine
2.686 hectares
-  Mangroves
1.347 hectares
-  Brazilian pepper
1.287 hectares
-  Marsh
1.210 hectares
-  Strangler fig
0.106 hectares
-  Replanting area
0.029 hectares
-  Unvegetated
16.099 hectares
-  < 1 m deep

1 in = 124 m



ISLAND NO. IR33

Date Sampled: 10 October 1988

I. Physical Description

- A. Island Size: 2.96 hectares
- B. Height Above Mean High Water: 1 m in middle
- C. Distance from Boat Ramps: 1 km south of Riverside Park boat ramps
- D. Distance and Direction from Channel Marker: 64 m southeast of marker 145A
- E. Erosion: None
- F. Boating access: None; no open beaches, shallow (<1 m) all around

II. Biological Description

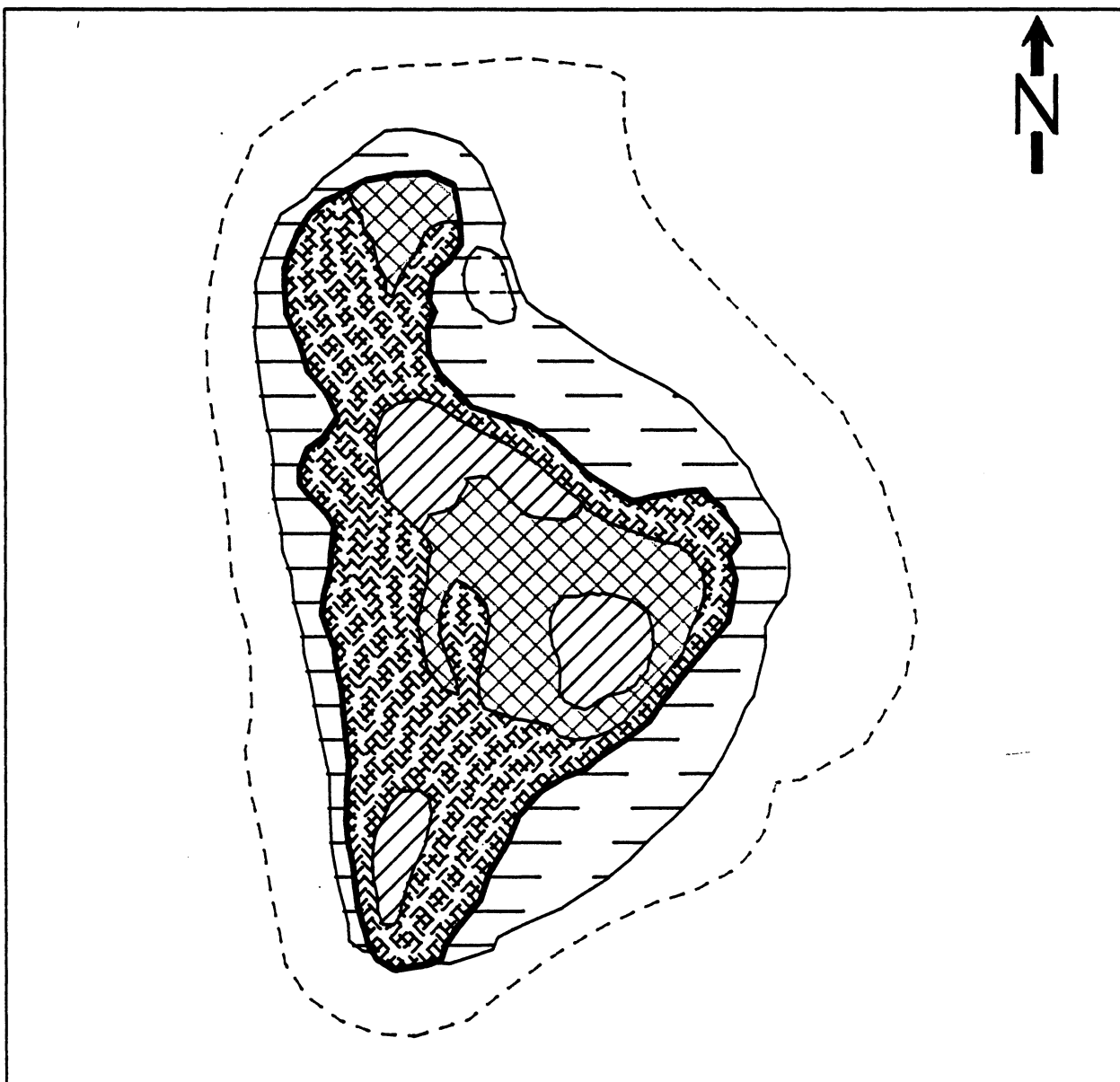
- A. Dominant Terrestrial Vegetation
Black mangrove (30%), Australian pine (25%), Brazilian pepper (20%), white mangrove (9%), red mangrove (6%); 13 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass surrounds island on all four sides, turtle grass on northeast side
- D. Bird Usage
Rookery island; brown pelicans and white ibis common, 10 bird species total; 80-100 nests
- E. Common Fishes and Invertebrates
Bay anchovy, mojarra, clown goby and code goby common, 17 fish species total; grass shrimp common, 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: brown pelican, little blue heron

III. Recommended usage: Conservation

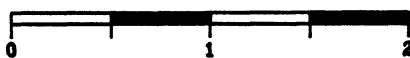
IV. Comments

This island is within the city limits of Vero Beach and has been dedicated as a wildlife sanctuary by the Florida Audubon Society. The island is an important nesting site for several species of birds and is surrounded by extensive grassbeds that contain a large number and diversity of fishes and invertebrates. Additionally, mangroves dominate most of the island. For these reasons, this island should be kept for conservation with no visitation during the February to August nesting season.

SPOIL ISLAND IR33



1 in = 70 m



-  Shoal grass
1.764 hectares
-  Turtle grass
0.045 hectares
-  Mangroves
1.743 hectares
-  Australian pine
0.753 hectares
-  Brazilian pepper
0.467 hectares

-  Unvegetated
-  < 1 m deep

ISLAND NO. IR34

Date Sampled: 5 January 1988

I. Physical Description

- A. Island Size: 1.531 hectares
- B. Height Above Mean High Water: < 1 meter
- C. Distance from Boat Ramps: 2.8 km south of Riverside park ramps
- D. Distance and Direction from Channel Marker: 165 m northwest of marker 146A
- E. Erosion: None
- F. Boating access: Northwest corner; 2.5 meters deep, small beach

II. Biological Description

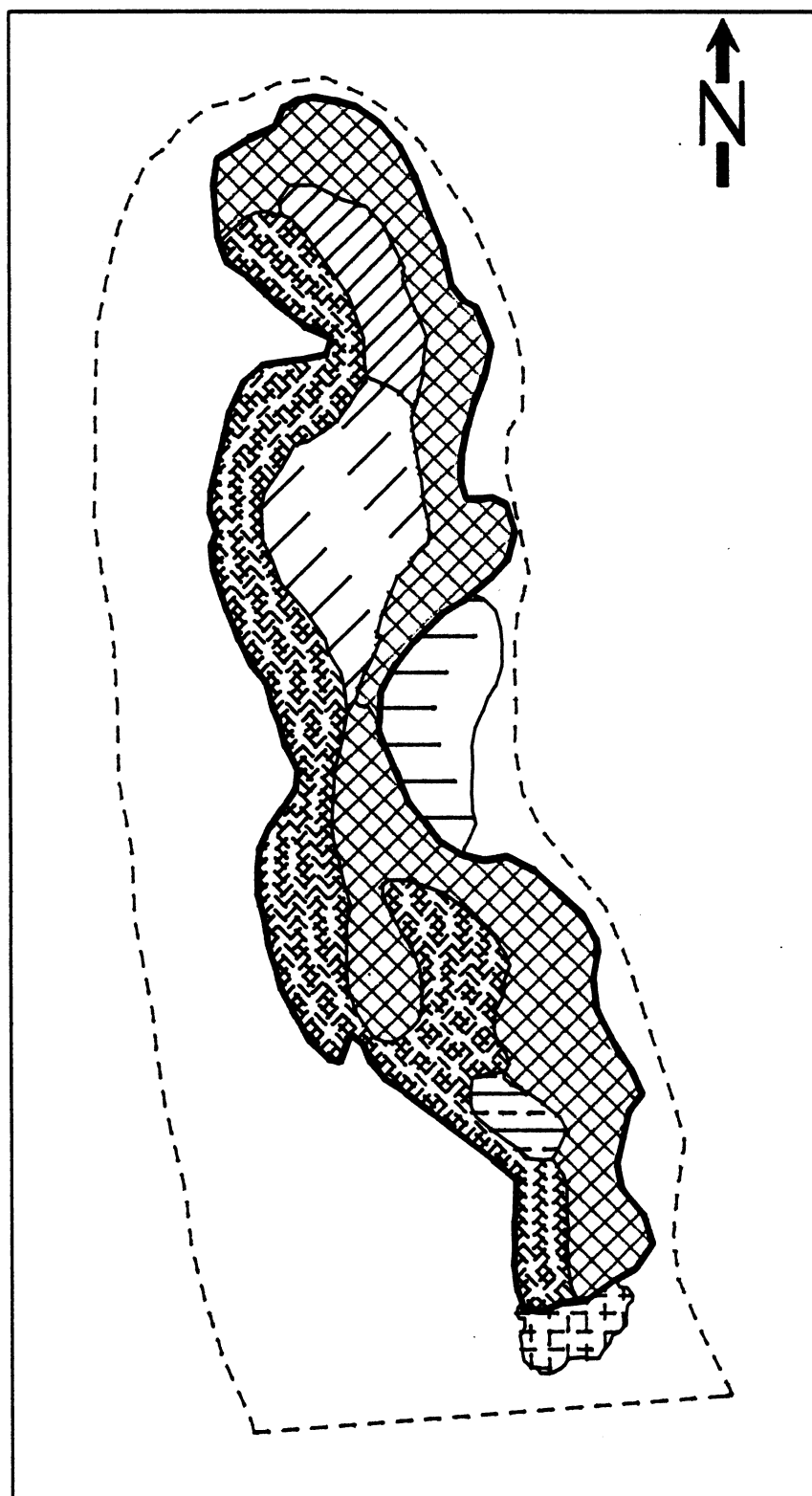
- A. Dominant Terrestrial Vegetation
Australian pine (24%), white mangrove (21%), black mangrove (19%), sea lavender (10%), Brazilian pepper (8%) buttonwood (8%); 18 species total
- B. Soil humus: 2 cm
- C. Seagrasses
Shoal grass on east side
- D. Bird Usage
Brown pelican, osprey, great blue heron common, 7 species total; 2 nests
- E. Common Fishes and Invertebrates
Striped mullet, mojarra common, 6 fish species total; oysters on north, northeast and south sides, 4 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: brown pelican, osprey

III. Recommended usage: Passive Recreation

IV. Comments

This island is within the city limits of Vero Beach and has been used for recreation. The central section of the island is a mangrove-marsh area, but the northern portion of the island is suitable for recreation and there is excellent boating access at this point. However, the usable portion of the island is too small for development of any sort, and should remain for passive recreation only.

SPOIL ISLAND IR34



-  Shoal grass
0.120 hectares
-  Oysters
0.038 hectares
-  Australian pine
0.642 hectares
-  Mangroves
0.546 hectares
-  Marsh
0.190 hectares
-  Brazilian pepper
0.084 hectares
-  Sea oxeye
0.030 hectares
-  Unvegetated
1.812 hectares
-  < 1 m deep

1 in = 46 m



ISLAND NO. IR34A

Date Sampled: 5 January 1989

I. Physical Description

- A. Island Size: 0.103 hectares
- B. Height Above Mean High Water: < 1 meter
- C. Distance from Boat Ramps: 2.9 km south of Riverside boat ramps
- D. Distance and Direction from Channel Marker: 64 km west of marker 146A
- E. Erosion: Slight on north side
- F. Boating access: Poor; 1.5 m deep on south end, rocky shores

II. Biological Description

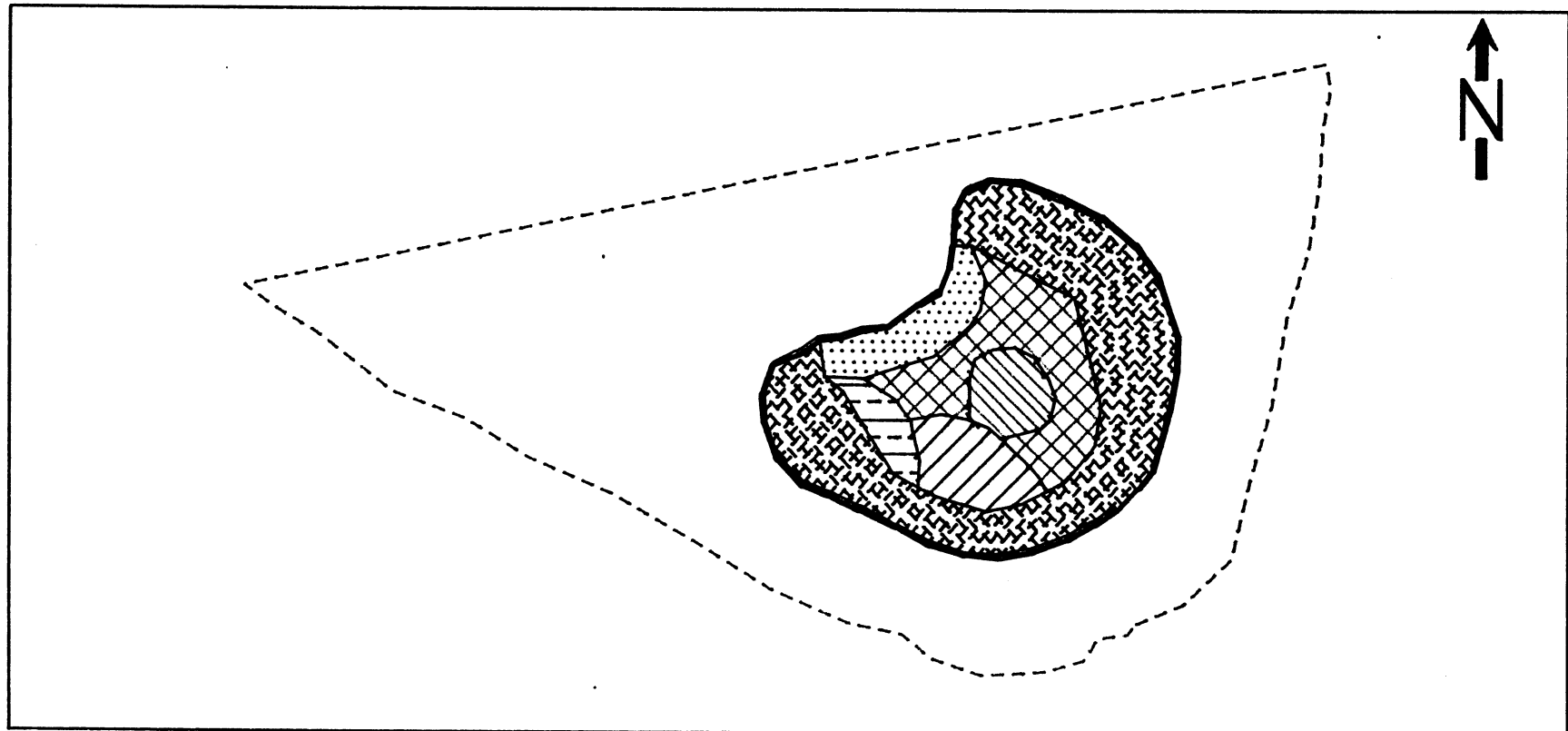
- A. Dominant Terrestrial Vegetation
White mangrove (25%), Australian pine (12%), black mangrove (12%),
Brazilian pepper (12%), buttonwood (12%); 14 species total
- B. Soil humus 2 cm
- C. Seagrasses
None
- D. Bird Usage
Only two birds observed on the island
- E. Common Fishes and Invertebrates
Mojarra frequent, four fish species total; mud snails common, 6 invertebrate
species total
- F. Threatened, endangered or species of special concern
Species of special concern: brown pelican

III. Recommended usage: Conservation

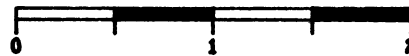
IV. Comments

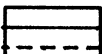
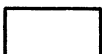
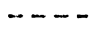
This island is within the city limits of Vero Beach. The island is small, there is no good boating access and there is a small stand of the uncommon native hammock tree blolly in the center of the island. There is not adequate room for recreational use of the island and the island has not been used historically for recreation. Therefore, IR34A should be designated a conservation island.

SPOIL ISLAND IR34A



1 in = 18 m



	Mangrove 0.055 hectares		Blolly 0.006 hectares
	Australian pine 0.021 hectares		Sea oxeye 0.004 hectares
	Sand 0.009 hectares		Unvegetated 0.271 hectares
	Brazilian pepper 0.009 hectares		< 1 m deep

ISLAND NO. IR35

Date Sampled: 4 November 1987

I. Physical Description

- A. Island Size: 4.48 hectares
- B. Height Above Mean High Water: 1 meter
- C. Distance from Boat Ramps: 3.85 km south of Riverside Park boat ramps
- D. Distance and Direction from Channel Marker: 400 m north of marker 150
- E. Erosion: Slight on west side
- F. Boating access: Poor; open beach on west, but only 0.6 meters deep

II. Biological Description

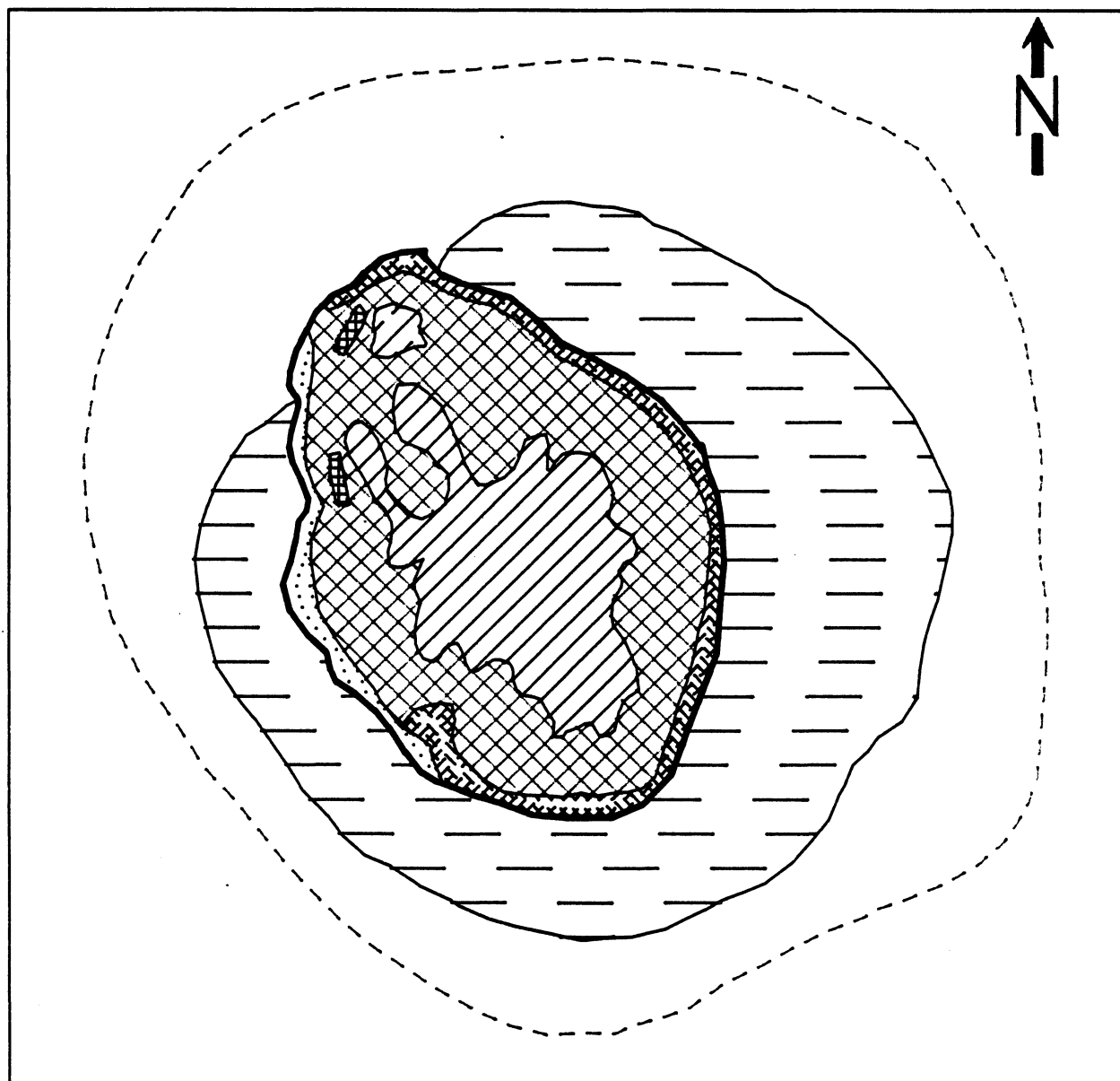
- A. Dominant Terrestrial Vegetation
Brazilian pepper (45%), Australian pine (35%); 17 species total
- B. Soil humus: 2 cm
- C. Seagrasses
Shoal grass surrounds island
- D. Bird Usage
Brown pelican common, 7 species total; 1 nest
- E. Common Fishes and Invertebrates
Mojarra, bay anchovy, clown goby common, 9 fish species total; grass shrimp common, 3 invertebrate species
- F. Threatened, endangered or species of special concern
Species of special concern: brown pelican, osprey

III. Recommended usage: Conservation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. This island has been revegetated with 15 species of native tropical hammock plants and has extensive seagrass beds which support a diverse aquatic fauna. Furthermore, access to the island is severely limited by shallow water. Therefore, this island should be reserved for conservation.

SPOIL ISLAND IR35



1 in = 85 m



	Shoal grass 5.418 hectares		Greenbriar 0.052 hectares
	Australian pine 2.447 hectares		Replanting area 0.032 hectares
	Brazilian pepper 1.278 hectares		Unvegetated 8.123 hectares
	Mangroves 0.464 hectares		< 1 m deep
	Sand 0.202 hectares		

ISLAND NO. IR36

Date Sampled: 8 November 1987

I. Physical Description

- A. Island Size: 1.115 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 4.8 km south of Riverside Park boat ramps
- D. Distance and Direction from Channel Marker: 385 m northeast of marker 153
- E. Erosion: Some on north side
- F. Boating access: North side; 1.5 m deep, open beach

II. Biological Description

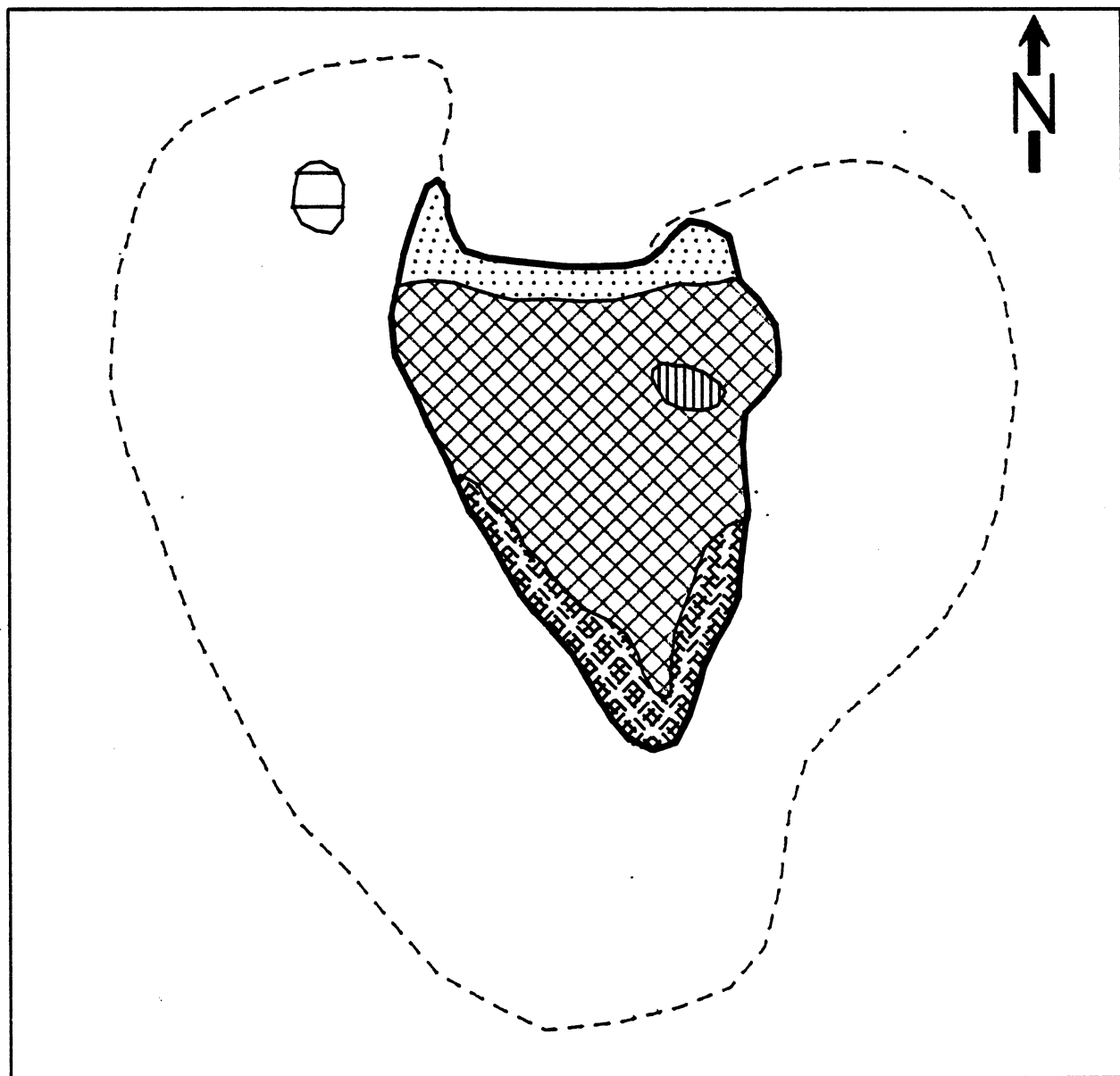
- A. Dominant Terrestrial Vegetation
Australian pine (53%), Brazilian pepper (22%), black mangrove (6%), buttonwood (6%), white mangrove (6%); 16 species total
- B. Soil humus: 3 cm
- C. Seagrasses
Shoal grass on northwest side of island
- D. Bird Usage
Brown pelican common, 2 species total; no nests
- E. Common Fishes and Invertebrates
Mojarra and bay anchovy common, 2 fish species total, no invertebrate species
- F. Threatened, endangered or species of special concern
Species of special concern: brown pelican

III. Recommended usage: Education/Active Recreation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and has been used historically by the Indian River County School District for educational purposes. The island has good deep water access and a large sand beach and is also heavily used for recreation. Although the island is not large, limited development in the form of picnic tables and fireplaces would be appropriate. Species diversity on the island is low and would not be adversely impacted by recreational usage. Therefore, this island should continue to be used for educational and recreational purposes.

SPOIL ISLAND IR36



1 in = 51 m



	Shoal grass 0.026 hectares
	Australian pine 0.813 hectares
	Mangroves 0.184 hectares
	Sand 0.136 hectares
	Sea lavender 0.022 hectares

	Unvegetated 4.019 hectares
	< 1 m deep

ISLAND NO. IR37A

Date Sampled: 5 January 1989

I. Physical Description

- A. Island Size: 0.169 hectares
- B. Height Above Mean High Water: < 1 meter
- C. Distance from Boat Ramps: 5.4 km south of Riverside Park boat ramps
- D. Distance and Direction from Channel Marker: 150 m south of marker 153
- E. Erosion: Slight on the southwest side
- F. Boating access: Southwest side; 1.8 m deep, open beach

II. Biological Description

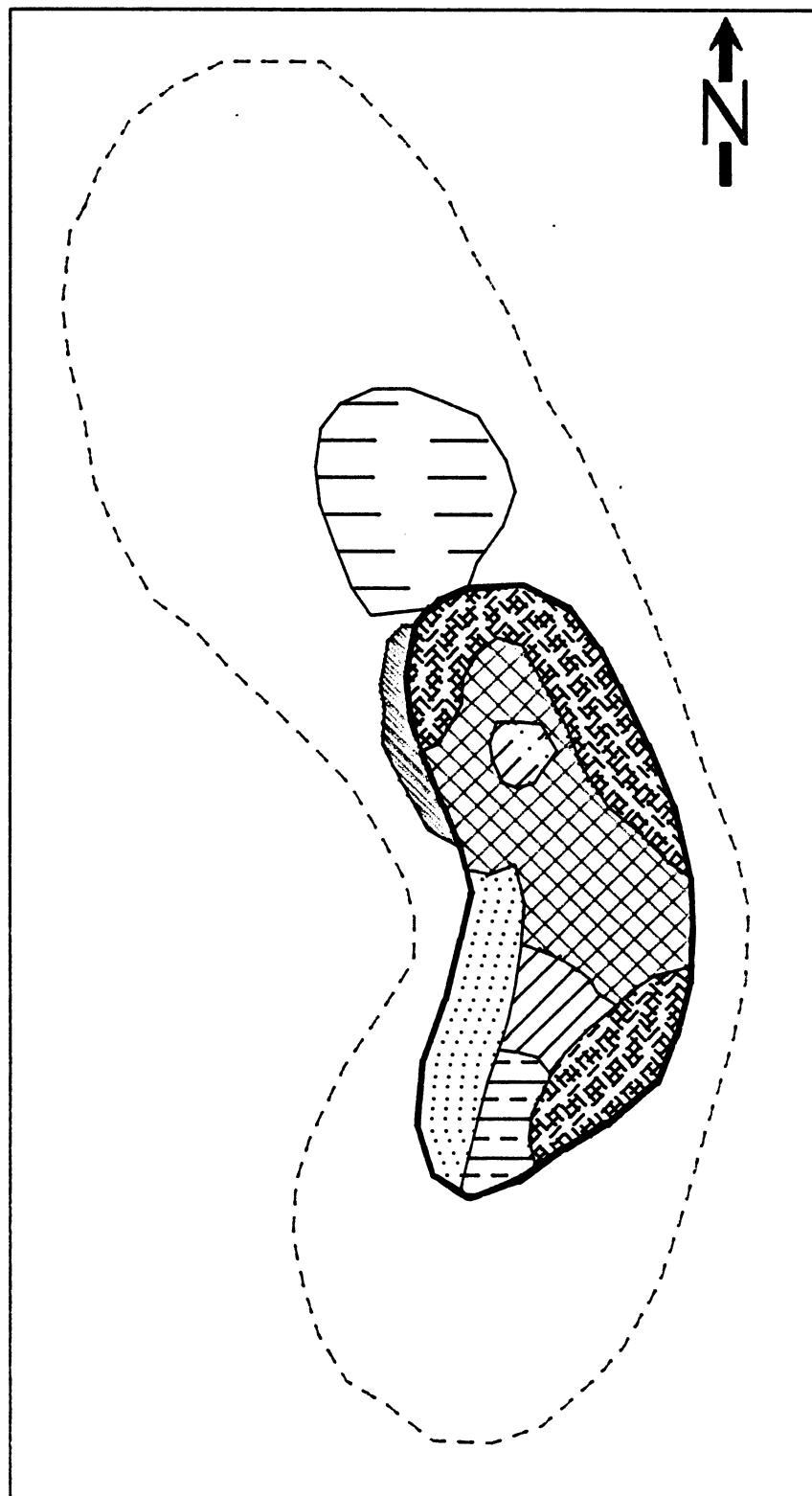
- A. Dominant Terrestrial Vegetation
White mangrove (18%), Australian pine (14%), black mangrove (14%), sea oxeeye (14), Brazilian pepper (9%); 16 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on northern end of island
- D. Bird Usage
Fish crows, sanderlings common, 8 species total; no nests
- E. Common Fishes and Invertebrates
Bay anchovy and mojarra frequent, 3 fish species total; striped hermit crab frequent, 4 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: osprey, American oystercatcher

III. Recommended usage: Passive Recreation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. There is good boating access at the southwest end and the island has historically received human usage. Plant and aquatic species diversity is low and the island is not used as a nesting site; therefore continued use of the island for recreation would not adversely impact the flora and fauna. Development of facilities on this island is not recommended because of the small size; therefore the island should be used for passive recreation only.

SPOIL ISLAND IR37A



	Shoal grass 0.044 hectares
	Australian pine 0.058 hectares
	Mangroves 0.054 hectares
	Sand 0.024 hectares
	Brazilian pepper 0.010 hectares
	Sea oxeye 0.010 hectares
	Cordgrass 0.008 hectares
	Privet 0.004 hectares
	Unvegetated 0.458 hectares
	< 1 m deep

1 in = 21 m



ISLAND NO. IR37

Date Sampled: 2 February 1988

I. Physical Description

- A. Island Size: 2.522 hectares
- B. Height Above Mean High Water: 1 meter
- C. Distance from Boat Ramps: 6.4 km south of Riverside Park, 2.6 km north of Oslo Rd. ramp
- D. Distance and Direction from Channel Marker: 220 m west of marker 154
- E. Erosion: Minimal
- F. Boating access: Poor; 1 meter deep on south end, no open beaches

II. Biological Description

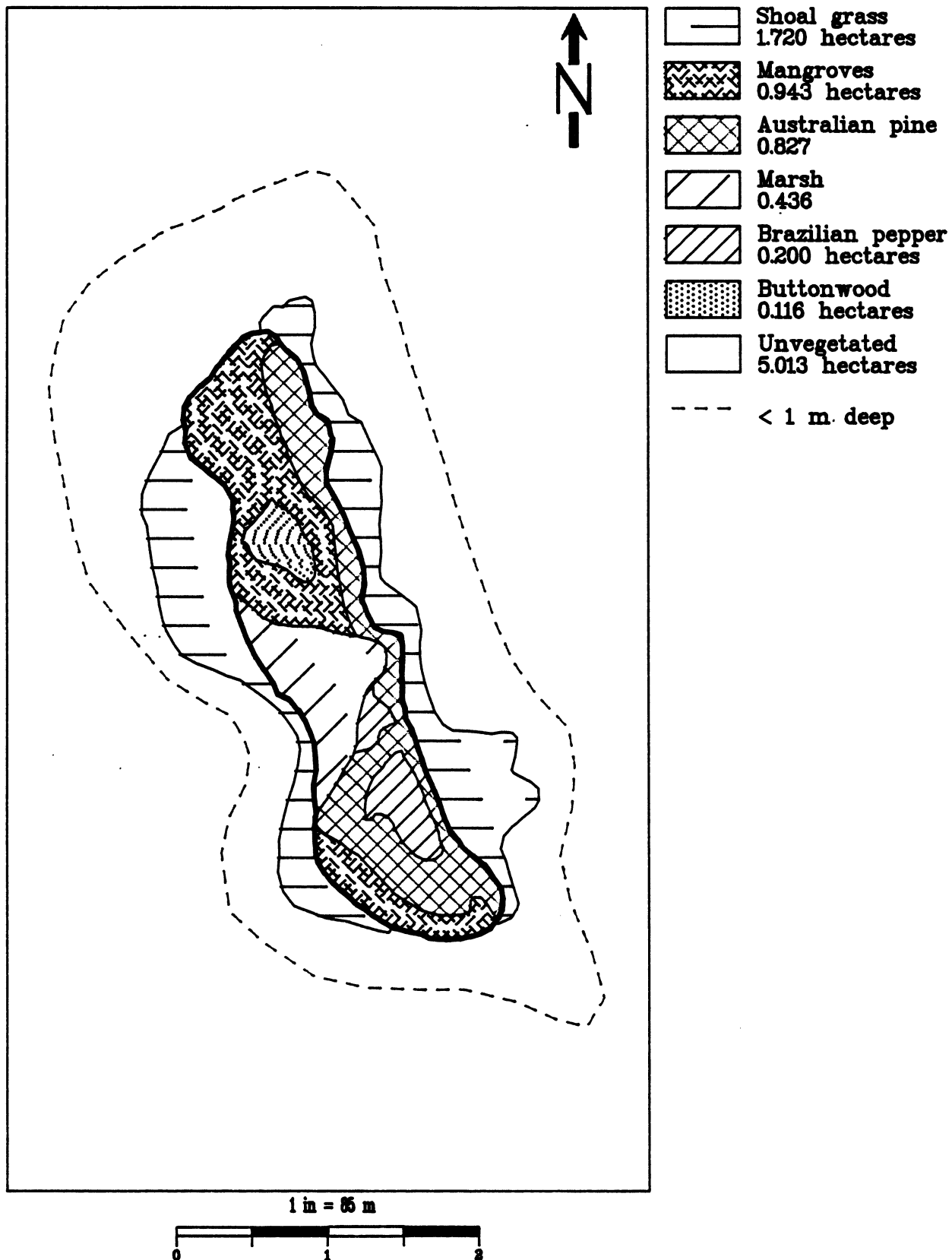
- A. Dominant Terrestrial Vegetation
Australian pine (29%), white mangrove (15%), sea lavender (14%), black mangrove (12%), buttonwood (11%); 18 species total
- B. Soil humus: 6 cm
- C. Seagrasses
Shoal grass on east and west sides
- D. Bird Usage
Brown pelican and turkey vulture common, 12 species total; no nests
- E. Common Fishes and Invertebrates
Striped mullet, mojarra, pinfish common, 8 fish species total; grass shrimp common, 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: osprey, brown pelican, little blue heron

III. Recommended usage: Conservation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. Boating access to the island is difficult due to shallow water and there are not open beaches that are easily accessible. Historical human usage of the island appears to be minimal. The central portion of IR37 is a mangrove marsh and the floral and faunal diversity on the island is fairly high. Thus, this island should be reserved for conservation.

SPOIL ISLAND IR37



ISLAND NO. IR38

Date Sampled: 14 November 1987

I. Physical Description

- A. Island Size: 1.539 hectares
- B. Height Above Mean High Water: 1-1.5 meters
- C. Distance from Boat Ramps: 8 km south of Riverside Park, 1.3 km north of Oslo
- D. Distance and Direction from Channel Marker: 600 m northwest of marker 156
- E. Erosion: Minimal
- F. Boating access: Poor; < 0.8 m deep all around island, no open beaches

II. Biological Description

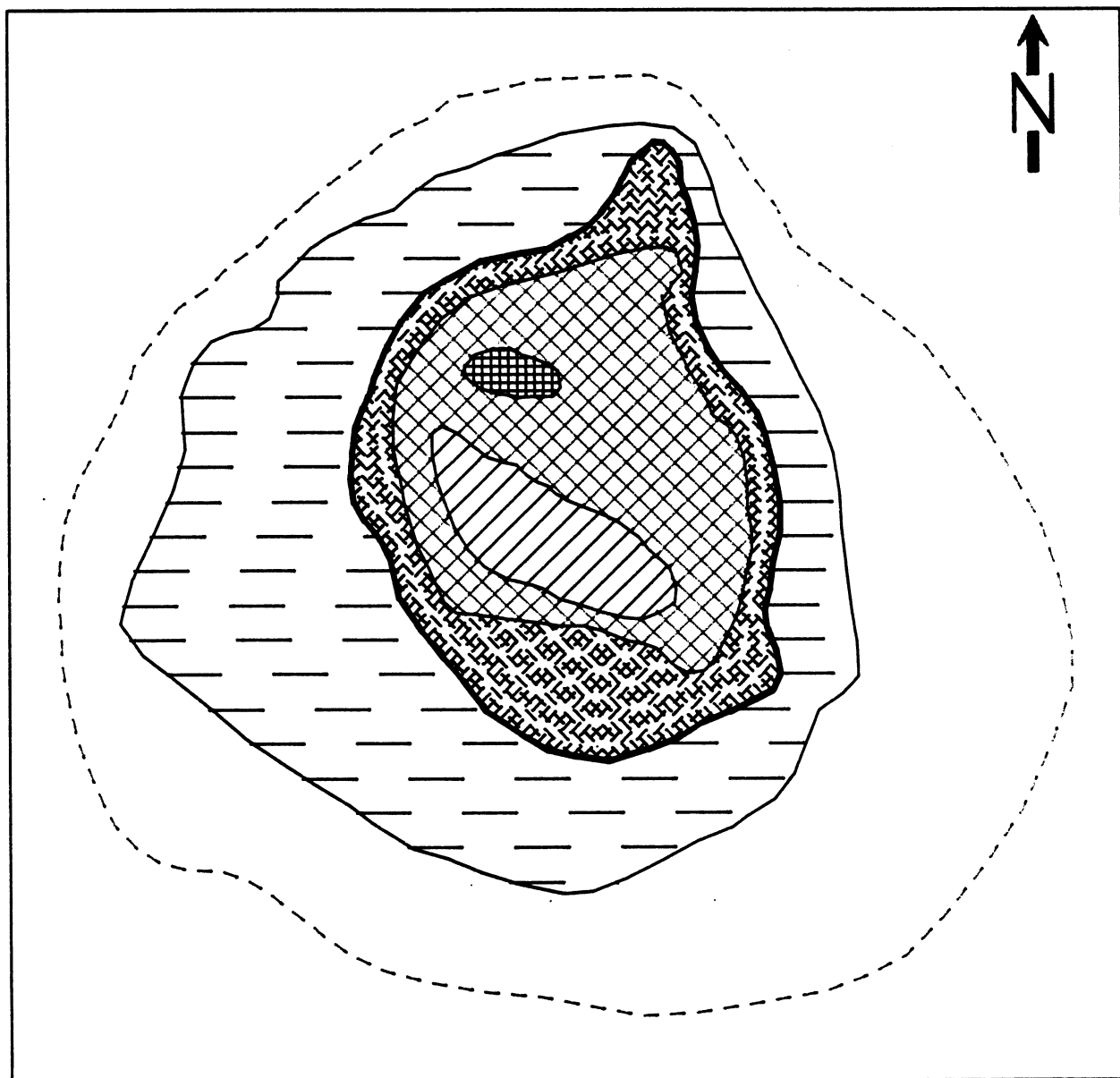
- A. Dominant Terrestrial Vegetation
Australian pine (49%), black mangrove (13%), Brazilian pepper (13%), white mangrove (11%); 33 species total
- B. Soil humus: 8 cm
- C. Seagrasses
Shoal grass surrounding island, turtle grass on northwest side of island
- D. Bird Usage
Bird rookery: Brown pelicans and white ibis common, 7 species total, 50 nests
- E. Common Fishes and Invertebrates
Mojarra common, 6 fish species total; grass shrimp common, 1 invertebrate species
- F. Threatened, endangered or species of special concern
Species of special concern: brown pelican, osprey, little blue heron

III. Recommended usage: Conservation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic preserve. The island is an important rookery for brown pelicans, white ibis and great blue herons and a portion of the island has been revegetated with native tropical hammock plants by the Florida Game and Freshwater Fish Commission. The island is not readily accessible to boaters and has high floral and faunal diversity. For these reasons, this island should be designated for conservation and human visitation should be discouraged during the February to August breeding season.

SPOIL ISLAND IR38



1 in = 51 m



	Shoal grass 1.924 hectares
	Australian pine 0.720 hectares
	Mangroves 0.591 hectares
	Brazilian pepper 0.197 hectares
	Replanting area 0.030 hectares

	Unvegetated 2.598 hectares
	< 1 m deep

ISLAND NO. IR39

Date Sampled: 20 July 1988

I. Physical Description

- A. Island Size: 1.804 hectares
- B. Height Above Mean High Water: 1 meter
- C. Distance from Boat Ramps: 825 m northeast of Oslo ramp
- D. Distance and Direction from Channel Marker: 275 m southwest of marker 158
- E. Erosion: Minimal
- F. Boating access: South sand spit; 1 m or less deep, open beach access

II. Biological Description

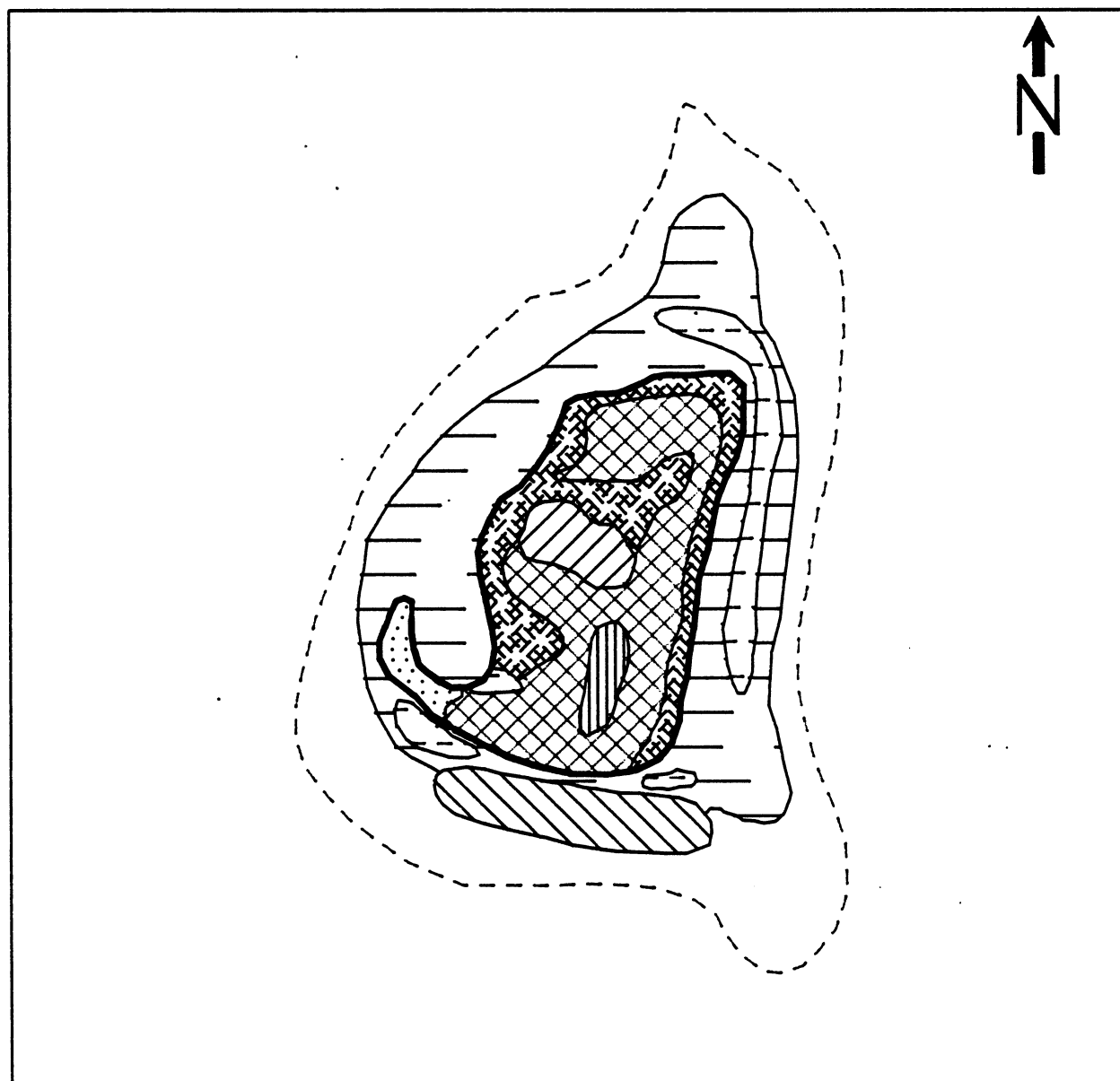
- A. Dominant Terrestrial Vegetation
Australian pine (31%), sea lavender (16%), buttonwood (14%), white mangrove (13%), Brazilian pepper (12%); 15 species total
- B. Soil humus: 11 cm
- C. Seagrasses
Shoal grass surrounds island, turtle grass on north, south and east sides of island, manatee grass on west, south and east sides
- D. Bird Usage
Brown pelican and least tern common, 9 species total; 1 nest
- E. Common Fishes and Invertebrates
Gulf pipefish, silver perch and bay anchovy common, 16 fish species total; grass and penaeid shrimps common, 8 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: least tern; Species of special concern: little blue heron, brown pelican, American oystercatcher

III. Recommended usage: Conservation

IV. Comments

This island is in the Vero Beach To Ft. Pierce Aquatic Preserve. The island is well used by many bird species and some nesting occurs. Extensive seagrass beds surround IR39, including three species of seagrasses and one of the highest faunal aquatic diversities of Indian River County spoil islands. For these reasons, IR39 should be designated for conservation.

SPOIL ISLAND IR39



1 in = 80 m



	Shoal grass 1.903 hectares
	Manatee grass 0.322 hectares
	Turtle grass 0.307 hectares
	Australian pine 0.909 hectares
	Mangroves 0.569 hectares

	Brazilian pepper 0.145 hectares
	Sand 0.083 hectares
	Sea lavender 0.080 hectares
	Sea oxeye 0.019 hectares
	Unvegetated 2.359 hectares

--- < 1 m deep

ISLAND NO. IR40

Date Sampled: 4 April 1988

I. Physical Description

- A. Island Size: 2.213 hectares
- B. Height Above Mean High Water: 1 meter
- C. Distance from Boat Ramps: 1.2 km south of Oslo, 5.9 km NW of Round Island
- D. Distance and Direction from Channel Marker: 330 m southwest of marker 160
- E. Erosion: Low; some on east side
- F. Boating access: South; 1 m deep, small sand/rock beach

II. Biological Description

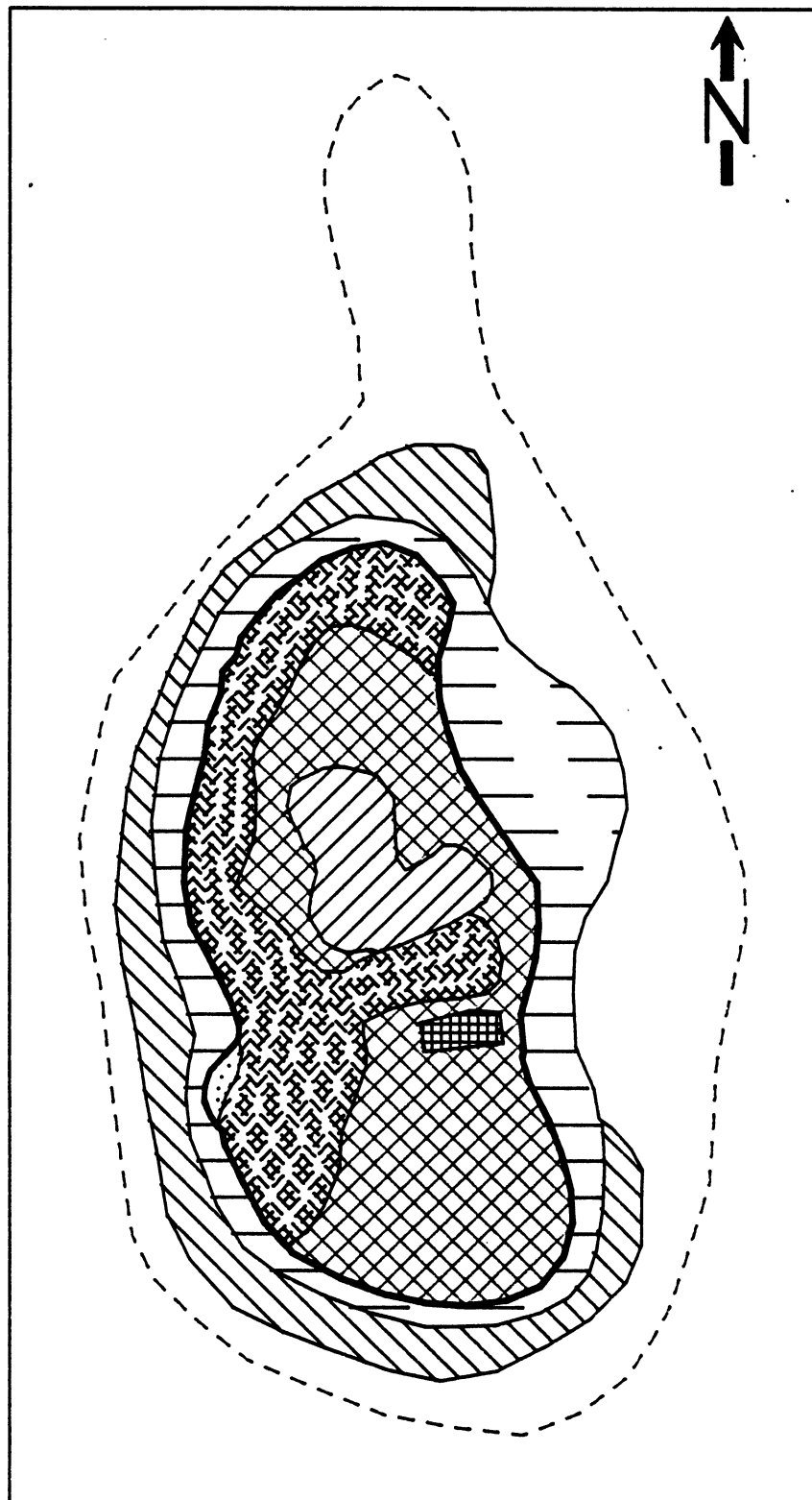
- A. Dominant Terrestrial Vegetation
Australian pine (44%), Brazilian pepper (12%), black mangrove (11%), sea lavender (11%); 30 species total
- B. Soil humus: 9 cm
- C. Seagrasses
Shoal grass on all four sides, manatee grass on north, west and south sides of island
- D. Bird Usage
Fish crow and brown pelican frequent, 5 species total; 3 nests
- E. Common Fishes and Invertebrates
Pinfish, bay anchovy, mojarra and spot common, 13 fish species total; oysters on north and west sides, grass shrimp common, 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: osprey, brown pelican

III. Recommended usage: Conservation/Education

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. A portion of IR40 has been revegetated with native tropical hammock plants. Floral and faunal diversity is high, nesting occurs and extensive seagrass beds surround the island. Although the island receives some recreational usage, boating access is limited and such usage should be discouraged. The island is ideally suited for educational purposes and should be designated as a combination education/conservation island.

SPOIL ISLAND IR40



	Shoal grass 0.959 hectares
	Manatee grass 0.718 hectares
	Australian pine 1.109 hectares
	Mangroves 0.821 hectares
	Brazilian pepper 0.237 hectares
	Replanting area 0.029 hectares
	Sand 0.017 hectares
	Unvegetated 2.098 hectares
	< 1 m deep

1 in = 60 m



ISLAND NO. IR41

Date Sampled: 20 June 1988

I. Physical Description

- A. Island Size: 2.564 hectares
- B. Height Above Mean High Water: 1 meter
- C. Distance from Boat Ramps: 2.1 km south of Oslo, 4.9 km northwest of Round Island
- D. Distance and Direction from Channel Marker: 500 m northwest of marker 163
- E. Erosion: Minimal
- F. Boating access: Southwest sand spit; 1.2 m deep, open beach

II. Biological Description

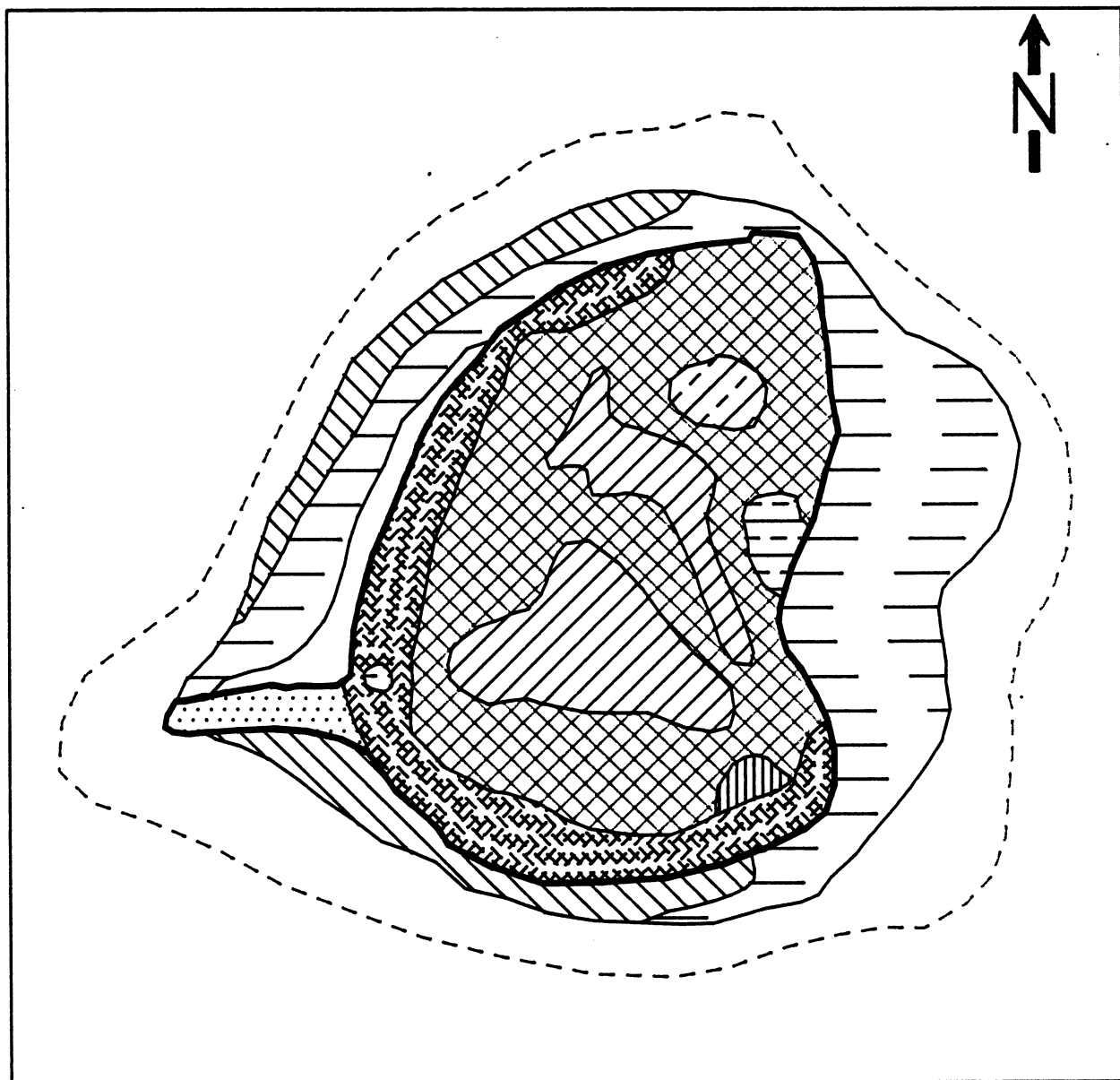
- A. Dominant Terrestrial Vegetation
Australian pine (34%), Brazilian pepper (32%), buttonwood (5%); 47 species total
- B. Soil humus: 6 cm
- C. Seagrasses
Shoal grass on north, east and west sides, manatee grass on north, south and west sides, turtle grass on north and south sides
- D. Bird Usage
Great blue heron and American oystercatcher frequent, 12 species total; 8 nests
- E. Common Fishes and Invertebrates
Pinfish and silver perch common, 15 fish species total; grass and penaeid shrimps common, 9 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: snowy egret, little blue heron, American oystercatcher, osprey

III. Recommended usage: Conservation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. The island has high floral and faunal diversity, is surrounded by seagrasses, is an important nesting area and has limited boating access. For these reasons, IR41 should be designated a conservation island.

