

# **LEMON BAY**

## **AQUATIC PRESERVE MANAGEMENT PLAN**



**1992**

**DEPARTMENT OF NATURAL RESOURCES**

LEMON BAY  
AQUATIC PRESERVE MANAGEMENT PLAN  
(CABINET DRAFT)  
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Division of State Lands

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## EXECUTIVE SUMMARY

The Lemon Bay Aquatic Preserve, located in Charlotte and Sarasota Counties, consists of approximately 7,667 acres of pristine submerged lands surrounded by a rapidly urbanizing basin.

Lemon Bay was designated an aquatic preserve by the Florida Legislature in July 1986. This area was established for the primary purpose of preserving the biological resources of endangered fringing mangroves and mangrove islands with clam beds, oyster bars, salt marsh and other habitats. The preserve is important in protecting critical habitat for an extensive array of fish, birds and other wildlife. Maintaining the continued health of the preserve will involve minimizing water pollution, from both point and non-point sources and losses of wetlands resulting from urban, residential and commercial development in the region.

The major objective of the Aquatic Preserve Program is to ensure the maintenance and restoration of essentially natural conditions. Management will also be directed to ensure public recreational opportunities which do not conflict with continued propagation of fish, bird, and other wildlife resources.

The Lemon Bay Aquatic Preserve is a resource at the crossroads. The future of the estuary depends upon the management decisions and actions taken in the present and immediate future. Only a full on-site staffing of the preserve with a full and complete implementation of aquatic preserve management rules and procedures, and programs in coordination with other concerned and involved agencies and entities, can assure that the Lemon Bay Aquatic Preserve will retain or improve its biological values and functions. Meeting this objective will require a fully implemented management program with the creation of a field staff presence for this aquatic preserve which integrates with the resource management, resource protection, education and research programs of the Southwest Florida Aquatic Preserves.

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Copies of the legal description of the Lemon Bay Aquatic Preserve as well as copies of Chapter 253 and 258, F.S., and Chapter 18-21, F.A.C., may be obtained from:

Department of Natural Resources  
Bureau of Submerged Lands and Preserves  
3900 Commonwealth Boulevard  
Mail Station 125  
Tallahassee, FL. 32399-3000

## CHAPTER I

### INTRODUCTION

#### A. THE LEMON BAY AQUATIC PRESERVE

The Lemon Bay Aquatic Preserve is a unique, submerged ecosystem of mangrove, seagrass and oyster biological communities. It is located in southwest Florida in Charlotte and Sarasota Counties. The bay is a long narrow estuarine system, running from just south of Placida north almost to Venice. It is about 13 miles long and averages 3/4 of a mile wide. The width varies from 1/8 mile to 1.2 miles in places. Figure 1 is a map of the Lemon Bay Aquatic Preserve.

Lemon Bay is separated from the Gulf of Mexico by two barrier islands. Little Gasparilla, Bocilla and Knight Islands make up the barrier island complex along the southern third of the bay. Manasota Key stretches along the northern two thirds of the bay's length.

The Lemon Bay Aquatic Preserve includes the sovereignty (state owned), submerged lands found at or below the mean high water line (the high tide line) of Lemon Bay. It also includes the sovereignty, submerged lands of the lower reaches of several creeks draining into the bay from the east. It does not include lands above the mean high water line (MHWL) or submerged lands for which the titles have been transferred to private ownership.

In July 1986, the Florida Legislature designated the bay as the Lemon Bay Aquatic Preserve because of the uniqueness and relative good health of it's natural resources. The designation was accomplished largely through the support of a concerned local citizenry.

The purpose of designating Lemon Bay as an aquatic preserve is to: preserve marine and estuarine areas in an essentially natural or restored condition so that the aesthetic, biologic and scientific values shall endure for the enjoyment of present and future generations.

Waters of the preserve are also classified as Outstanding Florida Waters (OFWs) by the Florida Department of Environmental Regulation (DER). Originally, the Environmental Regulation Commission voted unanimously on April 29, 1986 to designate portions of the Lemon Bay Aquatic Preserve OFWs. Two years later, in April 1988, the OFW designation was expanded to include all waters within the aquatic preserve boundary.

The regulatory significance of the OFW designation is that it limits the types of discharges DER is allowed to issue permits for to these waters. For example,



permits cannot be issued for either direct or indirect discharges which would degrade the water quality. As an example, because new dredging and filling activities significantly degrade water quality, permits for these activities must be shown to be clearly in the public interest before they can be approved by DER.

## **B. THE AQUATIC PRESERVE PROGRAM**

The Lemon Bay Aquatic Preserve is one of 42 officially designated preserves located around Florida as part of the statewide aquatic preserve system. Figure 2 shows the locations of the aquatic preserves.

The program was created in 1975 by the state legislature under the Florida Aquatic Preserves Act. The intent of the act is to set aside forever state-owned submerged lands with exceptional biological, aesthetic and scientific values as aquatic preserves or sanctuaries for the benefit of future generations.

## **C. THE MANAGEMENT PLAN PURPOSE AND PROCESS**

The management plan that follows is a guide for managing Lemon Bay Aquatic Preserve and protecting its natural resources. It is intended to be used by the preserve managers and other agency and private groups involved with maintaining the natural integrity of the preserve.

The plan includes scientific information about the existing conditions in the preserve along with the management strategies developed from the data. As more information is obtained about the preserve over time, the management strategies will be revised and improved.

The process for developing this management plan started with collecting an inventory of resource information from both field surveys and from previously collected, reliable data. Other agencies and groups involved with resource management and planning in the area were called on to help identify resource problems and management issues affecting the present and future uses of the preserve and its adjacent areas. Then the policies included in this plan were developed to ensure that the submerged land resources of Lemon Bay remain for future generations to enjoy. The policies are consistent with statutory authority and the statutory intent of the Aquatic Preserve Program.

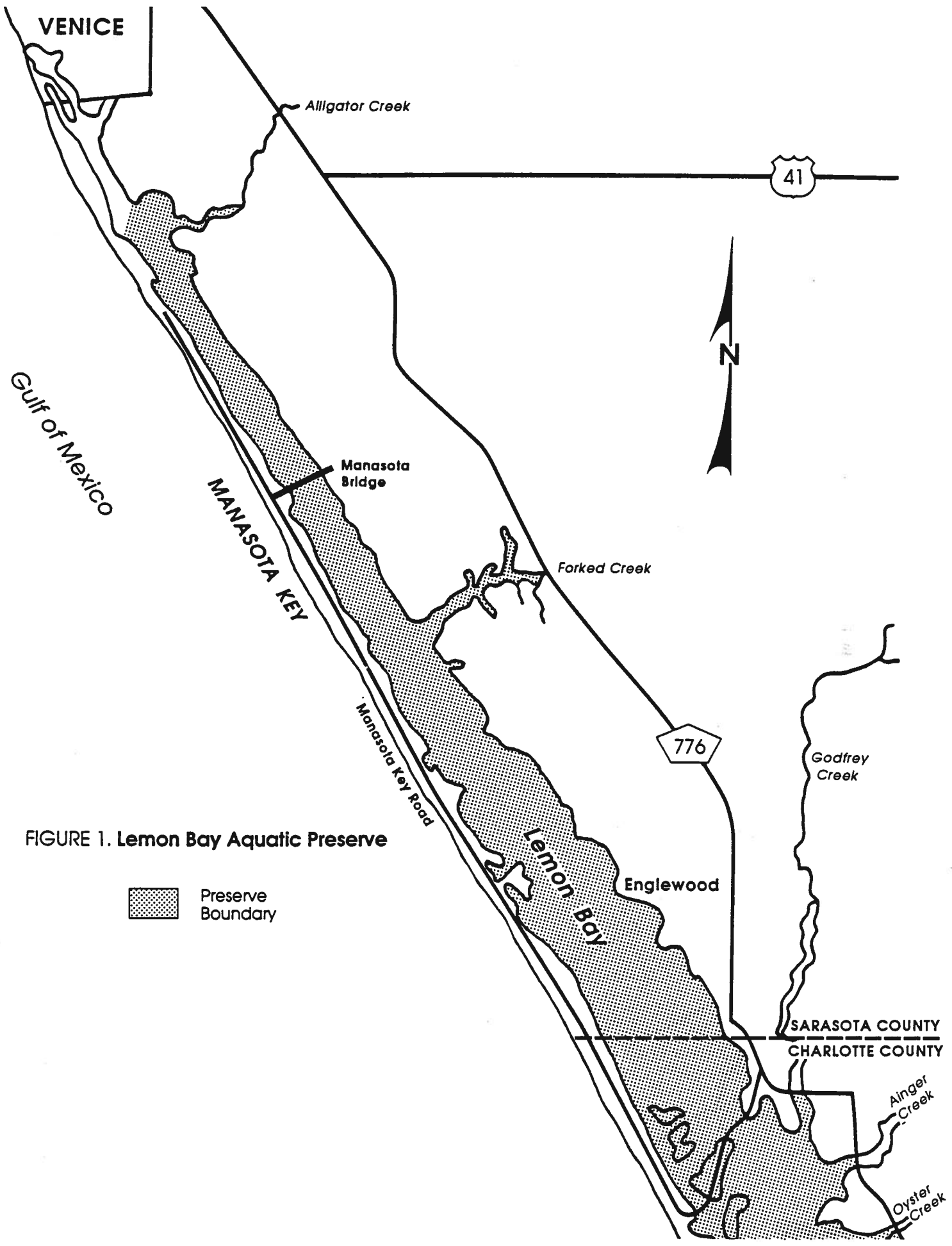


FIGURE 1. Lemon Bay Aquatic Preserve


 Preserve Boundary

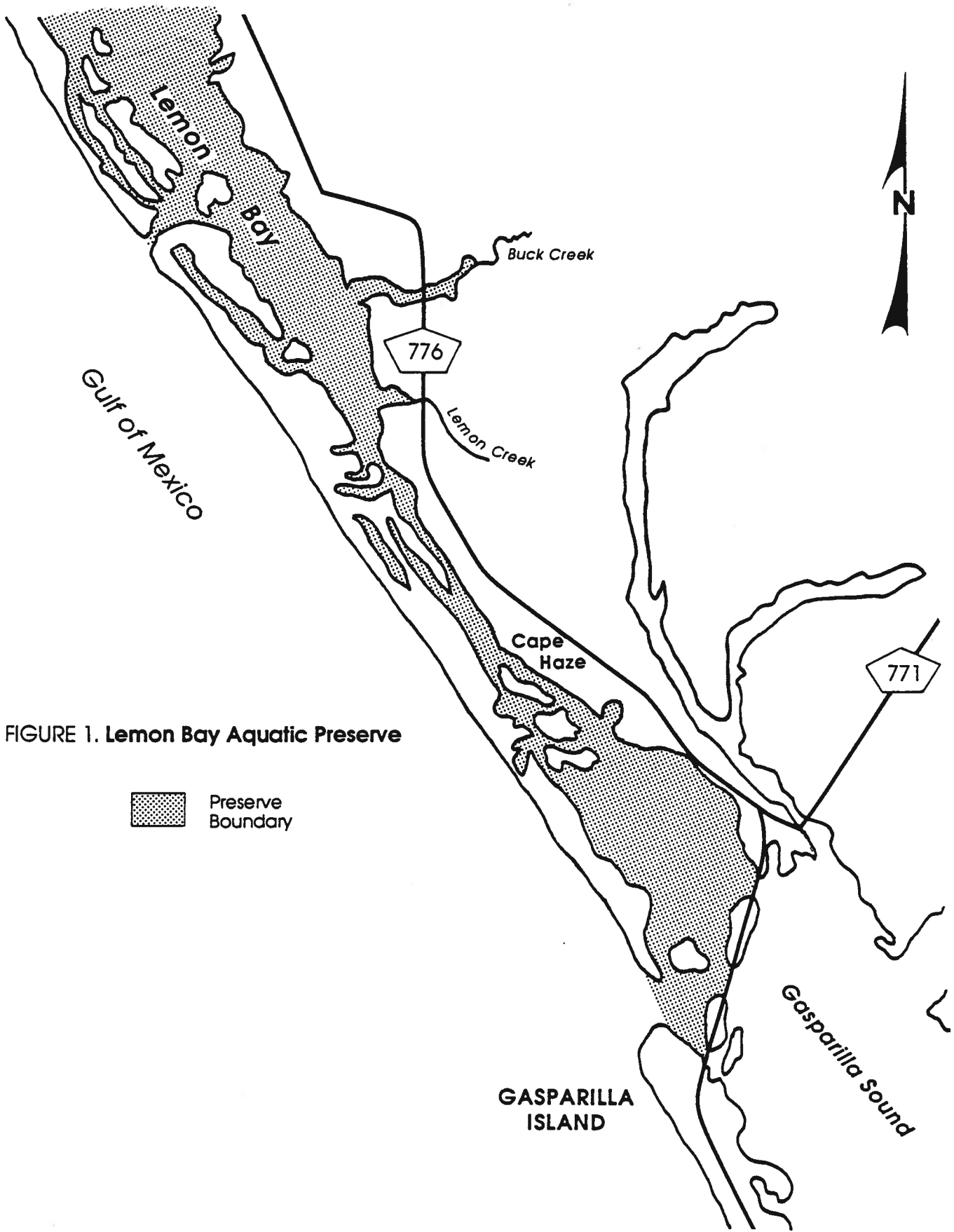


FIGURE 1. Lemon Bay Aquatic Preserve


 Preserve Boundary



# AQUATIC PRESERVES

AQUATIC PRESERVES ARE ESTABLISHED BY THE FLORIDA LEGISLATURE AND INCLUDE ONLY STATE OWNED SOVEREIGNTY SUBMERGED LANDS. THE GOVERNOR AND CABINET SITTING AS TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND ARE MANAGERS OF THESE AREAS.

FOR MORE INFORMATION REGARDING AQUATIC PRESERVES CONTACT:

DEPARTMENT OF NATURAL RESOURCES  
 DIVISION OF STATE LANDS  
 BUREAU OF AQUATIC PRESERVES

3900 COMMONWEALTH BLVD  
 TALLAHASSEE, FLORIDA 32303  
 CREATED BY CAROL A. KNOX  
 1988

FIGURE 2. Florida Aquatic Preserves

#### **D. THE MANAGEMENT PLAN AND THE AQUATIC PRESERVE RULES**

The rules and guidelines for the Aquatic Preserve Program are contained in the Florida Aquatic Preserve Act (Sections 258.35 - 258.46, Florida Statutes) and the Florida Aquatic Preserves Rules (Chapter 18-20, Florida Administrative code). Once approved by the Board of Trustees of the Internal Improvement Trust Fund, the aquatic preserve management plans become incorporated into Chapter 18-20, F.A.C. (Appendix A).

To date, fourteen management plans, embracing 21 of the 42 designated aquatic preserves in the state, have been adopted by reference into Chapter 18-20, F.A.C. This management plan will also be incorporated into rule following its approval by the Board of Trustees. As such, the special criteria in this plan pertaining to use of submerged lands will carry the same authority as rule criteria.

Preserving the threatened resources of the Lemon Bay Aquatic Preserve requires the maximum protection available under the state statutes and administrative rules. The administrative code allows for extra protection of resources in less developed, more pristine aquatic preserves, such as Lemon Bay. Section 18-20.004 (2)(a)2, F.A.C. states that proposed projects in less developed aquatic preserves shall be subject to a higher standard than projects in the more developed urban aquatic preserves.

Stringent resource protection practices in the Lemon Bay Aquatic Preserve will not just benefit the bay itself. They will also enhance adjacent water and land areas of Charlotte County and Sarasota County including the Gasparilla Sound-Charlotte Harbor Aquatic Preserve, the Cape Haze Aquatic Preserve, Don Pedro State Recreation Area, and the Port Charlotte State Recreation Area.

#### **E. THE CONTENTS OF THE MANAGEMENT PLAN**

The management plan is divided into the following chapters:

Chapter II explains the statutory authorities that are the basis for this resource management program and plan.

Chapter III describes the Lemon Bay Aquatic Preserve and its biological, physical and historical resources. It also includes information about the current and future uses of preserve itself and the adjacent lands.

Chapter IV defines and delineates the different management areas within the preserve. The management areas are based on the biological resources, the physical parameters and the aesthetic values of a given area, plus the adjacent land uses. The allowable uses for each management area are also given, as well as the minimum (design) criteria for each allowable use.

Chapter V lists the specific resource protection and management needs for the Lemon Bay Aquatic Preserve and the management initiatives developed to address each need.

Chapter VI outlines site-specific goals, objectives, and tasks required to meet the management needs of the preserve for resource management, resource protection, research, and environmental education.

Chapter VII identifies local, regional, state, and federal agencies involved with the preserve, along with their authorities and programs, and how they work together to protect and manage the preserve. It also identifies non-governmental organizations, interest groups, and individuals that can assist with preserve management.

Chapter VIII projects the future staffing and funding levels needed to effectively manage and protect the preserve and to conduct supporting research and environmental education activities.

Chapter IX outlines the program to monitor resource changes. It includes mechanisms to record and report resource changes, as well as to track resource management progress and accomplishments.

The unique resources of Lemon Bay inspired its designation as an aquatic preserve. This management plan is designed to guide the wise management of the resources within the preserve. In the next chapter, the statutes and authorities guiding that wise management are explained.

## CHAPTER II

### MANAGEMENT AUTHORITY

#### A. INTRODUCTION

The laws and rules guiding the Aquatic Preserve Program are found in several places. The primary relevant regulations include: state laws within the Florida Statutes, agency rules within the Florida Administrative Code and Comprehensive Plans prepared by state and local (county) governments. A description of each of these legal components and how they apply to the Aquatic Preserve Program follows.

#### B. FLORIDA STATUTORY AUTHORITY

##### 1. THE BASIC LAWS

The fundamental state laws providing management authority for the Lemon Bay Aquatic Preserve are contained in Chapters 258 and 253, Florida Statutes (F.S.). These statutes establish the proprietary role of the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund, as Trustees over all sovereignty submerged lands. In addition, these statutes empower the Trustees to adopt and enforce rules and regulations for managing all sovereignty (state owned) submerged lands, including aquatic preserves.

In particular, Sections 258.35 - 258.46, F.S., enacted in 1975 by the Florida Legislature represent the **Florida Aquatic Preserves Act**. These statutes set forth a standardized set of management criteria for all designated aquatic preserves, and represent the primary laws governing use of sovereignty submerged lands within aquatic preserves.

##### 2. THE INTENT OF THE AQUATIC PRESERVE ACT

The Legislative intent for establishing aquatic preserves is stated in Section 258.36, F.S.: **"It is the intent of the Legislature that the state-owned submerged lands in areas which have exceptional biological, aesthetic, and scientific value, as hereinafter described, be set aside forever as aquatic preserves or sanctuaries for the benefit of future generations."** This statement, along with the other applicable laws, clearly specifies the intended direction of management for the aquatic preserves.

### **3. MANAGEMENT OF THE AQUATIC PRESERVES**

To meet the legislative intent, the management of the aquatic preserves emphasizes maintenance of essentially natural conditions. The areas of the preserves to be managed include only the sovereign submerged lands and lands leased by the state with specific authorization to be included as part of an aquatic preserve. The aquatic preserve regulations do not cover management of lands above the mean high water line or submerged lands for which the titles have been transferred to private ownership.

Management responsibilities for aquatic preserves may be fulfilled directly by the Trustees or delegated to agency staff. The primary responsibilities for managing the Aquatic Preserve Program are delegated to the Department of Natural Resources, Division of State Lands. Division staff serve as the preserve managers who implement the provisions of the management plans and rules applicable to the aquatic preserves. In addition, other governmental bodies may also participate in the management of the preserves under appropriate authority delegated to them by the Trustees.

Any activity located on sovereignty submerged lands will require a consent of use, a lease or easement, or other approval from the Board of Trustees. Consent of use may be granted on small projects from the Division of State Lands in accordance with the authority delegated by the Board.

Aquatic preserve field staff evaluate proposed uses or activities in the preserve, and assess the impacts on the natural resources. Project reviews are primarily evaluated in accordance with the criteria in Sections 258.35-46, F.S. (Florida Aquatic Preserve Act) and 18-20, Florida Administrative Code (F.A.C.), (Rules of Florida Aquatic Preserves), and in accordance with the policies set forth in this plan.

The comments made by field staff on proposed uses are submitted to the Division of State Lands Regional Planner to be considered in the recommendations made to the Board of Trustees. This mechanism provides the Trustees with accurate information to be used to evaluate the public interest and merits of proposed projects relating to the potential environmental impacts of the projects on the aquatic preserves.

### **4. HISTORY OF THE AQUATIC PRESERVE LEGISLATION**

The laws supporting aquatic preserve management are the direct result of the public's awareness and interest in protecting Florida's aquatic environment. The rampant dredge and fill activities that occurred in the late 1960's stimulated this widespread concern.



In 1967, four major actions related to the protection of state-owned submerged lands occurred. First, the Florida Legislature passed the Randall Act (Chapter 67-393, Laws of Florida), which established procedures regulating previously unrestricted dredge and fill activities on state-owned submerged lands. Second, the legislature provided the statutory authority (Section 253.03, F.S.) for the Board of Trustees to exercise proprietary control over state-owned lands. Third, the Board of Trustees established a moratorium on the sale of submerged lands to private interests, because of the legislature's focus on protecting Florida's productive waterbodies from development. Last, an interagency advisory committee on submerged lands was created to develop strategies to protect and manage state-owned submerged lands.

