

**Lee County Board Of County Commissioners
Agenda Item Summary**

Blue Sheet No. 20060490

1. ACTION REQUESTED/PURPOSE: Approve updated management plan for the Matanzas Pass Preserve.

2. WHAT ACTION ACCOMPLISHES: Provides a modern, updated management plan for the Matanzas Pass Preserve.

3. MANAGEMENT RECOMMENDATION: Management recommends the Board approve the updated management plan for Matanzas Pass Preserve.

4. Departmental Category: 11

C 11 B

5. Meeting Date: 05-02-2006

6. Agenda:
 Consent
 Administrative
 Appeals
 Public
 Walk-On

7. Requirement/Purpose: (specify)
 Statute
 Ordinance
 Admin. Code
 Other

8. Request Initiated:
 Commissioner _____
 Department Parks & Recreation
 Division _____
 By: John Yarbrough

9. Background:

The original management plan for the Matanzas Pass Preserve was written in 1996 with technology that was available at that time. This 10 year updated plan includes new maps created with GIS capabilities, a vision statement, defines the conservation, restoration, and preservation goals for Matanzas Pass Preserve with a time line and includes a designated species list as well as plant and animal sightings list. It will serve as a guide for the best management practices for Lee County's Department of Parks and Recreation.

10. Review for Scheduling:

Department Director	Purchasing or Contracts	Human Resources	Other	County Attorney	Budget Services				County Manager/P.W. Director
					Analyst	Risk	Grants	Mgr.	
<i>4/16/06</i>				<i>4/19/06</i>	<i>4/19/06</i>	<i>4/19/06</i>	<i>4/19/06</i>	<i>4/20/06</i>	<i>4-20-06</i>

11. Commission Action:

- Approved
- Deferred
- Denied
- Other

RECEIVED BY
 COUNTY ADMIN: *[Signature]*
 4-19-06
 COUNTY ADMIN
 FORWARDED TO: *[Signature]*
 4/20/06
[Signature]

Rec. by CoAtty
 Date: *4/18/06*
 Time: *4:40pm*
 Forwarded To:
4/19/06

Summary of Public Meeting and Comments Received on the Matanzas Pass Preserve Management Plan

Draft documents of the Matanzas Pass Preserve Management Plan were available for the public at the Fort Myers Beach Library and the Fort Myers – Lee County Library. Compact discs and a website of the Matanzas Pass Preserve Management Plan provided by Lee County Parks and Recreation were available for public review and comment from January 9th through February 1st, 2006.

A public meeting was held on February 1, 2006 at 6:00pm in the Bay Oaks Community Center, which was attended by approximately **25** residents from San Carlos Island and Fort Myers Beach. A video of a recent restoration project in the preserve was shown, followed by a question and answer period. Responding participants to questions were Commissioner Ray Judah, Gary Porter-Manager Lee County Parks and Recreation, and Terry Cain-Land Stewardship Coordinator, Lee County Parks and Recreation.

Comment cards were placed on every table and many verbal comments and six written comments were taken into consideration. A recent news story of a third bridge to Fort Myers Beach with a location in the preserve was the main topic, along with future filling in of mosquito ditches, bike and moped traffic, and concern about new trails.

All original written comments are included with this document.

Any questions on this summary should be directed to:

Terry Cain
Land Stewardship Coordinator
Lee County Parks & Recreation
3410 Palm Beach Boulevard
Fort Myers, Fl. 33916
caintb@leegov.com

Matanzas Pass Preserve Management Plan

The following written comments were received at the public hearing:

- Parks and Recreation received **2** comments requesting no bridge in the preserve.
- Staff received **1** comment to include a strategy to reduce bicycle, moped, and motorcycle traffic.
- Staff received **1** comment to include barriers at entrance to impede traffic.
- Staff received **1** comment to request mosquito canals remain.
- Staff received **1** comment to attract more wildlife thru plantings.
- Staff received **3** comments stating the meeting or the plan was a learning experience.

Cards as written and signed in no particular order:

San Carlos Island people are opposed to any bridge or damage to the preserve. Also we are unhappy with the raw sewage dumped from derelict vessels in Hurricane Pass.

Co-Chairman San Carlos Committee-Tom Leonard

1) Please fight the MPO plan to build a bridge through the Preserve. I will be glad to voice my opposition in public meetings.

2) The plan should provide a strategy for reducing bicycle, moped and motorcycle traffic in the Preserve. The proposed Donora entrance could exacerbate this problem. If implemented it must include gates and/or barriers at the entrance to impede this traffic.

John Corning 463-7822

I enjoyed the meeting very much-I learned a lot.

Pete Longo - Port Carlos Cove

I have reviewed the Land Stewardship Plan and I found it to be very informative & in depth. The first part (pages 1-8) gave me an insight on the general information about the preserve – along with maps.

I feel the plan is good and the preserve is a great asset to the community of Fort Myers Beach.

Claude Bowyer-Board member Matanzas Pass Preserve

Terry- you were most interesting. I was so impressed with all you & the devoted volunteers are doing-I had no idea all this was here.

Not signed

I would like to see the mosquito canals remain-(at least some) and wonder if these should be kept clear of fallen tress to some degree.

Need for more “attention” to attracting more wildlife thru vegetation planting??

A.J. Bassett

NEWS-PRESS

Published every morning - Daily and Sunday

Fort Myers, Florida

Affidavit of Publication

STATE OF FLORIDA
COUNTY OF LEE

Before the undersigned authority, personally appeared

Kathy Allebach

who on oath says that he/she is the

Legal Assistant

of the News-Press, a

daily newspaper, published at Fort Myers, in Lee County, Florida; that the attached copy of advertisement, being a

Display

In the matter of

Public Notice

In the court was published in said newspaper in the issues of

January 25, 2006

Affiant further says that the said News-Press is a paper of general circulation daily in Lee, Charlotte, Collier, Glades and Hendry Counties and published at Fort Myers, in said Lee County, Florida and that said newspaper has heretofore been continuously published in said Lee County; Florida, each day, and has been entered as a second class mail matter at the post office in Fort Myers in said Lee County, Florida, for a period of one year next preceding the first publication of the attached copy of the advertisement; and affiant further says that he/she has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Kathy Allebach

Sworn to and subscribed before me this

25th day of January 2006 by

Kathy Allebach

personally known to me or who has produced

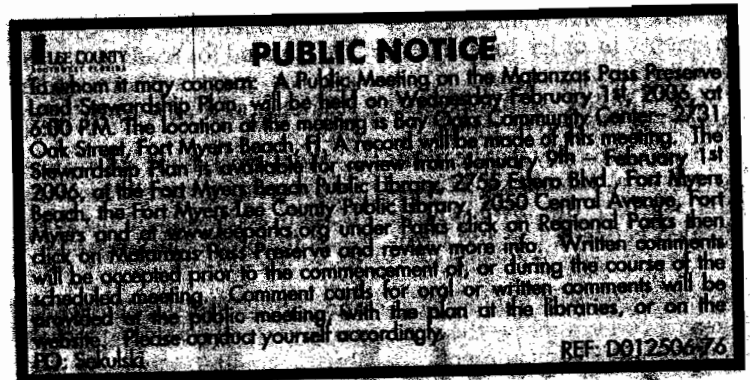
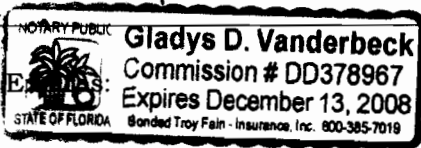
as identification, and who did or did not take an oath.

Notary Public

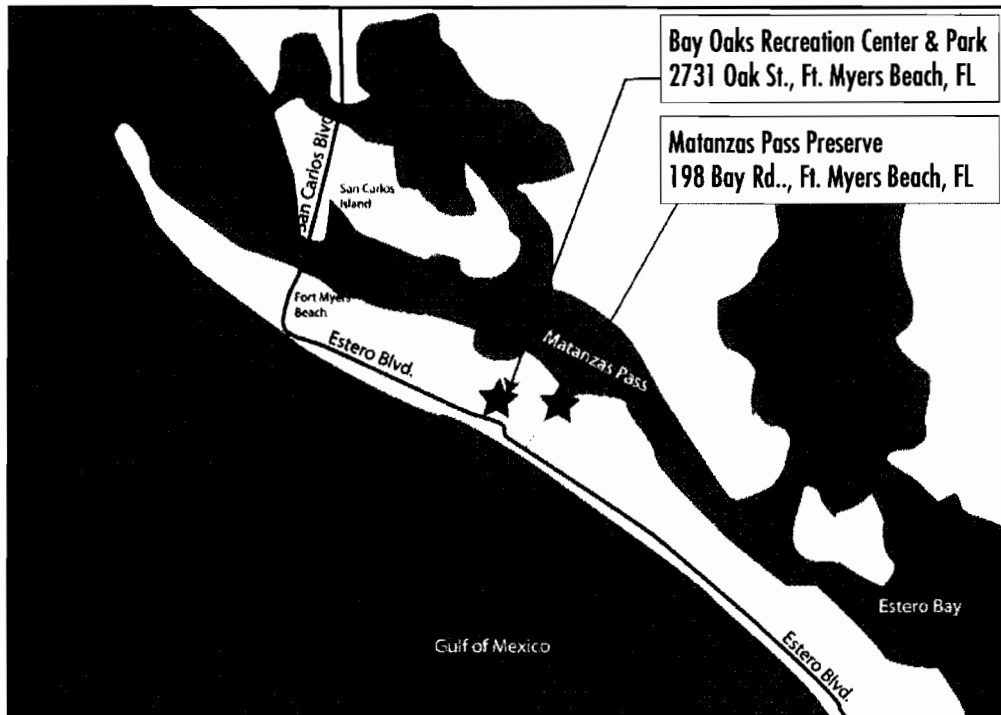
Gladys D. Vanderbeck

Print Name

My commission Expires



Notice of Public Meeting Wednesday February 1, 2006 Bay Oaks Recreation Center & Park



Matanzas Pass Preserve is a 58 acre preserve on Fort Myers Beach, located on 198 Bay Road, the same street as the Fort Myers Beach Library and the Beach Elementary School.

Lee County Parks and Recreation Staff invites the public to review the revised Land Stewardship plan for the Preserve and attend this public meeting to comment on the plans for Public Use and Resource Based Recreation.

Lee County Preserves allow hiking, bird watching, nature photography, and nature study. Matanzas Pass Preserve is home to a number of listed species including brown pelican, tricolor heron, and little blue herons. The small size of the Preserve has a diversity of habitats that allow for interesting nature studies and photo opportunities.

Public use amenities at Matanzas Pass Preserve include 1.34 miles of loop hiking trails through mangrove forest, maritime oak, and coastal grassland communities. There are several benches for bird watching around the trails and informational signs that discuss the restoration of the Preserve and some of the plants that visitors will encounter.

The public meeting will be held Wednesday, February 1, 2006 at 6 pm at the Bay Oaks Recreation Center, 2731 Oak Street, Fort Myers Beach. Come let us know what you think!

The Stewardship Plan is available for review from January 9th – February 1, 2006, at the Fort Myers Beach Public Library – 2755 Estero Blvd. Fort Myers Beach - and at www.leeparks.org under the Parks-Regional Parks- tab. Written comments will be accepted prior to the commencement of, or during the course of the scheduled meeting.



Public Meeting Sign-In Sheet

Name	Phone Number	Email	How heard about meeting
JOHN BURRE	765 5763		MEMBER
TOM LEONARD	463-2213	tomlucyleonard@earthlink.net	PORT CARLOS COVE SAN CARLOS ISLAND
JIM PRODWELL	463-4292		FRIENDS
George Rafos		George plus jill @ msn.com	San Carlos Island
Jill Rafos			San Carlos IS
Nancy & Joe Wilaby			San Carlos IS
Judy David			San Carlos IS
Ray Judah	335-2223	Dist 3C Leeger.com	
AD BASSETT	463-9701	ajbassett@hotmail.com	TERILY
John Corning	463-7822	CORNING @ comcast.net	Newspaper
GARY PORTER	461-7449	Porter@ppl.com	BARBARA MANZO
Catherine Wallace	463-9429	Cathwall @ hotmail.com	former member
KELLY LEHR	463-6996	kell@comcast.net	Newspaper
Roy Yost	463 6678	roy@ab.com	
Pete Lupp	463 2722		
John Amis	463 4279		
GREG GILBERT	765 9357	-	San Carlos ISL
Marty Barnes	765 8289		" " "
DICK MOSER	463 1069		" " "
Ryder Smith	463-2191		Friends of Preserve
Tom Myers	463 5258		Friends of Preserve

see to call

Nancy Randall 765 6381

Nature's Guide

NEWARKS PARK RECREATION

98 Park Road
Newark, NJ 07102

IMPROVEMENT PLAN 2008



Printed on recycled paper
100% Recycled Content

TABLE OF CONTENTS

Vision Statement	5
Executive Summary	6
I. Introduction & Purpose	7
II. Location and Site Description	9
III. Natural Resources Description	13
A. Physical Resources	13
i. Climate	13
ii. Geology	15
iii. Topography	15
iv. Soils	17
v. Hydrology and Watershed	19
B. Biological Resources	22
i. Ecosystem Function	22
ii. Natural Plant Communities	23
iii. Wildlife Species	28
iv. Listed Species	29
v. Biological Diversity	34
C. Cultural Resources	35
i. Archaeological	35
ii. Land Use History	35
iii. Public Interest	40

IV. Factors Influencing Management	40
A. Natural Trends and Disturbances	40
B. Internal Influences	41
C. External Influences	42
D. Legal Obligations and Constraints	43
i. Permitting and Mitigation Issues	43
ii. Relationship to other plans	43
E. Management Constraints and Coordination	44
F. Public Access and Resource Based Recreation	45
G. Future Acquisition	48
V. Management Action Plan	48
A. Management Units Description	48
B. Goals, Strategies and Projected Timetable	50
VI. Financial Considerations	54
A. Funding	54
B. Staffing	54
VII. Literature Cited	55
VIII. Appendices	57

LIST OF EXHIBITS

Figure 1 Location Map	11
Figure 2 Aerial Photograph	12
Figure 3 Topography Map	16
Figure 4 Soils Map	18
Figure 5 Watershed Map	21

Figure 6	Natural Plant Communities	27
Figure 7	Historical Aerial, 1944	37
Figure 8	Historical Aerial, 1953	38
Figure 9	Historical Aerial, 1958	39
Figure 10	Master Site Plan	47
Figure 11	Management Unit Map	49
Graph 1	Rainfall Comparison Data	14
Table 1	List of Designated Species	30
Table 2	Goals, Strategies and Projected Timetable for Implementation	51

A. APPENDICES

- A. Plant Species List
- B. Wildlife Species List
- C. Storm surge-Coastal High Hazard
- D. The Great Calusa Blueway Map
- E. Projected Costs and Funding Sources Table

Vision Statement

Continued dedication of residents, visitors, and Lee County Parks and Recreation will insure the preservation of the Matanzas Pass Preserve as a tropical island habitat. Guided nature walks, wildlife viewing from the pavilion on the bay, walking trails, and boardwalks will provide educational opportunities in this versatile outdoor classroom. The Matanzas Pass Preserve enhances opportunities for kayaking/canoeing along with bird watching and fishing in the Estero Bay Aquatic Preserve. Through conservation, restoration and maintenance the Matanzas Pass Preserve will remain a peaceful place of rest and tranquility for wildlife and those who visit.

Executive Summary

The Nature Conservancy donated the 58-acre Matanzas Pass Preserve to Lee County in 1994, after twenty years of stewardship. The physical distance of the Nature Conservancy office in Orlando to Fort Myers Beach made long distance management problematic. A volunteer committee, which became the Friends of Matanzas Pass Preserve, was established by The Nature Conservancy to co-manage the preserve and many projects were developed and completed with volunteer staff. When Lee County assumed stewardship of the Preserve, a site analysis was obtained, surveys prepared, and a Restoration Plan, Master Site Plan, and Resource Management Plan were created. This management plan is a revision and update of the 1996 plan. Since 1996, new recycled plastic boardwalks replaced deteriorated wooden boardwalks and interpretive signs were placed in the preserve with support from the Lee County Visitors Convention Bureau and the Tourist Development Council. Exotic removal began and was effective on air potato, Australian pines, and Brazilian peppers.

The Matanzas Pass Preserve is one of a few undeveloped, protected areas in the developed town of Fort Myers Beach on Estero Island. Walking the preserve boardwalk and trails offers a rare opportunity to view the flora and fauna of a mangrove forest and maritime oak hammock from within. The acquisition of the Matanzas Pass Preserve has insured its protection and preservation for present and future generations of residents and visitors.

Land Stewardship Plans are fluid and change through environmental influences, use changes, and population growth. Many of the issues addressed in the 1996 management plan are the same today - maintenance, exotic pest plant control, and restoration. Many issues evolve over time – resource based uses, carrying capacity, and educational programming.