SPOIL ISLAND IR41



1 in = 55 m



	Shoal grass 1.212 hectares
	Manatee grass 0.414 hectares
	Australian pine 1.326 hectares
	Mangroves 0.567 hectares
	Brazilian pepper 0.459 hectares

	Sand 0.079 hectares
	Vines 0.055 hectares
	Sea oxeye 0.052 hectares
	Sea lavender 0.026 hectares
	Unvegetated 1.817 hectares

--- < 1 m deep

ISLAND NO. IR42

Date Sampled: 18 April 1988

I. Physical Description

- A. Island Size: 3.217 hectares
- B. Height Above Mean High Water: 1 meter
- C. Distance from Boat Ramps: 3.3 km south of Oslo, 3.5 km west of Round Island
- D. Distance and Direction from Channel Marker: 250 m west of marker 168
- E. Erosion: Minimal
- F. Boating access: North; 1.3 m deep, no open beaches

II. Biological Description

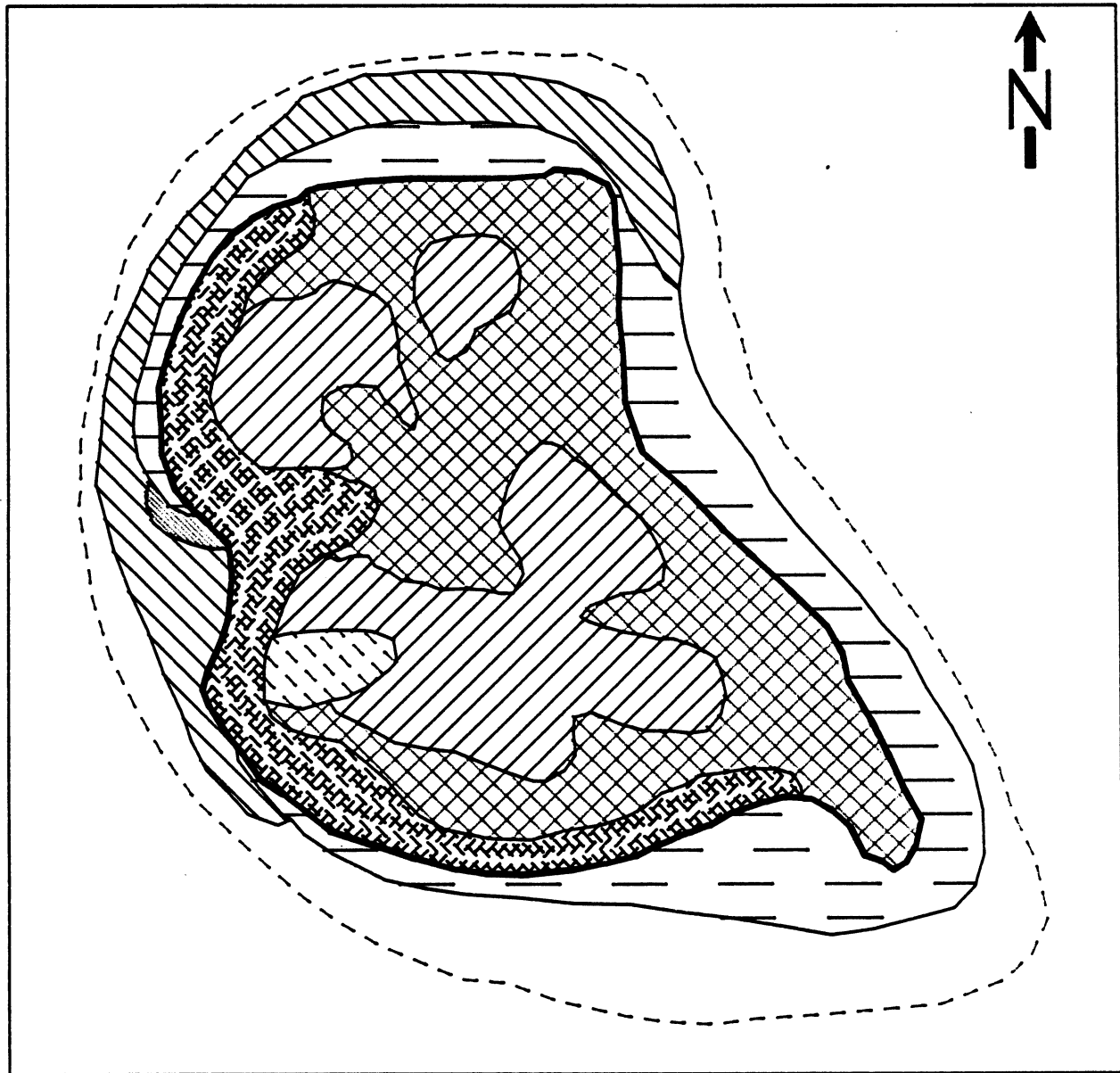
- A. Dominant Terrestrial Vegetation
Australian pine (42%), Brazilian pepper (39%), strangler fig (4%); 38 species total
- B. Soil humus: 6 cm
- C. Seagrasses
Shoal grass on north, east and south sides, manatee grass on east, north and west sides
- D. Bird Usage
Brown pelican and great blue heron frequent, 10 species total; 5 nests
- E. Common Fishes and Invertebrates
Pinfish and tidewater silverside common, 14 fish species total; grass shrimp common, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: brown pelican, osprey, little blue heron

III. Recommended usage: Passive Recreation

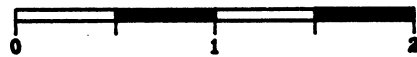
IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. Although there is a fairly high floral and faunal diversity on the island, rare or endangered species are uncommon and nesting is infrequent. The island has good boating access and it is currently used for recreation. This island is large enough for development for active recreation and such development would not negatively impact the resources if confined to areas presently covered with Australian pine or Brazilian pepper.

SPOIL ISLAND IR42



1 in = 52 m



	Shoal grass 1.013 hectares		Varnish leaf 0.076 hectares
	Manatee grass 0.507 hectares		Cordgrass 0.020 hectares
	Australian pine 1.500 hectares		Unvegetated 1.227 hectares
	Brazilian pepper 0.984 hectares		Mangroves 0.637 hectares
			< 1 m deep

ISLAND NO. IR43

Date Sampled: 20 May 1988

I. Physical Description

- A. Island Size: 2.206 hectares
- B. Height Above Mean High Water: 1 meter
- C. Distance from Boat Ramps: 3.3 km southwest of Round Island
- D. Distance and Direction from Channel Marker: 220 m west of marker 168A
- E. Erosion: None
- F. Boating access: Northwest side; 1.6 m deep, small, rocky beach

II. Biological Description

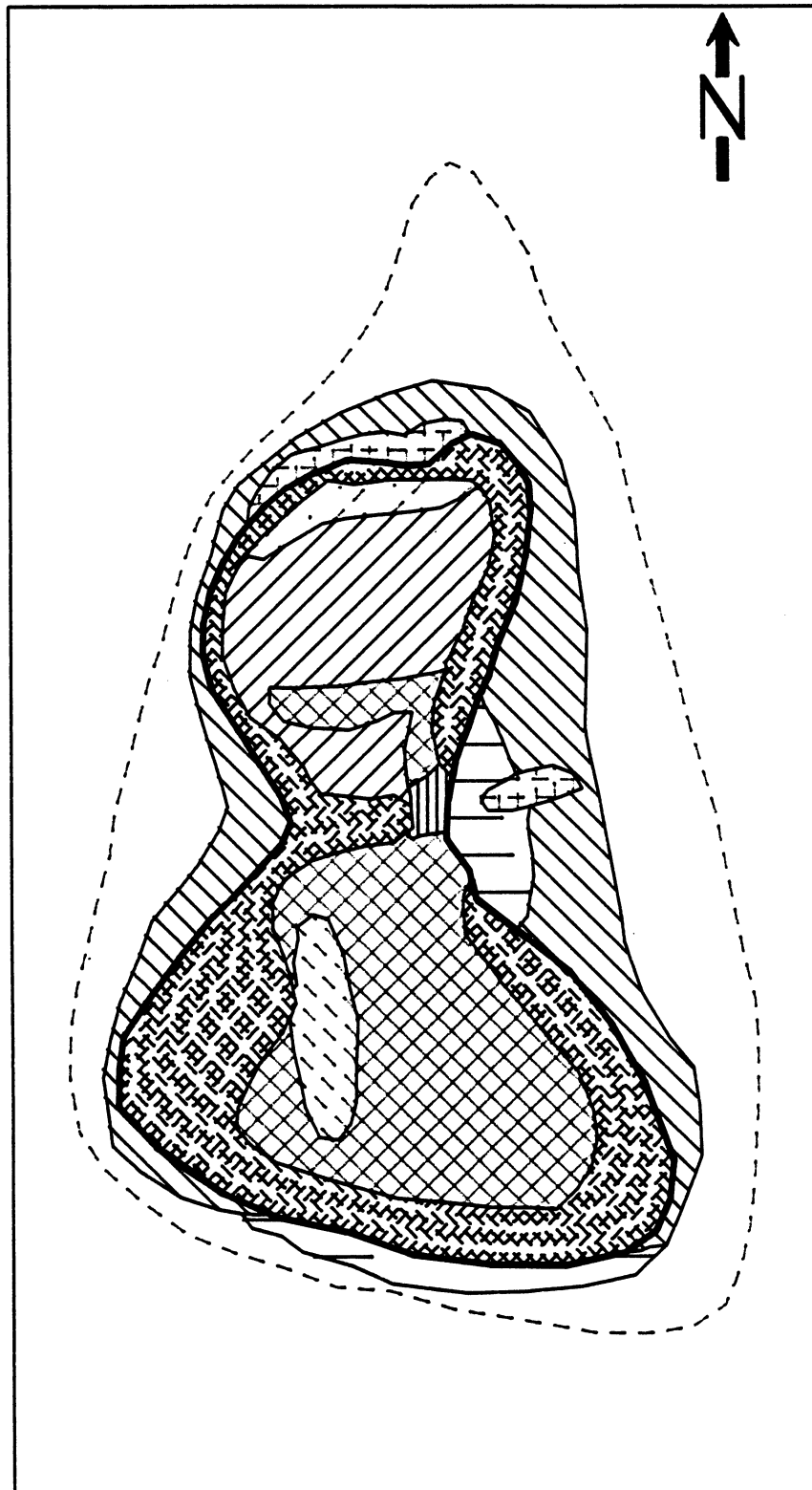
- A. Dominant Terrestrial Vegetation
Australian pine (33%), Brazilian pepper (32%), red mangrove (9%); 54 species total
- B. Soil humus: 13 cm
- C. Seagrasses
Shoal grass on east and south sides, manatee grass on east, north and west sides
- D. Bird Usage
Anhinga and chuck-will's-widow frequent, 11 species; 5 nests
- E. Common Fishes and Invertebrates
Pinfish, gulf pipefish and mojarra frequent, 15 fish species total; oysters on north side, grass shrimp and ladder horn shell common, 9 invertebrate species total
- F. Threatened, endangered or species of special concern
Species of special concern: osprey, little blue heron, brown pelican

III. Recommended usage: Passive Recreation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. Although the floral species diversity is high the island is dominated by Brazilian pepper and Australian pine. A recent fire scorched the southern portion of the island. Boating access to the island is good and IR43 historically receives recreational usage. Faunal diversity is moderately high and some nesting occurs on the island; therefore it is not recommended to develop IR43 for active recreation.

SPOIL ISLAND IR43



	Manatee grass 0.693 hectares
	Shoal grass 0.190 hectares
	Oysters 0.075 hectares
	Mangroves 0.899 hectares
	Australian pine 0.729 hectares
	Brazilian pepper 0.406 hectares
	Varnish leaf 0.095 hectares
	Grasses 0.057 hectares
	Sea lavender 0.019 hectares
	Unvegetated 1.398 hectares
	< 1 m deep

1 in = 53 m



DISCUSSION

Indian River County contains the largest number of spoil islands in the Indian River Lagoon and these islands extend the entire length of the county. There were no obvious floral or faunal differences in the islands between the northern and southern portions of the county. Indian River County islands had fairly high faunal diversity; 136 of the 205 invertebrates, fishes, reptiles, birds and mammals observed during the survey were found in Indian River County, representing 66% of the faunal list. In addition, Indian River County islands contained 12 animal species (6% of the total faunal list) that were not found in any other county. Part of the reason for this relatively high diversity may be that Indian River County has the largest islands in the survey, as well as several natural islands. Larger islands are able to support more diverse terrestrial animal populations, such as the three mammal species (opossum, river otter and raccoon) that were observed only in this county. The presence of seven rookery islands also increased faunal diversity. Additionally, most of the islands in Indian River County had extensive seagrass beds surrounding them, providing a large area for aquatic fauna. Five aquatic species (Florida fighting conch, smooth butterfly ray, jack crevalle, Gulf flounder and smooth trunkfish) were only found around Indian River County islands.

The most frequently captured aquatic species found in Indian River County included grass, penaeid and humpback shrimps, hermit and swimming crabs, bay anchovy, tidewater silverside, gulf pipefish, mojarras, pinfish and striped mullet. Twenty percent of the fishes collected around Indian River County islands were tropical or subtropical in origin (R.G. Gilmore, pers. comm.). This is a higher percentage of tropicals than was found in Brevard County but lower than that in Martin County. Tropicals can enter the lagoon through

either Ft. Pierce Inlet to the south of the county or Sebastian Inlet at the northern border of the county. The large volume of water coming through Ft. Pierce Inlet reaches the southern Indian River County islands within two tidal cycles while the majority of the incoming water from Sebastian Inlet flows south into Indian River County (Brown-Peterson and Eames, in press). As might be expected, most of the tropical and subtropical fishes captured were found at islands in the extreme northern or southern portion of the county.

The most frequently observed bird species included brown pelican, osprey, great blue heron, little blue heron, belted kingfisher and fish crow. Four species, magnificent frigate bird, hairy woodpecker, yellow-bellied sapsucker and savannah sparrow, were observed only in Indian River County. Indian River County had more island bird rookeries than any other county in the lagoon. Seven of the islands were important rookeries, supporting breeding populations of thousands of pelicans, herons and egrets. Five of these islands are within the Pelican Island National Wildlife Refuge, an area that has many additional rookeries not associated with spoil islands.

The floral diversity of Indian River County spoil islands was fairly high when compared to the collective whole. A total of 174 plant species, representing 66% of the total number of plant species collected on all spoil islands, were found on Indian River County islands. Some of the most commonly observed and most abundant species included ball moss, Australian pine, sea grape, perennial glasswort, sea purslane, gray nicker, Brazilian pepper, red, black and white mangroves, buttonwood, sea lavender, Florida privet, groundsel tree and sea oxeye. Twenty-six of the species observed (10%) were found only in Indian River County. The combination of the large number of islands in the county, several natural islands that have been spoiled on and the large area of several islands

probably account for both the high floral diversity and the high percentage of species found only in this county. For instance, eleven of these species (laurel oak, pigeon plum, cocoplum, torchwood, bay cedar, dahoon holly, Jamaica caper, limber caper, twinberry, saffron plum and inkberry) are native hammock hardwood trees, most common on large spoil islands or natural islands that have been spoiled on. All three of the most speciose families in the survey were well represented in Indian River County; 24 of the 31 species (77%) of asters (Asteraceae) 12 of the 21 species (57%) of bean (Fabaceae) and 13 of the 15 species (87%) of grasses (Poaceae) were documented on the islands.

Important marsh/wetland species of plants were well represented on Indian River County spoil islands. Mangroves were found on all islands and formed significant stands on some of them. Red, black and/or white mangroves and/or buttonwoods covered over 30% of the islands IR9B, IR20, IR22, IR23A, IR23B, IR24A, IR25A, IR25B, IR26A, IR26B, IR27A, IR27B, IR27C, IR28A, IR28B, IR28C, IR34, IR34A, IR37 and IR39. Cordgrass, found on 21 of the islands, was more common in Indian River County than in any other county except Martin County. Finally, Indian River county had more islands with marsh areas containing glasswort, saltwort and mangroves (13 islands total) than any of the other counties.

The exotics Australian pine and Brazilian pepper were found on all spoil islands in Indian River County. However, some of the natural islands such as IR23C and IR27A had lower abundances of both exotics, and correspondingly higher abundances of native vegetation, than most other islands in the county and in the lagoon. Other islands that showed a low abundance of Brazilian peppers were islands dominated by mangroves, such as IR22, IR23A, IR25B, IR26A, IR27B, IR27C, IR28A, IR28B and IR37. Both the natural

islands and the mangrove islands had a well established flora and further invasion by exotics seems unlikely. Several of the islands dominated by Brazilian pepper, however, such as IR26, IR28, IR35 and IR42, seemed in danger of being taken over by this invasive plant, which would result in local extinction of any native vegetation remaining on these islands. Islands dominated by Australian pine, such as IR5, IR6, IR11, IR32, IR36, IR38 and IR40 will resist colonization by native plants. However, islands with heavy Australian pine canopies could be used as recreation areas, bird nesting or loafing areas and would also be suitable for revegetation with native tropical hammock vegetation.

Pilot scale revegetation projects have already taken place on some Indian River Lagoon spoil islands. The earliest projects were done in Indian River County. Island IR38 was revegetated in September 1983 by the Florida Game and Freshwater Fish Commission (Fernald *et. al* 1985), using 300 plants representing 20 species of upland hammock trees. IR35 was revegetated in February 1989 with 600 plants representing 10 species as part of a Boy Scout eagle project. Four other islands (IR6, IR24B, IR32, and IR40) were revegetated by staff of the Bureau of Aquatic Preserves in October 1988 as a part of the spoil island study. Four hundred plants representing 22 different species of upland hammock species were planted under a canopy of Australian pines on each island. In 1989, the project was expanded to include islands in St. Lucie, Brevard, and Martin Counties, plus a second plot on IR32. Plant species that showed promise for high survival in 1988 were chosen again; substitutions were made for the remainder. The islands were planted with 400 plants representing 23 upland hammock species in October of 1989. Present staff efforts are focused on monitoring growth and survival of the plants for both the 1988 and 1989 projects. Survival of the plants has varied by island and by species, but at present,

establishment of small native tropical hammocks on several spoil islands looks promising. Many trees on island IR38, the earliest planting, have grown six meters or more in the six years since they have been planted. The establishment of native tropical hammocks on these islands will increase bird and wildlife utilization of the islands, provide excellent opportunities for education and research and increase the aesthetic value of the islands.

Two previous spoil island surveys have included some of the Indian River County spoil islands. Lewis and Lewis (1978) surveyed the plants on spoil islands and natural islands from Sebastian Inlet south to Wabasso but only reported data from two islands (IR18 and IR19). They reported only seven species from each island whereas the present study documented 17 species from IR18 and 21 species from IR19. The increase in species number is not unexpected in the 11 years between the two studies and represents natural succession and recruitment on the islands. Schreiber and Schreiber (1978) documented bird usage of the same islands in Indian River County and found that the major rookery islands in the present study, islands IR15-IR19, were also heavily used by breeding birds in 1977.

Indian River County (1980) surveyed 16 spoil islands in the county and made preliminary management recommendations regarding each island. The present study documented a greater number of both floral and faunal species on each of the islands and within the county. One of the major changes in terrestrial flora during the ten years between the two studies was on islands that had recently burned (1979) at the time of the first study. The grasses and asters found there in 1980 had, by 1989, been replaced by Australian pines and Brazilian peppers. Additionally, the common hop tree was found on the southern portion of IR43 by Indian River County (1980) while this species was not documented on any island in the present study. However, the most striking floral change

between the two studies was the dramatic increase in seagrasses, particularly around islands IR26, IR32, IR33, IR35, IR37, and IR38. These islands had small or no seagrass meadows in 1979 and now have extensive grassbeds. The differences in aquatic fauna found between the two studies can be attributed to the presence of more grassbeds in the present study. The major difference in the avian fauna is the establishment of IR38 as a rookery since the Indian River County (1980) survey.

Management Recommendations

Spoil islands in Indian River County can be divided into two basic groups, each centered around major population areas: north of Wabasso Causeway (Sebastian area) and south of the Wabasso Causeway (Winter Beach/Vero Beach area). Thus, islands in each group have been treated separately when assigning management designations (conservation, education, active and passive recreation). Table 2-2 lists all Indian River County spoil islands, their ownership and recommended classifications.

Table 2-2. Recommended management classifications of Indian River County Spoil Islands

Island Number	Ownership	Classification
IR1	State	Active Recreation
IR2	State	Passive Recreation
IR3	State	Conservation
IR4	State	Passive Recreation
IR5	State	Passive Recreation
IR6	State	Education/Passive Recreation
IR8	State	Conservation
IR9A	State	Active Recreation
IR9B	State	Passive Recreation
IR10	State	Passive Recreation
IR11	State	Passive Recreation
IR12	State	Passive Recreation

IR13	State	Passive Recreation
IR14	State	Passive Recreation
IR15	State	Conservation
IR16	State	Conservation
IR23	State	Active Recreation
IR18	State	Conservation
IR19	State	Conservation
IR20	Michael, Michael and Lier	Conservation
IR21	State	Conservation
IR22	State	Conservation
IR23A	Lost Tree Village Corp.	Passive Recreation
IR23B	Lost Tree Village Corp.	Conservation
IR23C	State	Conservation
IR24A	State	Conservation
IR24B	State	Conservation/Education
IR25A	State	Passive Recreation
IR25B	State	Conservation
IR26A	State	Active Recreation
IR26B	State	Conservation
IR26	State	Conservation
IR27A	USA	Conservation
IR27B	USA	Conservation
IR27C	USA	Conservation
IR28	Lost Tree Village Corp.	Active Recreation
IR28A	J.E. Tuerk	Conservation
IR28B	Lost Tree Village Corp.	Conservation
IR28C	Lost Tree Village Corp.	Conservation
IR29	Lost Tree Village Corp. & F.I.N.D.	Active Recreation
IR32	State	Conservation
IR33	State	Conservation
IR34	State	Passive Recreation
IR34A	State	Conservation
IR35	State	Conservation
IR36	State	Active Recreation/Education
IR37A	State	Passive Recreation
IR37	State	Conservation
IR38	State	Conservation
IR39	State	Conservation
IR40	State	Conservation/Education
IR41	State	Conservation
IR42	State	Passive Recreation
IR43	State	Passive Recreation

The northern group consists of 19 islands, seven of which have been designated for conservation, one for education, two for active recreation and the remaining nine for passive recreation. The northern group of islands appears to be more frequently and heavily used than the southern group. Five of the northern conservation islands (IR15-IR19) are within the Pelican Island National Wildlife Refuge and are important rookeries for colonial nesting birds such as pelicans, herons and egrets. The other two conservation islands (IR3 and IR8) are important nesting areas for great blue herons and other smaller, more solitary nesting water birds. It is recommended that human visitation to these seven islands be prohibited during the February to August breeding season. Human disturbance frequently results in abandonment of breeding colonies and human access should therefore be prohibited (Schreiber and Schreiber 1978). The two active recreation islands (IR1 and IR9A) have good deep water access and have open areas suitable for camping and limited construction, such as properly permitted docks, picnic facilities, lavatory facilities and barbecue pits. Island IR6 has been given a dual education/passive recreation designation. Although this island has historically been heavily used for recreation and has good deep water access, it has a diverse floral and faunal component and a portion of the island has been replanted with native vegetation. Thus, educational programs are encouraged to make full use of the island, while recreational usage should be strictly limited to day use of the beach areas only. Overnight camping, an approved activity on all other passive recreation islands, should not be allowed on IR6 due to the recently planted native vegetation.

The southern group of islands consists of 39 islands and includes some of the largest islands in the survey. Of the 39 islands, four were designated for active recreation, 6 for

passive recreation, three for education and the remaining 23 for conservation. Conservation islands IR26, IR33 and IR38 are important rookeries for great blue herons (IR26) and brown pelicans and ibis (IR33 and IR38) and all human visitation should be prohibited from these islands during the February to August breeding season. The large islands IR21, IR22, IR24A, IR27A, IR32, IR35, IR37, IR39 and IR41 were designated for conservation based on the presence of diverse or unusual native plant flora, threatened or endangered species, and the lack of beach and/or deep water access. All these islands, with the exception of IR32, are densely covered with vegetation and do not show evidence of recreational use. Although IR32 has occasionally been used for recreation, the lack of deep water access and presence of recently planted native vegetation are important factors in prohibiting any further recreational use of this island. The remaining conservation islands are all small, have a heavy mangrove fringe, contain no open areas for recreation, plus deep water and/or open beach access is limited or nonexistent. Two of the islands designated for education, IR24B and IR40, have also been designated for conservation. These islands have been replanted with native vegetation, have a diverse floral and faunal community along with productive seagrass beds and have large enough open areas for supervised educational activities. However, because of the limited deep water access and the sensitive floral communities, unsupervised recreational use of these islands should be prohibited and construction of docking or picnicking facilities to support educational use on these islands should not be permitted. The remaining education island, IR36, has also been designated for active recreation, although educational use should take precedence over recreation in the event of user conflicts. This island has good deep water and open beach access, and although it is small, construction of picnic facilities, fire places and properly permitted docks

would be appropriate. Two of the islands designated for active recreation in the southern portion of Indian River County, IR25 and IR28, already have limited development of recreational facilities in the form of docks, picnic pavilions and barbecue grills. Further development of IR25 is not recommended due to possible encroachment on a sensitive mangrove marsh area. However, expansion of the existing recreational facilities on IR28, known as the Joe H. Earman Park, would be appropriate after the proper permits have been acquired. Both IR28 and IR29 have extensive areas of Brazilian pepper that could be removed to provide additional areas for recreational facilities. IR29, although currently designated for active recreation, has not been developed. The northern tip of this island could be used for passive recreation activities until this island is developed for active recreation, providing proper permission is obtained from the owner, Lost Tree Village Corporation. The southern portion of IR29 is owned by the Florida Inland Navigation District, and is the only island in Indian River County that is large enough to accommodate additional spoil material should it be necessary to dredge the adjacent portion of the Atlantic Intracoastal Waterway. Thus, any recreational development on the southern portion of IR29 should take into account the possibility of future spoil deposition in that area.

These initial management recommendations can be expanded upon in the future as actual management of the islands becomes a reality. The computer generated vegetation maps provide an excellent reference source of information on the spoil islands that will become increasingly important as future vegetation surveys are made. Future management recommendations and decisions will depend in a large part on historical vegetation changes on the islands. Limited educational and/or recreational development of selected islands

could also be considered as spoil island management proceeds. For instance, developing docks and/or interpretive trails on the designated education islands would provide greater access and educational opportunities to the public. The islands designated for active recreation often have dense Brazilian pepper stands in the central portion which could be cleared and replanted with native vegetation or used as picnic or camping areas. Strategies such as these would both enhance the spoil islands and provide greater public access to relatively underutilized state lands.

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ST. LUCIE COUNTY
SPOIL ISLAND MANAGEMENT PLAN

Tom Gardner
Executive Director
Florida Department of Natural Resources

This plan was prepared by
Nancy Brown-Peterson and Ross W. Eames
The Bureau of Aquatic Preserves
Division of State Lands

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the Florida Inland Navigation District**

EXECUTIVE SUMMARY

The St. Lucie County Spoil Island Management Plan is one of four parts of a comprehensive Indian River Lagoon Spoil Island Management Plan. The thirty-four islands included in this portion of the plan occur between the Indian River County line and the area just south of the nuclear power plant on Hutchinson Island. All of the islands in St. Lucie county are owned by the state of Florida. The objectives of the St. Lucie County Spoil Island Management Plan are to provide current biological data and recommend appropriate management classifications for all the spoil islands in St. Lucie County.

A total of 167 species of plants and 129 species of animals were collected or observed on the thirty-four islands. Many of the islands have extensive seagrass meadows. Floral and faunal diversity is high, but lower than that of Indian River County islands. Twelve species of animals and twenty-six species of plants were found exclusively on St. Lucie County islands. The invasive exotics Brazilian pepper and Australian pine were found on all islands and dominated the vegetation on 53% of the islands. No St. Lucie County spoil islands are used as rookeries by colonial nesting water birds although six islands are important nesting sites for great blue herons.

St. Lucie County spoil islands were divided into four management classifications based on physical structure, ecological importance and historical use. St. Lucie County islands are more heavily used by the public than the islands in any other county. Four islands were designated for active recreation, fourteen for passive recreation, two for education and fourteen for conservation.

ACKNOWLEDGEMENTS

This management plan could not have been completed without the help of a number of people. We would like to thank Kellie Pendoley, David Rydene, David Singewald and Mary Crawford Dominic for their many hours of help in the field during the spoil island survey. Jane Brooks spent many hours identifying the majority of the plants collected during the survey; Dr. Roy Woodbury and Dr. Jim Haeger identified the remainder of the plants. The invertebrates we collected were identified by Paul Mikkelsen and Kalani Cairns. Dr. R. Grant Gilmore provided valuable insights into the fish collections. A special thanks to Paul Mikkelsen for setting up all the computers and writing all the computer programs for this project. Without his expertise this management plan would not have been a reality. David Rydene provided valuable assistance in producing the vegetation maps and Charissa Baker drew the cover illustration and Figure 3-1. Paul Mikkelsen and David Rydene reviewed and made helpful comments on the manuscript. Finally, a thanks to all the staff of the Indian River Lagoon Aquatic Preserves for their many helpful comments and suggestions during the course of this project. This project was funded in its entirety by the Florida Inland Navigation District through contracts with the Florida Department of Natural Resources, Bureau of Aquatic Preserves.

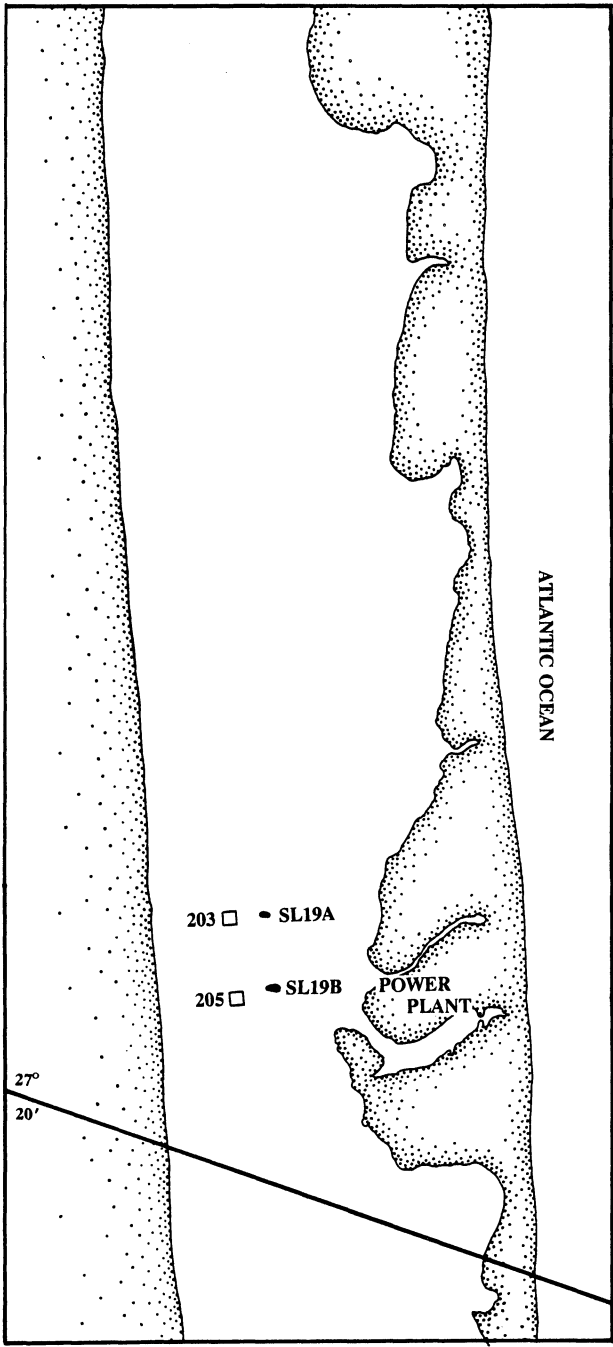
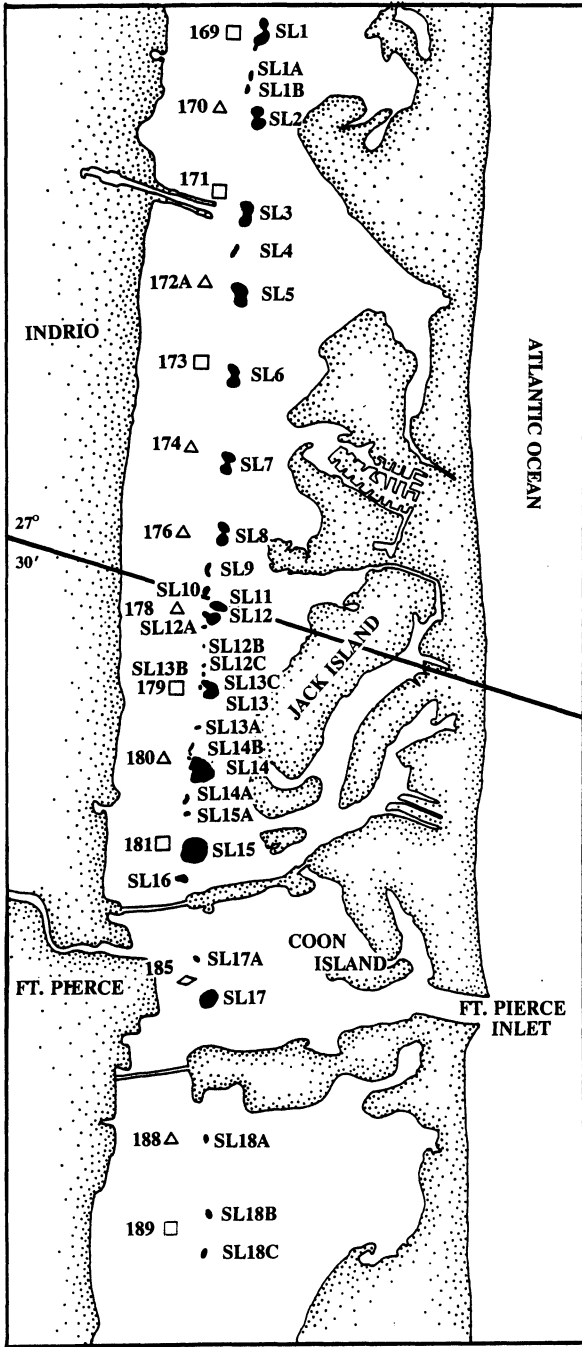
INTRODUCTION

The St. Lucie County Spoil Island Management Plan is one of four parts of a comprehensive Indian River Lagoon Spoil Island Management Plan. The purpose of the Spoil Island Management Plan is to provide both current, accurate biological data on all spoil islands in the Indian River Lagoon and to recommend an appropriate use for each island based on the summarized biological information. Local city and county governments will be able to set management guidelines for spoil islands in their jurisdictions using the information provided in the plan. Additionally, these guidelines will help the Florida Marine Patrol, staff of the Indian River Lagoon Aquatic Preserves and State Lands enforcement personnel more effectively manage public use of the spoil islands.

General Information on St. Lucie County Spoil Islands

The St. Lucie County section of the management plan encompasses spoil islands in the 35 km portion of the Atlantic Intracoastal Waterway within St. Lucie County. There are a total of 34 spoil islands in St. Lucie County, with 30 islands occurring in the northern portion of the county between the Indian River county line and the southern limits of the City of Ft. Pierce (Fig. 3-1). The twenty-seven northern islands are in the Vero Beach to Ft. Pierce Indian River Lagoon Aquatic Preserve, while the three southernmost islands are in the Jensen Beach to Jupiter Inlet Aquatic Preserve. Island SL16 and many of the small islands such as SL1A, SL1B, SL12A, SL12B, SL12C, SL13A, SL13C, SL14A, SL14B, SL15A, SL18A, SL18B and SL18C were present prior to 1951. The large islands north of the Ft. Pierce City limits were created when the Atlantic Intracoastal Waterway was dredged to 12 feet between October of 1958 and June 1960 while the remaining islands

Figure 3-1. St. Lucie County spoil islands



were created between April and October of 1961 (U.S. Army Corps of Engineers, pers. comm.). All of the islands in St. Lucie County are owned by the State of the Florida. All the spoil islands are encumbered by an easement to the Florida Inland Navigation District to use the islands for the disposal of dredge material derived from maintenance of the Atlantic Intracoastal waterway. The 34 islands in St. Lucie County were surveyed between October 6, 1987 and January 24, 1989. Additionally, 27 of the islands were cleaned between February and May 1988 as part of the spoil island clean-up program initiated by the Florida Inland Navigation District.

Management Authority

The primary management authorities available for implementing management directives affecting St. Lucie County spoil islands are found in Chapters 253 and 258, Florida Statutes (F.S.). Chapter 253 concerns all state-owned submerged lands while Chapter 258 is specifically concerned with aquatic preserves. Since all but four of the St. Lucie County spoil islands are in either the Vero Beach to Ft. Pierce or the Jensen Beach to Jupiter Inlet Aquatic Preserve, both chapters are applicable. These authorities clearly establish the proprietary management role of the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund, who are variously referred to as the "Trustees" or the "Board". Furthermore, all management responsibilities assigned to the Trustees by this plan may be fulfilled directly by the Governor and Cabinet or indirectly via staff or agents of the Trustees, pursuant to delegations of authority, management agreements, or other legal mechanisms.

Chapters 18-20 and 18-21, Florida Administrative Code (F.A.C.), are two administrative rules directly applicable to the DNR's/Trustee's actions regarding allowable uses of submerged lands in general (18-21) and both aquatic preserves (18-20) and spoil islands (18-21.012) in particular. In addition, the Conceptual State Lands Management Plan, adopted on March 17, 1981 by the Trustees, contains specific policies concerning spoil islands. Where these documents address the use of spoil islands, development is prohibited unless a greater public good can be demonstrated, and such development, with few exceptions, is limited to that serving water-dependent and recreational needs.

The Indian River Lagoon Aquatic Preserve Management Plan (Vero Beach to Fort Pierce and Jensen Beach to Jupiter Inlet), as adopted by the Trustees on January 22, 1985, contains program policy directives (Chapter III) that also affect the use and management of spoil islands. These directives include:

- 1) "managing all submerged lands within the aquatic preserve to ensure the maintenance of essentially natural conditions to ensure the propagation of fish and wildlife, and public recreation opportunities",
- 2) "developing a resource inventory and map natural habitat types within the aquatic preserve, with an emphasis on those habitat types utilized by threatened and/or endangered species",
- 3) "protecting and, where possible, enhancing threatened and endangered species habitat within the aquatic preserve",
- 4) "managing state-owned spoil islands within the aquatic preserve as bird rookeries and wildlife habitat areas", and

5) "encouraging public utilization of the aquatic preserve, consistent with the continued maintenance of its natural values and functions".

Thus, management of spoil islands as sovereignty submerged lands is mandated by the Trustees. This plan accomplishes the management directives as outlined above by:

- 1) providing a resource inventory and maps of vegetation and other habitats on the islands,
- 2) proposing guidelines for public use of the spoil islands that are consistent with their maintenance as essentially natural areas,
- 3) assigning a management designation to each of the islands that seeks to balance the following:
 - a) the island's value as wildlife habitat, including its function as a bird rookery,
 - b) the directive to maintain the islands in their natural state, and
 - c) the public good derived from permitting limited development on some islands for recreational purposes.

The Florida Inland Navigation District, which has a perpetual easement on many state-owned spoil islands, has consented to the use of the islands as outlined in this plan. The F.I.N.D. reserves the right to review and comment on any activities involved in implementing this plan.

Management Objectives

The Indian River Lagoon Aquatic Preserve Management Plan (Vero Beach to Fort Pierce and Jensen Beach to Jupiter Inlet), as adopted by the Trustees on January 22, 1985,

contains clear resource management objectives (Chapter V) that direct ongoing activities in the preserve. As stated above, all but four of the St. Lucie County spoil islands are located within the boundaries of either the Vero Beach to Fort Pierce or the Jensen Beach to Jupiter Inlet Aquatic Preserve, so these objectives apply to management activities on the islands as well. These objectives include:

- 1) becoming familiar with the plant and animal species and communities, and their locations,
- 2) monitoring communities for changes,
- 3) identifying areas and communities in need of restoration, and accomplishing that restoration,
- 4) coordinating efforts with other researchers, and
- 5) protecting communities from the impacts of human use.

This management plan has accomplished the first objective by providing a resource inventory and maps of vegetation and other habitats on the islands. The remaining objectives are tasks that must be part of the ongoing responsibilities of personnel assigned to implement the plan. The second objective will be accomplished by undertaking a general island inspection program that will serve to monitor communities for changes that have occurred since the first resource inventory was conducted. The third objective, community restoration, has already been started. A pilot project to restore native hammock communities on certain spoil islands was undertaken in 1988 and again in 1989. Current efforts are focusing on monitoring the areas to determine the feasibility of undertaking large scale restorations. The fourth objective, coordinating research efforts, will be accomplished by publicizing the results of completed research through publishing and public

speaking, continuing to conduct appropriate research on the islands, becoming familiar with related research both in the Indian River Lagoon and in similar estuaries, and promoting the use of the spoil islands for research by qualified persons. The fifth objective, community protection, is perhaps the most important of these goals if human use of these islands is to continue. This goal will be achieved by identifying sources of adverse human impact through the inspection program, and eliminating or minimizing them by:

- 1) notifying appropriate law enforcement officials of violations,
- 2) undertaking an information program to educate the general public about the ecology and proper use of the islands,
- 4) enlist public assistance, wherever possible, in litter control and reporting violations, and
- 3) promoting the use of management agreements whereby local government agencies and civic groups may "adopt an island" and assume responsibility for monitoring the island and implementing approved plans for its use.

Survey Methods

All of the measurements in the management plan are expressed in metric units. As an aid in converting metric units into more familiar English equivalents the following conversion table has been provided.

Metric Conversion Table

1 hectare (ha) = 2.49 acres

1 kilometer (km) = 0.62 miles

1 meter (m) = 3.25 feet

1 centimeter (cm) = 0.39 inches

The methods used for the biological survey of the spoil islands were identical for all the islands surveyed in the Indian River Lagoon to provide consistency to the data base. Each island was visited only once during the survey; thus, strong seasonal components are apparent in the flora and fauna listed for some of the islands due to the breeding seasons of birds and fishes and the flowering seasons of plants. However, the species lists included in the management plan do provide a complete list of all flora and fauna observed on each island during the day of the survey. The date that each island was surveyed is noted in the accompanying island description.

All the birds visible on an island were counted and identified to species prior to disembarking on the island. In addition, any birds noticed while working on the island were also identified. Nests or evidence of bird nests were recorded although it was difficult to ascertain which species actually used the nests except during the breeding season. The number of birds and bird nests were estimated on rookery islands that contained greater than 100 pairs of breeding birds. Any reptiles and mammals observed while on the islands were identified and recorded.

Ground truthing and on-site maps were made of each island to aid in producing

vegetation maps and to get information for percentage of plant cover on each island. One north-south and one east-west transect line was laid out on each island and all plants within 1 cm and directly overhead of the line were recorded at each 10 m interval along the line. In addition, the areas of the island not on the transect lines were thoroughly searched for plant species. Species occurring on the island but not on the transect line were noted for inclusion in the overall species list of the island. Unknown species or species not previously recorded during the spoil island survey were pressed, identified and mounted for inclusion in the spoil island herbarium collection. Vegetation maps of each island were produced using ARC/INFO GIS mapping software with 1:2400 aerial photographs of the islands and the information obtained during ground truthing.

Each end of the two terrestrial transects was extended an additional 30 m into the water in order to determine submerged bottom contours and seagrass type, if any; records were made at each 10 m interval along the transect. This information along with aerial photographs was used to determine the extent of the seagrass beds around each island in order to determine boating accessibility. One 20 m long seine haul using a small net (4 m x 2 m with 3.2 mm mesh) was taken at each of the four locations around the perimeter of the island. All the fishes and invertebrates collected were identified to the lowest taxonomic level possible. Each species was assigned to one of four abundance categories: 1) rare, less than 5 individuals; 2) occasional, 5-20 individuals; 3) common, 21-50 individuals; and 4) abundant, greater than 50 individuals. Representative samples of the less common fish species in the survey were preserved in 10% formalin and later transferred to 70% isopropanol for confirmation of identification. The following references were used to identify species found on spoil islands:

- Plants: Wunderlin (1982), Bell and Taylor (1982), Long and Lakela (1971), Stevenson (1969) and Radford *et. al* (1968).
- Invertebrates: Barnes (1980).
- Fishes: Robins *et. al* (1980), Robins *et. al* (1986), Hoese and Moore (1977) and Bohlke and Chaplin (1968).
- Reptiles: Behler and King (1979).
- Birds: Farrand (1988) and Robbins *et. al* (1966).
- Mammals: Whitaker (1980).

Nomenclature follows the first reference listed for each category.

Criteria for Island Usage Classification

Spoil islands were assigned to one of three general usage categories based on the results of the biological survey: conservation, education, or recreation. Recreation islands were further subdivided into two categories: passive recreation and active recreation. Islands designated for passive recreation should contain no structures but use of the islands for picnics, sunbathing and primitive overnight camping would be permitted. Islands designated for active recreation could support the development of docks, picnic shelters, brick fireplaces or barbecue grills, and perhaps sanitary facilities.

Criteria for classification as a conservation island include the presence of extensive seagrass beds, shallow water surrounding the island with no deep water access points, heavy mangrove fringe and little or no open beach access, breeding bird populations, rare or threatened plant species, a high percentage of native plants and high species diversity. Some conservation islands with high soil humus quality (greater than 10 cm) were also

identified as potential sites for revegetation with native tropical hammock plants. Public use of conservation islands for recreational purposes should be discouraged although occasional use for bird watching or nature study by nature or conservation oriented groups or individuals would be appropriate, provided these activities are conducted outside of the breeding season.

Criteria for classification as an education island include historical use of the island for education, one or more deep water access points with open beaches, seagrass beds surrounding at least part of the island and containing high aquatic diversity and a high plant species diversity including a healthy mangrove community and good representation of native plants. Furthermore, education islands should not have breeding bird populations. School children, scout troops and other groups desiring to learn more about the environment would be encouraged to visit islands set aside for education purposes. In the future these islands might be developed into small nature areas with interpretive trails.

Criteria for passive and active recreation islands are similar. Islands were classified for recreation if they had one or more deep water access points with open sand beaches, historical human usage, small or nonexistent seagrass beds, low species diversity, no rare or threatened species and no breeding bird populations. Passive recreation islands are small islands or densely vegetated islands that could not support the development of structures. Active recreation islands are larger islands with open areas that could support construction of permanent facilities. The general public should be encouraged to use the islands designated for recreation for picnicking, sunbathing, swimming and primitive overnight camping.

RESOURCE INVENTORY

This section of the management plan comprises all the biological information gathered during the spoil island survey. Table 3-1 presents a complete list of all the flora and fauna collected during the spoil island survey. Abundance information is presented for those species found in St. Lucie County. Vegetation maps and physical and biological descriptions of each island are included along with recommendations for the best use for each island. For a more detailed review of the management recommendations, see the discussion section of the plan.

The symbols for vegetation type on the maps are consistent throughout the entire management plan. Species that commonly occur together were represented by one symbol for ease of interpretation. For instance, the symbol for mangroves includes red, black and white mangroves as well as buttonwood; these species are commonly intermixed, making them difficult to distinguish on a small scale map. The symbol for marsh represents saltwort, perennial glasswort, white and black mangrove marsh areas. The symbol for cordgrass represents both smooth cordgrass and marshhay cordgrass. Although Brazilian pepper often occurs under a canopy of Australian pine, areas such as these were coded with the Australian pine symbol when it was the dominant plant species. Sections of the maps showing Brazilian pepper usually indicate a dense, monospecific stand of that species.

Table 3-1. Species list of all plants and animals collected or observed on spoil islands from October 1987 - January 1989 with species found on St. Lucie County spoil islands indicated. "Undet." means the species was not determined. Plant Key: numbers are percent relative frequency of occurrence, X=present on island but not on transect line. Invertebrate/Fish Key: R=rare (1-4 individuals), O=occasional (5-20 individuals), C=common (21-50 individuals), A=abundant (>50 individuals). Bird/Reptile/Mammal Key: number of individuals seen is indicated.

		ST. LUCIE COUNTY ISLAND NUMBER																							
		1	1A	1B	2	3	4	5	6	7	8	9	10	11	12	12A	12B	12C	13	13A	13B	13C	14	14A	14B
FUNGI																									
1.	Bracket fungus undet.	X				X		X	X					X									X		
	Bracket fungus																								
2.	Mushrooms							X		X															
	Mushrooms																								
PLANTAE																									
CHLOROPHYTA																									
SIPHONALES																									
CAULERPACEAE																									
3.	<i>Caulerpa</i> spp.																								
	<i>Caulerpa</i> algae																								
RHODOPHYTA																									
FLORIDEOPHYCIDAEE																									
GIGARTINALES																									
GRACILARIAACEAE																									
4.	<i>Gracilaria</i> spp.																								
	Drift algae																								
PTERIDOPHYTA																									
POLYPODIACEAE																									
5.	<i>Phlebodium aureum</i>																								
	Golden polypody																								
6.	<i>Polypodium polypodioides</i>																								
	Resurrection fern																								
DAVALLIACEAE																									
7.	<i>Nephrolepis cordifolia</i>																								
	Boston fern																								
PTERIDACEAE																									
8.	<i>Acrostichum danaeifolium</i>																								
	Giant leather fern																								
9.	<i>Pteris vittata</i>																								
	Ladder brake																								
GYMNOSPERMAE																									
CONIFERAE																									
ARAUCARIACEAE																									
10.	<i>Araucaria excelsa</i>										X														
	Norfolk Island pine																								
CUPRESSACEAE																									
11.	<i>Juniperus silicicola</i>																								
	Southern red cedar																								
ANGIOSPERMAE																									
MONOCOTYLEDONAE																									
TYPHACEAE																									
12.	<i>Typha latifolia</i>																								
	Common cattail																								
CYMODOCEACEAE																									
13.	<i>Halodule wrightii</i>	X	X	X	X	X	X	X		X		X	X	X	X	X	X		X			X	X	X	X
	Shoal grass																								
14.	<i>Syringodium filiforme</i>						X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X
	Manatee grass																								
HYDROCHARITACEAE																									
15.	<i>Halophila johnsonii</i>																								
	Johnson's sea grass																								
16.	<i>Thalassia testudinum</i>		X	X			X			X			X	X											X
	Turtle grass																								
POACEAE																									
17.	Grasses undet.				X		X		X	X	1			X					X	X	X		X	X	
	Unidentified grasses																								
18.	<i>Andropogon glomeratus</i>																								
	Bushy bluestem																								
19.	<i>Andropogon virginicus</i>																								
	Broom sedge																								
20.	<i>Cenchrus incertus</i>							X	X										X						
	Coast sandspur																								
21.	<i>Chloris</i> spp.				X	X					X			X											
	Finger grass																								
22.	<i>Cortaderia selloana</i>										X														
	Pampas grass																								
23.	<i>Dactyloctenium aegyptium</i>				X						X														
	Crow's foot grass																								
24.	<i>Distichlis spicata</i>	X	X		1	2	X	X	2		1			X	X				5	X		X		X	
	Saltgrass																								
25.	<i>Panicum maximum</i>																								
	Guinea grass																								
26.	<i>Paspalum</i> spp.	X				X		1	X																
	Bahia grass																								
27.	<i>Rhynchelytrum repens</i>																								
	Natal grass																								
28.	<i>Spartina alterniflora</i>				X									X	X								3	X	
	Saltmarsh cordgrass																								
29.	<i>Spartina patens</i>	X	X					X			X														
	Saltmeadow cordgrass																								

	ST. LUCIE COUNTY ISLAND NUMBER									
	15A	15	16	17A	17	18A	18B	18C	19A	19B
	---	---	---	---	---	---	---	---	---	---
1.	X	X							X	
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										
13.	X	X	X		X		X	X	X	X
14.	X	X	X		X	X	X		X	X
15.										
16.		X	X							
17.	7								X	X
18.										
19.	X									
20.	X				X			X		
21.										
22.										
23.					X	10		X		
24.					2	10	3	X	15	X
25.										
26.	3									
27.										
28.			X							
29.						X	X			
30.										
31.										
32.	X	X			X					
33.										
34.	3									
35.										
36.										

3 - 16

	ST. LUCIE COUNTY ISLAND NUMBER									
	15A	15	16	17A	17	18A	18B	18C	19A	19B
	10	9		X	2	X	18	X		X
37.										
38.										
39.										
40.										
41.										
42.	X	X			2					
43.										
44.		X								
45.										
46.										
47.										
48.	X									
49.		X								
50.	X									
51.										
52.										
53.										
54.										
55.	X									
56.	X									
57.										
58.										
59.	3	29	6	36	59	25	18	42	15	32
60.					2				8	
61.										
62.										
63.										
64.										
65.										
66.										
67.	7									
68.					X					
69.										
70.										
71.		X	X		X			5		
72.										
73.	3	1	X		X		X			9
74.										
75.										