In 1968, the Florida Constitution was revised, declaring in Article II, Section 7, the state's policy of conserving and protecting the natural resources and scenic beauty. That constitutional provision also established the authority for the legislature to enact measures for the abatement of air and water pollution.

Also in 1968, the committee issued a report recommending the establishment of twenty-six aquatic preserves.

On October 21, 1969, the Governor and Cabinet acted upon the recommendations of the Interagency Advisory Committee and adopted, by resolution, eighteen water bodies as aquatic preserves. Other preserves were individually adopted at various times through 1989, including Lemon Bay in 1986. In 1975, the standards and criteria for managing the preserves were established with the Aquatic Preserve Act.

### **C. AGENCY ADMINISTRATIVE RULES GOVERNING AQUATIC PRESERVES**

Chapters 18-20 and 18-21, Florida Administrative Code (F.A.C.), are the two administrative rules directly applicable to the uses of aquatic preserves specifically, and submerged lands in general.

#### **1. CHAPTER 18-20, F.A.C.**

Chapter 18-20, F.A.C., (Appendix A) specifically addresses aquatic preserves and derives its authority from Sections 258.35, 258.36, 258.37, and 258.38, F.S. The intent of this rule is contained in Section 18-20.001, F.A.C., which states:

- "(1) All sovereignty lands within a preserve shall be managed primarily for the maintenance of essentially natural conditions, the propagation of fish and wildlife, and public recreation including hunting and fishing where deemed appropriate by the board and the managing agency.

- (2) The aquatic preserves which are described in 73-534, Laws of Florida, sections 258.39, 258.391, 258.392, and 258.393, Florida Statutes, future aquatic preserves established pursuant to general or special acts of the legislature, and in Rule 18-20.002, Florida Administrative Code, were established for the purpose of being preserved in essentially natural or existing condition so that their aesthetic, biological and scientific values may endure for the enjoyment of future generations.
- (3) The preserves shall be administered and managed in accordance with the following goals:
  - (a) to preserve, protect, and enhance these exceptional areas of sovereignty submerged lands by reasonable regulation of human activity within the preserves through the development and implementation of a comprehensive management program;
  - (b) to protect and enhance the waters of the preserves so that the public may continue to enjoy the traditional recreational uses of those waters such as swimming, boating, and fishing;
  - (c) to coordinate with federal, state, and local agencies to aid in carrying out the intent of the Legislature in creating the preserves;
  - (d) to use applicable federal, state, and local management programs, which are compatible with the intent and provisions of the act and these rules, and to assist in managing the preserves;
  - (e) to encourage the protection, enhancement, or restoration of the biological, aesthetic, or scientific values of the preserves, including but not limited to the modification of existing man-made conditions towards their natural condition, and discourage activities which would degrade the aesthetic, biological, or scientific values, or the quality, or utility of a preserve, when reviewing applications, or when developing and implementing management plans for the preserves;
  - (f) to preserve, promote, and utilize indigenous life forms and habitats, including but not limited to: sponges, soft coral, hard corals, submerged grasses, mangroves, saltwater marshes, freshwater marshes, mudflats, estuarine, aquatic and marine reptiles, game and non-game fish species, estuarine aquatic,

and marine invertebrates, estuarine, aquatic, and marine mammals, birds, shellfish and mollusks;

- (g) to acquire additional title interests in lands wherever such acquisitions would serve to protect or enhance the biological, aesthetic, or scientific values of the preserve;
- (h) to maintain those beneficial hydrologic and biologic functions, the benefits of which accrue to the public at large."

## **2. CHAPTER 18-21, F.A.C.**

Chapter 18-21, F.A.C., controls activities conducted on sovereignty submerged lands in general and is predicated on the provisions of Sections 253.03 and 253.12, F.S. These rules are supplemental to Chapter 18-20, F.A.C. in the regulation of activities in aquatic preserves. The stated intent of this administrative rule is:

- "(1) to aid in fulfilling the trust and fiduciary responsibilities of the Board of Trustees of the Internal Improvement Trust Fund for the administration, management, and disposition of sovereignty lands;
- (2) to insure maximum benefit and use of sovereignty lands for all citizens of Florida;
- (3) to manage, protect, and enhance sovereignty lands so that the public may continue to enjoy traditional uses including, but not limited to, navigation, fishing and swimming;
- (4) to manage and provide maximum protection for all sovereignty lands, especially those important to public drinking water supply, shellfish harvesting, public recreation, and fish and wildlife propagation and management;
- (5) to insure that all public and private activities on sovereignty lands which generate revenues or exclude traditional public uses provide just compensation for such privileges;
- (6) to aid in the implementation of the State Lands Management Plan."

## **D. ADDITIONAL APPLICABLE PLANS AND PROGRAMS**

### **1. STATE COMPREHENSIVE PLAN**

The State Comprehensive Plan, established by Chapter 187, F.S., provides long-range policy guidance for the orderly social, economic and physical growth of the state. As such, the State Comprehensive Plan provides direction for the management of the physical resources within the state.

The goals, objectives and policies set forth in this aquatic preserve management plan are designed to be consistent with the goals and policies of the State Comprehensive Plan pertaining to the water resources, coastal and marine resources and natural systems.

### **2. STATE LANDS MANAGEMENT PLAN**

The State Lands Management Plan, adopted on March 17, 1981, and amended by the Board of Trustees on July 7, 1981, and March 15, 1983, contains specific policies concerning spoil islands, submerged land leases, "Outstanding Native Florida Landscapes," unique natural features, seagrass beds, archaeological and historical resources, and endangered species.

These policies provide some of the fundamental direction for formulating the management plans and policies of the Aquatic Preserves Program.

### **3. LOCAL GOVERNMENT COMPREHENSIVE PLANS**

Counties are required to develop Local Government Comprehensive Plans (LGCP). In the Lemon Bay Aquatic Preserve, Sarasota and Charlotte Counties are required to adopt the plans. The state law guiding the comprehensive plans is the Local Government Comprehensive Planning Act of 1975 (Section 163.3161, F.S.), (as amended by Chapter 85-55, Laws of Florida, to the Local Government Comprehensive Planning and Land Development Regulation Act).

The Local Government Comprehensive Plans must include elements relating to different governmental functions (e.g., housing, physical facilities, conservation, land use, coastal zone protection, etc.). The plans are intended to guide the future development of each respective county.

Cities and counties must also adopt land development regulations that conform to the criteria, policies, and practices of their comprehensive plans. The plans and regulations must be updated periodically as required by recent statutory amendments.

Both Charlotte and Sarasota Counties drafted Local Government Comprehensive Plans which were reviewed by the Florida Department of Community Affairs (DCA). The Sarasota County Comprehensive Plan was formally approved by the county and DCA in March 1989. However, since that time, the plan was sent to administrative hearing and the Governor and Cabinet for modifications primarily to procedural language. The county adopted amendments to the plan that are consistent with the final Governor's recommendations which are scheduled for review and subsequent approval by the Governor and Cabinet in mid-1992. Charlotte County's plan was adopted as of January 1990.

The intent of the Aquatic Preserve Program is to guide county governments during their planning processes, towards developing local planning criteria and standards that will be consistent with the objectives of the program.

Staff of the Southwest Florida Aquatic Preserve office work with the planning departments of Sarasota and Charlotte Counties to develop plans and ordinances which include land use policies and conservation elements that preserve the resources of the Lemon Bay Aquatic Preserve. Both counties have approved County Comprehensive Plans. Policy statements and relevant comprehensive plan sections which are adopted by counties and are consistent with the Aquatic Preserve Program will be incorporated by reference into this management plan. (See Appendix B).

#### **4. COASTAL CONSTRUCTION CONTROL LINE**

The Coastal Construction Control line was established pursuant to Section 161.053 F.S.. It is located around the northern end of Gasparilla Island. Areas seaward of the line are subject to excavation and coastal construction regulatory control, including vegetation protection. Submerged areas are subject to the provisions of Section 161.041 F.S. and inlets are subject to the provisions of Section 161.161 F.S. Under 161.161 F.S. management plans are developed for identified inlets. In Lemon Bay, inlet management plans are scheduled to be initiated for Stump Pass in FY 91-92 and for Gasparilla Pass in FY 93-94. The development of the inlet management plans will be coordinated between the DNR Office of Beach Erosion Control and the Southwest Florida Aquatic Preserve Office.

A variety of regulations have been established by the legislature and the local governments relating to the protection and management of the Lemon Bay Aquatic Preserve. The intent is to maintain the essentially natural conditions of the preserve. A description of the submerged resources of the preserve, along with the uses of the preserve and adjacent land areas follows in Chapter III.

## CHAPTER III

### RESOURCE DESCRIPTION

#### A. INTRODUCTION

The geology, climate and hydrology of Lemon Bay have combined to create a unique environment suitable for sustaining an exceptional variety of submerged biological communities. These unique natural resources also play an important role in the development of the local cultural resources.

Developing a strategy to effectively manage the preserve requires thorough knowledge of these resources. To form productive goals for the preserve, an understanding of the type, nature and functions of both the natural and the cultural resources of the preserve is critical. As background information to the management decisions included later in this plan, an overview of the aquatic preserve's environment is presented in this chapter.

The resource information is presented in three parts: the physical resources, biological resources and cultural resources of the preserve. The physical resources section describes the preserve's location, physical geography, climate, geology, topography, soils, submerged sediments, surface water hydrology, groundwater and water quality. The section on biological resources describes the biological communities and designated species. Part III, cultural resources, includes a description of the archeological resources, regional land use, local land use and uses of the waters of the preserve, along with the associated impacts.

#### PART I: PHYSICAL RESOURCES

##### A. LOCATION, DESCRIPTION AND BOUNDARIES

The Lemon Bay Aquatic Preserve is located in southwest Florida, in western Charlotte and Sarasota Counties. As shown in Figure 1 on page 3, Lemon Bay is a long, narrow, shallow estuarine system paralleling the Gulf of Mexico. It extends 13 linear miles from Alligator Creek in the north to the Gasparilla Pass in the south. The bay averages 3/4 mile wide and varies from 1/8 to 1.2 miles wide in places. The area of the submerged lands of the preserve is 11.98 square miles.

Lemon Bay is separated from the Gulf of Mexico by two barrier islands. Little Gasparilla, Bocilla and Knight Island make up the barrier island complex along the southern third of the bay. Manasota Key stretches along the northern two thirds of the bay's length.

Two passes occur between the bay and the Gulf of Mexico. Gasparilla Pass is located at the mouth of the bay. Stump Pass is located one third of the way up the bay, between Manasota Key and Knight Island.

Along the eastern shore of the preserve, seven freshwater, tidal creeks drain into Lemon Bay. From the north to the south, these creeks include: Alligator, Forked, Godfrey, Ainger, Oyster, Buck and Lemon Creeks.

The boundaries of the Lemon Bay Aquatic Preserve include all submerged bottoms and lands waterward of the mean high water line (MHWL) to which the state holds title. This includes tidal lands, islands, sandbars and shallow banks below the MHWL. It also includes all natural waterways tidally connected to the preserve, such as the lower reaches of the tributary creeks, upstream to SR 776/SR 775. The preserve does not include submerged lands for which titles have been transferred to private ownership or artificial waterways, such as canals, which are connected to the bay. Significant outparcels are held in private ownership in the more developed extents of Lemon Bay. In addition, a very large number of miles of man-made canals (greater than 48 miles) drain from the uplands into Lemon Bay and tributaries. Even though the canals are outside the preserve boundaries, their discharges have significant impacts on preserve resources.

## **B. PHYSICAL GEOGRAPHY**

Physical geography combines the physical features of the area, such as geology and topography, along with the cultural and biological communities. This section includes a general summary of the physical geography of the bay as an introduction to the more detailed sections on the physical, biological and cultural resources that follow.

The physical geography of the Lemon Bay area was largely developed during the past one million years of geologic history. Local surface and subsurface geology, the chronology of Pleistocene glaciations and weathering have produced the shape and appearance of the bay. These geologic processes formed the topography, drainage, soils, and other physical features which make up the coastal lagoons and barrier islands.

Lemon Bay Aquatic Preserve is composed of marine and estuarine waters, inlets, bays, tidal creeks, mudflats, sand bars, beaches and salt flats. It is recognized as a pristine area which supports a diverse flora and fauna, but is threatened by increasing development. The preserve includes a variety of submerged and intertidal habitats, such as seagrass beds; mangrove islands, fringes and forests; oyster bars; soft bottom communities; brackish marshes and algae flats. Of these, the extensive seagrass beds and mangrove areas are the most notable. Turtle, Manatee and shoal grass beds are common throughout the shallow, submerged

areas of Lemon Bay. Red mangroves are common along the barrier islands and the mainland shorelines. Landward of the red mangrove fringes are forests of black and white mangroves.

The surface area of the bay at mean high water is approximately 7,667 acres, with a volume of 36,410 acre feet. The average depth is approximately 6 feet at mean high water (MHW). However, in the past, prior to the time when dredging activities were common, the average water depth of the bay was only 4 feet at MHW.

The preserve consists of two discrete bays: Lemon Bay proper and Placida Harbor. The Lemon Bay proper lagoon comprises the northern two-thirds of the bay, from Alligator Creek in the north to Buck Creek in the south. Placida Harbor makes up the lower 1/6 of the bay, stretching along the length of Little Gasparilla Island to Gasparilla Pass. The two bays are separated by a narrow constriction in the bay near Bocilla Island.

Tidal exchange of water between the waters of the preserve and the Gulf of Mexico occurs at two passes, Gasparilla Pass in Placida Harbor and Stump Pass in Lemon Bay. The next nearest passes to the Gulf are Venice Inlet, eight miles to the north and Boca Grande Pass, seven miles to the south.

The seven creeks draining to the eastern shore of Lemon Bay contribute small quantities of fresh water to the bay, relative to its saltwater volume. The amount of freshwater from the creeks increases after times of heavy rainfall. The lower reaches of the creeks are inundated with saltwater during high tides. At the mouth of preserve, Placida Harbor receives some freshwater from Coral Creek and saltwater via Gasparilla Pass and Gasparilla Sound.

Because of the tidal creeks and the few number of passes, the salinity of the bay waters varies from north to south and depending on the amount of rainfall. Past samples showed salinity values in the north end of the bay near Forked Creek to be 16 parts per thousand (ppt) and in the south, near Stump and Gasparilla Passes, to be 36 ppt. For comparison, average salinities for the open ocean are 35 ppt and for freshwater, salinities are generally less than 1 ppt.

The communities adjacent to the bay include: Placida, Cape Haze, Grove City, New Point Comfort, Englewood Beach, Englewood, Manasota, South Venice and Manasota Beach, along with unincorporated residential areas. Within easy driving and boating distance of the preserve are the communities of Venice, Northport, El Jobean, Port Charlotte, Punta Gorda, Pine Island and the Fort Myers area.

Lemon Bay is accessible both by road and by water. The major highways into the area are Interstate 75 and US 41 from the north and south, and SR 776 from the north and east.



By water, access is via Intracoastal Waterway from the south from Charlotte Harbor, via the Venice Channel from the north and through the tributary creeks in the east. From the Gulf of Mexico access to the bay is through Stump Pass and Gasparilla Pass. To facilitate boat access, there are 11 marinas and five public boat ramps. The marinas are located at Englewood, Placida, Grove City, Punta Gorda Beach, Manasota and South Venice. Public boat ramps are located at the north Manasota Key Bridge, at Indian Mound Park in Englewood, at the El Jobean Park on SR 776 and in Placida.

The preserve's adjacent shorelines are predominantly in private ownership, with prevalent finger canals and other waterfront development on the barrier islands and the mainland communities.

Only 11.5 percent of the total land and water area in Charlotte and Sarasota Counties has been set aside as public or private preserves dedicated to the conservation of natural resources. Other protected areas near the aquatic preserve include the Gasparilla Sound-Charlotte Harbor Aquatic Preserve, the Cape Haze Aquatic Preserve, the Charlotte Harbor State Reserve, the Don Pedro State Recreation Area and the Port Charlotte State Recreation Area.

Increasing urbanization, with its accompanying water quality and habitat impacts, is, and will continue to be, the most significant environmental threat to the Lemon Bay Aquatic Preserve. Northwestern Charlotte County and southwestern Sarasota County are currently expanding and rapid development is occurring on the barrier islands of the bay. As development on these islands continues, the western bay will especially be subject to impacts due to increases in sewage and stormwater runoff. These sources will contribute to subsequent increases in the amounts of bacterial and chemical pollutants reaching the bay.

### **C. CLIMATE**

Located in southwest Florida, Lemon Bay has a subtropical climate with warm temperatures and a summer rainy season. The climate allows for the great diversity of biological communities in the area.

The average temperature in the winter is 68 degrees Fahrenheit (F) and in the summer, 81 degrees F. The average daily winter minimum temperature is 58 degrees F and the average daily summer maximum is 90 degrees F. The lowest recorded temperature was 25 degrees F in December 1962 and the highest was 103 degrees F in July 1942. (USDA 1984).

The total annual precipitation is 51 inches, 60% (31 inches) of which occurs in the summer, from April to September. Dry summers occur in two out of ten years, during which less than 12 inches of rain falls from April to September. Rainfalls can

be heavy, especially during summer afternoon rainstorms. The heaviest recorded 1 day rainfall was 9 inches in September 1962. Thunderstorms occur on about 80 days each year, mostly in late afternoon (SFWMD, 1980).

Southwest Florida is situated in a seasonal tropical weather belt that produces or channels hurricanes toward the coast. Few devastating hurricanes have reached land in this area. Although a major storm can strike at any time, projections based on storm-track averaging suggest that the probability of a storm occurring in any given year is 50%, and for two storms in one year, the probability is 15%. There is only a small (1% to 5%) probability that any of these storms will be hurricanes (Gentry 1984).

#### **D. GEOLOGY**

The subsurface geology determines the underlying character of Lemon Bay. It influences the land elevations and surface water drainage patterns, the soil types and depths, and the groundwater movement, all of which influence the types of the biological communities present.

In general, the subsurface geology of Lemon Bay consists of 13,000 feet of sedimentary formations laid down by marine and fresh waters over a basement of Jurassic volcanic rock (Barnett, 1975). The Pleistocene glacial periods played an important role in forming the near-surface sediment layers and shaping the topography.

Lemon Bay lies on the Florida Platform, the South Florida Basin and within the Gulf Coastal Lowlands physiographic area. The Florida Platform underlies the peninsula of Florida from Georgia to the Keys, extending to the continental shelf in the east and west. It is a broad, flat, stable platform with little geologic movement. The South Florida Basin is a stratigraphic basin which includes south Florida and the area off the southwest Florida coast. It is about 150 million years (m.y.) old and lacks major geologic structural activity. The Gulf Coastal Lowlands physiographic area parallels and borders the western coastal areas of the state. It is generally bounded on the east by uplands and intermittently along the Gulf of Mexico by coastal lagoons and barrier chains (Hoffmeister, 1974). The basement volcanic rocks underlying the sediments of the Lemon Bay area are primarily basalts, generally formed more than 190 m.y. old, during the Triassic and Jurassic Periods of the Mesozoic Era (Arthur, 1988).

Directly above the basement rocks are Upper Jurassic and Upper Cretaceous sedimentary deposits. These sedimentary rocks were generally deposited between 165 and 65 m.y. ago and comprise the lower 3/4 of the layers underlying this region. The rocks are comprised of carbonates (limestones and dolostones), with thin beds of anhydrites and gypsum, and were deposited in shallow water. During

the Tertiary Period of the Cenozoic Era, which extended from 65 to 1.6 m.y. ago, an additional 4,000 feet of limestone and dolostone were deposited (Miller, 1986). Carbonates of Eocene and Oligocene comprise most of the Floridian aquifer system in this region.

During the Miocene Epoch in the late Tertiary Period, clastic sediments and phosphorites were also being deposited along with the carbonates. As time progressed, clays became more dominant in the deposits (Scott, 1988). These clay rich strata and inter bedded carbonates make up the intermediate aquifer and confining units. During the Pliocene, the carbonates and shells of the Tamiami Formation were deposited (Florida Geologic Survey files). Surficial aquifer system sediments include portions of the Tamiami Formation and overlaying Pleistocene units.

The Pleistocene Fort Thompson(?) and Caloosahatchee Formations comprise the near surface sediments of the Lemon Bay area. The sediments are composed of varying amounts of sand and shell, with some carbonates. In south and southwest Florida, the deposits range in thickness from 0 to 30 feet deep and are locally exposed in areas. These formations generally comprise the surficial aquifer system in this region.

During the Pleistocene Epoch, most of the physiography affecting the Lemon Bay area occurred as a result of sea level fluctuations which were due to glacial advances and retreats. The Pleistocene Epoch included at least 5 glacial advances, which lowered sea levels, and 4 interglacial warmer periods with higher sea levels. The sea level changes during the last glacial advance, the Wisconsin Age, most significantly affected the formation of the surface geology of the area. During high water levels, marine and freshwater deposits were produced by biological and chemical processes and subsequently covered by these, as well as clastic, sediments. Calcium compounds were precipitated and/or extracted from solution in saltwater by plant and animal biological, and associated chemical, processes. During times of low water, the exposed land was subject to wind and water erosion, which cut river valleys and deposited sediments further down slope (Hoffmeister, 1974). Since the last glacial retreat, the sea level has been rising, slowing its rate of rise about 6,000 years ago and again about 3,000 years ago (Wanless, 1989, personal communication). It was during these times that the Lemon Bay Aquatic Preserve estuarine complex began to form.