Revisions to the 1996 plan include: updating surveys, plant community maps, and fauna list and creating management units, management goals, and strategies. Implementation timetables and standards to measure the achievements are included in an easy to read table. Incorporating a vision statement and action plan with this revised plan as well as updated aerial photographs, site plan, and management unit map brings the preserve information up to date.

I. Introduction & Purpose

The Matanzas Pass Preserve (MPP) is located in southwestern Lee County on the seven-mile long island of Estero, in the town of Fort Myers Beach. The 58 acre preserve runs along Matanzas Pass which links San Carlos Bay and Estero Bay, the first aquatic preserve in the state of Florida. The preserve is accessible from Bay Road and ends in a small parking area in front of the Historic Cottage. Three natural plant communities make up the preserve: mangrove swamp, maritime hammock and coastal grassland. The natural plant communities and shady hammock support a variety of wildlife on land and in the estuary.

The efforts of many people, both residents and visitors, have played a part in the acquisition of this parcel of property. Calusa Indians, homesteaders Robert Gilbert and George McAuley, Dr. and Mrs. Winkler, Martha Redd, nature photographer John Dunning, The Nature Conservancy and Lee County Government all are responsible for the preservation of the Matanzas Pass Preserve. The Winkler's came to Estero Island in 1912 by boat and bought 50 acres of land from Robert Gilbert and another 25 acres of land from homesteader George McAuley, which gave them the parcel of property from the Gulf of Mexico to Matanzas Pass including the Preserve area. Dr. Winkler built the two-story Beach Hotel and pier on the Gulf of Mexico by barging lumber to Estero Island.

The Winklers hired Martha Redd to care for them as they aged and when they passed on in 1938, she inherited the property on the bay side of Estero Boulevard in its pristine condition. As the development boom was beginning, Martha Redd was under pressure to sell her large parcel of land. For 36 years Martha had lived on the land in the area of the Matanzas Pass Preserve with little improvement and was criticized for living in a jungle. In 1974 Martha Redd's nieces and nephews inherited the land and were interested in selling it for development. Local residents, realizing the importance of acquiring this land, spearheaded grass roots fund raisers to secure the option to buy.

Nature photographer and island residents, John and Harriett Dunning, purchased 43 acres of the then believed to be 55 acres of the Martha Redd estate for \$125,000.00 in October 1974. Mr. Dunning donated 22 acres to The Nature Conservancy, keeping one acre for himself, and offered to sell

the rest of the property to the residents for \$105,000.00. Through tremendous grass-root efforts residents and visitors raised the money to buy the remaining acres and completed the purchase two years later. With this goal achieved, The Nature Conservancy was given possession of the Matanzas Pass Preserve in 1977 to insure that this area would be properly managed and remain in conservation. A local volunteer committee was established to oversee the property.

The Preserve has historically been referred to as a 42-acre site either due to early surveying techniques or to the area being estimated in size. The Preserve now stands at 58 acres due to corrections made with modern technology in surveying and the donation of approximately one acre of land from the School District of Lee County to the Lee County Board of County Commissioners in 1995. These out parcels can be seen in figure 2: Matanzas Pass Preserve 2005 Aerial.

Clearing paths, hauling debris, building an elevated boardwalk with bridges, placing benches, and trimming vegetation began in 1977 with volunteers including students from teacher Bill Hammond's Environmental Education Program - the Monday Group, from Lee County Schools, and Boy Scout Troops. The Fort Myers Beach Rotary Club built the Rotary Pavilion on the bay, Estero Island Garden Club landscaped the entrance and Lois Gressman, an original member of the Friends group, wrote a trail guide. The Nature Conservancy officially opened the Preserve with a ribbon cutting ceremony January 20, 1979 and the title, Matanzas Pass Wilderness Preserve.

In June 1992, vandals destroyed the main bridge causing the closing of the Preserve. The Nature Conservancy held a meeting September 15, 1992 to investigate management alternatives. After exploring possibilities, The Nature Conservancy donated the property to Lee County in 1994 to insure proper future management and protection of the natural resources. The title of the Preserve was changed to reflect the possible discrepancy of the term "wilderness" and that which the site represents.

In 1995, the School District of Lee County donated an acre of land to serve as an entrance for the preserve, provide parking, and to house the Historic Davison Cottage, the fourth house built on Fort Myers Beach, and to serve as an information area for the preserve. This addition of land gave the Preserve a public access. Americorps volunteer Yih-Ming Hsu completed

the Matanzas Pass Preserve Restoration Plan, Master Site Plan and Resource Management Plan in 1996 for Lee County Division of Parks and Recreation.

Land stewardship for the preserve continues to be a challenge. The upland area and mosquito control ditch spoil piles are invaded with exotics species in the southeast and southwest sections. Boaters and careless visitors contribute to the constant need for litter control. Human disturbances from bicycles and pets occur as well as unwanted, destructive, and irresponsible behavior. Many wading birds and listed species utilize the preserve. A balance is needed between the natural resources and the resource based recreational opportunities this preserve can provide. Limiting the Preserve to pedestrian traffic on trails only, no bicycles or motorized vehicles, and control of unauthorized use along with education for preservation will go a long way to achieving balance.

The purpose of this stewardship plan is to revise the 1996 plan, and to define the conservation, restoration, and preservation goals for the Matanzas Pass Preserve. It is a guide to support the best management practices for Lee County's Department of Parks and Recreation.

II. Location and Site Description

Matanzas Pass Preserve is located in southwestern Lee County, Sections 19-20, Township 46 South, Range 24 East on the island of Estero, south of Sanibel Island and north of Bonita Beach and consists of 58 acres. The Preserve runs along Matanzas Pass, the body of water connecting San Carlos Bay and Estero Bay. The main entrance to the preserve is located on Bay Road off Estero Boulevard in the Town of Fort Myers Beach, Lee County and is an estimated 1.1 miles southeast of the Matanzas Pass Bridge. The north-northeast boundary of the preserve is Matanzas Pass; the south and southeast boundaries border the subdivisions of Shell Mound Park and Zimmer's Addition to Shell Mound Park, Donora Boulevard. The south and southwest boundary are adjacent to the Red Coconut RV Park, Gulf View Colony, Borton's Subdivision, Nature View Court, Fort Myers Beach Elementary School and Lee County's Bay Oaks Recreation Center; the western boundary is the man-made canal along Tropical Shores Way. (Figures 1 & 2)

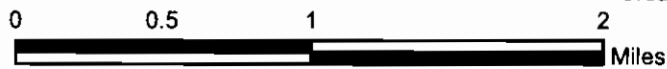
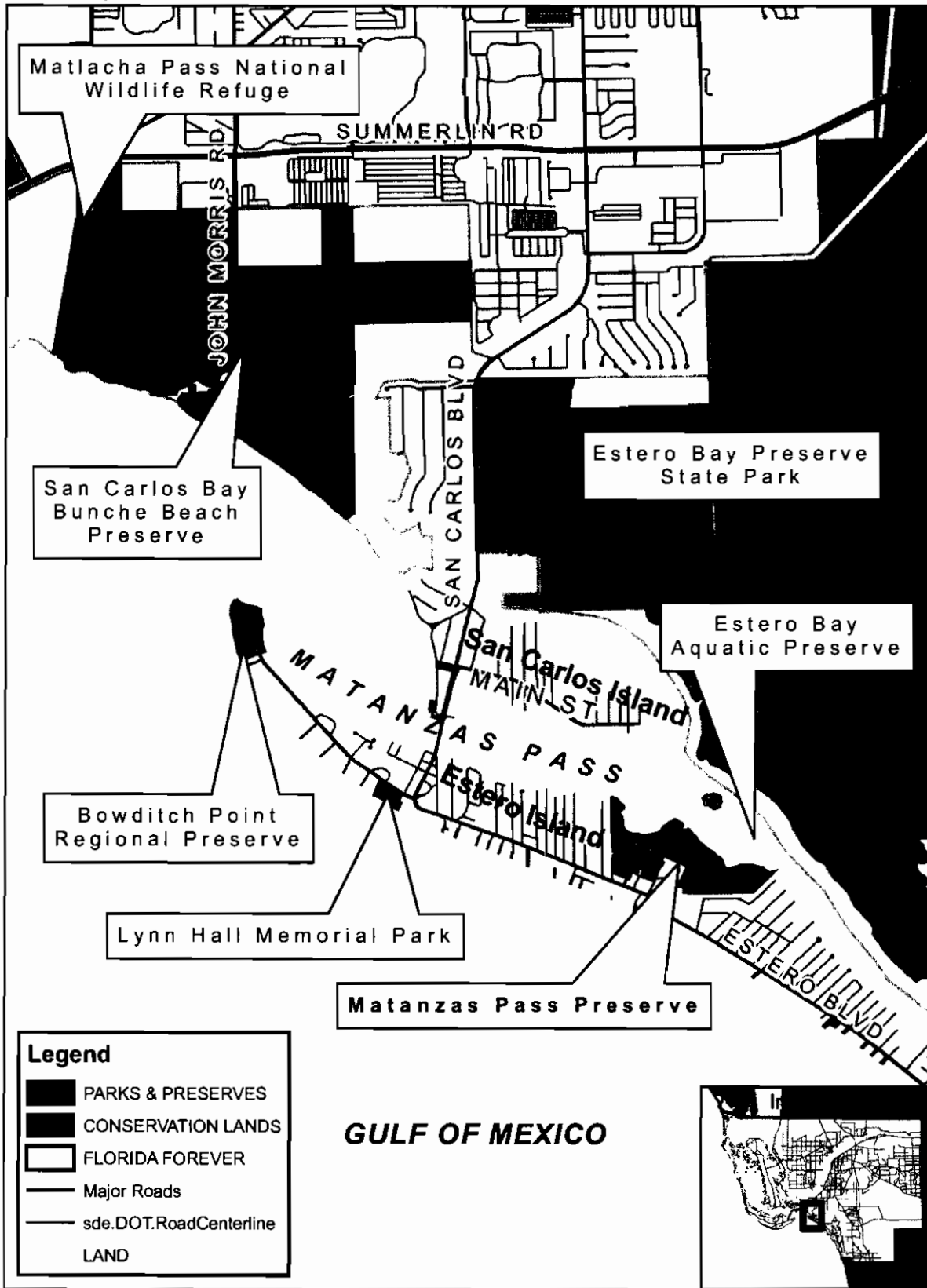
Many preserves and wildlife sanctuaries are located in the region. Little Estero Critical Wildlife Area is located 4.5 miles to the south and Bowditch

Pointe Regional Preserve is located 1.5 miles to the north. On the mainland to the west is San Carlos Bay –Bunche Beach Preserve located on John Morris Road and J.N. “Ding” Darling National Wildlife Refuge is located on Sanibel Island.

The Preserve consists of three native plant communities: tidal swamp, maritime hammock, and coastal grassland. (Figure 6). These community designations are based upon Florida Natural Areas Inventory’s Guide to the Natural Communities of Florida (Florida State University 1990) (www.fnai.org).

Figure 1: Matanzas Pass Preserve Location Map

Created: July 2005



Created by: dcalvert@leegov.com

Figure 2: Matanzas Pass Preserve 2005 Aerial

Created: November 2005



Created by: dcalvert@leegov.com

III. Natural Resources Description

A. Physical Resources

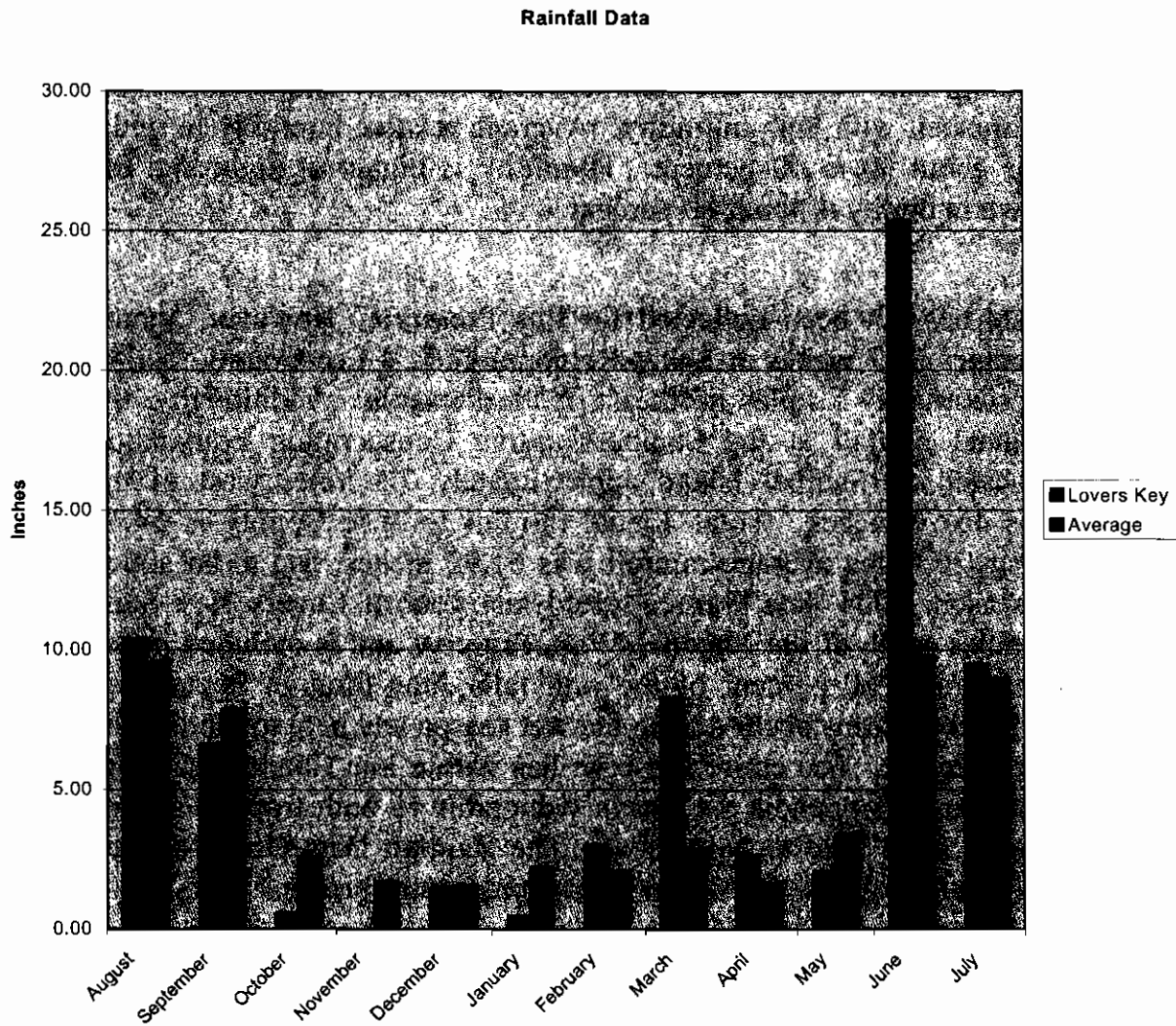
i. Climate

Southwest Florida has a humid, sub-tropical climate due to its maritime influence from the Caribbean Sea and the Gulf of Mexico, with temperature trends linked to its latitude and proximity to these bodies of water. Four seasons occur in Florida if only with slight changes. The seasons influence the weather by length of daylight, precipitation, sea breeze, storm fronts, and extreme events, such as hurricanes and tropical storms. Winters are mild with an average temperature of 65 degrees Fahrenheit, but the jet stream can bring in cool air and freezes. The summer mean monthly temperature is 91 degrees Fahrenheit with high humidity. Average relative humidity in mid - afternoon is about 50 to 60 percent. Humidity is higher at night and the average dawn humidity is about 80 percent.

Rainfall data has not been collected for this Preserve. However, annual rainfall averages 54.7 inches at Lakes Regional Park; a Lee County facility located approximately 5 miles northeast of the Preserve. Additionally, the average annual rainfall at the Sanibel-Captiva Conservation Foundation (SCCF), located on Sanibel Island approximately 7.5 miles west of the Preserve, is 46.59 inches. Total annual rainfall for Lee County is 54.19 inches and in 2004 the average rainfall was 61.92 inches, due to an active hurricane season. 2004 data was collected last year at Lovers Key State Park, five miles south of the Matanzas Pass Preserve and is included in the graph. On average, 60 percent of the rain falls June through September. Afternoon thunderstorms occur during the wet season and help to modify the summer temperature. The entire Preserve lies within Lee County's Coastal High Hazard Area (Appendix C) and is vulnerable to both tropical storms and hurricanes from June to November. The Rainfall Data Graph depicts southwest Florida's typical dry winter and summer rainy season.