		ST. LUCIE COUNTY ISLAND NUMBER																							
		1	1A	1B	2	3	4	5	6	7	8	9	10	11	12	12A	12B	12C	13	13A	13B	13C	14	14A	14B
76.	<i>Rumex verticillatus</i> Swamp dock																								
CHENOPODIACEAE																									
77.	<i>Atriplex pentandra</i> Sand atriplex																								
78.	<i>Chenopodium album</i> Lambquarter																								
79.	<i>Chenopodium ambrosioides</i> Mexican tea																								
80.	<i>Salicornia virginica</i> Perennial glasswort	X	X		X	1	X		X		X				X	X					X	X			X
81.	<i>Suaeda linearis</i> Sea blite										X				X									2	X
AMARANTHACEAE																									
82.	<i>Blutaparon vermiculare</i> Sapphire						X				1							X			X			X	
83.	<i>Iresine diffusa</i> Bloodleaf																								
NYCTAGINACEAE																									
84.	<i>Boerhavia diffusa</i> Red spiderling										X			1											
85.	<i>Guapira discolor</i> Blolly																								
BATAACEAE																									
86.	<i>Batis maritima</i> Saltwort				1	X				X											5				
PHYTOLACCACEAE																									
87.	<i>Phytolacca americana</i> Pokeberry				X						X				X										
88.	<i>Rivina humilis</i> Rouge plant	1				1								X	X										
AIZOACEAE																									
89.	<i>Senivium portulacastrum</i> Sea purslane	X	5		X	X	X	X	2	X	X	X			X	X	X		X		X		X		
PORTULACACEAE																									
90.	<i>Portulaca oleracea</i> Purslane														X										X
91.	<i>Portulaca pilosa</i> Pink purslane																							2	
CARYOPHYLLACEAE																									
92.	<i>Stellaria media</i> Common chickweed				X																				
93.	<i>Stipulicida setacea</i> Stipulicida																								
MENISPERMACEAE																									
94.	<i>Cissampelos pareira</i> Moonseed																								
BRASSICACEAE																									
95.	<i>Cakile lanceolata</i> Sea rocket																								
96.	<i>Lepidium virginicum</i> Poor man's pepper	X			X			X			X			X											X
CRASSULACEAE																									
97.	<i>Kalanchoe pinnata</i> Life plant																							8	
98.	<i>Kalanchoe tubiflora</i> Chandelier plant				X	X		2			X											X	2		
CHRYSOBALANACEAE																									
99.	<i>Chrysobalanus icaco</i> Coco-plum																								
FABACEAE																									
100.	<i>Abrus precatorius</i> Crab's eye																								
101.	<i>Canavalia rosea</i> Seaside bean							X	X		X														
102.	<i>Cassia</i> spp. Cassia														X										
103.	<i>Cassia chamaecrista</i> Partridge pea																								
104.	<i>Cassia columboides</i> Cassia																								
105.	<i>Caesalpinia bonduc</i> Gray nicker	1			X				X		X		2	X	X				X						X
106.	<i>Cassia marilandica</i> Wild senna										X			X											
107.	<i>Crotalaria pallida</i> Rattlebox																								
108.	<i>Crotalaria rotundifolia</i> Rabbit bells																								
109.	<i>Dalbergia ecastophyllum</i> Coin vine	1			2	X		6	X	X	X		2	X											
110.	<i>Desmanthus virgatus</i> Desmanthus										4														
111.	<i>Desmodium</i> spp. Tick trefoil																								
112.	<i>Desmodium triflorum</i> Beggars tick																								
113.	<i>Erythrina herbacea</i> Coral bean														X										
114.	<i>Indigofera spicata</i> Short indigofera																								
115.	<i>Indigofera suffruticosa</i> Indigofera					1																			
116.	<i>Parkinsonia aculeata</i> Mexican palo verde																								
117.	<i>Ricinus communis</i> Castor bean																								

	ST. LUCIE COUNTY ISLAND NUMBER									
	15A	15	16	17A	17	18A	18B	18C	19A	19B
	==	==	==	==	==	==	==	==	==	==
76.										
77.	X									
78.			3						8	
79.										
80.	X									
81.			X					X		
82.										
83.					X					
84.										
85.		1								
86.					2					
87.			3							
88.		1			X					
89.		X			X	10	3	11	X	9
90.										
91.										
92.										
93.										
94.										
95.										
96.										
97.										
98.										
99.										
100.										
101.					X			X		X
102.										
103.										
104.										
105.		X			X					
106.										
107.										
108.										
109.	X	1								
110.		2	X							
111.	X									
112.	X									
113.		X								
114.	7	2								
115.	X									
116.										
117.										

	1	1A	1B	2	3	4	5	6	7	8	9	10	11	12	12A	12B	12C	13	13A	13B	13C	14	14A	14B
118. <i>Sophora tomentosa</i> Necklace pod							X		X							X		X						
119. <i>Vicia acutifolia</i> Vicia																								
120. <i>Vigna luteola</i> Cow pea														X										
GERANIACEAE																								
121. <i>Geranium spp.</i> Geranium																								
122. <i>Geranium carolinianum</i> Crane's bill								X																
OXALIDACEAE																								
123. <i>Oxalis spp.</i> Wood sorrel				X																				
RUTACEAE																								
124. <i>Amyris elemifera</i> Torchwood																								
125. <i>Zanthoxylum clava-hercul</i> Hercules club	X				X		X		X					X				X						
126. <i>Zanthoxylum fagara</i> Wild lime														X										
SURIANACEAE																								
127. <i>Suriana maritima</i> Bay cedar																								
BURSERACEAE																								
128. <i>Bursera simaruba</i> Gumbo limbo				1			X	2					X					X				1		
EUPHORBIACEAE																								
129. <i>Chamaesyce spp.</i> Milk Spurge	X			X			X	X		X			X										X	
130. <i>Chamaesyce spp.</i> Milk Spurge									X															
131. <i>Chamaesyce hirta</i> Hairy spurge																								
132. <i>Chamaesyce hyasopifolia</i> Eye bane																								
133. <i>Cnidoscolus stimulosus</i> Tread softly										X								X						
134. <i>Croton glandulosus</i> Glandular croton							X																	
135. <i>Croton punctatus</i> Beach tea																								
136. <i>Euphorbia spp.</i> Jacob's ladder																								X
137. <i>Jatropha curcas</i> Physic nut										X														X
138. <i>Phyllanthus abnormis</i> Phyllanthus																								
139. <i>Poinsettia cyathophora</i> Painted leaf					X		X			1			1											
EMPETRACEAE																								
140. <i>Ceratiola ericoides</i> Rosemary																								
ANACARDIACEAE																								
141. <i>Rhus copallina</i> Winged sumac																								
142. <i>Schinus terebinthifolius</i> Brazilian pepper	23	10	25	29	34	40	22	29	48	23	13	12	21	28	13	16	28	42	24	31	21	40	15	26
AQUIFOLIACEAE																								
143. <i>Ilex cassine</i> Dahoon holly																								
SAPINDACEAE																								
144. <i>Dodonaea viscosa</i> Varnish leaf	1			3	X		14	5	2	6			7	X				2						
145. <i>Excoecia paniculata</i> Inkwood																								
RHAMNACEAE																								
146. <i>Krugiodendron ferreum</i> Black ironwood																								
VITACEAE																								
147. <i>Ampelopsis arborea</i> Pepper vine										1														
148. <i>Parthenocissus quinquefo</i> Virginia creeper														X										
149. <i>Vitis aestivalis</i> Summer grape																								
150. <i>Vitis rotundifolia</i> Muscadine grape																								
CAPPARACEAE																								
151. <i>Capparis cynophallophora</i> Jamaica caper tree																								
152. <i>Capparis flexuosa</i> Limber caper																								
MALVACEAE																								
153. <i>Hibiscus spp.</i> Hibiscus (cultivated)					X																		2	
154. <i>Hibiscus tiliaceus</i> Mahoe																								
155. <i>Kosteletzkya spp.</i> Mallow																								
156. <i>Kosteletzkya virginica</i> Saltmarsh mallow																								
157. <i>Mahoeastrum corchorifoliu</i> False mallow																								
158. <i>Sida acuta</i> Broomweed																								

	ST. LUCIE COUNTY ISLAND NUMBER									
	15A	15	16	17A	17	18A	18B	18C	19A	19B
	==	==	==	==	==	==	==	==	==	==
118.										
119.										
120.				X						
121.										
122.										
123.										
124.										
125.	X	1			X					
126.										
127.										
128.		X			X					
129.						X				
130.										
131.	X									
132.	X									
133.										
134.										
135.										
136.										
137.									X	
138.										
139.					X					
140.	3									
141.										
142.	26	35	17	29	17	15	18	16		9
143.										
144.					X					
145.										
146.										
147.										
148.	X	1								
149.										
150.			X							
151.										
152.										
153.										
154.										
155.										
156.										
157.	X									
158.										

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	ST. LUCIE COUNTY ISLAND NUMBER									
	15A	15	16	17A	17	18A	18B	18C	19A	19B
	==	==	==	==	==	==	==	==	==	==
159.										
160.										
161.					X					
162.										
163.	X									
164.		2								
165.										
166.										
167.										
168.										
169.	10	6	36		X					
170.		X	3							
171.	X	3	3	7	X	X	X			
172.		X								
173.		X								
174.										
175.										
176.										X
177.										
178.										
179.										
180.										
181.										
182.		1								
183.										
184.	X	X			4					
185.										
186.										
187.										
188.										
189.	X	1		7	X	5	3			X
190.		2								
191.										
192.										
193.		X								
194.										
195.										
196.										
197.										

		ST. LUCIE COUNTY ISLAND NUMBER																							
		1	1A	1B	2	3	4	5	6	7	8	9	10	11	12	12A	12B	12C	13	13A	13B	13C	14	14A	14B
		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
CONVOLVUACEAE																									
198.	<i>Ipomoea</i> spp. Morning glory				2				X		1			2											
199.	<i>Ipomoea pandurata</i> Wild potato vine																								
200.	<i>Ipomoea pes-caprae</i> Railroad vine							X	X										X						
BORAGINACEAE																									
201.	<i>Heliotropium angiospermum</i> Scorpion tail	X			X			X	X		X		X	X					X		X			X	
202.	<i>Heliotropium curvassavie</i> Seaside heliotrope										X														
VERBENACEAE																									
203.	<i>Callicarpa americana</i> Beauty bush													X											
204.	<i>Lantana camara</i> Shrub verbena																								
205.	<i>Lippia nodiflora</i> Carpetweed																								
206.	<i>Vitex trifolia</i> Vitex																								
AVICENNIACEAE																									
207.	<i>Avicennia germinans</i> Black mangrove	5	35	17	2	2	5	1	2	X	1	15	23	3	12	13	16	11	4	14	8	21	2	13	16
LAMIACEAE																									
208.	<i>Leonotis nepetaefolia</i> Lion's ear																								
209.	<i>Pycnanthemum</i> spp. Horsemint																								
210.	<i>Trichostema dichotomum</i> Forked blue curls										1			1					X						
SOLANACEAE																									
211.	<i>Lycium carolinianum</i> Christmas berry							X	X			X		X											
212.	<i>Lycopersicon esculentum</i> Tomato																								
213.	<i>Physalis viscosa</i> Ground cherry													1											
214.	<i>Solanum americanum</i> Common nightshade										X														
215.	<i>Solanum elaeagnifolium</i> Potato tree																								
216.	<i>Solanum elaeagnifolium</i> Climbing nightshade																								
SCROPHULARIACEAE																									
217.	<i>Buchnera americana</i> Blue heart																								
218.	<i>Capraria biflora</i> Twinflower																								
219.	<i>Scoparia dulcis</i> Sweet broom													X											
BIGNONIACEAE																									
220.	<i>Tecomaria capensis</i> Cape honeysuckle				X																				
221.	<i>Mangifera indica</i> Mango																								
PLANTAGINACEAE																									
222.	<i>Plantago virginica</i> Southern plantain																								
RUBIACEAE																									
223.	<i>Chicococca alba</i> Snowberry							X						X											
224.	<i>Ixora</i> spp. Ixora																							X	
225.	<i>Psychotria nervosa</i> Wild coffee																								
226.	<i>Randia aculeata</i> White indigo berry																								
CAPRIFOLIACEAE																									
227.	<i>Sambucus canadensis</i> Elderberry										X														
CUCURBITACEAE																									
228.	<i>Cucumis melo</i> var. <i>dudaim</i> Dudaim melon																								
229.	<i>Melothria pendula</i> Creeping cucumber	X						X	X																
230.	<i>Momordica charantia</i> Wild balsam apple	X		1			8	X						X	X										
GOODENIACEAE																									
231.	<i>Scaevola frutescens</i> Scaevola	X																							
232.	<i>Scaevola plumieri</i> Inkberry																								
ASTERACEAE																									
233.	<i>Ambrosia artemisiifolia</i> Common ragweed	X		1	X			X	X		X			X	X				X		X				
234.	<i>Ambrosia artemisiifolia</i> Common ragweed																								
235.	<i>Aster</i> spp. Asters undet.																								
236.	<i>Baccharis halimifolia</i> Groundsel tree			X	X			X	X	X	X			1					X	X					
237.	<i>Bidens alba</i> Spanish needles			X				X		X				3	X				X					X	
238.	<i>Borreria frutescens</i> Sea oxeye	X		1	5	5	X	2		X				1	X	23	16	11	X	5	4	X	X	2	X

	ST. LUCIE COUNTY ISLAND NUMBER									
	15A	15	16	17A	17	18A	18B	18C	19A	19B
	==	==	==	==	==	==	==	==	==	==
198.					X					
199.										
200.										
201.	X	X			X	5				
202.										9
203.										
204.	X									
205.										
206.										
207.	10	4	28	7	7		X	5		
208.										
209.	X							X		
210.										
211.										
212.										
213.										
214.			X							
215.										
216.		1								
217.										
218.										
219.										
220.										
221.	3									
222.										
223.										
224.										
225.										
226.										
227.										
228.										
229.					2					
230.					X					
231.										
232.										
233.					X					
234.			3							
235.										
236.	X	X								
237.	7									X
238.	X	X				10	8	X		9

	1	1A	1B	2	3	4	5	6	7	8	9	10	11	12	12A	12B	12C	13	13A	13B	13C	14	14A	14B
239. <i>Chromolaena odorata</i> Eupatorium				X			X						X	X										
240. <i>Chrysopsis spp.</i> Goldenaster																								
241. <i>Chrysopsis subulata</i> Goldenaster	X			2	X			X					1											
242. <i>Coryza canadensis</i> Dwarf horseweed							X											X						
243. <i>Emilia sonchifolia</i> Tassel flower				X	X								1											
244. <i>Erigeron strigosus</i> Daisy fleabane	X			X																				
245. <i>Eupatorium capillifolium</i> Dog fennel				1									X											
246. <i>Eupatorium serotinum</i> Late thoroughwort	X			X			X																	
247. <i>Euthamia minor</i> Goldenrod																								
248. <i>Gnaphalium obtusifolium</i> Rabbit tobacco										X														
249. <i>Helianthus debilis</i> Beach sunflower																								
250. <i>Hieracium gronovii</i> Hawkweed	1																							
251. <i>Iva frutescens</i> Marsh elder					1		1	X																
252. <i>Iva imbricata</i> Beach elder								X																
253. <i>Lactuca canadensis</i> Wild lettuce	1			X	X		X			X			X											X
254. <i>Lactuca graminifolia</i> Wild lettuce	X			X						X			X											
255. <i>Liatris tenuifolia</i> Blazing star																								
256. <i>Mikania cordifolia</i> Climbing hemp																								
257. <i>Mikania scandens</i> Hempweed				X			X			X			X	X										X
258. <i>Pluchea foetida</i> Marsh fleabane																								
259. <i>Pluchea odorata</i> Camphor weed																								
260. <i>Solidago sempervirens</i> Seaside goldenrod																								
261. <i>Sonchus asper</i> Spiny leaved sow thistle																								
262. <i>Sonchus oleraceus</i> Common sow thistle							X			X			X	X										
263. <i>Taraxacum officinale</i> Common dandelion																								
264. <i>Wedelia trilobata</i> Creeping oxeye				1				X																
ANIMALIA																								
PORIFERA																								
265. Porifera Sponge												R	R											
CTENOPHORA																								
266. Ctenophora Jellyfish, ctenophores					C	R			C															
MOLLUSCA																								
GASTROFODA																								
MESOGASTROFODA																								
POTAMIDIDAE																								
267. <i>Batillaria minina</i> Little horn shell																								
268. <i>Cerithidea scalariformis</i> Ladder horn shell												R					R							
CERITHIIDAE																								
269. <i>Cerithiopsis greeni</i> Green's cerith																								
STROMBIDAE																								
270. <i>Strombus alatus</i> Florida fighting conch																								
NEOGASTROFODA																								
MURICIDAE																								
271. <i>Urosalpinx cinerea</i> Atlantic oyster drill																								
MELONGENIDAE																								
272. <i>Melongenella corona</i> Florida crowned conch																								
NASSARIIDAE																								
273. <i>Nassarius vibex</i> Mud snail																								
MARGINELLIDAE																								
274. <i>Prunum apicinum</i> Common Atlantic marginella													R		R		R							
ANASPIDAEA																								
APLYSIIDAE																								
275. <i>Aplysia brasiliana</i> Sooty seabare						R						O					O	O						

	ST. LUCIE COUNTY ISLAND NUMBER									
	15A	15	16	17A	17	18A	18B	18C	19A	19B
	==	==	==	==	==	==	==	==	==	==
239.										
240.										
241.					X				8	
242.	X									
243.										
244.										X
245.			X		X					
246.			X							
247.										
248.										
249.										
250.										
251.										
252.					X	X				
253.					X			X		
254.										
255.										
256.										
257.								X		
258.										
259.										
260.										
261.										
262.										
263.	X									
264.					X					
265.	O									
266.	O					O			O	
267.										
268.										
269.										
270.										
271.										
272.										
273.										
274.	R									
275.			R	R						

ST. LUCIE COUNTY ISLAND NUMBER																									
	1	1A	1B	2	3	4	5	6	7	8	9	10	11	12	12A	12B	12C	13	13A	13B	13C	14	14A	14B	
	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
BIVALVIA																									
PTERIOIDA																									
OSTREIDAE																									
276. <i>Crassostrea virginica</i> American oyster																									
VENEROIDA																									
VENERIDAE																									
277. <i>Mercenaria mercenaria</i> Northern quahog																									
ANNELIDA																									
POLYCHAETA																									
278. <i>Polychaeta</i> undet. Polychaete worms														R											
CHELICERATA																									
MEROSTOMATA																									
XIPHOSURIDA																									
LIMULIDAE																									
279. <i>Limulus polyphemus</i> Horseshoe crab																									
CRUSTACEA																									
MALACOSTRACA																									
DECAPODA																									
PENAEIDAE																									
280. <i>Penaeus</i> spp. Commercial shrimps			O	O			O	O	O			O	A	O		A	A	A		O	R	C		O	
PALAEOMONIDAE																									
281. <i>Palaemonetes</i> spp. Grass shrimp			A	C	A	O	A	A	A	A	R	A	A	A		A	A	A		O	A	A		A	R
ALPHEIDAE																									
282. <i>Alpheus</i> spp. Snapping shrimps														R											
HIPPOLYTIDAE																									
283. <i>Tozeuma carolinensis</i> Arrow shrimp			C	R			C	A		C	R		A	C		C	A	A		O	O		A	O	
284. <i>Hippolytes pleuracanthus</i> Humpback shrimp			A	A		R	O			C		R	A			A	A	A		O	R		O		
PANULIRIDAE																									
285. <i>Panulirus argus</i> Spiny lobster																									
PAGURIDAE																									
286. <i>Clibanarius vittatus</i> Striped hermit crab			R	O		O	O	R	R		R		C	O		O	C	O		R		R		O	R
MAJIDAE																									
287. <i>Lubinia emarginata</i> Spider crab			R		R			R	R		R					R		R						R	
ORYPODIDAE																									
288. <i>Uca</i> spp. Fiddler crabs																									
PORTUNIDAE																									
289. <i>Callinectes</i> spp. Swimming crabs			R	R	R	R			R				O			O	R	O							
290. <i>Callinectes sapidus</i> Blue crab					R	R						R				R							R		
XANTHIDAE																									
291. <i>Xanthidae</i> undet. Mud crabs					R	R			R			R	R	O		R	R	R				R		R	
292. <i>Menippe mercenaria</i> Stone crab																									
GRAPSIDAE																									
293. <i>Arates pisonii</i> Mangrove tree crab																									
294. <i>Cardisoma guanhumi</i> Great land crab																									
ECHINODERMATA																									
CRINOIDEA																									
295. Echinodermata Echinoderms																									
STELLEROIDEA																									
296. Holothurian Sea cucumber																									
ASTEROIDEA																									
297. Asteroidea Starfish																									
CHORDATA																									
ASCIDIACEA																									
298. <i>Tunicata</i> undet. Tunicates			R										O	R		R				R					
CHONDRICTHYES																									
RAJIFORMES																									
DASYATIDAE																									
299. <i>Dasyatis sabina</i> Atlantic stingray																								R	
300. <i>Gymnura micrura</i> Smooth butterfly ray																									
OSTEICTHYES																									
CLUPEIFORMES																									

	ST. LUCIE COUNTY ISLAND NUMBER									
	15A	15	16	17A	17	18A	18B	18C	19A	19B
	--	--	--	--	--	--	--	--	--	--
276.										
277.										
278.										
279.										
280.	A		O				R	R		
281.	A		O	A			O			
282.	R									
283.						R		A		C
284.			A							
285.										
286.	C					R			O	
287.	R								R	
288.										
289.	R		R			R	R			
290.	R						R			R
291.	R		R							
292.										
293.			C							
294.										
295.										
296.										
297.										
298.										
299.							R			
300.										
301.			A					A		
302.								C		
303.								A		
304.								R		

		ST. LUCIE COUNTY ISLAND NUMBER																							
		1	1A	1B	2	3	4	5	6	7	8	9	10	11	12	12A	12B	12C	13	13A	13B	13C	14	14A	14B
305.	<i>Anchoa mitchelli</i> Bay anchovy ELOPIFORMES ELOPIDAE		C	A	R	O	A			R			O			A	C	R		O	O				
306.	<i>Elops saurus</i> Ladyfish		R	R	A	A			A			A		A											A
307.	<i>Megalops atlanticus</i> Tarpon BATRACHOIDIFORMES BATRACHOIDIDAE																				R				
308.	<i>Opsanus tau</i> Oyster toadfish ATHERINIFORMES EXOCOETIDAE																								
309.	<i>Hyporhamphus unifasciatus</i> Halfbeak BELONIDAE																				R				
310.	<i>Strongylura notata</i> Redfin needlefish CYPRINODONTIDAE				C						R	R		R		R								R	R
311.	<i>Cyprinodon variegatus</i> Sheepshead minnow																								
312.	<i>Floridichthys carpio</i> Goldspotted killifish		R					R					R												
313.	<i>Fundulus confluentus</i> Marsh killifish																								
314.	<i>Fundulus grandis</i> Gulf killifish				O							R				R									
315.	<i>Fundulus majalis</i> Striped killifish																							R	
316.	<i>Fundulus similis</i> Longnose killifish																								
317.	<i>Lucania parva</i> Rainwater killifish POECILIIDAE							R																	
318.	<i>Poecilia latipinna</i> Sailfin molly ATHERINIDAE																								
319.	<i>Menidia beryllina</i> Inland silverside																								
320.	<i>Menidia peninsulae</i> Tidewater silverside GASTEROSTEIFORMES SYNGNATHIDAE				R			R								A									
321.	<i>Hippocampus erectus</i> Lined seahorse																								
322.	<i>Hippocampus zostera</i> Dwarf seahorse																	R							
323.	<i>Syngnathus louisianae</i> Chain pipefish		R			R	O	R				R	R	O		R	O	R		R				R	R
324.	<i>Syngnathus scovelli</i> Gulf pipefish PERCIFORMES CENTROPOMIDAE		O	O	O	R	C	O	R	R	R	C	C	O		O	C	C		R		R		O	O
325.	<i>Centropomus undecimalis</i> Snook CARANGIDAE																				R				
326.	<i>Caranx hippos</i> Jack crevalle																								
327.	<i>Oligoplites saurus</i> Leatherjacket									R										O				R	
328.	<i>Trachinotus falcatus</i> Permit LUTIANIDAE								R		R									R					
329.	<i>Lutjanus griseus</i> Grey snapper		R															R						R	
330.	<i>Ocyurus chrysurus</i> Yellowtail snapper LOBOTIDAE																								
331.	<i>Lobotes surinamensis</i> Tripletail GERREIDAE									R															
332.	<i>Diapterus auratus</i> Irish pompano																		R			R			
333.	<i>Eucinostomus spp.</i> Mojarra HAEMULIDAE		A	A	O	O	A	A	A	C	A	O	A	C		C	A	A		A	A	A		A	A
334.	<i>Haemulon chrysargyreum</i> Small mouth grunt									R															
335.	<i>Orthopristis chrysoptera</i> Fighfish SPARIDAE				O	C		O		R	R	C	R	O		R	O	R			R	O		R	R
336.	<i>Archosargus probatocephalus</i> Sheepshead		R								R			R		R	R								R
337.	<i>Diplodus argenteus</i> Silver porgy					O						C													O
338.	<i>Lagodon rhomboides</i> Pinfish SCIAENIDAE		R	O	C	C	O		O	R	R	C	R	C		R	R	C		O	R	C		O	C
339.	<i>Bairdiella chrysoura</i> Silver perch																	R							
340.	<i>Cynoscion nebulosus</i> Spotted seatrout									R								R							R
341.	<i>Leiostomus xanthurus</i> Spot				A	A			A		R	A		O						A	A	A			
342.	<i>Menticirrhus americanus</i> Southern kingfish																								

	15A	15	16	17A	17	18A	18B	18C	19A	19B
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305.	O			R		R		A	A	
306.				R		R	A			
307.										
308.										
309.										
310.			R							O
311.										
312.										
313.										
314.										
315.										
316.										
317.	O									
318.										
319.										
320.			O						R	
321.										
322.	R		R							
323.	R		R							
324.	C		O	R			R	R	R	R
325.	R									
326.										
327.									R	
328.							O		C	
329.								R		
330.										
331.										
332.	R		R						R	
333.	A		C	C		A	A	A	C	O
334.										
335.	R		R	R			R	O		R
336.	R		A							
337.				O			O			
338.	R		A	R			C	R		A
339.	R									
340.										
341.			R	A			A			R
342.										

ST. LUCIE COUNTY ISLAND NUMBER																								
	1	1A	1B	2	3	4	5	6	7	8	9	10	11	12	12A	12B	12C	13	13A	13B	13C	14	14A	14B
343. <i>Micropogonias undulatus</i> Atlantic croaker		A	C		O	O		R								R	C		O		O			
344. <i>Sciaenops ocellatus</i> Red drum									C								O		C				A	
EPHIPPIDAE																								
345. <i>Chaetodipterus faber</i> Spadefish																								
MUGILIDAE																								
346. <i>Mugil cephalus</i> Striped mullet		A	O	C	A	A		A			C				R	O			A	C	A			
347. <i>Mugil curema</i> White mullet		A						R																
SPHYRAENIDAE																								
348. <i>Sphyraena barracuda</i> Greater barracuda									R															
349. <i>Sphyraena borealis</i> Northern sennet																R								R
BLENNIIDAE																								
350. <i>Chasmodes bosquianus</i> Striped blenny																								
351. <i>Chasmodes saburrae</i> Florida blenny		R					R	R																
GOBIIDAE																								
352. <i>Bathygobius soporator</i> Frillfin goby																R								R
353. <i>Gobionellus boleosoma</i> Darter goby												R				R					O			
354. <i>Gobiosoma boscii</i> Naked goby		R			R			O			R		O			O								
355. <i>Gobiosoma robustum</i> Code goby		O	R	O	R	O					O	R	O			R	O	O				R		
356. <i>Microgobius gulosus</i> Clown goby					R							R				R								
STROMATEIDAE																								
357. <i>Peprius spp.</i> Butterfish																								
TRIGLIDAE																								
358. <i>Prionotus tribulus</i> Bighead searobin		R																						
PLEURONECTIFORMES																								
BOTHIDAE																								
359. <i>Citharichthys spilopterus</i> Bay whiff																								
360. <i>Paralichthys spp.</i> Southern or summer flounder				R				R																
361. <i>Paralichthys albipinnatus</i> Gulf flounder																								
SOLEIDAE																								
362. <i>Trinectes maculatus</i> Hogchoker								R																
CYNOGLOSSIDAE																								
363. <i>Symphurus plagiosa</i> Blackcheek tonguefish												R												
TETRAODONTIFORMES																								
BALISTIDAE																								
364. <i>Akureus scriptus</i> Scrawled filefish																								
365. <i>Monacanthus hispidus</i> Planehead filefish								R		R							R							
OSTRACIADAE																								
366. <i>Lactophrys triquetra</i> Smooth trunkfish																								
TETRAODONTIDAE																								
367. <i>Sphaeroides nephelus</i> Southern puffer		R																						
368. <i>Sphaeroides spengleri</i> Bandtail puffer								R																
369. <i>Sphaeroides testudineus</i> Checkered puffer														R						R	R			
DIODONTIDAE																								
370. <i>Chilomycterus antillarum</i> Web burrfish																								
371. <i>Chilomycterus schoepfi</i> Striped burrfish																								
REPTILIA																								
SQUAMATA																								
IGUANIDAE																								
372. <i>Anolis carolinensis carolinensis</i> Green anole					1				1	6														
373. <i>Anolis sagrei</i> Brown anole										6													1	
374. <i>Sceloporus woodi</i> Florida scrub lizard										2														
SCINCIDAE																								
375. <i>Eumeces fasciatus</i> Five lined skink																								
COLUBRIDAE																								
376. <i>Coluber constrictor priapus</i> Southern black racer							1																	
377. <i>Elaphe obsoleta quadrivittata</i> Yellow rat snake													7											
AVES																								
GAVIIFORMES																								
GAVIIDAE																								
378. <i>Gavia immer</i> Common Loon	1																							

	15A	15	16	17A	17	18A	18B	18C	19A	19B
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343.	R									
344.	O			A						
345.										
346.				C		R	A	O		
347.										
348.										
349.				R						
350.										
351.									R	
352.	R						R			
353.										
354.	R		O							
355.	R						R			
356.	O									
357.				R						
358.										
359.										
360.										
361.										
362.	R									
363.										
364.										
365.										
366.										
367.										
368.										
369.										
370.									R	
371.										
372.	1				1					
373.				1				1		
374.										
375.										
376.										
377.										
378.										

	1	1A	1B	2	3	4	5	6	7	8	9	10	11	12	12A	12B	12C	13	13A	13B	13C	14	14A	14B
ST. LUCIE COUNTY ISLAND NUMBER																								
PELECANIFORMES																								
PELECANIDAE																								
379. <i>Pelecanus erythrorhynchos</i> White pelican																								
380. <i>Pelecanus occidentalis</i> Brown pelican	21		10			11	24	1	1	1	2											5		
FREGATIDAE																								
381. <i>Fregata magnificens</i> Magnificent frigate bird																								
PHALACROCORACIDAE																								
382. <i>Phalacrocorax auritus</i> Double-crested cormorant			70			36	2															5		
ANHINGIDAE																								
383. <i>Anhinga anhinga</i> Anhinga	1																							
ANSERIFORMES																								
ANATIDAE																								
384. <i>Anas acuta</i> Pintail																								
385. <i>Anas carolinensis</i> Green-winged teal																								
386. <i>Anas platyrhynchos</i> Mallard																								
387. <i>Aythya affinis</i> Lesser scaup																								
388. <i>Aythya marila</i> Greater scaup																								
389. <i>Mergus serrator</i> Red-breasted merganser					1																			
FALCONIFORMES																								
CATHARTIDAE																								
390. <i>Cathartes aura</i> Turkey vulture								3	20	1								20						
391. <i>Coragyps atratus</i> Black vulture										2		3												
ACCIPITRIDAE																								
392. <i>Falco peregrinus</i> Peregrine falcon																								
393. <i>Falco sparverius</i> American kestrel																								
394. <i>Haliaeetus leucocephalus</i> Bald eagle																			1					
395. <i>Pandion haliaetus</i> Osprey	1			1	1	1	1	1	2	1						1		1				4		
CICONIIFORMES																								
ARDEODAE																								
396. <i>Ardea herodias</i> Great blue heron	2					1					2	5	1	1				2			1	1	1	4
397. <i>Bubulcus ibis</i> Cattle egret																								
398. <i>Butorides virescens</i> Green-backed heron					1									3										
399. <i>Casmerodius albus</i> Great egret										1				1									1	1
400. <i>Dichromanassa rufescens</i> Reddish egret																								
401. <i>Florida caerulea</i> Little blue heron	1								1					1				2						
402. <i>Hydranassa tricolor</i> Tricolor heron				1																				
403. <i>Leucophox thula</i> Snowy egret																								
404. <i>Nyctanassa violacea</i> Yellow-crowned night heron												1												
405. <i>Nycticorax nycticorax</i> Black-crowned night heron																						2		
CICONIIDAE																								
406. <i>Mycteria americana</i> Wood stork																								
THRESKIORNITHIDAE																								
407. <i>Ajaia ajaja</i> Roseate spoonbill																								
408. <i>Eudocimus albus</i> White ibis					1		1	6					1										1	
409. <i>Plegadis falcinellus</i> Glossy ibis																								
GRUIFORMES																								
RALLIDAE																								
410. <i>Fulica americana</i> American coot																								
CHARADRIIFORMES																								
HAEMATOPODIDAE																								
411. <i>Haematopus palliatus</i> American oystercatcher			1			2																		
CHARADRIIDAE																								
412. <i>Charadrius vociferus</i> Killdeer																								
413. <i>Charadrius wilsonia</i> Wilson's plover																								
414. <i>Pluvialis squatarola</i> Black bellied plover																								
SCOLOPACIDAE																								
415. <i>Actitis macularia</i> Spotted sandpiper																		1						
416. <i>Arenaria interpres</i> Ruddy turnstone																								

	ST. LUCIE COUNTY ISLAND NUMBER									
	15A	15	16	17A	17	18A	18B	18C	19A	19B
	==	==	==	==	==	==	==	==	==	==
379.										
380.		4			7	1			3	16
381.										
382.			1		2				2	3
383.										
384.										
385.										
386.										
387.										
388.										
389.										
390.		60				18	2			
391.										
392.										
393.										
394.										
395.	1	2			2	2				
396.	1	2	5	1			1	1		
397.										
398.										
399.										
400.										
401.		1					1			
402.										
403.										
404.										
405.	1									
406.										
407.					1					
408.	2									
409.										
410.										
411.				7						
412.										
413.										
414.									3	
415.					3					
416.									1	

	1	1A	1B	2	3	4	5	6	7	8	9	10	11	12	12A	12B	12C	13	13A	13B	13C	14	14A	14B
417. <i>Calidris alba</i> Sanderling																								
418. <i>Calidris alpina</i> Dunlin																								
419. <i>Calidris minutilla</i> Least sandpiper																								
420. <i>Catoptrophorus semipalmatus</i> Willet																								
421. <i>Erolia or Ereunetes spp.</i> Sandpipers	23						18		3															
422. <i>Limnodromus griseus</i> Short-billed dowitcher		1																						
423. <i>Tringa solitaria</i> Solitary sandpiper										2														
LARIDAE																								
424. <i>Hydroprogne caspia</i> Caspian tern																								
425. <i>Larus argentatus</i> Herring gull																								
426. <i>Larus atricilla</i> Laughing gull																								
427. <i>Larus delawarensis</i> Ring-billed gull						4																		
428. <i>Larus marinus</i> Lesser black-backed gull																								
429. <i>Sterna albifrons</i> Least tern																								
430. <i>Thalasseus maximus</i> Royal tern																								
RYNCHOPIDAE																								
431. <i>Rynchops nigra</i> Black skimmer																								
COLUMBIFORMES																								
COLUMBIDAE																								
432. <i>Zenaidura macroura</i> Mourning dove													2											
STRIGIFORMES																								
TYTONIDAE																								
433. <i>Tyto alba</i> Barn owl																								
CAPRIMULGIFORMES																								
CAPRIMULGIDAE																								
434. <i>Caprimulgus carolinensis</i> Chuck-will's-widow										1														
CORACIIFORMES																								
ALCEDINIDAE																								
435. <i>Megasceryx alcyon</i> Belted kingfisher	3	1			1	1		1				1			1		1	3	1			1		
PICIFORMES																								
PICIDAE																								
436. <i>Centurus carolinus</i> Red-bellied woodpecker	2				2			2		1			4										1	2
437. <i>Dendrocopos villosus</i> Hairy woodpecker																								
438. <i>Dryocopus pileatus</i> Pileated woodpecker										1														
439. <i>Sphyrapicus varius</i> Yellow-bellied sapsucker																								
PASSERIFORMES																								
CORVIDAE																								
440. <i>Corvus ossifragus</i> Fish crow	1			4		2							3											
441. <i>Cyanocitta cristata</i> Blue jay													1	1										
CERTHIIDAE																								
442. <i>Certhia familiaris</i> Brown creeper													1											
MIMIDAE																								
443. <i>Dumetella carolinensis</i> Gray cat bird																								
444. <i>Mimus polyglottos</i> Northern mockingbird																								
445. <i>Toxostoma rufum</i> Brown thrasher																		1						
TURDIDAE																								
446. <i>Turdus migratorius</i> American robin	3							2																
SYLVIIDAE																								
447. <i>Polioptila caerulea</i> Blue-gray gnatcatcher	1				10			3										2						
STURNIDAE																								
448. <i>Sturnus vulgaris</i> European starling																								
PARULIDAE																								
449. Parulidae Warblers																								
450. <i>Dendroica caerulescens</i> Black-throated blue warbler																								
451. <i>Dendroica coronata</i> Yellow-rumped warbler																								
452. <i>Dendroica discolor</i> Prairie warbler																								1
453. <i>Dendroica dominica</i> Yellow-throated warbler																								
454. <i>Dendroica pinus</i> Pine warbler													1											

	ST. LUCIE COUNTY ISLAND NUMBER									
	15A	15	16	17A	17	18A	18B	18C	19A	19B
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417.										
418.										
419.									1	
420.										
421.										
422.										
423.										1
424.										10
425.							2			
426.				1						2
427.					60					
428.		2								
429.										7
430.										22
431.					16					2
432.										
433.										
434.										
435.					2	1		2	1	
436.										
437.										
438.										
439.										
440.							6			
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		ST. LUCIE COUNTY ISLAND NUMBER																							
		1	1A	1B	2	3	4	5	6	7	8	9	10	11	12	12A	12B	12C	13	13A	13B	13C	14	14A	14B

455.	<i>Geothlypis trichas</i> Yellowthroat								2																
456.	<i>Mniotilta varia</i> Black and white warbler																								
457.	<i>Seiurus aurocapillus</i> Ovenbird										2														
458.	<i>Setophaga ruticilla</i> American redstart										2														
ICTERIDAE		-----																							
459.	<i>Agelaius phoeniceus</i> Red-winged black bird																								
460.	<i>Cassidix mexicanus</i> Boat-tailed grackle																								
461.	<i>Molothrus ater</i> Brown-headed cowbird																								
462.	<i>Quiscalus quiscula</i> Common grackle																								
FRINGILLIDAE		-----																							
463.	<i>Passerculus sandwichensis</i> Savannah sparrow																								
464.	<i>Richmondia cardinalis</i> Northern cardinal									1	1			1	1										
MAMMALIA																									
MARSUPIALIA																									
DIDELPHINIDAE		-----																							
465.	<i>Didelphis marsupialis</i> Opossum																								
LAGOMORPHA																									
LEPORIDAE		-----																							
466.	<i>Sylvilagus palustris paludicola</i> Marsh rabbit																								
CARNIVORA																									
PROCYONIDAE		-----																							
467.	<i>Procyon lotor</i> Raccoon																								
MUSTELIDAE		-----																							
478.	<i>Lutra canadensis</i> River otter																								
SIRENIA																									
TRICHECHIDAE		-----																							
469.	<i>Trichechus manatus</i> West Indian manatee																								
CETACEA																									
DELPHINIDAE		-----																							
470.	<i>Tursiops truncatus</i> Bottlenose dolphin																								
		6																							

	ST. LUCIE COUNTY ISLAND NUMBER									
	15A	15	16	17A	17	18A	18B	18C	19A	19B
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455.										
456.										
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ISLAND NO. SL1

Date Sampled: 18 January 1988

I. Physical Description

- A. Island Size: 3.069 hectares
- B. Height Above Mean High Water: 2 m
- C. Distance from Boat Ramps: 4 km from Round Island
- D. Distance and Direction from Channel Marker: 275 m east of marker 169
- E. Erosion: Low
- F. Boating access: East side; open beach, 1.2 m deep

II. Biological Description

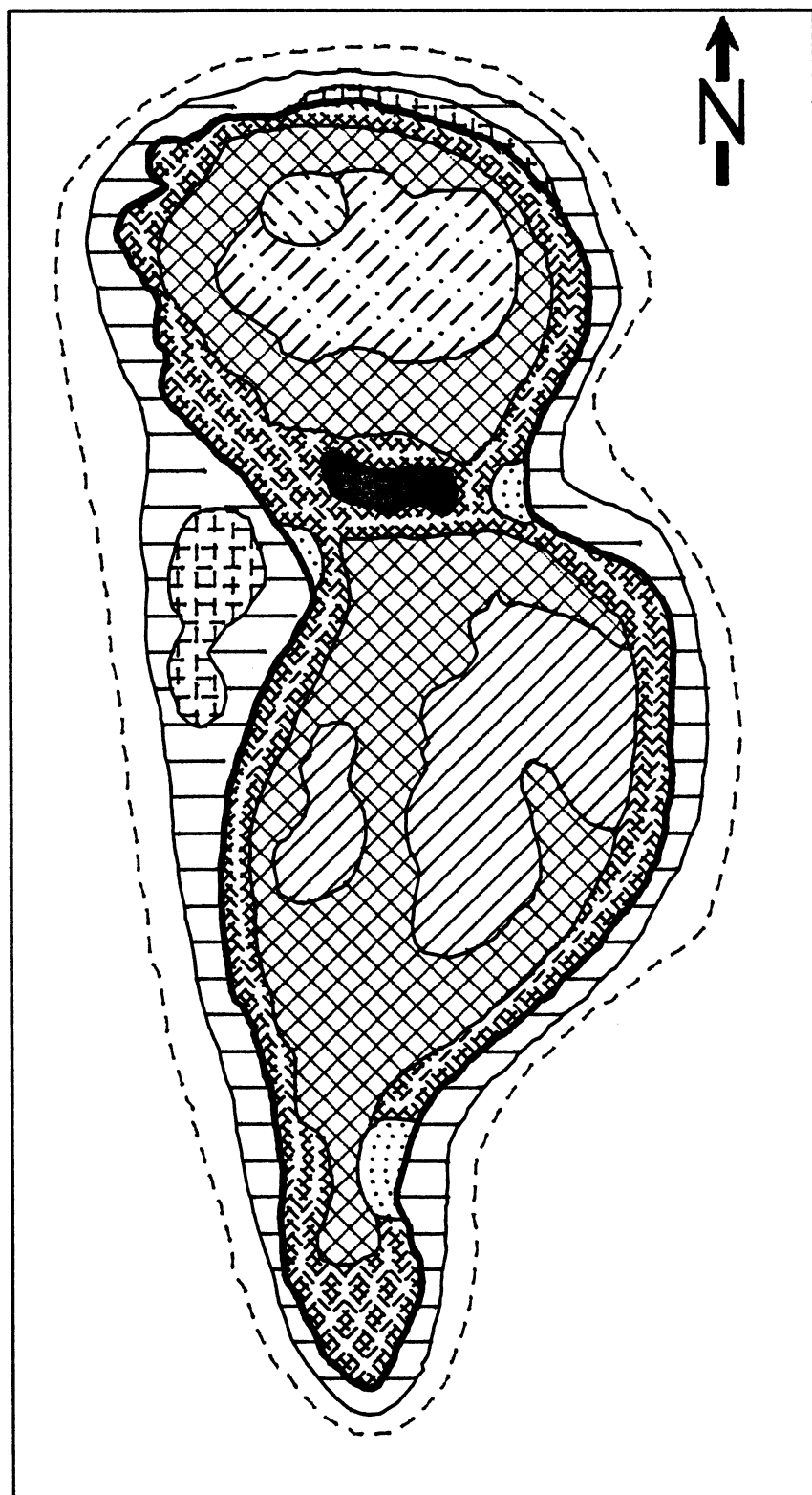
- A. Dominant Terrestrial Vegetation
Australian pine (78%), Brazilian pepper (54%), Florida privet (17%), red mangrove (15%), white mangrove (15%), 42 species total
- B. Soil humus: 3.5 cm
- C. Seagrasses
Shoal grass on north, south, east and west sides of island
- D. Bird Usage
Sandpipers, brown pelicans, kingfishers, robins, great blue herons (nesting) and red-bellied woodpeckers (nesting) common, 12 bird species total; 6 nests
- E. Common Fishes and Invertebrates
Ladyfish, striped mullet, white mullet, gulf pipefish, 10 fish species total; grass and penaeid shrimp, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: brown pelican, little blue heron, osprey

III. Recommended usage: Conservation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and is used by nesting birds. A mangrove marsh and a Florida privet/varnish leaf forest are on the northern end of the island. The center of the island appears to have been recently damaged by fire. Replanting of native tropical hammock trees on the north end of the island would be feasible and greatly enhance the habitat. For these reasons, we feel this island should be set aside for conservation.

SPOIL ISLAND SL1



	Australian pine 1266 hectares
	Mangroves 0.933 hectares
	Brazilian pepper 0.497 hectares
	Privet 0.316 hectares
	Sand 0.058 hectares
	Pond 0.041 hectares
	Varnish leaf 0.040 hectares
	Oysters
	Shoal grass
	Unvegetated bottom
	< 1 m deep

1 in = 52 m



ISLAND NO. SL1A

Date Sampled: 22 December 1988

I. Physical Description

- A. Island Size: 0.173 hectares
- B. Height Above Mean High Water: 0.5 m
- C. Distance from Boat Ramps: 1.76 km south of Round Island
- D. Distance and Direction from Channel Marker: 159 m southeast of marker 169
- E. Erosion: South and north ends
- F. Boating access: Southeast side; open beach, 1.5 m deep

II. Biological Description

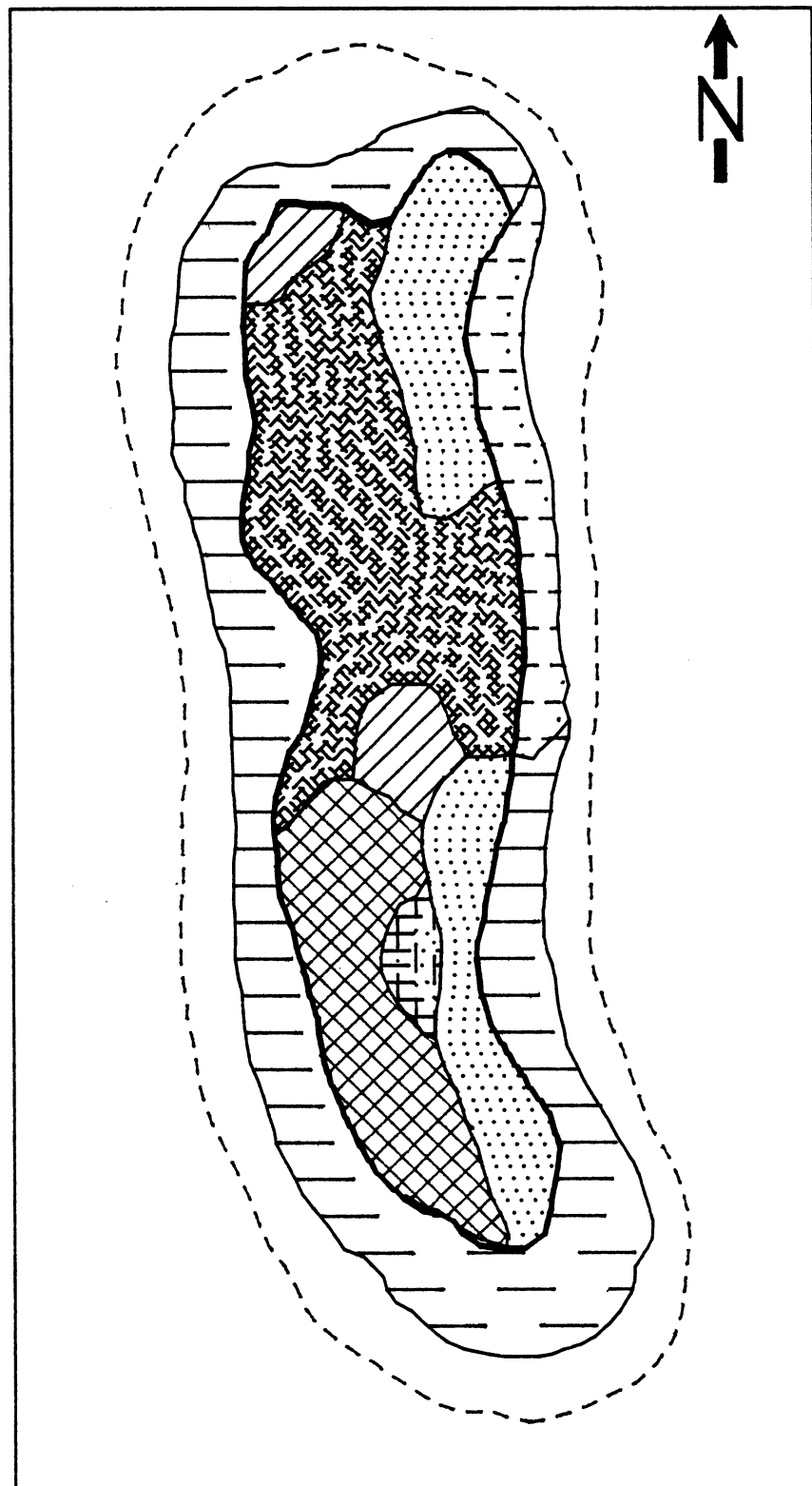
- A. Dominant Terrestrial Vegetation
Black mangrove (35%), Australian pine (20%), buttonwood (15%), Brazilian pepper (10%), white mangrove (10%); 12 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north, west and south sides, turtle grass on east side
- D. Bird Usage
Ruddy turnstone common, 3 species, no nests
- E. Common Fishes and Invertebrates
Croaker, mullet and mojarra common, 13 fish species total; grass and humpback shrimps common, 7 invertebrate species total
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Passive Recreation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. Although the majority of the island is covered by mangroves, there are open beach areas along the east side that provide adequate space for picnicking, swimming and fishing. However, the island is too small to support the development of structures for active recreation and should remain a passive recreation island.

SPOIL ISLAND SL1A



-  Mangroves
0.071 hectares
-  Sand
0.047 hectares
-  Australian pine
0.037 hectares
-  Brazilian pepper
0.013 hectares
-  Sea purslane
0.005 hectares
-  Shoal grass
-  Turtle grass
-  Unvegetated bottom
-  < 1 m deep

1 in = 10 m



ISLAND NO. SL1B

Date Sampled: 22 December 1988

I. Physical Description

- A. Island Size: 0.090 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 1.78 km south of Round Island
- D. Distance and Direction from Channel Marker: 79 m northeast of marker 170
- E. Erosion: South end
- F. Boating access: Southeast side; open beach, 1.3 m deep

II. Biological Description

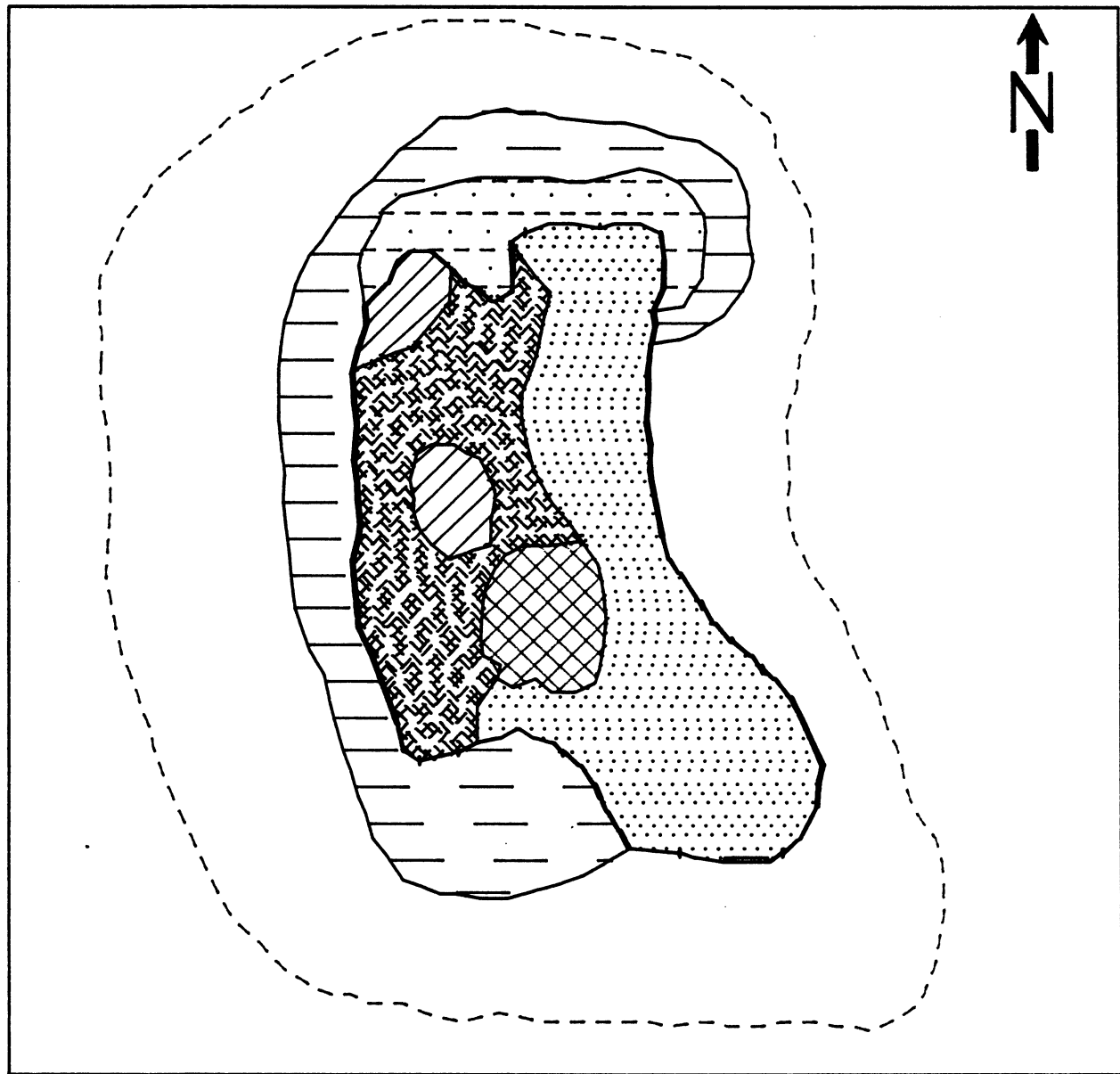
- A. Dominant Terrestrial Vegetation
Brazilian pepper (25%), buttonwood (25%), black mangrove (17%); 6 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass, north and west sides, turtle grass, north side
- D. Bird Usage
Loafing area for double crested cormorants and brown pelicans, 3 species total, no nests
- E. Common Fishes and Invertebrates
Mojarra and bay anchovy common, 9 fish species total; humpback and grass shrimps common, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: brown pelican and American oystercatcher

III. Recommended usage: Conservation

IV. Comments

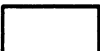
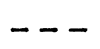
This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and is an important loafing area for several species of birds. Additionally, the sand spit to the south could be used for nesting by shore birds. This island is small and has not had heavy human usage and should thus be reserved for conservation.

SPOIL ISLAND SL1B



1 m = 12 m



	Sand 0.047 hectares		Turtle grass
	Mangroves 0.029 hectares		Unvegetated bottom
	Australian pine 0.008 hectares		< 1 m deep
	Brazilian pepper 0.007 hectares		
	Shoal grass		

ISLAND NO. SL2

Date Sampled: 16 March 1988

I. Physical Description

- A. Island Size: 1.779 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 10.7 km from North Bridge
- D. Distance and Direction from Channel Marker: 385 km east of marker 170
- E. Erosion: Low
- F. Boating access: West side; open beach, 1.7 m deep

II. Biological Description

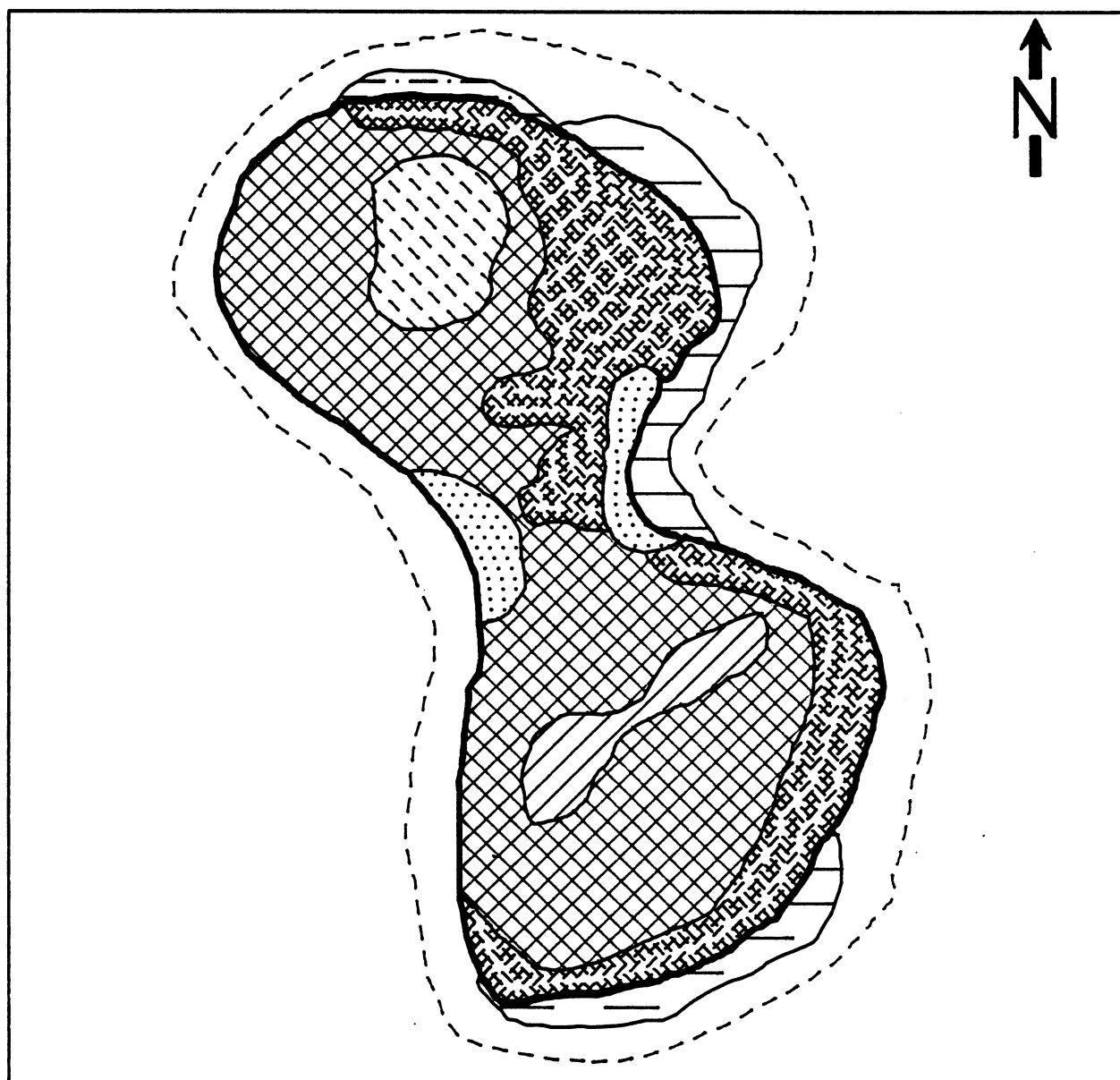
- A. Dominant Terrestrial Vegetation
Australian pine (94%), Brazilian pepper (83%), parietaria (11%), milkweed (11%), 55 species total
- B. Soil humus: 5 cm
- C. Seagrasses
Shoal grass on east and south sides
- D. Bird Usage
Fish crows common, total of 2 species seen; no nests
- E. Common Fishes and Invertebrates
Ladyfish, spot, white mullet, redbfin needlefish, pinfish, pigfish, 13 fish species total; grass shrimp, 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: tricolor heron

III. Recommended usage: Active Recreation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. This island has historically received heavy human activity. There were few birds and no nesting birds observed on the island, there is good deep water and beach access on the west side and seagrasses are not plentiful around the island. This island could be developed for active recreation by selective removal of exotic vegetation.