The barrier islands in this region were formed when limestone and quartz materials were transported from the north by longshore currents. As the sediments were deposited, oyster bars were established, adding shell fragments to the quartz sands. As the bars reached the intertidal water depths, mangroves began to colonize the areas, trapping sediments, increasing the amount of peat in the deposits and the size of the islands (Hoffmeister, 1974).

The major components of the near-surface deposits of the Lemon Bay area are sand and carbonates. The type of sediment depends on the environmental conditions under which the rocks were formed and exist. Commonly, these are unconsolidated sediments may also include organic materials, such as peat from the mangroves and associated plant growth. In areas where recent filling has occurred by human activity, the surface sedimentary deposits are of variable composition.

These near-surface carbonates and quartz sands support a gentle surface topography and sandy, organic soils, further described in the following paragraphs.

### **E. SURFACE TOPOGRAPHY**

The topography of Lemon Bay is uncomplicated, low, flat and relatively featureless. However, even small changes in elevation can make significant differences in the vegetation communities and associated fauna.

On both the mainland and the barrier islands, the elevations are low, averaging about 7 feet with a maximum of less than 20 feet. The slopes are gentle throughout the adjacent land areas, even at the headwaters of the eastern tributary creeks. The relatively higher, steeper areas of the preserve occur in the north, near the north end of Manasota Key and the community of Manasota. The slopes and elevations are lowest near the south of the preserve, near Don Pedro Island, Cape Haze and the mouth of Lemon Bay.

Because of the nearly level topography, large areas of wetlands occur inland east of the bay, as well as along the shorelines of the mainland and barrier islands. The natural surface drainage patterns are poorly defined and the tributary creeks are winding, with little gradient. The natural shorelines along the bay are irregular, with numerous mangrove islands.

Significant artificial alterations have been made to the natural shorelines and drainage patterns of the Lemon Bay area through dredging and filling activities.

### **F. SOILS**

The types of soils and sediments in the Region have been determined by the processes of parent rock formation, weathering, and transport. The mineral content of a formation affects its chemical and physical stability and the nature of its breakdown derivatives. The water in geological formations is affected by the mineral composition and in turn affects the rate and outcome of soil-building processes. Biological factors also play important roles in the production and fate of soils and sediments (Estevez, 1981). For the coastal area in general, the soils have been mapped in Sarasota County and Charlotte County.

Unlike the well-developed soil profiles found elsewhere in the unglaciated portion of the United States, the soils of the lower west coast of Florida are generally described as surface sediments rather than the products of long-term weathering, decomposition and biotic alteration of a parent material. The horizons of layers found in southern Florida surface and near surface sediments usually reflect changes in sediment type, e.g. sand overlying calcareous marsh, rather than the dissolution or mechanical reduction of material.

Most of the soils are sandy or organic. The environment of sandy soils vary from seasonally inundated, low-lying pine flatwoods and prairies to elevated xeric (dry) dunes and ridges. The organic soils, peat and mucks are composed of the partially decomposed remains of plant material.

In Sarasota County, sands are dominated by Eau Gallie Fine Sands, which are acidic and marine, poorly draining, and have an organic pan subsoil. The area of coverage by Eau Gallie Fine Sands in the county is approximately 29 percent. Myakka Fine Sands cover about 17 percent of the county. The next most common soils are the Pineda Fine Sands, loose marine deposits over calcareous sediment, which drain poorly. These soils cover about 11 percent of the county. A related soil, the Holopaw Fine Sand, drains less and is characteristically found in shallow basins, flatwood sloughs, and wet prairies. Coastal Beach, Coastal Ridge, and Tidal Swamp and Marsh Soils are prevalent on barrier islands and wetlands (USDA, 1959; Sarasota Department of Planning, 1980). Most of the soils in the county exhibit severe to very severe limitations for agricultural use, and are excessively wet (Florida Board of Conservation, 1966).

In Charlotte County, general soil descriptions are available but must be interpreted with the recognition that extensive agricultural and residential drainage improvements have altered the soils in significant ways. The most extensive soil association of the county is found among Pineda, Pople and Holopaw Soils, occurring in broad lowlands and depressions. The next most common soils are found as the Myakka, Eau Gallie and Holopaw Association. These are acid sand soils with brown organic pans and associated neutral or basic components (USDA, 1984). Both associations are dominated by nearly level soils, thin (less than 40 inches) sand surfaces, and a ground water table 0 to 30 inches below the surface. The next most frequent association (of Bradenton, Wabasso and Felda Soils) typically have sandy surface layers thicker than 40 inches. Extensive salt water, marsh and swamp, and coastal beach sediments, are present (Florida Board of Conservation, 1966).

## **G. SUBMERGED SEDIMENTS**

The Intracoastal Waterway is dredged to 9-12 feet deep. Cores taken by the Florida Department of Transportation across similar local areas, including Matlacha

Pass, the Myakka River, and the Peace River, showed that the average thickness of recent sediments is about 10 feet (Estevez, 1981). Most of the sediments in the area are quartz shell and sand mixtures. Sediments are dominated (greater than 50%) by quartz (Estevez, 1981). The quartz sand is derived mainly from quaternary marine terraces which surround the estuarine system (Huang and Goodell, 1967). The rivers of the region run at low grade, and transport finer than sand-size sediment to the harbor complex. Some sediment may move ashore from deeper coastal waters (Meade, 1969).

Sediments are predominantly sand-sized. Detrital carbonate shell constitutes the gravel-sized deposits. Much coarser sediments are present in the deeper channels. Although the percentage of sand decreases on the west or seaward side of the bay, the mean grain size increases because of the addition of shell gravel.

Montmorillonite, kaolinite, illite, attapulgite and zeolite are among the clay minerals. Among carbonate minerals, magnesium calcite, aragonite and dolomite are present in sediments of the area. Overall, carbonates vary from 0.64 percent in the freshwater to 93.87 percent in tidal channels. A general decrease of carbonates is seen with increasing depth. Minerals comprised of phosphates appear on shores and in channels as coarse sand to dark granular sediment, or in shallows, as dark medium sand or silt. Highest concentrations of sedimentary phosphate occur in the central channels (Estevez, 1981).

The interplay of currents, waves, changes of sea level, the subsurface geology of the region have and the actions of bottom dwelling organisms over millions of years, has resulted in the accumulation of sediments into the emergent barrier islands.

## **H. SURFACE WATER HYDROLOGY**

Because of the level topography, the surface drainage patterns to the bay are poorly defined, with significant numbers of wetlands and relatively short, low gradient freshwater tributary streams. Lemon Bay and Placida Harbor are estuaries, with varying salinities in different locations and times. The salinity levels depend on the balance of fresh and saltwater input from the tributaries and rainfall.

The Lemon Bay Aquatic Preserve is a linear lagoon system, connected by artificial dredging activities which were conducted through former wetlands. The estuaries of Lemon Bay proper and Placida Harbor have surface areas of 6,042 and 1,625 acres, respectively. Surface water hydrology is influenced by the interaction of freshwater inputs from major man-made canals, the seven tidal creeks and overland sheetflow with tidal exchange with the Gulf of Mexico via the two major inlets. The interaction of the discharged fresh water with the tides influences the circulation patterns, sedimentation, nutrient levels, and pollution levels.

The area has mixed diurnal and semi-diurnal tides of variable heights and ranges, depending on the location and time of year. The tidal range averages 1.9 feet (0.6 meters), with an average amplitude of two feet and a maximum of three feet. The lowest low tides occur in the winter months of December, January, February and the highest high tides in June, July and August.

Wind can cause observed tidal amplitudes to vary considerably from the predicted values. Wind effects are most pronounced in the winter months where higher observed tides occur prior to the passage of cold fronts and lower observed tides occur after the fronts pass. Higher observed tides also occur during March and April when the prevailing wind direction is from the southwest.

The geomorphology and vegetation of tidal creeks and mangrove forests cause significant tidal dampening and time lags between high tides in the deep waters and in the adjacent salt marsh. A tidal lag of 2.5 hours can be observed between the head of a small creek and its mouth, about one mile away.

The water circulation of Lemon Bay and Placida Harbor is complex, not well understood and complicated by man-created channel connections. Unlike more southern back bay systems, there are few Gulf of Mexico inlets. The existing passes are constantly opening, closing and changing position through natural sediment transport processes.

Along the mainland of Lemon Bay, most stormwater either evaporates or empties into streams that discharge into the bay. The extent of recharge in the coastal zone to the aquifers near the coasts is a matter of current debate. For the most part, coastal streams are relatively short (less than 5 miles long), sluggish due to low gradients (about 5 feet/mile) and have historic extensive marsh or mangrove fringes. The fringes have commonly been destroyed by development (Sutcliffe and Thompson, 1983). During times of low flow conditions (such as droughts) most of these coastal streams have negligible freshwater discharge.

Many of the larger coastal streams have been altered and deepened. These stream modifications permit further intrusion of salt water inland (Flippo and Joyner, 1968).

## **I. GROUNDWATER**

The Floridan aquifer system in the Lemon Bay area is generally an artesian aquifer, comprised of the Oldsmar and Lake City Limestones, Avalon Park Formation and Ocala and Suwannee Limestone. These sediments lie beneath the impermeable rocks of the Hawthorn Group. The Hawthorn Group, with the Peace River and Arcadia Formations, serve as a barrier above Floridan aquifer system, and comprise the intermediate confining unit and the intermediate aquifer system in this area. The surficial aquifer system is comprised primarily of the Fort Thompson (?),

Caloosahatchee and Tamiami Formations (FDNR, FGS, 1986). The general direction of water movement, including both groundwater and surface water, is from east to west and ultimately flows into the Gulf of Mexico.

The Floridan aquifer system provides most of the groundwater used by agricultural, industrial, and domestic users in west-central Florida. Along the coast, however, the surficial aquifer system is the primary source of potable groundwater for domestic use. Groundwater from the lower levels of the Floridan aquifer system is too mineralized (saline) to serve as potable water source, although these waters may be used for irrigation (Sutcliffe and Thompson, 1983). Some aquifers in coastal areas have experienced salt water intrusion as a result of groundwater overpumping, the use of drainage canals, and, less frequently, storm surges.

## **J. WATER QUALITY**

The waters of Lemon Bay Aquatic Preserve are designated as both Outstanding Florida Waters (OFWs) and Class II and Class III waters. For each designation, acceptable levels, or standards, have been set for several water quality parameters (components). Discharges to the water bodies cannot lower the quality of the water to below the identified standards. The standards are used by Florida Department of Environmental Regulation to evaluate proposed permits for discharges to surface waters.

All the waters of the Lemon Bay Aquatic Preserve have been designated as OFWs since April 1988. The purpose of the OFWs designation is to preserve existing water quality. Therefore, the standards for the water quality parameters are set at the level of the existing water quality. FDER cannot issue permits for direct pollutant discharges to OFWs which would lower ambient (existing) water quality or for indirect discharges which would significantly degrade the OFWs. This includes permits for new dredging and filling activities, which must be shown to be clearly in the public interest to be approved.

In addition to the OFWs designation, the preserve waters are also classified by FDER as Class II and Class III. All of Florida's surface waters are classified into 5 different classes, depending on their "present and future most beneficial use". Class I has the best, potable water quality and Class V has the poorest. For each class, different standards are set for each parameter and discharges cannot lower the water quality below the identified levels. Lemon Bay Aquatic Preserve waters are designated as Class II from Forked Creek south, and upstream in the tributaries to SR 776 and SR 775. Class II waters have very good quality, and are designated as shellfish harvest and propagation areas. The remaining 1/5 of the bay, north of Forked Creek, is Class III. These waters have good water quality, designated for recreation, propagation and maintenance of a healthy, well balanced population of fish and wildlife.



The rules guiding both OFW and class designations are found in 17-302 F.A.C., relating to water quality standards, and in 17-4.242, which contains permitting criteria and procedures.

There are several sources of water quality data for the Lemon Bay Aquatic Preserve. In the mid 1970's, data was collected for the bay as part of the Clean Water Act requirements. The information was collected by the Southwest Florida Regional Planning Council (SWFRPC). In the mid 1980's, additional data was collect by FDER as part of the proposal to designate the area as an aquatic preserve. On-going, routine ambient water quality data is also being collected by three groups: 1) the FDER South Florida District Office in Punta Gorda; 2) the FDNR Shellfish Assessment Section, Southwest Coast Field Office in Punta Gorda; and 3) the Sarasota County Department of Natural Resources, Environmental Services Lab. Some historical data exists with the Southwest Florida Water Management District Hydrologic Data Base, but it is up-dated as requested for new projects.

The water quality data for the Lemon Bay Aquatic Preserve area has been summarized in three publications: 1) the 1977 Final Water Quality Report of the Lemon Bay Complex Study Area by John Morrill, for the SWFRPC; 2) the 1984 Water Quality Inventory for the State of Florida by Joe Hand and Dean Jackman for FDER; and 3) the 1985 Report to the Environmental Regulation Commission: Proposed Designation of Sarasota Bay and Lemon Bay as Outstanding Florida Waters, for FDER.

The data shows variable water quality conditions for the preserve waters, depending on the location and date of the sampling, and the report in which the data is summarized. The historic data shows fair and poor levels of dissolved oxygen and fecal coliform bacteria in both the bay waters and the mouths of the tributary creeks. However, the 1984 report by Hand and Jackman indicates that the overall water quality of the system is still generally good, particularly in open bay waters. The poorest conditions appear to be in and near the tributary creeks, which commonly have low dissolved oxygen and high coliform bacteria levels. The urbanized creeks of the Englewood area also have high nutrient levels.

In urbanizing and developed areas, such as the drainage areas of Lemon Bay, elevated fecal coliform bacteria levels often indicate wastes are being carried into surface waters from sewage treatment plants, inadequate marina sewage pump-out stations and areas with high densities of septic systems. Also, high nutrient levels and low dissolved oxygen levels are associated with increased stormwater runoff discharges to surface waters.

The effects of the high fecal coliform levels have already been felt in the preserve. Due to the high levels, certain areas of Lemon Bay are unsuitable for shellfish harvesting. The areas of the bay currently closed to shellfish harvesting include:

from navigation marker #27 north to marker #19A on the east side of the Intracoastal Waterway; from marker 19A north to marker #28A on both sides of the Intracoastal Waterway; from marker #28A north to marker #36 on the east side of the Waterway; and from marker #36 north to the preserve boundary on both sides of the Waterway. In addition, recently proposed prohibited shellfishing areas include: the Cape Haze canals, Knight Pass, and an area surrounding Elred's Marina in Placida Harbor.

The citizens of the Lemon Bay area are concerned about the apparent and potential degradation of the quality of the waters in the preserve. They have organized an annual Lemon Bay Conference, with the spring 1991 conference focusing on water quality. The purpose of the meeting is to improve citizen involvement in water quality monitoring of the bay.

## **PART II: BIOLOGICAL RESOURCES**

### **A. COMMON BIOLOGICAL COMMUNITIES**

The wealth of Lemon Bay's plant and animal associations are briefly described below. The individual species have been grouped into representative community types based on the dominant flora and fauna. The community compositions are not rigid and some species occur in more than one community. Even though the communities are presented separately here, in reality they have a great variety of combinations of species associations which are connected and inter-dependant.

Also, one community type can not be valued greater than another, because the productivity, fishery, recreational and aesthetic values of the Lemon Bay Aquatic Preserve depend on the matrix of interrelated habitats and microhabitats: submerged and emergent, wetland and upland, vegetated and unvegetated.

The Lemon Bay Aquatic Preserve is a classic back barrier island lagoon system which displays the estuarine, marine and associated riverine communities that exemplify a productive aquatic ecosystem. The major community associations within the preserve include: seagrass beds, mangroves, oyster bars and salt marshes, along with tidal creek wetland and soft bottom communities and the associated phytoplankton community. Landward of the preserve boundaries, the associated communities include: mangrove forests, salt marshes, pine flatwoods, oak hammocks and coastal scrub strands. Figure 3 shows the locations of the seagrass, mangrove, oyster and salt marsh communities in the preserve.

Under natural conditions, subtle differences in geology, topography, microclimate and other physical parameters determine the dominant plant and animal association in an area. The communities are never static and progress towards more complex, diverse and productive communities.

However, human alteration and catastrophic events such as hurricanes, change which communities dominate an area, as well as their succession towards the next community type. Often the disturbed communities are less diverse and productive than the natural communities were.

The affected community is not the only one that is diminished. All marine systems are interrelated and thus changes in one association will directly or indirectly affect a number of other related and interdependent associations. While people have long recognized how productive marine environments are, they are only recently beginning to understand the significant role marine communities play in larger, global ecological functions.

The qualitative information below is based on general knowledge of the preserve and the biological communities. Additional, more detailed inventories of preserve's communities are needed, and will be collected, to acquire more quantitative, site specific information. The detailed information is needed as baseline data against which to compare future changes, both positive and negative.

## **1. SEAGRASSES**

Within the Lemon Bay Aquatic Preserve boundaries below MHWL, the most extensive vegetation community is dominated by seagrasses. Seagrasses are submerged vascular plants. The three most common species in the preserve are: Cuban shoal grass (Halodule wrightii), turtle grass (Thalassia testudinum) and manatee grass (Syringodium filiforme). They occur in extensive beds throughout most of the shallow waters of the bay, from the shore out to a depth of about 7 feet. The few areas in the bay without seagrass cover include an area parallel to the east shore just north and south of Englewood and the eastern part of Placida Harbor from Cape Haze to Placida.

Seagrass meadows serve many valuable functions within the estuary. They provide the primary productive food base for the estuarine system. They also stabilize sediments, trap silt, recycle nutrients and provide shelter, habitat and substrate for animals and other plant forms. In addition, they function as nursery areas for juvenile forms of shellfish, provide a food source for the endangered West Indian manatee (Trichechus manatus latirostris) and serve as a substrate for the many species of epiphytic algae eaten by invertebrates, which are in turn eaten by fish (Wood et al., 1969; Odum, 1974).

Most commercially and recreationally important fishes spend at least part of their lives in these beds (Zieman, 1982), and seagrass patches near inlets may be especially important in keeping larval and juvenile fish from being passively washed back into the ocean during falling tides. The invertebrate fauna and algae associated with seagrass beds are rich and diverse, and collectively form an intricate biotic complex central to the ecology of the bay.