Graph 1

Average Lee County rainfall over a 30-year period in inches is depicted with the dark red bars and the August 2004 to July 2005 rainfall data in inches is depicted with blue bars. The 2004-2005 data was collected at Lovers Key State Park, five miles south of the Matanzas Pass Preserve.



ii. Geology

Barrier Island Geology

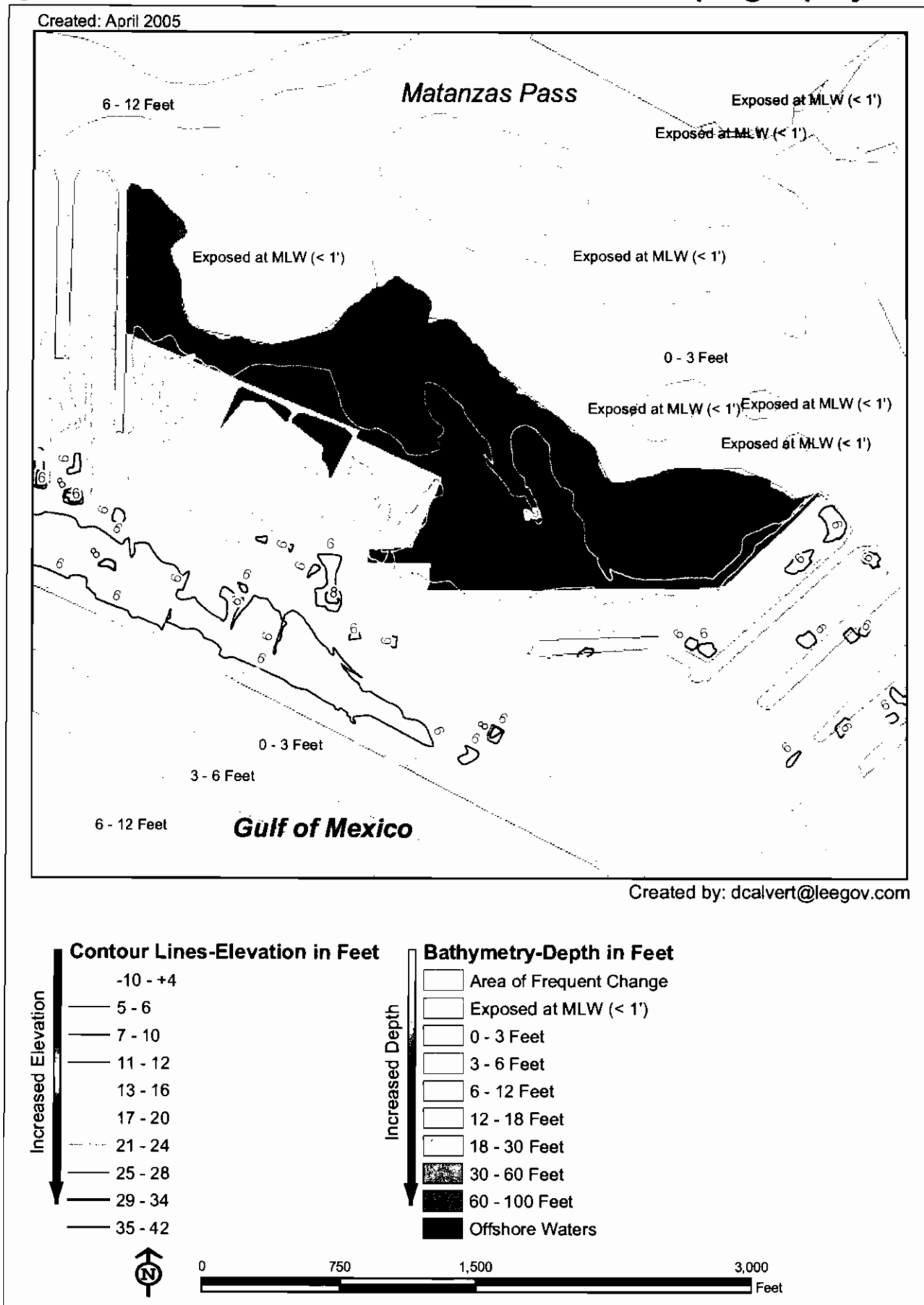
Barrier islands are linear islands of sand that parallel coastlines. They are thought to have been formed in three ways: by the growth of spits from headlands and their subsequent breaching by inlets; by the emergence of underwater shoals; and by the drowning and isolation of mainland dunelines as sea level rose (Schwartz, 1971).

Florida's peninsular Gulf of Mexico barrier islands occur on "highs" in the underlying Pleistocene surface (Johnson and Barbour, 1991). This Pleistocene is of the Anastasia Formation and consists of limestone, sand, and clay (Brown, et al. 1991). The islands bounding Estero Bay are essentially sedimentary deposits that were carried by longshore currents. These deposits originate from sediments deposited at the mouths of rivers and creeks, including the Caloosahatchee River, when rising sea levels flooded this area approximately 5,000 years before present (Johnson and Barbour, 1991).

iii. Topography

The slope of the site ranges from zero to four feet in elevation (Figure 3). A majority of the site falls between zero and two-feet in elevation as the mangrove swamp rises out of Matanzas Pass. When the intertidal zone of Matanzas Pass is exposed at mean low water level, a feeding area is created for resident avian life. Within the Preserve, the elevation reaches four feet as the site approaches the south-southeast and south-southwest boundaries and the land slopes upward. This slight change in elevation makes possible the change in community from a mangrove swamp to a maritime hammock and a small portion of coastal grassland. All elevations are based on the National Geodetic Vertical Datum (NGVD).

Figure 3: Matanzas Pass Preserve Topography Map



iv. Soils

Soils in the Preserve are identified as Entisols and Histosols. Level, poorly drained coastal marshes and swamps of variable-textured mineral and organic materials subject to frequent tidal flooding can dominate these soils. Ecosystems include mangroves, salt marshes, and maritime forests. Primarily used for recreation and wildlife (Ecosystems of Florida, 1990) (Figure 4).

The northern sections of the Preserve consist of Kesson Fine Sand. This is a nearly level, very poorly drained soil in broad tidal swamps, with areas subject to tidal flooding. Slopes are smooth and range from 0 to 1 percent. Natural vegetation consists of black mangrove (*Avicennia germinans*), sea ox-eye daisy (*Borrchia arborescens*), and red mangrove (*Rhizophora mangle*) (USDA/SCS 1984).

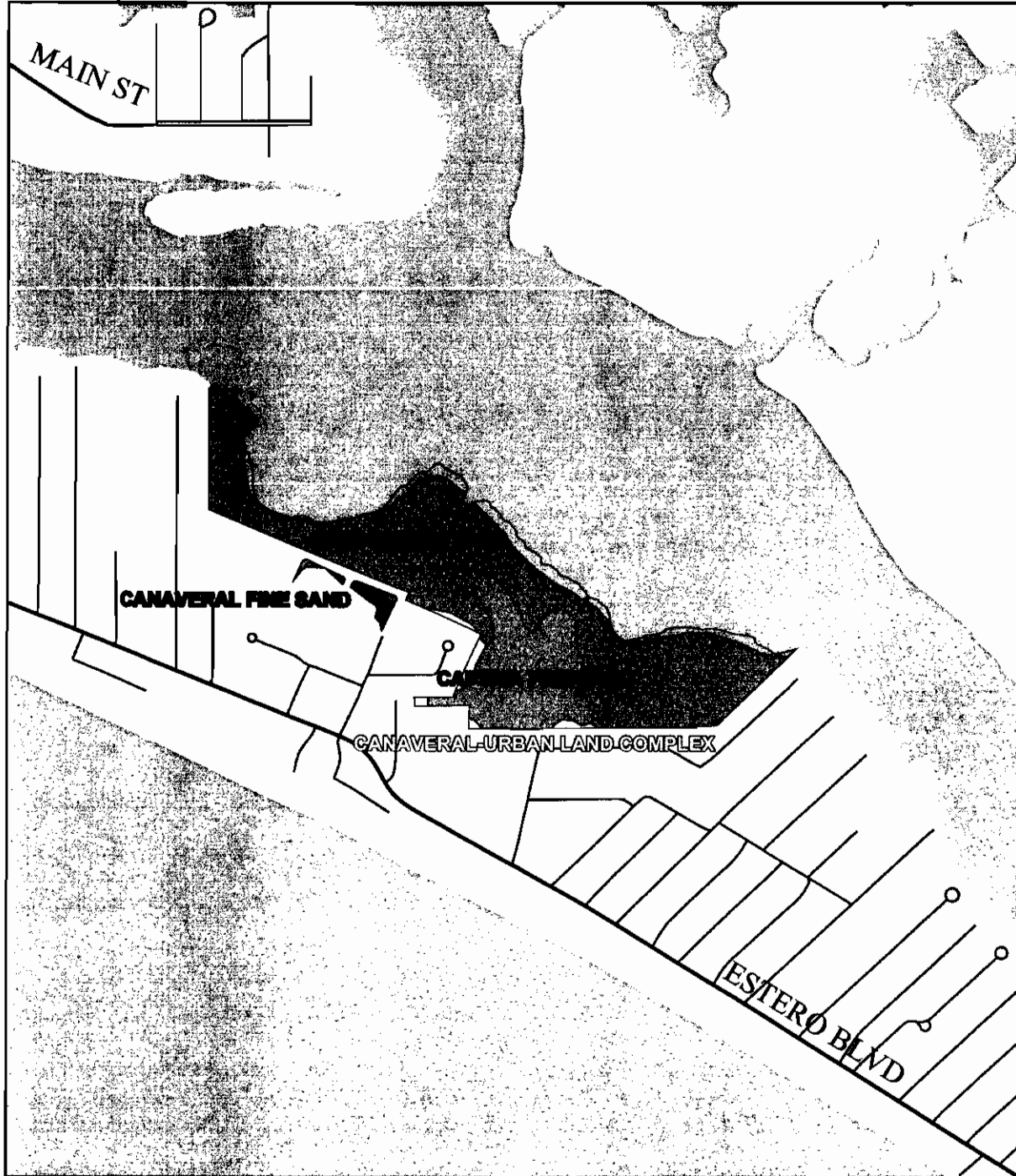
Canaveral fine sand, in the southwestern portion of the preserve, includes small areas (less than ten percent) of Captiva and Kesson soils and is described as nearly level, moderately well drained and somewhat poorly drained soil in low ridges. Slopes are smooth to slightly convex, ranging from zero to two percent. Natural vegetation includes cabbage palm (*Sabal palmetto*), seagrape (*Coccoloba uvifera*), wild coffee (*Psychotria nervosa*) and an understory of vines and herbaceous plants (USDA/SCS 1984).

Captiva fine sand makes up a southeastern central portion of the Preserve. This is nearly level, poorly drained soil in sloughs. Slopes are smooth to concave and range from zero to one percent. Natural vegetation consists of cabbage palm, sand cordgrass (*Spartina bakeri*), leather fern (*Acrostichum danaeifolium*), and wax myrtle (*Myrica cerifera*) (USDA/SCS 1984).

Canaveral-Urban Land Complex soil makes up a limited area of the southern border of the Preserve where homes are located. This complex consists of Canaveral fine sand and areas of Urban land. The Canaveral soil and Urban land are so intermingled that they cannot be separated on the scale used for mapping (SDA/SCS 1984) (Figure 4).

Figure 4: Matanzas Pass Preserve Soils Map

Created: July 2005

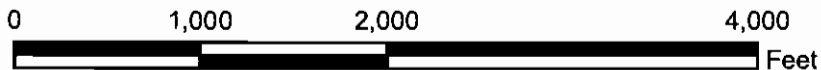


Created by: dcalvert@leegov.com

Legend

E

-  CANAVERAL FINE SAND
-  CAPTIVA FINE SAND
-  KESSON FINE SAND
-  CANAVERAL-URBAN LAND COMPLEX
-  WATER



1 inch equals 1,000 feet

v. Hydrology and Watershed

Over three quarters of the Preserve consists of mangrove swamp that is influenced by tidal flow and fresh water run off. The tides bring relatively clean water to the mangroves, and in turn, flush out accumulations of hydrogen sulfide and salts. The mangrove swamp also filters nutrients such as phosphorus and nitrogen from terrestrial runoff, which help to buffer the estuary from water pollution.

The construction of mosquito control ditches in the late 1950's has impacted the site. When the ditches were dug the spoil piles were left on the sides of the ditches creating dirt mounds that prevent natural water flow and increased the area of mangrove habitat. The ditches generally run through the site from northeast to southwest and northwest to southeast, an estimated 6,440 feet in length. Approximately half of the ditching occurs in the submerged mangrove areas where hydrological impacts may not be noticeable.

Matanzas Pass Preserve is located within the Greater Charlotte Harbor Watershed. The Greater Charlotte Harbor Watershed extends over an area of 4,400 square miles. At its northern end, the Peace River basin begins in Polk County near Lakeland with the Myakka River basin starting to the east in Manatee County until it winds and meanders to meet the north side of the Charlotte Harbor. To the south Pine Island Sound and Matlacha Pass connects Charlotte Harbor to the tidal Caloosahatchee River and Estero Bay in Lee County.

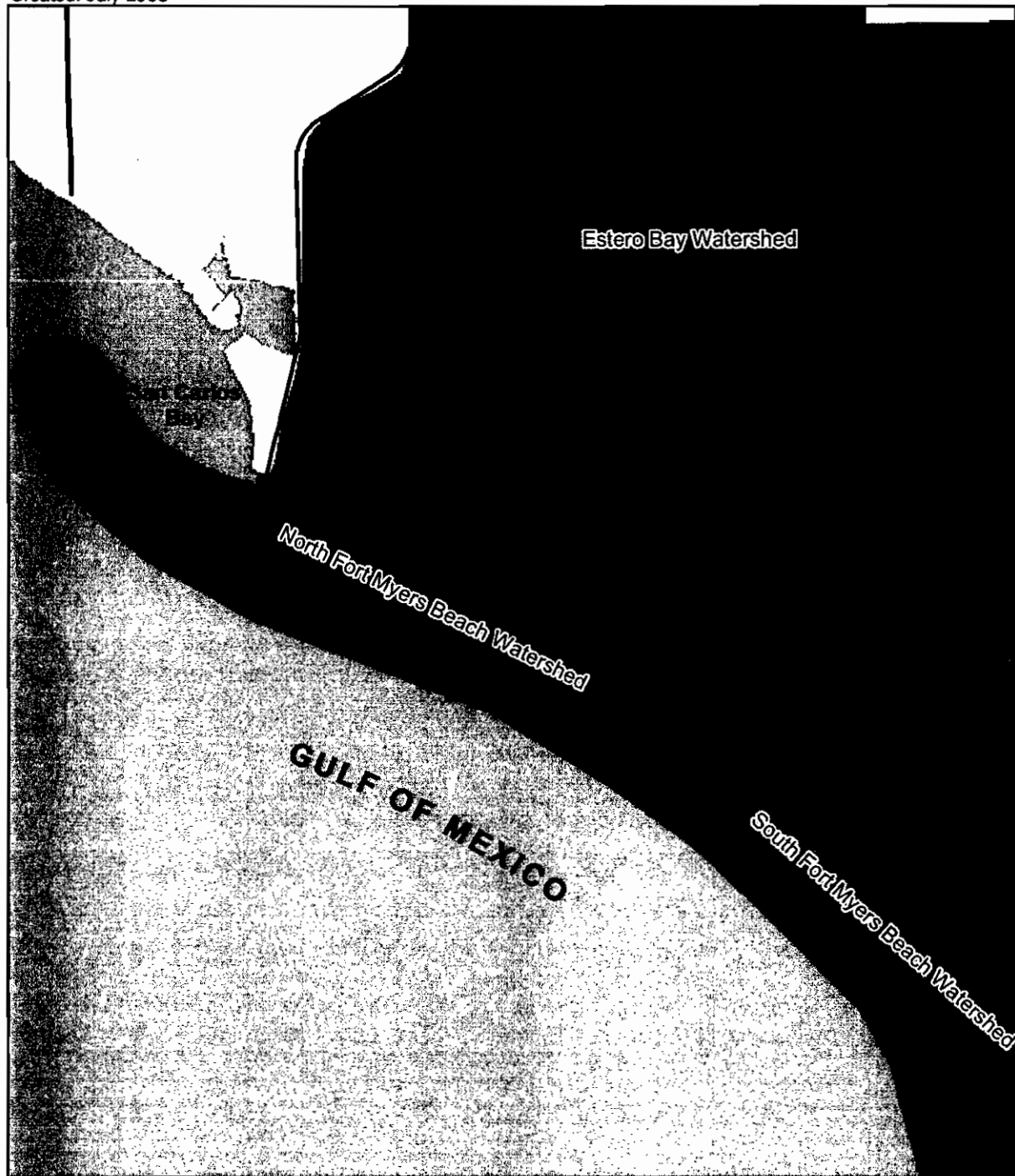
The area south of the Caloosahatchee River mouth, including San Carlos Bay and Matanzas Pass forms the northern boundary of the Estero Bay estuary. Protected on the west by a barrier island chain including the Town of Fort Myers Beach and Bonita Beach, the estuary stretches southeast to the mouth of the Imperial River at the county boundary.

The 300 square mile Estero Bay Watershed includes Ten Mile Canal, Hendry Creek, Mullock Creek, Estero River, Spring Creek, Imperial River, Estero Bay, Hurricane Bay, Hell Peckney Bay, and the waterway known as Matanzas Pass.