SPOIL ISLAND SL2



1 in = 4 m



	Australian pine 0.984 hectares		Rocks
	Mangroves 0.521 hectares		Shoal grass
	Varnish leaf 0.110 hectares		Unvegetated bottom
	Brazilian pepper 0.082 hectares		< 1 m deep
	Sand 0.081 hectares		

ISLAND NO. SL3

Date Sampled: 1 March 1988

I. Physical Description

- A. Island Size: 2.302 hectares
- B. Height Above Mean High Water: 2 m on north end
- C. Distance from Boat Ramps: 9.9 km from North Bridge
- D. Distance and Direction from Channel Marker: 385 m east of marker 171
- E. Erosion: Minimal
- F. Boating access: West or east side; open beaches, 1.5 m deep

II. Biological Description

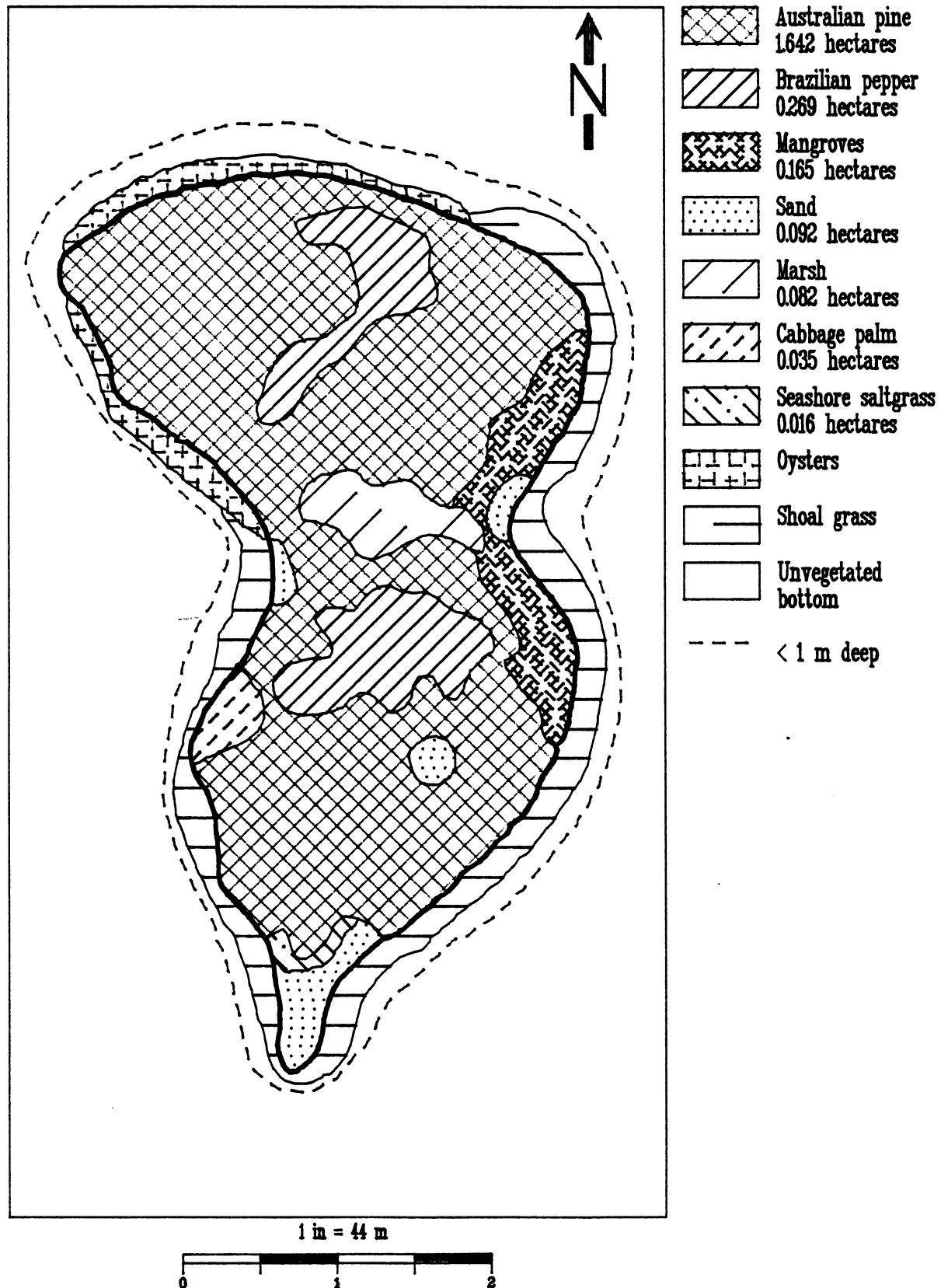
- A. Dominant Terrestrial Vegetation
Australian pine (83%), Brazilian pepper (73%), sea oxeye (10%), 41 species total
- B. Soil humus: 2 cm
- C. Seagrasses
Shoal grass on east and south sides; manatee grass on south side
- D. Bird Usage
Blue-gray gnatcatcher and red-bellied woodpeckers common, 7 bird species total; 1 nest
- E. Common Fishes and Invertebrates
Ladyfish, white mullet, spot, pinfish, 13 fish species total; ctenophores, hermit crabs, 7 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: osprey

III. Recommended usage: Active Recreation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. The island has historically received heavy human activity and several cultivated plants are currently growing wild on the island. There is good deep water access and open beaches on two sides of the island, and there is an area on the southern part of the island that could easily be further developed for pavilions, picnic tables, fireplaces or sanitary facilities. Thus, the designation for this island should be active recreation.

SPOIL ISLAND SL3



ISLAND NO. SL4

Date Sampled: 22 December 1988

I. Physical Description

- A. Island Size: 0.132 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 3.3 km north of North Bridge
- D. Distance and Direction from Channel Marker: 127 m northeast of marker 172A
- E. Erosion: South end
- F. Boating access: Southeast side; open beach, 1.7 m deep

II. Biological Description

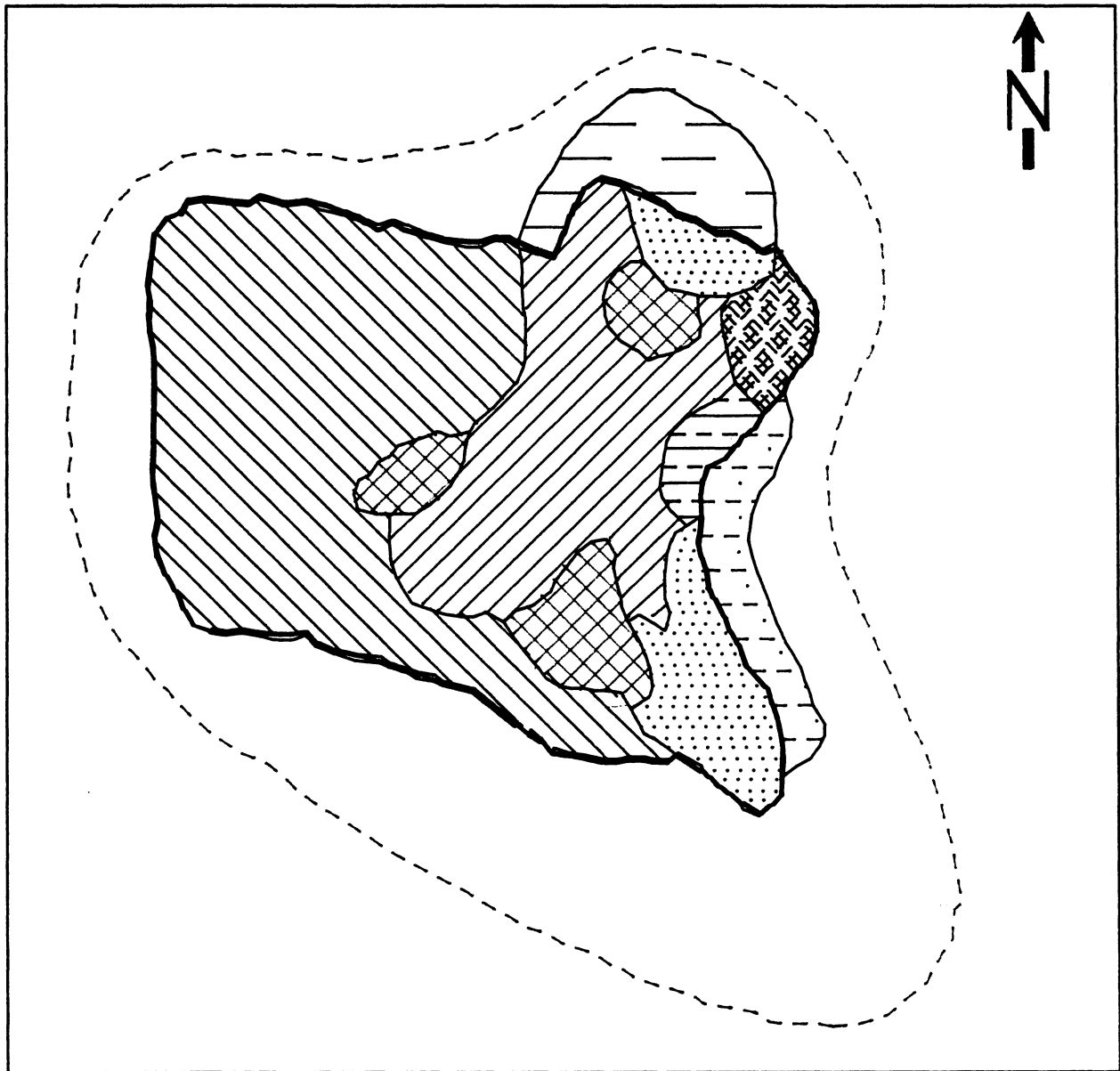
- A. Dominant Terrestrial Vegetation
Brazilian pepper (40%), Australian pine (35%); 13 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north side, manatee grass on west side, turtle grass on east side
- D. Bird Usage
Double crested cormorants and brown pelicans common, 8 species total, no nests
- E. Common Fishes and Invertebrates
Striped mullet, bay anchovy, mojarra and gulf pipefish common, 10 fish species total; grass and arrow shrimps common, 7 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: osprey, brown pelican, American oystercatcher

III. Recommended usage: Passive Recreation

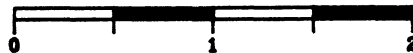
IV. Comments

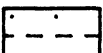
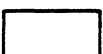
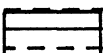
This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and has historically been used for recreation. There is good deep water access on the southeast side and low floral diversity on the island. Although many birds were seen on the island, it is not used for nesting. This island is too small to be developed for active recreation so its designation should remain passive.

SPOIL ISLAND SL4



1 in = 16 m



	Brazilian pepper 0.065 hectares		Shoal grass
	Sand 0.029 hectares		Manatee grass
	Australian pine 0.024 hectares		Turtle grass
	Mangroves 0.008 hectares		Unvegetated bottom
	Sea oxeye 0.006 hectares		< 1 m deep

ISLAND NO. SL5

Date Sampled: 3 December 1987

I. Physical Description

- A. Island Size: 2.925 hectares
- B. Height Above Mean High Water: 2 m
- C. Distance from Boat Ramps: 8.2 km from North Bridge
- D. Distance and Direction from Channel Marker: 275 m east of marker 173
- E. Erosion: Some on north end
- F. Boating access: West side; open beach, 1.5 m deep

II. Biological Description

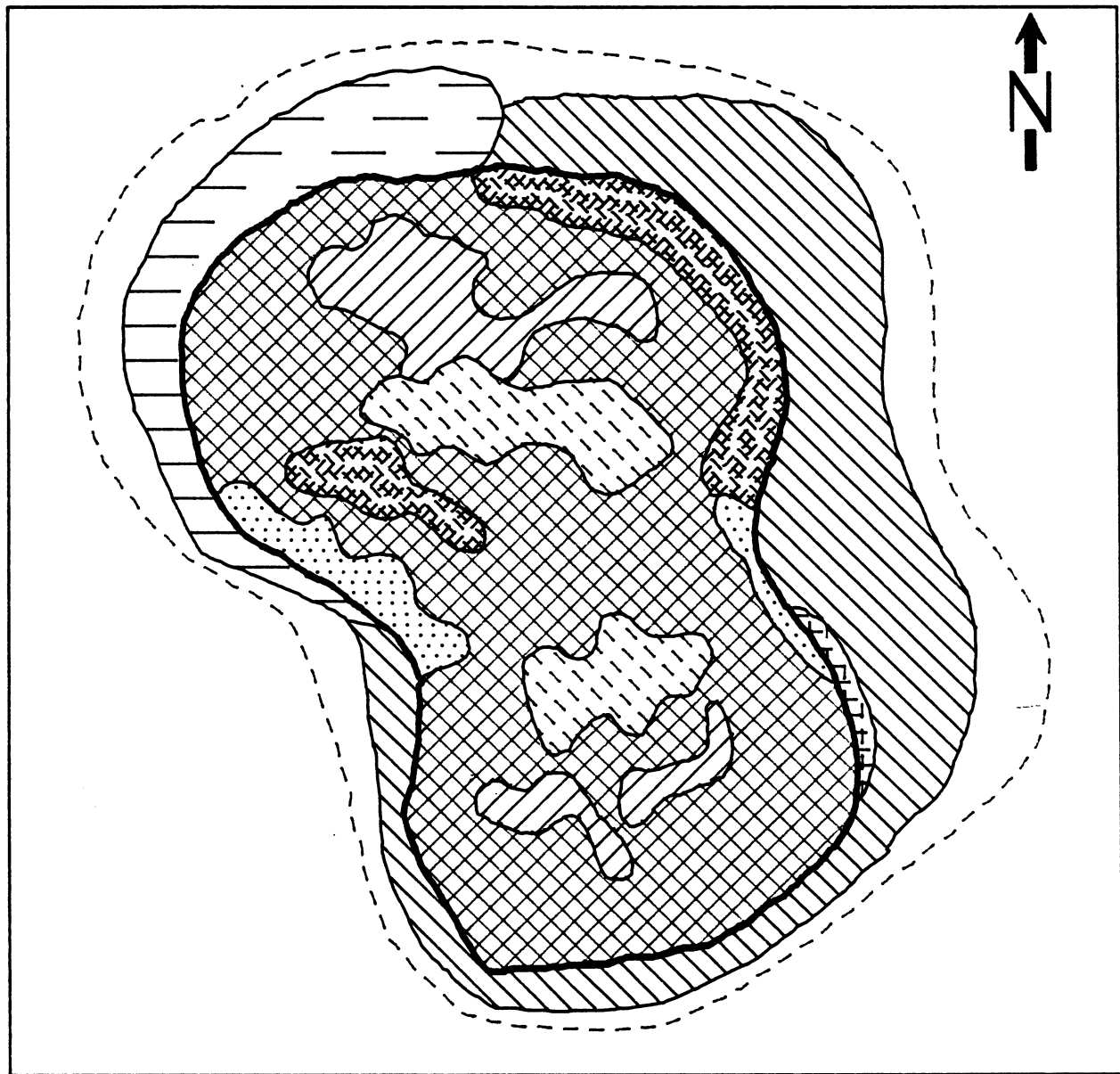
- A. Dominant Terrestrial Vegetation
Australian pine (79%), Brazilian pepper (47%), varnish leaf (29%), wild balsam apple (18%), coin vine (12%); 48 species total
- B. Soil humus: 5 cm
- C. Seagrasses
Shoal grass on north and west sides, manatee grass on all sides
- D. Bird Usage
Brown pelicans, sandpipers, ruddy turnstone and double-crested cormorant common, 6 species total; no nests
- E. Common Fishes and Invertebrates
Mojarra, gulf pipefish and naked goby; 12 fish species total; arrow, grass and penaeid shrimps; 5 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus; Special concern: osprey, brown pelican

III. Recommended usage: Education

IV. Comments

This island is located in the Vero Beach to Ft. Pierce Aquatic Preserve. SL5 has one of the most diverse terrestrial plant flora (48 species) of all the islands surveyed and is a good candidate for replanting with native hammock species. Many birds, fishes and invertebrates were observed and there are extensive grassbeds surrounding this island. The floral and faunal diversity, good deep water access and lack of nesting birds make this island an excellent choice for environmental education. However, unsupervised recreational use of this island by the general public should be discouraged.

SPOIL ISLAND SL5



1 in = 48 m



	Australian pine 1906 hectares		Oysters
	Varnish leaf 0.302 hectares		Shoal grass
	Brazilian pepper 0.297 hectares		Manatee grass
	Mangroves 0.279 hectares		Unvegetated bottom
	Sand 0.141 hectares		< 1 m deep

ISLAND NO. SL6

Date Sampled: 9 February 1988

I. Physical Description

- A. Island Size: 2.019 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 7 km from North Bridge
- D. Distance and Direction from Channel Marker: 220 m east of marker 173
- E. Erosion: Minimal
- F. Boating access: East and west sides; open sand beaches, 1.8 m deep

II. Biological Description

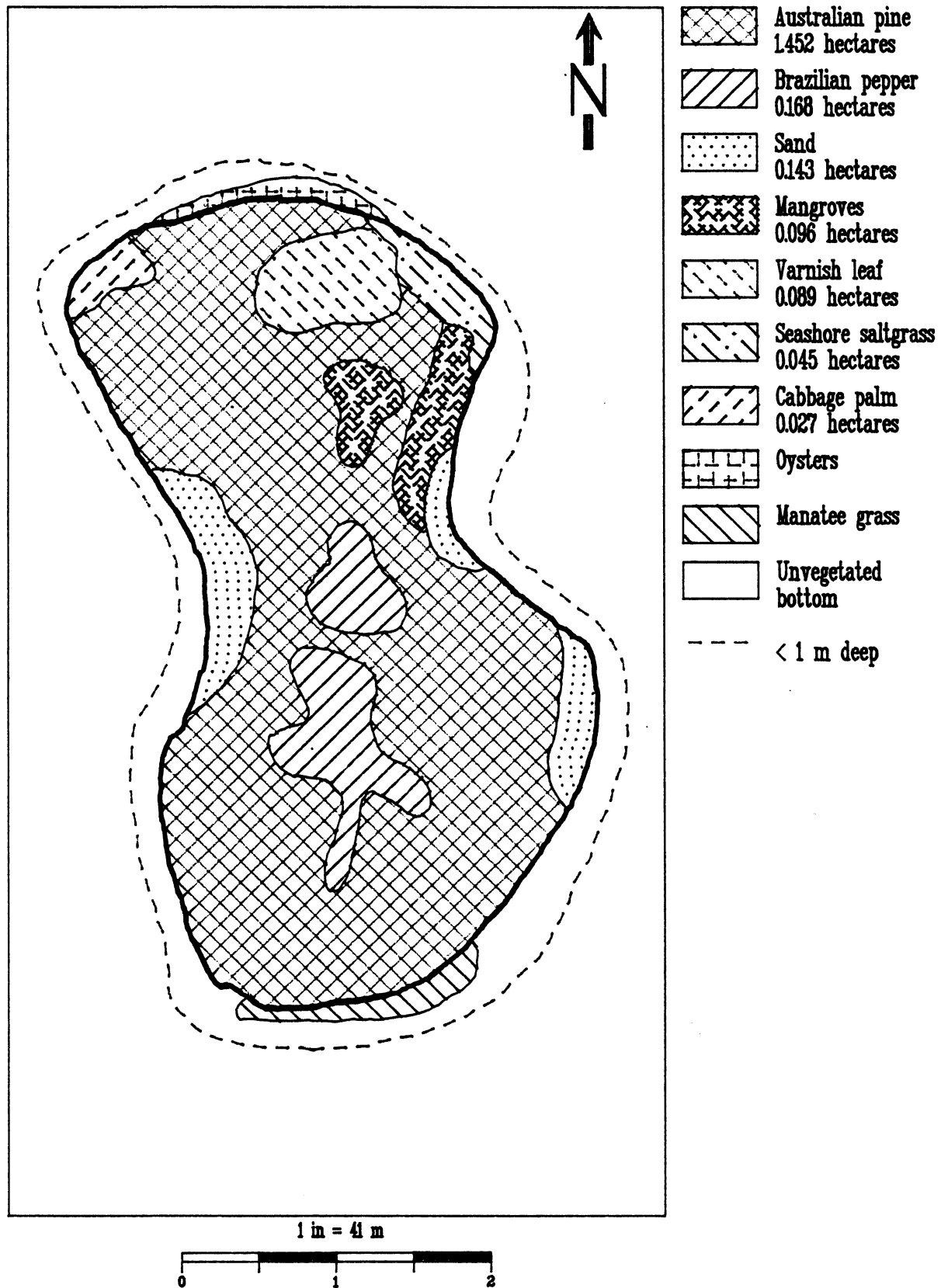
- A. Dominant Terrestrial Vegetation
Australian pine (87%), Brazilian pepper (60%), cabbage palm (10%), red mangrove (10%), ball moss (10%), varnish leaf (10%), black mangrove (10%), 42 species total
- B. Soil humus: 6 cm
- C. Seagrasses
Shoal and manatee grass on south side of island
- D. Bird Usage
White ibis, turkey vulture, blue-gray gnatcatcher common, 9 species total; no nests
- E. Common Fishes and Invertebrates
Ladyfish, mojarra, spot, white mullet, 9 fish species total; grass shrimp, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: osprey, brown pelican

III. Recommended usage: Passive Recreation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. Historically it has received human use, there is good deep water and open beach access on two sides of the island, there is little seagrass around the island and there are no nesting birds or endangered plants. For these reasons, this island should be used for passive recreation.

SPOIL ISLAND SL6



ISLAND NO. SL7

Date Sampled: 23 October 1987

I. Physical Description

- A. Island Size: 1.762 hectares
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 5.9 km from North Bridge
- D. Distance and Direction from Channel Marker: 330 m east of marker 174
- E. Erosion: Low
- F. Boating access: West and east; open beaches, 2 m deep

II. Biological Description

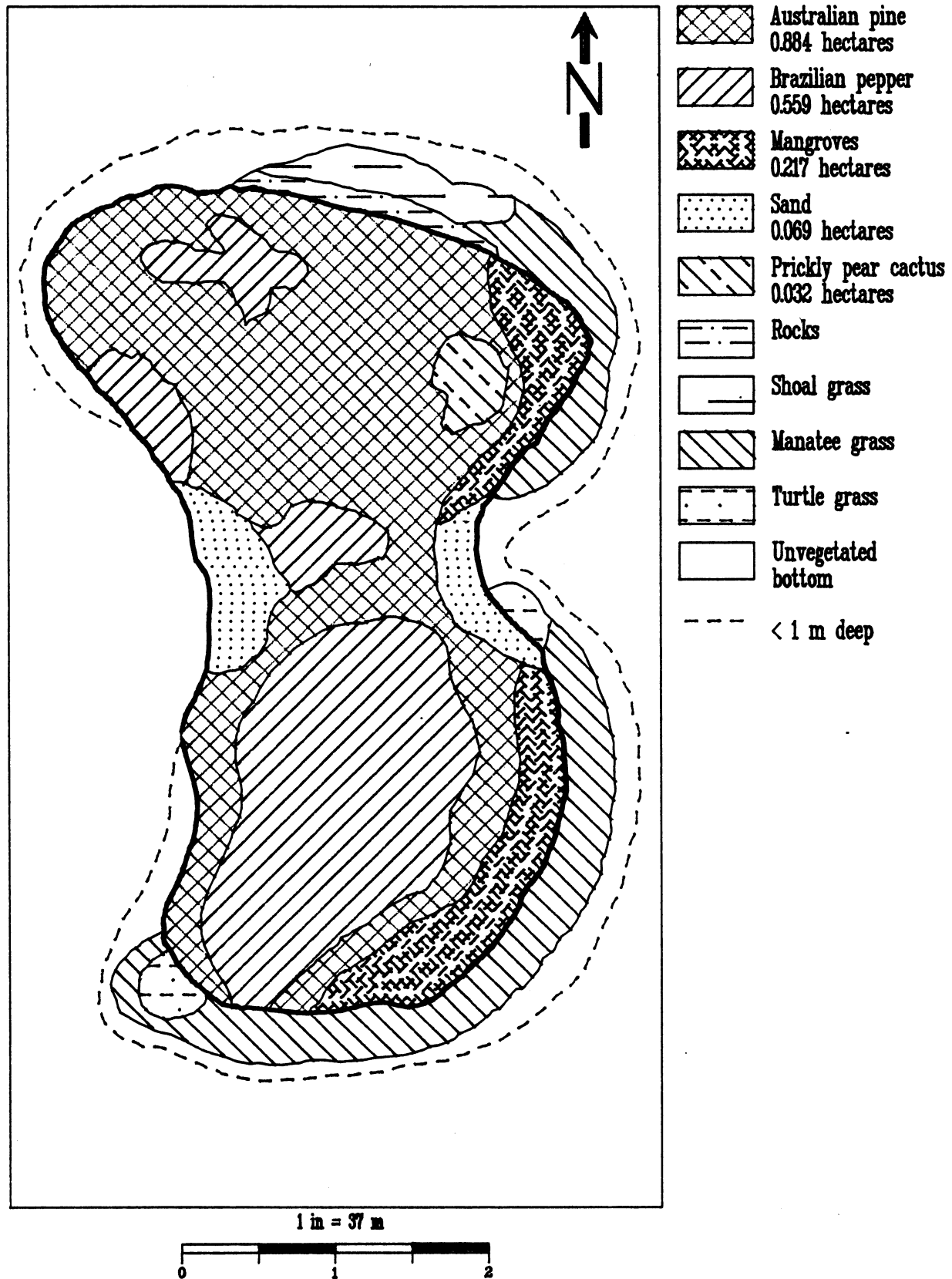
- A. Dominant Terrestrial Vegetation
Brazilian pepper (83%), Australian pine (72%), 21 total species
- B. Soil humus: 5 cm
- C. Seagrasses
Shoal grass on north side, manatee grass on south side and turtle grass on east side
- D. Bird Usage
Turkey vulture, sandpipers and osprey common, 6 species total; 1 nest
- E. Common Fishes and Invertebrates
Menhaden, mojarra, red drum, 13 fish species total; grass, arrow and humpback shrimps, 4 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus; special concern: osprey, brown pelican, little blue heron

III. Recommended usage: Passive Recreation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. Good deep water and open beach access, particularly on the west side, low terrestrial plant diversity and lack of nesting birds suggest passive recreation would be an appropriate use for this island. Construction of permanent structures is not recommended at this time due to the dense vegetation throughout much of the island. If the Brazilian peppers were removed at some future point, reclassification for active recreation might be appropriate.

SPOIL ISLAND SL7



ISLAND NO. SL8

Date Sampled: 2 May 1988

I. Physical Description

- A. Island Size: 1.608 hectares
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 4.5 km from North Bridge
- D. Distance and Direction from Channel Marker: 385 m east of marker 176
- E. Erosion: Some on south end
- F. Boating access: South and east sides; open beaches, 2 m deep

II. Biological Description

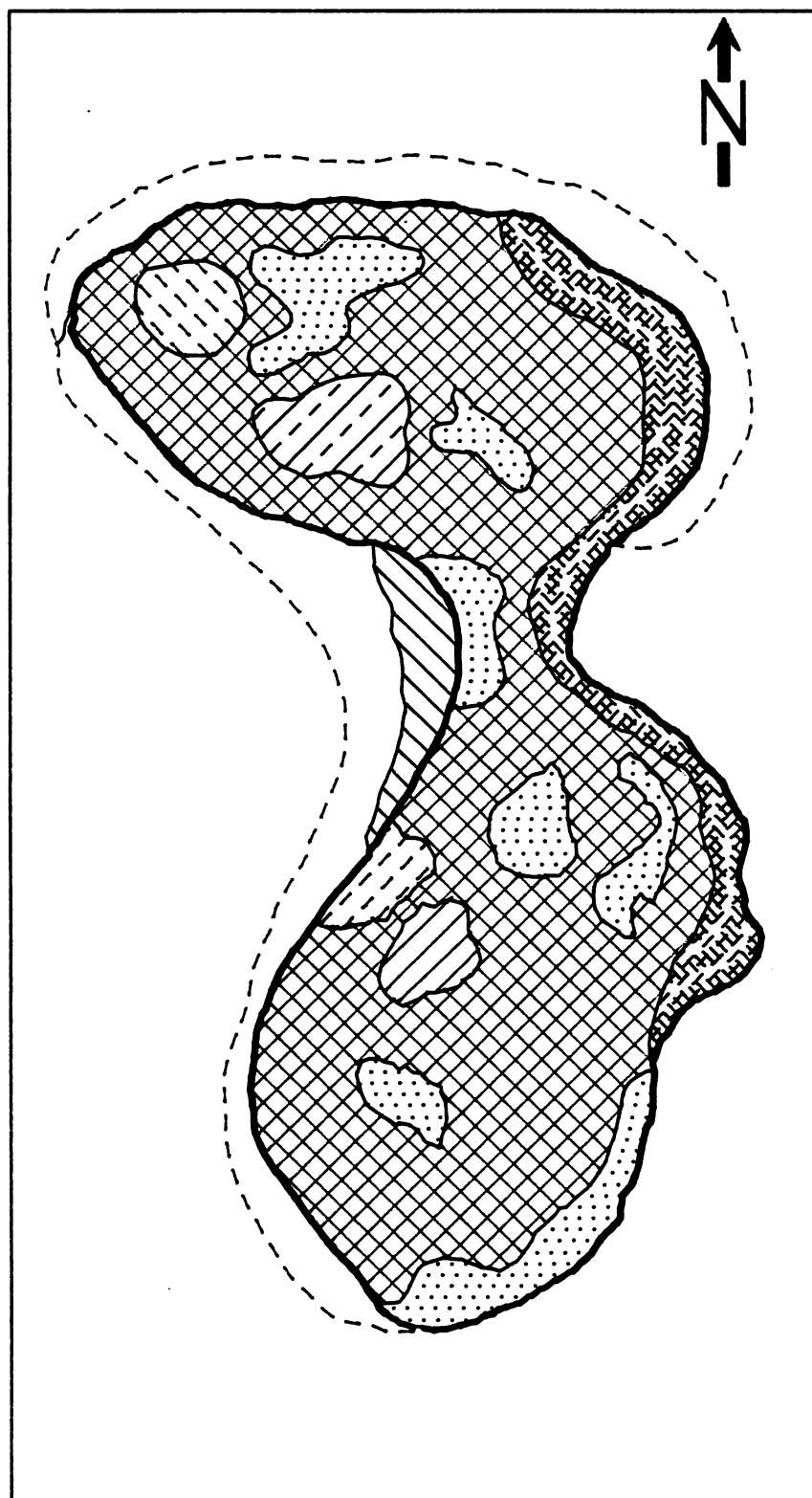
- A. Dominant Terrestrial Vegetation
Australian pine (74%), Brazilian pepper (53%), Madagascar periwinkle (13%), varnish leaf (13%); 71 species total
- B. Soil humus: 2 cm
- C. Seagrasses
Manatee grass on west side of island
- D. Bird Usage
Black vulture, solitary sandpiper, ovenbird and American redstart most common, 12 species total; 1 nest
- E. Common Fishes and Invertebrates
Mojarra, 8 fish species total; 3 invertebrate species total, none common
- F. Threatened, endangered or species of special concern
Special concern: brown pelican, osprey

III. Recommended usage: Active Recreation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and has received the highest human activity of all the islands in St. Lucie County. There is good deep water and open beach access on two sides of the island, no significant seagrass beds and few nesting birds. Additionally, the southern portion of the island is clear of dense underbrush and could easily support pavilions, picnic tables, fireplaces and sanitary facilities as well as a dock. There is high plant diversity on this island, many of which are exotics that have escaped from cultivation, but the island is otherwise well suited for active recreation.

SPOIL ISLAND SL8



-  Australian pine
1074 hectares
-  Sand
0.229 hectares
-  Mangroves
0.168 hectares
-  Greenbriar
0.052 hectares
-  Varnish leaf
0.033 hectares
-  Brazilian pepper
0.028 hectares
-  Cabbage palm
0.024 hectares
-  Manatee grass
-  Unvegetated bottom
-  < 1 m deep

1 in = 37 m



ISLAND NO. SL9

Date Sampled: 31 March 1988

I. Physical Description

- A. Island Size: 0.353 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 1.8 km north of North Bridge
- D. Distance and Direction from Channel Marker: 600 m northeast of marker 178
- E. Erosion: None
- F. Boating access: South end; small beach, 2 m deep

II. Biological Description

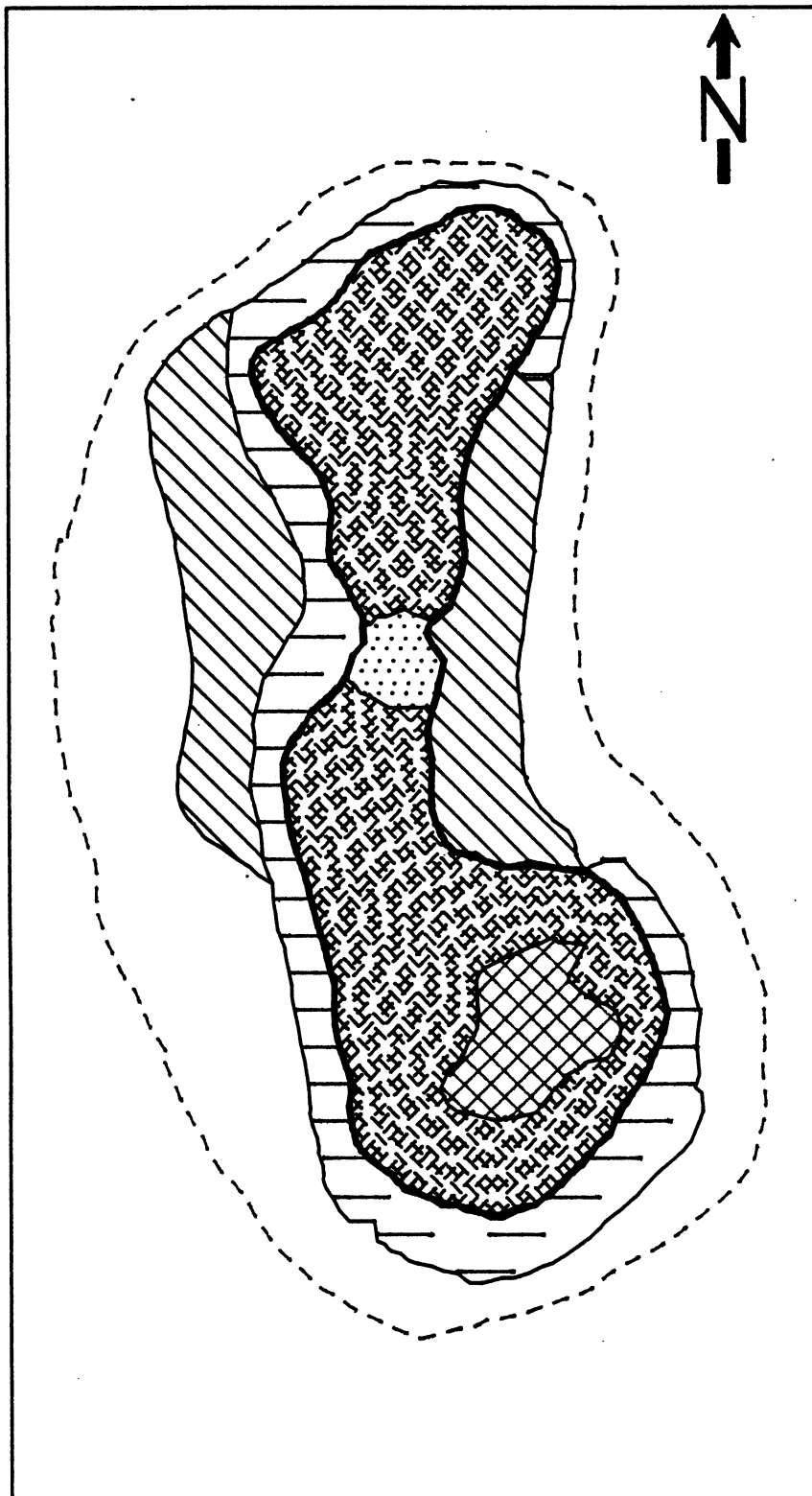
- A. Dominant Terrestrial Vegetation
White mangrove (31%), red mangrove (26%), black mangrove (15%),
Brazilian pepper (13%); 10 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north, west, and south sides, manatee grass on west and east
sides, turtle grass on south side
- D. Bird Usage
Nesting great blue herons, 2 species, 2 nests
- E. Common Fishes and Invertebrates
Spot and ladyfish common, 14 fish species total; grass shrimp common, 6
invertebrate species total
- F. Threatened, endangered or species of special concern
Special Concern: brown pelican

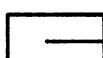
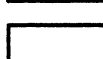
III. Recommended usage: Conservation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. The island is covered by mangroves, has no open areas for recreation and is used by nesting great blue herons. In addition, productive seagrass beds surround the island on all four sides. Therefore, this island ought to be reserved for conservation purposes.

SPOIL ISLAND SL9



-  Mangroves
0.306 hectares
-  Australian pine
0.035 hectares
-  Sand
0.012 hectares
-  Shoal grass
-  Manatee grass
-  Unvegetated bottom
-  < 1 m deep

1 in = 25 m



ISLAND NO. SL10

Date Sampled: 7 December 1988

I. Physical Description

- A. Island Size: 0.427 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 1.6 km north of North Bridge
- D. Distance and Direction from Channel Marker: 143 m northeast of marker 178
- E. Erosion: None
- F. Boating access: None; no open beaches, <1 m deep on all sides

II. Biological Description

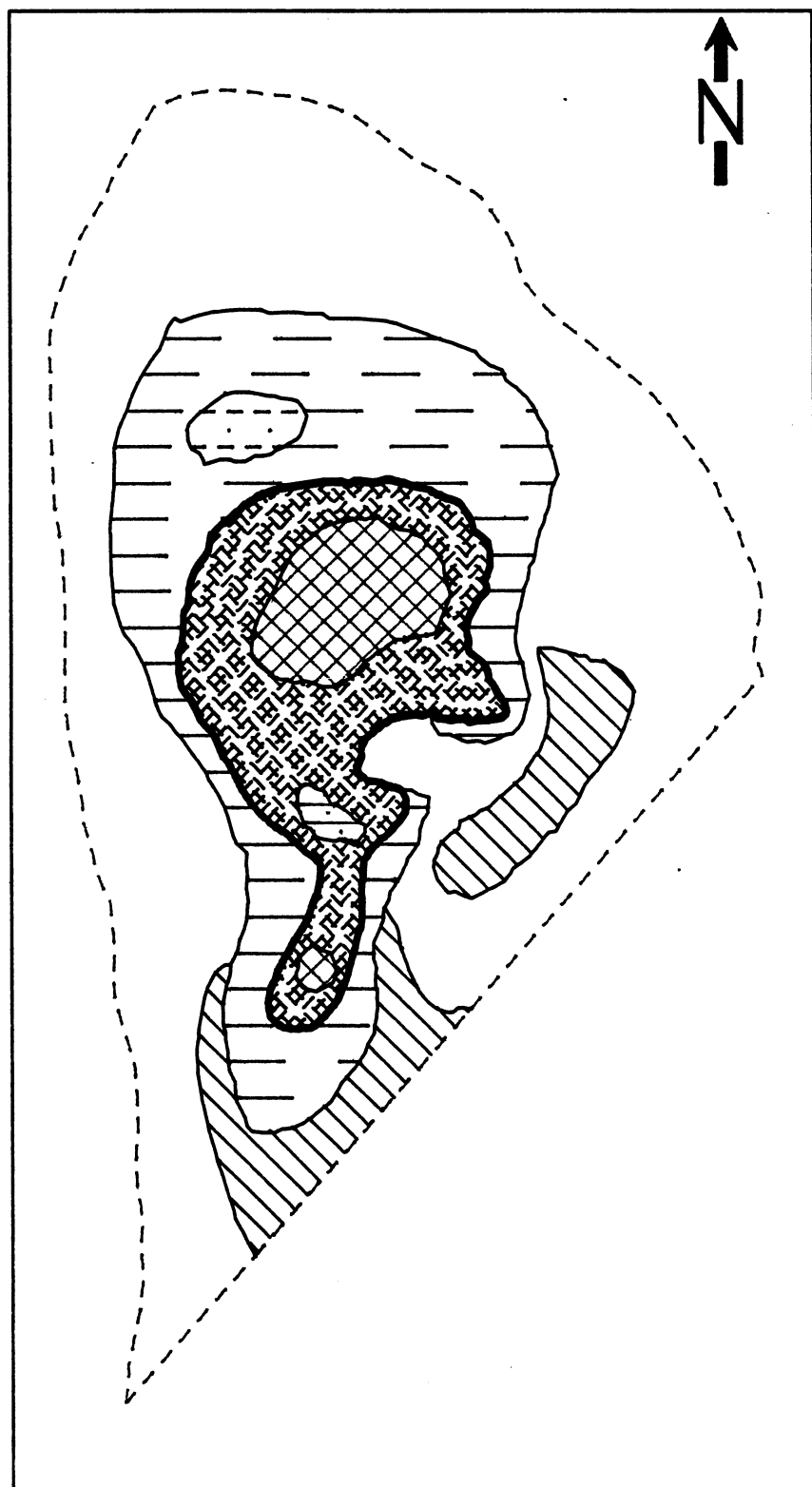
- A. Dominant Terrestrial Vegetation
Red mangrove (28%), black mangrove (23%), Australian pine (16%), Brazilian pepper (12%); 10 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north, west and south sides, manatee grass on west, south and east sides, turtle grass on north side
- D. Bird Usage
Great blue herons nest on this island; 3 species total, 4 nests
- E. Common Fishes and Invertebrates
Mojarras and gulf pipefish common, 11 fish species total; penaeid, arrow, grass and humpback shrimps common, 11 invertebrate species total
- F. Threatened, endangered or species of special concern
None

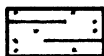
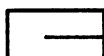
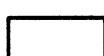
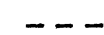
III. Recommended usage: Conservation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and is used by nesting great blue herons. In addition, the island is covered with mangroves, has no boating access and has highly productive seagrass beds on all four sides. Thus, this island should be reserved for conservation.

SPOIL ISLAND SL10



-  **Mangroves**
0.305 hectares
-  **Australian pine**
0.111 hectares
-  **Gray nicker**
0.011 hectares
-  **Shoal grass**
-  **Manatee grass**
-  **Turtle grass**
-  **Unvegetated bottom**
-  **< 1 m deep**

1 in = 30 m



ISLAND NO. SL11

Date Sampled: 11 April 1988

I. Physical Description

- A. Island Size: 1.912 hectares
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 4 km from North Bridge
- D. Distance and Direction from Channel Marker: 330 km northeast of marker 178
- E. Erosion: None
- F. Boating access: North; no open beaches, 1 m deep

II. Biological Description

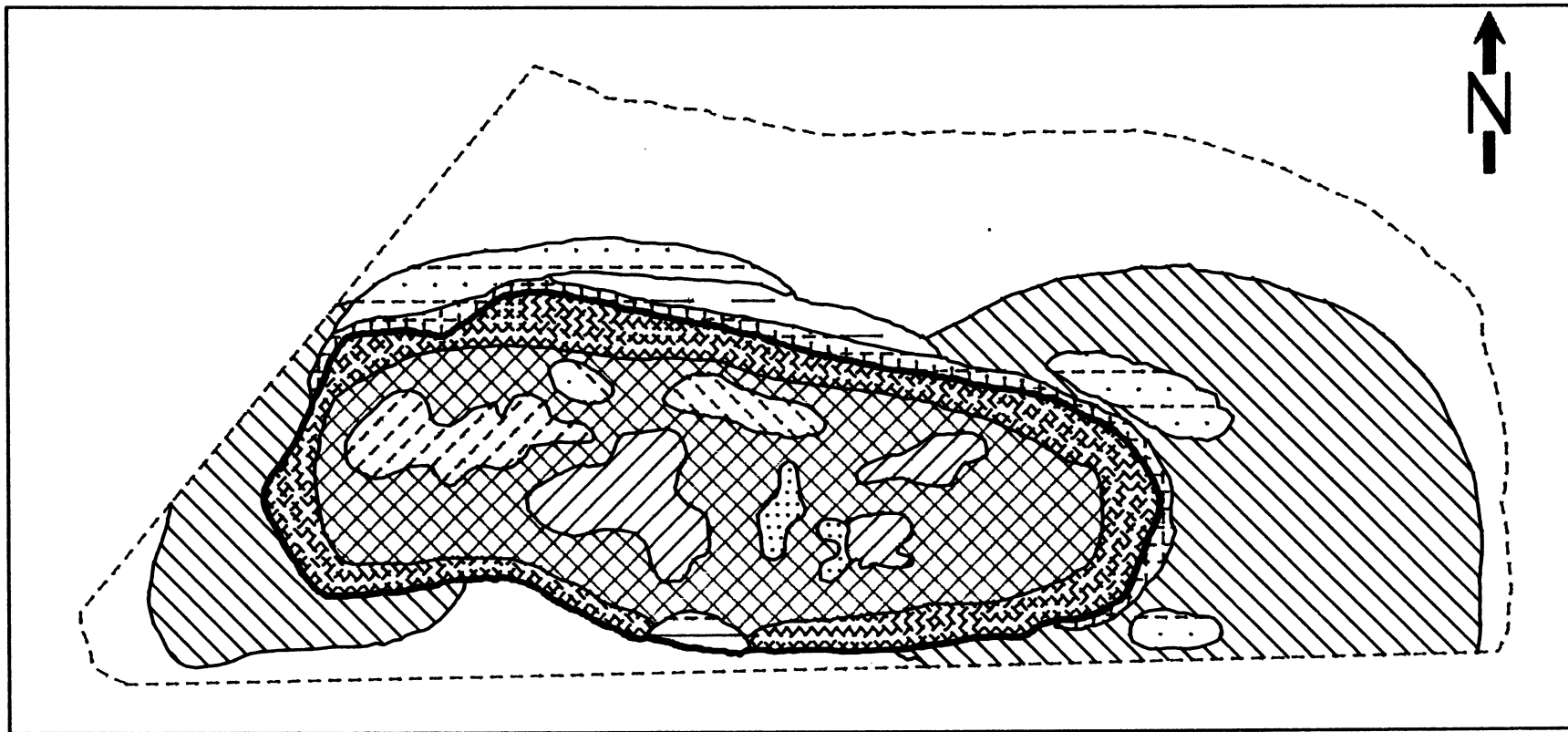
- A. Dominant Terrestrial Vegetation
Australian pine (76%), Brazilian pepper (52%), varnish leaf (7%); 74 species total
- B. Soil humus: 11 cm
- C. Seagrasses
Shoal grass on north and west sides, manatee grass on east side
- D. Bird Usage
Red-bellied woodpecker, black vulture and fish crow common, 10 species total; no nests
- E. Common Fishes and Invertebrates
Ladyfish, pinfish, mojarra, 12 fish species total; oysters, north and east sides; grass and arrow shrimp; 10 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus

III. Recommended usage: Conservation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and has a high floral and faunal species diversity. Additionally, the island is surrounded by shallow water and grassbeds, has no open beach access and has high soil humus, making it an ideal candidate for future revegetation efforts. Therefore, even though this island has a history of high human usage, the current recommended usage is conservation with the potential for future revegetation.

SPOIL ISLAND SL11



1 in = 50 m



 Australian pine 0.972 hectares	 Varnish leaf 0.045 hectares	 Oysters	 Unvegetated bottom
 Mangroves 0.536 hectares	 Sand 0.031 hectares	 Shoal grass	 < 1 m deep
 Brazilian pepper 0.179 hectares	 Sea oxeye 0.022 hectares	 Manatee grass	
 Cabbage palm 0.110 hectares	 Christmas berry 0.016 hectares	 Turtle grass	

ISLAND NO. SL12

Date Sampled: 17 June 1988

I. Physical Description

- A. Island Size: 1.542 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 4.4 km from North Bridge
- D. Distance and Direction from Channel Marker: 330 m east of marker 178
- E. Erosion: None
- F. Boating access: North side; no open beach, 1.2 m deep

II. Biological Description

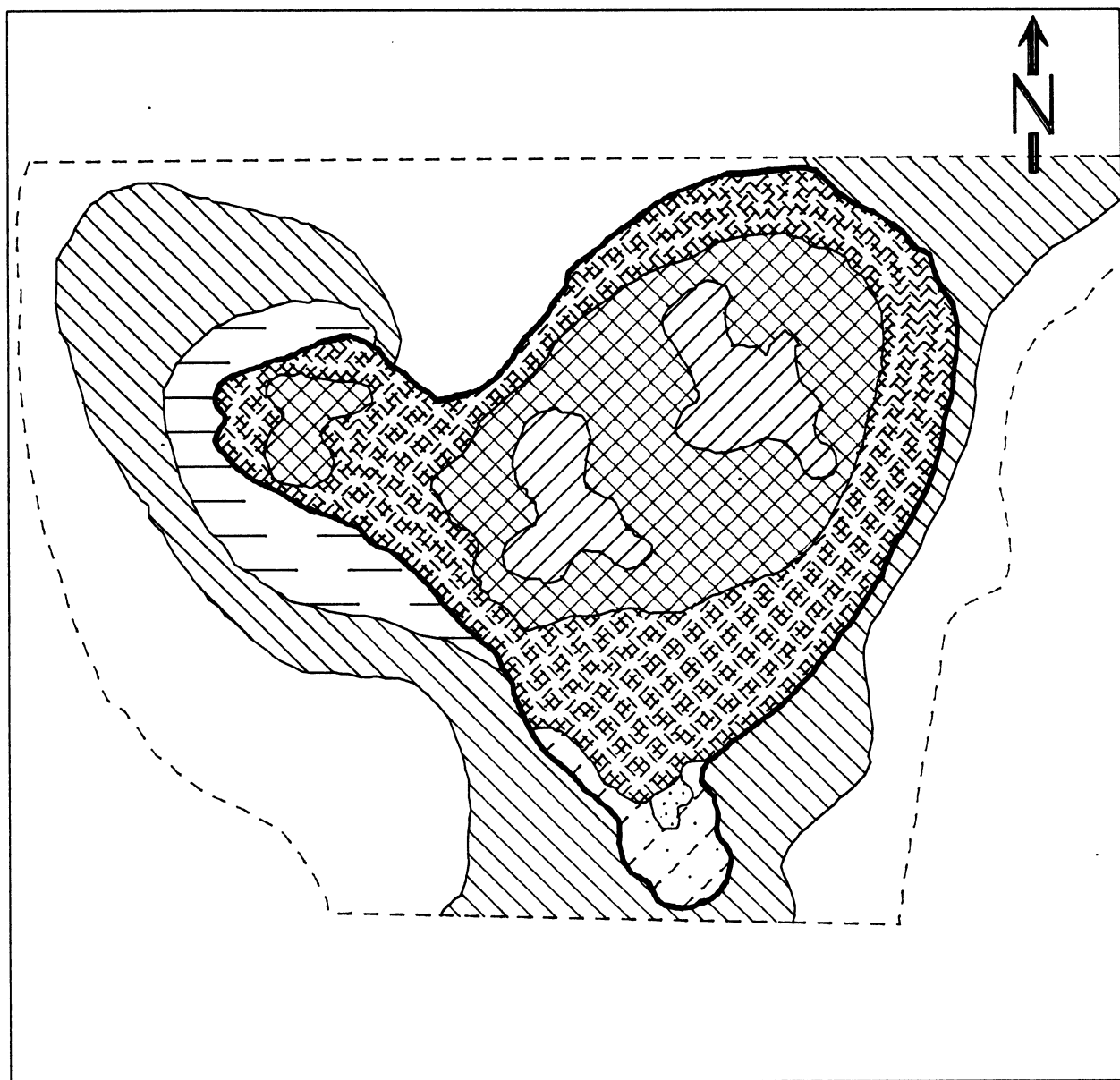
- A. Dominant Terrestrial Vegetation
Australian pine (80%), Brazilian pepper (63%), black mangrove (27%), red mangrove (23%), white mangrove (13%); 32 species total
- B. Soil humus: 4 cm
- C. Seagrasses
Shoal and manatee grasses on south and west sides
- D. Bird Usage
Green heron common, 6 species total; no nests
- E. Common Fishes and Invertebrates
Mojarra, pinfish, tidewater silverside, 16 fish species total; grass and penaeid shrimps, 3 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: little blue heron

III. Recommended usage: Conservation

IV. Comments

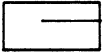
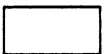
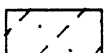
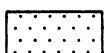
This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. The water is shallow all around the island except for a small, unmarked channel leading into the deeper northern side, where there is no open beach access. In addition, the productive seagrass beds support a high diversity of fishes and many birds were observed on the island although none were nesting. Finally, the island harbors a dense mosquito population that would make any recreational activities uncomfortable. Therefore, it is recommended that this island be set aside for conservation purposes.