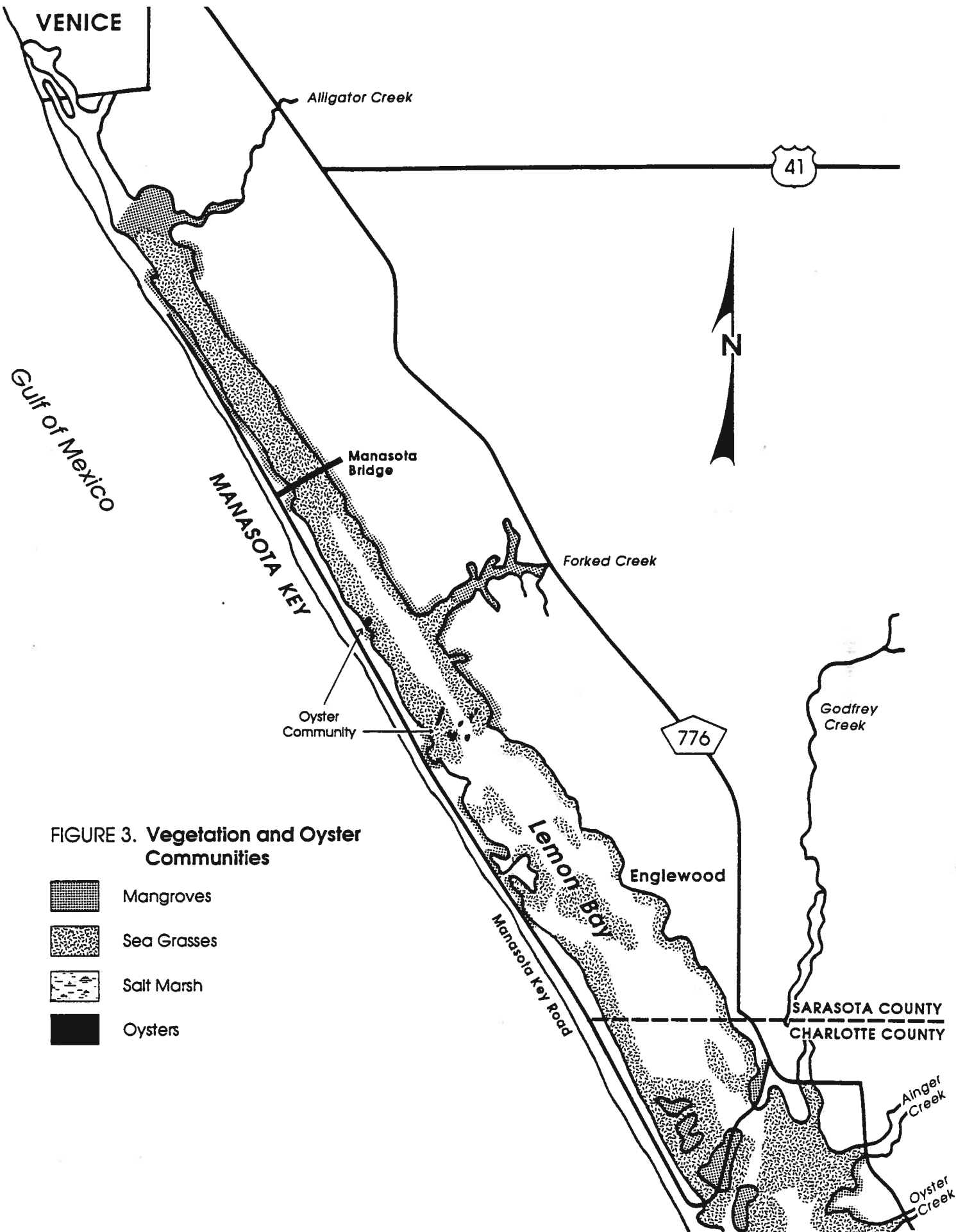






FIGURE 3. Vegetation and Oyster Communities

-  Mangroves
-  Sea Grasses
-  Salt Marsh
-  Oysters

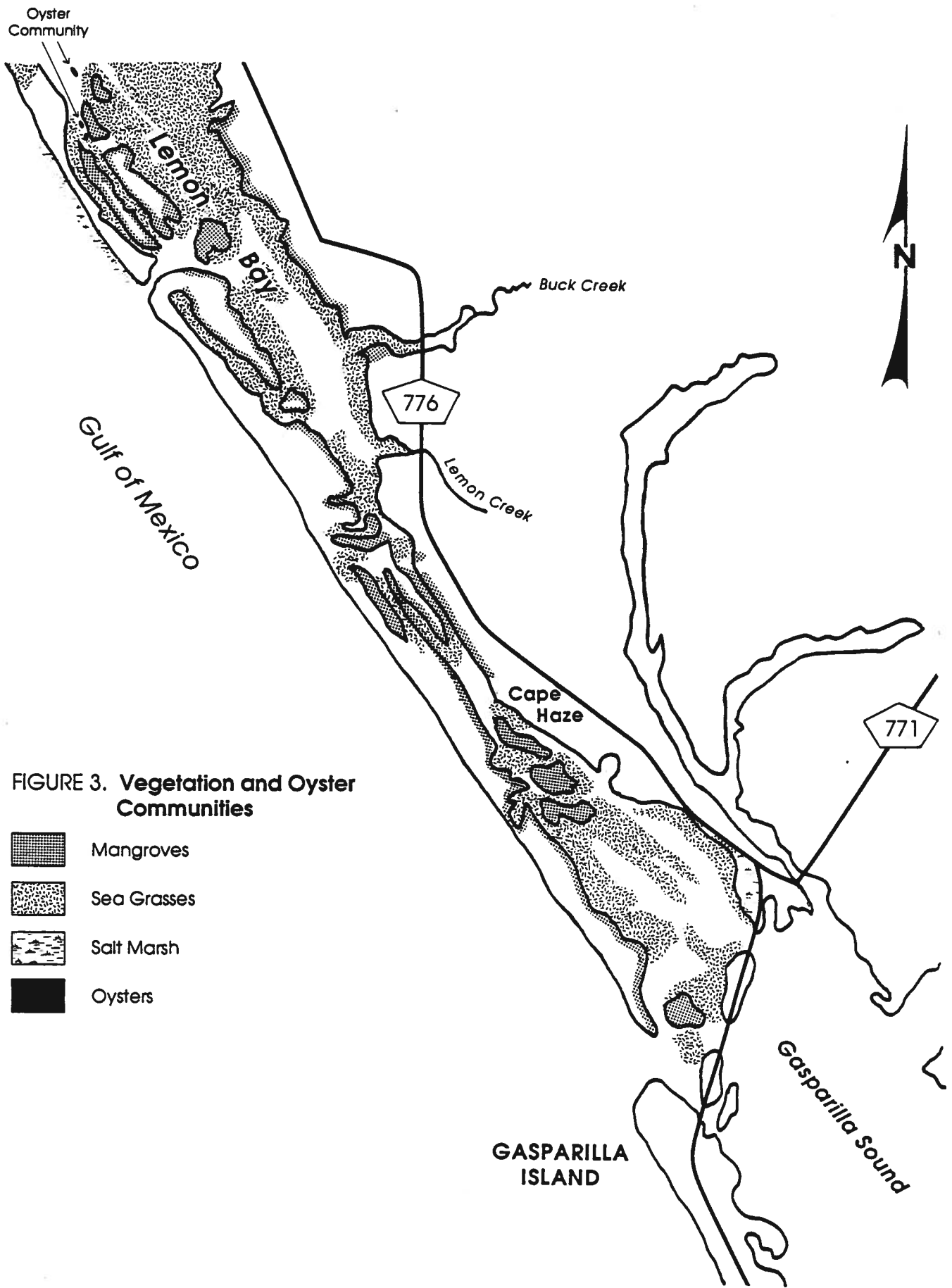






FIGURE 3. Vegetation and Oyster Communities

-  Mangroves
-  Sea Grasses
-  Salt Marsh
-  Oysters

Fauna associated with the seagrasses in Lemon Bay includes many species of macroinvertebrates, fish, algae and birds. Primary feeders on seagrasses include sea turtles, manatees, sea urchins, blue crabs, fiddler crabs, and many fishes. The amount of direct grazing by these herbivores varies with location. In Lemon Bay many seagrass grazing fishes are at their northern limit. Many of these fauna, such as conch, scrape the seagrass blades for epiphytic algae and animals.

Seagrass coverage, density and diversity vary seasonally, yearly and possibly in longer cycles. The principle factors governing seagrass beds development are clarity of the water column at depth and exposure to air during lowest tides. Generally, shoal grass tolerates more exposure and is found both in the shallowest depths and down to the lower light limit. Turtle grass generally occurs deeper, in 3 to 33 feet (1 to 10 meters) when good water clarity is available, because it is less resistant to exposure. Manatee grass is often found intermixed in Thalassia beds and occasionally as an unmixed stand in natural deeper, clearer waters. With optimal depths, water clarity and temperature, seagrasses can grow as fast as 1 centimeter per day.

Seagrasses are negatively affected by reductions in sunlight availability, either from natural causes or human activities. Historically, the bottoms of Lemon Bay Aquatic Preserve were covered with a rich green carpet of seagrasses, except for the deeper river channels, the Gulf passes and the oyster bars. Today the seagrass resources of the preserve have been reduced in area, in the depths at which they occur and in the abundance of the rarer species. In turbid areas of the developed portions of the bay, the maximum depths of the grassbeds can be as shallow as 6 feet.

The human activities which directly and indirectly negatively affect the grassbeds include: direct dredging and filling, turbidity, siltation, pollution from upland runoff and petroleum products, shading by structures and docks and propeller dredging. The productivity of the Lemon Bay estuarine system has been reduced correspondingly. Given all the impacts to these seagrass beds, protection and enhancement of the current extent of the seagrasses and their productivity is essential to the survival of the other functions of the estuarine system.

## **2. MANGROVES**

The second most extensive community within the preserve is the mangrove community. The populations within the preserve are complimented by extensive mangrove fringes and forests landward of the MWHL, just outside of the preserve boundaries.

Mangroves are highly specialized, tropical trees adapted to growing in the varying salinity conditions that occur along the shores and shallow waters of oceans,

estuaries and tidal creeks. The four common species found in the Lemon Bay Aquatic Preserve include: red mangroves (Rhizophora mangle), black mangroves (Avicennia germinans), white mangrove (Laguncularia racemosa), and buttonwood (Conocarpus erectus).

The red mangroves, mixed with black and white mangroves, grow as a fringe of varying width throughout the barrier islands and mainland of the preserve where they have not been removed by human alterations. The most extensive fringes occur along the east shore, north of Forked Creek; along the northeast shore of Manasota Key; along the mainland from Lemon Creek south to Placida; and along the east shore of the barrier islands from Stump Pass south to Gasparilla Pass. Mangrove islands are concentrated along the eastern shore of the barrier islands, from southern 1/4 of Manasota Key south to Knight Key.

As compared to other southwest Florida aquatic preserves, the mangrove forest of Lemon Bay Aquatic Preserve is relatively narrow due to somewhat steeper shoreline topography and past development practices. Classic mangrove zonation finds red mangroves most waterward, black mangroves at slightly higher elevations and white mangroves and buttonwoods landward.

The mangrove forest of the Lemon Bay Aquatic Preserve are a vital component of the estuarine environment providing a major detrital base to organic food chains, significant habitat for arboreal, intertidal and subtidal organisms, nesting sites, cover and foraging grounds for birds and the habitats for less apparent reptiles and mammals.

The relationship between mangroves and their associated marine life cannot be overemphasized. The mangrove forest provides protected nursery areas for fishes, crustaceans and shellfish that are important to both commercial and sports fisheries.

The detritus provided by decomposition of phenologically shed mangrove leaves is the food base for micro-crustaceans and other detrital processors which are consumed by larger crustaceans, small fishes and other first order predators. The animals in turn are the prey of larger fish species such as snook (Centropomus undecimalis), snapper (Lutjanus sp.), tarpon (Megalops atlantica), jack (Caranx sp.), sheepshead (Archosargus probatocephalus), spotted sea trout (Cynoscion nebulosus), and redfish (Sciaenops ocellatus).

This diverse fish community also includes other drums, porgys, grunts, mojarras, mullet, pipefish, flounder, sole, sea robins, toadfish, anchovies, herrings, needlefish, pinfish, silver perch, pigfish, scaled sardines, live bearers, silversides, sea cats, gobies, sharks and rays. At least 230 species of fish depend directly upon the mangrove ecosystem for food, shelter, breeding and/or nursery grounds.

In the southwest Florida region, at least 20 species of reptiles and amphibians, 90 species of birds and 20 species of mammals utilize the mangroves as habitat for feeding, roosting, breeding and/or cover. More than 250 species of arboreal arthropods inhabit the mangrove canopy, branches and wood. Most of the 300 species of local marine invertebrates of Lemon Bay are found in or depend in some part upon the mangrove forests for habitat or food.

Salinity, water and air temperature, tidal amplitude and soil conditions affect mangrove growth form and distribution. In Lemon Bay, the major consistent source of mortality to mangroves is human development and destruction. Although abused by man, the mangrove forests provide shoreline protection by stabilization and considerable storm protection. The sports fisheries and commercial fisheries of Lemon Bay are, in concert with the other submerged habitats of seagrass, algae beds, sand and mud flats and oyster bars, utterly dependent upon the mangrove fringing forests.

The aesthetics of the mangrove canopy with associated birds and fish is a major contributor to the tourist and retirement based economy of the Lemon Bay region. Mangroves also filter water, maintaining water quality and clarity at levels vital for other submerged habitats.

Interlinked with seagrass beds, algae habitats, natural unvegetated bottoms, oyster communities, salt marshes and riverine systems, mangrove forests are the primary components that make Lemon Bay worthy of being an aquatic preserve.

### **3. OYSTER BARS**

Oyster bars and reefs are common in the shallow waters of the preserve. They are commonly found near the mouths of the eastern tidal streams, as well as in other scattered locations, such as across the bay south of Forked Creek and near the mangrove islands north of Stump Pass.

Oysters are bivalve mollusks and the most common species in the preserve are the eastern oyster (*Crassostrea virginica*) and the flat tree oyster (*Isognomon alatus*). Mussels are also bivalves which commonly occur with the oysters, especially the atlantic ribbed mussel (*Geukensia demissa*).

Intertidal oyster reefs range in size from small scattered clumps to massive mounds of living oysters on dead shells. Reefs are limited to the middle intertidal zone, where minimum inundation time determines the maximum reef height. Predation and siltation limit oyster populations in the subtidal zone to scattered individuals.

During ebb tide exposure to the air, living reefs are greenish-brown from a thin film of associated algae. In typical reefs the upper surface is level. Sides slope steeply



at the edges with the living portion of the reef thickest at the perimeter. Central areas tend to trap mud from sedimentation and biodeposition which can smother the live oyster.

At least 50 species of macroinvertebrates are associated with oyster bars including sponges, insects, barnacles, mud, stone and commensal crabs, clams, mussels, anemones, polychaetes, amphipods, and mollusks including oyster drills.

Several bird species, many fish and an occasional raccoon hunt the oyster bars, at appropriate tides, for the reef dwellers and the oysters themselves. Many fish and swimming invertebrates take shelter in the rough topography of the reef to escape predators.

The filter feeding oysters, clams, mussels, sponges and fan-worm polychaetes directly consume the plankton and suspended particulate material from the water column. In the process of concentration of biomass from this food source, filter feeders can also concentrate metals, red tide toxins, certain harvesting human pathogens and exotic anthropogenic chemicals. For this reason shellfish harvesting is allowed only in areas with safe water quality. In Lemon Bay most of the oyster bars are in prohibited areas due to high fecal bacteria runoff from human sources in the adjacent tributaries.

Digging of clams from the unvegetated and vegetated soft bottoms is the active shellfish harvesting of this preserve. With each biannual review of the Lemon Bay Aquatic Preserve shellfish harvesting waters, the areas of approved shellfish harvesting waters continue to decrease as water quality declines.

Oyster bars fill a major trophic role in the conversion of carbon and nutrients from phytoplankton and detritus to animal biomass available to higher order consumers including blue crab (Callinectes sapidus), black drum (Pogonias cromis), American Oystercatchers (Haematopus palliatus), oyster drill (Urosalpinx cinerea), stone crab (Mennippe mercenaria), and Herbst's mud crab (Panopeus herbstii).

Concurrent with their metabolism, the oysters, their associated fauna, and aerobic bacteria mineralize organic carbon and release nitrogen and phosphorus in forms usable by primary producers such as phytoplankton, benthic algae, seagrasses, mangroves and marsh grasses. Oyster reef communities have among the highest measured metabolic rate of any benthic community.

Oysters in reefs live close to their stress tolerance threshold. Further perturbation of conditions by man can easily destroy the entire reef community. Dredging turbidity, man-made chemicals, heavy metals, and artificial hydraulic changes and oxygen depletion by over-nutrition and sediment disturbance all contribute to the continual loss of live oyster reefs in Lemon Bay (Sprague et al., 1986).

#### 4. SALT MARSH COMMUNITIES

Salt marshes are low, wet, flat lands dominated by salt tolerant rushes and cordgrasses. In general, they occur along areas of protected coasts and inland along tidal creeks. The vegetation often occurs in distinct zones in the interconnected shallow channels that affect tidal action and salinity in the water and soils. Some species are tolerant of tidal and salinity changes and can be found throughout the marsh. Others occur only in areas with a particular combination of these factors.

The salt marshes of the Lemon Bay Aquatic Preserve are typically dominated by black needlerush (*Juncus roemerianus*) in tidal creeks and smooth cordgrass (*Spartina alterniflora*) in the bay proper. They occur only in small scattered locations in the preserve, associated with the mangrove communities. The most extensive areas occur along the south edge of Manasota Key and the southwest edge of Placida Harbor.

In combination with mangrove forests and seagrass beds, the salt marsh forms the detrital food base for the fisheries of Lemon Bay Aquatic Preserve and Placida Harbor. The salt marsh is one of the most productive natural ecological systems.

The marsh is the habitat for the early life stages of many finfish and shellfish species as they feed on the numerous invertebrate animals in the mud and vegetation. Many wildlife species including ducks, geese, deer, raccoons and migratory birds, utilize the marsh on a regular or seasonal basis to consume this productivity and occasionally become part of the food chain themselves.

Salt marshes perform important functions in the stabilization of shoreline and moderation of boat wake. The nutrient uptake and water purification qualities of salt marshes continue to be underrated and relatively unstudied. Large areas of salt marsh have been destroyed in the development of Lemon Bay shoreline for residential purposes with the subsequent decline in water quality.

The coastal salt marshes of the Lemon Bay Aquatic Preserve consist of a low marsh of black needlerush and a high marsh of saltgrass (*Distichlis spicata*). The black needlerush can extend from the lower marsh landward to the upper marsh. It forms wide monocultures at the most waterward edge of the marsh. Occasionally the smooth cordgrass (*Spartina alterniflora*), a tall emergent grass, can be found in low regularly flooded marsh. Black needlerush provides the major detrital contribution to the local marshes.

Landward, the middle marsh includes the black needlerush in combination with a variety of tougher grasses. Marsh cordgrass (*Spartina patens*), provides a soft bunchgrass cover favored by nesting birds. Its seeds and stems provide food for numerous insects and rodents of the marsh system. Four different low growing

grasses can be found including: seashore dropseed (Sporobolus virginicus); seashore knotgrass (Paspalum distichum); saltgrass (Distichlis spicata) and key grass (Monanthochloe littoralis). Each of these grasses can occur together or separately in the middle or upper marsh above the normal high tides but where seasonal high tides will inundate the soil.

Interlaced with the grasses or often occurring alone are several viney and low growing herbs including sea blite (Suaeda linearis), sea purselane (Sesuvium portulacastrum), the saltwort (Batis maritima), and the annual and perennial glasswort (Salicornia bigelowii and S. caroliniana). These herbs possess fleshy succulent water retaining leaves and are often colored orange or red in areas of high salinity.

At the high marsh, shrubs are able to grow in regions with suitable drainage and sufficient freshwater. These shrubs include saltbush (Baccharis halimnifolia), marshelder (Iva frutescens), wax myrtle (Myrica cerifera), sea-ox-eye daisy (Borrchia frutescens and B. arborescens). Each of these plants possess distinctive leaf shapes and fruits which conserve water and protect against the heat and dryness of the high marsh. Where the high marsh does not drain well and high tidal events become ponded, the soils often become saturated with salt and other minerals resulting in variably sized regions of bare sands with areas of the mentioned herbaceous creepers, the low grasses and black needlerush.

Some common mammals of natural undisturbed salt marsh systems include deer, otter, raccoon, opossum, rice rats, muskrats, and bobcat.

Almost all of the common wading birds and waterfowl of Florida utilize salt marsh habitats including the egrets, herons, bitterns, coots, gulls, terns, seaside sparrows, pelicans, wood storks, roseate spoonbills, ibis, ducks, geese, willets and stilts. Many predatory birds including bald eagle, osprey, falcons, hawks and kestrels live in and/or feed in the marsh.

The reptiles of the salt marsh include alligator, terrapin, salt marsh snakes, water moccasins, ribbon and garter snakes, and in fresh water systems various turtles.

The abundance and the productivity of the salt marsh is established and maintained by the dynamic forces of tides, winds (including storms), seasonal changes, runoff from upstream systems and the spatial and nutritive contributions of soils and vegetation. Left alone the salt marsh provides a wide variety of habitats for animals, including man. Disturbed or destroyed by development contributions to fisheries and wildlife are degraded or lost forever.

## 5. TIDAL CREEK WETLANDS

Historically, the riverine wetlands of the Lemon Bay Aquatic Preserve were much more extensive both in aerial extent, habitat value and relative contribution to the estuarine system. Today, channelization, bulkheading and fill has reduced this natural habitat to pockets of undeveloped shoreline.

The low tidal creek reaches display a mixture of mangrove and salt marsh vegetation discussed previously. Further upstream, the less saline mixture of upland watershed drainage with the Lemon Bay waters provides a zone of wide salinity variations which can support up to 29 species of plants that can grow in saline soil (halophytes). These wetlands are the border between the mangroves/salt marsh communities of the preserve and the freshwater wetlands above the aquatic preserves boundaries.

The dominant plant species change in response to seasonal variations in salinity, water volume, air and water temperature, nutrient loading and grazing pressures. Diversion of fresh water by unnatural water control projects and activities shifts plant species composition in favor of more salt tolerant plants.

The gross productivity of riverine wetlands increases when surface freshwater input increases; however net production decreases because of stress associated with osmotic regulation (pressure differences from different salinities). The net productivity is optimal at medial salinity. In these moderate to low salinity waters a wide variety of plant communities can develop depending on sediment, elevation and season.

Widgeon grass (Ruppia maritima), a submerged grass tolerant of wide salinity changes, vegetates sandy shallow channels providing habitat for fishes and invertebrates in similar fashion to seagrasses. Other brackish tolerant submerged vegetative beds include tape grass (Vallisneria americana), pond weed (Potamogeton illinoensis), marine naiad (Najas marina) and a wide variety of 46 associated algae species.

Creek banks below the mean high water support a variety of emergents including bulrushes (Scirpus sp.), fingerushes (Fimbristylis sp.), other rushes (Juncus sp.), spikerushses (Eleocharis sp.), cattails (Typha sp.), giant reed (Phragmites communis), leather fern (Acrostichum sp.), saltgrass (Distichlis spicata), knotgrass (Paspalum distichum), various cordgrass (Spartina sp.), several asters (Aster sp.), pinks (Sabatia sp.), coast water hyssop (Bacopa monnieri), and many of the salt marsh herbs.

Further inland the creek systems become fresher, but these areas are not within the current aquatic preserve boundaries. This artificial boundary to a fluid continuum ignores the strong habitat connectivity and water quality effects of these creeks systems on the Lemon Bay Aquatic Preserve.

The health of the estuary depends upon the health of its tributaries. If the riverine wetlands are destroyed, the creeks channelized and the water quality degraded in the watershed external of the preserve boundaries, it is not possible for the Lemon Bay Aquatic Preserve to retain its fisheries, wildlife habitat and water quality values.

## 6. UNVEGETATED SOFT BOTTOM SAND AND MUD FLATS

The apparently unvegetated soft bottom community is a misunderstood and undervalued component of the Lemon Bay estuary. Naturally occurring, undisturbed unvegetated bottoms are rich in animal biomass and can display high diversities of invertebrates and fishes. Knowing where and when to look is important. The principal sand and mudflat community is buried beneath and within the unvegetated substrates. The community includes an extensive macroinvertebrate community, along with birds and micro algae.