This watershed divides near central Fort Myers Beach to become the North Fort Myers Beach Watershed and the South Fort Myers Beach Watershed with the Matanzas Pass Preserve being located in the former. This watershed is subject to storm water runoff, tidal, and storm surge influences that affect the island (Figure 5).

Figure 5: Matanzas Pass Preserve Watershed

Created: July 2005



Created by: dcalvert@leegov.com



Legend

 Major Roads

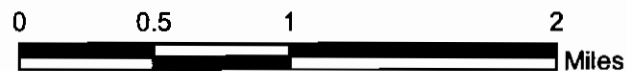
 Matanzas Pass Preserve

Watersheds

 Estero Bay Watershed

 North Fort Myers Beach Watershed

 South Fort Myers Beach Watershed



B. Biological Resources

i. Ecosystems Function

Flood storage and desynchronization is the process by which wetland basins store and gradually release peak water flows from precipitation or upland runoff. Wetlands that perform this function may provide significant flood control services to nearby communities. Coastal wetlands also store flood waters, thus reducing the flood impact of major storms (Scodari, 1990). The 17.4 acres of maritime hammock and 2.9 acres of coastal grasslands in the Preserve have a lower elevation than that of the immediate surrounding community. This enhances the ability of the Preserve to retain and dissipate runoff from rain and small storms. Storm magnitude and duration are factors that will affect this function.

Shoreline anchoring is the process by which the root system of wetland vegetation stabilizes soil at the water's edge and enhances the accretion of soil and/or peat at the shoreline. Dissipation of erosive forces is the process by which wetland vegetation diminishes the erosive impact on soil by waves, currents, and general water level fluctuations. These wetland functions protect both natural resources and man-made structures by inhibiting shoreline erosion and the creation of eroded sediments that can cause siltation of navigable waterway. Larger wetlands with extensive, persistent vegetation (e.g., forested wetlands) are probably the most effective at dissipating erosive forces (Scodari, 1990). The 37.7 acre of tidal swamp community provides this function with a forest of red, black, and white mangroves (*Laguncularia racemosa*), and buttonwoods (*Conocarpus erectus*) which dissipate wave energy and anchor soil with their intertwined root system.

Nutrient retention is the process by which wetlands store nutrient waste, such as phosphorus and nitrogen, within their soil and vegetation. Nutrient removal is the process by which wetlands release these retained wastes. More study is necessary to determine the exact role that wetlands play in improving water quality. For example, no literature suggests general criteria for measuring levels of wetland nutrient retention (Scodari, 1990). It is believed that all wetlands serve as nutrient traps to varying degrees. The Preserve is a 58 - acre nutrient trap, serving the Estero Bay Watershed.

The aquatic food chain support function refers to the direct and indirect use of the wetland-derived nutrients by fish and shellfish. This function is known to be important to the production of commercial and sport estuarine fish and shellfish (Scodari, 1990). The detritus material that is produced from the 37.7 acres of tidal swamp community is flushed to areas where fish and aquatic invertebrates can consume it directly or indirectly, or it can be consumed by organisms present near the point of production.

Fisheries habitat support function refers to the “physical and chemical factors, which affect the metabolism, attachment, and predator avoidance of the adult or larval forms” (P. Adamus & L. Stockwell). This function is widely recognized as important; wetlands provide both nursery grounds and food for many species of freshwater and saltwater fish. Most commercial saltwater fish and shellfish depend on coastal estuaries and their wetlands for spawning grounds and nurseries (Scodari, 1990). A total of 37.7 acres of mangrove root systems in the Preserve provide cover, food, and water quality through sediment settlement (turbidity) for larval, juvenile, and adult fish.

Wildlife habitat support is the provision of environmental features that supply food and shelter needs of birds, mammals, and other wildlife. This function gives people the opportunity to engage in bird watching, hunting and other wildlife-oriented recreational activities. Factors affecting a wetland’s wildlife support function include availability of cover and freedom from disturbance; availability of food; and availability of specialized habitat needs (Scodari, 1990).

The 58 acres of the Matanzas Pass Preserve is devoted to creating wildlife habitat that provides cover and food availability as well as specialized habitat needs such as coastal grass lands, standing snags, and fruit bearing vegetation for the wildlife population. To prevent disturbances to wildlife no bikes, motorized vehicles, or pets are allowed in the Preserve.

ii. Natural Plant Communities

Florida Natural Areas Inventory’s Guide to the Natural Communities of Florida (Florida State University, 1990)(Figure 6) ranks natural areas as significant on a Global (G) or State (S) basis and numerically from 1 to 5 including an uncertain rank marked by a question mark (?). A rank of 1

designates an area as critically imperiled (G1-S1) and a rank of 5, (G5 –S5) as demonstrably secure, although it may be quite rare in part of its range. The three native plant communities of the Matanzas Pass Preserve are ranked as follows:

G3 S3 Tidal Swamp

G4 S3 Maritime Hammock

G3 S2 Coastal Grassland

Definitions of Global (G) element ranks:

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range or because of other factors making it vulnerable to extinction throughout its range, 21 to 100 occurrences;

G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery;

Definition of State (S) element ranks:

S2 = Imperiled in state because of rarity (6-20 occurrences or little remaining area) or because of some factor(s) making it very vulnerable to extinction throughout its range;

S3 = Rare or uncommon in state (on the order of 21 to 100 occurrences).
Plant species list can be found in Appendix A.

Tidal Swamp Community - 37.7 acres, 65 % of MPP

The northern boundary along Matanzas Pass is vegetated with red mangrove, black mangrove, white mangrove and buttonwood. Typically these species occur in zones defined by varying water level determined by land elevation. Exceptions are seen in the Matanzas Pass Preserve. Red mangroves usually occupy the lowest zone along the shoreline and in the water, black mangrove the intermediate zone a slight increase in land elevation, and white

mangrove and buttonwood share the highest zone. On the mangrove boardwalk, observing red and black mangroves in the same area is not unusual and at times white mangroves, black mangroves and buttonwood occur in the same area.

Other plants associated with Tidal Swamps and seen in the preserve are glasswort (*Salicornia spp.*), sea purslane (*Sesuvium portulacastrum*), saltwort (*Batis maritima*), and sea oxeye. Unconsolidated substrates are usually found in the sub tidal regions surrounding tidal swamps. The Matanzas Pass Preserve supports healthy areas of subtidal, intertidal, and supratidal zones which make up the unconsolidated substrate. The Preserve helps to protect other inland communities by absorbing the brunt of tropical storms and hurricanes.

The condition of this community is good. Invasive exotic plants were treated in December 2004, and are limited to the mosquito ditch berms dug in the 1950's. This area will continue to be monitored and treated as needed in the future for exotic pest plants. Volunteer workdays and designated coastal clean up dates will target this area of the Preserve to have litter removed as trash washes in with the tides and storms.

Maritime Oak Hammock Community - 17.4 acres, 30 % of MPP

Upland parts along the south border and central area of the Preserve are vegetated with live oak (*Quercus virginiana*), cabbage palm, sea grape, strangler fig (*Ficus aurea*), saw palmetto (*Serenoa repens*), beauty berry (*Callicarpa americana*), poison ivy (*Toxicodendron radicans*), coral bean (*Erythrina herbacea*), coontie (*Zamia integrifolia*), and rouge-plant (*Rivina humilis*). Maritime hammocks occur on old coastal dunes that have been stabilized long enough for the growth of a forest as seen in the 1944 aerial.(Figure 7). The oaks and palms of the Preserve support a variety of epiphytes such as golden polypody (*Polypodium aureum*), resurrection fern (*Polypodium polypodioides*), ball moss (*Tillandsia recurvata*), Spanish moss (*Tillandsia usneoides*), and shoestring fern (*Vittaria lineata*). Nutrient recycling is generally accomplished by detrital organisms instead of by fire. Maritime hammocks are used by migrating birds for food and shelter following trans-oceanic or trans-gulf migrations. Maritime hammocks originally occurred in continuous bands on barrier islands but are now

dissected into short strips by development and are rapidly disappearing. The Matanzas Pass Preserve is surrounded by development. (Figure 6)

This community is at maintenance level for invasive exotic vegetation since Lee County took possession. Clean up events, Lee County Staff, and the Friends of the Matanzas Pass Preserve keep this area litter and exotic plant free.

Coastal Grassland Community – 2.9 acres, 5 % of MPP

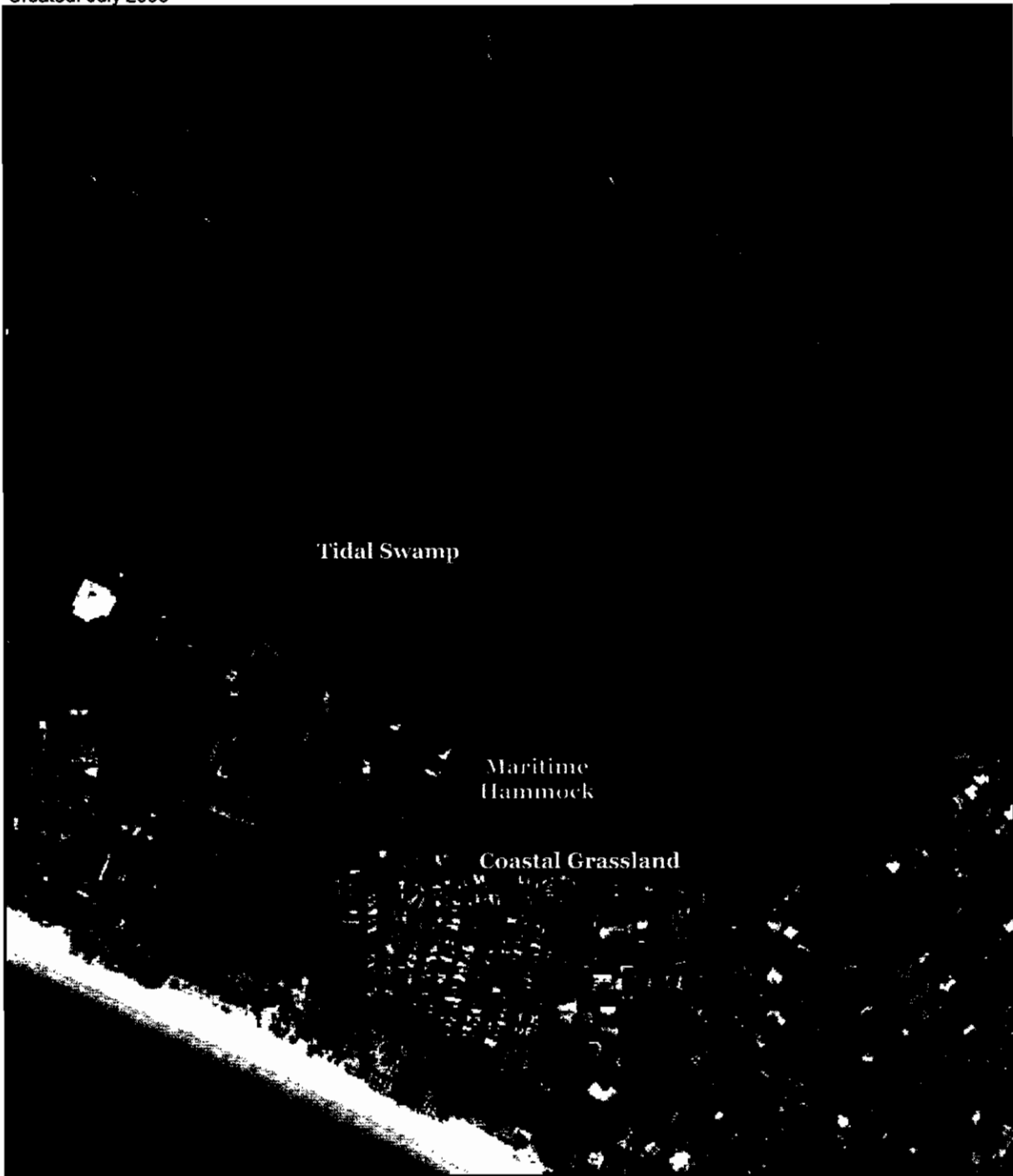
In the very southern portion of the Preserve is a section called the restoration area because it is in the process of being restored to its former community. Here the elevation increases slightly and a small coastal grassland exists. Characterized by the gently undulating land scattered with small clumps of trees and shrubs. Typical plants include beach morning glory (*Ipomoea stolonifera*), sea oxeye, sand spurs (*Cenchrus spp.*), crowfoot grass (*Dactyloctenium aegyptium*), prickly pear cactus (*Opuntia spp.*), wax myrtle (*Myrica cerifera*), and groundsel bush (*Baccharis spp.*). Coastal grassland is a low flat area behind fore dunes that is found on broader barrier islands, capes, spits, and is best developed along the Gulf Coast. The old fore dune line on Fort Myers Beach lies to the north of present day Estero Boulevard just to the south of the Preserve boundary. It may be flooded by saltwater and covered with sand and debris during major storms. With time, these areas become vegetated with pioneer species, eventually taking on characteristics similar to prairie.

If no major storms occur to renew the process, coastal grasslands will often be colonized by shrubs and trees and eventually may succeed to coastal strand or flatwoods (Figure 6).

Invasive exotics are being removed in this area and the Friends of Matanzas Pass Preserve have obtained funding from the Charlotte Harbor National Estuary Program to restore this area with wax myrtle, sea oxeye, beautyberry (*Callicarpa americana*) and white indigoberry (*Randia aculeata*).

Figure 6: Matanzas Pass Preserve Natural Plant Communities

Created: July 2005

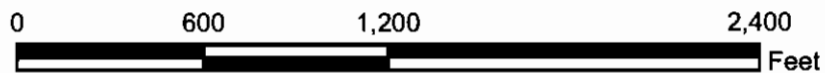


Created by: dcalvert@leegov.com

E

Matanzas Pass Preserve Natural Plant Communities

- Coastal Grassland
- Maritime Hammock
- Tidal Swamp



1 inch equals 600 feet

iii. Wildlife Species

The two types of tidal swamps in the Preserve are over wash swamps, found on islands that are frequently inundated by tides, and narrow fringe swamps, located along waterways. These communities are significant because they function as nursery grounds for most of the state's commercially and recreationally important fish and shellfish. This natural area is also the breeding grounds for a substantial population of wading birds, shorebirds, and other animals. The continuous shedding of mangrove leaves and other plant components produce as much as 80% of the total organic material available in the aquatic food web.

Typical animals that rest, forage, or nest in the Preserve are mangrove water snake (*Nerodia clarkia compressicauda*), brown pelican (*Pelecanus occidentalis*), osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), herons (*Ardea*), egrets (*Egretta*), and raccoons (*Procyon lotor*).

Tidal swamp grades into the maritime hammock with hardwood forest and dense understory. This area of the Preserve is centrally located and at a slightly higher elevation from the tidal swamp area, providing good habitat and foraging area for yellow rat snakes (*Elaphe obsoleta quadrivittata*), gray squirrel (*Sciurus carolinensis*), raccoon, opossum (*Didelphis virginiana*), blue jay (*Cyaocitta cristata*), northern cardinal (*Cardinalis cardinalis*), and pileated woodpecker (*Dryocopus pileatus*).

The smallest area in the preserve is the coastal grassland and has the largest number of private residences for neighbors, the highest natural elevation, and the most open space. Habitat for marsh rabbit (*Sylvilagus palustris*), butterflies, red-shouldered hawk (*Buteo lineatus*), American kestrel (*Falco sparverius*), and box turtle (*Terrapene carolina*) is unique to this area.

A Wildlife Species List can be found in Appendix B. As staff explores the preserve monthly the FNAI field reports for rare animal and plant species will be consulted and filled out if applicable. These can be found in the Land Stewardship Operations Manual

iv. Listed Species and their Designation

Providing habitat for a wide range of animals may protect designated species included on Florida's Endangered Species, Threatened Species, and Species of Special Concern document maintained by Florida Fish and Wildlife Conservation Commission in accordance with Rules 68A-27.003, 68A-27.004 and 68A-27.005 respectively Florida Administrative Code (F.A.C.) as well as those listed by the federal government in the Endangered Species Act.

Maintaining the native biological communities will benefit all species and proper stewardship practices in the Preserve will ensure protection of designated species. Management practices in the Preserve include the control of exotic plants and litter, wildlife monitoring, restoring native plants to areas cleared of exotic plants, and enforcement of unacceptable behavior in the Preserve such as camping, biking, motorized vehicles, weapons, and pets.

Table 1 documents designated species that occur in the Preserve. Many other species inhabit the Preserve as well (Appendix B). Following the list and key to abbreviations and notations is a brief summary of a few of the species, why they are in decline and management measures that will take place to protect them in the Matanzas Pass Preserve.