SPOIL ISLAND SL12



1 in = 41 m



	Mangroves 0.744 hectares		Shoal grass
	Australian pine 0.547 hectares		Manatee grass
	Brazilian pepper 0.175 hectares		Unvegetated bottom
	Grass 0.069 hectares		< 1 m deep
	Sand 0.007 hectares		

ISLAND NO. SL12A

Date Sampled: 7 December 1988

I. Physical Description

- A. Island Size: 0.197 hectares
- B. Height Above Mean High Water: 1 meter
- C. Distance from Boat Ramps: 1.46 km north of North Bridge
- D. Distance and Direction from Channel Marker: 127 m east of marker 178
- E. Erosion: Slight, northwest side
- F. Boating access: West; open beach, 1.7 m deep

II. Biological Description

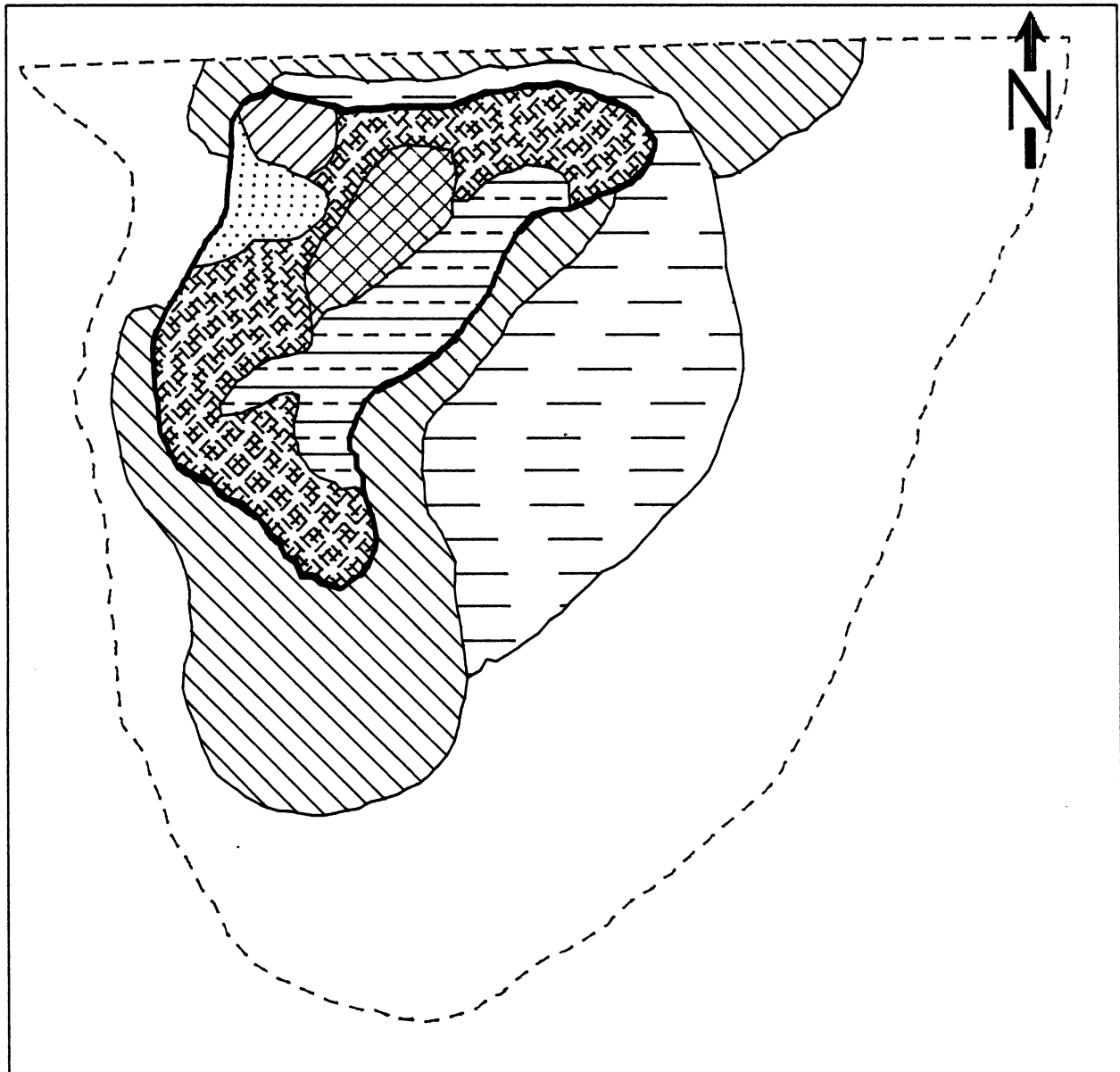
- A. Dominant Terrestrial Vegetation
Sea oxeye (23%), Australian pine (13%), black mangrove (13%), Brazilian pepper (13%), red mangrove (13%), white mangrove (13%); 13 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north and east sides, manatee grass on north, east and south sides
- D. Bird Usage
One kingfisher seen on island; no nests
- E. Common Fishes and Invertebrates
Bay anchovy and mojarra common, 10 fish species total; grass and humpback shrimps common, 10 invertebrate species total
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Passive Recreation

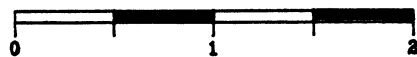
IV. Comments

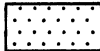
This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and has good deep water and open beach access on the west side. There are no nesting birds or threatened plants on the island and it has been used historically for recreation. This island should continue to be used for passive recreation. Development for active recreation is not recommended due to the small size of the island

SPOIL ISLAND SL12A



1 in = 21 m



	Mangroves 0.101 hectares		Shoal grass
	Sea oxeye 0.050 hectares		Manatee grass
	Australian pine 0.022 hectares		Unvegetated bottom
	Sand 0.013 hectares		< 1 m deep
	Brazilian pepper 0.010 hectares		

ISLAND NO. SL12B

Date Sampled: 7 December 1988

I. Physical Description

- A. Island Size: 0.102 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 1.3 km north of North Bridge
- D. Distance and Direction from Channel Marker: 191 m northeast of marker 179
- E. Erosion: None
- F. Boating access: South side; no open beaches, 1.4 m deep

II. Biological Description

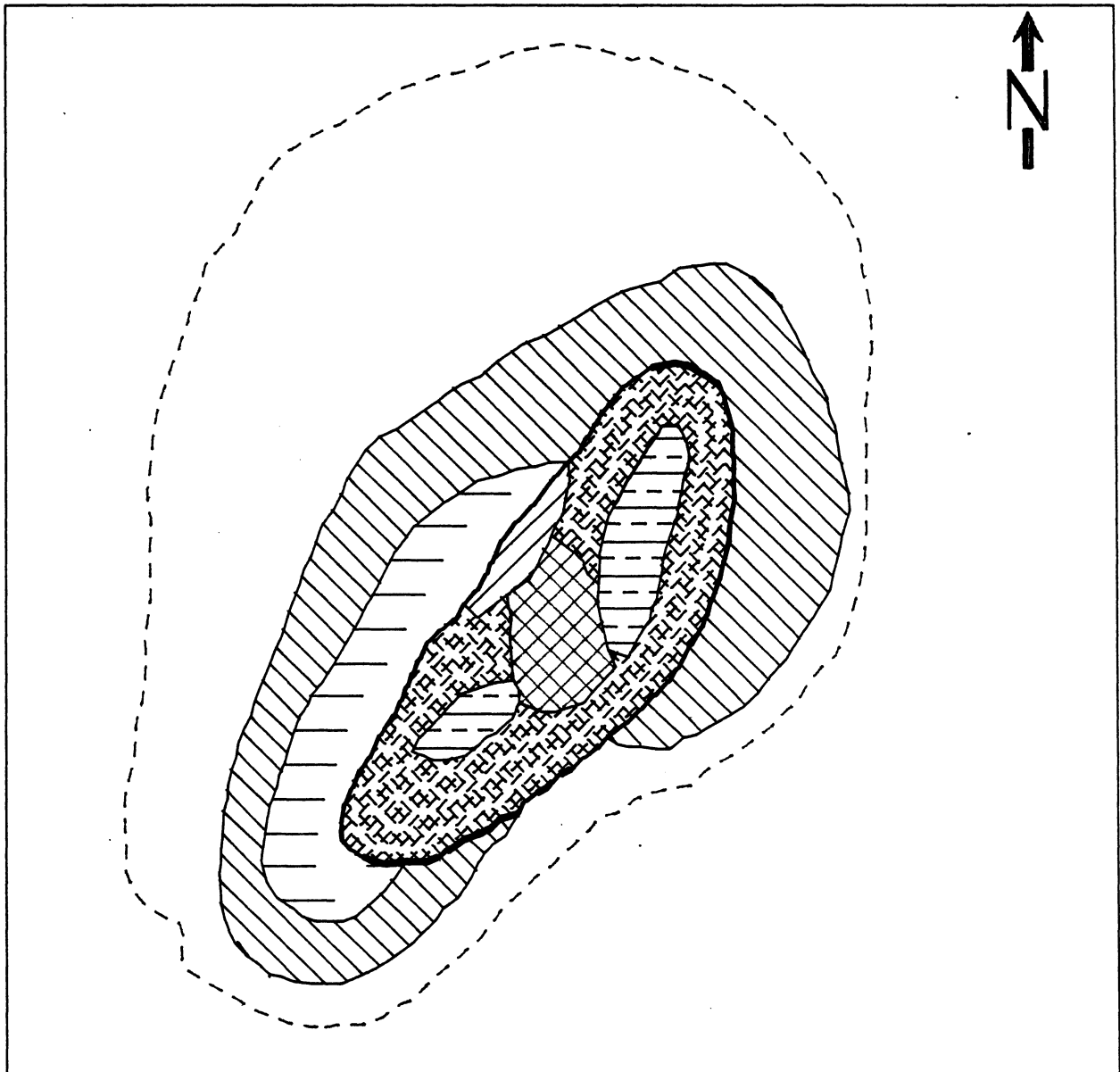
- A. Dominant Terrestrial Vegetation
Buttonwood (21%), Australian pine (16%), black mangrove (16%), Brazilian pepper (16%), sea oxeye (16%); 9 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on west side, manatee grass on west, north and east sides
- D. Bird Usage
The only bird seen on the island was one osprey
- E. Common Fishes and Invertebrates
Mojarras, bay anchovy and gulf pipefish common, 13 fish species total; penaeid, grass, arrow and humpback shrimps common, 8 invertebrate species common
- F. Threatened, endangered or species of special concern
Special concern: osprey

III. Recommended usage: Conservation

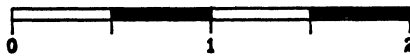
IV. Comments

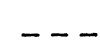
This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. The island has no open beach access and no open areas for recreational use. Mangroves are the dominate vegetation and productive seagrass beds surround three sides of the island. This island should be reserved for conservation.

SPOIL ISLAND SL12B



1 in = 18 m



	Mangroves 0.066 hectares		Manatee grass
	Sea oxeye 0.018 hectares		Unvegetated bottom
	Australian pine 0.014 hectares		< 1 m deep
	Brazilian pepper 0.005 hectares		
	Shoal grass		

ISLAND NO. SL12C

Date Sampled: 7 December 1988

I. Physical Description

- A. Island Size: 0.104 hectares
- B. Height Above Mean High Water: Less than 1 m
- C. Distance from Boat Ramps: 1.2 km north of North Bridge
- D. Distance and Direction from Channel Marker: 44 m northeast of marker 179
- E. Erosion: None
- F. Boating access: East side; no open beaches, 1.6 m deep

II. Biological Description

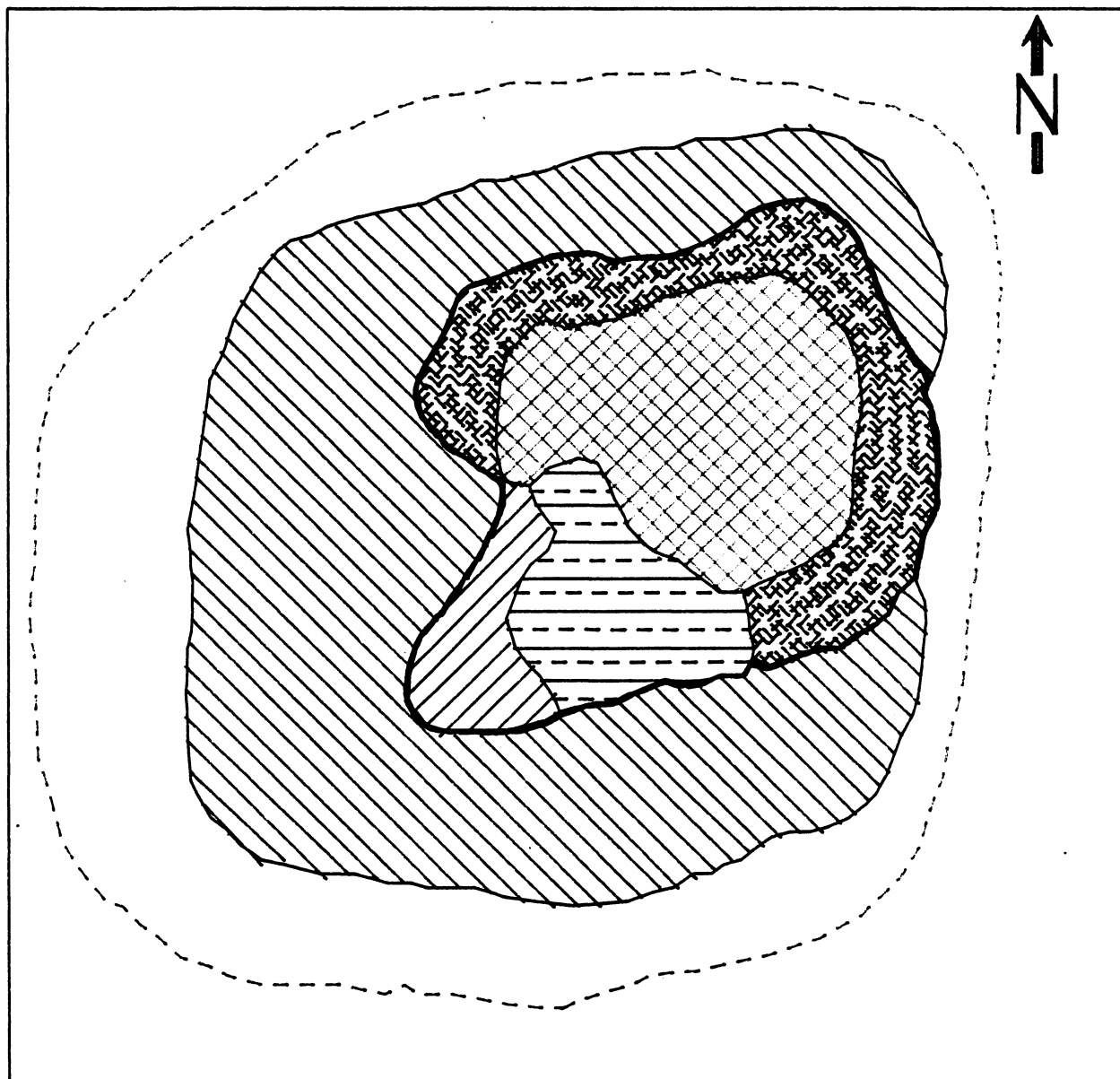
- A. Dominant Terrestrial Vegetation
Brazilian pepper (28%), Australian pine (17%), black mangrove (11%), buttonwood (11%); 10 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Manatee grass on south, west and north sides
- D. Bird Usage
The only bird seen was one belted kingfisher
- E. Common Fishes and Invertebrates
Mojarras, pinfish, gulf pipefish and Atlantic croaker common, 10 fish species total; grass, penaeid, arrow and humpback shrimps common, 11 invertebrate species total
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Conservation

IV. Comments

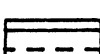
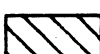
This island is in the Vero Beach to Ft. Pierce Aquatic Preserve, does not have good boating access and is densely vegetated. Mangroves are an important component of the vegetation and the grassbeds support a high diversity of invertebrates. This island has not received much human usage and should be kept for conservation due to the difficulty of access.

SPOIL ISLAND SL12C



1 in = 12 m



- | | | | |
|---|------------------------------------|---|-----------------------|
|  | Australian pine
0.041 hectares |  | Unvegetated
bottom |
|  | Mangroves
0.033 hectares |  | < 1 m deep |
|  | Sea oxeye
0.019 hectares | | |
|  | Brazilian pepper
0.010 hectares | | |
|  | Manatee grass | | |

ISLAND NO. SL13

Date Sampled: 16 October 1987

I. Physical Description

- A. Island Size: 2.014 hectares
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 2.9 km from North Bridge
- D. Distance and Direction from Channel Marker: 330 m east of marker 179
- E. Erosion: Minimal
- F. Boating access: West side; open beach, 1.8 m deep

II. Biological Description

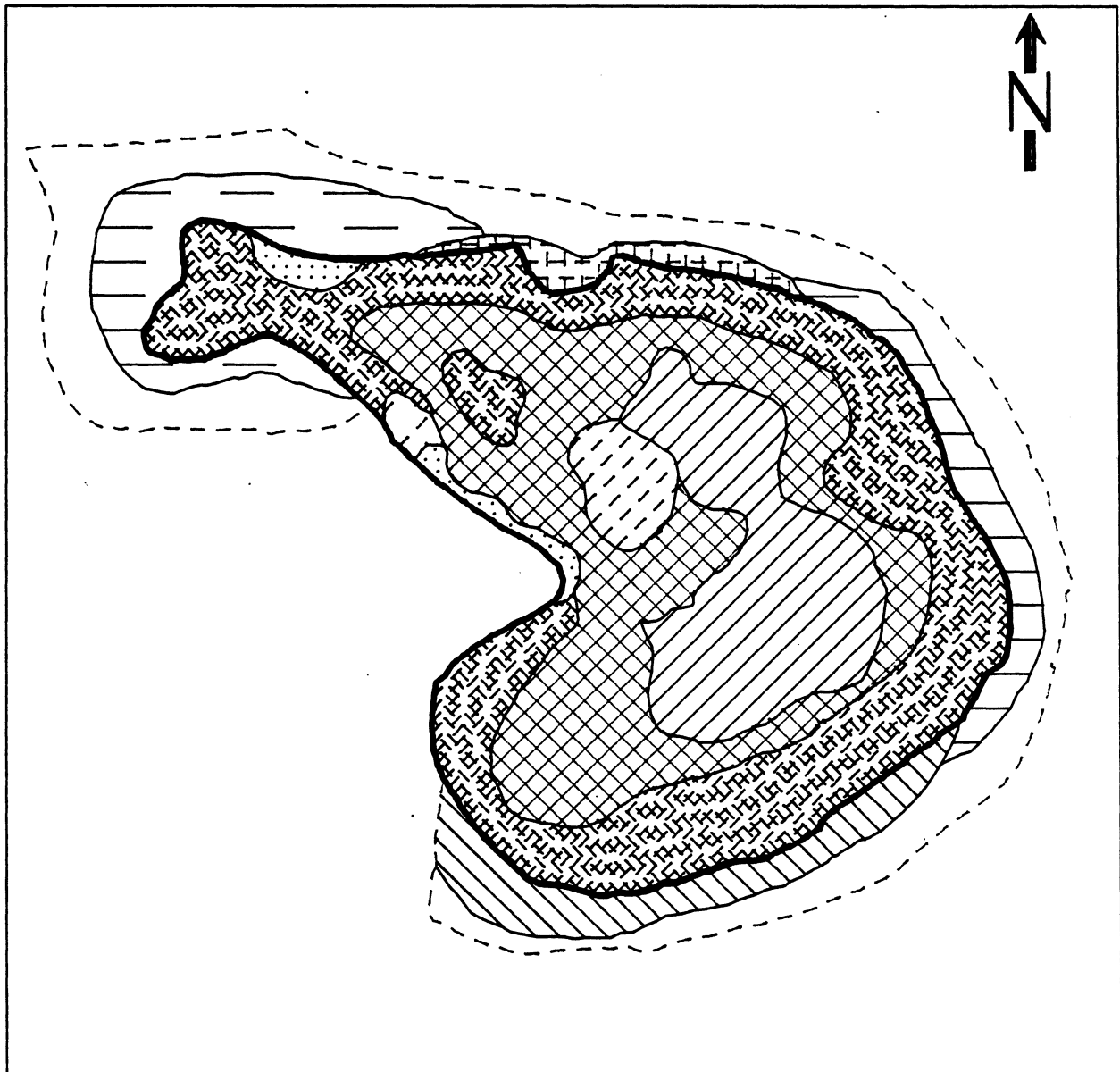
- A. Dominant Terrestrial Vegetation
Brazilian pepper (85%), Australian pine (54%), cabbage palm (27%), 35 species total
- B. Soil humus: 3 cm
- C. Seagrasses
Shoal grass on east side, manatee grass on north, south and east sides
- D. Bird Usage
Turkey vulture, belted kingfisher, great blue heron, little blue heron and blue-gray gnatcatcher most common, 9 species total; no nests
- E. Common Fishes and Invertebrates
Bay anchovy, mojarra, red drum, 7 fish species total; grass shrimp, 3 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: bald eagle; Special concern: osprey, little blue heron

III. Recommended usage: Active Recreation

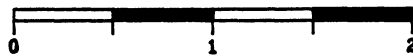
IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. The west side of the island provides excellent deep water and open beach access and is protected from the intracoastal waterway by a small island (SL13B). Although the east and south sides of the islands are ringed by mangroves and many birds were observed on the island, this island is not used for nesting and has no threatened plants. The dense Brazilian pepper in the center of the island could be cleared for the construction of picnic pavilions, barbecue pits, etc., and properly permitted dock construction would be appropriate on the western side of the island.

SPOIL ISLAND SL13



1 in = 44 m



	Mangroves 0.864 hectares		Grass 0.015 hectares	--- < 1 m deep
	Australian pine 0.670 hectares		Oysters	
	Brazilian pepper 0.354 hectares		Shoal grass	
	Cabbage palm 0.064 hectares		Manatee grass	
	Sand 0.046 hectares		Unvegetated bottom	

ISLAND NO. SL13A

Date Sampled: 24 January 1989

I. Physical Description

- A. Island Size: 0.078 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 0.9 km north of North bridge
- D. Distance and Direction from Channel Marker: 191 m southeast of marker 179
- E. Erosion: None
- F. Boating access: North side; open beach, 1.8 m deep

II. Biological Description

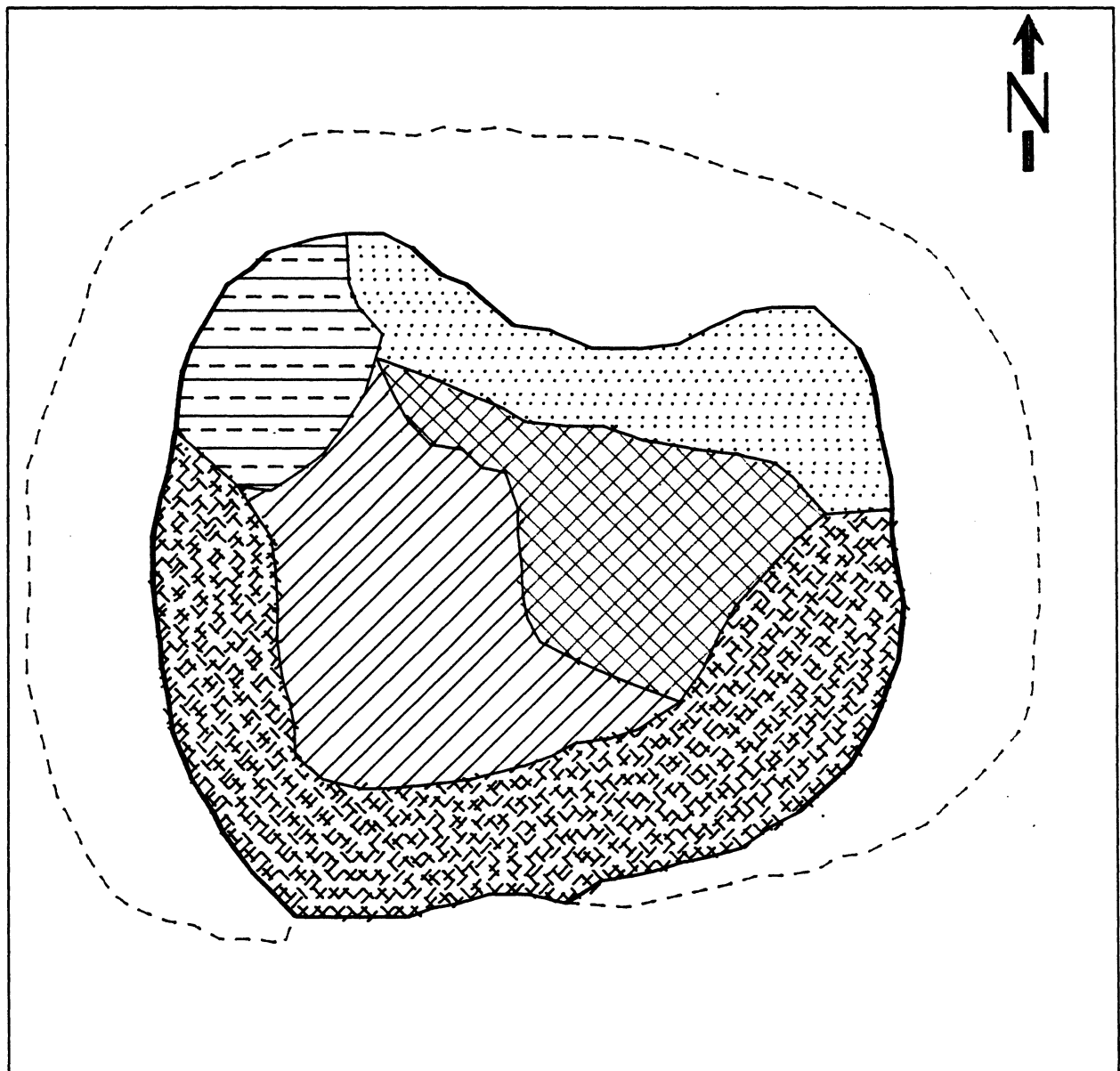
- A. Dominant Terrestrial Vegetation
Brazilian pepper (24%), Australian pine (19%), white mangrove (19%), black mangrove (14%); 11 species total
- B. Soil humus: 0 cm
- C. Seagrasses
None
- D. Bird Usage
The only bird seen was one belted kingfisher
- E. Common Fishes and Invertebrates
Mojarras, striped mullet, spot and Spanish sardine common, 10 fish species; 1 invertebrate species
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Passive Recreation

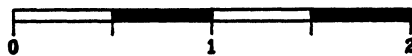
IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and has received some human activity. Access on the north side is good and floral and faunal diversity are low on the island, making it an excellent choice for recreation. The island is too small, however, to support development for active recreation.

SPOIL ISLAND SL13A



1 in = 8 m



	Mangroves 0.028 hectares		Unvegetated bottom
	Brazilian pepper 0.018 hectares	---	< 1 m deep
	Australian pine 0.012 hectares		
	Sand 0.012 hectares		
	Sea oxeye 0.007 hectares		

ISLAND NO. SL13B

Date Sampled: 24 January 1989

I. Physical Description

- A. Island Size: 0.155 hectares
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 1.1 km north of North Bridge
- D. Distance and Direction from Channel Marker: 24 m east of marker 179
- E. Erosion: None
- F. Boating access: East side; small beach, 2 m deep

II. Biological Description

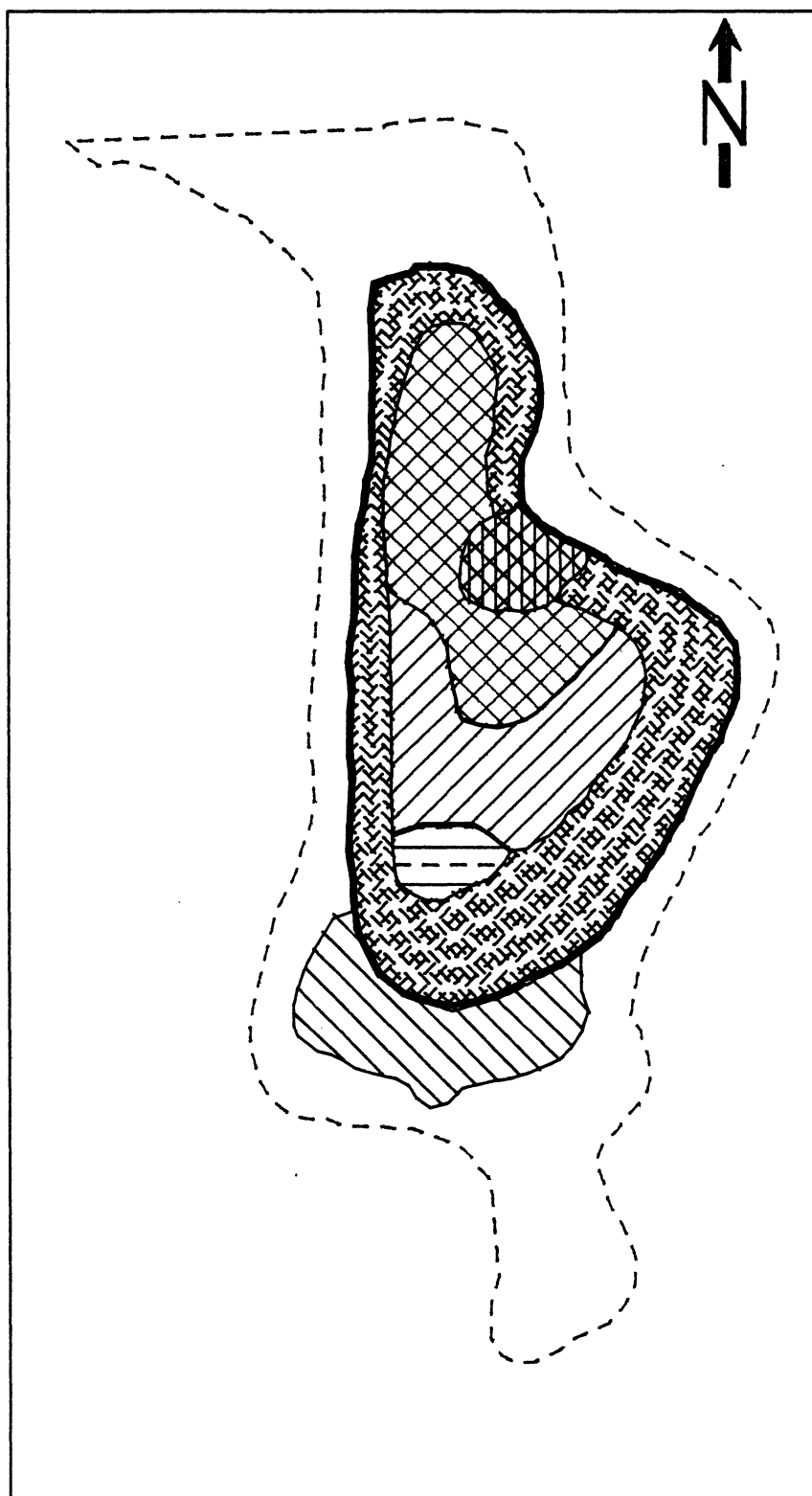
- A. Dominant Terrestrial Vegetation
Brazilian pepper (31%), Australian pine (23%), red mangrove (12%), white mangrove (12%); 17 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Manatee grass on west side
- D. Bird Usage
No birds were seen on this island the day of the survey
- E. Common Fishes and Invertebrates
Mojarras and spot common, 10 fish species total; grass shrimps common, 4 invertebrate species total
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Passive Recreation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and does receive some human use. It has excellent deep water access and open areas for primitive camping. The floral and faunal diversity is low and there are few seagrasses around the island. This island should remain designated for passive recreation, as it is not large enough to support development for active recreation.

SPOIL ISLAND SL13B



-  Mangroves
0.078 hectares
-  Australian pine
0.034 hectares
-  Brazilian pepper
0.030 hectares
-  Sea grape
0.008 hectares
-  Sea oxeye
0.006 hectares
-  Manatee grass
-  Unvegetated
bottom
-  < 1 m deep

1 in = 17 m



ISLAND NO. SL13C

Date Sampled: 24 January 1989

I. Physical Description

- A. Island Size: 0.081 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 1.16 km north of North Bridge
- D. Distance and Direction from Channel Marker: 34 m northeast of marker 179
- E. Erosion: None
- F. Boating access: North side; no open beaches, 1.8 m deep

II. Biological Description

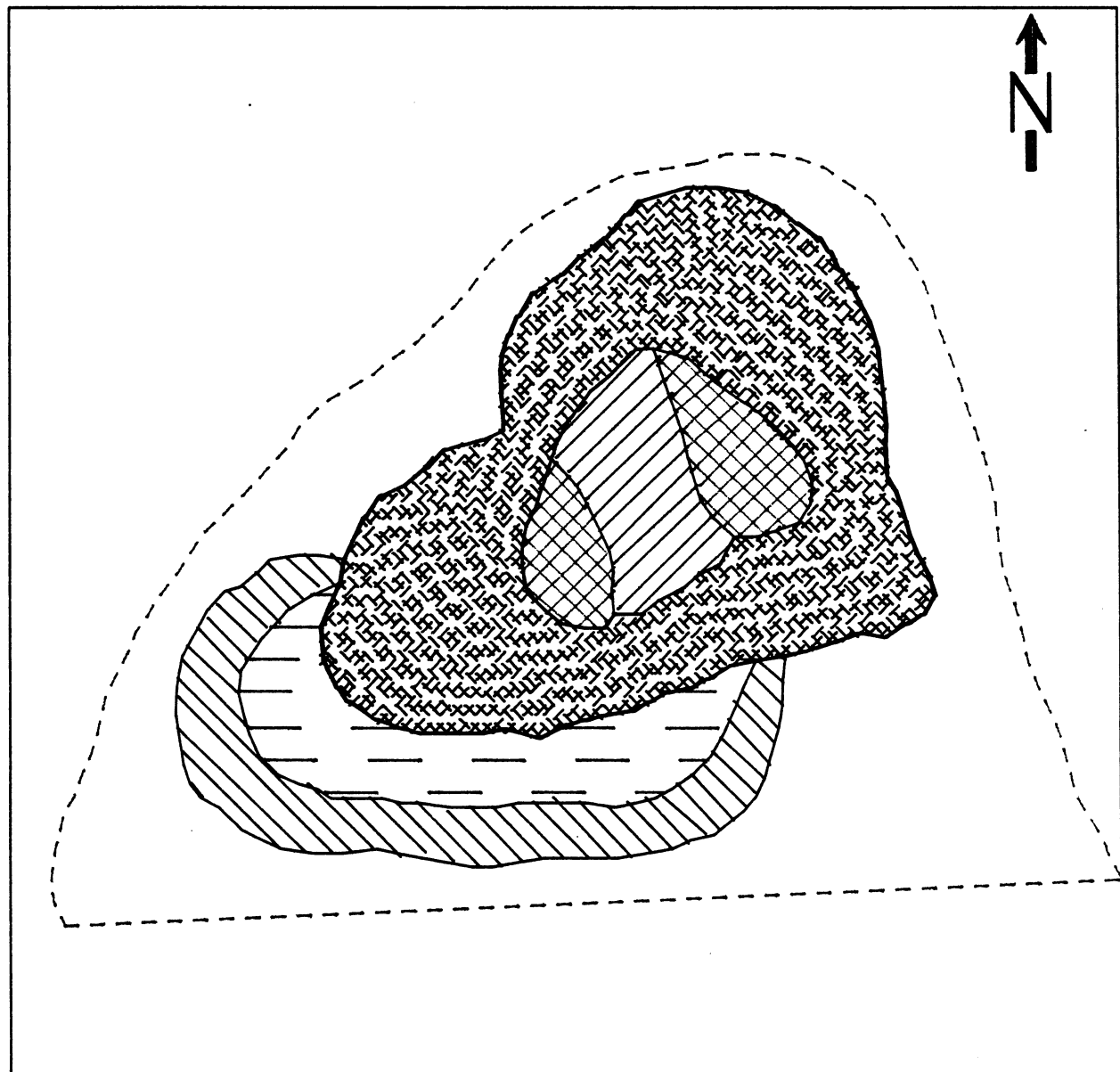
- A. Dominant Terrestrial Vegetation
Australian pine (21%), black mangrove (21%), Brazilian pepper (21%), red mangrove (16%); 10 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass and manatee grass on south side
- D. Bird Usage
One great blue heron was seen on this island; no nests
- E. Common Fishes and Invertebrates
Spot, striped mullet and mojarras common, 11 fish species total; grass shrimps common, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Conservation

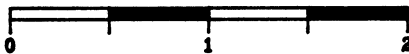
IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. There is no easy access into this island, few open areas in the interior and the island receives little human use. Thus, it should be set aside for conservation.

SPOIL ISLAND SL13C



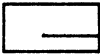
1 in = 11 m



 Mangroves
0.062 hectares

 Australian pine
0.010 hectares

 Brazilian pepper
0.010 hectares

 Shoal grass

 Manatee grass

 Unvegetated
bottom

--- < 1 m deep

ISLAND NO. SL14

Date Sampled: 8 October 1987

I. Physical Description

- A. Island Size: 2.994 hectares
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 1.6 km from North Bridge
- D. Distance and Direction from Channel Marker: 385 m southeast of marker 180
- E. Erosion: Slight erosion on east and north sides
- F. Boating access: West side, open beach, 1 m deep

II. Biological Description

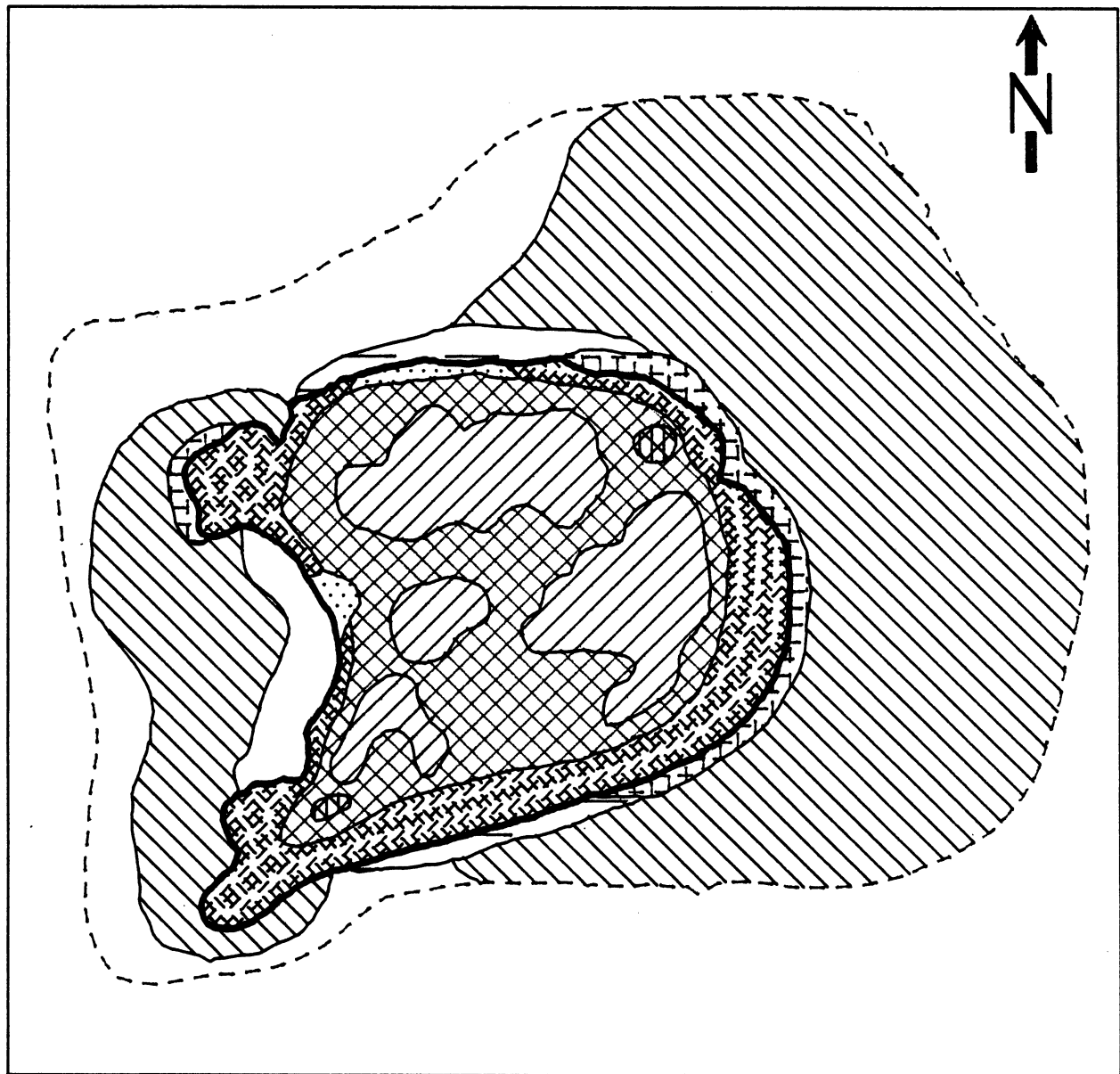
- A. Dominant Terrestrial Vegetation
Australian pine (80%), Brazilian pepper (77%), 23 species total
- B. Soil humus: 5 cm
- C. Seagrasses
Shoal grass on north and south sides, manatee grass on east, west and north sides
- D. Bird Usage
Brown pelican, double crested cormorants, osprey common, 6 species total; 31 nests. Important nesting and loafing island
- E. Common Fishes and Invertebrates
Mojarra, red drum, 7 fish species total; oysters on north, west and east sides, grass shrimp common, 3 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: osprey, brown pelican

III. Recommended usage: Conservation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. It is heavily used by loafing and nesting birds, has thick seagrass beds, mangroves lining the south and east sides and many oysters on the northern side. Shallow water and grassbeds between the Intracoastal Waterway and the open beach on the western side of the island severely limit access. Additionally, the interior of this island is almost impenetrable due to dense vegetation. Therefore, it is recommended this island be designated for conservation.

SPOIL ISLAND SL14



1 in = 64 m



	Australian pine 1.191 hectares		Oysters
	Mangroves 0.866 hectares		Shoal grass
	Brazilian pepper 0.851 hectares		Manatee grass
	Sand 0.060 hectares		Unvegetated bottom
	Sea grape 0.026 hectares		< 1 m deep

ISLAND NO. SL14A

Date Sampled: 13 July 1988

I. Physical Description

- A. Island Size: 0.362 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 1.2 km from North Bridge
- D. Distance and Direction from Channel Marker: 605 m northeast of marker 181
- E. Erosion: None
- F. Boating access: Poor; no open beaches, <1 m deep all around

II. Biological Description

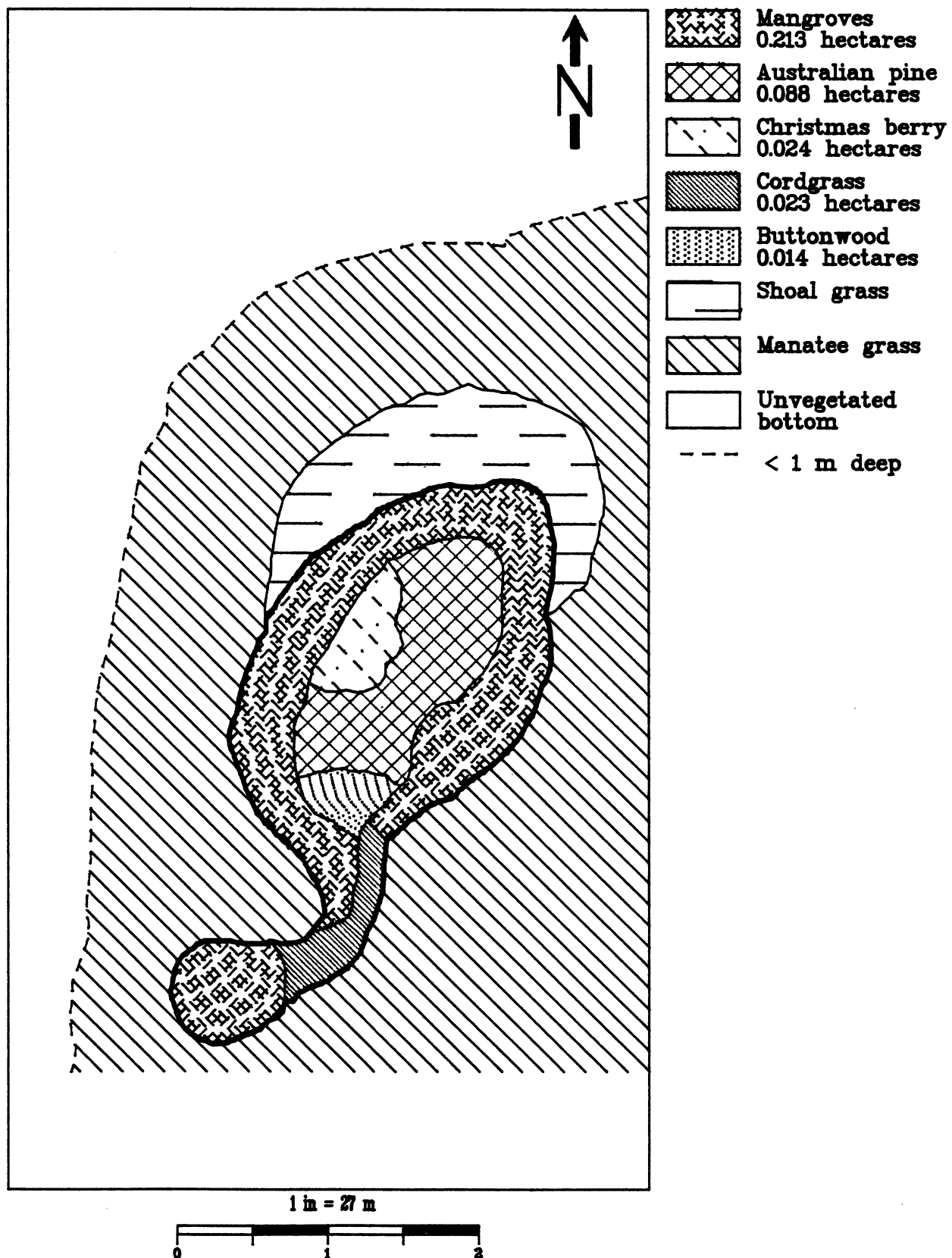
- A. Dominant Terrestrial Vegetation
Brazilian pepper (47%), white mangrove (47%), black mangrove (42%), Australian pine (26%), life plant (26%), red mangrove (26%), African bowstring hemp (21%), 33 species total
- B. Soil humus: 5 cm
- C. Seagrasses
Shoal and manatee grasses on all sides
- D. Bird Usage
No common birds, 4 species total; no nests
- E. Common Fishes and Invertebrates
Mojarra, gulf pipefish, pinfish, 10 fish species total; grass and arrow shrimps; 7 invertebrate species total
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Conservation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. There are extensive, dense seagrass beds surrounding the island and there is no deep water or open beach access. The floral diversity of the island is increased by exotic plants escaped from cultivation. The small size and inaccessibility of this island make it a good candidate for conservation.

SPOIL ISLAND SL14A



ISLAND NO. SL14B

Date Sampled: 16 May 1988

I. Physical Description

- A. Island Size: 0.136 hectares
- B. Height Above Mean High Water: 0.5-1 m
- C. Distance from Boat Ramps: 2.6 km from North Bridge
- D. Distance and Direction from Channel Marker: 385 m northeast of marker 180
- E. Erosion: None
- F. Boating access: South side; small beach, 1.2 m deep

II. Biological Description

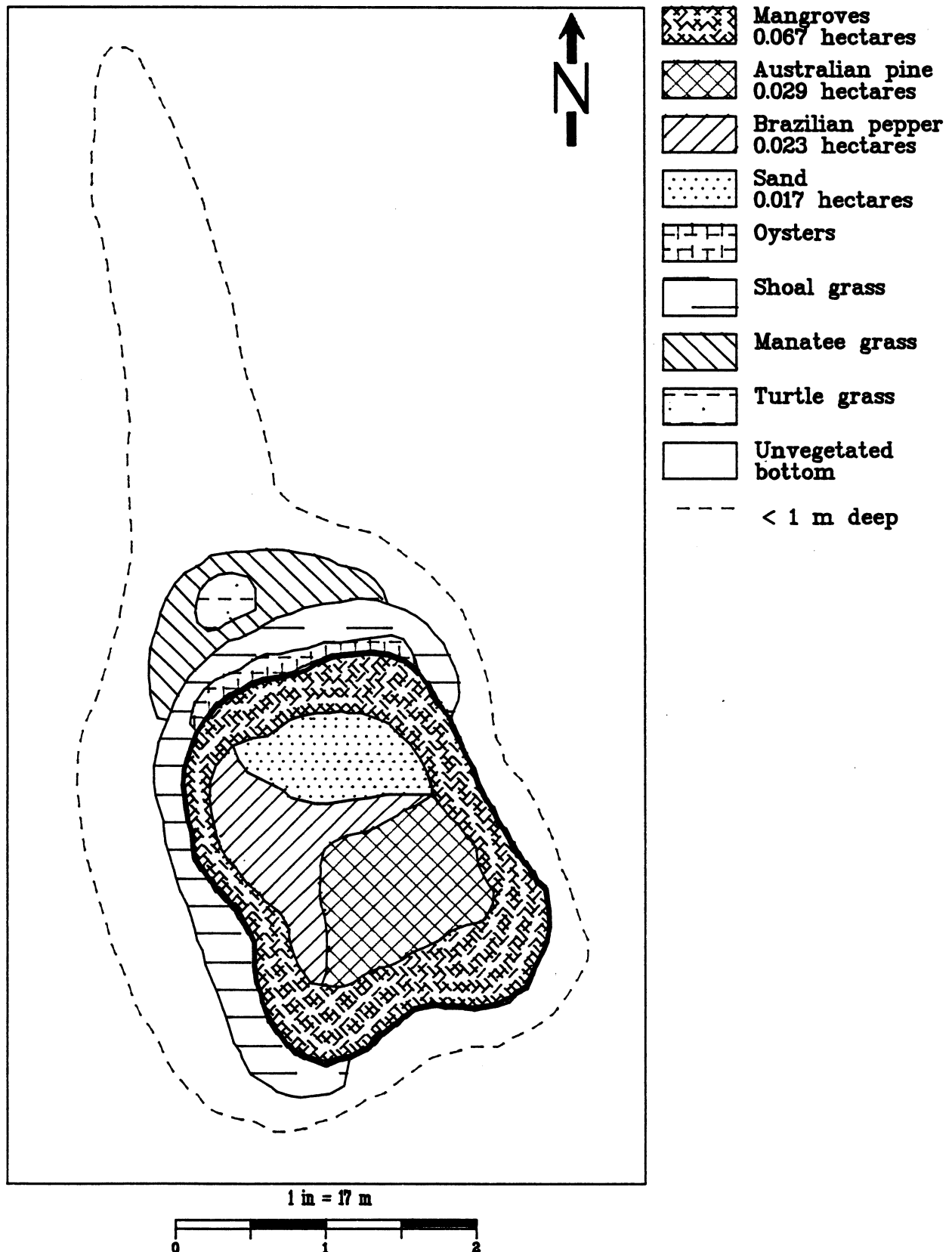
- A. Dominant Terrestrial Vegetation
Brazilian pepper (50%), white mangrove (50%), Australian pine (40%), black mangrove (30%), red mangrove (20%), 20 species total
- B. Soil humus: 2 cm
- C. Seagrasses
Shoal grass on north, south and west sides, manatee and turtle grasses on north side
- D. Bird Usage
Great blue heron and red-bellied woodpecker common, 4 species total; no nests
- E. Common Fishes and Invertebrates
Ladyfish, menhaden, mojarra and pinfish, 11 fish species total; oysters on north, arrow shrimp, 3 invertebrate species total
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Passive Recreation

IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. There is sufficient deep water and a very small beach to the south, low terrestrial diversity with no threatened species or nesting birds and no major seagrass beds. However, this island is too small and too low to justify any development and is therefore recommended for passive recreational usage.

SPOIL ISLAND SL14B



ISLAND NO. SL15A

Date Sampled: 14 October 1987

I. Physical Description

- A. Island Size: 0.395 hectares
- B. Height Above Mean High Water: 1-1.5 m
- C. Distance from Boat Ramps: 1.1 km from North Bridge
- D. Distance and Direction from Channel Marker: 495 m northeast of marker 181
- E. Erosion: Minimal
- F. Boating access: West side; small beach, 1.2 m deep

II. Biological Description

A. Dominant Terrestrial Vegetation

Brazilian pepper (62%), black mangrove (23%), cabbage palm (23%), red mangrove (23%), grasses (15%), Spanish needle (15%), strangler fig (15%), 46 species total

B. Soil humus: 15 cm

C. Seagrasses

Shoal grass on north and west sides of island, manatee grass on all sides of island.

D. Bird Usage

White ibis common, 4 species total; no nests

E. Common Fishes and Invertebrates

Bay anchovy, mojarra, red drum, 8 fish species total; oysters on south side, penaeid shrimp, mud crabs common, 5 invertebrate species total

F. Threatened, endangered or species of special concern

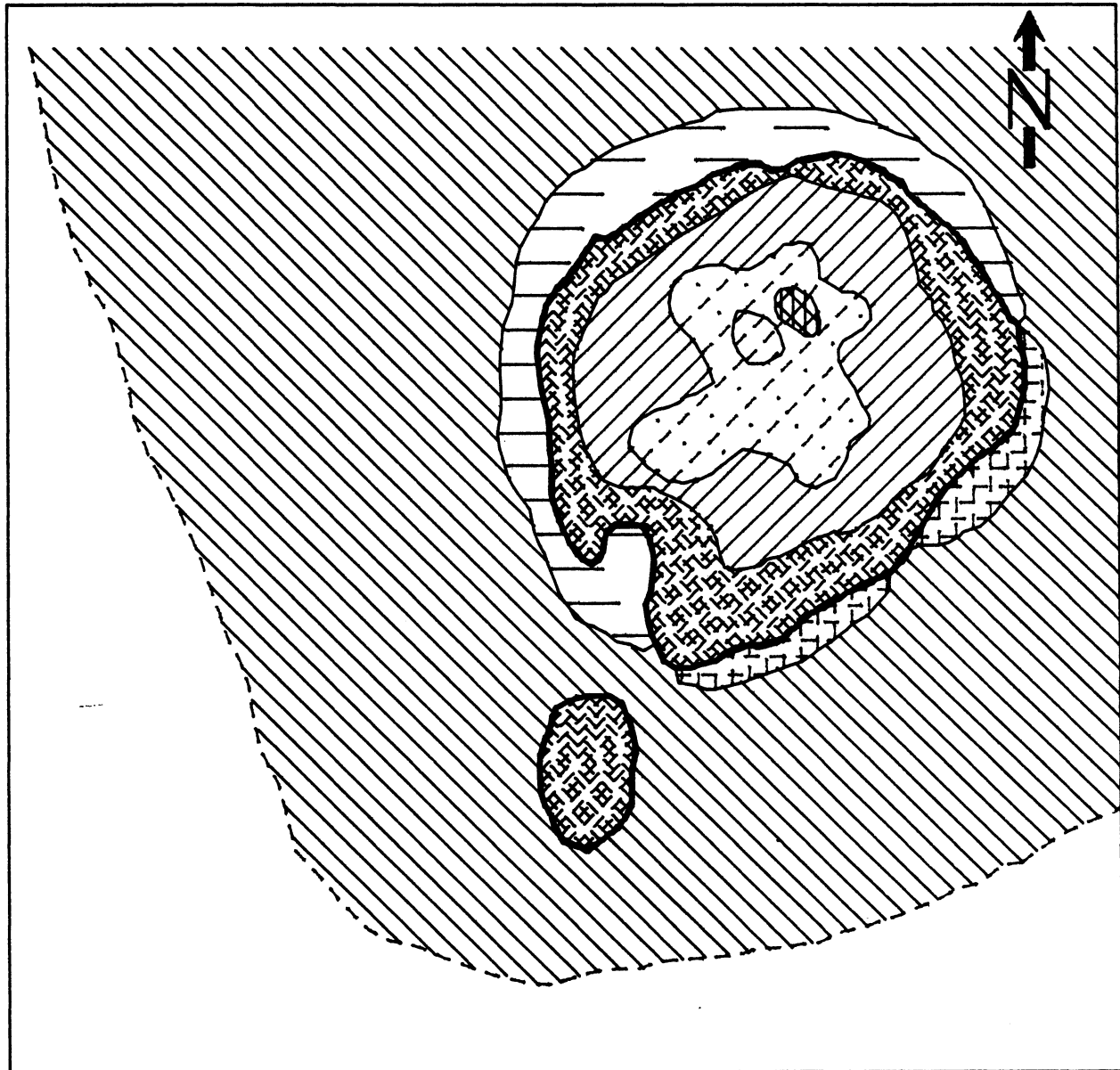
Threatened: coconut palm. Special concern: osprey, snook

III. Recommended usage: Education

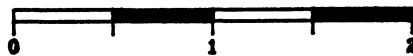
IV. Comments

This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and has a high floral diversity for its small size. Deep water and open beach access is limited, but not impossible. There are good seagrass beds on all sides of this island, a thick mangrove fringe on the east and south sides and a clearing in the center that would be ideal for an outdoor classroom situation. This island would be best used for education and unsupervised recreational activities should be discouraged.