The macroinvertebrates found in the softbottoms and mudflats of the preserve are diverse. These same animals are also found throughout the mangrove and seagrass communities. The macroinvertebrates include species from the classes of bivalve mollusks, gastropod mollusks, polychaete worms, crustaceans and tunicates as well as from the echinoderm phylum.

Some of the common bivalve mollusks in the preserve, in addition to the oysters and mussels, include: hard shelled clams (Mercenaria), razor clams (Salecortus cumingiamus) and (Ensis minor), donax clams (including Donax variabilis), lucines (Lucina sp., Anodantia alba and Codakia sp.) and many others.

Numerous species of gastropods, which are also associated with seagrass and algae beds, live on and within the sand and mudflats. Often in amazing abundance, the species include: Florida Crown Conch (Melongena corona), whelks (Busycon sp.), nassa mud snails (Nassarius sp.), horse conchs (Pleroplaca gigantea), tulip conchs (Facialaria sp.), moon snails (Polinices duplicatus), and horn shells and ceriths (Batillaria minima, Cerithidea sp. and Cerithium sp.).

The polychaetes include burrowing segmented worms and filter feeding segmented tube worms. Other worm phyla are represented by burrowing flatworms and ribbon worms.

The echinoderms present include burrowing crustaceans, brittle starfish and sand dollars. The mollusks, polychaetes and echinoderms scavenge, hunt and filter-feed within the unvegetated substrates.

The crustaceans include crabs, amphipods and commercial shrimp. The intertidal flats support abundant burrowing crab (Uca sp. and Sesarma sp.) colonies which forage in coordination with tidal cycles.

The predatory, bottom feeding fishes flourish in these areas of naturally diverse often patchy bottom habitats. Many mobile invertebrates and fishes which avoid open, unvegetated areas during the day forage across these flats nocturnally.

Wading and shore birds, including sandpipers, dowitchers, willets, plovers, egrets, herons and ibis hunt the denizens of the flats by probing the substrates and snatching the exposed invertebrates.

Benthic micro-algae are often present in more consolidated substrates providing a pale pink, green, brown or black hue to surface sand/mud layers. The natural unvegetated bottom observed today is often the seagrass bed, algae bed or oyster bar of tomorrow given the proper conditions and freedom from disturbance. Frequently, when areas are observed in mid-winter the vegetation component is not apparent. The same site examined in mid-summer can be a lush seagrass bed.

## 7. MACRO ALGAE COMMUNITIES

Within the Lemon Bay Aquatic Preserve the primary types of algae growth are: those which grow on the soft sediments; epiphytic (attached) species that utilize seagrasses, mangroves, or emergent marsh grasses; the algae which require a hard substrate to anchor such as oyster bars, rip-rap rubble, and occasional native limerock outcropping; and the unattached drift algae.

The only algae able to remain in the soft sand and mud substrates utilized by seagrass are mat-forming algae and the Siphonales green algae which have creeping rhizoid anchor. These include Halimeda, Penicillus, Caluerpa, Rhipocephalus and Udotea. They have limited substrate stabilization capability when compared to seagrasses. They are able to survive in more shifting sediments however and are often considered as a prior successional stage for seagrass establishment. The algae provide primary food production and deposit large quantities of calcium carbonate or lime mud from their skeletons upon seasonal die back.

The epiphytic algae are a diverse assemblage of algae belonging to the red, blue-green, green and brown algae phyla. There are many species, with more than 100 species recorded from turtle grass alone (Humm, 1964).

The turnover of the epiphytic community is rapid since a seagrass blade's lifetime is 30 to 60 days. The epiphytes increase the primary productivity of seagrass beds and can account for 18% to 33% of community metabolism. Many animals feed directly on these epiphytes. Heavy growth of encrusting coralline algae, however, can damage seagrass blades by reducing photosynthesis. Also, blue green algae epiphytes can fix molecular nitrogen which is utilized by seagrass (Goering and Parker, 1972).

Hard substrate algae consist of hundreds of species from all of the major macroalgae phyla. Natural bottoms of the Lemon Bay Aquatic Preserve provide few hard abiotic surfaces, with old exposed shells (oysters, clams and whelks) and some areas of exposed bed rock the principle natural mixed abundances of these plants where water quality and clarity is good.

The drift algae species begin growth attached to a firm substrate, plant or inorganic, and subsequently become detached by wave action, grazing or mechanical disturbance. Large masses travel, like organic tumbleweeds, on the tides and currents providing shelter and food sources for many small invertebrates and fishes, often where no other cover would be available. The drift algae of the Lemon Bay Aquatic preserve are commonly the red algae, Gracilaria and Laurencia which seasonally peak in abundance and concentration from July to December.

## **8. PHYTOPLANKTON**

Phytoplankton are microscopic, floating algae. Their contributions to the estuarine productivity and food chain is often overlooked because of their microscopic size and seasonality. Diatoms and armored flagellates comprise the major abundance and diversity of the phytoplankton. Together with the benthic (bottom) and epiphytic (attached) algae, phytoplankton are essential to zooplankton, the larval life stages of crustaceans and fish species, and filter feeding mollusks, such as clams and oysters.

Productivity of the phytoplankton community is seasonal with different species assemblages resulting from changes in temperature, day length, water quality and clarity, nutrient balance and grazing pressures. Imbalances in these factors result in algae blooms including the notorious red tide. Although phytoplankton productivity is on the average, one sixth of macrophytic production system wide, its productivity is directly available often at critical periods in consumers' life cycles. In combination with bacteria and saprophytes, the epiphytic microflora mediate the productivity of mangroves, seagrass and salt marsh plants by converting their detrital biomass to nutritive forms digestible by animals.

The importance of this less apparent plant community should not be underestimated in evaluating the factors important to estuarine and marine fisheries of the Lemon Bay Aquatic Preserve.

## **B. DESIGNATED SPECIES**

The Florida Game and Freshwater Fish Commission (1987) compiles the official list of endangered flora and fauna in Florida. Table I lists endangered, threatened, and species of special concern which are found in the preserve (Drew and Schomer, 1984).

For management of designated plant species in the aquatic preserve, the Florida Department of Agriculture and Consumer Services (list published in Preservation of Native Flora of Florida Act, Section 581.185.187, F.S.) is the primary reference source. For management of designated animal species in the aquatic preserve, the Florida Game and Fresh Water Fish Commission (19st published in 29-27.03-05, F.A.C.) is the primary reference source.

**TABLE 1**

**DESIGNATED SPECIES KNOWN TO OCCUR IN OR  
TO BE DEPENDENT UPON THE LEMON BAY AQUATIC PRESERVE.**

COMMON/SCIENTIFIC NAME	STATUS		
	FGFWFC <sup>2</sup>	FDA <sup>3</sup>	USFWS <sup>4</sup>
<b>PLANTS</b>			
Golden leather fern <u>Acrostichum aureum</u>		E	
Giant leather fern <u>A. danaeifolium</u>		T	
Satin leaf <u>Chrysophyllum olivaeforme</u>		E	
<b>FISH</b>			
Common snook <u>Centropomus undecimalis</u>	SSC		
<b>AMPHIBIANS AND REPTILES</b>			
American alligator <u>Alligator mississippiensis</u>	SSC		T(S/A)
Atlantic loggerhead <u>Caretta caretta caretta</u>	T		T
Atlantic green turtle <u>Chelonia mydas mydas</u>	E		E
Atlantic ridley <u>Lepidochelys kempfi</u>	E		E



TABLE 1 (cont.)

COMMON/SCIENTIFIC NAME	STATUS		
	FGFWFC <sup>2</sup>	FDA <sup>3</sup>	USFWS <sup>4</sup>
<b>BIRDS</b>			
Roseate spoonbill <u>Aiaia ajaja</u>	SSC		
Snowy plover <u>Charadrius alexandrinus tenuirostris</u>	T		UR
Piping plover <u>C. melodus</u>	T		T
Little blue heron <u>Egretta caerulea</u>	SSC		
Reddish egret <u>E. rufescens</u>	SSC		UR
Snowy egret <u>E. thula</u>	SSC		
Tricolor heron <u>E. tricolor</u>	SSC		
American oystercatcher <u>Haematopus palliatus</u>	SSC		E
Bald eagle <u>Haliaeetus leucocephalus</u>	T		E
Wood stork <u>Mycteria americana</u>	E		
Brown pelican <u>Pelecanus occidentalis</u>	SSC		
Least tern <u>Sterna antillarum</u>	T		
<b>MAMMALS</b>			
Chadwick beach cotton mouse <u>Peromyscus gossypinus restrictus</u>	E		UR
Florida mouse <u>Peromyscus floridanus</u>	T		
Sherman's fox squirrel <u>Sciurus niger shermani</u>	T		UR
West Indian manatee <u>Trichechus manatus latirostris</u>	E		E

- E = Endangered
- T(S/A) = Threatened Due to Similarity of Appearance
- T = Threatened
- SSC = Species of Special Concern
- UR = Under review for federal listing.

2. Florida Game and Freshwater Fish Commission (list published in Section 39-27.003-005, F.A.C.)

3. Florida Department of Agriculture and Consumer Services (list published in Preservation of Native Flora of Florida Act, Section 581.185-187, F.S.)

4. United States Fish and Wildlife Service (list published in List of Endangered and Threatened Wildlife and Plants, 50 CRF 17.11-12).

Citizens of the Lemon Bay area are helping to monitor the number of Manatees in the preserve. Manatee Sighting Data Sheets have been prepared by the American Littoral Society/Englewood Branch. The data sheets are being used by concerned citizens and high school students to record the number, location and conditions of manatees sighted in the area. The data is forwarded to Mote Marine Laboratory in Sarasota and DNR's Marine Research Institute to assist with on-going manatee research. The Lemon Bay High School students also track the data and keep an up-to-date visual display of the information.

A list of the species of plants and animals found in the aquatic preserves in southwest Florida can be obtained from the DNR Southwest Florida Aquatic Preserves Office. More detailed, site specific data for the Lemon Bay Aquatic Preserve will be available upon completion of pending resource inventories.

The biological communities in the Lemon Bay Aquatic Preserve are unique and diverse. The communities are interrelated and a change in one will directly or indirectly cause changes to the other communities. The detailed inventory is need to compare future changes in the composition and extent of the communities, positive and negative, to.

The area was designated as an aquatic preserve for the purpose of maintaining and protecting these biological resources in essentially natural conditions for the benefit of present and future generations. A discussion of the cultural resources affecting these biological resources follows.

## **PART III: CULTURAL RESOURCES**

### **A. INTRODUCTION**

The biological and physical resources of the preserve affect, and are affected by human activities, past and present. In the past, saltwater fisheries, freshwater drinking supplies and a variety of wild game food sources attracted cultures to the area. Today, the natural resources, recreational opportunities and aesthetics associated with Lemon Bay also attract residents, tourists and commercial interests. The resources of the bay form the support of the economic base of the area.

The archeology, history, existing land use, existing use of the natural resources, future land and resource use, and potential future concerns are described below as they relate to the other resources of the preserve and the management decisions that follow.

### **B. ARCHEOLOGY**

The lengthy time period and sparse settlements of prehistoric indian cultures in the Lemon Bay area are reflected in the number of local archeological sites. There are 34 archeological sites in and adjacent to the Lemon Bay Aquatic Preserve in Sarasota and Charlotte Counties, including 27 shell middens, 3 burial sites and mounds and 1 artifact scatter.

The first humans in the Lemon Bay area were the nomadic hunting and foraging Paleo-Indian peoples, from 12,000 to 6,500 B.C. The natural resources of the area were different at that time; the sea level was 100 feet lower, the uplands were covered with savannah and grasslands and fresh water was hard to find. The Paleo-Indian populations were small and they moved between water sources, hunting large and small game including: mammoths, horses, deer, tortoises and sloths. Small groups would use large tracts of land to support themselves, leaving behind small riverside camp sites of artifacts and simple stone tools.

The next group of people in the area had to adapt to a drier climate, a higher sea level, hardwood forests, fewer large mammals and increasing population numbers. This was the Early Archaic period from 6,500 to 5,000 B.C.. This culture began to utilize different food sources of hardwood nuts, freshwater snails and oysters.

Social patterns changed in response to food supplies. At times the populations would break into small family units and at other times they would gather together in large groups. The archaeological sites associated with the congregated groups

are large, located near limestone and chert quarries and contain many, more advanced tools designed for a variety of activities.

The Middle Archaic period, from 5,000 to 3,000 B.C., is characterized by hunting camps, central base villages - such as Little Salt Springs, longer residence times and increased woodworking tools. The climate became wetter and the vegetation gave way to pine forests. At this time, about 4,000 B.C., the large shell middens began to accumulate along the rivers. The presence of the middens indicates that significant numbers of people began to live on the coasts, at least for parts of the year.

Manufactured and fired clay pottery first appeared in the Lemon Bay area during the Late Archaic period, from 3,000 to 1,000 B.C. This time was followed by an important transition period from 1,200 to 500 B.C.. During this time the hunting and foraging Archaic cultures transitioned into regional, agricultural cultures along the coasts, leaving the interior forests relatively unpopulated. They showed increased cultural interactions within and beyond the Florida peninsula. With larger populations, they left behind dense village middens.

From 500 B.C. to 200 A.D., the Deptford culture inhabited the Lemon Bay area, creating distinctive pottery and utilizing coastal resources such as fish, shellfish, deer, plants and other wild food. Occasionally groups would move inland up the river valleys to gather specific food supplies such as nuts, berries and other river valley products. This movement made trade and cultural contact possible with noncoastal cultures. These sites are rarely deeply stratified or large which indicates that the populations were small or the sites were inundated by sea water. The coastal villages were nearly always located in live-oak, magnolia hammocks adjacent to salt marshes, providing the food source of live oak acorns and sabal palmberries.

Around 1 A.D., changes occurred in the Lemon Bay area to the Deptford culture which did not occur in other locations. The changes appear to have been motivated by the coastal location and corresponding ability to facilitate trade exchange with the Gulf coastal plain cultures, the woodland people of the north and the south Florida people. This Manasota culture of the Lemon Bay area, from 500 B.C. to 800 A.D., lived directly on the coast or the coastal flatlands, had increasing population numbers and plain pottery. They hunted deer, raccoon, bear, opossum and other small mammals; collected a variety of shellfish, marine fish and turtles and plants; and cultivated squash and corn. Later, the populations began to move inland from the coast to areas more suitable for horticulture, where they established ceremonial centers and villages.

Following the Manasota period, the Weeden Island culture occupied the Lemon Bay area until about 1400 A.D.. At that time, the Safety Harbor culture had been

established from Tarpon Springs south to Sarasota, including the Lemon Bay area at its southern limits. The culture was more complex, leaving behind at least thirteen mound-village complexes, concentrated around Tampa Bay. They used some of the social and political ideas from the Mississippian cultures, but rejected the intensive agriculture ideas that weren't suitable for the southwest Florida region. This culture was associated with the Tocobaga Indians who were met by the Spanish explorers of the 1500's.

### **C. HISTORY**

From the Safety Harbor Culture, the group of Tocobaga Indians developed and were living in the Lemon Bay area when the Spanish explorers arrived during the sixteenth and seventeenth centuries. Although the Spanish contact with the Indians was limited, it brought European diseases to the Tocobagas which rapidly decimated the populations. In addition, during the 1560's, warfare occurred between the Tocobaga and the Calusa for control of villages in the Lemon Bay Area. The fighting was part of the Calusa expansion into the sparsely occupied lands south of the Safety Harbor center at Tampa Bay.

In 1513 when Ponce de Leon first encountered Florida, the Calusa Indians controlled an area from north of Charlotte Harbor south to Cape Sable and from the Gulf of Mexico west to Lake Okeechobee, including Lemon Bay and all the other Southwest Florida Aquatic Preserves. The barrier islands of the preserve were visited by explorers in 1513, 1521, 1528, 1539 and 1566.

Pirates, buccaneers and freebooters frequented the Lemon Bay islands and coastlines during the eighteenth and nineteenth centuries.

Cuban fisherman and settlers utilized the Lemon Bay area during the 18th Century for seasonal fishing and cultivating citrus fruit on the mainland. The settlers often used the high ground created by Indian mounds as building sites, leaving their own china and pottery artifacts in the upper layers of the mounds.

The major historical and development events of the next 170 years were as follows:

In 1821 Florida became an American territory. The Tocobaga and Calusa were extinct, replaced by the Seminoles, who were scheduled to be moved west of the Mississippi River by the federal government.

In 1835-42 and 1855-58, the Second and Third Seminole Wars took place, respectively.

On March 3, 1845, Florida became a state and the Lemon Bay area first became part of St. Johns County, then Hillsborough County and finally Manatee County.

In 1878 the first documented American settler established the Goff homestead.

In 1886 the Florida Southern Railroad brought wealthy tourists to the Lemon Bay area, and delivered fish, timber and turpentine to northern markets from the area waters and uplands.

In 1887 Desoto County was split from Manasota County.

From 1893 to 1896, the Nichols Brothers moved to the area and established the Town of Englewood on Lemon Bay.

During the late 1890's and early 1900's, commercial fishing was a primary economic force in the Lemon Bay area, especially in Englewood. During that time, more than a million pounds of fish, mostly mullet were shipped out of the Lemon Bay area each year.

In 1921 Charlotte and Sarasota Counties were divided from DeSoto County.

In 1925 the community of Englewood acquired a hardware store, post office, casino, town hall and fish house.

In the 1920's and 1930's the Bass Laboratories pioneered the field of Marine Biology in New Port, operating a biological supply house, using Lemon Bay's abundant fauna and flora.

In 1940 the commercial fish house at Gasparilla Village on Gasparilla Island was moved to the mainland in Placida, where it operates today as the main commercial fish house for lower Lemon Bay and Gasparilla Sound.

In the 1930's to 1950's, commercial fishing, agriculture, low intensity tourism and excellent sport fishing were the principle activities in the Lemon Bay Area.

In 1955 the first building in Port Charlotte was built by General Development Company on the 80,000 acres they had purchased.

In 1958 Punta Gorda Isles, a development with an extensive salt water canal system, began construction. The city of Punta Gorda annexed each phase of the development as it was completed, resulting in a five fold increase in the size of the city.

Between 1930 and 1980, Punta Gorda, Port Charlotte and coastal residential development expanded in the Lemon Bay area. The barrier island beaches and

estuary waters became, and continue to be, the principle recreational destinations for the residents of Sarasota and Charlotte Counties and out-of-state winter tourists. The population of the Lemon Bay area expanded 1500% during that time.

In 1971 the Lemon Bay Conservancy was formed as a non-profit citizens organization for the preservation, protection and acquisition of important natural areas of Lemon Bay.

In 1986 Lemon Bay was designated as an aquatic preserve in a significantly suburbanized area, which continues to develop at a rapid rate.

In 1988 the first annual Lemon Bay Conference was held to inform and involve citizens in the protection of Lemon Bay resources.

The current and future land and water uses of the Lemon Bay Aquatic Preserve and adjacent areas are described in the following sections.

#### **D. EXISTING ADJACENT LAND USE**

Human activities located directly on the Lemon Bay shoreline as well as in the land area draining to the bay affect the health of the biological resources of the bay. Activities along the shore can directly destroy shallow water vegetation and habitat in the estuary. Upstream activities can degrade complimentary biological habitats in the streams, plus carry pollutants and sediment into the estuary, degrading water quality.

The more intensely the adjacent and watershed (drainage area) land is used, the greater the potential is for sediment, nutrients, bacteria, metals and other toxic materials to be carried into the bay with runoff from city streets, shopping center parking lots, fertilized suburban lawns and septic systems.

#### **1. DESCRIPTION OF THE WATERSHED**

Lemon Bay is 13 miles long. The watershed draining into the bay and its 7 adjacent tidal creeks is 16 miles long, extending from the headwaters of Alligator Creek northeast of South Venice, south to Placida. The drainage area is 6 miles wide at its widest, near Oyster Creek south of Englewood. It narrows to less than .5 mile wide at Placida.

Including the barrier islands on the west and the drainage area of the creeks to the east, the area of the watershed is about 73 square miles (46,720 acres). The exact boundaries of the watershed are difficult to delineate due to the flat, wetland topography and the large number of artificial drainage canals that have been created.

The natural boundaries of the bay and watershed cross the political boundaries of the Sarasota/Charlotte County line. The bay itself has an area of about 12 square miles (7,667 acres), of which the southern 3/4 is in Charlotte County and the northern 1/4 in Sarasota County. However, because of the shape of the bay, the shoreline, totalling over 40 miles, is more equally distributed between counties. Of the total shoreline miles of the bay, about 55% are in Charlotte County and 45% are in Sarasota County (22 and 17 miles, respectively). Surprisingly, only 1/3 of the watershed area (24 square miles/15,360 acres) is located in Charlotte County, with the remaining 2/3 (49 square miles/31,360 acres) in Sarasota County. Therefore, even though a quick glance at the nautical chart gives the impression that Lemon Bay is located mostly in Charlotte County, a closer look at the watershed shows that both counties share in the responsibility for managing the tributary resources.

Additional note: The following land use estimates are based on available county statistics, air photos and a cursory watershed survey conducted by DNR staff in May 1991. In some cases, as indicated, the numbers relating to the Lemon Bay watershed are extrapolated from county data based on the percent of the county that falls within the watershed. For Charlotte County, 3% of the county area falls within the Lemon Bay watershed. For Sarasota County, 9% of the county area is within the watershed.