Table 1

Listed Species Found at Matanzas Pass Preserve and their designated status

Common Name	Scientific Name	FWC	USFWS	Occurrence
Reptiles				
American alligator	<i>Alligator mississippiensis</i>	SSC (1,3)	T (S/A)*	confirmed
Gopher tortoise	<i>Gopherus polyphemus</i>	SSC (1,2,3)		confirmed
Birds				
Brown pelican	<i>Pelecanus occidentalis</i>	SSC (1)		confirmed
Reddish egret	<i>Egretta rufescens</i>	SSC (1,4)		confirmed
Snowy egret	<i>Egretta thula</i>	SSC (1)		confirmed
Little blue heron	<i>Egretta caerulea</i>	SSC (1,4)		confirmed
Tricolored heron	<i>Egretta tricolor</i>	SSC (1,4)		confirmed
White ibis	<i>Eudocimus albus</i>	SSC (2)		confirmed
Osprey	<i>Pandion haliaetus</i>	SSC (1,2)		confirmed
Roseate spoonbill	<i>Platalea ajaja</i>	SSC (1,4)		expected
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	T	expected
Peregrine falcon	<i>Falco peregrinus</i>	E		expected
Mammals				
Florida manatee	<i>Trichechus manatus latirostris</i>	E	E	confirmed
Plants				
		FDA	FWS	
Golden leather fern	<i>Acrostichum aureum</i>	T	E	confirmed
Joe wood	<i>Jacquinia keyensis</i>	T		confirmed
Wild cotton	<i>Gossypium hirsutum</i>	E		confirmed

Key to Abbreviation and Notations

FDA	= Florida Department of Agriculture & Consumer Services
FWC	= Florida Fish and Wildlife Conservation Commission
USFWS	= United States Fish and Wildlife Service
E	= Endangered
T	= Threatened
SSC	= Species of Special Concern
T (S/A)*	= Threatened/Similarity of Appearance to a Threatened Taxon in the Entire Range

Below is a brief description of a few of the species listed in Table 1, as well as management recommendations for the Matanzas Pass Preserve in regard to the needs of these species.

American Alligator

The best know reptile in Florida was once on the way to extinction due to habitat destruction and a market for hunting hides. Laws protecting the alligator have enabled this species to make a remarkable recovery.

Occasionally an alligator is sited at the preserve. Alligators can co-exist with man as long as care is taken not to feed the alligators.

The major threat to the American alligator existence is the destruction of suitable habitat. Matanzas Pass Preserve does not provide habitat for the alligator, yet they have been sited using the pond.

Gopher Tortoise

Gopher tortoises were last sited in the preserve in 1999. The habitat is not typical of sand hills, scrub, upland pine flatwoods, or pastures but increased growth in the area may have forced them into the Preserve or they may have been released by people.

Little can be done in the Matanzas Pass Preserve to enhance habitat for gopher tortoise due to the low elevation and lack of upland habitat.

Brown Pelican

The brown pelican is perhaps Florida's most distinctive and recognized bird. It wanders inland upon occasion; pelicans are grace in the air as they flap and glide over the water. Endangered at one time by effects of pesticides, the pelican has made a good come back since the use of DDT was outlawed. Food shortages, human disturbance, increased turbidity from dredging and pollution (especially entanglement in fishing gear) are all factors that led to their decline between the 1970's through the mid 90's (Hipes et.al. 2000).

Education about the importance of proper disposal of monofilament, litter, and keeping a distance from the pelicans will protect this bird and it's habitat. Continued use of trash receptacles and scheduled volunteer clean up days will concentrate on monofilament and debris that can endanger pelicans and other wildlife.

Reddish Egret

The reddish egret is Florida's least common heron. Still suffering the effects of century past plume hunting, this wading bird's rate of recovery following protection has been much slower than that of other species. Red mangroves appear to be a favored nest site (Kale & Maehr 1990) and it is not unusual to observe this egret in the preserve feeding.

Continued protection of red mangroves, a litter free preserve, maintain the "no dog" policy, and teaching visitors to observe wildlife from a distance will be beneficial to the reddish egret.

Snowy Egret

Long filmy feathers (aigrettes), prominent head, neck, and back plumes of breeding adults made snowy egrets a prime target for plume hunters during the last century. This wading bird has made a remarkable come back from drastically low numbers and nest in multi-species colonies located in shrub-covered wetlands or islands in lakes and coastal lagoons (Kale & Maehr 1990).

Management for this species will include education in the proper behavior of people and their domesticated animals and the importance of habitat preservation and restoration.

Little Blue Heron

The general population trend for this species is in decreasing. This may be related to wetland losses and there is speculation that competition with cattle egrets for nest sites may be contributing to this decline (Kale & Maehr 1990).

Management issues for the little blue heron species will be the same as the snowy egret.

Osprey

Drastic declines in osprey population in the 1950s and 60s were due to environmental contaminants. Banning of chlorinated hydrocarbon pesticides has helped this species recover. The birds will nest readily on tall manufactured platforms and other structures. (Kale & Maehr 1990).

Ospreys are seen frequently using the snags in the Preserve for hunting and eating. Preservation of the Matanzas Pass Preserve will provide a foraging area as well as a future nesting site if tall man-made platforms are constructed (Kale & Maehr 1990).

Peregrine Falcon

Peregrine Falcons also suffered decline due to habitat destruction and environmental contamination. It has made a fairly good come back since the use of DDT has stopped (Kaufman 2000). As one of the wintering areas for the falcon, the Preserve provides good hunting grounds and an area with little human disturbance

Management will be the same as for the osprey.

Florida Manatee

The manatee has been documented by Lee County Parks and Recreation staff swimming in Matanzas Pass adjacent to the preserve. Increased boat traffic in the area is the main concern for this species, as frequent scaring and some deaths due to boat encounters are documented. Sea grass beds just off the coast of the preserve provide food for manatees and a channel provides a waterway for this mammal.

Signage for a manatee zone would be appropriate for the pavilion in the Preserve, as well as education for residents and visitors.

v. Biological Diversity

Many species of birds, reptiles, invertebrates, fish, and mammals inhabit, forage, nest, or rest in the Matanzas Pass Preserve. At low tide, wading and shore birds take advantage of the mud flats and ditches that are teeming with food. The mangroves provide nesting and roosting area for birds. Many species of fish either breed or spend some part of their juvenile life in the protection of the mangroves. The integrity and diversity of the Matanzas Pass Preserve and its associated waters must be protected when and where possible. Management staff will perform the following actions in this regard:

- Control of invasive exotic vegetation and annual follow-up maintenance will provide suitable habitat for native wetland and terrestrial species.
- Removal of any debris and prevention of future dumping on site will improve and protect water quality.
- Removal of hazardous debris such monofilament line and other potential entrapment debris will also contribute to the quality of surrounding waters and protect wildlife species that utilize this area.
- On-going species surveys conducted by volunteers and staff will confirm and protect the diversity that is present.
- Provide educational opportunities for visitors through both interpretive signs and programs.

C. Cultural Resources

i. Archaeology

Human disturbance in the Matanzas Pass Preserve consists of the mosquito ditching that took place in the 1950's and the original boardwalk constructed in the 1970's through the mangrove swamp. This all occurred prior to 1987 when Piper Archaeological Research, Inc. conducted an archaeological site inventory of Lee County.

Although the Preserve is not likely to contain archaeological material due to its wet nature, it is located less than one mile from the Florida Master Site File number 8LL 1101, which is locally known as the Mound House. This site is an archaeologically significant Calusa shell mound. The shell mound was altered first in 1906 with the construction of a home that was enlarged through the years and again in the 1950's with the dredging of canals surrounding the property in order to create the Shell Mound Park subdivision. The most western canal dug to fill the Shell Mound Park subdivision is the east boundary of the Preserve.

ii. Land use History

Prior to 1958, the Preserve was virtually undisturbed by man except for a few foot trails and a jeep trail, seen in the 1944 and 1953 aerials (Figures 7&8). Since 1958, the Matanzas Pass Preserve and the surrounding areas have gone through great changes, as seen in the aerial photo taken in 1958 (Figure 9). Land adjacent to the Matanzas Pass Preserve has been developed with roadways, home sites, a school, and canals visible in the aerials. Mosquito control ditches were excavated in the central and eastern section of the Preserve with a 750 foot unpaved mosquito control service road, visible in the 1958 aerial. These ditches were used frequently in Florida to drain wetlands and reduce mosquito-breeding habitat. Spoil piles were left in place and can be seen as white spots along the ditches in the 1958 aerial.

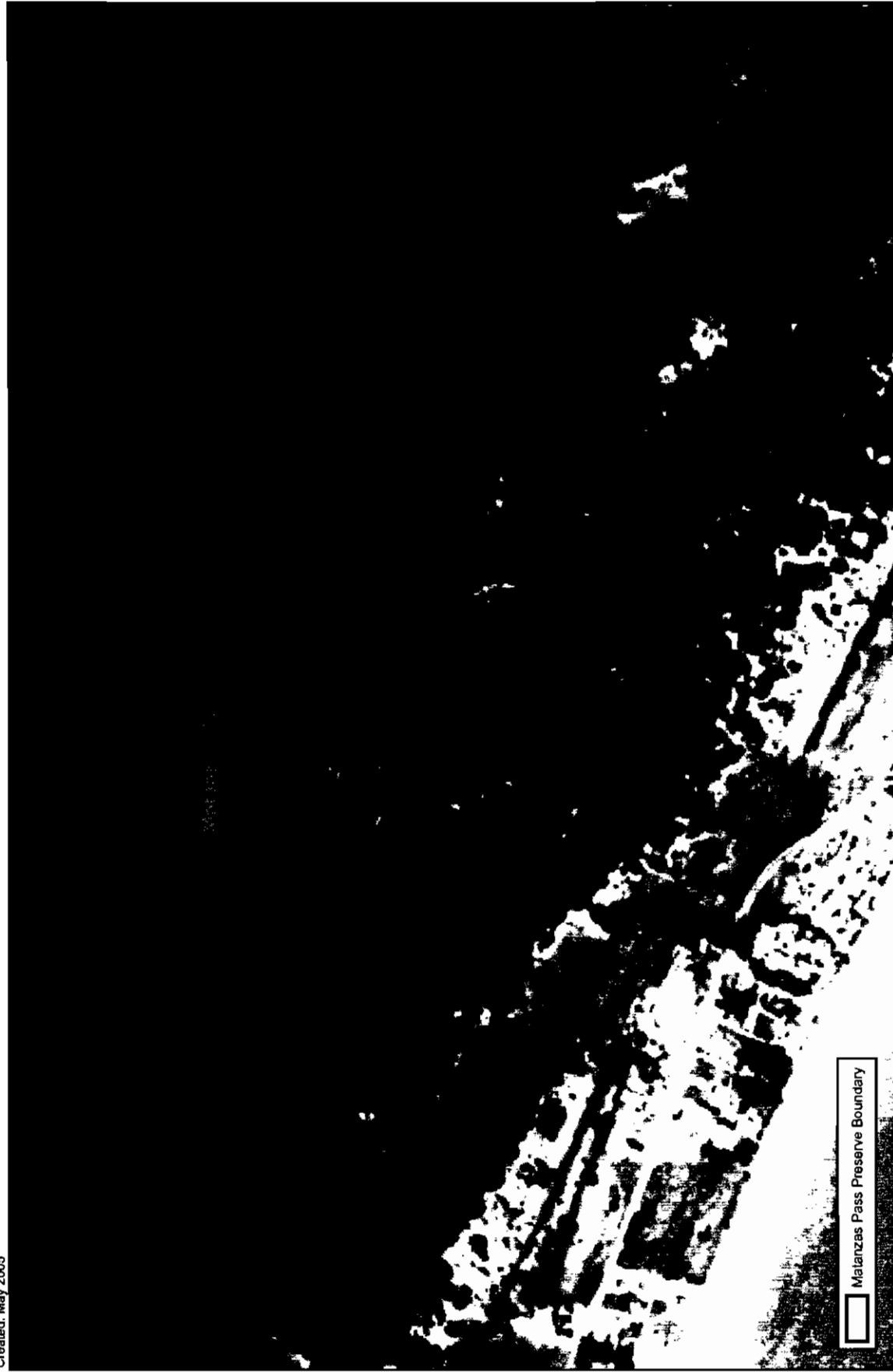
The higher elevations of the spoil piles and the disturbed land made these areas susceptible to invasion by exotic vegetation. In 1996, shortly after Lee County took possession of the Preserve from The Nature Conservancy, control of invasive exotic vegetation began. By removing Brazilian pepper (*Schinus terebinthifolius*) and Australian pines (*Casuarina*

equisetifolia) at the end of Bay Road, an entrance and parking area for the Preserve and Historic Cottage were created.

Lee County Tourist Development Council funding was used to replace and expand an elevated boardwalk and pavilion, which were in dire need of repair, and added a kayak /canoe landing dock. The foot trails are in good condition and have resting benches and trash receptacles placed in quiet areas along the trail.

Figure 7: Matanzas Pass Preserve 1944 Aerial

Created: May 2005



Rec	Flight FIPS	Year	Flight#	Tiled	Latitude	Longitude	County	Quadr Name	Zipcode	Place Name	Township Range
1	12071	1944	3C	13	26.47228	-81.93127	LEE	FORTMYER S BEACH	33908		46S24E

E
NOT TO SCALE

Created by: dcalvert@leegov.com
Source: web.uflib.ufl.edu/digital/collections/FLAP

Figure 8: Matanzas Pass Preserve 1953 Aerial

Created: May 2005



Rec	Flight FIPB	Year	Flight#	Tile#	Latitude	Longitude	County	Quad Name	Zipcode	Place Name
1	12071	1953	3H	95	26.45688	-81.9329	LEE	FORT MYER S BEACH	33908	

E
NOT TO SCALE

Created by: dcalvert@leegov.com
Source: web.uflib.ufl.edu/digital/collections/FLAP

Figure 9: Matanzas Pass Preserve 1958 Aerial



iii. Public Interest

The entrance to Matanzas Pass Preserve is anchored by two cottages. The *We're Here* cottage, which was the fourth home built on Fort Myers Beach in the early 1900's, and a 1950's style cottage. Both are the present day home of the Estero Island Historic Society and host the display information for the Preserve. One block west is the Fort Myers Beach Elementary School and Fort Myers Beach Library. One block north of the Preserve is Bay Oaks Recreation Complex and Town Pool. Two blocks west is the beach and Gulf of Mexico. A grocery store, church, restaurants, homes, offices, and fire station are within walking distance. Florida Gulf Coast University is located thirty minutes away by car.

Florida Gulf Coast University, public and private school groups, private and non-profit organizations use the Preserve as an outdoor classroom due to the close location. Coastal geomorphology and ecology can be experienced at its best in this rare 58-acre area of coastal grassland, mangrove swamp, and maritime hammock on Estero Island.

IV. Factors Influencing Management

A. Natural Trends and Disturbances

Natural trends influencing stewardship include hurricanes, drought, tropical storms, tidal flooding, patterns of wet and dry seasons, bird migration and nesting seasons. Coastal grassland communities depend on occasional saltwater flooding to keep from transforming into a coastal strand community. High intensity wind and long durations of standing salt water from tidal flooding or storm surge effects even salt tolerant plant species by weakening or eventually killing them. Bird nesting and migration will be considered when work is conducted in the Preserve to minimize disturbance to the foraging birds resting, feeding, and raising young.

Significant storms can and have caused damage to the vegetation in the Preserve with mortality and dieback of slash pines, buttonwood, strangler figs, and live oaks. Only the maritime hammock area of the preserve can support heavy equipment to remove large vegetation from the Donora Street access after a storm and this is not recommended. If restoration needs to

take place after a significant storm, plant community and site elevation will be taken into consideration. After flooding, low-lying areas of the Preserve are prone to hold saltwater for a period of time. It is not unusual to have a storm tide wash over a barrier island and no precautions other than the removal of hazard trees needs to be taken.

B. Internal Influences

There are varieties of human influences as mentioned in previous sections of the plan that impact the Matanzas Pass Preserve.

In the past visitors became accustomed to a lack of enforcement of county regulations relating to littering, motorized vehicles, camping, biking, and walking pets. The following will help to explain these issues further and specify stewardship measures to reduce or eliminate these problems.

Several mosquito ditches are located in the central and east-southeast portion of the Preserve. The associated berms and mounds have had invasive exotics plants on them in the past and will need continued monitoring and treatment. When applying any chemicals for invasive exotic plant removal Land Stewardship Staff will follow the procedures described in the Land Stewardship Operations Manual. (see management action plan Table 2, units 1, 2, 3, 4)

The coastal grassland community, in the southeast section, has had a great deal of human disturbance from dumping and motorized vehicles. There is also scattered trash spread in portions of this area. Much of the trash washed up during storms, but most is from visitors and neighbors of the Preserve. This area was the target area for exotic removal in 1995 and is part of the restoration area.

Since staff has been hired, organized trash removal is a goal with volunteers and the Friends group. This problem will continue to decrease over time as the trash is regularly picked up.

(management action plan, Table 2, Units 1, 2, 3, 4).

A live aboard boating community anchors just off shore and a heavily used boating channel is adjacent to the Preserve. Continual clean up of debris that washes up on the shore, including containers of cleaning solutions, oil, and paint, collected before the pollutants leak into the waters will improve water quality (see management action plan, Table 2, Units 1-4).