SPOIL ISLAND SL15A



1 in = 25 m



	Mangroves 0.167 hectares		Oysters
	Brazilian pepper 0.147 hectares		Shoal grass
	Grass 0.073 hectares		Manatee grass
	Cabbage palm 0.004 hectares		Unvegetated bottom
	Sea grape 0.003 hectares		< 1 m deep

ISLAND NO. SL15

Date Sampled: 16 December 1988

I. Physical Description

- A. Island Size: 5.650 hectares
- B. Height Above Mean High Water: 1.5 m
- C. Distance from Boat Ramps: 720 m from North Bridge
- D. Distance and Direction from Channel Marker: 220 m east of marker 181
- E. Erosion: None
- F. Boating access: None; no open beaches, very shallow water (<0.5 m)

II. Biological Description

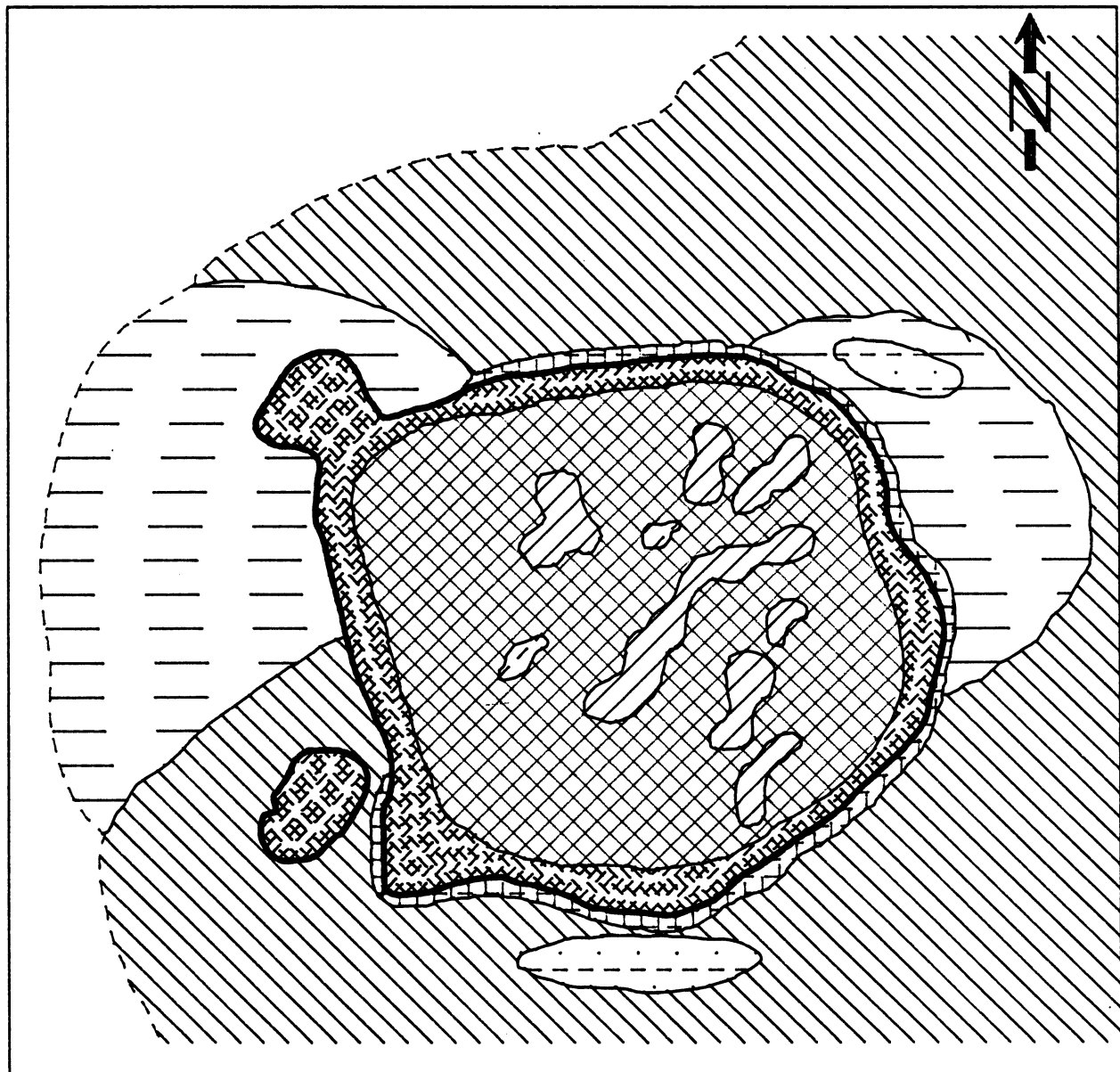
- A. Dominant Terrestrial Vegetation
Brazilian pepper (89%), Australian pine (74%), cabbage palm (22%), red mangrove (15%), black mangrove (11%), 37 species total
- B. Soil humus: 4.5 cm
- C. Seagrasses
Shoal grass on east and west sides, manatee grass on north and south sides, turtle grass on east and south sides
- D. Bird Usage
Turkey vulture and brown pelican common, 6 species total; no nests
- E. Common Fishes and Invertebrates
Mojarra, gulf pipefish, bay anchovy, clown goby, rainwater killifish, 14 fish species total; oysters on south, east and north sides, penaeid and grass shrimps common, 11 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: osprey, brown pelican, little blue heron

III. Recommended usage: Conservation

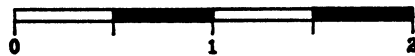
IV. Comments

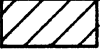
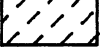
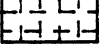
This island is in the Vero Beach to Ft. Pierce Aquatic Preserve. There are extensive seagrass beds containing highly diverse aquatic fauna on all four sides of the island. The flora contains several representatives of native tropical hammock vegetation as well as extensive mangrove forests. The island is used for loafing by several bird species. Shallow water and lack of open beach access make this island inaccessible to the public. Finally, this island is a good candidate for replanting with native vegetation.

SPOIL ISLAND SL15



1 in = 76 m



	Australian pine 3.588 hectares		Shoal grass
	Mangroves 1.488 hectares		Manatee grass
	Brazilian pepper 0.539 hectares		Turtle grass
	Cabbage palm 0.035 hectares	---	< 1 m deep
	Oysters		

ISLAND NO. SL16

Date Sampled: 1 June 1988

I. Physical Description

- A. Island Size: 0.649 hectares
- B. Height Above Mean High Water: 0.5-1 m
- C. Distance from Boat Ramps: 220 m from North Bridge
- D. Distance and Direction from Channel Marker: 495 m southeast of marker 181
- E. Erosion: None
- F. Boating access: None; no open beaches, water <0.5 m deep

II. Biological Description

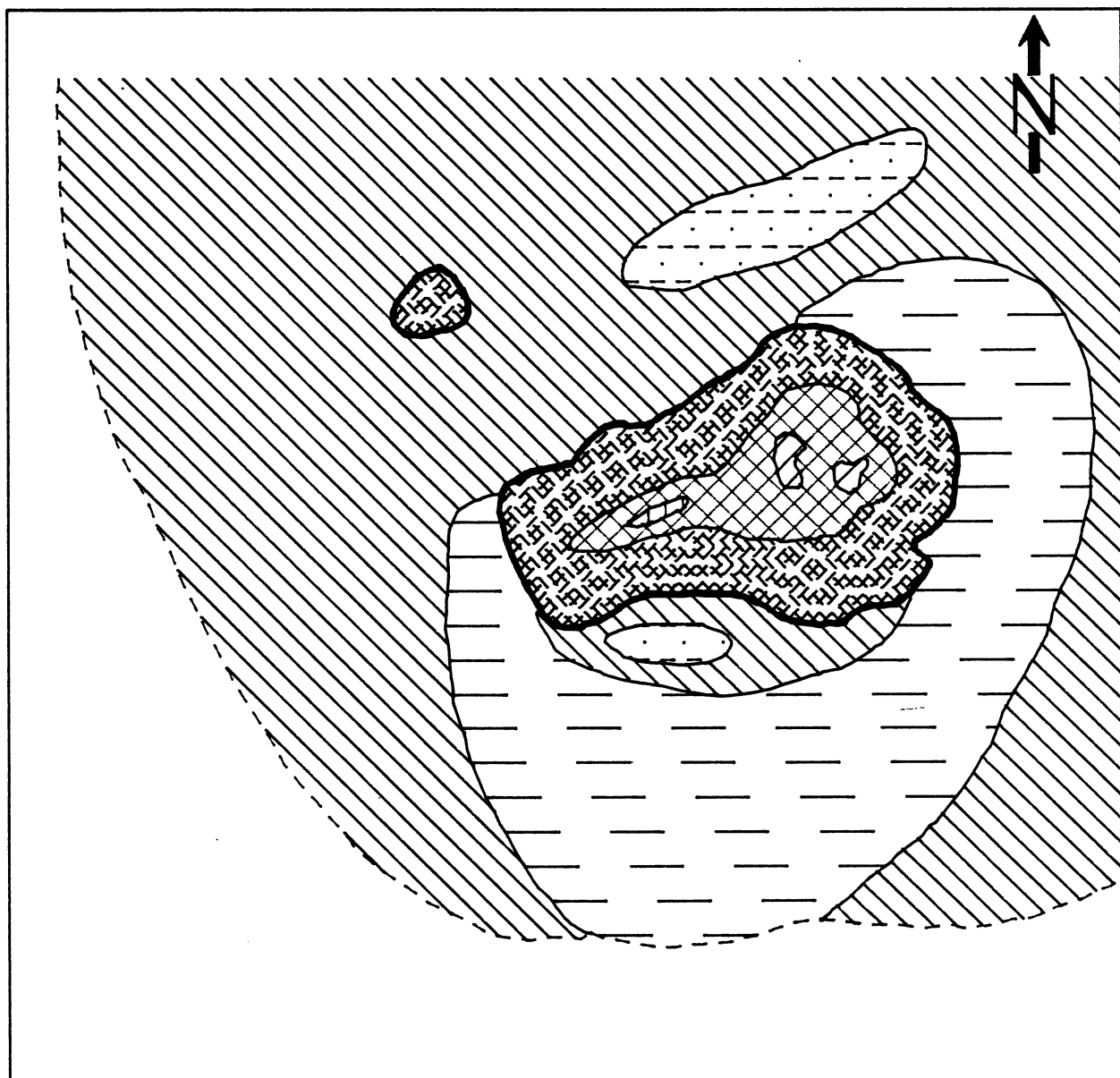
- A. Dominant Terrestrial Vegetation
Red mangrove (65%), black mangrove (50%), Brazilian pepper (30%), Australian pine (10%), 18 species total
- B. Soil humus: 12 cm in center of island
- C. Seagrasses
Shoal grass on south, east and west sides, manatee grass on all sides, turtle grass on north and south sides
- D. Bird Usage
Brown pelican and great blue heron common; 3 nests. This is an important loafing island for brown pelicans
- E. Common Fishes and Invertebrates
Pinfish, sheepshead, mojarra, 12 fish species total; humpback shrimp, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: brown pelican

III. Recommended usage: Conservation

IV. Comments

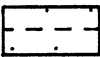
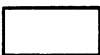
This island is in the Vero Beach to Ft. Pierce Aquatic Preserve and is an important loafing area for a large flock of brown pelicans during the winter and spring. Extensive seagrass beds with a large amount of turtle grass support a diverse aquatic fauna. The lack of deep water and open beach access, the importance of this island to avian and aquatic fauna and the high percentage of mangrove cover on the island itself are the reasons this island has received a conservation designation.

SPOIL ISLAND SL16



1 in = 45 m



	Mangroves 0.472 hectares		Manatee grass
	Australian pine 0.159 hectares		Turtle grass
	Brazilian pepper 0.013 hectares		Unvegetated bottom
	Lamb's quarter 0.005 hectares		< 1 m deep
	Shoal grass		

ISLAND NO. SL17A

Date Sampled: 24 January 1989

I. Physical Description

- A. Island Size: 0.064 hectares
- B. Height Above Mean High Water: 1 m or less
- C. Distance from Boat Ramps: 0.3 km south of North Bridge
- D. Distance and Direction from Channel Marker: 206 m southeast of can 185
- E. Erosion: South side
- F. Boating access: South end; rocky, 2.5 m deep

II. Biological Description

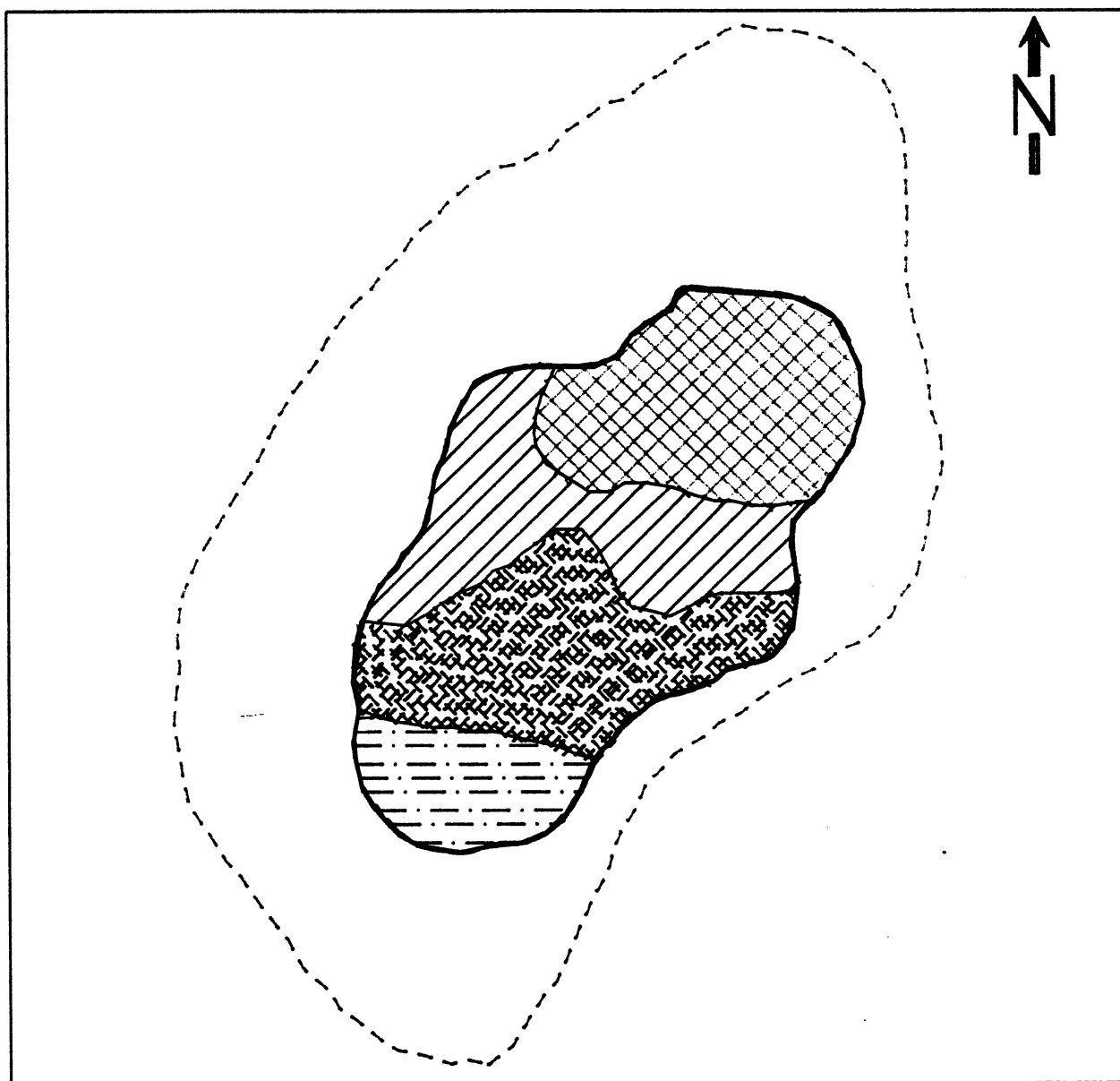
- A. Dominant Terrestrial Vegetation
Australian pine (36%), Brazilian pepper (29%); 7 species total
- B. Soil humus: 0 cm
- C. Seagrasses
None
- D. Bird Usage
American oystercatchers common, 3 species; no nests
- E. Common Fishes and Invertebrates
Spot, mojarras and striped mullet common, 6 species total, 1 invertebrate species
- F. Threatened, endangered or species of special concern
Special concern: American oystercatcher

III. Recommended usage: Passive Recreation

IV. Comments

This island lies within the city limits of Ft. Pierce, and has historically received heavy human usage. It is locally known as "Shark Island". There is good access to the island, although the currents around the north and south ends can be strong. Floral and faunal diversity on the island is low and there are open areas for fishing and primitive camping. However, this island is too small for development for active recreation.

SPOIL ISLAND SL17A



1 in = 11 m



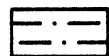
Australian pine
0.022 hectares



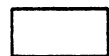
Mangroves
0.022 hectares



Brazilian pepper
0.019 hectares



Rocks



Unvegetated
bottom

--- < 1 m deep

ISLAND NO. SL17

Date Sampled: 16 October 1988

I. Physical Description

- A. Island Size: 2.626 hectares
- B. Height Above Mean High Water: 2 m
- C. Distance from Boat Ramps: 2.2 km from North Bridge
- D. Distance and Direction from Channel Marker: 550 m northeast of can 185
- E. Erosion: Yes, on south east end
- F. Boating access: East and north sides; open beaches, 1.5 m deep

II. Biological Description

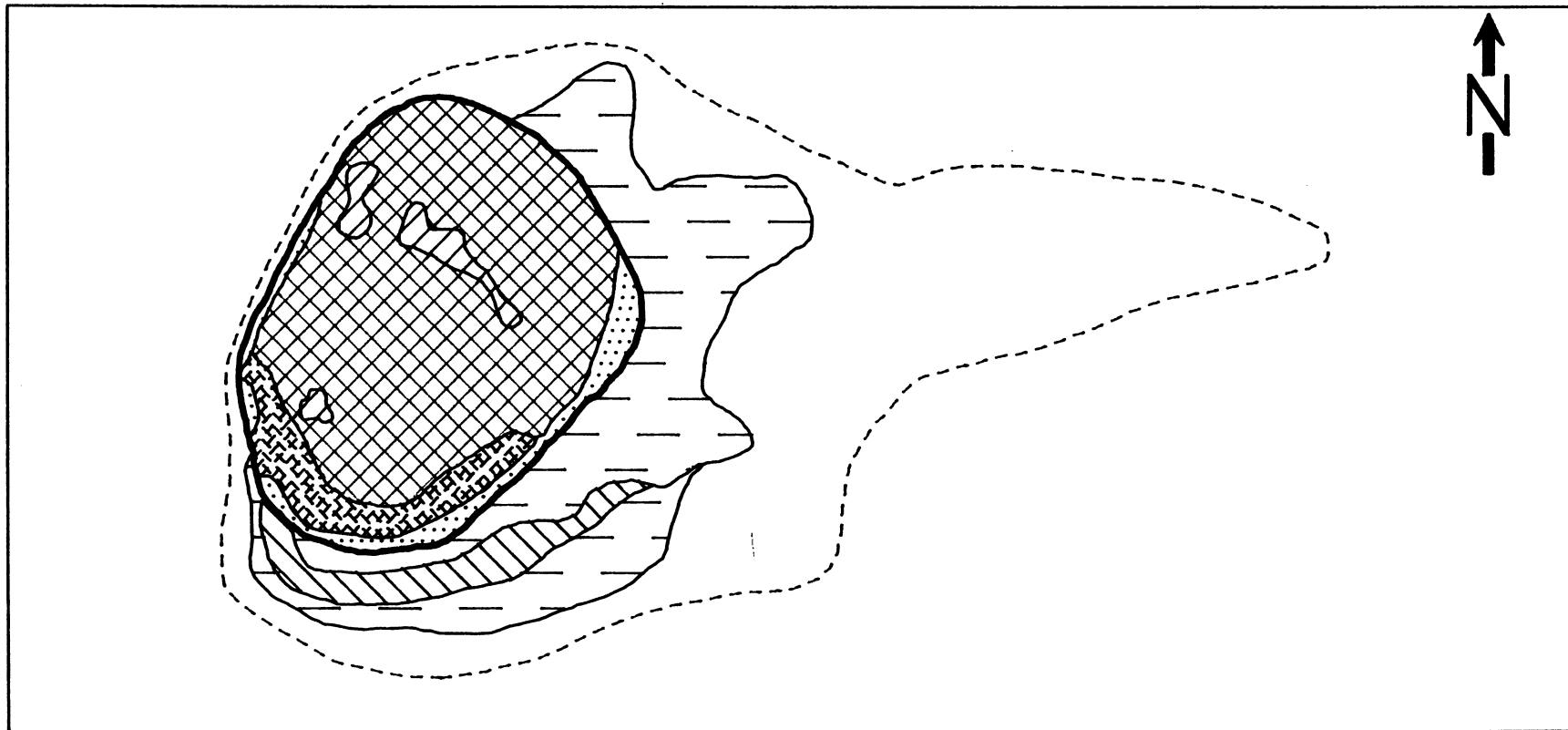
- A. Dominant Terrestrial Vegetation
Australian pine (84%), Brazilian pepper (25%), 37 species total
- B. Soil humus: 5 cm
- C. Seagrasses
Shoal grass on south side, manatee grass on south and east sides
- D. Bird Usage
Ring billed gull, great blue heron, black skimmer, brown pelican, double crested cormorant common; 40 nests (great blue heron and double crested cormorant)
- E. Common Fishes and Invertebrates
Bay anchovy, menhaden, red drum, 9 fish species total; grass shrimp the only invertebrate species
- F. Threatened, endangered or species of special concern
Special concern: roseate spoonbill, osprey, brown pelican

III. Recommended usage: Conservation/Education

IV. Comments

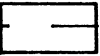
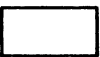
This island lies within the city limits of Ft. Pierce. It is an important nesting area for great blue herons and double crested cormorants and is an important loafing area for gulls and skimmers. The center of this island is ideal for future revegetation with native tropical hammock hardwoods. The good deep water and open beach access, productive seagrass beds and good floral diversity are reasons for recommending this island for education as well as conservation. However, all use of this island should be prohibited during the February to May nesting season, and recreational usage of this island should be prohibited completely.

SPOIL ISLAND SL17



1 in = 80 m



	Australian pine 1.968 hectares		Shoal grass
	Mangroves 0.286 hectares		Manatee grass
	Sand 0.250 hectares		Unvegetated bottom
	Brazilian pepper 0.121 hectares		< 1 m deep

ISLAND NO. SL18A

Date Sampled: 28 November 1988

I. Physical Description

- A. Island Size: 0.147 hectares
- B. Height Above Mean High Water: 1 meter or less
- C. Distance from Boat Ramps: 0.5 km east of Ft. Pierce City Marina
- D. Distance and Direction from Channel Marker: 127 m east of marker 188
- E. Erosion: North end
- F. Boating access: East side; open beaches, 1.8 m deep

II. Biological Description

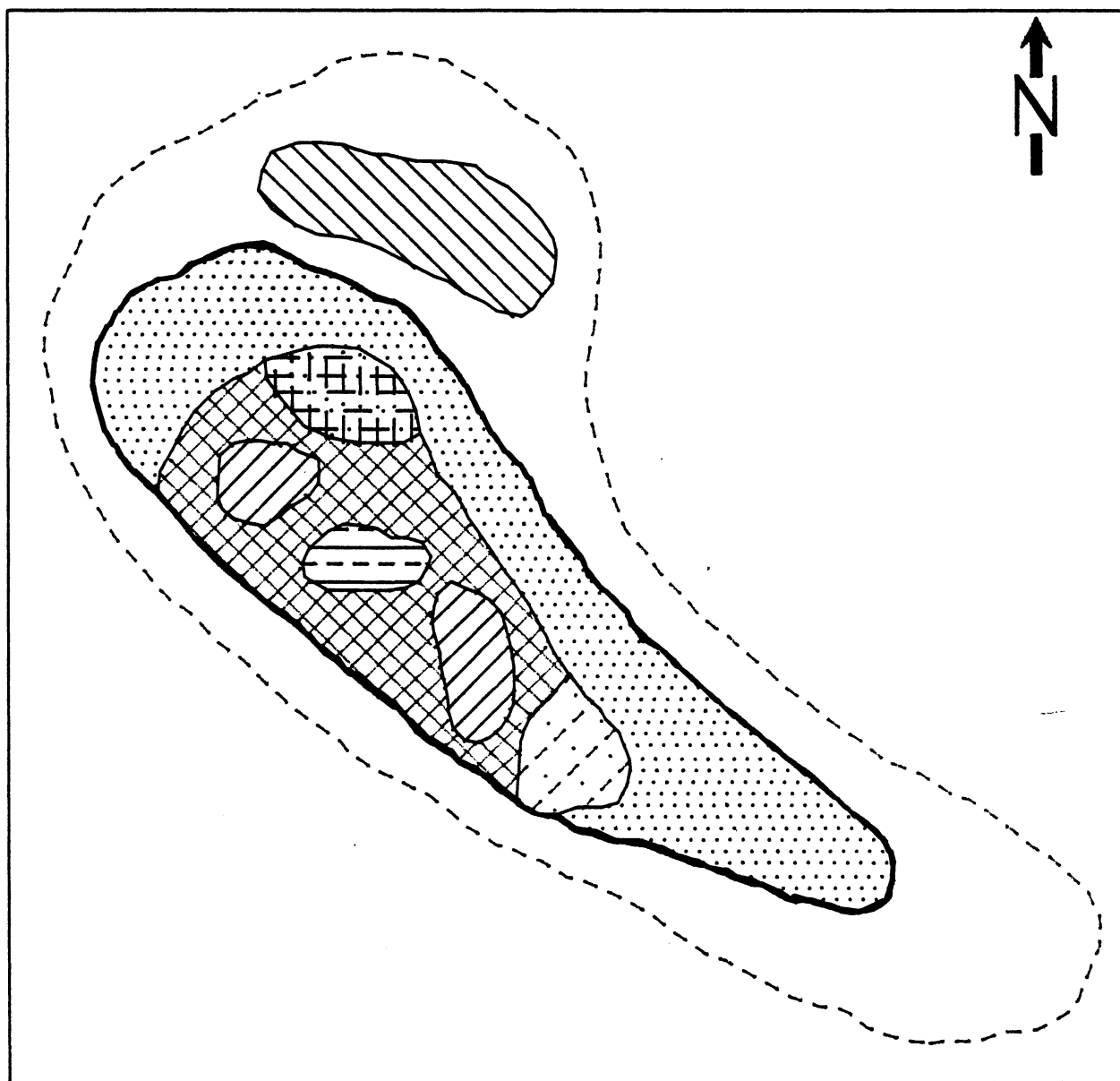
- A. Dominant Terrestrial Vegetation
Australian pine (25%), Brazilian pepper (15%), crow's foot grass (10%), saltgrass (10%); 13 species total
- B. Soil humus: 0 cm
- C. Seagrasses
None
- D. Bird Usage
Turkey vulture, spotted sandpiper common, 6 species total; no nests
- E. Common Fishes and Invertebrates
Mojarra common, 4 fish species total, ctenophores common, 4 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: osprey, brown pelican

III. Recommended usage: Passive Recreation

IV. Comments

This island is within the city limits of Ft. Pierce, has low floral and aquatic diversity and has no submerged grasses. It has good boating access, open areas for primitive camping, picnicking or fishing and has historically received heavy human use. The island designation should remain passive recreation, as it is too small for development of active recreational areas.

SPOIL ISLAND SL18A



1 cm = 15 m



	Sand 0.073 hectares		Sea oxeye 0.005 hectares
	Australian pine 0.041 hectares		Manatee grass
	Brazilian pepper 0.012 hectares		Unvegetated bottom
	Grass 0.008 hectares		< 1 m deep
	Sea purslane 0.008 hectares		

ISLAND NO. SL18B

Date Sampled: 24 March 1988

I. Physical Description

- A. Island Size: 0.407 hectares
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 3 km east of Ft. Pierce City Marina
- D. Distance and Direction from Channel Marker: 275 m east of marker 189
- E. Erosion: Sand spit on northern end
- F. Boating access: West side, open beach, 1.5 m deep

II. Biological Description

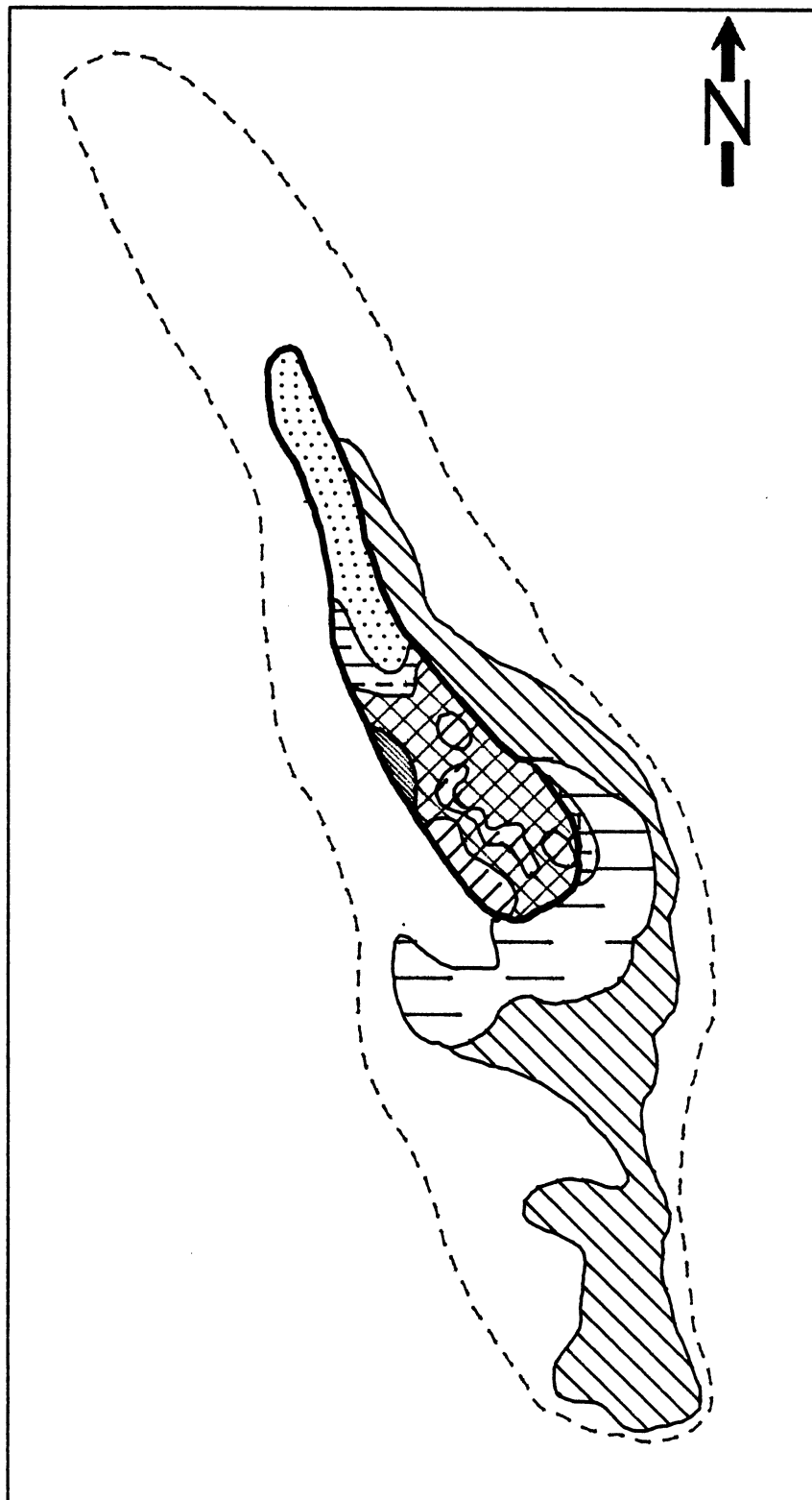
- A. Dominant Terrestrial Vegetation
Australian pine (33%), Brazilian pepper (33%), cabbage palm (33%), sea
oxeye (14%), 11 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on south side, manatee grass on south and east sides
- D. Bird Usage
Fish crow and turkey vulture common, 5 species total; no nests
- E. Common Fishes and Invertebrates
Striped mullet, spot, ladyfish, mojarra, 11 fish species total; grass shrimp, 4
invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: little blue heron

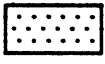
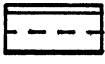
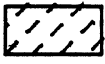
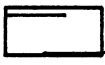
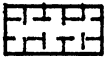
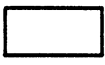
III. Recommended usage: Passive Recreation

IV. Comments

This island is within the city limits of Ft. Pierce. There is good deep water and open beach access on the west side of the island. This island is too low and small to recommend construction of permanent structures such as picnic shelters or sanitary facilities, although passive recreation activities such as picnicking and overnight camping are appropriate and recommended.

SPOIL ISLAND SL18B



-  Australian pine
0.169 hectares
-  Sand
0.128 hectares
-  Privet
0.030 hectares
-  Sea oxeye
0.030 hectares
-  Cabbage palm
0.021 hectares
-  Brazilian pepper
0.015 hectares
-  Cordgrass
0.015 hectares
-  Shoal grass
-  Oysters
-  Manatee grass
-  Unvegetated bottom
-  < 1 m deep

1 in = 54 m



ISLAND NO. SL18C

Date Sampled: 28 November 1988

I. Physical Description

- A. Island Size: 0.182 hectares
- B. Height Above Mean High Water: 1 meter or less
- C. Distance from Boat Ramps: 0.9 km southeast of Ft. Pierce City Marina
- D. Distance and Direction from Channel Marker: 49 m southeast of marker 189
- E. Erosion: North and east sides
- F. Boating access: East; open beaches, 2.5 m deep

II. Biological Description

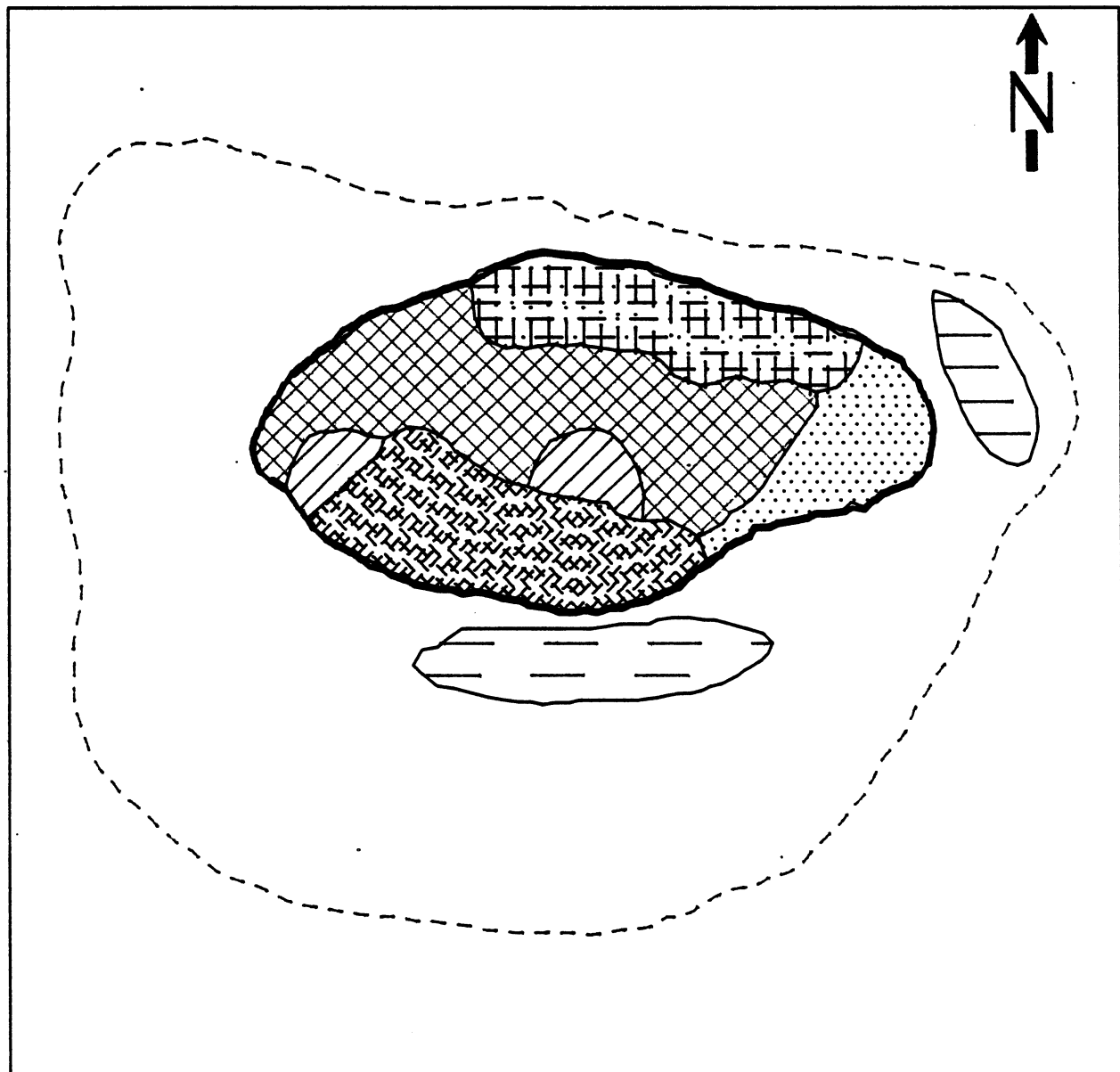
- A. Dominant Terrestrial Vegetation
Australian pine (42%), Brazilian pepper (16%), sea purslane (10%); 15 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on south and west sides
- D. Bird Usage
Belted kingfisher common, 2 species; no nests
- E. Common Fishes and Invertebrates
Menhaden, mojarras, bay anchovy and Spanish sardine common, 13 fish species total; arrow shrimp common, 2 invertebrate species total
- F. Threatened, endangered or species of special concern
None

III. Recommended usage: Passive Recreation

IV. Comments

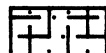
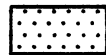
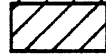
This island is in the Jensen Beach to Jupiter Inlet Aquatic Preserve and has historically received human use. There is good deep water and open beach access and adequate area for recreational activities. Floral and faunal diversity is average on this island, and there are no rare plants or nesting birds. This island is too small, however, for development for active recreation.

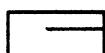
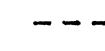
SPOIL ISLAND SL18C



1 cm = 10 m



-  Australian pine
0.069 hectares
-  Mangroves
0.044 hectares
-  Sea purslane
0.034 hectares
-  Sand
0.022 hectares
-  Brazilian pepper
0.013 hectares

-  Shoal grass
-  Unvegetated bottom
-  < 1 m deep

ISLAND NO. SL19A

Date Sampled: 20 October 1988

I. Physical Description

- A. Island Size: 0.064 hectares
- B. Height Above Mean High Water: 1 meter or less
- C. Distance from Boat Ramps: 16.2 km south of Ft. Pierce City Marina
- D. Distance and Direction from Channel Marker: 34 m east of marker 203
- E. Erosion: Sand spit on east end
- F. Boating access: West side; open beach, 1 m deep

II. Biological Description

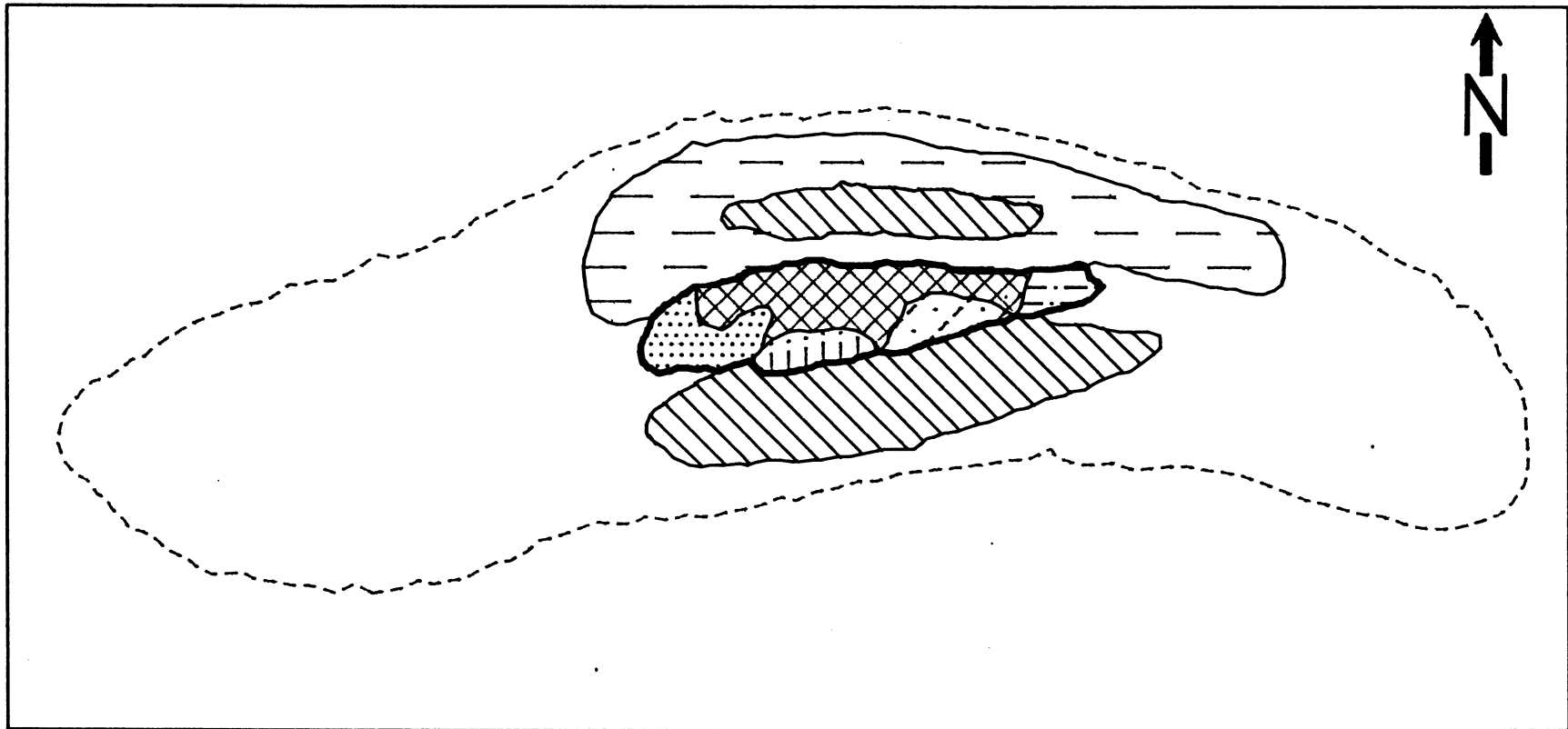
- A. Dominant Terrestrial Vegetation
Australian pine (15%), saltgrass (15%); 8 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on east and north sides, manatee grass on south and north sides
- D. Bird Usage
Brown pelican and black bellied plovers common, 6 species total; no nests
- E. Common Fishes and Invertebrates
Bay anchovy common, 7 fish species total; 3 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: brown pelican

III. Recommended usage: Passive Recreation

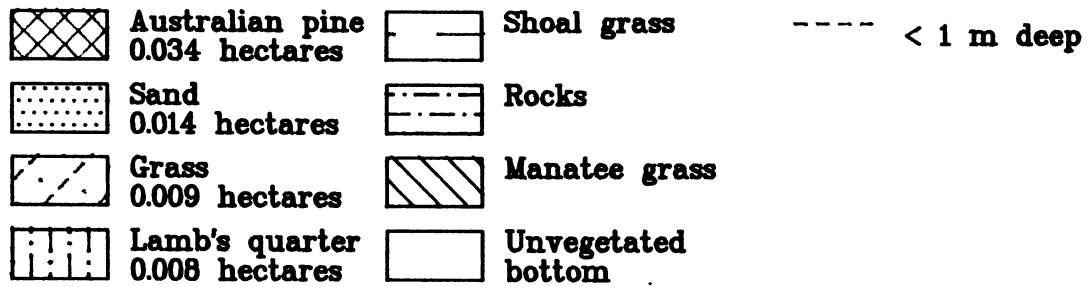
IV. Comments

This island is in the Jensen Beach to Jupiter Inlet Aquatic Preserve. The island has low floral and faunal diversity and has historically been used for recreation. The island is too small for construction of any facilities for active recreation, however, and its designation should therefore remain passive.

SPOIL ISLAND SL19A



1 in = 25 m



ISLAND NO. SL19B

Date Sampled: 27 May 1988

I. Physical Description

- A. Island Size: 0.171 hectares
- B. Height Above Mean High Water: Less than 1 m
- C. Distance from Boat Ramps: 17 km south of Ft. Pierce City Marina
- D. Distance and Direction from Channel Marker: 385 m northeast of marker 205
- E. Erosion: Sand spit on north east end
- F. Boating access: East side; open beach, 1.5 m deep

II. Biological Description

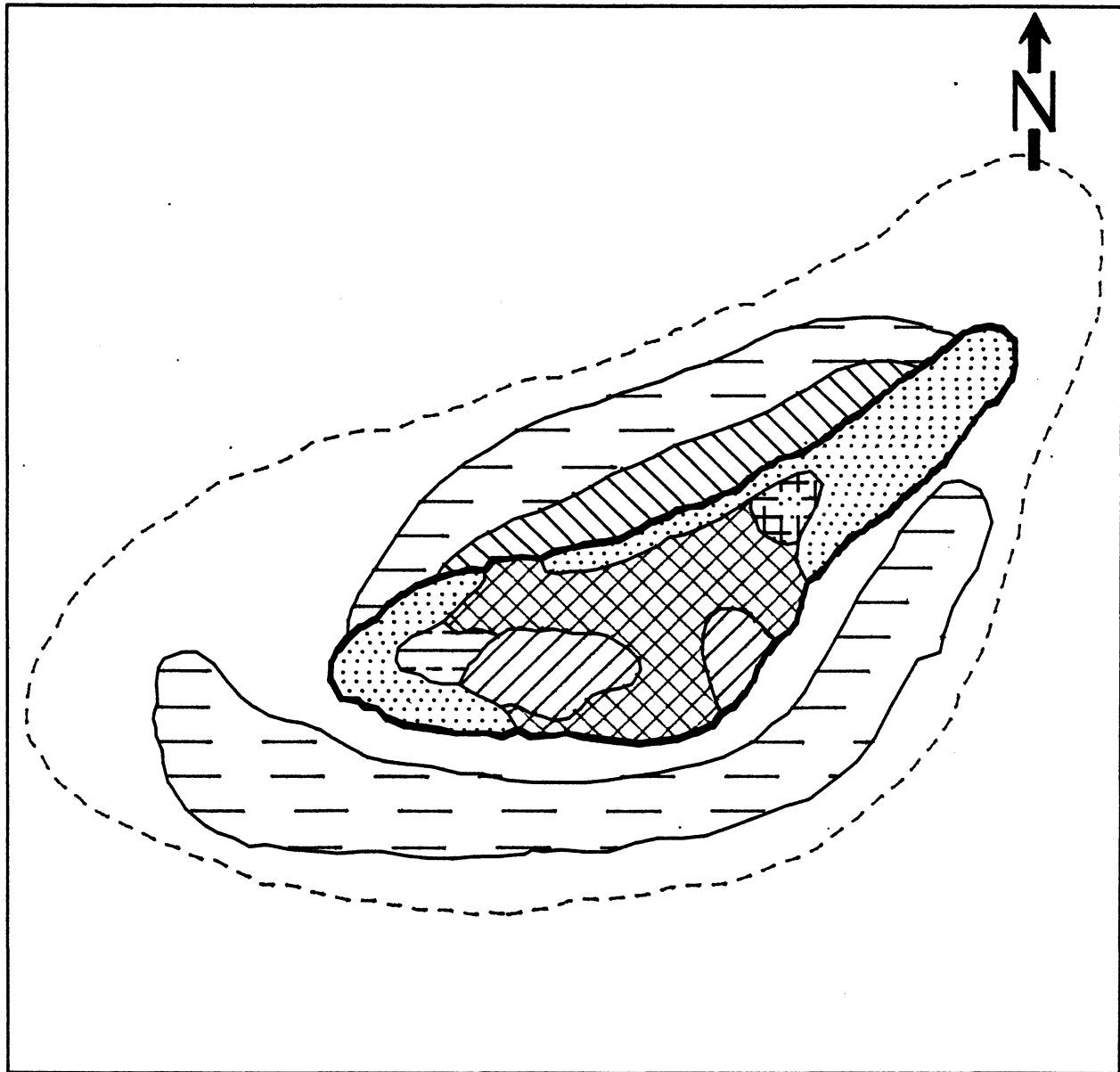
- A. Dominant Terrestrial Vegetation
Australian pine (54%), Brazilian pepper (15%), sea grape (15%), sea purslane (15%), sea oxeye (15%), seaside heliotrope (15%), 15 species total
- B. Soil humus: 2 cm
- C. Seagrasses
Shoal grass on north, south and west sides, manatee grass on north side
- D. Bird Usage
Royal tern, brown pelican, caspian tern and least tern common, 8 species total; no nests
- E. Common Fishes and Invertebrates
Pinfish, redfin needlefish and mojarra, 8 fish species total; arrow shrimp, 2 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: least tern. Special concern: brown pelican

III. Recommended usage: Passive Recreation

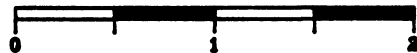
IV. Comments

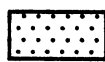
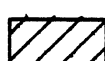
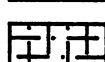
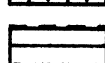
This island is in the Jensen Beach to Jupiter Inlet Aquatic Preserve and has good open beach and deep water access. Although many birds loaf on the sand spit on the northeastern end of the island, this island is otherwise suitable for recreational purposes. However, the island is too small and too low to develop any active recreational facilities.

SPOIL ISLAND SL19B



1 in = 22 m



	Sand 0.069 hectares		Shoal grass
	Australian pine 0.064 hectares		Manatee grass
	Brazilian pepper 0.026 hectares		Unvegetated bottom
	Sea purslane 0.006 hectares		< 1 m deep
	Sea oxeye 0.006 hectares		

DISCUSSION

St. Lucie County has the third largest number of spoil islands of the four counties in the Indian River Lagoon. All but two of the islands are concentrated in the northern part of the county. The St. Lucie County islands have historically been the most heavily used islands in the Indian River Lagoon and many islands contained evidence of permanent human habitation prior to the island clean-up program initiated in 1988. St. Lucie County islands had fairly high faunal diversity; 129 of the 205 invertebrates, fishes, reptiles, birds and mammals documented during the survey were found on these islands, representing 63% of the faunal list. In addition, there were 12 species of animals (6% of the total faunal list) that were not found in any other county. Ten of these species were fishes, including two members of the herring family, game fish such as snook and tarpon and several tropical species such as great barracuda, bandtail puffer and web burrfish. The proximity of the St. Lucie County islands to Ft. Pierce Inlet, the major inlet in terms of tidal flow within the lagoon (Smith, in press), may account for the large number of fish species (14% of the total) that were found only in this county.

The most frequently captured aquatic species found in St. Lucie County included penaeid, grass, arrow and humpback shrimps, hermit and swimming crabs, bay anchovy, chain and gulf pipefish, mojarras, pigfish, pinfish, spot, striped mullet, and code goby. The majority of these species are typically associated with submerged grasses and many islands in the county had extensive seagrass beds. Twenty-two percent of the fishes collected around St. Lucie County islands were tropical or subtropical in origin (R.G. Gilmore, pers. comm.), a higher percentage of tropicals than were found in all counties except for Martin County. Oceanic water entering the lagoon through Ft. Pierce inlet can reach all the St.

Lucie County islands within two tidal cycles (Brown-Peterson and Eames, in press), offering opportunities for recruitment to island grassbeds by juveniles that were spawned offshore.

The most frequently observed bird species included brown pelican, double-crested cormorant, osprey, great blue heron, belted kingfisher and red-bellied woodpecker. Two species, blue jay and brown thrasher, were observed only on St. Lucie County islands. None of the spoil islands in St. Lucie County were observed being used as rookeries for colonial nesting birds, although several (SL14, SL16, SL17) were important loafing areas for brown pelicans and cormorants during the fall and winter. Several islands, such as SL1, SL9, SL10, SL14, SL16 and SL17, are also important for breeding great blue herons, cormorants and other more solitary breeders.

The floral diversity of St. Lucie County spoil islands was the second highest in the lagoon, with 167 plant species represented (63% of the total number of plants species collected on all spoil islands). Twenty-six of the species documented (10%) were found only on islands in this county. The majority of these species were exotics that have escaped from cultivation, such as palms, Norfolk Island pine, wandering Jew, century plant and *Kalanchoe*. The high incidence of human habitation on the St. Lucie County islands probably contributed to the large number of exotic species found and the high percentage of species found only in this county. Some of the most commonly observed and most abundant plant species included saltgrass, cabbage palm, ball moss, Australian pine, sea grape, glasswort, sea purslane, gray nicker, coin vine, Brazilian pepper, varnish leaf, red, black and white mangrove, buttonwood, sea lavender, Florida privet, Madagascar periwinkle, scorpion tail and sea oxeye. All three of the most speciose families in the survey were well represented in St. Lucie County: 22 of the 31 species (71%) of asters

(Asteraceae), 13 of the 21 species (62%) of beans (Fabaceae) and 10 of the 15 species (67%) of grasses (Poaceae) were documented on the islands.

Important marsh/wetland species of plants are well represented on St. Lucie County spoil islands. Mangroves were found on all islands with the exception of SL19A and SL19B and formed significant stands on some of them. Red, black and/or white mangroves and/or buttonwoods cover over 30% of islands SL1A, SL1B, SL9, SL10, SL12A, SL12B, SL13A, SL13C, SL14A, SL14B, and SL16. Cordgrass, found on 12 of the islands, was less common in St. Lucie County than in Indian River and Martin Counties. Marsh areas containing glasswort, saltwort and mangroves were found on only one island in this county (SL3).

The exotics Australian pine and Brazilian pepper were found on all spoil islands in St. Lucie County. Islands that showed a low abundance of Brazilian peppers were islands dominated by mangroves, such as SL9, SL10, SL12A, SL12B, SL14A, and SL16. These mangrove islands had a well established flora and further invasion by exotics seems unlikely. Several of the islands dominated by Brazilian pepper, such as SL7, SL13 and SL14, seem in danger of being taken over by this invasive plant, which would result in local extinction of any native vegetation remaining on these islands. Islands dominated by Australian pine, such as SL3, SL6, SL8, SL15 and SL17 will probably also resist colonization by native plants. However, islands with heavy Australian pine canopies could be used as recreation areas, bird loafing or nesting areas and would also be suitable for revegetation with native tropical hammock vegetation.

Pilot scale revegetation projects have already taken place on some Indian River Lagoon spoil islands. The earliest projects were done in Indian River County. Island IR38 was revegetated in September 1983 by the Florida Game and Freshwater Fish Commission

(Fernald *et. al* 1985), using 300 plants representing 20 species of upland hammock trees. Another island was revegetated in February 1989 with 600 plants representing 10 species as part of a Boy Scout eagle project. Four Indian River County islands were revegetated by staff of the Bureau of Aquatic Preserves in October 1988 as a part of the spoil island study. Four hundred plants representing 22 different species of upland hammock trees were planted under a canopy of Australian pines on each island. In 1989, the project was expanded to include islands in St. Lucie, Brevard, and Martin Counties. Plant species that showed promise for high survival in 1988 were chosen again; substitutions were made for the remainder. The islands, including three in St. Lucie County (SL5, SL11, and S17), were revegetated with 400 plants representing 23 upland hammock species in October of 1989. Present staff efforts are focused on monitoring growth and survival of the plants for both the 1988 and 1989 projects. Survival of the plants has varied by island and by species, but at present, establishment of small native tropical hammocks on several spoil islands looks promising. Many trees on island IR38, the earliest planting, have grown six meters or more in the six years since they have been planted. The establishment of native tropical hammocks on these six islands will increase bird and wildlife utilization of the islands, provide excellent opportunities for education and research and increase the aesthetic value of the islands.

Management Recommendations

All of the islands in St. Lucie County, with the exception of SL19A and SL19B, are closely associated and should therefore be managed as one unit when assigning management designations (conservation, education, passive and active recreation). Table 3-2 lists all the

St. Lucie County spoil islands, their ownership and recommended classifications.

Table 3-1. Recommended management classifications of St. Lucie County Spoil Islands

Island number	Ownership	Classification
SL1	State	Conservation
SL1A	State	Passive Recreation
SL1B	State	Conservation
SL2	State	Active Recreation
SL3	State	Active Recreation
SL4	State	Passive Recreation
SL5	State	Education
SL6	State	Passive Recreation
SL7	State	Passive Recreation
SL8	State	Active Recreation
SL9	State	Conservation
SL10	State	Conservation
SL11	State	Conservation
SL12	State	Conservation
SL12A	State	Passive Recreation
SL12B	State	Conservation
SL12C	State	Conservation
SL13	State	Active Recreation
SL13A	State	Passive Recreation
SL13B	State	Passive Recreation
SL13C	State	Conservation
SL14	State	Conservation
SL14A	State	Conservation
SL14B	State	Passive Recreation
SL15A	State	Education
SL15	State	Conservation
SL16	State	Conservation
SL17A	State	Passive Recreation
SL17	State	Conservation/ Education
SL18A	State	Passive Recreation
SL18B	State	Passive Recreation
SL18C	State	Passive Recreation
SL19A	State	Passive Recreation
SL19B	State	Passive Recreation

The St. Lucie County islands have a history of human activity and thus many of the islands have been designated for passive (fourteen islands) or active (four islands) recreation. All the islands designated for recreation have good deep water access and open beach areas. Of the four active recreation islands, only SL8 currently has large, cleared areas suitable for recreational development. However, SL2, SL3 and SL13 could have suitable areas for recreation if some of the Brazilian pepper were to be cleared.

Two islands in St. Lucie County have been designated exclusively for education (SL5 and SL15A). These islands have adequate deep water access and excellent floral and faunal diversity. Island SL5 is large enough for overnight camping by organized educational groups, and would be an excellent island for development of an interpretive nature trail. While recreational use of these islands should be prohibited, they should remain available for educational uses by interested groups or individuals.