## **2. GENERAL WATERSHED LAND USE**

The shoreline land use of the mainland and barrier islands adjacent to the bay is currently about 2/3 developed in urban, residential and commercial uses. The remaining third of the shoreline is in vegetated, natural condition. The percent of the shoreline that is developed is the same in both counties, but Charlotte County has a slightly greater number of urban shoreline miles in the aquatic preserve than Sarasota County (about 15 miles and 11 miles, respectively).

The watershed land use is overall less densely developed than the shoreline. Of the total watershed, about 24 square miles (15,460 acres) or 1/3 is in urban use. The remaining 2/3 of the area is in rural land use. The rural areas are located in the eastern watershed, south of US 41 and east of SR 776/SR 775 to the tributary headwaters. Of the 49 square miles of rural land, over 3/4 of it is in agricultural use, almost exclusively of pasture and woodland. A significant amount of the pasture and woodland falls in wetlands.

The urban/residential/commercial areas are concentrated in the western watershed, between the Lemon Bay shore and the SR 776/SR 775 corridor and north of US 41. As much as 90% of the watershed population lives in this area. These dense urban areas are located in the most biologically sensitive mangrove and salt marsh estuarine shoreline and tidal creek areas of the preserve and the



watershed. The combination of the intensity of the land use and the sensitivity of the resources causes the majority of the watershed's adverse habitat impacts to originate in these urban areas.

The population in 1990 for Charlotte County was 110,385 and for Sarasota County was 277,776. Extrapolating from the percent of each county falling within the watershed, the watershed population is about 28,000 permanent residents. Winter residents increase the population by 30% during January, February and March, along with the addition of the out-of-state tourists. Of the overall watershed population, approximately 25,000 people live in the urban areas adjacent to the aquatic preserve.

### **3. LAND USES IN THE URBAN AREA OF THE WATERSHED**

Because the urban areas generate the majority of the adverse resource impacts and are located closest to the aquatic preserve, they are described with additional detail here. The major categories of urban land uses in the watershed include: single family residential, multi family residential, commercial, public recreation and preservation. These land use categories are used to make management decisions affecting the aquatic preserve, including the determination of the management areas described in Chapter IV of this plan. The related, less extensive urban uses include: wastewater treatment, artificial canals and transportation.

**a) Single Family Residential:** This category includes single family houses, manufactured homes and mobile homes. The houses can be located close together or far apart, giving relatively low, medium or high densities. The higher the housing density is, the greater the area of roof and street surfaces is which is impervious to infiltration and filtering of stormwater. Larger areas of impervious surfaces cause greater volumes and rates of stormwater runoff, erosion and pollutant loads to receiving waters.

There are more than 46 single family housing areas in the urban areas of the watershed. Thirteen single family housing areas are located on the barrier islands. Commonly the houses are less than 20 years old, built on cement slabs and have grass ditch stormwater conveyance systems. Slightly over half (24) have relatively moderate housing density, 1/4 (12) have high density and 1/4 (10) have low density. The high density areas include the central parts of Englewood, South Venice and Grove City, as well as Point of Pines south of Englewood, Manasota Key near the Tom Adams bridge and parts of Little Gasparilla Island.

**b) Multi Family Residential:** This category includes apartment and condominium complexes and clusters of rental cottages. There are at least 22 multi family areas in the urban areas of the watershed, with at least 7

located on the barrier islands. They are generally less than 20 years old and have large amounts of impervious roof top and parking areas. Two thirds (14) of the multi family residential areas are high density, 6 are medium and 2 are low density. The low density areas are rental cottages along the bay by Englewood and in the central part of Manasota Key. The high density areas include: Manasota Key near the end of the Tom Adams Bridge; Manasota Key along Manasota Key Road north of the Tom Adams bridge; along SR 776 north of Englewood and parts of Little Gasparilla and Knight Islands.

**c) Commercial:** This category includes central business districts, commercial strip shopping areas, hotels/motels/restaurants, commercial fish houses and marinas. Almost all of the surfaces of commercial areas are impervious to stormwater runoff and have higher levels of pollutants associated with the parking areas. There are at least 48 commercial areas of different sizes in the watershed. At least 9 are located on the barrier islands. Twenty of the commercial areas are associated with marinas, at least 1/3 of which have lodging and/or restaurants associated with them. Marinas have the added potential problems associated with fueling and sewage pump-out facilities.

There are 5 major commercial centers in the watershed, including: Englewood along SR 776/SR 775, Grove City along SR 775; Merchants Crossing at the junction of SR 775 and SR 776; Manasota Key at the end of the Tom Adams bridge and US 41 north of the junction of SR 775. The 20 commercial strips vary in size one convenience store to over a city block long. They follow the SR 775, SR 776 and US 41 road corridors, especially north of Placida, north of Englewood and east of the SR 775/SR 776 junction.

**d) Public Recreation:** This category includes upland areas used by the general public for recreation at no charge as well as federal, state, county and municipal parks that charge a nominal fee. There are 7 county and state recreation areas adjacent to the aquatic preserve. There are 5 beach/water access parks, four of which are located on the barrier islands. The three Sarasota County parks are Manasota Beach (about 5 acres), Blind Pass Beach (63 acres) and Indian Mound Park. The two state recreation areas are Port Charlotte Beach (213 upland/32 submerged acres) and Don Pedro (165 acres). Of the 3 public boat ramps, all are operated by the county and 1 is located on the barrier island. Manasota Key boat ramp (1 ramp) and Indian Mound Park (1 ramp) are owned by Sarasota County and Lemon Bay boat ramp (1 ramp) is owned by Charlotte County. Additionally, Englewood Beach Charlotte County Park is located on Manasota Key, but accesses the gulf only.

**e) Preserves:** This category includes publicly and privately owned lands set aside for preserves. The current preserve list within the aquatic preserve is small, only 4 mangrove islands totalling less than .5 square mile. They are located just off the southeast shore of Manasota Key. The two larger islands are state owned, the two smaller ones are owned by The Nature Conservancy.

There are 2 areas currently being proposed for public nature parks. These include a 23 acre parcel in Sarasota County between Englewood and Buchan Airport and an 88 acre parcel in Charlotte County between Englewood and Grove City. Both parcels are adjacent to the aquatic preserve. The Sarasota County parcel is a mangrove swamp and coastal hammock surrounded by pine flatlands and is currently in private ownership. Charlotte County is in the first of three years of purchasing their parcel from a private trust organization. The parcel is quality salt marsh habitat housing several listed species including gopher tortoises and eagles.

**f) Wastewater Treatment:** Wastewater is commonly treated by regional treatment plants, smaller privately owned franchise systems and septic systems. There are no regionally operated treatment plants within the watershed. There are approximately 39 smaller franchise wastewater treatment systems in the watershed, with 25 in Charlotte County and 14 in Sarasota County. They are associated with single and multi family residential and commercial areas. The privately owned treatment systems frequently do not have a full time licensed operator and commonly do not upgrade the equipment or size of the system when needed due to lack of operating funds.

Septic systems are common in the watershed, with Charlotte County having 40,000 and Sarasota County having 45,000. Extrapolating based on the area of each county in the watershed, there are approximately 5,250 septic systems in the watershed. The sandy soils are often unsuited for effective septic system operation due to shallowness to limestone bedrock or lenses of wet, mottled clay soils.

The nutrients and bacteria from inadequately treated wastewater is carried to surface and ground water, contributing to water quality degradation and potential health problems. Portions of Lemon Bay have already been closed to shellfish harvesting due to elevated fecal coliform bacteria levels.

**g) Artificial Canals:** The natural drainage patterns of the Lemon Bay shore and tributary creeks have been altered to create extensive systems of artificial canals and associated filled upland areas, primarily for residential use. The major areas with canals include: the mouths of Lemon, Buck, Oyster, Ainger and Forked Creeks and Lemon Bay near Englewood and

parts of Venice Gardens. The canals remove natural submerged and emergent vegetation and habitats, disrupt groundwater flows, serve as a conduit for septic system leaching and stormwater runoff to reach surface waters and alter upland hydrology, making it easier for exotic plant species to out compete native species.

**h) Transportation:** The major roadways in the watershed include the north/south SR 776/SR 775, Manasota Key Road and River Road/CR 777, along with the east/west SR 776 and US 41. Together, they total about 54 miles of roadway within the watershed. Buchan Airport is less than .25 square miles in size and is located between Englewood and South Venice. The large areas of impervious road surface need proper stormwater management and hydrologic design to avoid contaminated runoff water from reaching surface waters and disruption of natural ground and surface water flow patterns.

## **E. EXISTING USES OF AQUATIC PRESERVE RESOURCES**

The natural resources of the Lemon Bay Aquatic Preserve provide many types of recreational and commercial uses for the area residents, winter residents and visiting tourists. The 388,000 Charlotte and Sarasota County residents, together with thousands of part-time residents and tourists use Lemon Bay for recreational boating and fishing, swimming and enjoying the aesthetics of the area. The natural resources provide a large part of the area's economic base and make the area special.

As a measure of the use of the preserve, information is provided below on levels of recreational and commercial boating, recreational and commercial fishing, single and multi family docks and miscellaneous commercial and utility uses. The data was compiled from available county statistics, DNR boating and fishing license data and a DNR field survey of water related uses of the preserve conducted in April 1990.

### **1. RECREATIONAL AND COMMERCIAL BOATING**

A major activity in the preserve is boating, both commercial and recreational, for fishing, aesthetics and some water skiing. As a measure of the boating use of the preserve, the number of boat registrations in the area was obtained from the DNR Division of Law Enforcement files. In the 1989/90 year 31,079 boats were registered in Charlotte and Sarasota Counties. Charlotte County registered 13,852 boats, including 13,213 pleasure and 639 commercial boats. Sarasota County registered 17,227 boats, of which 16,756 were pleasure and 471 were commercial.

Extrapolating for percent of each county within the watershed, the boats registered in the watershed area are about 2,000, 97% of which are for pleasure and 3% are for commercial use. In reality, the annual boating use of the aquatic preserve probably falls closer to the county total due to the large number of boats that come into the bay from outside areas. It is clear that most of the use is for private, pleasure boating.

Potential problems associated with high levels of boating in the preserve include: significant propeller dredging of the extensive shallow seagrass areas, fuel spills, anti-fouling paint contamination and illegal open water sewage pump-outs.

## **2. RECREATIONAL FISHING**

Recreational fishing for snook, sea trout and redfish, as well as snapper and sheepshead, is a popular activity in Lemon Bay. License sales at the state level and support services at the local level provide an important source of revenue. Based on DNR Division of Law Enforcement data, the 1990 saltwater sport fishing license sales were as follows. For Charlotte County, 22,347 licenses were sold at a total cost of \$437,791. Of these, 11,938 were resident 1 year and 10 day licenses and 10,409 were non-resident 1 year and 7 day licenses. For Sarasota County, 30,565 licenses were sold for \$535,341. Of these, 18,674 were resident and 11,891 were non-resident.

Extrapolating from the county figures, an estimated watershed total saltwater sport fishing license sale would be about 3,425, 60% of which would be resident and 40% would be non-resident. The sales would generate about \$61,000. The cost of the supporting bait, tackle and beverage sales is also important locally, but is very difficult to estimate.

Potential problems associated with recreational fishing include monofilament fishing line left in the mangrove fringes that entangles birds and fish and boat propeller scarring of seagrass beds.

## **3. COMMERCIAL FISHING**

The primary commercial fish for Lemon Bay is mullet, along with some jack crevalle. The area is also an important regional clam fishing area, especially during the winter months. The areas of the bay open to shell fishing include: from the Boca Grande bridge north to navigation marker #27 on both sides of the Intracoastal Waterway; from marker #27 north to marker #19A on the west side of the Intracoastal Waterway; and north of marker #28A to marker #36, west of the Intracoastal Waterway. Shrimp are not commercially harvested in the bay, but some bait shrimp fishing does occur. A commercial fish processing house is located at Placida.

The level and success of commercial fishing in the area varies greatly by year. According to available National Marine Fisheries Service (NMFS) data, the number of regular and part-time commercial fishing licenses, the number of pounds of fish landed and the value of the landed fish varies greatly each year, partly depending on the market value of the species.

The most recent, available NMFS data from 1986 showed the following information. In Charlotte County, 3,542,000 pounds of fin and shellfish were landed with a value of \$1,705,000. Of this, 3,241,000 pounds were finfish and 301,000 pounds were shellfish. For Sarasota County, 607,000 pounds of finfish plus 19,000 pounds of shellfish were harvested for a total of 626,000 pounds worth \$206,000.

Extrapolating the county data to the watershed area estimates that about 162,500 pounds of fin and shellfish were harvested in the Lemon Bay watershed in 1986 with a value of \$69,500. Of the total pounds harvested, over 90% were finfish.

#### **4. SINGLE FAMILY WATERFRONT STRUCTURES**

Another common use of the preserve resources is related to single family waterfront structures. The shoreline of Lemon Bay is highly urbanized, largely for residential use. Docks, boat slips, boat houses and decks are common along the waterfront.

Based on the April 1990 DNR survey, there are 1,020 single family docks within the Lemon Bay Aquatic Preserve, plus an additional 600 in artificial canals connected to aquatic preserve waters. Boat slips number 1,956 in the preserve, with 1,716 more in connected canals. There are about 118 covered boat houses, 29 decks and 1 residential structure along the shore. A large total area is also sea walled or rip rapped, and 238 sites have mangrove fringe cuts.

Potential problems associated with this high number of waterfront structures are: loss of mangrove habitat along the shores; degradation of seagrass beds due to propeller scarring and shading from docks; increased stormwater runoff from lack of infiltration areas and loss of aesthetic value.

#### **5. MULTI FAMILY WATERFRONT STRUCTURES**

Multi family apartments, condominiums and yacht clubs are common in the preserve along the bayshore and on the barrier islands. The total number of multi family docks in 1990 survey of the preserve was over 53, with over 385 boat slips.

The same habitat problems associated with single family docks also apply to multi family docks. However, in some cases, depending on the site, there may be less adverse habitat impacts from 1 multi family, multi slip dock than with many individual docks in the same area.

## **6. COMMERCIAL USES**

The major commercial uses of the preserve are the docks and boat slips associated with marinas, restaurants and resorts. There are over 110 commercial docks in the preserve, with over 1,500 slips. There is also a commercial outboard engine testing facility adjacent to the preserve which commonly uses the bay waters to run its engine test boats in. Concentrations of boats at marinas increase the potential for fuel and sewage pollutants to be discharged into bay waters. Dry storage boat slips upland from the marinas help alleviate the need for expansion of existing dock and wet slip areas into sensitive habitat areas.

## **7. MISCELLANEOUS UTILITY USES**

The miscellaneous uses of the preserve waters and submerged lands include 30 stormwater discharge outfalls, 11 telephone and power utility crossings and 10 barge and ferry crossings. The stormwater discharges cause acute and chronic water quality and habitat impacts at the outfall point and in adjacent waters. Barge and ferry traffic in the shallow Lemon Bay waters can increase turbidity which degrades seagrass beds and fish spawning and nursery habitats.

## **8. SWIMMING**

Swimming and other beach front recreational activities are provided at the 5 county and 2 state recreation areas in the preserve. The numbers of people who use these low impact facilities are not possible to calculate in the context of this management plan.

## **F. FUTURE USES OF THE AQUATIC PRESERVE AND WATERSHED**

Protecting the natural resources of the Lemon Bay Aquatic Preserve requires proper planning of future activities in the preserve and its adjacent watershed. Well thought out future use planning can balance the numerous public and private demands for decreasing space from increasing population numbers, while still assuring that sensitive resources in critical locations are set aside for non degrading uses. A comprehensive approach and a cooperative public/private, inter-agency effort is essential for the success of future land use and natural resource management affecting the Lemon Bay area.

In the following paragraphs, future use of the preserve resources is projected from population, boat registration and fishing license numbers. Future land uses of the nearshore and watershed areas are interpreted from available Charlotte and Sarasota County Comprehensive Plans. Finally, concerns that have the potential to impact the aquatic preserve resources in the future are summarized.

## 1. FUTURE USES OF PRESERVE RESOURCES

**a) Increasing Population:** Based on Southwest Florida Regional Planning Council information, the populations of both Charlotte and Sarasota Counties will increase by 21% in 2000 and in 2010 by 44% and 39% respectively. In 20 years there will be an additional 156,500 people in the two counties. The Lemon Bay watershed will have about 39,600 permanent residents by 2010. These people will be concentrated in the urban areas between the Lemon Bay shore and SR 776/SR 775, where the sensitive natural resources are also concentrated. There will also be additional winter residents and tourists.

**b) Additional Boats:** Based on 1990 DNR boat registration information and using the existing ratio of boats per person for each county, there will be an additional 112,950 boats, a 41% increase, registered in Charlotte and Sarasota Counties in 2010. With 1 boat per 8 people in Charlotte County and 1 boat per 16 people in Sarasota County, the number of boats in the watershed by 2010 is estimated to be 2,770. There will be a corresponding need for additional boat ramps and slips.

**c) More Fishing:** Also using DNR saltwater fishing license data and the current ratio of licenses per person for each county, there will be an additional 12,838 resident saltwater fishing licenses issued in Charlotte and Sarasota Counties in 2010. That is a 42% increase in the next 20 years, from the 30,595 resident licenses sold in 1990. Extrapolating from county data, the watershed will have 2,850 licensed anglers in 2010.

**d) Additional Waterfront Structures:** With the increases in population and current development trends, the number of houses in the area will also continue to grow. Existing and future, single and multi family housing located on the bayshore and tributary creeks will bring some increase to the number of private docks, boat slips and stabilized shorelines. It is not possible to estimate the number of these waterfront structures in the context of this aquatic preserve management plan. However, the future extent of the structures will depend largely on the land use and resource management decisions made by the local governments and state agencies.

## 2. FUTURE LAND USES

**a) Changes in Land Uses in the Watershed:** The Comprehensive Plans for both Charlotte and Sarasota counties have been approved by the respective counties and the Florida Department of Community Affairs (DCA).

The future land use map for Charlotte County reflects existing land uses. Any changes in uses will require amendments to the map on a case by case basis, that must be approved by the county and DCA.



Sarasota County's Future Land Use Plan Map for 2010 reflects several changes. The map indicates that the urban area will be increased to include all areas west of SR 776/SR 775 and north of US 41, as well as a semi-circle around Englewood to the east. A future urban/(semi-rural) band parallels the urban corridor to the west. A future urban/(rural) tract is shown near the headwaters of Forked Creek in the east central area of the watershed. The City of North Port will be incorporated to the outskirts of the Englewood urban area, where a 340 acre major employment center is projected to be located. An additional north/south road is shown between SR 776 and River Road, with a future commercial center at it's junction with US 41 in the north.

**b) Additional Boat Ramps and Slips:** Currently in the watershed there are 3 boat ramps with parking for 80 cars and 20 assorted marinas with about 1,368 wet and dry boat slips. Charlotte County projects by 1994 they will need 3 more boat ramps with 55 more parking spaces, as well as an additional 2,420 boat slips, county-wide.

By 2010, Sarasota County projects they will need ramps to handle an additional 228 people per day, a 20% increase, and 1,720 more boat slips, county-wide.

As an estimate of potential watershed needs, the county information can be multiplied by the percent of the county within the watershed. This would project a future need for the watershed of 1 additional boat ramp with 17 more parking spaces and 228 additional boat slips. Both the parking and the boat slips would cause less adverse impacts to the aquatic resources if they were placed upland of existing waterfront structures, using dry boat storage instead of wet slips.

### **3. POTENTIAL FUTURE CONCERNS**

To achieve the legislative mandate of the Aquatic Preserve Program - to preserve the aquatic preserve resources for future generations, several considerations need to be included in future decisions concerning natural resource and public land management, as well as private development, in the Lemon Bay watershed. These potential concerns include:

**a) a decrease in the natural mangrove buffer** areas along the bay and tidal creeks, that serve as habitat and buffers, as additional areas are urbanized;

**b) a decrease in the health and size of seagrass beds** and manatee feeding areas as water turbidity, waterfront structures and boat propeller scarring increase;

- c) a decrease in water quality** as stormwater and wastewater from septic systems, franchise treatment systems and boat sewage pump-outs increase;
- d) an increase in stormwater discharge pollutants** reaching the bay and tributaries as additional impervious residential, commercial and roadway areas are built;
- e) an increase in wastewater discharge pollutants** reaching ground and surface waters from additional septic systems, undersized and/or poorly operating franchise wastewater treatment systems and illegal boat sewage pump-outs;
- f) an increase in the numbers of waterfront structures**, docks and shoreline stabilization areas and corresponding habitat loss; and
- g) an increase in boat propeller scarring of seagrass beds** from additional boat traffic in shallow bay areas.
- h) an increase in the number of requests to dredge dynamic natural inlets** as the number of larger draft boats increases.

These potential problems and associated adverse resource impacts can be minimized through well coordinated and thought out management decisions by local and state agencies. The next chapter describes the DNR's management action plan for the Lemon Bay Aquatic Preserve.

## CHAPTER IV

### MANAGEMENT AREAS

#### A. INTRODUCTION

This chapter describes the specific management areas, and their associated allowable uses, that the Lemon Bay Aquatic Preserve has been divided into. The management area classifications are designed to help assist both DNR aquatic preserve managers and other state agency and local government staff with resource management decisions affecting the preserve.

The management areas are classified based on a combination of the adjacent upland use and the value of the submerged aquatic resources. The upland uses consider existing and proposed future uses, as given in the county comprehensive plans. The resource values include the biological and habitat values together with the associated cultural values of the natural resources.