Fishing is allowed at the Matanzas Pass Preserve, which could lead to a problem with monofilament line litter. Monofilament line can cause injury and death to birds and other wildlife when tangled or ingested. Coordination with the Monofilament Recovery and Recycling Program (<http://fishinglinerecycling.org/>) to organize volunteer clean-up days and set up recycling bins will help alleviate this problem (see management action plan Table 2, Unit 2).

Because the Preserve is in a secluded area, enforcing the regulations that apply to all county parks and preserves has been difficult. It will take time for visitors to the Preserve to learn that these and other practices will no longer be tolerated and that there will be a regular staff presence to enforce these regulations.

Visits by the Lee County Park Rangers staff, Lee County Maintenance staff, Lee County Parks and Recreation staff, and the Lee County Sheriffs Office has improved the behavior by visitors in the Preserve.

C. External Influences

There are forty-four existing single-family residences and two mobile home/recreational vehicle parks that directly abut the south-southeast and south-southwest property boundaries. These are the sources of two major problems.

First, illegal dumping of both garbage and vegetation waste into the Preserve has littered the area and continues to occur on some boundaries. Second, there exist structural encroachments, which include a fence and tool sheds. The Preserve has been used as a campsite by vagrants and for illicit activities such as drug and alcohol use. The level of this type of use has decreased greatly. Problems prevalent today are the use of motorized vehicles (mopeds and scooters) and bicycles, vandalism to the boardwalk and pavilion, and littering throughout the area.

The mobile home communities and residential homes to the south and southeast section of the Preserve are possible areas for horticultural dumping and encroachment concerns. The situation should be monitored and if necessary, the use of signage and presentations/public workshops incorporating “When Nature is your Neighbor” and “Florida Yards and

Neighborhoods” will be used to alleviate any problems. (see management action plan, Table 2, Unit 3).

D. Legal Obligations and Constraint

i. Permitting and Mitigation Issues

Because the Preserve is comprised mainly of wetland plant communities, should any construction be considered, required permits would need to be obtained from various agencies, including the U. S. Army Corps of Engineers, Florida Department of Environmental Protection and the South Florida Water Management District.

Since the entire area of the Preserve is located within the Coastal High Hazard Area any construction considered will need to take this into consideration. (Appendix C)

Lee County’s Local Mitigation Strategy supports the efforts of the County to purchase environmentally sensitive areas in high hazard flood zones through Conservation 20/20 funds. It also supports natural resource protection activities that preserve or maintain natural areas through restoration and renourishment. The management of this Preserve implements this strategy.

ii. Relationship to Other Plans

The Lee Plan, 2004 Codification, is used as a vision for the future. In the first chapter of the Lee Plan, entitled Lee County – A vision for 2020, the three broad purposes of the plan are listed:

“First of all, certain day-to-day public and private activities within each jurisdiction must be consistent with the goals, objectives, and policies in the adopted plan. Second, the plan is a source of authority for the local government’s land development regulations and for a wide range of official discretionary actions, including, but not limited to, the capital improvement program. Finally, the plan represents the community’s vision of what it will or should look like by the end of the planning horizon.”

The entire Lee Plan is found on the Internet at: <http://www.leecounty.com/dcd1/Leeplan/Leeplan.pdf>. The two chapters of the Lee Plan

that affect the management of the Matanzas Pass Preserve are Chapter V Parks, Recreation and Open Space and Chapter VII Conservation and Coastal Management.

Chapter V, provides that Land Stewardship staff ensure that any public use facilities constructed at the Matanzas Pass Preserve complies with Goal 85: Park Planning and Design. Staff will also work to provide, whenever staffing and funding permit, appropriate environmental programs to the public in order to meet Goal 86: Environmental and Historic Programs.

Under Chapter VII, Goal 107: Resource Protection within Objective 107.1: Environmentally Critical Areas, Lee County Land Stewardship Staff has the responsibility to conserve and enhance the natural functions of environmentally critical lands such as the wetland habitats found at the Matanzas Pass Preserve.

Objective 107.2: Plant Communities, states Lee County will protect, maintain and routinely update an inventory of native plant communities.

Objective 107.3: Wildlife, states that Lee County has a responsibility to maintain and enhance the fish and wildlife diversity for the benefit of a balanced ecological system.

Within Objective 106.1: Coastal High Hazard Area Expenditures, Policy 106.1.1 describes the need to seek approval from the county commission for the use of public funds in a Coastal High Hazard Area, in which the entire Matanzas Pass Preserve is located, for the development of public use facilities.

E. Management Constraints and Coordination

The main constraints to management of the Preserve are funding and staffing. The Matanzas Pass Preserve has received a grant for assistance with exotic plant removal and native plant restoration from The Charlotte Harbor National Estuary Program. The Friends of the Matanzas Pass Preserve wrote and provided the in kind match for this grant. Obtaining funds through grants and other sources will continue.

Coordination with other agencies and adjacent landowners will also be an important part of managing the Preserve. Bowditch Point Regional Preserve

is located 1.5 miles west on Estero Boulevard and staff will coordinate activities that would affect both Preserves when necessary. Environmental education relating to the dynamics of barrier islands would be productive for both preserves.

F. Public Access and Resource Based Recreation

The public has used the Matanzas Pass Preserve for at least 60 years, as evident in the 1944 aerial (Figure 7). For more information on the historic use of the Preserve see the Land Use History section. There is presently no parking fee at Matanzas Pass Preserve due to the lack of facilities and limited parking.

Public use of this Preserve will always need to be monitored and controlled to ensure that it does not interfere with the health of the ecosystem or the wildlife that utilize it. There will be at least one staff person on site that will play a very important role with interacting with the public. Staff will make sure that the public is complying with Lee County Parks and Recreation's rules as well as educating visitors about the Preserve and what makes it such a unique and important area. The environmental education programs offered each year will also be important for educating visitors and instilling respect for the resources while enjoying the Preserve.

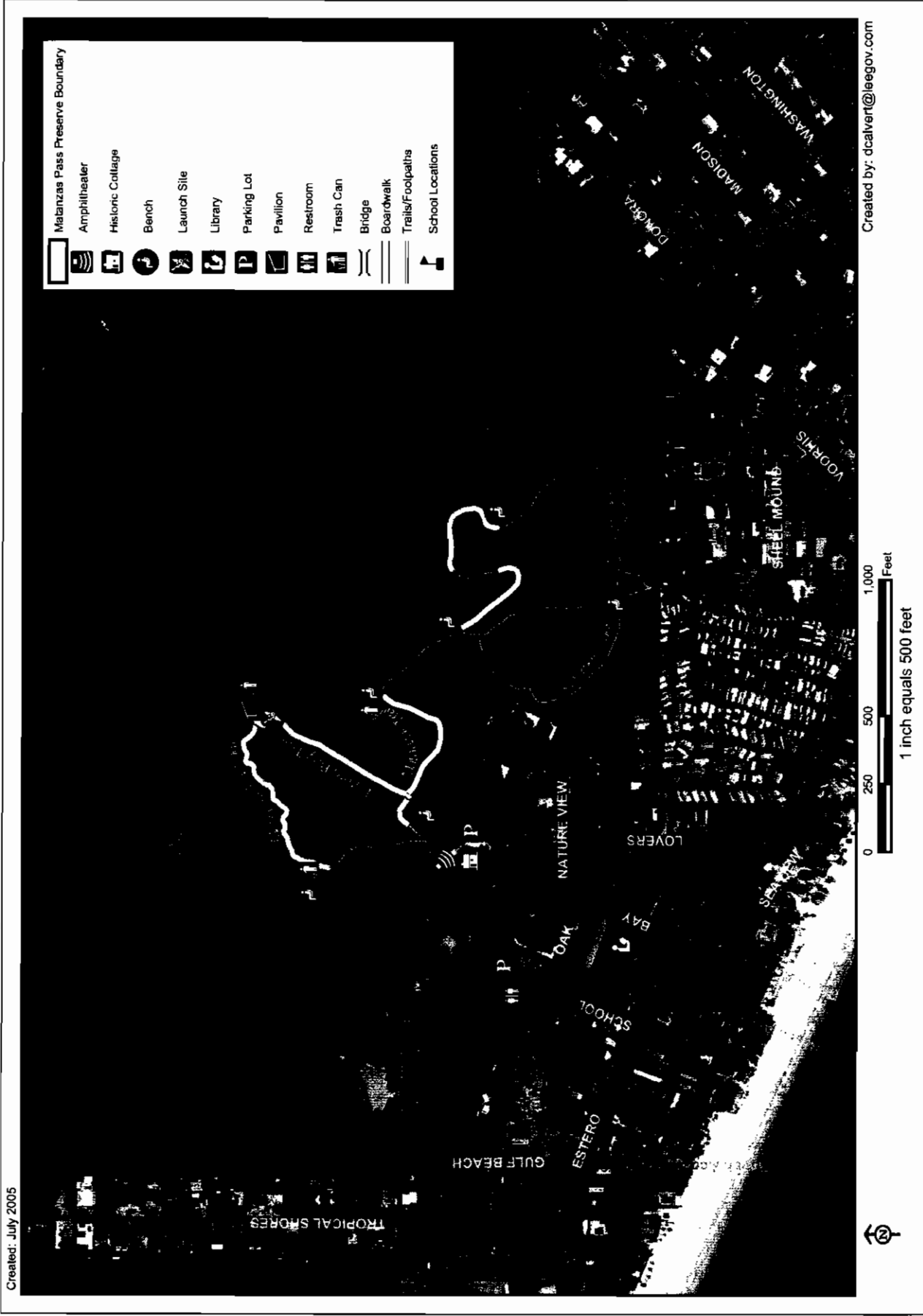
This Preserve is Highlight number 4 on the Estero Bay portion of The Great Calusa Blueway, Lee County's paddling trail that provides an ecological tour of the bays, rivers, backwaters and shorelines of southwest Florida. Information on this canoe trail can be found at www.thegreatcalusablueway.com and a map of the Estero Bay portion of this trail is located in Appendix D.

Existing improvements to the property are the 7,091 feet of trail system that includes 2,986 feet of elevated boardwalk, which meanders down to the pavilion overlooking the bay. The elevated boardwalk, along with the estimated 4,105 feet of foot hiking trails provide an enjoyable hiking area, as well as wildlife viewing, fishing, and photography. The elevated boardwalk includes a landing area for visitors arriving by canoe and kayak (Figure 10).

The Master Site Plan for the Preserve (Figure 10) displays other existing improvements such as the teaching amphitheater, pavilion on the bay, resting areas, and the Historic Cottage.

The challenge of providing a positive experience for visitors, while protecting the fragile ecosystem of the Preserve, will always be a focus for county staff.

Figure 10: Matanzas Pass Preserve Site Plan



G. Future Acquisition

Adjacent lands to the Preserve will be considered for acquisition. Conservation 20/20 nominations number 283 and 284 are adjacent to the preserve and have recently been acquired. This estimated acre of land consists of maritime oak hammock and will be added to management unit 2 goals and strategies.

V. Management Action Plan

A. Management Units

The Matanzas Pass Preserve has been divided into management units to better organize and achieve management goals. Figure 11 delineates the four management units, which were created based on community habitat type, management needs, and restoration required.

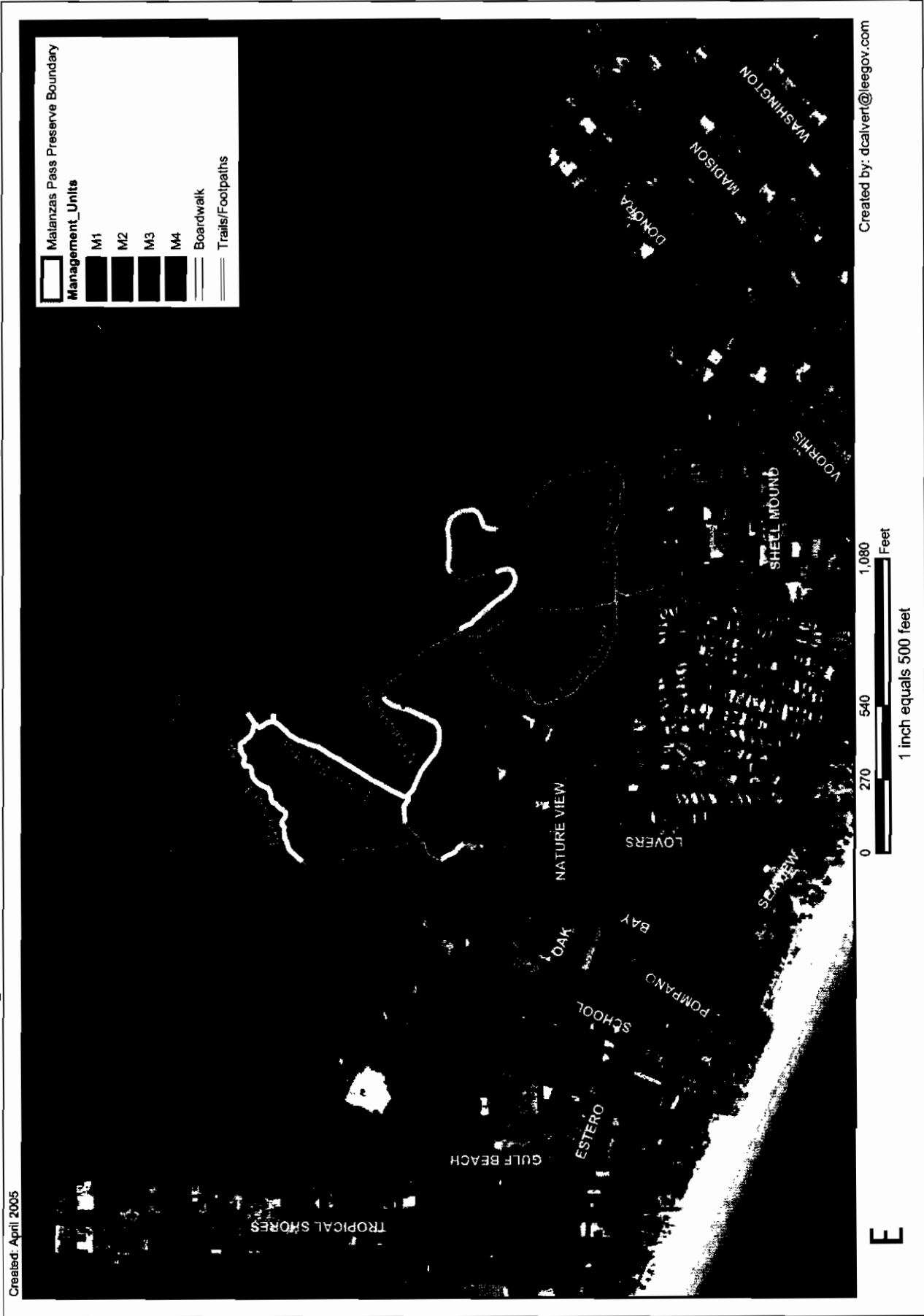
Management unit #1 is 13.14 acres and located in the western portion of the Preserve and consists of a mangrove swamp community which extends north to Matanzas Pass and west to the canal off Tropical Shores Way, east to the elevated boardwalk and south to the boundary lines of a roadway easement belonging to the Town of Fort Myers Beach.

Management unit #2 is the 15.10 acres tract east of the Mangrove Passage boardwalk and extends north to Matanzas Pass, east to a boundary line where the single foot trail ends and splits into three trails, and south to residential home boundaries. It is comprised of maritime hammock and mangrove swamp.

Management unit #3 is 17.04 acres and is located south of unit #2 and consists of coastal grasslands, maritime hammock and mangrove swamp. This area is know as the restoration area and is the target area for exotic pest plant control and future native plant restoration.

Management unit #4 consists of 12.75 acres of the east section of the preserve and is entirely mangrove swamp with east and west boundaries being mosquito ditches, the south property line behind residential homes on Donora Avenue and the north boundary is Matanzas Pass.

Figure 11: Matanzas Pass Preserve Management Units



B. Goals, Strategies and Projected Timetable

The Matanzas Pass Preserve is part of a countywide quarterly site inspection program for all preserves. A copy of the site inspection form is available in the Land Stewardship Operations Manual. The inspection allows staff to monitor any impacts and/or changes to each preserve and includes listing all animal sightings and new plants found. If during these inspections at the Preserve staff finds FNAI listed species, staff will report those findings to FNAI using the appropriate form located in the Land Stewardship Operations Manual.

The Florida Exotic Pest Plant Council's List of Invasive Species (www.fleppc.org) will be consulted in determining the invasive exotic plants to be controlled in every management unit. The invasive exotic plant control will be conducted with the least amount of impact to the preserve possible and with appropriate herbicides (as per the Land Stewardship Operations Manual).

Table 2 outlines the goals, strategies and projected timetable for projects in the Preserve.

A. Goals, Strategies and Projected Timetable for Implementation
 The table below outlines the goals for each management unit and strategies for achieving the goals.

Table 2: Goals, Strategies, Implementation Timetable and standards for success in all Management units in the MPP.