The remaining fourteen islands in St. Lucie County have been designated for conservation, including SL17, which has a dual conservation/education classification. Although St. Lucie County has no major bird rookeries on spoil islands, several islands (SL1, SL9, SL10, SL14, SL16 and SL17) are important breeding sites for great blue herons and double crested cormorants, while other islands (SL1B, SL14, SL16, and SL17) are important feeding and loafing areas for brown pelicans and other shore birds. It is recommended that human visitation to the six islands used for nesting be prohibited during the February to August breeding season. Human disturbance frequently results in abandonment of breeding colonies and human access should therefore be prohibited (Schreiber and Schreiber 1978). Islands SL11 and SL12 have been designated for conservation because of a lack of deep water access to the islands and the extensive

seagrass beds surrounding the islands. In addition, island SL11 has a diverse floral community and is not dominated by Brazilian pepper, presenting the possibility that a rich native flora could develop on this island. The remaining conservation islands are generally small, lined with mangroves, and surrounded by shallow water.

These initial management recommendations can be expanded upon in the future as actual management of the islands becomes a reality. The computer generated vegetation maps provide an excellent reference source of information on the spoil islands that will become increasingly important as future vegetation surveys are made. Future management recommendations and decisions will depend in large part on historical vegetation changes on the islands. Limited educational and/or recreational development of selected islands could also be considered as spoil island management proceeds. For instance, developing docks and/or interpretive trails on the designated education islands would provide greater access and educational opportunities to the public. The islands designated for active recreation often have dense Brazilian pepper stands in the central portion which could be cleared and replanted with native vegetation or used as picnic or camping areas. Strategies such as these would both enhance the spoil islands and provide greater public access to relatively underutilized state lands.

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MARTIN COUNTY
SPOIL ISLAND MANAGEMENT PLAN

Tom Gardner
Executive Director
Florida Department of Natural Resources

This plan was prepared by
Nancy Brown-Peterson and Ross W. Eames
The Bureau of Aquatic Preserves
Division of State Lands

**Preparation of this management plan was supported by funding from
the Florida Inland Navigation District.**

EXECUTIVE SUMMARY

The Martin County Spoil Island Management Plan is one of four parts of a comprehensive Indian River Lagoon Spoil Island Management Plan. The seven islands included in this portion of the plan occur between the Stuart Causeway and St. Lucie Inlet in the Indian River Lagoon. Five of the islands are owned by the State of Florida and two islands are in private ownership. The objectives of the Martin County Spoil Island Management Plan are to provide current biological data and recommend appropriate management classifications for all of the islands in Martin County.

A total of 105 species of plants and 72 species of animals were collected or observed on the six islands. All the islands had large seagrass beds with the exception of MC2 and MC7. In general, faunal diversity is low and floral diversity is average when compared to the collective group of Indian River Lagoon spoil islands. Five species of animals and two species of plants were found exclusively in Martin County. The invasive exotic Brazilian pepper is not as common on Martin County spoil islands as it is in other counties; only island MC3 had abundant stands of Brazilian pepper. Island MC2 is an important rookery for 10 species of birds, including two species of special concern.

Martin County spoil islands were divided into three management classifications based on biological findings and historical use of the islands. Island MC1 is recommended for educational use, MC2 for conservation and islands MC3 and MC4 for passive recreation. Island MC7 is actively used as a spoil deposition site; thus, the northern portion of MC7 has been designated for spoil deposition but the southern portion for conservation. The two privately owned islands, MC5 and MC6, should be considered for conservation.

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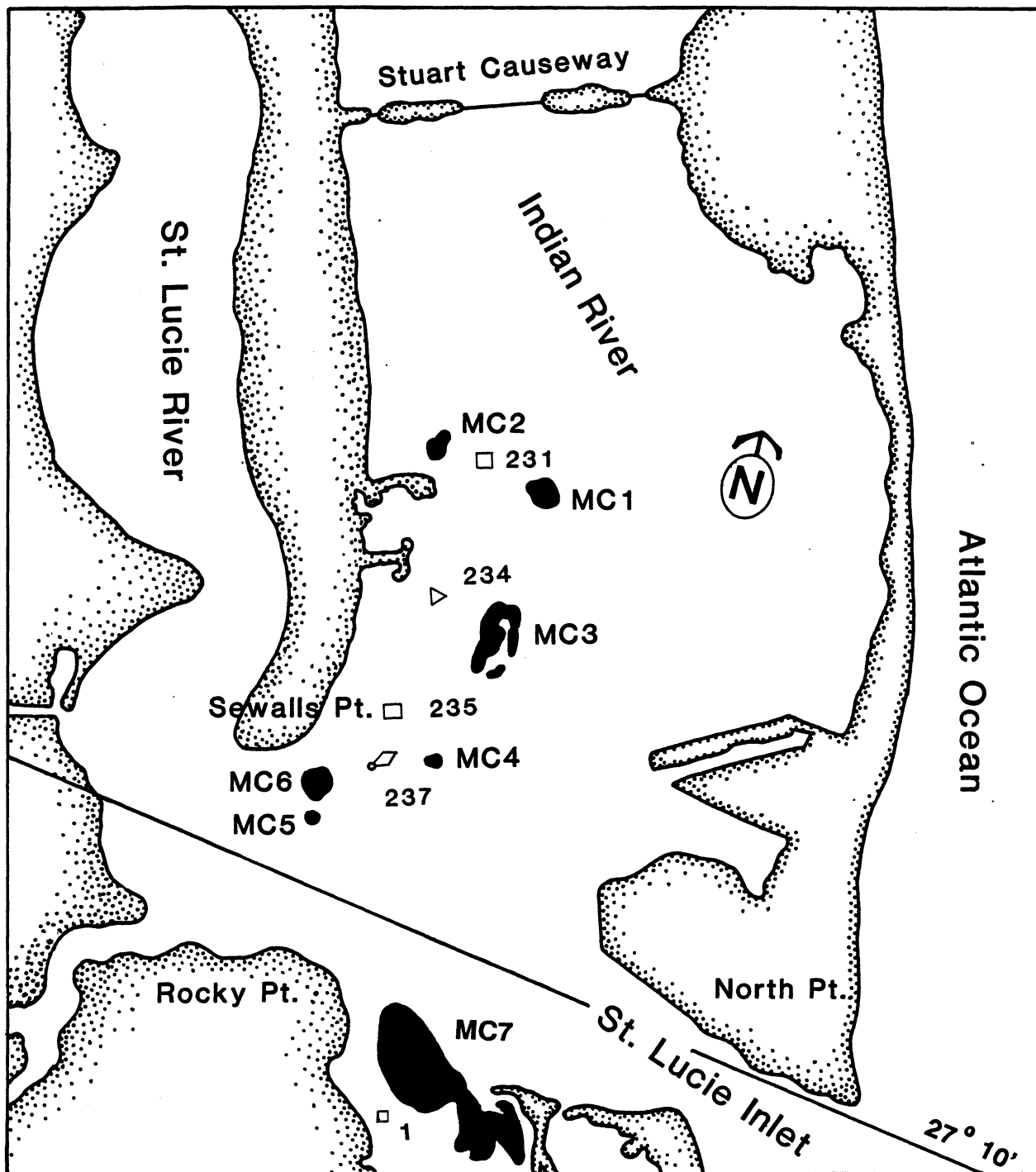
INTRODUCTION

The Martin County Spoil Island Management Plan is one of four parts of a comprehensive Indian River Lagoon Spoil Island Management Plan. The purpose of the Spoil Island Management Plan is to provide current, accurate biological data on all spoil islands in the Indian River Lagoon and to recommend an appropriate use for each island based on the summarized biological information. Local city and county governments will be able to set management guidelines for spoil islands in their jurisdictions using the information provided in the plan. Additionally, these guidelines will help the Florida Marine Patrol, staff of the Indian River Lagoon Aquatic Preserves and State Lands enforcement personnel more effectively manage public use of the spoil islands.

General Information on Martin County Spoil Islands

The Martin County section of the management plan encompasses spoil islands in the 46.2 km portion of the Atlantic Intracoastal Waterway within Martin County. There are a total of seven spoil islands in this county, all of which occur between the Stuart Causeway and St. Lucie Inlet (Fig. 4-1). All seven spoil islands are in the Jensen Beach to Jupiter Inlet Indian River Lagoon Aquatic Preserve. Islands MC2, MC6 and MC7 were present prior to 1951; the remainder of the islands were created when the Atlantic Intracoastal Waterway was dredged to 12 feet in the autumn of 1961 (U.S. Army Corps of Engineers, pers. comm.). Five of these islands (MC1-MC4, MC7) are owned by the State of Florida and have been dedicated to Martin County while the remaining two islands (MC5 and MC6) are privately owned by Bessemer Properties, Inc. All the spoil islands are

Figure 4-1. Martin County spoil islands



encumbered by an easement to the Florida Inland Navigation District to use the islands for the disposal of dredge material derived from maintenance of the Atlantic Intracoastal Waterway. The seven islands in Martin County were surveyed between October 19, 1987 and January 26, 1989. Additionally, the four state-owned islands (MC1-MC4) were cleaned in October 1988 as part of the spoil island clean-up program initiated by the Florida Inland Navigation District.

Management Authority

The primary management authorities available for implementing management directives affecting Martin County spoil islands are found in Chapters 253 and 258, Florida Statutes (F.S.). Chapter 253 concerns all state-owned submerged lands while Chapter 258 is specifically concerned with aquatic preserves. Since all of the Martin County spoil islands are in the Jensen Beach to Jupiter Inlet Aquatic Preserve, both chapters are applicable. These authorities clearly establish the proprietary management role of the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund, who are variously referred to as the "Trustees" or the "Board". Furthermore, all management responsibilities assigned to the Trustees by this plan may be fulfilled directly by the Governor and Cabinet or indirectly via staff or agents of the Trustees, pursuant to delegations of authority, management agreements, or other legal mechanisms.

Chapters 18-20 and 18-21, Florida Administrative Code (F.A.C.), are two administrative rules directly applicable to the DNR's/Trustee's actions regarding allowable uses of submerged lands in general (18-21) and both aquatic preserves (18-20) and spoil islands (18-21.012) in particular. In addition, the Conceptual State Lands Management

Plan, adopted on March 17, 1981 by the Trustees, contains specific policies concerning spoil islands. Where these documents address the use of spoil islands, development is prohibited unless a greater public good can be demonstrated, and such development, with few exceptions, is limited to that serving water-dependent and recreational needs.

The Indian River Lagoon Aquatic Preserve Management Plan (Vero Beach to Fort Pierce and Jensen Beach to Jupiter Inlet), as adopted by the Trustees on January 22, 1985, contains program policy directives (Chapter III) that also affect the use and management of spoil islands. These directives include:

- 1) "managing all submerged lands within the aquatic preserve to ensure the maintenance of essentially natural conditions to ensure the propagation of fish and wildlife, and public recreation opportunities",
- 2) "developing a resource inventory and map natural habitat types within the aquatic preserve, with an emphasis on those habitat types utilized by threatened and/or endangered species",
- 3) "protecting and, where possible, enhancing threatened and endangered species habitat within the aquatic preserve",
- 4) "managing state-owned spoil islands within the aquatic preserve as bird rookeries and wildlife habitat areas", and
- 5) "encouraging public utilization of the aquatic preserve, consistent with the continued maintenance of its natural values and functions".

Thus, management of spoil islands as sovereignty submerged lands is mandated by the Trustees. This plan accomplishes the management directives as outlined above by:

- 1) providing a resource inventory and maps of vegetation and other habitats on the islands,
- 2) proposing guidelines for public use of the spoil islands that are consistent with their maintenance as essentially natural areas,
- 3) assigning a management designation to each of the islands that seeks to balance the following:
 - a) the island's value as wildlife habitat, including its function as a bird rookery,
 - b) the directive to maintain the islands in their natural state, and
 - c) the public good derived from permitting limited development on some islands for recreational purposes.

The Florida Inland Navigation District, which has a perpetual easement on many state-owned spoil islands, has consented to the use of the islands as outlined in this plan. The F.I.N.D. reserves the right to review and comment on any activities involved in implementing this plan.

Management Objectives

The Indian River Lagoon Aquatic Preserve Management Plan (Vero Beach to Fort Pierce and Jensen Beach to Jupiter Inlet), as adopted by the Trustees on January 22, 1985, contains clear resource management objectives (Chapter V) that direct ongoing activities in the preserve. The Martin County spoil islands, as stated above, are all located within the boundaries of the Jensen Beach to Jupiter Inlet Aquatic Preserve, so these objectives apply to management activities on the islands as well. These objectives include:

- 1) becoming familiar with the plant and animal species and communities, and their locations,
- 2) monitoring communities for changes,
- 3) identifying areas and communities in need of restoration, and accomplishing that restoration,
- 4) coordinating efforts with other researchers, and
- 5) protecting communities from the impacts of human use.

This management plan has accomplished the first objective by providing a resource inventory and maps of vegetation and other habitats on the islands. The remaining objectives are tasks that must be part of the ongoing responsibilities of personnel assigned to implement the plan. The second objective will be accomplished by undertaking a general island inspection program that will serve to monitor communities for changes that have occurred since the first resource inventory was conducted. The third objective, community restoration, has already been started. A pilot project to restore native hammock communities on certain spoil islands was undertaken in 1988 and again in 1989. Current efforts are focusing on monitoring the areas to determine the feasibility of undertaking large scale restorations. The fourth objective, coordinating research efforts, will be accomplished by publicizing the results of completed research through publishing and public speaking, continuing to conduct appropriate research on the islands, becoming familiar with related research both in the Indian River Lagoon and in similar estuaries, and promoting the use of the spoil islands for research by qualified persons. The fifth objective, community protection, is perhaps the most important of these goals if human use of these islands is to continue. This goal will be achieved by identifying sources of adverse human

impact through the inspection program, and eliminating or minimizing them by:

- 1) notifying appropriate law enforcement officials of violations,
- 2) undertaking an information program to educate the general public about the ecology and proper use of the islands,
- 4) enlist public assistance, wherever possible, in litter control and reporting violations, and
- 3) promoting the use of management agreements whereby local government agencies and civic groups may "adopt an island" and assume responsibility for monitoring the island and implementing approved plans for its use.

Survey Methods

All of the measurements in the management plan are expressed in metric units. As an aid in converting metric units into more familiar English equivalents the following conversion table has been provided.

Metric Conversion Table

1 hectare (ha) = 2.471 acres

1 kilometer (km) = 0.62 miles

1 meter (m) = 3.25 feet

1 centimeter (cm) = 0.39 inches

The methods used for the biological survey of the spoil islands were identical for all the islands surveyed in the Indian River Lagoon to provide consistency to the data base.

Each island was visited only once during the survey; thus, strong seasonal components are apparent in the flora and fauna listed for some of the islands due to the breeding seasons of birds and fishes and the flowering seasons of plants. However, the species lists included in the management plan do provide a complete list of all flora and fauna observed on each island during the day of the survey. The date that each island was surveyed is noted in the accompanying island description. Endangered or threatened species and species of special concern follow the 1987 Official Lists of Endangered and Potentially Endangered Fauna and Flora in Florida, distributed by the Florida Game and Freshwater Fish Commission.

All the birds visible on an island were counted and identified to species prior to disembarking on the island. In addition, any birds noticed while working on the island were also identified. Nests or evidence of bird nests were recorded although it was difficult to ascertain which species actually used the nests except during the breeding season. The number of birds and bird nests were estimated on rookery islands that contained greater than 100 pairs of breeding birds. Any reptiles and mammals observed while on the islands were identified and recorded.

Ground truthing and on-site maps were made of each island to aid in producing vegetation maps and to get information for percentage of plant cover on each island. One north-south and one east-west transect line was laid out on each island and all the plants within 1 cm and directly overhead of the line were recorded at each 10 m interval along the line. In addition, the areas of the island not on the transect lines were thoroughly searched for plant species. Species occurring on the island but not on the transect line were noted for inclusion in the overall species list of the island. Unknown species or species not previously recorded during the spoil island survey were pressed, identified and mounted for

inclusion in the spoil island herbarium collection. Vegetation maps of each island were produced using ARC/INFO GIS mapping software with 1:2400 aerial photographs of the islands and the information obtained during ground truthing.

Each end of the two terrestrial transects was extended an additional 30 m into the water in order to determine submerged bottom contours and seagrass type, if any; records were made at each 10 m interval along the transect. This information along with aerial photographs was used to determine the extent of the seagrass beds around each island in order to determine boating accessibility. One 20 m seine haul using a small net (4 m x 2 m with 3.2 mm mesh) was taken at each of the four locations around the island. All the fishes and invertebrates collected were identified to the lowest taxonomic level possible. Each species was assigned to one of four abundance categories: 1) rare, less than 5 individuals; 2) occasional, 5-20 individuals; 3) common, 21-50 individuals; and 4) abundant, greater than 50 individuals. Representative samples of the less common fish species in the survey were preserved in 10% formalin and later transferred to 70% isopropanol for confirmation of identification. The following references were used to identify species found on spoil islands:

- | | |
|----------------|--|
| Plants: | Wunderlin (1982), Bell and Taylor (1982), Long and Lakela (1971),
Stevenson (1969), Radford <i>et. al</i> (1968). |
| Invertebrates: | Barnes (1980). |
| Fishes: | Robins <i>et. al</i> (1980), Robins <i>et. al</i> (1986), Hoese and Moore (1977),
Bohlke and Chaplin (1968). |
| Reptiles: | Behler and King (1979). |
| Birds: | Farrand (1988) and Robbins <i>et. al</i> (1966). |

Mammals: Whitaker (1980).

Nomenclature follows the first reference listed for each category.

Criteria for Island Usage Classification

Spoil islands were assigned to one of three general usage categories based on the results of the biological survey; conservation, education, or recreation. Recreation islands were further subdivided into two categories, passive recreation and active recreation. Islands designated for passive recreation should contain no structures but use of the islands for picnics, sunbathing and primitive overnight camping would be permitted. Islands designated for active recreation could support the development of docks, picnic shelters, brick fireplaces or barbecue grills and perhaps sanitary facilities.

Criteria for classification as a conservation island include the presence of extensive seagrass beds, shallow water surrounding the island with no deep water access points, heavy mangrove fringe and little or no open beach access, breeding bird populations, rare or threatened plant species, a high percentage of native plants and high species diversity. Some conservation islands with high soil humus quality (greater than 10 cm) were also identified as potential sites for revegetation with native tropical hammock plants. Public use of conservation islands for recreational purposes should be discouraged although occasional use for bird watching or nature study by nature or conservation oriented groups or individuals would be appropriate, provided these activities are conducted outside of the breeding season.

Criteria for classification as an education island include historical use of the island for education, one or more deep water access points with open beaches, seagrass beds

surrounding at least part of the island that contain high aquatic diversity, and a high plant species diversity including a healthy mangrove community and good representation of native plants. Furthermore, education islands should not have breeding bird populations. School children, scout troops and other groups desiring to learn more about the environment would be encouraged to visit islands set aside for education purposes. In the future these islands might be developed into small nature areas with interpretive trails.

Criteria for passive and active recreation islands are similar. Islands were classified for recreation if they had one or more deep water access points with open sand beaches, historical human usage, small or nonexistent seagrass beds, low species diversity, no rare or threatened species and no breeding bird populations. Passive recreation islands are small islands or densely vegetated islands that could not support the development of structures. Active recreation islands are larger islands with open areas that could support construction of permanent facilities. The general public should be encouraged to use the islands designated for recreation for picnicking, sunbathing, swimming and primitive overnight camping.

RESOURCE INVENTORY

This section of the management plan comprises all the biological information gathered during the spoil island survey. Table 4-1 presents a complete list of all the flora and fauna collected during the spoil island survey; abundance information is presented for those species found in Martin County (Table 4-1). Vegetation maps and physical and biological descriptions of each island are included along with recommendations for the best use for each island. For a more detailed review of the management recommendations, see the discussion section of the plan.

The symbols for vegetation type on the maps are consistent throughout the entire management plan. Species that commonly occur together were represented by one symbol for ease of interpretation. For instance, the symbol for mangroves includes red, black and white mangroves as well as buttonwood; these species are commonly intermixed, making them difficult to distinguish on a small scale map. The symbol for marsh represents saltwort, glasswort, white and black mangrove marsh areas. The symbol for cordgrass includes both smooth cordgrass and marshhay cordgrass. Although Brazilian pepper often occurs under a canopy of Australian pine, areas such as these were coded with the Australian pine symbol when it was the dominant plant species. Sections of the maps showing Brazilian pepper usually indicate a dense, monospecific stand of that species.

Table 4-1. Species list of all plants and animals collected or observed on spoil islands from October 1987 - January 1989 with species found on Martin County spoil islands indicated. "Undet." means the species was not determined. Plant Key: numbers are percent relative frequency of occurrence, X=present on island but not on transect line. Invertebrate/Fish Key: R=rare (1-4 individuals), O=occasional (5-20 individuals), C=common (21-50 individuals), A=abundant (>50 individuals). Bird/Reptile/Mammal Key: number of individuals seen is indicated.

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7
FUNGI							
1. Bracket fungus undet.			X			X	X
Bracket fungus							
2. Mushrooms			X				
Mushrooms							
PLANTAE							
CHLOROPHYTA							
SIPHONALES							
CAULERPACEAE							
3. <i>Caulerpa</i> spp.							
<i>Caulerpa</i> algae							
RHODOPHYTA							
FLORIDEOPHYCIDAE							
GIGARTINALES							
GRACILARIACEAE							
4. <i>Gracilaria</i> spp.	X		X				
Drift algae							
PTERIDOPHYTA							
POLYPODIACEAE							
5. <i>Phlebodium aureum</i>							X
Golden polypody							
6. <i>Polypodium polypodioides</i>							
Resurrection fern							
DAVALLIACEAE							
7. <i>Nephrolepis cordifolia</i>							
Boston fern							
PTERIDACEAE							
8. <i>Acrostichum danaeifolium</i>							
Giant leather fern							
9. <i>Pteris vittata</i>							
Ladder brake							
GYMNOSPERMAE							
CONIFERAE							
ARAUCARIACEAE							
10. <i>Araucaria excelsa</i>							
Norfolk Island pine							
CUPRESSACEAE							
11. <i>Juniperus silicicola</i>							
Southern red cedar							
ANGIOSPERMAE							
MONOCOTYLEDONAE							
TYPHACEAE							
12. <i>Typha latifolia</i>							
Common cattail							
CYMODOCEACEAE							
13. <i>Halodule wrightii</i>	X	X	X	X	X	X	X
Shoal grass							
14. <i>Syringodium filiforme</i>	X	X	X	X			
Manatee grass							
HYDROCHARITACEAE							
15. <i>Halophila johnsonii</i>							X
Johnson's sea grass							
16. <i>Thalassia testudinum</i>							
Turtle grass							
POACEAE							
17. Grasses undet.	X	6.8		5.6			0.3
Unidentified grasses							
18. <i>Andropogon glomeratus</i>							
Bushy bluestem							
19. <i>Andropogon virginicus</i>							
Broom sedge							
20. <i>Cenchrus incertus</i>		X					
Coast sandspur							
21. <i>Chloris</i> spp.		4.1					3.3
Finger grass							
22. <i>Cortaderia selloana</i>							
Pampas grass							
23. <i>Dactyloctenium aegyptium</i>				X			0.9
Crow's foot grass							
24. <i>Distichlis spicata</i>	X	5.5		X			X
Saltgrass							
25. <i>Panicum maximum</i>		2.7					X
Guinea grass							
26. <i>Paspalum</i> spp.	1.8						
Bahia grass							
27. <i>Rhynchelytrum repens</i>							0.6
Natal grass							
28. <i>Spartina alterniflora</i>	X	1.4			5.4	X	X
Saltmarsh cordgrass							
29. <i>Spartina patens</i>	1.8	X		X			0.3
Saltmeadow cordgrass							
30. <i>Sporobolus</i> spp.							0.3
Sporobolus grass							
31. <i>Uniola paniculata</i>				5.6			
Sea oats							
CYPERACEAE							
32. <i>Cyperus ligularis</i>		X					0.3
Sedge							

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7
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ARECACEAE							
33. <i>Chamaedorea</i> spp. Dwarf cluster palm							
34. <i>Cocos nucifera</i> Coconut palm							
35. <i>Phoenix</i> spp. Date palm							
36. <i>Phoenix canariensis</i> Canary Island date palm							
37. <i>Sabal palmetto</i> Cabbage palm	5.4	1.4	6.7	11.1		X	1.2
38. <i>Serenoa repens</i> Saw palmetto							
39. <i>Washingtonia robusta</i> Washington palm							X
ARACEAE							
40. <i>Monstera</i> spp. Arrowhead vine							
BROMELIACEAE							
41. <i>Tillandsia fasciculata</i> Cardinal air plant							
42. <i>Tillandsia recurvata</i> Ball moss					X	X	X
43. <i>Tillandsia usneoides</i> Spanish moss							
44. <i>Tillandsia utriculata</i> Pineapple air plant							0.3
COMMELINACEAE							
45. <i>Commelina elegans</i> Dayflower		4.1					
46. <i>Rhoeo spathacea</i> Oyster-plant							X
47. <i>Tradescantia fluminensis</i> Wandering jew							
LILIACEAE							
48. <i>Aloe vera</i> Aloe							
SMILACACEAE							
49. <i>Smilax</i> spp. Smilax							
50. <i>Smilax rotundifolia</i> Greenbrier							
AGAVACEAE							
51. <i>Agave</i> spp. Century plant							0.9
52. <i>Yucca aloifolia</i> Spanish dagger							
AMARYLLIDACEAE							
53. <i>Amaryllis</i> spp. Amaryllis							
54. <i>Crinum</i> spp. Crinum lily							
55. <i>Hymenocallis</i> spp. Spider lily							
IRIDACEAE							
56. <i>Sisyrinchium atlanticum</i> Blue-eyed grass							
ORCHIDACEAE							
57. <i>Encyclia tampensis</i> Butterfly orchid							
58. <i>Habenaria odontopetala</i> Habenaria orchid							0.6
DICOTYLEDONAE							
CASUARINACEAE							
59. <i>Casuarina</i> spp. Australian pine	21.4	9.6	29.8	27.8	23.2	34.7	34.6
SALICACEAE							
60. <i>Salix caroliniana</i> Carolina willow							
MYRICACEAE							
61. <i>Myrica cerifera</i> Wax myrtle							
FAGACEAE							
62. <i>Quercus laurifolia</i> Laurel oak							
63. <i>Quercus virginiana</i> Live oak							
ULMACEAE							
64. <i>Celtis laevigata</i> Hackberry							
MORACEAE							
65. <i>Ficus</i> spp. Exotic fig tree							
66. <i>Ficus aurea</i> Strangler fig		X	X			13.9	0.6
67. <i>Ficus nitida</i> Retus fig							
68. <i>Morus rubra</i> Red mulberry							

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7
URTICACEAE							
69. <i>Boehmeria cylindrica</i>							
False nettle							
70. <i>Parietaria floridana</i>							2.7
Parietaria							
POLYGONACEAE							
71. <i>Coccoloba diversifolia</i>							
Pigeon plum							
72. <i>Coccoloba uvifera</i>	12.5	4.1	5.8	5.6		4.2	2.4
Sea grape							
73. <i>Rumex</i> spp.							
Dock							
74. <i>Rumex hastatulus</i>							
Hastate-leaved dock							
75. <i>Rumex verticillatus</i>							
Swamp dock							
CHENOPODIACEAE							
76. <i>Atriplex pentandra</i>							
Sand striples							
77. <i>Chenopodium album</i>							
Lambsquarter							
78. <i>Chenopodium ambrosioides</i>							
Mexican tea							
79. <i>Salicornia virginica</i>							
Perennial glasswort							
80. <i>Suaeda linearis</i>							
Sea blite							
AMARANTHACEAE							
81. <i>Blutaparon vermiculare</i>							X
Samphire							
82. <i>Iresine diffusa</i>							0.3
Bloodleaf							
NYCTAGINACEAE							
83. <i>Boerhavia diffusa</i>							
Red spiderling							
84. <i>Guapira discolor</i>		1.4					
Blolly							
BATAACEAE							
85. <i>Batis maritima</i>							
Saltwort							
PHYTOLACCACEAE							
86. <i>Phytolacca americana</i>		1.4					
Pokeberry							
87. <i>Rivina humilis</i>		X				X	X
Rouge plant							
AIZOACEAE							
88. <i>Sesuvium portulacastrum</i>	X	X	1.0	5.6			0.3
Sea purslane							
PORTULACACEAE							
89. <i>Portulaca oleracea</i>							
Purslane							
90. <i>Portulaca pilosa</i>							
Pink purslane							
CARYOPHYLLACEAE							
91. <i>Stellaria media</i>							
Common chickweed							
92. <i>Stipulicida setacea</i>							
Stipulicida							
MENISPERMACEAE							
93. <i>Cissampelos pareira</i>							X
Moonseed							
BRASSICACEAE							
94. <i>Cakile lanceolata</i>				X			X
Sea rocket							
95. <i>Lepidium virginicum</i>							X
Poor man's pepper							
CRASSULACEAE							
96. <i>Kalanchoe pinnata</i>							
Life plant							
97. <i>Kalanchoe tubiflora</i>							
Chandelier plant							
CHRYSOBALANACEAE							
98. <i>Chrysobalanus icaco</i>							
Coco-plum							
FABACEAE							
99. <i>Abura precatorius</i>							
Crab's eye							
100. <i>Canavalia rosea</i>							X
Seaside bean							
101. <i>Caesalpinia bonduc</i>	X	X	1.0		X	2.8	X
Gray nicker							
102. <i>Cassia</i> spp.							0.6
Cassia							
103. <i>Cassia chamaecrista</i>							
Partridge pea							
104. <i>Cassia coluteoides</i>							
Cassia							
105. <i>Cassia marilandica</i>							
Wild senna							

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7
106. <i>Crotalaria pallida</i> Rattlebox							
107. <i>Crotalaria rotundifolia</i> Rabbit bella							
108. <i>Dalbergia ecastophyllum</i> Coin vine	14.3		16.3	X		X	0.9
109. <i>Desmanthus virgatus</i> Desmanthus							
110. <i>Desmodium spp.</i> Tick trefoil							
111. <i>Desmodium triflorum</i> Beggars tick							
112. <i>Erythrina herbacea</i> Coral bean							
113. <i>Indigofera spicata</i> Short indigofera							
114. <i>Indigofera suffruticosa</i> Indigofera							
115. <i>Parkinsonia aculeata</i> Mexican palo verde							
116. <i>Ricinus communis</i> Castor bean							X
117. <i>Sophora tomentosa</i> Necklace pod						X	0.6
118. <i>Vicia acutifolia</i> Vicia							
119. <i>Vigna luteola</i> Cow pea		X					X
GERANIACEAE							
120. <i>Geranium spp.</i> Geranium							
121. <i>Geranium carolinianum</i> Crane's bill							
OXALIDACEAE							
122. <i>Oxalis spp.</i> Wood sorrel							
RUTACEAE							
123. <i>Amyris elemifera</i> Torchtwood							
124. <i>Zanthoxylum clava-herculis</i> Hercules club							
125. <i>Zanthoxylum fagara</i> Wild lime							0.3
SURIANACEAE							
126. <i>Suriana maritima</i> Bay cedar							
BURSERACEAE							
127. <i>Bursera simaruba</i> Gumbo limbo	1.8	X	X			2.8	0.6
EUPHORBIACEAE							
128. <i>Chamaesyce spp.</i> Milk Spurge	1.8	4.1					X
129. <i>Chamaesyce hirta</i> Hairy spurge							
130. <i>Chamaesyce hysopifolia</i> Eye bane							
131. <i>Cnidoscolus stimulosus</i> Tread softly		X					0.3
132. <i>Croton glandulosus</i> Glandular croton							
133. <i>Croton punctatus</i> Beach tea							
134. <i>Euphorbia spp.</i> Jacob's ladder							
135. <i>Jatropha curcas</i> Physic nut							
136. <i>Phyllanthus abnormis</i> Phyllanthus							
137. <i>Poinsettia cyathophora</i> Painted leaf		5.5		11.1			
EMPETRACEAE							
138. <i>Ceratiola ericoides</i> Rosemary							
ANACARDIACEAE							
139. <i>Rhus copallina</i> Winged sumac							
140. <i>Schinus terebinthifolius</i> Brazilian pepper	X	1.4	5.8	5.6	8.9	13.9	7.2
AQUIFOLIACEAE							
141. <i>Ilex cassine</i> Dahoon holly							
SAPINDACEAE							
142. <i>Dodonaea viscosa</i> Varnish leaf	5.4			5.6		X	X
143. <i>Excoecia paniculata</i> Inkwood							
RHAMNACEAE							
144. <i>Krugiodendron ferreum</i> Black ironwood						X	X

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7

VITACEAE							
145. <i>Ampelopsis arborea</i> Pepper vine							
146. <i>Parthenocissus quinquefolia</i> Virginia creeper		X					X
147. <i>Vitis aestivalis</i> Summer grape							
148. <i>Vitis rotundifolia</i> Muscadine grape							
CAPPARACEAE							
149. <i>Capparis cynophallophora</i> Jamaica caper tree							
150. <i>Capparis flexuosa</i> Lumber caper							
MALVACEAE							
151. <i>Hibiscus</i> spp. Hibiscus (cultivated)						0.3	
152. <i>Hibiscus tiliaceus</i> Mahoe						1.5	
153. <i>Kosteletzkya</i> spp. Mallow							
154. <i>Kosteletzkya virginica</i> Saltmarsh mallow							
155. <i>Malvastrum corchorifolium</i> False mallow							
156. <i>Sida acuta</i> Broomweed							
157. <i>Sida rhombifolia</i> Indian hemp							
158. <i>Thespesia populnea</i> Seaside mahoe							
159. <i>Urena lobata</i> Caesar weed		X					
HYPERICACEAE							
160. <i>Hypericum hypericoides</i> St. Andrew's cross							
PASSIFLORACEAE							
161. <i>Passiflora incarnata</i> Passion flower							X
CARICACEAE							
162. <i>Carica papaya</i> Papaya					X		
LOASACEAE							
163. <i>Mentzelia floridana</i> Poorman's patch							
CACTACEAE							
164. <i>Cereus pteranthus</i> Snake cactus							
165. <i>Cereus undatus</i> Night-blooming cereus							
166. <i>Opuntia stricta</i> Prickly-pear cactus							X
RHIZOPHORACEAE							
167. <i>Rhizophora mangle</i> Red mangrove	1.8	12.3	6.7	X	19.6	12.5	13.1
COMBRETACEAE							
168. <i>Conocarpus erecta</i> Buttonwood			2.9		7.1	1.4	
169. <i>Laguncularia racemosa</i> White mangrove	X	X	5.8		19.6	X	3.3
MYRTACEAE							
170. <i>Eugenia axillaris</i> White stopper		1.4					
171. <i>Eugenia foetida</i> Spanish stopper							
172. <i>Myrcianthes fragrans</i> Twinberry							
173. <i>Psidium guajava</i> Guava							
ONAGRACEAE							
174. <i>Gaura angustifolia</i> Gaura							
175. <i>Oenothera humifusa</i> Seaside evening primrose							
ARALIACEAE							
176. <i>Schefflera actinophylla</i> Australian umbrella tree		1.4					X
APIACEAE							
177. <i>Centella asiatica</i> Coinwort							
178. <i>Oxypolis filiformis</i> Water dropwort							
ERICACEAE							
179. <i>Vaccinium stamineum</i> Deerberry							
MYRSINACEAE							
180. <i>Ardisia escallonioides</i> Marberry							
181. <i>Rapanea punctata</i> Myrsine		X					

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7
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PLUMBAGINACEAE							
182. <i>Limonium carolinianum</i> Sea lavender	X		X				X
183. <i>Plumbago scandens</i> Wild plumbago		1.4				X	3.6
SAPOTACEAE							
184. <i>Bumelia celtstrina</i> Saffron plum							
185. <i>Bumelia tenax</i> Tough bumelia							
186. <i>Mastichodendron foetidissimum</i> Mastic							0.3
OLEACEAE							
187. <i>Forestiera segregata</i> Florida privet	X		1.0		X		X
188. <i>Jasminum spp.</i> Jasmine							
LOGANIACEAE							
189. <i>Polypremum procumbens</i> Rustweed							
APOCYNACEAE							
190. <i>Allamanda cathartica</i> Golden trumpet							
191. <i>Catharanthus roseus</i> Madagascar periwinkle						X	0.9
192. <i>Nerium oleander</i> Oleander							
193. <i>Rhabdadenia biflora</i> Rubber vine							X
194. <i>Sansevieria hyacinthoides</i> African bowstring hemp							
ASCLEPIADACEAE							
195. <i>Cynanchum angustifolium</i> Vine milkweed							
196. <i>Sarcostemma clausa</i> White vine							
CONVOLVUACEAE							
197. <i>Ipomoea spp.</i> Morning glory		2.7					
198. <i>Ipomoea pandurata</i> Wild potato vine							
199. <i>Ipomoea pes-caprae</i> Railroad vine	X	2.7		X			
BORAGINACEAE							
200. <i>Heliotropium angiospermum</i> Scorpion tail							X
201. <i>Heliotropium curvassavicum</i> Seaside heliotrope							
VERBENACEAE							
202. <i>Callicarpa americana</i> Beauty bush							
203. <i>Lantana camara</i> Shrub verbena							
204. <i>Lippia nodiflora</i> Carpetweed							
205. <i>Vitex trifolia</i> Vitex							
AVICENNIACEAE							
206. <i>Avicennia germinans</i> Black mangrove	5.4	11.0	11.5		14.3	13.9	2.7
LAMIACEAE							
207. <i>Leonotis nepetaefolia</i> Lion's ear							
208. <i>Pycnanthemum spp.</i> Horsemint							
209. <i>Trichostema dichotomum</i> Forked blue curls							X
SOLANACEAE							
210. <i>Lycium carolinianum</i> Christmas berry							
211. <i>Lycopersicon esculentum</i> Tomato							
212. <i>Physalis viscosa</i> Ground cherry							
213. <i>Solanum americanum</i> Common nightshade							X
214. <i>Solanum elaeagnifolium</i> Potato tree							X
215. <i>Solanum seaforthianum</i> Climbing nightshade							
SCROPHULARIACEAE							
216. <i>Buchnera americana</i> Blue heart							
217. <i>Capraria biflora</i> Twinflower							
218. <i>Scoparia dulcis</i> Sweet broom							

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7
BIGNONIACEAE							
219. <i>Tecomaria capensis</i> Cape honeysuckle							
220. <i>Mangifera indica</i> Mango							
PLANTAGINACEAE							
221. <i>Plantago virginica</i> Southern plantain							
RUBIACEAE							
222. <i>Chicococca alba</i> Snowberry					X	X	
223. <i>Ixora</i> spp. Ixora							
224. <i>Psychotria nervosa</i> Wild coffee						0.6	
225. <i>Randia aculeata</i> White indigo berry						X	
CAPRIFOLIACEAE							
226. <i>Sambucus canadensis</i> Elderberry							
CUCURBITACEAE							
227. <i>Cucumis melo</i> var. <i>dudaim</i> Dudaim melon					X	X	
228. <i>Melothria pendula</i> Creeping cucumber	X	13.7	X				0.9
229. <i>Momordica charantia</i> Wild balsam apple							
GOODENIACEAE							
230. <i>Scaevola frutescens</i> Scaevola							0.3
231. <i>Scaevola plumieri</i> Inkberry							
ASTERACEAE							
232. <i>Ambrosia artemisiifolia</i> Common ragweed	X						0.6
233. <i>Aster</i> spp. Asters undet.							X
234. <i>Baccharis halimifolia</i> Groundsel tree	X						X
235. <i>Bidens alba</i> Spanish needles	X	X					X
236. <i>Borrchia frutescens</i> Sea oxeye			1.0				0.9
237. <i>Chromolaena odorata</i> Eupatorium							
238. <i>Chrysopsis</i> spp. Goldenaster							
239. <i>Chrysopsis subulata</i> Goldenaster	7.1						8.4
240. <i>Conyza canadensis</i> Dwarf horseweed							
241. <i>Emilia sonchifolia</i> Tassel flower	X						X
242. <i>Erigeron strigosus</i> Daisy fleabane							X
243. <i>Eupatorium capillifolium</i> Dog fennel							0.3
244. <i>Eupatorium serotinum</i> Late thoroughwort							0.9
245. <i>Euthamia minor</i> Goldenrod							
246. <i>Gnaphalium obtusifolium</i> Rabbit tobacco							
247. <i>Helianthus debilis</i> Beach sunflower							X
248. <i>Hieracium gronovii</i> Hawkweed							
249. <i>Iva frutescens</i> Marsh elder							X
250. <i>Iva imbricata</i> Beach elder	X			X			X
251. <i>Lactuca canadensis</i> Wild lettuce				5.6			X
252. <i>Lactuca graminifolia</i> Wild lettuce							
253. <i>Liatrus tenuifolia</i> Blazing star							
254. <i>Mikania cordifolia</i> Climbing hemp							
255. <i>Mikania scandens</i> Hempweed							X
256. <i>Pluchea foetida</i> Marsh fleabane							
257. <i>Pluchea odorata</i> Camphor weed							
258. <i>Solidago sempervirens</i> Seaside goldenrod							
259. <i>Sonchus asper</i> Spiny leaved sow thistle							

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7
260. <i>Sonchus oleraceus</i> Common sow thistle							
261. <i>Taraxacum officinale</i> Common dandelion							
262. <i>Wedelia trilobata</i> Creeping oxeye							
ANIMALIA							
PORIFERA							
263. Porifera Sponge			R				
CTENOPHORA							
264. Ctenophora Jellyfish, ctenophores			F	F			
MOLLUSCA							
GASTROPODA							
MESOGASTROPODA							
POTAMIDIDAE							
265. <i>Basillaria minina</i> Little horn shell							
266. <i>Cerithidea scalariformis</i> Ladder horn shell							
CERITHIIDAE							
267. <i>Cerithiopsis greeni</i> Green's cerith							
STROMBIDAE							
268. <i>Strombus alatus</i> Florida fighting conch							
NEOGASTROPODA							
MURICIDAE							
269. <i>Urosalpinx cinerea</i> Atlantic oyster drill							
MELONGENIDAE							
270. <i>Melongena corona</i> Florida crowned conch							
NASSARIIDAE							
271. <i>Nassarius vibex</i> Mud snail						R	
MARGINELLIDAE							
272. <i>Prunum apicinum</i> Common Atlantic marginella							
ANASPIDEA							
APLYSIIDAE							
273. <i>Aplysia brasiliana</i> Sooty seahare			R				
BIVALVIA							
PTERIOIDA							
OSTREIDAE							
274. <i>Crassostrea virginica</i> American oyster							
VENEROIDA							
VENERIDAE							
275. <i>Mercenaria mercenaria</i> Northern quahog							
ANNELIDA							
POLYCHAETA							
276. Polychaeta undet. Polychaete worms							
CHELICERATA							
MEROSTOMATA							
XIPHOSURIDA							
LIMULIDAE							
277. <i>Limulus polyphemus</i> Horseshoe crab							
CRUSTACEA							
MALACOSTRACA							
DECAPODA							
PENAEIDAE							
278. <i>Penaeus</i> spp. Commercial shrimps		F	R			F	
PALAEMONIDAE							
279. <i>Palaemonetes</i> spp. Grass shrimp		A	C	C		C	
ALPHEIDAE							
280. <i>Alpheus</i> spp. Snapping shrimps							
HIPPOLYTIDAE							
281. <i>Toxuma carolinensis</i> Arrow shrimp						R	
282. <i>Hippolytes pleuracanthus</i> Humpback shrimp						F	
PANULIRIDAE							
283. <i>Panulirus argus</i> Spiny lobster							
PAGURIDAE							
284. <i>Clibanarius vittatus</i> Striped hermit crab		F	F			C	

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7
MAJIDAE							
285. <i>Lubinia emarginata</i> Spider crab							
ORYPODIDAE							
286. <i>Uca</i> spp. Fiddler crabs							
PORTUNIDAE							
287. <i>Callinectes</i> spp. Swimming crabs				F			F
288. <i>Callinectes sapidus</i> Blue crab					R	R	
XANTHIDAE							
289. Xanthidae undet. Mud crabs				R			
290. <i>Menippe mercenaria</i> Stone crab							
GRAPSIDAE							
291. <i>Aratus pisonii</i> Mangrove tree crab							
292. <i>Cardisoma guanhumi</i> Great land crab			100			15	60
ECHINODERMATA							
CRINOIDEA							
293. Echinodermata Echinoderms							
STELLEROIDEA							
294. Holothurian Sea cucumber							
ASTEROIDEA							
295. Asteroidea Starfish							
CHORDATA							
ASCIDIACEA							
296. Tunicata undet. Tunicates							
CHONDRICHTHYES							
RAJIFORMES							
DASYATIDAE							
297. <i>Dasyatis sabina</i> Atlantic stingray							
298. <i>Gymnura micrura</i> Smooth butterfly ray			R				
OSTEICHTHYES							
CLUPEIFORMES							
CLUPEIDAE							
299. <i>Brevoortia</i> spp. Menhaden							
300. <i>Opisthonema oglinum</i> Atlantic thread herring							
301. <i>Sardinella aurita</i> Spanish sardine							
ENGRAULIDAE							
302. <i>Anchoa hepsetus</i> Striped anchovy							
303. <i>Anchoa mitchelli</i> Bay anchovy		A	R				C
ELOPIFORMES							
ELOPIDAE							
304. <i>Elops saurus</i> Ladyfish	A			A			
BATRACHOIDIFORMES							
BATRACHOIDIDAE							
305. <i>Opsanus tau</i> Oyster toadfish							
ATHERINIFORMES							
EXOCOETIDAE							
306. <i>Hyporhamphus unifasciatus</i> Halfbeak							
BELONIDAE							
307. <i>Strongylura marina</i> Atlantic needlefish							
308. <i>Strongylura notata</i> Redfin needlefish			R				
CYPRINODONTIDAE							
309. <i>Cyprinodon variegatus</i> Sheepshead minnow					R		
310. <i>Fundulus confluentus</i> Marsh killifish							
311. <i>Fundulus grandis</i> Gulf killifish							
312. <i>Fundulus majalis</i> Striped killifish			R				
313. <i>Fundulus similis</i> Longnose killifish							
314. <i>Lucania parva</i> Rainwater killifish							
POECILIIDAE							
315. <i>Poecilia latipinna</i> Sailfin molly							

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7

ATHERINIDAE							
316. <i>Menidia beryllina</i>							
Inland silverside							
317. <i>Menidia peninsulæ</i>							
Tidewater silverside							
GASTEROSTEIFORMES							
SYNGNATHIDAE							
318. <i>Hippocampus erectus</i>							
Lined seahorse							
319. <i>Hippocampus zosterae</i>		R					
Dwarf seahorse							
320. <i>Syngnathus louisianae</i>		R		R			
Chain pipefish							
321. <i>Syngnathus scovelli</i>	R		F	R	R		R
Gulf pipefish							
PERCIFORMES							
CENTROPOMIDAE							
322. <i>Centropomus undecimalis</i>							
Snook							
CARANGIDAE							
323. <i>Caranx hippos</i>							
Jack crevalle							
324. <i>Oligoplites saurus</i>		R	R				
Leatherjacket							
325. <i>Trachinotus falcatus</i>							
Permit							
LUTJANIDAE							
326. <i>Lutjanus griseus</i>	R						
Grey snapper							
327. <i>Ocyurus chrysurus</i>			R				
Yellowtail snapper							
LOBOTIDAE							
328. <i>Lobotes surinamensis</i>		R	R				
Tripletail							
GERREIDAE							
329. <i>Diapterus auratus</i>							
Irish pompano							
330. <i>Eucinostomus</i> spp.	A	A	A	C	A	A	A
Mojarra							
HAEMULIDAE							
331. <i>Haemulon chrysargyreum</i>			F				
Small mouth grunt							
332. <i>Orthopristis chrysoptera</i>			F				
Pigfish							
SPARIDAE							
333. <i>Archosargus probatocephalus</i>							
Sheepshead							
334. <i>Diplodus argenteus</i>				A			
Silver porgy							
335. <i>Lagodon rhomboides</i>	A	R	R	A	A	R	R
Pinfish							
SCIAENIDAE							
336. <i>Bairdiella chrysoura</i>							
Silver perch							
337. <i>Cynoscion nebulosus</i>			R				
Spotted seatrout							
338. <i>Leiostomus xanthurus</i>	R			A	R		A
Spot							
339. <i>Menticirrhus americanus</i>							
Southern kingfish							
340. <i>Micropogonias undulatus</i>							
Atlantic croaker							
341. <i>Sciaenops ocellatus</i>	R	A	A			A	
Red drum							
EPHIPPIDAE							
342. <i>Chaetodipterus faber</i>							
Spadefish							
MUGILIDAE							
343. <i>Mugil cephalus</i>			R				
Striped mullet							
344. <i>Mugil curema</i>	R	A		A			R
White mullet							
SPHYRAENIDAE							
345. <i>Sphyræna barracuda</i>							
Greater barracuda							
346. <i>Sphyræna borealis</i>		R					
Northern sennet							
BLENNIIDAE							
347. <i>Chasmodes bosquianus</i>							
Striped blenny							
348. <i>Chasmodes saburrae</i>							
Florida blenny							
GOBIIDAE							
349. <i>Bathygobius soporator</i>							R
Frillfin goby							
350. <i>Gobionellus boleosoma</i>	R			R			
Darter goby							

		MARTIN COUNTY ISLAND NUMBER						
		1	2	3	4	5	6	7
351. <i>Gobiosoma boeci</i>	Naked goby	R						F
352. <i>Gobiosoma robustum</i>	Code goby	R						R
353. <i>Microgobius gulosus</i>	Clown goby							
STROMATEIDAE								
354. <i>Peprilus</i> spp.	Butterfish							
PLEURONECTIFORMES								
BOTHIDAE								
355. <i>Citharichthys spilopterus</i>	Bay whiff							
356. <i>Paralichthys</i> spp.	Southern or summer flounder							
357. <i>Paralichthys albigutta</i>	Gulf flounder							
SOLEIDAE								
358. <i>Trinectes maculatus</i>	Hogchoker							
CYNOGLOSSIDAE								
359. <i>Symphurus plagiatus</i>	Blackcheek tonguefish							
TETRAODONTIFORMES								
BALISTIDAE								
360. <i>Akarterus scriptus</i>	Scrawled filefish		R					
361. <i>Monacanthus hispidus</i>	Planehead filefish		R	F				
OSTRACIIDAE								
362. <i>Lactophrys triqueter</i>	Smooth trunkfish							
TETRAODONTIDAE								
363. <i>Sphoeroides nephelus</i>	Southern puffer							
364. <i>Sphoeroides spengleri</i>	Bandtail puffer							
365. <i>Sphoeroides testudineus</i>	Checkered puffer							
DIODONTIDAE								
366. <i>Chilomycterus antillarum</i>	Web burrfish							
367. <i>Chilomycterus schoepfi</i>	Striped burrfish							
REPTILIA								
SQUAMATA								
IGUANIDAE								
368. <i>Anolis carolinensis carolinensis</i>	Green anole	1						
369. <i>Anolis sagrei</i>	Brown anole						1	
370. <i>Sceloporus woodi</i>	Florida scrub lizard							
SCINCIDAE								
371. <i>Eumeces fasciatus</i>	Five lined skink							
COLUBRIDAE								
372. <i>Coluber constrictor priapus</i>	Southern black racer						1	
373. <i>Elaphe obsoleta quadrivittata</i>	Yellow rat snake							
AVES								
GAVIIFORMES								
GAVIIDAE								
374. <i>Gavia immer</i>	Common Loon							
PELECANIFORMES								
PELECANIDAE								
375. <i>Pelicanus erythrorhynchos</i>	White pelican							
376. <i>Pelicanus occidentalis</i>	Brown pelican	3	150			1	3	
FREGATIDAE								
377. <i>Fregata magnificens</i>	Magnificent frigate bird							
PHALACROCORACIDAE								
378. <i>Phalacrocorax auritus</i>	Double-crested cormorant		8					
ANHINGIDAE								
379. <i>Anhinga anhinga</i>	Anhinga	1	2					
ANSERIFORMES								
ANATIDAE								
380. <i>Anas acuta</i>	Pintail							
381. <i>Anas carolinensis</i>	Green-winged teal							
382. <i>Anas platyrhynchos</i>	Mallard							
383. <i>Aythya affinis</i>	Lesser scaup							

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7
384. <i>Aythya marila</i> Greater scaup							
385. <i>Mergus serrator</i> Red-breasted merganser							
FALCONIFORMES							
CATHARTIDAE							
386. <i>Cathartes aura</i> Turkey vulture		10	6				
387. <i>Coragyps atratus</i> Black vulture							
ACCIPITRIDAE							
388. <i>Falco peregrinus</i> Peregrine falcon							
389. <i>Falco sparverius</i> American kestrel							
390. <i>Haliaeetus leucocephalus</i> Bald eagle							
391. <i>Pandion haliaetus</i> Osprey	3		1				2
CICONIIFORMES							
ARDEODAE							
392. <i>Ardea herodias</i> Great blue heron	1	2	4	1	1	5	4
393. <i>Bubulcus ibis</i> Cattle egret							
394. <i>Butorides virescens</i> Green-backed heron						1	
395. <i>Casmerodius albus</i> Great egret					1	2	
396. <i>Dichromanassa rufescens</i> Reddish egret							
397. <i>Florida caerules</i> Little blue heron	1		2			1	2
398. <i>Hydranassa tricolor</i> Tricolor heron							
399. <i>Leucophox thula</i> Snowy egret	1						1
400. <i>Nyctanassa violacea</i> Yellow-crowned night heron							
401. <i>Nycticorax nycticorax</i> Black-crowned night heron							
CICONIIDAE							
402. <i>Mycteria americana</i> Wood stork							
THRESKIORNITHIDAE							
403. <i>Ajaia ajaja</i> Roseate spoonbill							
404. <i>Eudocimus albus</i> White ibis		50	3				1
405. <i>Plegadis falcinellus</i> Glossy ibis							
GRUIFORMES							
RALLIDAE							
406. <i>Fulica americana</i> American coot							
CHARADRIIFORMES							
HAEMATOPODIDAE							
407. <i>Haematopus palliatus</i> American oystercatcher		2					
CHARADRIIDAE							
408. <i>Charadrius vociferus</i> Killdeer					1		
409. <i>Charadrius wilsonia</i> Wilson's plover							
410. <i>Pluvialis squatarola</i> Black bellied plover							
SCOLOPACIDAE							
411. <i>Actitis macularia</i> Spotted sandpiper			1				
412. <i>Arenaria interpres</i> Ruddy turnstone							
413. <i>Calidris alba</i> Sanderling							
414. <i>Calidris alpina</i> Dunlin							
415. <i>Calidris minutilla</i> Least sandpiper							
416. <i>Catoptrophorus semipalmatus</i> Willet							
417. <i>Erolia or Ereunetes spp.</i> Sandpipers					1		
418. <i>Limnodromus griseus</i> Short-billed dowitcher			1				
419. <i>Tringa solitaria</i> Solitary sandpiper							
LARIDAE							
420. <i>Hydroprogne caspia</i> Caspian tern							
421. <i>Larus argentatus</i> Herring gull							

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7
422. <i>Larus atricilla</i> Laughing gull		1	1				
423. <i>Larus delawarensis</i> Ring-billed gull		1					
424. <i>Larus marinus</i> Lesser black-backed gull							
425. <i>Sterna albifrons</i> Least tern							
426. <i>Thalasseus maximus</i> Royal tern							
RYNCHOPIDAE							
427. <i>Rynchops nigra</i> Black skimmer							
COLUMBIFORMES							
COLUMBIDAE							
428. <i>Zenaidura macroura</i> Mourning dove							
STRIGIFORMES							
TYTONIDAE							
429. <i>Tyto alba</i> Barn owl							
CAPRIMULGIFORMES							
CAPRIMULGIDAE							
430. <i>Caprimulgus carolinensis</i> Chuck-will's-widow							
CORACIIFORMES							
ALCEDINIDAE							
431. <i>Megasceryle alcyon</i> Belted kingfisher	1		4			3	
PICIFORMES							
PICIDAE							
432. <i>Centurus carolinus</i> Red-bellied woodpecker							
433. <i>Dendrocopos villosus</i> Hairy woodpecker							
434. <i>Dryocopus pileatus</i> Pileated woodpecker							
435. <i>Sphyrapicus varius</i> Yellow-bellied sapsucker							
PASSERIFORMES							
CORVIDAE							
436. <i>Corvus ossifragus</i> Fish crow		13	2		2		
437. <i>Cyanocitta cristata</i> Blue jay							
CERTHIIDAE							
438. <i>Certhia familiaris</i> Brown creeper							
MIMIDAE							
439. <i>Dumetella carolinensis</i> Gray cat bird							
440. <i>Mimus polyglottos</i> Northern mockingbird							
441. <i>Taxostoma rufum</i> Brown thrasher							
TURDIDAE							
442. <i>Turdus migratorius</i> American robin							
SYLVIIDAE							
443. <i>Poliophtila caerulea</i> Blue-gray gnatcatcher					6	6	
STURNIDAE							
444. <i>Sturnus vulgaris</i> European starling							
PARULIDAE							
445. Parulidae Warblers							
446. <i>Dendroica caerulescens</i> Black-throated blue warbler							
447. <i>Dendroica coronata</i> Yellow-rumped warbler							
448. <i>Dendroica discolor</i> Prairie warbler				1			
449. <i>Dendroica dominica</i> Yellow-throated warbler							
450. <i>Dendroica pinus</i> Pine warbler							
451. <i>Geothlypis trichas</i> Yellowthroat	1						
452. <i>Mniotilta varia</i> Black and white warbler							
453. <i>Seiurus aurocapillus</i> Ovenbird							
454. <i>Setophaga ruticilla</i> American redstart							
ICTERIDAE							
455. <i>Agelaius phoeniceus</i> Red-winged black bird							
456. <i>Cassidix mexicanus</i> Boat-tailed grackle				2			

	MARTIN COUNTY ISLAND NUMBER						
	1	2	3	4	5	6	7
457. <i>Molothrus ater</i> Brown-headed cowbird							
458. <i>Quiscalus quiscula</i> Common grackle							
FRINGILLIDAE							
459. <i>Passerculus sandwichensis</i> Savannah sparrow							
460. <i>Richmondia cardinalis</i> Northern cardinal			1			1	
MAMMALIA							
MARSUPIALIA							
DIDELPHINIDAE							
461. <i>Didelphis marsupialis</i> Opossum							
LAGOMORPHA							
LEPORIDAE							
462. <i>Sylvilagus palustris paludicola</i> Marsh rabbit				2			
CARNIVORA							
PROCYONIDAE							
463. <i>Procyon lotor</i> Raccoon							
MUSTELIDAE							
464. <i>Lutra canadensis</i> River otter							
SIRENIA							
TRICHECHIDAE							
465. <i>Trichechus manatus</i> West Indian manatee							
CETACEA							
DELPHINIDAE							
466. <i>Tursiops truncatus</i> Bottlenose dolphin							

ISLAND NO. MC1

Date Sampled: 25 January 1988

I. Physical Description

- A. Island Size: 1.557 ha
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 3 km south of Stuart causeway
- D. Distance and Direction from Channel Marker: 500 m southeast of marker 231
- E. Erosion: Slight on SE side of island
- F. Boating access: South end; 2.5 m deep, open beach

II. Biological Description

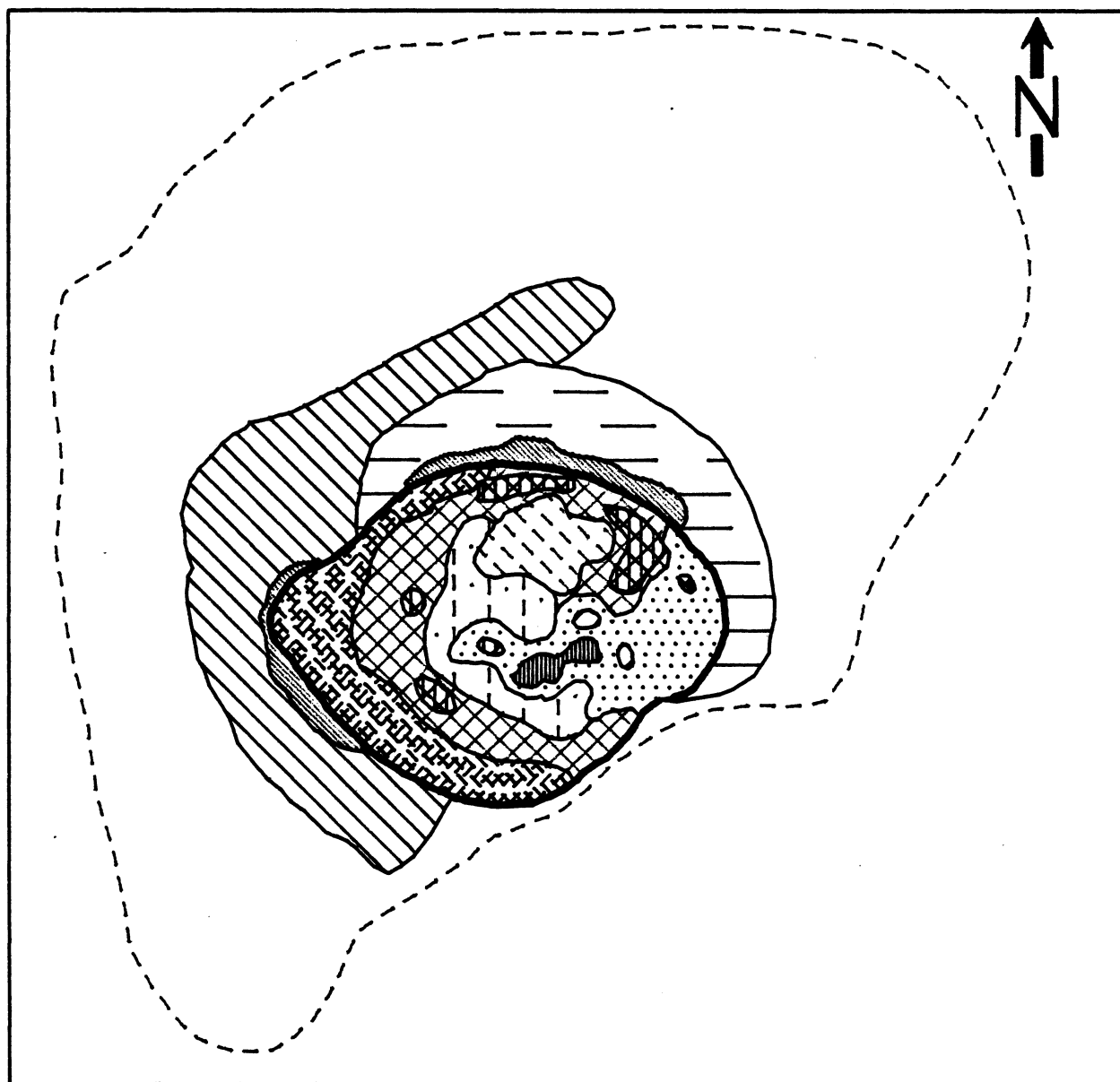
- A. Dominant Terrestrial Vegetation
Australian pine (21.5%), coin vine (14%), sea grape (12.5%), black mangrove (5.3%), cabbage palm (5.3%) and varnish leaf (5.3%); 28 species total
- B. Soil humus: 2-4 cm
- C. Seagrasses
Shoal grass on east and north sides; manatee grass on north and west sides.
- D. Bird Usage
Brown pelican and osprey most common, 8 species total; no nests
- E. Common Fishes and Invertebrates
Mojarra, pinfish, ladyfish, 11 fish species total; grass and penaeid shrimps, 6 invertebrate species total
- F. Threatened, endangered or species of special concern
Special concern: brown pelican, osprey, little blue heron, snowy egret

III. Recommended usage: Education

IV. Comments

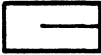
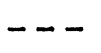
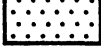
This island has been dedicated to Martin County by the State of Florida and is presently used by the Martin County school district as part of their environmental education program. It has a good diversity of plant and animal life. We recommend that this island continue to be used for educational purposes.