The allowable uses for each management area classification are based on the general and/or specific rule criteria given in Chapter 18-20 F.A.C.

The purposes of this chapter are four-fold: (1) to provide a better understanding of the general and special rule criteria designed to preserve and protect resources and habitat, (2) to identify the types of allowable uses on state-owned submerged lands within the aquatic preserve, (3) to provide local planners with a guide for land use decisions, and (4) to provide the staff of the Bureau of Submerged Lands and Preserves and other agencies with a continuity of direction in regards to the management of aquatic preserves.

Prior to providing the criteria for specific resource management areas, it is important that the intent, jurisdiction, and limitations of Florida's Aquatic Preserve Program be reiterated. Section 258.36, F.S., states that "it is the intent of the Legislature that state-owned submerged lands in areas which have exceptional biological, aesthetic, and scientific value... be set aside forever as aquatic preserves or sanctuaries for the benefit of future generations."

The Aquatic Preserve Program has jurisdiction over the use of state-owned submerged lands within the boundaries of a given aquatic preserve. Activities which occur outside the boundaries of the aquatic preserve (i.e., adjacent upland land uses) or which do not directly affect the state-owned submerged land (i.e., regulation of commercial fishing or water quality) are not within the jurisdiction of the Aquatic Preserve Program. However, the Aquatic Preserve Program is designed to complement the natural resource protection and management programs of other state agencies and local governments affecting a given aquatic preserve.

There are a number of differences between the rules that govern the use of state-owned submerged lands within an aquatic preserve and submerged lands that are not within an aquatic preserve. The principle difference is that uses of submerged lands within an aquatic preserve must be shown to be "in the public interest" before they can be authorized as opposed to being "not contrary to the public interest" for non-aquatic preserve areas.

The Lemon Bay Aquatic Preserve has been classified into 9 different management areas, based on the following guidelines.

## **B. MANAGEMENT AREA CLASSIFICATIONS**

Similar to land use zoning, dividing an aquatic preserve into management areas is intended to guide future development activities. The management areas are designed to direct future development activities which affect the preserve into areas where they are most compatible with the resources. The management areas: (1) identify areas of public and private uses, and (2) provide standards with which proposed uses and activities must comply. Through these management classifications, future land use activities can be directed to be consistent with resource protection goals.

### **1. LAND USE DESIGNATIONS**

Designated or existing land uses are incorporated into the classification of management areas because use of the adjacent uplands has a direct bearing on the intensity of demand for uses of state-owned submerged lands. The Aquatic Preserve Program has no jurisdiction over the designated use of adjacent uplands.

The incorporation of a designated land use into the management area classification is simply an acknowledgement of a local government's decision as to how a specific upland area can be developed. The designation does serve as a tool in designating compatible uses of the submerged lands in accordance with upland uses.

The specific land use categories that are used in classifying the management areas, along with their two letter codes, are:

**Single-Family (SF):** This category represents state-owned submerged lands adjacent to land designated on an approved future land use map for a county and/or municipality as single-family residential. It is intended to include areas using the adjacent portion of the aquatic preserve solely for private recreational activities.

**Multi-Family (MF):** This category represents state-owned submerged lands adjacent to land designated on an approved future land use map for a county and/or municipality as multi-family residential. It is intended to include areas where more than one private residence are using the adjacent portion of the aquatic preserve solely for private, recreational activities. The associated residences include town houses, trailer parks, condominiums, apartments, and any other group of multi-family dwellings. They may also include a group of single-family property owners, as in the case of a homeowners association, that desires to construct any of the above-mentioned structures for the mutual benefit of the group.

**Commercial (C):** This category represents state-owned submerged lands adjacent to land designated on an approved future land use map for a county and/or municipality as commercial. The category is also intended to incorporate uses associated with structures that charge fees or generate revenue. Examples of commercial uses includes marinas that charge fees; yacht clubs that charge membership fees; private businesses such as fish houses; and, establishments such as restaurants.

**Public Recreation (PR):** This category represents state-owned submerged lands adjacent to land designated on an approved future land use map of a county and/or municipality as public usage or preservation and which is utilized for the purposes of public recreation. It is intended to include both areas where structures are used by the general public at no charge and federal, state, county, or municipal parks that charge a nominal fee.

**Preservation (P):** This category represents state-owned submerged lands adjacent to land designated on an approved future land use map of a county and/or municipality as preservation. Upland ownership can be either public or private.

**Open-water (OW):** This category represents state-owned submerged lands within an aquatic preserve which are of a distance of greater than 500 feet from land.

## **2. RESOURCE VALUE CONSIDERATIONS**

Classifications of management areas are also derived from the resource value of the state-owned submerged lands adjacent to the upland property. Each area of the submerged bottoms has been given a resource value. The methodology used for determining the resource value is and shall be consistent with the latest procedure approved by the Bureau of Submerged Lands and Preserves. If an area within the preserve is designated as a **Primary Resource Protection Area (PRPA)**, then it will be assigned a resource value of "1". A PRPA essentially

combines Resource Protection Areas 1 and 2, as defined in Section 18-20.003(31), and 18-20.003(32), F.A.C.

Submerged areas that are characterized by the absence of the above resource attributes will be designated as a **Secondary Resource Protection Area (SRPA)**, and will be assigned a resource value of "2". A SRPA is a Resource Protection Area 3 as defined by Section 18-20.003(33), F.A.C.

These resource values are incorporated into the classification of the management areas and included in the title of the area by a one number code. For example, if an area within the preserve is determined to have a primary resource protection area, and if the adjacent land is zoned as a single-family residential neighborhood, it would be classified as a **SF/1** management area.

### **C. MINIMUM CRITERIA FOR ALLOWABLE USES**

Minimum criteria has been outlined for a number of uses and activities that can occur in the aquatic preserve. The minimum criteria given in Chapter 18-20, F.A.C., apply to the uses and activities allowed for each management area.

Chapter 18-20, F.A.C. (Appendix A), provides the minimum standards with regard to utilization of the state-owned submerged lands within an aquatic preserve as authorized by the Board of Trustees and DNR. It should be noted that other regulatory agencies rules and jurisdictions over activities may also apply within aquatic preserves. The minimum standards for each allowable use are detailed below:

**All Dock Structures:** Section 18-20.004(5)(a), F.A.C., provides that all docks within an aquatic preserve shall meet the following standards and criteria.

1. No dock shall extend more than 500 feet waterward of the mean or ordinary high water line or 20% of the width of the water body at that particular location.
2. Areas of significant biological, scientific, historic, and/or aesthetic value require special management considerations. Modifications to docks in these areas may be more restrictive and are determined on a case-by-case analysis.
3. The number, lengths, drafts, and types of vessels allowed to utilize the proposed facility may be stipulated.

4. Where local governments have more stringent standards and criteria for docking facilities, the more stringent standards for protection and enhancement of the aquatic preserve shall prevail.

Additional policies include all docking structures to access a depth of -4 mean low water (MLW) and a reduction in the width of a terminal platform to 4 feet wide if the platform is over seagrasses. This reduction will not affect the overall area of the terminal platform.

**Private Residential Single Docks:** In addition to the above criteria for all docks, Section 18-20.004(5)(b), F.A.C., provides that private residential single docks shall conform to the following specific design standards and criteria:

1. An access dock cannot exceed a width of more than 4 feet.
2. Must be designed and constructed to ensure maximum light penetration.
3. May extend from the shoreline no further than to a maximum depth of -4 feet mean low water (MLW).
4. When the water depth is -4 feet MLW at an existing bulkhead, the maximum dock length from the bulkhead shall be 25 feet, subject to modifications accommodating shoreline vegetation overhang.
5. Wave break devices shall be designed to allow for maximum water circulation and built in such a manner as to be part of the dock structure.
6. The maximum size of the terminal platform shall not exceed 160 square feet.
7. Dredging is strongly discouraged.

To clarify, the term "private residential single docks" refers to those docks associated with single-family residences that are used for private recreational purposes.

**Private residential multi-slip docks:** In addition to meeting the standards for all docking facilities noted above, Section 18-20.004(5)(c), F.A.C., provides that private residential multi-slip docks shall conform to the following specific design standards and criteria:

1. The area of sovereignty submerged land preempted by the docking facility shall not exceed the square footage amounting to ten times the

riparian waterfront footage of the affected water body of the applicant, or the square footage attendant to providing a single dock in accordance with the criteria for private residential single docks, whichever is greater. A conservation easement or other such restriction acceptable to the Board must be placed on the riparian shoreline, used for the calculation of the 10:1 threshold, to conserve and protect shoreline resources and subordinate or waive any further riparian rights of ingress and egress for additional docking facilities.

2. Docking facilities and access channels shall be prohibited in Resource Protection Areas 1 and 2, except as allowed pursuant to Sections 258.42 (3)(e)(1), F.S., while dredging in Resource Protection Area 3's shall be strongly discouraged.

3. Water depths adjacent to and within the facility shall have a minimum of one foot of clearance between the deepest draft of a vessel and the bottom at MLW.

4. Main access docks and connecting or cross walks shall not exceed 6 feet in width.

5. Terminal platforms shall not exceed 8 feet in width.

6. Finger piers shall not exceed 3 feet in width and 25 feet in length.

7. Pilings may be utilized as required to provide adequate mooring capabilities.

8. Specific provisions of Section 18-20.004 (5)(d), F.A.C., for commercial industrial, and other revenue generating/income related docking shall also apply to private residential multi-slip docks.

**Commercial-Industrial docking facilities and marinas:** Section 18-20.004(5)(d), F.A.C., provides that commercial, industrial, and other revenue generating/income related docking shall conform to the following specific design criteria and standards:

1. Docking facilities shall only be located in or near areas with good circulation, flushing, and adequate water depths.

2. Docking facilities and access channels shall not be located in Resource Protection Areas 1 or 2; however, main access docks may be allowed to pass through Resource Protection Areas 1 or 2 that are located along the shoreline, to reach an acceptable Resource Protection Area 3, provided that such crossing will generate minimal environmental impact.



3. The siting of docking facilities shall take into account the access of the boat traffic to avoid marine grassbeds or other aquatic resources in the surrounding area.
4. The siting of new facilities within the aquatic preserve shall be secondary to the expansions of existing facilities when such expansion is consistent with other standards.
5. The location of new facilities and expansion of existing facilities shall consider the use of upland dry storage as alternative to multiple wet slip docking.
6. Marina siting will be coordinated with local governments to insure consistency with local plans and ordinances.
7. Marinas shall not be sited within state designated manatee sanctuaries.
8. In any area with known manatee concentrations, manatee warning/notice and /or speed limit signs shall be erected at the marina and/or ingress and egress channels, according to Florida Marine Patrol specifications.

Exceptions to the standards and criteria for any docking facility may be considered, but only upon demonstration that such exceptions are necessary to ensure reasonable riparian ingress and egress.

**Piers:** Piers shall be constructed in accordance with the minimum criteria provided by Section 18-20.004(5)(b), F.A.C. In addition, the following conditions apply to all piers: (1) the entire structure will be elevated to a minimum of 5 feet above the MHWL, (2) hand rails will be installed around the perimeter of the structure, (3) at least one "Docking Prohibited" sign will be posted and maintained on each side of the pier, (4) no temporary or permanent vessel mooring shall be permitted, and (5) dredging is strictly prohibited when associated with pier construction or maintenance.

**Ramps:** May be permitted only on a case-by-case basis, after site inspection to assess the potential impacts. The determining factors to be considered include: (1) the elimination or alteration of natural resources or habitat (i.e. seagrasses, mangroves, nesting areas); (2) the amount of dredging and/or filling of submerged lands; and (3) the accessibility to the ramp from water or land access.

**Lease or transfer of lands, (Private Leases):** Section 18-20.004(1)(b), F.A.C., provides that there shall be no further lease or transfer of sovereignty lands within an aquatic preserve unless such transaction is in the public interest. Section 18-20.004(2), F.A.C., specifically defines the public interest test (see Appendix A for a copy of Chapter 18-20, F.A.C.). Section 18-20.004(1)(e), F.A.C., states that lease, easement, or consent may be authorized for only the following activities: (1) a public navigation project; (2) maintenance of an existing navigation channel; (3) installation or maintenance of navigation aids; (4) creation or maintenance of a commercial/industrial dock, pier, or marina; (5) creation or maintenance of private docks; (6) minimum dredging of navigation channels attendant to docking facilities; (7) creation or maintenance of shore protection structures; (8) installation or maintenance of oil and gas transportation facilities; (9) creation, maintenance, replacement, or expansion of facilities required for the provision of public utilities; and (10) other activities which are a public necessity or which are necessary to enhance the quality or utility of the preserve and which are consistent with the Florida Aquatic Preserves Act (Section 258.35, F.S. through Section 258.46, F.S.).

Section 18-20.004(1)(f), F.A.C., provides that structures to be built in, on, or over sovereignty lands are limited to those necessary to conduct water dependent activities.

**Utility Easements:** Section 18-20.004(3)(c), F.A.C., provides that utility cables, pipes, and other such structures shall be constructed and located in a manner that will cause minimal disturbance to submerged land resources such as oyster bars and submerged grassbeds and do not interfere with traditional uses. It will be the policy within the aquatic preserve to encourage the placement of utilities in designated corridors, or existing easements.

**Spoil Disposal:** Section 18-20.004(3)(d), F.A.C., provides that spoil disposal within an aquatic preserve shall be strongly discouraged and may be approved only where the applicant has demonstrated that there is no other reasonable alternative and that the spoiling activity may be beneficial to, or at a minimum, not harmful to the quality and utility of the preserve. It will be the policy to not recommend spoil disposal onto a PRPA within the Lemon Bay Aquatic Preserve. Exceptions to this criteria may be granted where beach quality sand is transferred and deposited onto shoreline beaches as part of an approved inlet management plan.

In addition to what is listed for the allowable uses, certain activities are generally permissible in all management areas, in accordance with general rules. These include maintenance dredging of existing marked channels and maintenance of channel markers. Where appropriate to protect environmental resources, certain conditions or restrictions may be placed on these types of activities. For example, seawalls in some locations may be discouraged, and riprap may be required to be placed along a seawall in order to provide additional habitat.

Additional criteria for the repair, replacement, and expansion of existing structures are provided for in Chapter 18-21, F.A.C. Replacement and expansion of structures must comply with the minimum criteria provided for in Chapter 18-20, F.A.C.

#### **D. MANAGEMENT AREAS**

In this section, each management area is described, including the boundaries, a description of the resources and the allowable uses. The Lemon Bay Aquatic Preserve has been classified into the nine management areas, as listed in the next paragraph and shown in Figure 4.

The nine management areas in the Lemon Bay Aquatic Preserve are:

SF/1 - Single family/primary resource protection area;

SF/2 - Single family/secondary resource protection area;

SF-MF/1 - Single family-multi family/primary resource protection area;

SF-MF-PR/1 - Single family-multi family-public recreation/primary resource protection area;

SF-MF-C/1 - Single family-multi family-commercial/primary resource protection area;

SF-MF-C-PR/1 - Single family-multi family-commercial public recreation/primary resource protection area;

PR-P/1 - Public recreation-preserve/primary resource protection area;

P/1 - Preserve/primary resource protection area; and

P-OW/1 - Preserve-open water/primary resource protection area.

No agricultural or industrial zones are located in the Lemon Bay Aquatic Preserve.

Changes in upland use and aquatic resources may occur due to rezoning of adjacent lands and/or altering biological conditions on submerged lands. Therefore, the final decision on approving, modifying or denying uses of the submerged lands within the preserve will be made based on site specific field surveys and assessment of proposed project impacts.

Descriptions of each of the nine management areas follow.

## **MANAGEMENT AREA SF/1**

(single family/primary resource protection area)

Sarasota County, Lemon Bay North of the North Manasota Key Bridge: This management area is defined as all state-owned submerged lands within the aquatic preserve boundaries up to and including the MHWL, which are bounded by the northern boundary of the Lemon Bay Aquatic Preserve, (the Venice Inlet) on the north and the north Manasota Key Bridge on the south and including the total extent of Alligator Creek within the aquatic preserve boundaries.

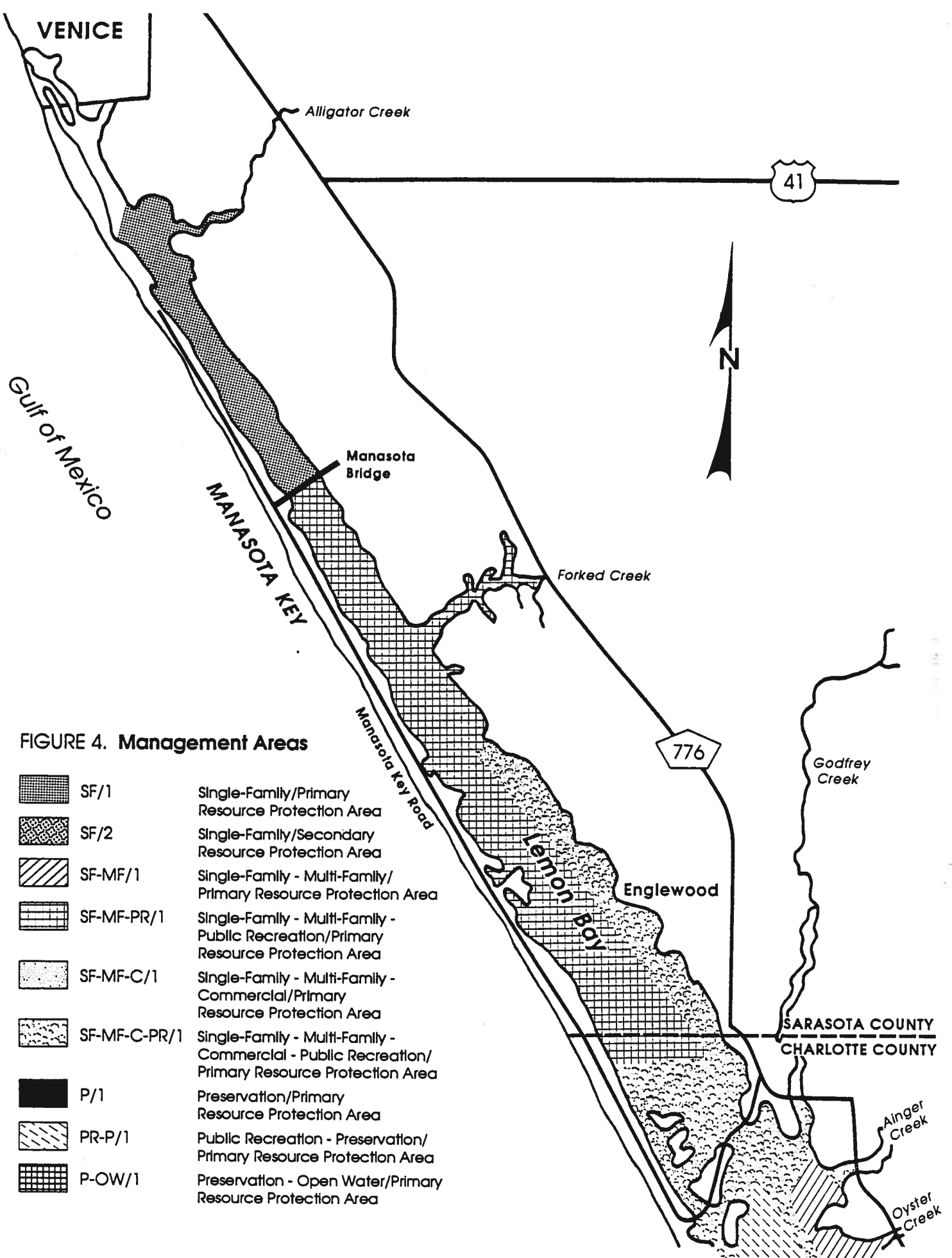
Description: This area of the Lemon Bay Aquatic Preserve is characterized by healthy mangrove forest and thick seagrass beds wherever development has not removed it. Natural water depths are shallower than -4 feet MLW throughout this area. Currently there are 78 single family docks with 183 slips in this area (2.4 slips/dock). There are 14 covered boat houses, 1 covered porch, 5 private boat ramps are located on the preserve. Only 6 locations on the aquatic preserve possess unnatural shoreline (vertical concrete bulkhead, rip-rap, etc.) on the mainland shore, while 27 unnatural shoreline locations occur on this section of Manasota Key. There are 39 mangrove cutting violations . Significant propeller dredging and eight (8) unpermitted access channels are associated with docks on Manasota Key located in very shallow water. A ferry operates between the mainland south of Alligator Creek and Manasota Key. The ferry constitutes a utility. A utility corridor is associated with the north Manasota Key Bridge. Bird nesting and roosting sites are located in the aquatic preserve extents of Alligator Creek.

Allowable Uses: Utility easements (in designated corridors), private residential single docks and piers.










## **MANAGEMENT AREA SF/2**

(single-family/secondary resource protection area)

Charlotte County, The Cape Haze Development: This management area is defined as all state-owned submerged lands within the aquatic preserve boundaries up to and including the MHWL, which are bounded by the north end of the Cape Haze development slow speed zone on the north, the ICW channel on the west and the southern edge of the Cape Haze development slow speed zone on the south.