<i>Management units</i>	<i>Goals</i>	<i>Strategies</i>	<i>Projected Timetable for Implementation</i>	<i>Performance Measures</i>
All	1. Develop a self guided walk	Develop a self-guided trail to coincide with markers sensitively placed throughout the trail.	This project may be funded by grants and completed by November 30, 2010.	Placing of markers
	2. Establish photo points to monitor changes	A panoramic view taken from GIS points at designated times of the year.	The photos will be taken annually under similar conditions.	Photos will provide staff with visual documentation of changes in the Preserve
U1 12.99 acres	1. Invasive exotic plant control, keep unit at maintenance level	Monitor and maintain invasive exotic plants on the existing mosquito control ditches with hand clearing methods using appropriate herbicide mix for each exotic plant species.	Ongoing project. Monitor unit one for exotics during quarterly inspections.	All target invasive exotic vegetation treated. Seed sprouts and re-sprouts will be treated annually
	2. West boundary on Tropical Shore Lagoon canal and North boundary along Matanzas Pass kept free of debris	Work with volunteer groups, such as the Friends of Matanzas Pass Preserve, Annual Coastal Clean Up, and Monofilament Madness to keep this area free from debris.	At least four-scheduled debris pick up days annually.	The coastline boundary of U1 kept free from debris
U2 14.99 acres	1. Invasive exotic plant control, keep unit at maintenance level.	Control Brazilian pepper, Australian pine, and air potato, in the southeast area and along spoil piles created from mosquito ditching. Cut stump and foliar applications of appropriate herbicide mix for each exotic plant species and removal of air potato tubers.	Treatment of Brazilian pepper, Australian pines and air potato to be completed by July 30, 2006. This project is funded by a grant from Lee County Visitor & Convention Bureau, Beach and Shoreline Project.	All target invasive exotic vegetation controlled to a 95% level
	2. Planting native plants in restoration area	Appropriate native plants will be selected to re-vegetate the restoration area.	Plantings will be installed by September 30, 2005. This project will be funded by a grant from the Charlotte Harbor National Estuary Program.	Natural recruitment of native plants has occurred and plantings achieved a 90% survival rate.

Table 2: Goals, Strategies, Implementation Timetable and Standards for success for all management Units in the MPP.

Management units	Goals	Strategies	Projected Timetable for Implementation	Performance Measures
U2	<p>3. Contact adjacent neighbors about controlling invasive exotic vegetation.</p> <p>4. Monitor coastal and upland areas, keep free of debris.</p> <p>5. Develop and implementation of environmental education programs.</p>	<p>Work with neighbors to control invasive exotic vegetation that is a seed source to Management Unit 2</p> <p>Target volunteer groups and special events such as Coastal Clean up to aid in debris removal</p> <p>Continue to support guided walks through the preserve</p>	<p>Ongoing project</p> <p>Staff will work with volunteer groups to keep the area clean on a monthly basis or as needed</p> <p>Weekly guided walks through the preserve will be provide by Bay Oaks programming staff and volunteers</p>	<p>Staff will work with appropriate entity to control off-site invasive exotic plant seed source</p> <p>Coastal and upland areas of unit 2 will be kept free of debris</p> <p>Program staff to offer environmental education programs ranging from plant and animal identification to barrier island dynamics will be available to the public</p>
U3 17.09 acres	<p>1. Goals #1, 2, 3, 4, and 5 or Unit 2 also apply to Unit 3.</p> <p>6. Prevent inappropriate use of the preserve</p> <p>7. Prevent dumping and encroachments from adjacent neighbors</p>	<p>Install signs with clearly stated rules and regulation. Implement stepped up surveillance by Lee County Park Rangers, staff at Bay Oaks, and the Lee County Sheriff's department</p> <p>Preserve boundary/no-dumping signage. Maybe required to control encroachments and dumping, such as yard waste. Meeting with neighbors to educate about living next to nature</p>	<p>Replace old and install new signs and increase surveillance by January 30, 2006</p> <p>Ongoing project as neighbors change</p>	<p>Inappropriate behavior in the preserve will be controlled</p> <p>Encroachments and dumping will be prevented</p>

Table 2: Goals, Strategies, Implementation Timetable and standards for success in all management units in the MPP

<p>U4 12.96 acres</p>	<p>1. Invasive exotic plant control, keep unit at maintenance level</p>	<p>Control Australian pine, Brazilian pepper, and air potato along spoil piles created from mosquito ditching. Cut stump and foliar applications of appropriate herbicide mix for each exotic plant species and remove air potato tubers.</p>	<p>On going project</p>	<p>All targeted invasive exotic vegetation controlled to a 95% level</p>
<p>U4</p>	<p>2. Research and create enhancement of trail system</p>	<p>Discover possibilities of extending trail system to include access off of Donora Street for local population.</p>	<p>Staff will determine if this project is possible and can be accomplished by December 30, 2008</p>	<p>If this goal can be accomplished there will be a new trail system with an access off Donora Street for public use</p>

VI. Financial Consideration

A. Funding

Funding sources will be researched and applications will be made for appropriate grants or other sources of funding such as Florida Department of Environmental Protection Bureau of Invasive Plant Management for the exotic control projects.

Project cost and funding sources are listed in Appendix E.

B. Staffing

Maintenance for the Matanzas Pass Preserve is divided into operations and land stewardship; both are located in the Department of Parks and Recreation. The land stewardship section is responsible for the management of all preserves, and consists of a manager, supervisor, coordinators, contracts coordinator, and field technician. A land steward's job consists of conservation and restoration of biological communities, which includes exotic plant removal and monitoring, debris removal, forming contacts with other groups and agencies to share the latest data on similar land management activities, establishing volunteer programs for the sites, protecting water resources, establishing opportunities for multiple uses and compatibility, providing public access and response to public use. Land Stewardship staff from other preserves are available to assist with management from time to time.

Partnerships with the Fort Myers Beach Historic Society, Town of Fort Myers Beach, Fort Myers Beach Elementary School, Florida Gulf Coast University, Lee County Master Gardeners, and the Department of Environmental Protection have created educational opportunities for thousands of people to explore the mangrove and maritime forest of a barrier island, learning the importance of native vegetation and conservation.

VII. Literature Cited

- Florida Natural Areas Inventory and Florida Department of Natural Resources. (1990). Guide to the Natural Communities of Florida. Tallahassee: FNAI & FDNR
- Scodari, Paul F., Wetlands Protection: The Role of Economics (1990). Environmental Law Institute, Washington, D.C.
- Hsu, Yih-Ming, Matanzas Pass Preserve, Restoration Plan, Master Site Plan, Resources Management Plan (1996).unpublished manuscript
- Myers, Ronald & Ewel, John, Ecosystems of Florida (1990). University of Central Florida Press, Orlando
- Charlotte Harbor National Estuary Program, Committing To Our Future, A Comprehensive Conservation and Management Plan for the Greater Charlotte Harbor Watershed (2000).
- Lee County Parks and Recreation Land Stewardship Operations Manual (2003). Unpublished manuscript
- South Florida Ecosystem Restoration Taskforce (1996). South Florida Ecosystem Restoration: Scientific Information Needs Subregion 10. Retrieved 4-16-2003 from <http://everglades.fiu.edu/taskforce/scineeds/sub10.pdf>.
- Henderson, W.G. Jr. 1984. Soil Survey of Lee County, Florida. U.S. Department of Agriculture/Soil Conservation
- Brandt, Karla & Chafin, Linda, Rare, Threatened, and Endangered Species in Forest of Florida (2003)
- Kaufman, Kenn, Birds of North America (2000).Houghton Mifflin Company, New York

Florida Exotic Pest Plant Council [Internet] 2005. Fort Lauderdale, Fl.
List of Florida's Invasive Species; Available from:
<http://www.fleppc.org/05list.htm>

Wunderlin, Richard P. and Hansen, Bruce F. 2003. Guide to the
Vascular Plants of Florida. Second Edition. Gainesville, Florida:
University Press of Florida

Florida Exotic Pest Plant Council [Internet] 2005. Fort Lauderdale, Fl.
List of Florida's Invasive Species; Available from:
<http://www.fleppc.org/05list.htm>

Wunderlin, Richard P. and Hansen, Bruce F. 2003. Guide to the
Vascular Plants of Florida. Second Edition. Gainesville, Florida:
University Press of Florida

Appendices

Appendix A

Plant sightings at Matanzas Pass Preserve

Appendix A: Plant Sightings at Matanzas Pass Preserve

Scientific names for this list were obtained from Wunderlin & Hansen, 2003

Scientific Name	Common Name	Native Status
Family: Surianaceae (BayCedar)		
<i>Suriana maritima</i>	Bay cedar	native
Family: Convolvulaceae (Morning –Glory)		
<i>Ipomoea alba</i>	Moonflower	native
<i>Ipomoea pes-caprae</i>	Railroad Vine	native
<i>Ipomoea sagittata</i>	Saltmarsh Morning Glory	native
Family: Callicarpa		
<i>Callicarpa americana</i>	Beautyberry	native
Family: Rhizophoraceae		
<i>Rhizophora mangle</i>	Red mangrove	native
Family: Avicenniaceae		
<i>Avicennia germinans</i>	Black mangrove	native
Family: Combretaceae		
<i>Laguncularia racemosa</i>	White mangrove	native
<i>Conocarpus erectus</i>	Buttonwood	native
Family: Lentibulariaceae		
<i>Utricularia amethystina</i>	.Bladderwort	native
Family: Rhamnaceae		
<i>Rhamnus caroliniana</i>	Buckthorn	native
Family: Fabaceae		
<i>Pithecellobium unguis-cati</i>	Catclaw Blackbead	native
<i>Sophora tomentosa</i>	Necklacepod	native
<i>Dalbergia ecastophyllum</i>	Coinvine	native
<i>Caesalpinia bonduc</i>	Nickerbean	native
<i>Abrus precatorius</i>	Rosary pea	exotic
Family: Zamiaceae		
<i>Zamia intergrifolia</i>	Coontie	native
Family: Poaceae		
<i>Dactyloctenium aegyptium</i>	Crowfoot grass	native
<i>Spartina bakeri</i>	Sand cord grass	native
<i>Panicum maximum</i>	Guineagrass	exotic
Family: Ruppiceae		
<i>Sansevieria hyacinthoides</i>	Bowstring hemp	exotic
Family: Anacardiaceae		
<i>Schinus terebinthifolius</i>	Brazilian pepper	exotic
<i>Toxicodendron radicans</i>	Eastern poison ivy	native
Family: Asteraceae		
<i>Eupatorium capillifolium</i>	Dogfennel	native
<i>Ambrosia artemisiifolia</i>	Common ragweed	native
<i>Borrchia frutescens</i>	Seaside oxeye	native
<i>Pluchea camphorata</i>	Camphorweed	native
<i>Solidago sempervirens</i>	Seaside goldenrod	native
<i>Baccharis angustifolia</i>	Saltwater falsewillow	native
<i>Bidens bipinnata</i>	Spanish needle	native
Family: Anacardiaceae		
<i>Salicornia bigelovii</i>	Glasswort	native
Family: Bataceae		
<i>Batis maritima</i>	Saltwort	native

Appendix A: Plant Sightings at Matanzas Pass Preserve (continued)

Scientific Name	Common Name	Native Status
Family: Fagaceae		
<i>Quercus virginiana</i>	Live oak	native
Family: Burseraceae		
<i>Bursera simaruba</i>	Gumbo limbo	native
Family: Cactaceae		
<i>Opuntia humifusa</i>	Prickly pear cactus	native
Family: Apocynaceae		
<i>Asclepias tuberosa</i>	Milkweed	native
Family: Annonaceae		
<i>Toxicodendron radicans</i>	Poison ivy	native
Family: Phytolaccaceae (pokeweed)		
<i>Rivina humilis</i>	Rouge-plant	native
Family: Polypodiaceae (polypody)		
<i>Phlebodium aureum</i>	Golden polypody	native
Family: Pteridaceae		
<i>Acrostichum danaeifolium</i>	Giant leather fern	native
Family: Vittariaceae		
<i>Vittaria lineata</i>	Shoestring fern	native
Family: Pinaceae		
<i>Pinus elliottii</i>	Slash pine	native
Family: Arecaceae (palm)		
<i>Sabal palmetto</i>	Cabbage palm	native
<i>Serenoa repens</i>	Saw palmetto	native
Family: Agavaceae		
<i>Yucca aloifolia</i>	Spanish bayonet	native
Family: Bromeliaceae		
<i>Tillandsia flexuosa</i>	Twisted airplant	native
<i>Tillandsia recurvata</i>	Ball moss	native
<i>Tillandsia usneoides</i>	Spanish moss	native
Family: Musaceae		
<i>Musa acuminata</i>	Dwarf banana	exotic
Family: Orchidaceae		
<i>Encyclia tampenisi</i>	Florida butterfly orchid	native
Family: Moraceae		
<i>Ficus aurea</i>	Strangler fig	native
Family: Polygonaceae		
<i>Coccoloba uvifera</i>	Seagrape	native
Family: Rubiaceae		
<i>Psychotria nervosa</i>	Wild coffee	native
<i>Randia aculeata</i>	White indigoberry	native
Family: Sapindaceae		
<i>Cupaniopsos anacardioides</i>	Carrotwood	exotic
Family: Solanaceae		
<i>Lycium carolinianum</i>	Christmasberry	native
Family: Vitaceae		
<i>Parthenocissus quinquefolia</i>	Virginia creeper	native
Family: Myricaceae		
<i>Myrica cerifera</i>	Wax myrtle; southern bayberry	native

Appendix A: Plant Sightings at Matanzas Pass Preserve (continued)

Scientific Name	Common Name	Native Status
<i>Family: Myrtaceae</i>		
<i>Eugenia axillaris</i>	White stopper	native
<i>Eugenia uniflora</i>	Surinam cherry	exotic
<i>Family: Theophrastaceae</i>		
<i>Jacquinia keyensis</i>	Joewood	native
<i>Family: Malvaceae</i>		
<i>Gossypium hirsutum</i>	Wild cotton	native

Appendix B

Wildlife Sightings at Matanzas Pass Preserve

Appendix B: Wildlife Sightings at Matanzas Pass Preserve

Scientific Name	Common Name	Designated Status		Occurrence
		FWC	USFWS	
Crustaceans				
<i>Family: Grapsidae</i>				
<i>Aratus pisoni</i>	Mangrove tree crab			confirmed
Butterflies				
<i>Family: Pieridae (whites and sulphurs)</i>				
<i>Ascia monuste</i>	Great southern white			confirmed
<i>Phoebis philea</i>	Orange –barred sulpher			confirmed
<i>Family: Danaidae</i>				
<i>Danaus plexippus</i>	Monarch			confirmed
<i>Family: Nymphalidae</i>				
<i>Junonia coenia</i>	Buckeye			confirmed
<i>Agraulis vanille</i>	Gulf fritillary			confirmed
Reptiles				
<i>Family: Alligatoridae</i>				
<i>Alligator mississippiensis</i>	American alligator	SSC	T	confirmed
<i>Family: Colubrids</i>				
<i>Elaphe obsoleta quadrivittata</i>	Yellow rat snake			confirmed
<i>Nerodia clarkii compressicauda</i>	Mangrove water snake			confirmed
<i>Coluber constrictor priapus</i>	Southern black racer			confirmed
<i>Family: Emydidae</i>				
<i>Terrapene carolina bauri</i>	Florida box turtle			
<i>Family: Testudinids</i>				
<i>Gopherus polyphemus</i>	Gopher tortoise	SSC		confirmed
<i>Family: Polychridae</i>				
<i>Anolis sagrei</i>	Brown anole			confirmed
<i>Family: Scincids</i>				
<i>Eumeces fasciatus</i>	Five lined skink			confirmed
Birds				
Brown pelican	<i>Pelecanus occidentalis</i>	SSC		confirmed
Blue jay	<i>Cyanocitta cristata</i>			confirmed
<i>Family: Ardeidae</i>				
<i>Ardea alba</i>	Great egret			confirmed
<i>Ardea herodias</i>	Great blue heron			confirmed
<i>Bubulcus ibis</i>	Cattle egret			confirmed
<i>Butorides virescens</i>	Green heron			confirmed
<i>Egretta caerulea</i>	Little blue heron	SSC		confirmed
<i>Egretta thula</i>	Snowy egret	SSC		confirmed