SPOIL ISLAND MC1



1 in = 63 m



	Manatee grass 0.92 hectares		Coin vine 0.19 hectares		Cabbage palm 0.009 hectares
	Shoal grass 0.52 hectares		Cordgrass 0.13 hectares		Unvegetated 5.96 hectares
	Australian pine 0.38 hectares		Varnish leaf 0.11 hectares		< 1 m deep
	Mangroves 0.34 hectares		Sea grape 0.083 hectares		
	Sand 0.28 hectares		Railroad vine 0.025 hectares		

ISLAND NO. MC2

Date Sampled: 17 October 1988

I. Physical Description

- A. Island Size: 0.871 ha
- B. Height Above Mean High Water: 1 m.
- C. Distance from Boat Ramps: 1.3 km south of Stuart Causeway
- D. Distance and Direction from Channel Marker: 144 m west of marker 231
- E. Erosion: None
- F. Boating access: Limited, southeast corner; 0.9 m deep, small beach

II. Biological Description

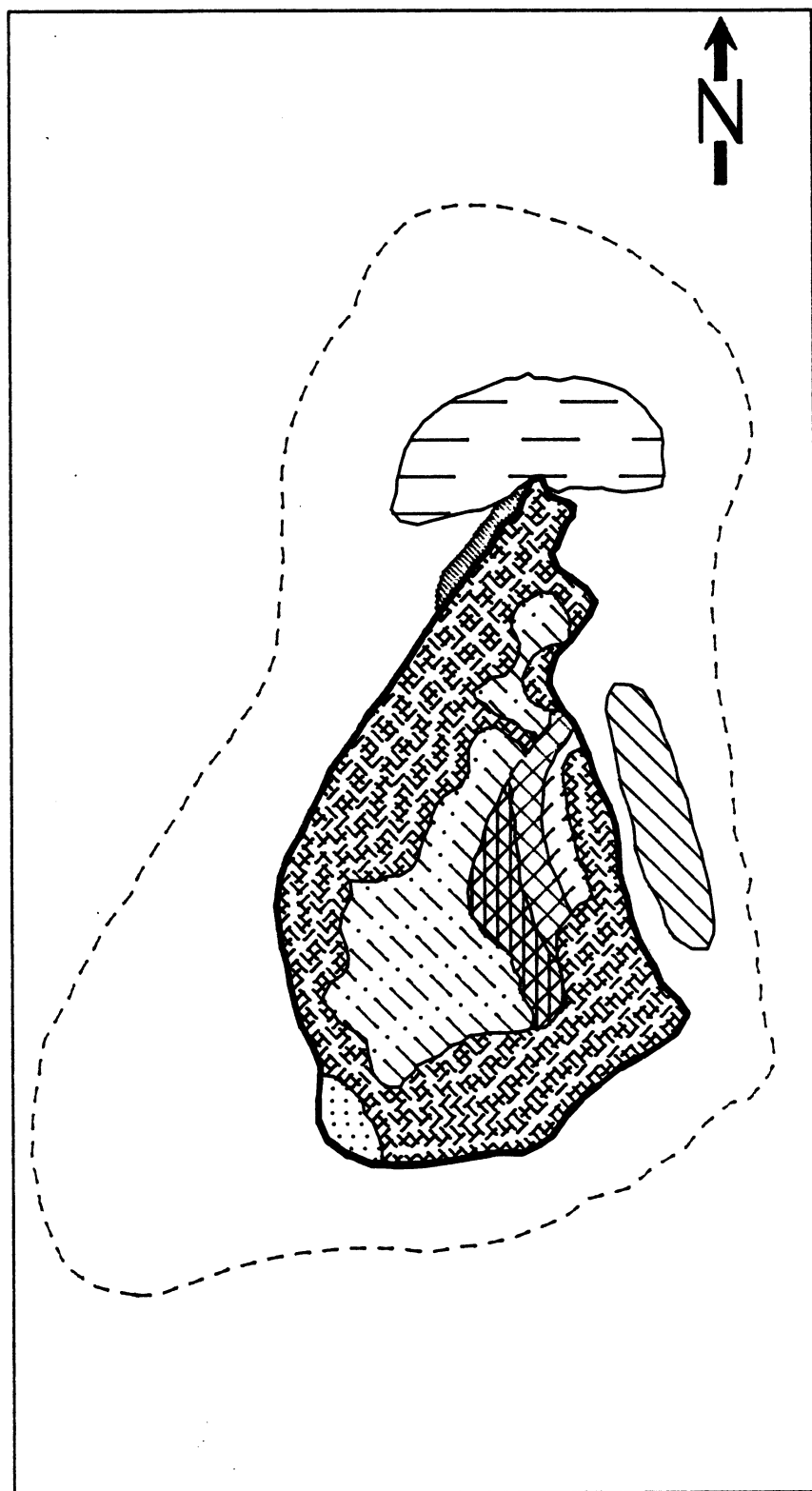
- A. Dominant Terrestrial Vegetation
Wild balsam apple (14%), red mangrove (12.5%), black mangrove (11%), Australian pine (9.7%), grasses (6.9%), seashore saltgrass (5.6%), painted leaf (5.6%), sea grape (4.2%); 38 species total
- B. Soil humus: 28 cm
- C. Seagrasses
Shoal grass on north side, manatee grass on east
- D. Bird Usage
Important rookery island for brown pelicans, white ibis, fish crow, anhinga, great blue heron; 10 species total, many nests
- E. Common Fishes and Invertebrates
White mullet, mojarra, red drum and bay anchovy common, 15 fish species total; no invertebrates.
- F. Threatened, endangered or species of special concern
Special concern: brown pelican, American oystercatcher

III. Recommended usage: Conservation

IV. Comments

This island has been dedicated to Martin County and has been designated by the Florida Audubon Society as a bird sanctuary. Nesting occurs on this island over a six month period. Therefore, this island has been designated for conservation with the additional stipulation that human visitation be prohibited during the February to August nesting season.

SPOIL ISLAND MC2



	Shoal grass 0.145 hectares
	Manatee grass 0.074 hectares
	Mangroves 0.51 hectares
	W. balsam apple 0.22 hectares
	Sea grape 0.05 hectares
	Australian pine 0.038 hectares
	Sand 0.02 hectares
	Cabbage palm 0.02 hectares
	Cordgrass 0.013 hectare
	Unvegetated 1.74 hectares
	< 1 m deep

1 in = 42 m



ISLAND NO. MC3

Date Sampled: 21 October 1987

I. Physical Description

- A. Island Size: 3.535 ha
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 3.7 km south of Stuart Causeway
- D. Distance and Direction from Channel Marker: 300 m east of marker 234
- E. Erosion: Minimal
- F. Boating access: South and west sides; 1 m deep south, 1.2 m deep west

II. Biological Description

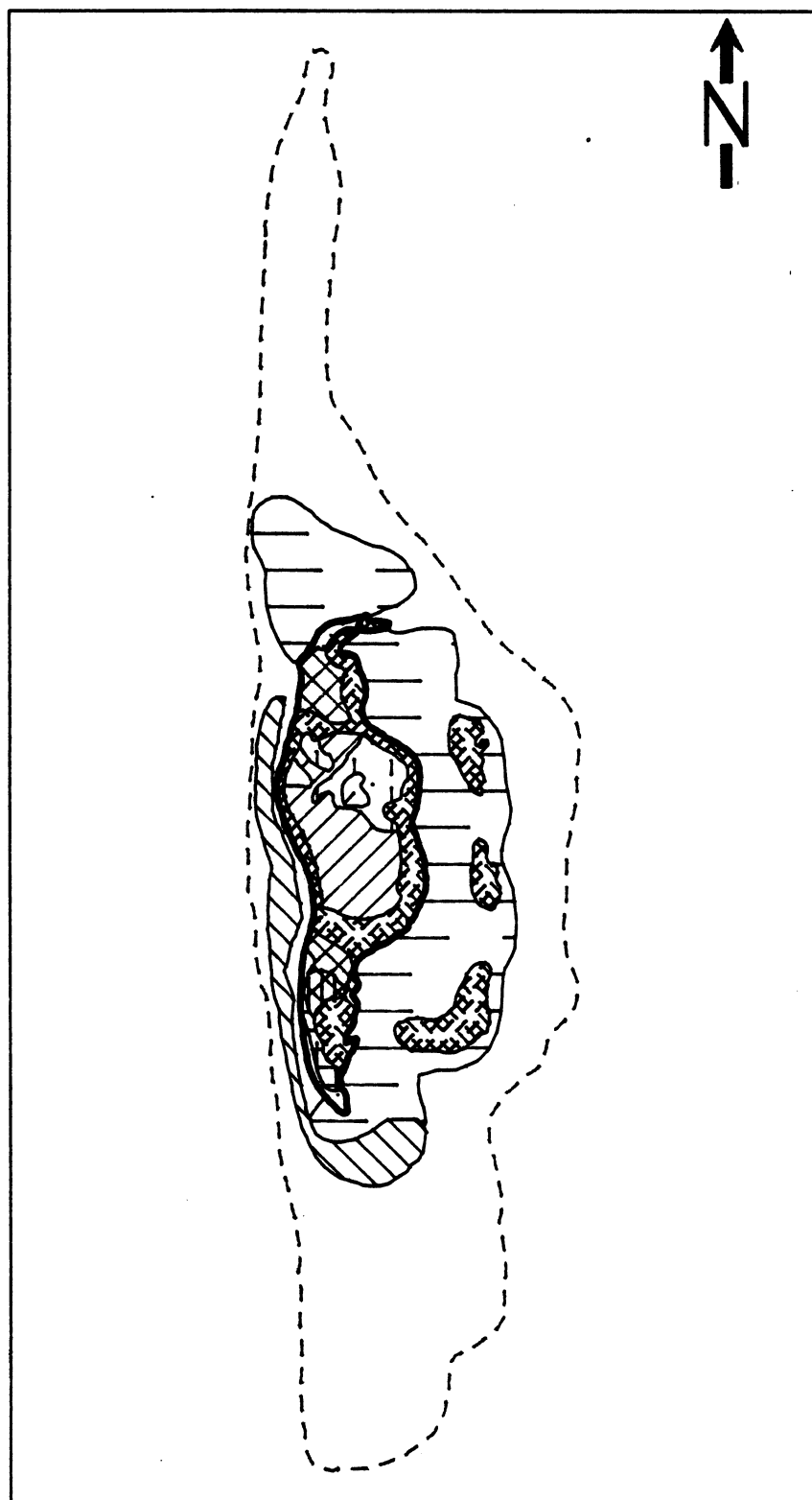
- A. Dominant Terrestrial Vegetation
Australian pine (30%), coin vine (16.4%), black mangrove (11.5%), cabbage palm (6.7%), red mangrove (6.7%), Brazilian pepper (5.8%), sea grape (5.8%), white mangrove (5.8%); 19 species total
- B. Soil humus: 5 cm
- C. Seagrasses
Shoal grass on north, south and east sides, manatee grass on south and west sides.
- D. Bird Usage
Common birds include great blue heron, belted kingfisher, white ibis, little blue heron and fish crow; 11 bird species total, four bird nests.
- E. Common Fishes and Invertebrates
Mojarra, red drum, gulf pipefish, planehead filefish, sailor's choice, 14 fish species total; grass and penaeid shrimps, 6 invertebrates total
- F. Threatened, endangered or species of special concern:
Special concern: little blue heron, osprey

III. Recommended usage: Passive Recreation

IV. Comments

This island has been dedicated to Martin County. Historically, this island has received day use by boaters. We recommend that such use be continued, but this island does not currently have enough open area for development of structures. Development for active recreation could be considered, however, if the Brazilian peppers in the center of the island were removed.

SPOIL ISLAND MC3



	Shoal grass 4.64 hectares
	Manatee grass 0.98 hectares
	Mangroves 1.64 hectares
	Brazilian pepper 0.83 hectares
	Coin vine 0.39 hectares
	Australian pine 0.31 hectares
	Sand 0.138 hectares
	Sea grape 0.086 hectares
	Sea purslane 0.083 hectares
	Cabbage palm 0.05 hectares
	Unvegetated 10.77 hectares
	< 1 m deep

1 in = 100 m

ISLAND NO. MC4

Date Sampled: 16 February 1988

I. Physical Description

- A. Island Size: 0.240 ha
- B. Height Above Mean High Water: 1 m
- C. Distance from Boat Ramps: 4.6 km south of Stuart Causeway
- D. Distance and Direction from Channel Marker: 330 m east of can 237
- E. Erosion: Yes, on south and west sides
- F. Boating access: Southeast end; 2.5 m deep, open beach

II. Biological Description

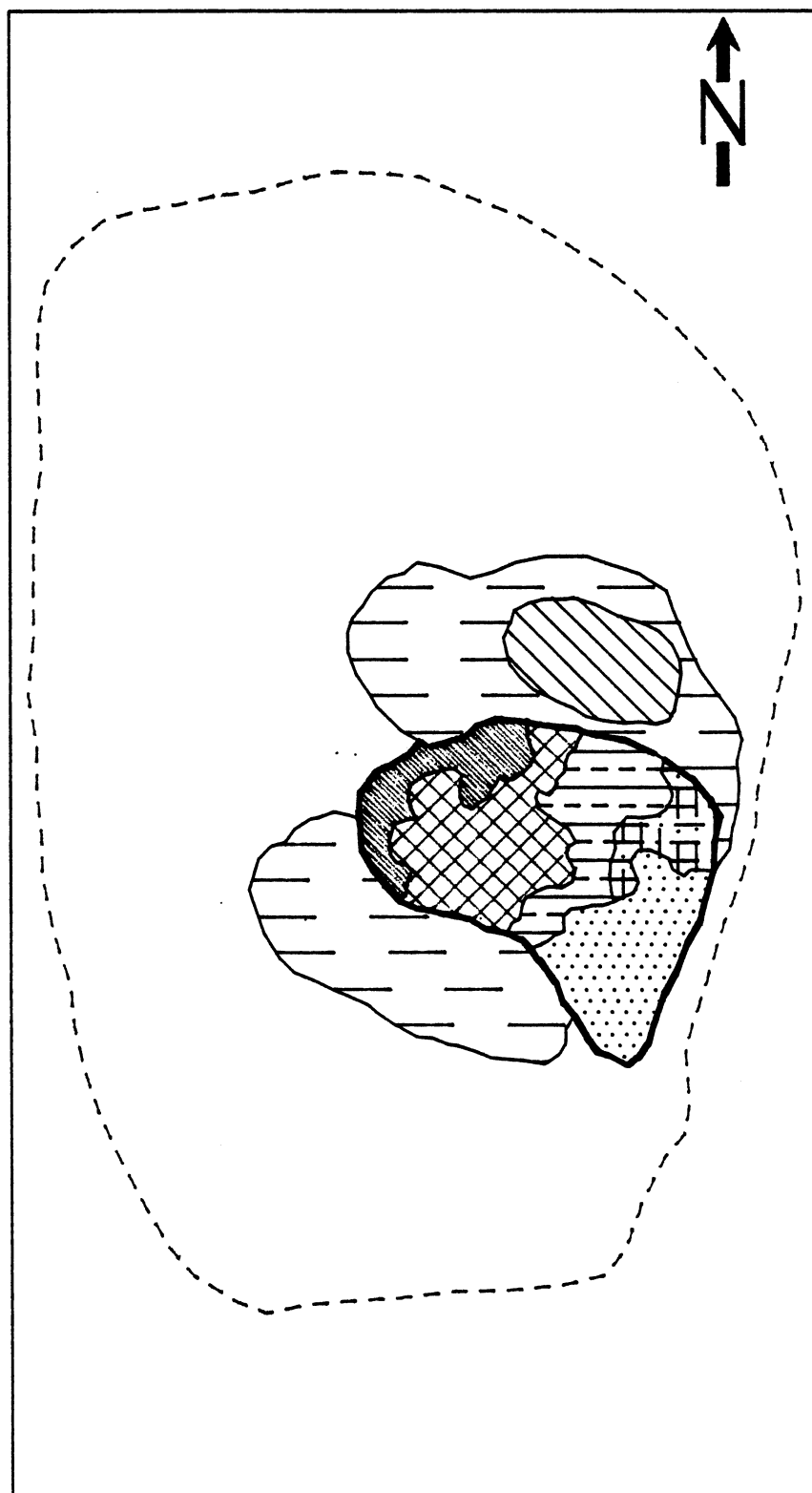
- A. Dominant Terrestrial Vegetation
Australian pine (27.8%), cabbage palm (11%), painted leaf (11%), sea purslane (5.6%), sea oxeye (5.6%); 18 species total
- B. Soil humus: 0 cm
- C. Seagrasses
Shoal grass on north and south sides, manatee grass on north and east sides
- D. Bird Usage
The only bird seen on the island was 1 great blue heron
- E. Common Fishes and Invertebrates
Spot, ladyfish, pinfish, silver porgy, white mullet, 8 fish species total; grass shrimp and ctenophores, 6 invertebrates total
- F. Threatened, endangered or species of special concern
Protected: Sea oats

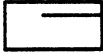
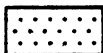
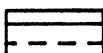
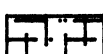
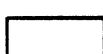
III. Recommended usage: Passive Recreation

IV. Comments

This island has been dedicated to Martin County and has a single plant of the protected sea oat. However, this island has deep water and open beach access on the southeast end of the island, is close to the St. Lucie Inlet, and has historical usage as a picnic spot, so we recommend that this island remain undeveloped but open for passive recreational use.

SPOIL ISLAND MC4



-  Shoal grass
0.27 hectares
-  Manatee grass
0.05 hectares
-  Australian pine
0.07 hectares
-  Sand
0.06 hectares
-  Sea oxeye
0.047 hectares
-  Cordgrass
0.034 hectares
-  Sea purslane
0.02 hectares
-  Unvegetated
1.71 hectares
-  < 1 m deep

1 in = 33 m



ISLAND NO. MC5

Date Sampled: 15 April 1988

I. Physical Description

A. Island Size: 0.775 ha

B. Height Above Mean High Water: 1 m

C. Distance from Boat Ramps: 5.5 km south of Stuart Causeway

D. Distance and Direction from Channel Marker: 300 m southwest of marker 237

E. Erosion: None

F. Boating access: None; shallow (<0.5 m) all around island with small beach on northeast end

II. Biological Description

A. Dominant Terrestrial Vegetation

Australian pine (23%), red mangrove (19.6%), white mangrove (19.6%), black mangrove (14.3%), Brazilian pepper (8.9%), buttonwood (7.2%), smooth cordgrass (5.3%); 10 species total

B. Soil humus: 0 cm

C. Seagrasses

Shoal grass on north, south and east sides

D. Bird Usage

Great blue heron, fish crows, boat-tailed grackles; 6 bird species total, 2 nests

E. Common Fishes and Invertebrates

Pinfish and mojarra, 6 fish species total; grass shrimp, 2 invertebrate species total

F. Threatened, endangered or species of special concern

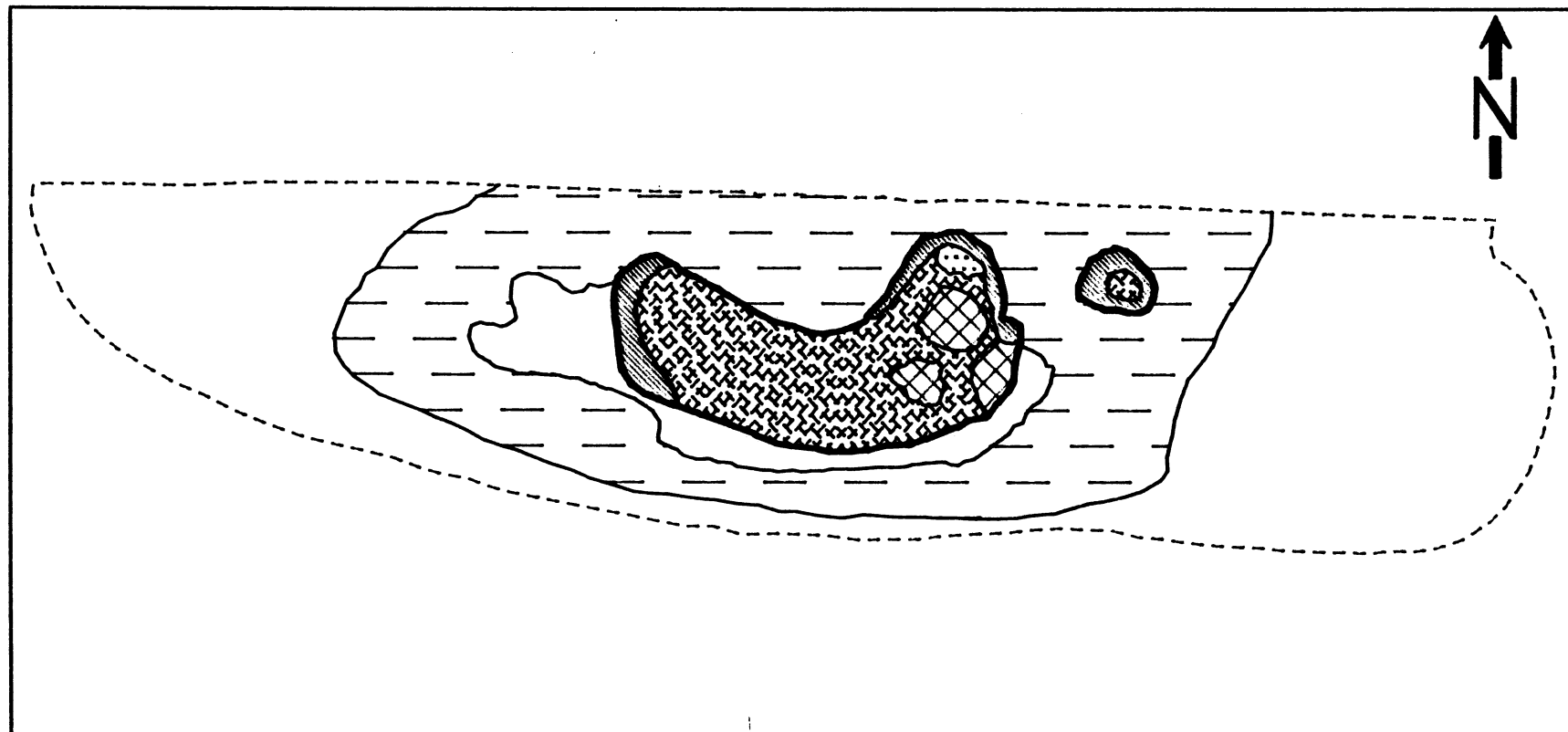
None

III. Recommended usage: Conservation

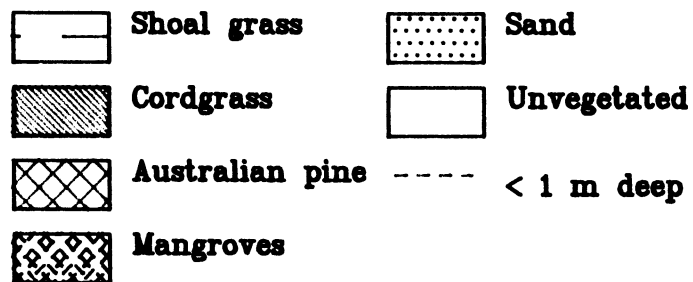
IV. Comments

This island is privately owned by Bessemer Properties, Inc. There is no deep water access and most of the island is surrounded by a heavy mangrove fringe. Two great blue heron nests and a family of marsh rabbits was seen on the island. Therefore, we recommend that this island be kept for conservation and that recreational boaters be discouraged from using this island for picnicking or camping.

SPOIL ISLAND MC5



1 in = 63 m



ISLAND NO. MC6

Date Sampled: 19 October 1987

I. Physical Description

- A. Island Size: 2.617 ha
- B. Height Above Mean High Water: 1-2 m
- C. Distance from Boat Ramps: 5.3 km south of Stuart Causeway
- D. Distance and Direction from Channel Marker: 275 m west of can 237
- E. Erosion: None
- F. Boating access: Limited; 1.8 m deep on east, 0.9 m on west, no beaches

II. Biological Description

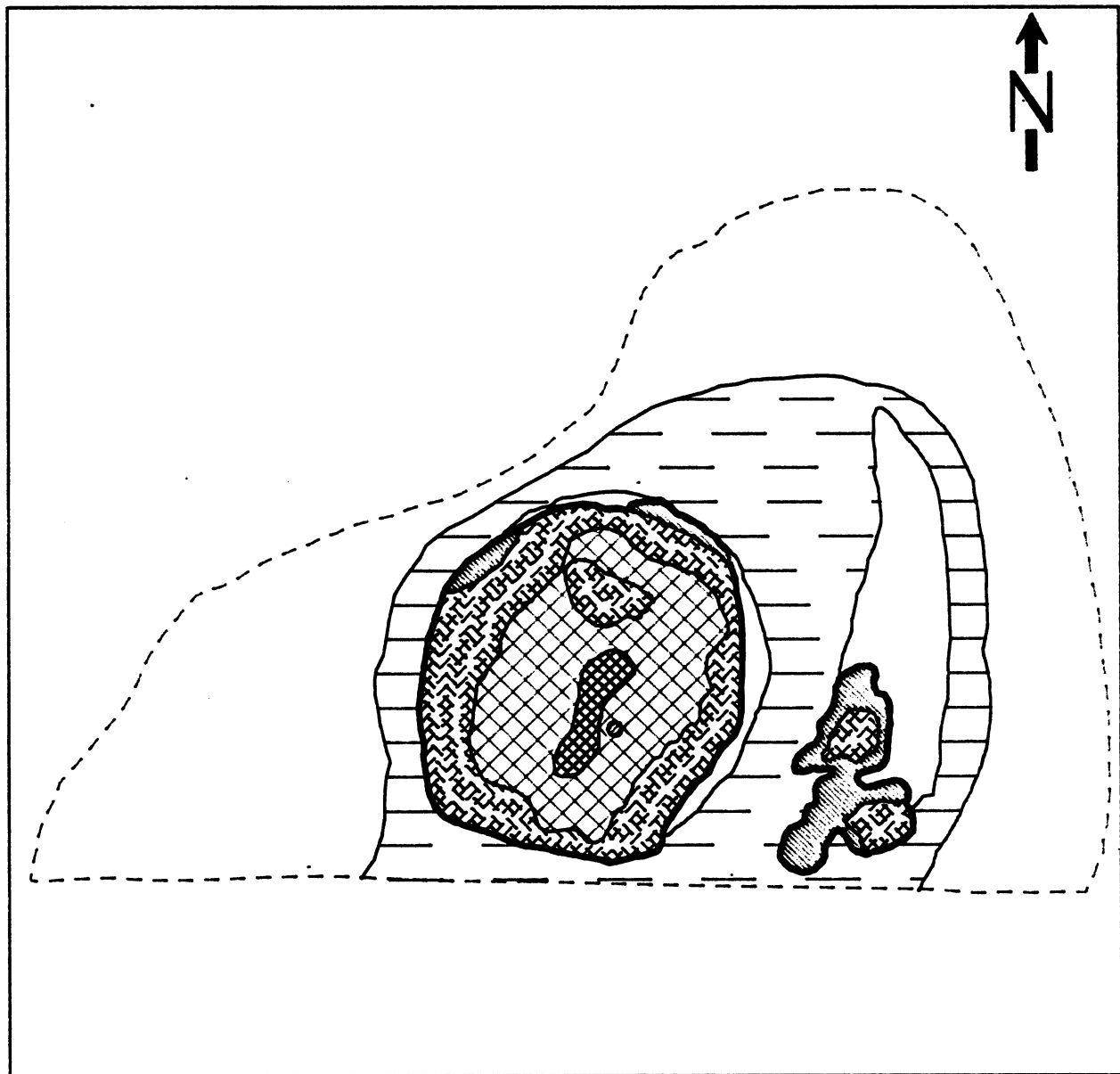
- A. Dominant Terrestrial Vegetation
Australian pine (34.7%), black mangrove (14%), Brazilian pepper (14%), strangler fig (13%), red mangrove (12.5%), 24 species total
- B. Soil humus: 7.3 cm
- C. Seagrasses
Shoal grass on all sides of island
- D. Bird Usage
Great blue heron, blue-gray gnatcatchers, great egrets, 7 bird species total; 14 nests
- E. Common Fishes and Invertebrates
Red drum and mojarra, 3 fish species total; the only invertebrate captured was 1 blue crab
- F. Threatened, endangered or species of special concern
Species of special concern: brown pelican, little blue heron

III. Recommended usage: Conservation

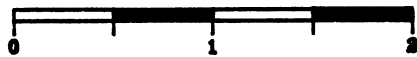
IV. Comments

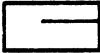
This island is privately owned by Bessemer Properties, Inc. There is no open beach access, there are many strangler figs, a native tropical hammock plant and the island is heavily used by breeding great blue herons. Therefore, we recommend that the designation for this island be conservation and that any recreational use of this island be discouraged.

SPOIL ISLAND MC6



1 in = 85 m



	Shoal grass 3.015 hectares		Gumbo limbo 0.004 hectares
	Mangroves 1.16 hectares		Unvegetated 6.145 hectares
	Australian pine 1.036 hectares		< 1 m deep
	Cordgrass 0.314 hectares		
	Strangler fig 0.105 hectares		

ISLAND NO. MC7

Date Sampled: 26 January 1989

I. Physical Description

- A. Island Size: 27.38 hectares
- B. Height Above Mean High Water: 7.4 m
- C. Distance from Boat Ramps: 3.7 km south of Stuart Causeway
- D. Distance and Direction from Channel Marker: 30 m east of marker 1
- E. Erosion: Slight erosion on east side
- F. Boating access: Limited; 1.9 m deep on west side, small beach

II. Biological Description

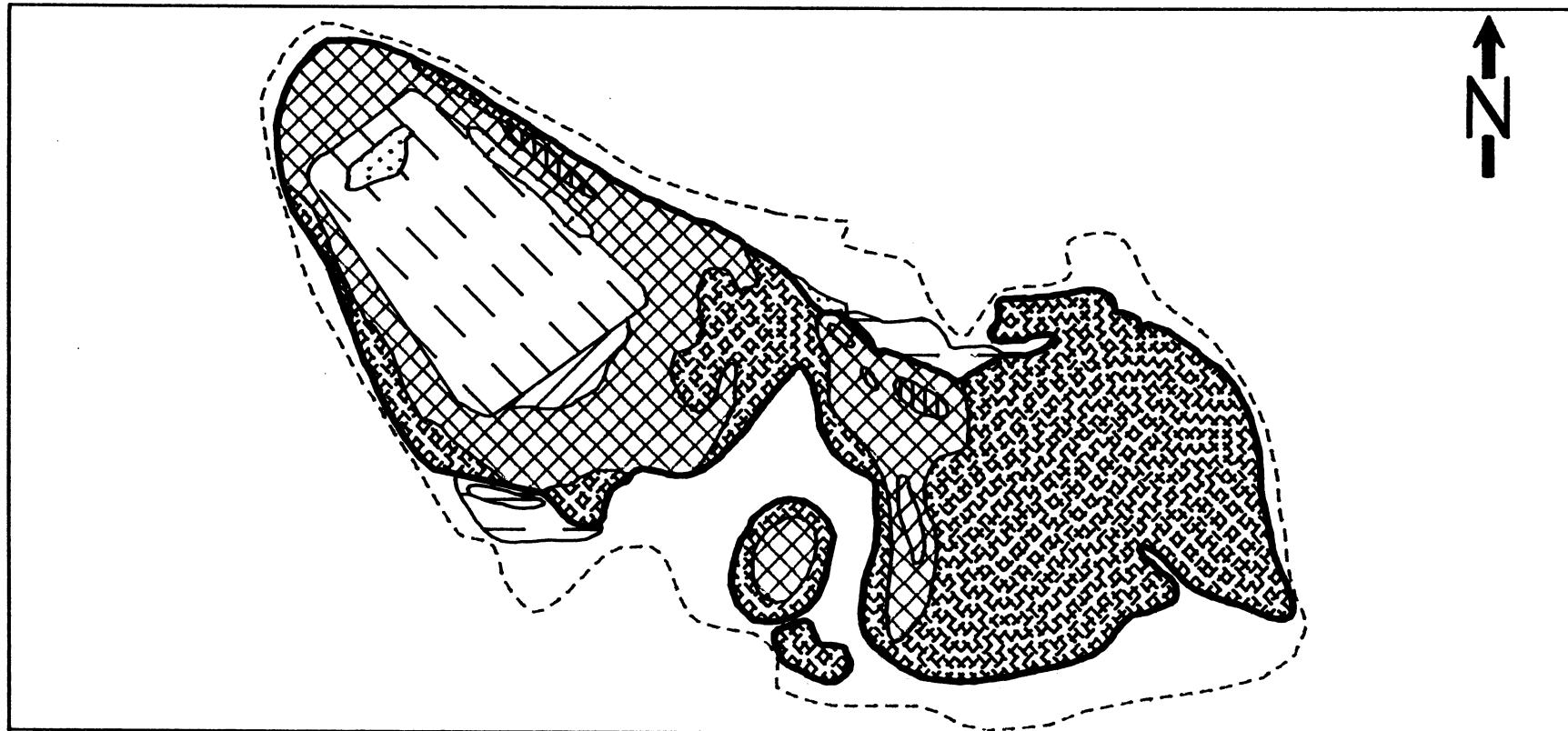
- A. Dominant Terrestrial Vegetation
Australian pine (35%), red mangrove (13%), golden aster (8.4%), Brazilian pepper (7.2%), wild plumbago (3.6%); 85 species total.
- B. Soil humus: 12 cm
- C. Seagrasses
Johnson's seagrass on south side, shoal grass on south and east sides.
- D. Bird Usage
Common birds include blue-gray gnatcatcher, great blue heron, belted kingfisher and brown pelican; 9 species total, no nests.
- E. Common Fishes and Invertebrates
Mojarra, spot, bay anchovy, 9 fish species total; hermit crabs and grass shrimp, 7 invertebrate species total
- F. Threatened, endangered or species of special concern
Threatened: prickly-pear cactus. Special concern: little blue heron, snowy egret, brown pelican, osprey

III. Recommended usage: Conservation/Spoil Deposition

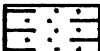
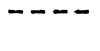
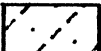
IV. Comments

The northern portion of this island was used for spoil deposition within the last five years and remains available for future use as required. The plant community on the island is diverse, with many native plant species and large stands of mangroves. The southern portion is also well suited for revegetation with native hammock plants. We therefore recommend that areas not already reserved for spoil deposition be designated conservation, and that the entire island gain conservation status when its use for waterway maintenance has ended.

SPOIL ISLAND MC7



1 in = 100 m

	Shoal grass 0.833 hectares		Spoil area 5.032 hectares		Dried mud 0.202 hectares		Unvegetated bottom 10.432 hectares
	Johnson's seagrass 0.087 hectares		Brazilian pepper 0.481 hectares		Sand 0.069 hectares		Cordgrass 0.065 hectares
	Mangroves 13.238 hectares		Sea grape 0.243 hectares		Mahoe 0.042 hectares		
	Australian pine 7.801 hectares		Grass/meadow 0.209 hectares				

--- < 1 m deep

DISCUSSION

Martin County contains the fewest number of spoil islands of the four counties in the Indian River Lagoon. In general, the Martin County islands had low faunal diversity relative to the rest of the spoil islands in the Indian River Lagoon. Only 72 of the 203 invertebrates, fishes, reptiles, birds and mammals collected during the survey were found in Martin County, representing 35% of the total faunal list. Five species (7% of the total fauna list) were found exclusively in Martin county: Green's cerith, yellowtail snapper, scrawled filefish, killdeer and marsh rabbit. This low faunal diversity is surprising, given that MC2 is an important bird rookery and the islands, with the exception of MC2, all have extensive seagrass beds on three sides of the island, which provide potential habitat for fishes and invertebrates. The relatively small size of the islands may contribute to the low faunal diversity.

The most frequently captured aquatic species found in Martin County included the grass shrimps, the mojarras, pinfish, red drum, and gulf pipefish, while the most abundant species were the grass shrimps, ladyfish, mojarras, pinfish and red drum. All ladyfish captured were leptocephalus larvae. Thirty-two percent of the fish species collected around Martin County islands are tropical or subtropical in origin (R.G. Gilmore, pers. comm.). Factors contributing to this high percentage are probably both the proximity of these islands to St. Lucie Inlet and their southerly location, relative to the other islands in the study. The most frequently observed bird species included brown pelican, great blue heron, little blue heron, and fish crow, while the most abundant species were brown pelican, turkey vulture, great blue heron, white ibis and fish crow.

The floral diversity of Martin County spoil islands was average, relative to Indian

River Lagoon spoil islands in general. A total of 105 species of plants, representing 40% of the total number collected on all spoil islands were found in Martin County. Five of the species observed (4.7% of the Martin County plants) were found only in Martin County. These include sea oats, wild plumbago, potato tree, golden polypody and Johnson's seagrass. Some of the most commonly observed plant species include Australian pine, shoal grass, red mangrove, Brazilian pepper, cabbage palm, sea grape, grey nicker, white mangrove and black mangrove. The most abundant species were Australian pine, black mangrove, red mangrove, Brazilian pepper, sea grape, coin vine and white mangrove. The two most speciose families in the survey were not well represented in Martin County; only 8 of the 31 species (25%) of asters (Asteraceae) were documented and only 4 of the 21 species (19%) of beans (Fabaceae) were found. In contrast, the grass family (Poaceae), which was the third most specious overall, was well represented with 10 of the possible 15 species (67%) present.

The three oldest islands (MC2, MC6 and MC7) had a more diverse flora, larger trees and more native tropical hammock vegetation than the younger islands. Large strangler fig, cabbage palm and bolly trees were found on these islands. Several species of native vegetation were found only on one of these older islands, such as rouge plant, necklace pod, tread softly, black ironwood, Virginia creeper, myrsine, snowberry, potato tree, golden polypody and creeping cucumber.

Important marsh/wetland species of plants are well represented on Martin County spoil islands. Mangroves were found on all islands and formed significant stands on most of them. Red, black and/or white mangroves cover over 22% of islands MC3, MC5, MC6 and MC7. Cordgrass was more common on Martin County islands than in any other county

in the survey; all islands except MC3 had it. However, none of the Martin County islands had marsh areas containing glasswort, saltwort and mangroves such as were typically found on islands in the other counties.

The exotics Australian pine and Brazilian pepper were found on all seven islands in Martin County. However, while stands of Australian pine were well developed on all islands, the invasive Brazilian pepper was not as common in Martin County as in the other three counties in the Lagoon. All islands except MC3 had only small areas of Brazilian pepper that were too small to be included in the vegetation maps. In this respect, Martin County spoil islands are atypical, as many spoil islands in the Indian River Lagoon are covered with Brazilian pepper. The lack of Brazilian pepper in combination with the high percentage of marsh/wetland vegetation indicates Martin county islands have a more natural flora than islands in the other counties. This suggests that the communities on islands MC1, MC2, MC4, MC5, MC6 and MC7 may continue to develop, resulting in islands with flora relatively representative of historical vegetation in the Indian River Lagoon area.

In an effort to determine the feasibility of enhancing the floral diversity, pilot scale revegetation projects have taken place on some Indian River Lagoon spoil islands. The earliest projects were done in Indian River County. Island IR38 was revegetated in September 1983 by the Florida Game and Freshwater Fish Commission (Fernald *et. al* 1985), using 300 plants representing 20 species of upland hammock trees. Another island was revegetated in February 1989 with 600 plants representing 10 species as part of a Boy Scout eagle project. Four Indian River County islands were revegetated by staff of the Bureau of Aquatic Preserves in October 1988 as a part of the spoil island study. Four hundred plants representing 22 different species of upland hammock trees were planted

under a canopy of Australian pines on each island. In 1989, the project was expanded to include islands in St. Lucie and Brevard Counties, plus one island (MC1) in Martin County. Plant species that showed promise for high survival in 1988 were chosen again; substitutions were made for the remainder. The islands were revegetated with 400 plants representing 23 upland hammock species in October of 1989. Present staff efforts are focused on monitoring growth and survival of the plants for both the 1988 and 1989 projects. Survival of the plants has varied by island and by species, but at present, establishment of small native tropical hammocks on several spoil islands looks promising. Many trees on island IR38, the earliest planting, have grown six meters or more in the six years since they have been planted. The establishment of native tropical hammocks on these islands will increase bird and wildlife utilization of the islands, provide excellent opportunities for education and research and increase the aesthetic value of the islands.

Management Recommendations

All of the Martin County spoil islands are located in close proximity to each other and most of the length of the Intracoastal Waterway in Martin County does not contain spoil islands. Thus, islands in a relatively concentrated area have to serve multiple purposes for the public. Therefore, the five state-owned spoil islands within Martin County have been classified into three usage categories: conservation, education and passive recreation (Table 4-2). Unfortunately, none of the islands in Martin County are large enough or currently have enough clear area to be classified as active recreation islands.

Table 4-2. Recommended management classifications of Martin County Spoil Islands

Island Number	Ownership	Classification
MC1	State	Education
MC2	State	Conservation
MC3	State	Passive Recreation
MC4	State	Passive Recreation
MC5	Bessemer Properties	Conservation
MC6	Bessemer Properties	Conservation
MC7	State	Spoil deposition/ Conservation

Island MC2 is the oldest of the state-owned islands, has a well developed flora with many native hammock plants and is an important rookery for many species of water birds. In addition, the Audubon Society has designated island MC2 as a breeding bird area. These facts combine to make this island an obvious choice for conservation. It is recommended that human visitation of island MC2 be prohibited during the February to August breeding season. Human disturbance frequently results in abandonment of breeding colonies and human access should therefore be prohibited (Schreiber and Schreiber 1978).

The Martin County Environmental Learning Center uses island MC1 for education of school children. This island has the third most diverse flora of all Martin County islands, includes representatives of different plant communities (mangrove, cordgrass and native vegetation such as varnish leaf, cabbage palm and sea grape) and has extensive seagrass beds of two different species. This island has all the necessary requirements for an education designation and should remain an education island.

Islands MC3 and MC4 are designated for passive recreation. Both islands currently receive substantial human usage, have good deep water access, and open beaches. Furthermore, neither island can presently support construction of structures. However, clearing of the dense Brazilian pepper in the center of MC3 might provide sufficient area that an active recreation designation could be considered.

Island MC7 is unique because, although it has the most diverse flora of any spoil island in the Indian River Lagoon, it is also currently in use as a spoil deposition site. The high floral diversity is a combination of the age and size of the island, plus recent colonization by grasses and asters due to habitat modification resulting from spoil deposition. The eastern and southern portions of the island support well developed tropical hammocks and are excellent sites for further revegetation with same. Thus, this island has been designated for dual usage: spoil deposition in the northern portion, and conservation for the remainder of the island. Further, it is hoped that when the island is no longer needed for its role in waterway maintenance, the entire island would gain conservation status.

The state does not have the authority to designate a management strategy for the privately owned islands MC5 and MC6, but we would like to recommend to the owner that these islands be managed for conservation. This recommendation is made based on the lack of good deep water access for both islands, plus MC6 is an important nesting area for great blue herons while MC5 is predominately mangrove covered.

These initial management recommendations can be expanded upon in the future as actual management of the islands becomes a reality. The computer generated vegetation maps provide an excellent reference source of information on the spoil islands that will

become increasingly important as future vegetation surveys are made. Future management recommendations and decisions will depend in a large part on historical vegetation changes on the islands. Limited recreational development of selected islands could also be considered as spoil island management proceeds. For instance, developing docks and an interpretive trail on MC1, the designated education island, would provide greater access and educational opportunities to the public. The central portion of island MC3 is covered with dense Brazilian pepper thickets and coin vine; this area could be cleared and selectively replanted with native vegetation to provide shaded picnic areas. This would result in a two-fold benefit to the public: Martin County would then have an active recreation island and at the same time exotic vegetation would be removed. Strategies such as these would both enhance the spoil islands and provide greater public access to relatively undeveloped and underutilized state lands.

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SUMMARY DISCUSSION AND CONCLUSIONS

A total of 262 species of plants were documented from the spoil islands in the Indian River Lagoon. One or both of the nuisance exotic species (Australian pine and Brazilian pepper) were found on 132 of the 137 islands, indicating these undesirable species have been highly successful in colonizing the man-made islands. However, several islands in each of the four counties were dominated by native hardwood species, suggesting that not all islands will eventually be overgrown by exotics. In addition, portions of six islands in Indian River County, three islands in Brevard County, three islands in St. Lucie County and one island in Martin County have been revegetated with native hardwood hammock species, which should ensure that some islands will retain a native floral component.

Native wetland species, represented by red, black and white mangroves, buttonwood, sea lavender, sea purslane, saltgrass and marsh elder were common on many of the islands. However, a latitudinal gradient is evident in the distribution of some of these species; neither red mangrove nor sea lavender occurred north of island BC36. Transitional wetland species (species often associated with wetland areas but that are not true wetland plants) were also well represented on the islands and include sea oxeye, coin vine, gray nicker, groundsel tree and the four bromeliad species (*Tillandsia* spp.). A latitudinal gradient was also evident in this species grouping, with coin vine and the four bromeliads never occurring north of island BC36. Finally, the most common upland plant species included Florida privet, cabbage palm, golden aster, seagrape, strangler fig, periwinkle, gumbo limbo and hercules club. Of these species, golden aster, sea grape, strangler fig and gumbo limbo were never found north of island BC36. Varnish leaf, an upland species common in the

southern portion of the lagoon, was not found on islands north of IR42, while southern red cedar was not found on islands south of BC43.

The majority of the spoil islands had some submerged aquatic vegetation associated with them. Evidence was presented that, at least for some islands in Indian River County, submerged grassbeds have increased in size in the past five to ten years. Shoal grass was the most common seagrass surrounding the islands although manatee grass was also abundant. Species of *Caulerpa* were common around islands in Cocoa and never found south of island BC43. In contrast, turtle grass was more prevalent in the southern portion of the lagoon and was not found north of island IR23B. Johnson's sea grass was only found around the southernmost island in the study, MC7.

A total of 205 species of animals were observed on the spoil islands. The most common bird species included brown pelican, great blue heron, osprey, double-crested cormorant and laughing gull. Seasonal differences were much more apparent than latitudinal differences in the distribution of bird species. Twenty-one islands were important rookeries or overwintering areas for colonial nesting water birds such as herons, egrets, pelicans, terns and gulls. Sixteen of these islands are currently used for actual nesting by colonial water birds; eight are in Brevard County, seven are in Indian River County and one is in Martin County. St. Lucie County does not currently have an island used by colonial nesting birds. SL16 was a brown pelican rookery in the early 1980's, but the nesting birds apparently abandoned the island when a small house was built there. The house was removed through the island clean-up program and with the island being designated for conservation, it is possible that brown pelicans may begin nesting on SL16 again. Many other islands are also important for nesting, but are used by the more solitary nesters such

as great blue herons, ospreys and double crested cormorants.

A limited number of reptiles and mammals were recorded from the spoil islands. Green and brown anoles were found on islands throughout the lagoon but snakes were only seen on islands in the three southern counties. Upland mammals were only recorded from islands in Indian River and Martin Counties although there was evidence of raccoons in Brevard and St. Lucie Counties as well. Dolphins and manatees were seen around islands throughout the lagoon.

Common fish species captured around the islands included mojarra, pinfish, gulf pipefish, striped mullet and cide goby. Distribution of fish species appears to be related to the island's proximity to ocean inlets. The ichthyofauna around islands in Titusville and Cocoa (BC1-BC35) was depauperate and consisted primarily of resident species, when compared with the ichthyofauna in the remainder of the lagoon. Islands near inlets had a higher proportion of juvenile fishes recruited from offshore spawners than islands not associated with inlets. Finally, the percentage of fishes that are tropical or subtropical in origin increased with decreasing latitude; 18% of the fish species captured in Brevard County were tropical or subtropical in origin, while 20% in Indian River County, 22% in St. Lucie County and 32% in Martin County were tropical or subtropical.

Islands in each of the four management classifications have been designated for each of the four counties. Additionally, both Brevard and Indian River Counties have been subdivided into north and south management areas. Overall, thirteen islands have been designated for active recreation, fifty-seven for passive recreation, fifty-one for conservation and nine for education. Three islands received a dual education/conservation classification, and three received a dual education/recreation classification, reflecting the unique, multi-

use characteristics of these islands. Only four of the thirteen islands designated for active recreation currently have facilities on them: BC46, BC48, IR25 and IR28. However, construction of facilities on the remaining nine islands should be encouraged once proper authorization has been obtained and the appropriate permits have been procured. The Conceptual State Lands Management Plan states that authorization for public development of spoil islands may be obtained after comments have been solicited and received from appropriate agencies, and that authorized development will be administered by management agreements or similar instruments from the Trustees. Non-profit organizations and city and county governments should be encouraged to enter into management agreements with the State of Florida to "adopt" these active recreation islands, developing a plan for each island that specifically addresses its management goals. Non-profit organizations should also be encouraged to adopt passive recreation islands as a community service project, while nature groups may be interested in adopting an education island and developing interpretive trails.

The management classifications set forth in this plan for each island should be periodically reviewed and updated. For example, if an island currently designated for passive recreation develops into a bird rookery, the island should be reclassified for conservation. Inspection of the islands should be a joint responsibility of Marine Patrol, State Lands law enforcement and the staff of the Indian River Lagoon Aquatic Preserves. Enforcement of the designated classifications would be the responsibility of the Marine Patrol and State Lands law enforcement.

Several policies applying to public usage of spoil islands should be implemented. These policies should include:

- 1) a prohibition against cutting or removing any living plant material from the islands,
- 2) no littering,
- 3) camping not to exceed a period of fourteen (14) days, and
- 4) public access prohibited on rookery islands during the February to August breeding season.

These policies are consistent with current regulations in state parks and therefore should be readily accepted by the general public. The first and second policies are already codified; the first is a rule under Chapter 16Q-14 of the Florida Administrative Code, which empowers enforcement officials to levy a fine for willful damage to or removal of products from state lands. The second is Florida Statute 403.413, the Florida Litter Law, which prohibits littering of any kind. The third policy should be adopted in connection with spoil island management to enable enforcement officials to make a clear distinction between campers and trespassers. The fourth policy should be established in response to the Indian River Lagoon Aquatic Preserve Management Plan policy directives, which include "protecting ... threatened and endangered species habitat ...", and "managing state-owned spoil islands ... as bird rookeries ...". These policies will help protect the natural resources contained on the islands and preserve the natural character of the islands for the public to enjoy.