Appendix B: Wildlife Sightings at Matanzas Pass Preserve

Scientific Name	Common Name	Designated Status		Occurrence
		FWC	USFWS	
Family: Ardeidae-continued				
<i>Egretta tricolor</i>	Tricolored heron	SSC		confirmed
<i>Nycticorax nycticorax</i>	Black-crowned night heron			confirmed
<i>Egretta rufescens</i>	Reddish egret	SSC		confirmed
<i>Nyctanassa violacea</i>	Yellow-crowned night heron			confirmed
Family: Threskiornithidae				
<i>Platalea ajaja</i>	Roseate spoonbill	SSC		expected
<i>Eudocimus albus</i>	White ibis	SSC		confirmed
<i>Plegadis falcinellus</i>	Glossy ibis			expected
Family: Cathartidae				
<i>Coragyps atratus</i>	Black vulture			expected
<i>Cathartes aura</i>	Turkey vulture			confirmed
Family: Accipitridae				
Subfamily: Buteoninae				
<i>Buteo lineatus</i>	Red-shoulder hawk			confirmed
<i>Haliaeetus leucocephalus</i>	Bald eagle	T	T	expected
Family: Pandionidae				
<i>Pandion haliaetus</i>	Osprey			confirmed
Family: Falconidae				
<i>Falco sparverius</i>	American Kestrel			expected
Family: Columbidae				
<i>Zenaida macroura</i>	Mourning dove			confirmed
Family: Picidae				
<i>Picoides pubescens</i>	Downy woodpecker			confirmed
<i>Dryocopus pileatus</i>	Pileated woodpecker			confirmed
<i>Melanerpes carolinus</i>	Red-bellied woodpecker			expected
Family: Sylviidae				
Subfamily: Polioptilinae				
<i>Polioptila caerulea</i>	Blue-grey gnatcatcher			confirmed
Family: Mimidae				
<i>Dumetella carolinensis</i>	Grey catbird			confirmed
<i>Mimus polyglottos</i>	Northern mockingbird			expected
Family: Corvidae				
<i>Corvus brachyrhynchos</i>	American crow			expected
<i>Corvus ossifragus</i>	Fish crow			expected
<i>Cyanocitta cristata</i>	Blue jay			confirmed
Family: Laniidae				
<i>Lanius ludovicianus</i>	Loggerhead shrike			confirmed
Family: Cardinalidae				
<i>Cardinalis cardinalis</i>	Northern cardinal			confirmed

Appendix B: Wildlife Sightings at Matanzas Pass Preserve

Scientific Name	Common Name	Designated Status		Occurrence
		FWC	USFWS	
Family: Strigidae				
<i>Bubo virginianus</i>	Great horned owl			confirmed
Family: Icteridae				
<i>Agelaius phoeniceus</i>	Red-winged blackbird			confirmed
Mammals				
Family: Trichechidae				
<i>Trichechus manatus latirostris</i>	Florida manatee	E	E	confirmed
Family: Didelphidae				
<i>Didelphis virginiana</i>	Opossum			confirmed
Family: Procyonidae				
<i>Procyon lotor</i>	Raccoon			confirmed
Family: Sciuridae				
<i>Sciurus carolinensis</i>	Gray squirrel			confirmed
Family: Leporidae				
<i>Sylvilagus palustris</i>	Marsh rabbit			confirmed
Family: Mustelidae				
<i>Lutra canadensis</i>	River otter			confirmed

Key

FWC: Florida Fish & Wildlife Conservation Commission

USFWS: U.S. Fish and Wildlife Service

SSC: Species of Special Concern

T: Threatened

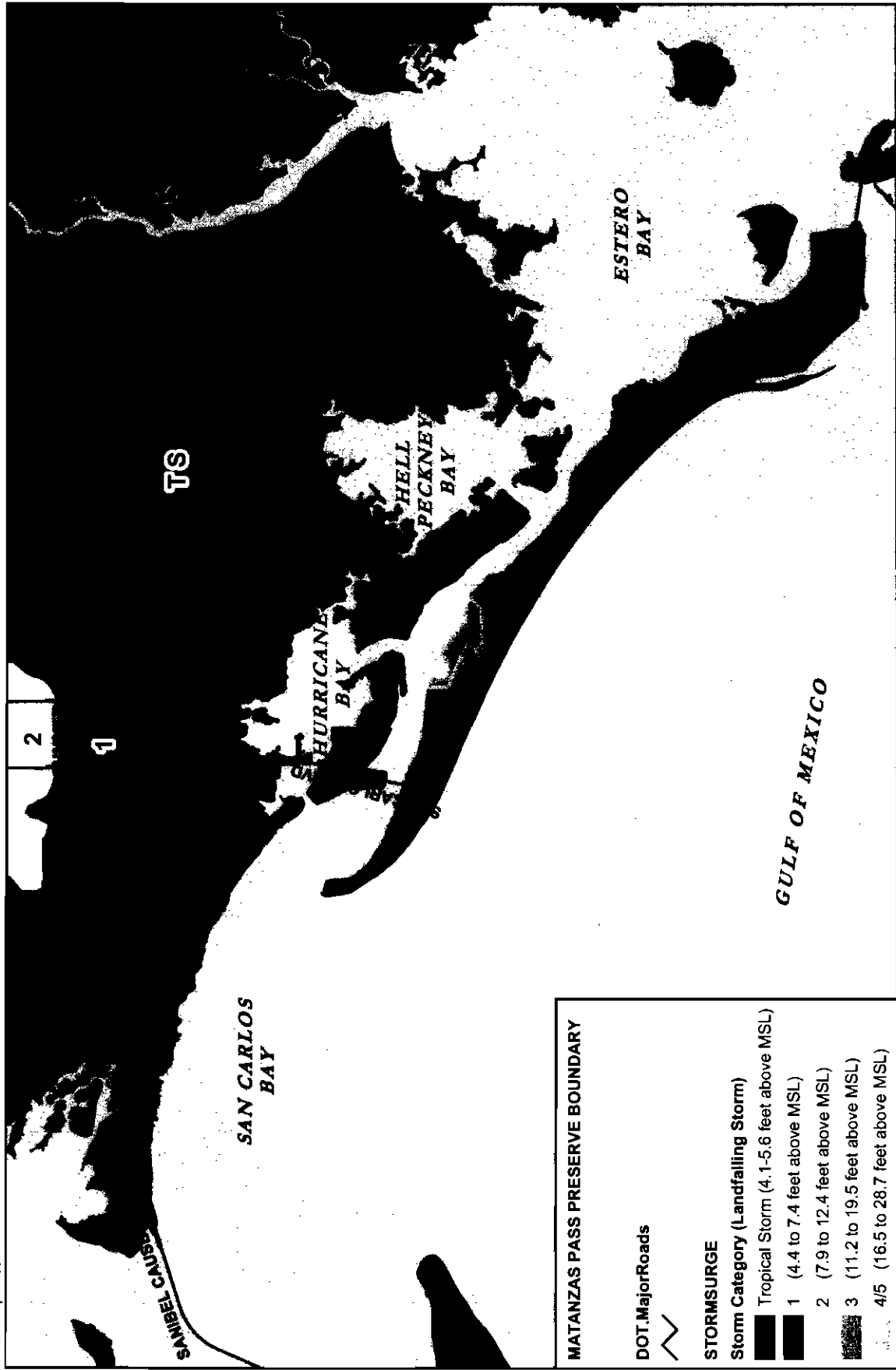
E: Endangered

Appendix C

Strom surge-Coastal High Hazard

Storm Surge-Coastal High Hazard

Created: April 2005



MATANZAS PASS PRESERVE BOUNDARY

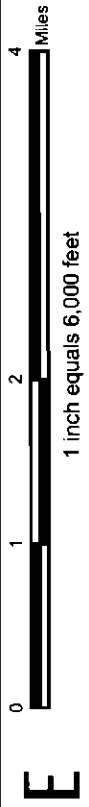
DOT Major Roads

STORMSURGE

Storm Category (Landfalling Storm)

- Tropical Storm (4.1-5.6 feet above MSL)
- 1 (4.4 to 7.4 feet above MSL)
- 2 (7.9 to 12.4 feet above MSL)
- 3 (11.2 to 19.5 feet above MSL)
- 4/5 (16.5 to 28.7 feet above MSL)

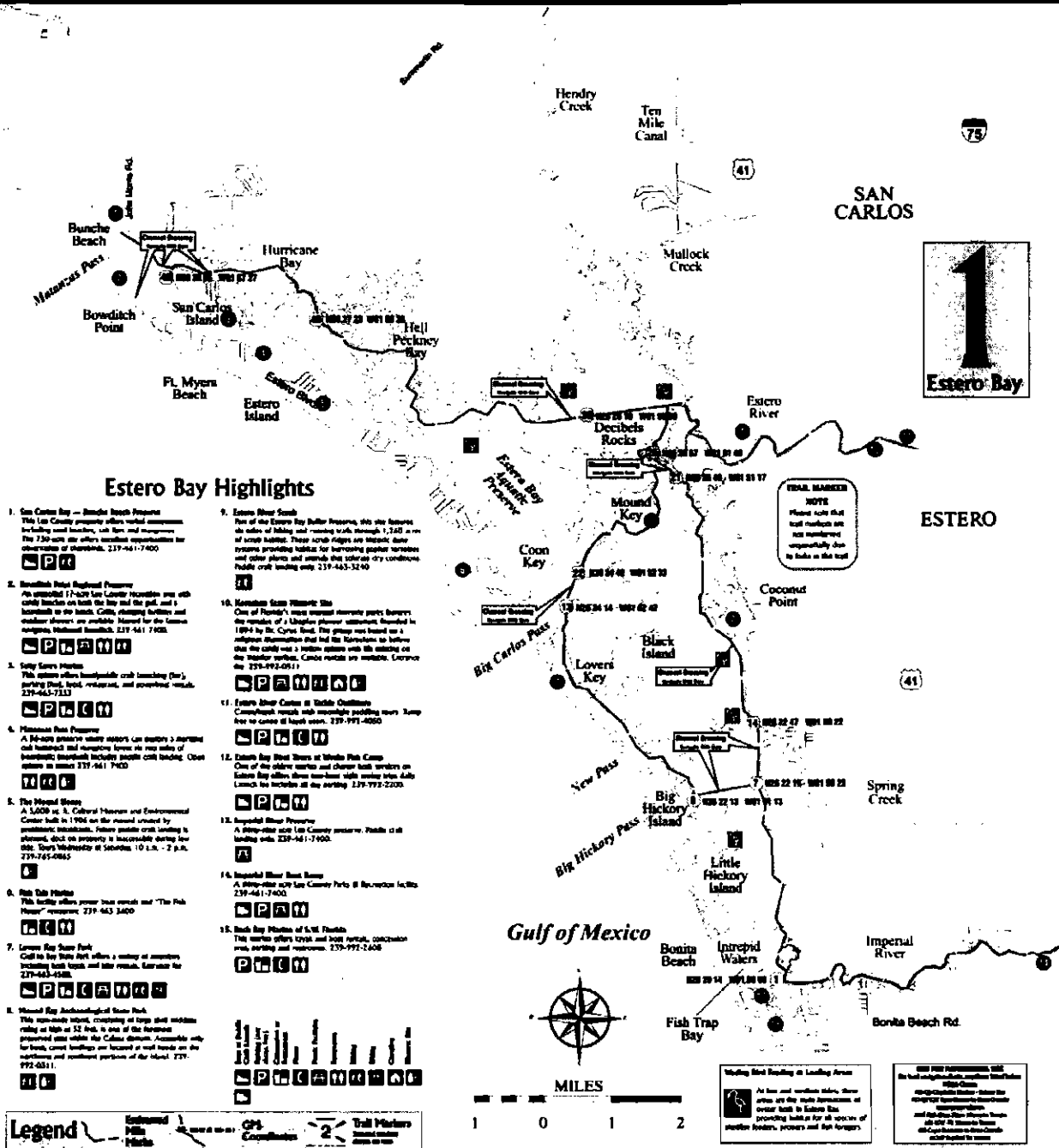
Created by: dcalvert@leegov.com



Appendix D

The Great Calusa Blueway Map

The Great Calusa Blineway • Estero Bay



Estero Bay Highlights

- San Carlos Bay - Boulder Beach Preserve**
This Lee County preserve offers world-class swimming, fishing and boating, all free and chargeless. The 130-acre site offers excellent opportunities for observation of shorebirds. 237-641-7400
[P] [R] [A]
- San Carlos Bay - Boulder Beach Preserve**
An unspoiled 17-acre Lee County Recreation area with canoe launch on both the bay and the gulf, and a boardwalk to the beach. Caffe, changing facilities and outdoor shower are available. Housed for the Lee County, Mullock Beach. 237-641-7400
[P] [R] [A]
- Sally Savers Marina**
This marina offers beautiful crab boat fishing (see), parking, fuel, food, restaurant, and overnight moorings. 237-641-7113
[P] [R] [A]
- Mound Key Preserve**
A 34-acre preserve where visitors can explore a natural oak hammock and mangrove forest via way-side of boardwalk. Boardwalk facility boasts crab boat launch. Open season is sunset. 237-641-7400
[P] [R] [A]
- The Mound Key**
A 1,600 sq. ft. Cultural Museum and Environmental Center built in 1906 on the mound created by post-hurricane sandbars. Future plans include building a museum, dock on property is inaccessible during low tide. Tours Wednesday at 10 a.m. - 2 p.m. 237-641-0845
[A]
- Big Fish Marina**
This facility offers power boat launch and "The Fish House" restaurant. 237-643-3400
[P] [R] [A]
- Lovers Key State Park**
Call to Bay State Park offers a variety of activities including boat tours and water rentals. Entrance fee 237-643-0588.
[P] [R] [A]
- Mound Key Archaeological State Park**
This prehistoric island, consisting of large sand mounds rising to high of 55 feet, is one of the best preserved sites within the Calusa domain. Accessible only for boat, canoe landings are located at west ends on the northern and southern portions of the island. 237-643-0511.
[P] [R] [A]
- Estero River South**
Part of the Estero Bay Baiter Preserve, this site features six miles of hiking and viewing trails through 1,200 acres of scrub habitat. These scrub ridges are historic baiter systems providing habitat for increasing migrant terns and other plants and animals that tolerate dry conditions. Public crab landing only. 237-643-3240
[P] [R] [A]
- Mound Key Historic Site**
One of Florida's most unusual historic parks features the remains of a unique pioneer settlement founded in 1894 by Dr. Carter Bond. The group was based on a religious determination that led the Mound Key to believe that the only way a system system with its existing on the island surface. Canteen and ice machine. Entrance fee 237-643-0511
[P] [R] [A]
- Estero River Center at Table Outcrops**
Cape Coral's newest park with beautiful walking trails. There are no canoe or boat launch. 237-643-0500
[P] [R] [A]
- Estero Bay Boat Tours at Table Outcrops**
One of the oldest marinas and charter boat operators on Estero Bay offers three-hour sight seeing tours. A fee launch fee includes all day sailing. 237-643-2200
[P] [R] [A]
- San Carlos Bay Preserve**
A 100-acre Lee County preserve. Health club and boat launch only. 237-641-7400.
[P] [R] [A]
- San Carlos Bay Boat Tours**
A 100-acre Lee County Park at Recreation in, 237-641-7400.
[P] [R] [A]
- San Carlos Bay Marina of S.W. Florida**
This marina offers kayak and boat rental, concession stand, parking and restaurant. 237-643-2408
[P] [R] [A]

REAL MARRIAGE
NOTE
Please note that trail markings are not maintained infrequently due to high water in the bay.

Working Bird Banding at Landing Area
At low and middle tides, there are up to 100 birds banded at our band in Estero Bay providing habitat for all species of waterfowl, plovers and fish foragers.

San Carlos Bay Preserve, 2002
The Lee County Preserve, 2002
San Carlos Bay Preserve, 2002
San Carlos Bay Preserve, 2002
San Carlos Bay Preserve, 2002
San Carlos Bay Preserve, 2002
San Carlos Bay Preserve, 2002
San Carlos Bay Preserve, 2002
San Carlos Bay Preserve, 2002
San Carlos Bay Preserve, 2002
San Carlos Bay Preserve, 2002

Legend

- Submerged Hills
- Trail Markers
- GPS Coordinates

Appendix E

Projected Cost and Funding Sources Table

Projected Cost and Funding Sources Table

Structures and Improvements

Item	Possible Funding source	Estimated cost
Trail improvement	Tourist Development	\$ 4,000.00
Picnic tables	Council (TDC) and or	\$ 800.00
Boundary markers	Program (FERDAP)	\$ 1,000.00
Fencing installed	Grants	\$ 8,000.00
New foot trails		\$ 1,000.00
		\$14,800.00

Resource Enhancement & Protection

Item	Possible Funding Source	Estimated Cost
Invasive Exotic Plant Removal	Lee County Visitor & Convention Bureau (VCB)	\$25,000.00
Native Planting	Charlotte Harbor National Estuary Program	\$40,500.00
		\$65,000.00

Education Programs

Item	Possible Funding	Estimated Cost
Information Kiosk and Educational markers	Lee County Parks and Recreation	\$20,000.00
Education Program Material including trail guides		\$ 5,000.00
		\$25,000.00

Total Cost Estimate

Site Management & Maintenance

Item	Possible Funding Sources	Estimated Cost
Exotic Plant Control	VCB	\$ 6,000.00 per year
Trail Maintenance	Lee County Parks and Recreation	\$ 5,000.00 per year
Upkeep		\$ 3,000.00 per year
Staff	Tourist Development Council (TDC)	\$40,000.00 - \$60,000.00 per year
		\$54,000.00-\$74,000.00