**FIGURE 4. Management Areas**

- |  |              |  |
|--|--------------|--|
|  | SF/1         | Single-Family/Primary Resource Protection Area   |
|  | SF/2         | Single-Family/Secondary Resource Protection Area   |
|  | SF-MF/1      | Single-Family - Multi-Family/Primary Resource Protection Area                                  |
|  | SF-MF-PR/1   | Single-Family - Multi-Family - Public Recreation/Primary Resource Protection Area              |
|  | SF-MF-C/1    | Single-Family - Multi-Family - Commercial/Primary Resource Protection Area                     |
|  | SF-MF-C-PR/1 | Single-Family - Multi-Family - Commercial - Public Recreation/Primary Resource Protection Area |
|  | P/1          | Preservation/Primary Resource Protection Area  |
|  | PR-P/1       | Public Recreation - Preservation/Primary Resource Protection Area                              |
|  | P-OW/1       | Preservation - Open Water/Primary Resource Protection Area                                     |

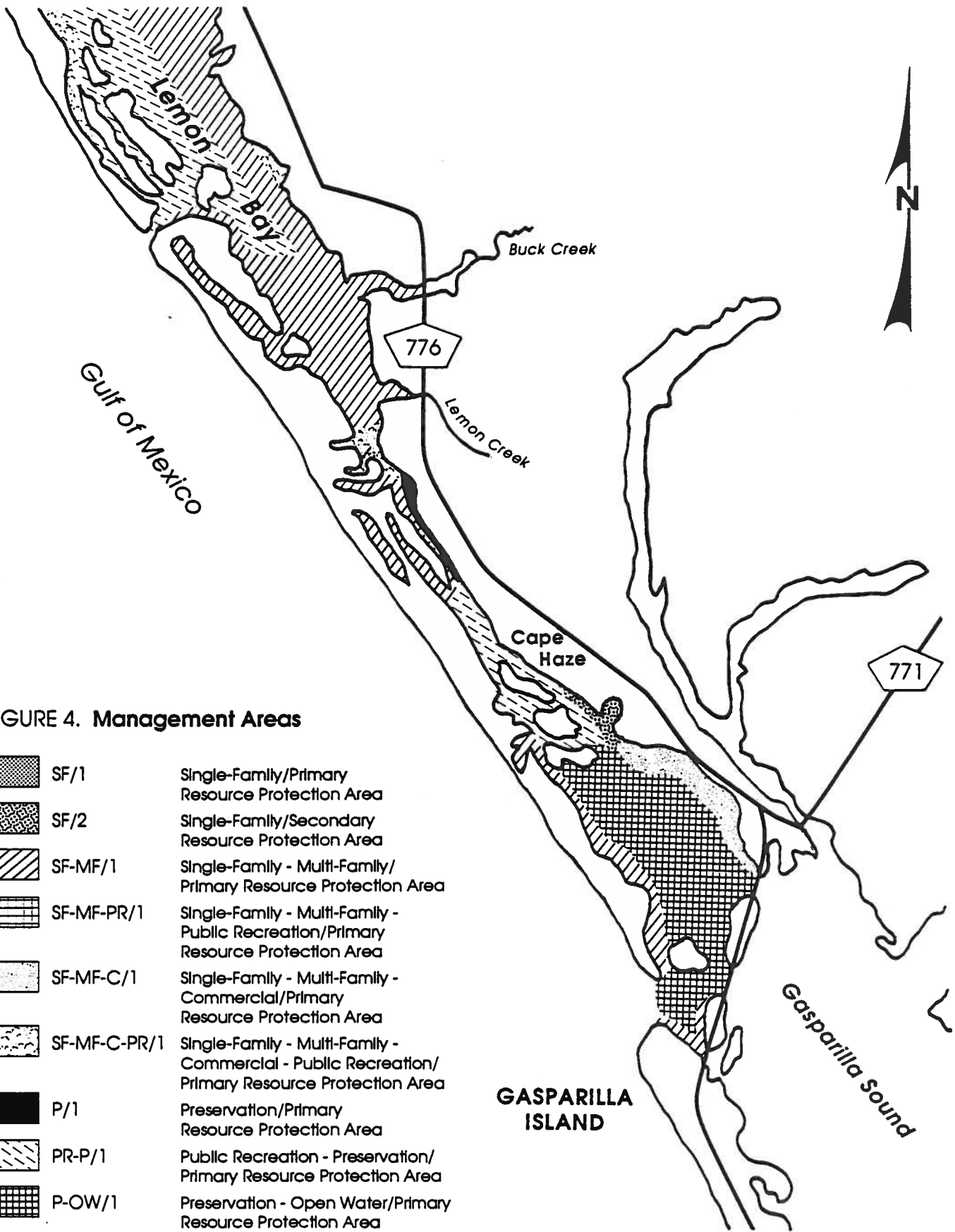











FIGURE 4. Management Areas

	SF/1	Single-Family/Primary Resource Protection Area
	SF/2	Single-Family/Secondary Resource Protection Area
	SF-MF/1	Single-Family - Multi-Family/Primary Resource Protection Area
	SF-MF-PR/1	Single-Family - Multi-Family - Public Recreation/Primary Resource Protection Area
	SF-MF-C/1	Single-Family - Multi-Family - Commercial/Primary Resource Protection Area
	SF-MF-C-PR/1	Single-Family - Multi-Family - Commercial - Public Recreation/Primary Resource Protection Area
	P/1	Preservation/Primary Resource Protection Area
	PR-P/1	Public Recreation - Preservation/Primary Resource Protection Area
	P-OW/1	Preservation - Open Water/Primary Resource Protection Area

Description: This area of the Lemon Bay Aquatic Preserve is characterized the most degraded submerged bottoms within preserve boundaries, (note the ICW channel is not included in preserve boundaries). Remnants of the original mangrove forest and seagrass beds are located on small canal islands and in the north remnant shallows. Water depths exceed -4 feet MLW with the exception of the very near shore littoral, throughout this area. Currently there are 33 single family docks with 62 slips in this area (1.9 slips/dock). There are 148 additional boat slips located on canals which are not in but connect to this area. All but two lot locations on the aquatic preserve possess unnatural shoreline (vertical concrete bulkhead, rip-rap, etc.). Both of these parcels have mangrove cutting violations . A utility corridor is located in a narrow section of the Bay at an old road crossing site.

Allowable Uses: Utility easements, private residential single docks and piers.

### **MANAGEMENT AREA SF-MF/1**

(single family-multi family/primary resource protection area)

This management zone designation is found in two distinct geographic locations in the Lemon Bay Aquatic Preserve.

Charlotte County, Rock Creek South to Knight and Don Pedro Island: This management area is defined as all state-owned submerged lands within the aquatic preserve boundaries up to and including the MHWL, which are bounded on the north by the junction of Godfrey Creek and Rock/Ainger Creek at New Point Comfort and on the west by the ICW, extending south from Navigational Marker 23 to the north end of Thorton Key, then expanding in width to the entire Lemon Bay and continuing south to the south end of Kettle Harbor, including the total extents of Oyster Creek, Buck Creek and Lemon Creek and all barrier island lagoons within the aquatic preserve boundaries, but excluding the following three areas: the mouth of Rock/Ainger Creek, the cove by Stump Pass Marina across Lemon Bay from Stump Pass, and the width of Lemon Bay from Palm Island Marina on the east, west to and including Palm Island Lagoon, as shown on Figure 4.

Description: This area of the Lemon Bay Aquatic Preserve is characterized by healthy mangrove forest and thick seagrass beds. Natural water depths are shallower than -4 feet MLW throughout this area. Dredged channels associated with finger canals outside of the preserve range in depth from -3 to -5 feet MLW. Currently there are more than 125 single family and multi family docks with greater than 250 slips within preserve boundaries. Northward in Knight Pass (Rum Bay) there are 10 docks with 43 slips associated with a multi-family development on Knight Island with 10 "guest" slips, 15 multi-family slips, 18 single family slips and

1 non-water dependent structure located on the preserve. There are an additional 118 slips from 54 docks located in canals of Knight and Don Pedro Islands. There are 1 covered boat house, 1 covered porch located on the preserve. There are 19 mangrove cutting violations definitely on preserve shoreline. Significant propeller dredging is associated with docks Knight Pass. A private ferry operates between the mainland and the Knight Island development. There are over 13 stormwater outfalls in the area.

Utility corridors are associated with the Tom Adams bridge and near Navigation Markers 28 and 29. Bird nesting and roosting sites are located at Cedar point, on Oyster Creek and on Buck Creek, as well as the larger mangrove stands in this zone.

Charlotte County, Little Gasparilla Island and north Gasparilla Island: This management area is defined as all state-owned submerged lands within the aquatic preserve boundaries up to and including the MHWL, which are bounded by the historic extents of Little Gasparilla Pass on the north, by the central seagrass bed shallows of Placida Harbor on the east and the Boca Grande Bridge zone on the south, including the total extents of Gasparilla Pass within the aquatic preserve boundaries.

Description: This area of the Lemon Bay Aquatic Preserve is characterized by healthy to impacted mangrove forest and healthy, thick seagrass beds wherever propeller dredging has not removed it. Natural water depths range from -1 to than -3 feet MLW near shore to -9 feet MLW in natural channels associated with Gasparilla Pass. Currently there are 106 docks with 210 slips in this area (1.98 slips/dock). There are 5 covered boat houses, 9 covered porches, 3 private boat ramps, 3 barge landings, 2 ferry boat landings and 2 decks located on the preserve. Twenty (20) locations on the aquatic preserve possess unnatural shoreline (vertical concrete bulkhead, wood bulkhead, rip-rap, etc.). There are 51 mangrove cutting violations, which is the largest number in a Lemon Bay Aquatic Preserve Management Zone. Significant propeller dredging from all vessels and unpermitted propeller dredged access channels are associated with ferry boat and barge landings. Two private ferries operate between the mainland of Placida Harbor and multifamily developments on Little Gasparilla Island. A utility corridor is associated with the Boca Grande Bridge. Little Gasparilla Island is an unbridged barrier island.

Allowable Uses: Utility easements (in designated corridors), private residential docks (a single two-slip dock built in accordance with standards and criteria for private residential single docks); private residential multi-slip docks (restricted); and piers.



### **MANAGEMENT AREA SF-MF-PR/1**

(single family-multi family public recreation/primary resource protection area)

Sarasota County, Manasota Key north of Leach's Key and the Forked Creek area mainland: This management area is defined as all state-owned submerged lands within the aquatic preserve boundaries up to and including the MHWL, which are bounded by the north Manasota Key Bridge on the north and the oyster bar narrows at marker 33 and Leach's Key including the total extents of Forked Creek within the aquatic preserve boundaries, and south to the Charlotte County border, west of the Intracoastal Waterway.

Description: This area of the Lemon Bay Aquatic Preserve is characterized by spotty but healthy mangrove forest and thick seagrass beds except where out-parcels destroyed them. Natural water depths typically are shallower than -4 feet MLW throughout this area with a natural deep area (-5) south of the mouth of Forked Creek around marker 36 and dredged channels (at -5 feet MLW) in the Preserve boundaries associated with Forked Creek and an upland canal. Currently there are 250 docks with 477 slips in this area (1.9 slips/dock). There are 10 covered boat houses/slips/basins, 6 private boat ramps, and 1 deck located on the preserve. A total of 205 locations on the aquatic preserve possess unnatural shoreline (vertical concrete bulkhead, rip-rap, etc.) on the mainland shore while 18 unnatural shoreline locations occur on this section of Manasota Key. There are 32 mangrove cutting violations. Significant propeller dredging is associated with docks on Manasota Key located in very shallow water. No existing utility corridors are present in this management area. Bird nesting and roosting sites are located in the aquatic preserve extents of Forked Creek and the oyster bar shoals at marker 33. A Sarasota County boat ramp and dockage facility is located immediately south of the north Manasota Key Bridge on Manasota Key.

Allowable Uses: Utility easements (in designated corridors), private residential docks (a single two-slip dock built in accordance with standards and criteria for private residential single docks); private residential multi-slip docks (restricted); and public docks (meeting the requirements of a private residential single dock), ramps, and piers.

### **MANAGEMENT AREA SF-MF-C/1**

(single family-multi family-commercial/primary resource protection area)

Charlotte County, Placida Harbor Mainland: This management area is defined as all state-owned submerged lands within the aquatic preserve boundaries up to and

including the MHWL, which are bounded by the Cape Haze slow speed zone, the ICW channel on the west and the Boca Grande Bridge on the south.

Description: This area of the Lemon Bay Aquatic Preserve is characterized by very healthy mangrove forest and thick seagrass beds in all waters of -4 feet or shallower MLW depth. Natural water depths are shallower than -4 feet MLW in a wide near shore band and attain -5 feet MLW in the deeper central portion of Placida Harbor. Dredged channels (at -5 feet MLW) are found in the preserve boundaries associated with two residential canals and a fish house and residential area. Currently there are 4 docks with 16 slips, of which 3 are commercial docks associated with the fish house facility and a private ferry landing. Only one location on the aquatic preserve possesses a rip-rap revetment with an associated mangrove cutting violation. Significant propeller dredging is associated with a ferry for the Little Gasparilla Island multi-family developments which crosses very shallow water. A utility corridor is associated with the Boca Grande Bridge. The near shore shallows in this management zone is a major feeding area for birds and dolphins. A Charlotte County boat ramp and dockage facility is proposed to be constructed in a finger canal system which currently connects a marina and trailer park to the waters of this management zone.

Allowable Uses: Utility easements (in designated corridors), private residential docks (a single two-slip dock built in accordance with standards and criteria for private residential single docks), and private residential multi-slip docks (restricted).

Note: a commercial dock, however, may be permitted to pass over a primary resource protection area in order to reach a secondary resource protection area.

### **MANAGEMENT AREA SF-MF-C-PR/1**

(single family-multi family-commercial-public recreation  
/primary resource protection area)

This management zone designation is found in one large, plus three smaller geographic locations in the Lemon Bay Aquatic Preserve as described below.

Sarasota County and Charlotte County, Englewood to Godfrey Creek and Manasota Key-Englewood Beach: This management area is defined as all state-owned submerged lands within the aquatic preserve boundaries up to and including the MHWL, which are bounded on the north by the oyster bar narrows at Navigational Marker 33 and on the west by the ICW, extending south to Navigational Marker 25 near the county line, then expanding in with to the entire Lemon Bay and continuing south of Godfrey Creek to it's junction with Rock/Ainger Creek at New Point

Comfort and Navigational Marker 23, then extending further south between the east shore of Manasota Key and the adjacent mangrove islands to the north end of Port Charlotte State Recreation Area.

Charlotte County, Rock Creek, Stump Pass Marina and Palm Island: This management area also includes the following three smaller areas: the mouth of Rock/Ainger Creek between the New Point Comfort and Pines on the Bay subdivisions, the cove by Stump Pass Marina between Navigational Markers 17 and 17A and the width of Lemon Bay from Palm Island Marina on the east to, and including, Palm Island Lagoon on the west.

Description: This area of the Lemon Bay Aquatic Preserve is characterized by healthy mangrove forest and thick seagrass beds north of the Tom Adams Bridge and east of the deep channel along Manasota Key south of the Tom Adams Bridge. Natural water depths typically are shallower than -4 feet MLW throughout this area with a natural deep channel (-8 MLW controlling depth) extending from the Tom Adams Bridge south to the northern boundary of the Port Charlotte State Recreation Area. Natural deep (-5 to -6 feet MLW) basins occur in central parts of Lemon Bay in association with the ICW and old pass alignments. Currently there are greater than 440 docks with more than 1,000 slips in this area, including 7 commercial docks (95 slips), 4 marinas, more than 35 multi-family docks (greater than 275 slips), and more than 60 other commercial enterprises (restaurants, offices, motels, etc.). There are more than 45 covered boat houses/slips/basins, 9 private boat ramps, 3 covered deck, 9 decks, one barge landing and 1 ferry boat landing located on the preserve. There are greater than 300 locations on the aquatic preserve with unnatural shorelines (vertical concrete bulkhead, rip-rap, etc.). There are more than 80 mangrove cutting violations definitely on preserve shoreline, including 9 in the Palm Island lagoon area. Significant propeller dredging is associated with docks in the Palm Island Lagoon and on Manasota Key north of the Tom Adams Bridge in very shallow water. A public ferry operates between the mainland and Knight and Don Pedro Islands. A private ferry operates between the mainland and the Knight Island development. There are more than 20 stormwater outfalls and 20 wastewater treatment plants in this management zone. Bird nesting and roosting sites are located on the mangrove islands separate from Manasota Key. County boat ramps are located in Sarasota County at mound Park in Englewood and in Charlotte County on Manasota Key, immediately south of the Tom Adams Bridge.

Existing utility corridors are located at the public ferry operation area and near Navigation Markers 28 and 29. Three wooden bridges cross State submerged lands in the Palm Island lagoon. Bird nesting and roosting sites are located in association with the large mangrove stands in this zone.

Allowable Uses: Utility easements (in designated corridors), private residential docks (a single two-slip dock built in accordance with standards and criteria for

private residential single docks); private residential multi-slip docks (restricted); and public docks (meeting the requirements of a private residential single dock), ramps.

Note: a commercial dock, however, may be permitted to pass over a primary resource protection area in order to reach a secondary resource protection area.

### **MANAGEMENT AREA PR-P/1**

(public recreation- preserve/primary resource protection area)

This management zone designation is found in two distinct geographic locations in the Lemon Bay Aquatic Preserve.

Charlotte County, Stump Pass and the Port Charlotte State Recreation Area: This management area is defined as all state-owned submerged lands within the aquatic preserve boundaries up to and including the MHWL, which are bounded by the northern boundary of the Port Charlotte State Recreation Area on the north, the ICW channel on the east and the middle of Thorton Key on the south including the total extents of Stump Pass within the aquatic preserve boundaries, as shown on Figure 4.

Description: This area of the Lemon Bay Aquatic Preserve is characterized by healthy mangrove forest and thick seagrass beds in all shallow waters. Natural water depths range from -1/2 to -5 feet MLW in grass bed shallows, to -6 and -7 feet MLW in secondary channels, and to -9 to -12 in Stump Pass itself. Currently there is 1 dock with 2 slips on Knight Island. Significant propeller dredging is associated with the dockage in Knight Pass and in the seagrass flats flanking the Stump Pass channels. No utility corridors are located in this management area. Bird nesting and roosting sites are located in the aquatic preserve extents of the State Recreation Area, on Peterson Island, on Whidden Key, Stump Key and Thorton Key. The seagrass beds of this area are a major sports and commercial fishing grounds of Lemon Bay. The channel between Peterson Island and Manasota Key is a major recreational boating and water skiing area.

Charlotte County, Don Pedro Island State Recreation Area: This management area is defined as all state-owned submerged lands within the aquatic preserve boundaries up to and including the MHWL, which are bounded by the old Don Pedro Island Road on the north, the ICW channel on the east and the northern end of Little Gasparilla Island including the total extents of the Don Pedro Island State Recreation Area and Rambler Hole within the aquatic preserve boundaries.

Description: This area of the Lemon Bay Aquatic Preserve is characterized by healthy mangrove forest and thick seagrass beds in all shallow waters. Natural water depths range from -1/2 to -5 feet MLW in grass bed shallows, to -7 feet MLW in Rambler Cove. Currently there is 1 dock with 2 slips on Don Pedro Island which serves the State Recreation Area. Significant propeller dredging is associated with vessels from the dockage in Knight Pass and in the seagrass flats flanking Coon Key where vessels attempt to shortcut the Cape Haze Development slow speed zone. A utility corridor is located at the north boundary of this management area. Bird nesting and roosting sites are located in the aquatic preserve extents of the State Recreation Area, on Coon Key and associated unnamed islands. The seagrass beds of this area are utilized by sports and commercial fishing interests of Lemon Bay. Shellfish harvesting is commonly observed in these conditionally approved waters.

Allowable Uses: Utility easements (in designated corridors) public docks (meeting the requirements of a private residential single dock).

### **MANAGEMENT AREA P/1**

(preserve/primary resource protection area)

Charlotte County, The Cutoff Mainland: This management area is defined as all state-owned submerged lands within the aquatic preserve boundaries up to and including the MHWL, which are bounded by the Palm Island Marina channel on the north, the ICW channel on the west and the northern edge of the Cape Haze development on the south.

Description: This area of the Lemon Bay Aquatic Preserve is characterized by wide, healthy mangrove forest, with near shore seagrass beds. Natural water depths range from -1/2 to -3 feet MLW. Deep water is found only in the ICW channel. Currently there are 2 docks with 4 slips in this management area. Adjacent canals, not on the preserve have 4 docks with 79 slips, associated predominantly with the private Palm Island Marina. Extensive propeller dredging is not currently present in this area. A utility corridor is located at the north boundary of this management area. Bird nesting, roosting and feeding sites are located in and landward of the aquatic preserve extents of the mangrove forest. This mangrove forest is the last major mainland mangrove system on the Lemon Bay Aquatic Preserve in Charlotte County.

Allowable Uses: A single two-slip dock built in accordance with standards and criteria for private residential single docks.

## **MANAGEMENT AREA P-OW/1**

(preserve-open water/primary resource protection area)

Charlotte County, Central Placida Harbor: This management area is defined as all state-owned submerged lands within the aquatic preserve boundaries up to and including the MHWL, which are bounded by the south shoreline of Coon Key on the north, by the north channel arm of Gasparilla Pass on the west, by the ICW on the east and the Boca Grande Bridge zone on the south, including the total extents of the primary resource protection areas of Placida Harbor within these boundaries.

Description: This area of the Lemon Bay Aquatic Preserve is characterized by major seagrass bed extents and a hard bottom reef with associated mangrove forest fringed islands. Natural water depths range from -1/2 to -2 feet MLW in grass bed shallows, to -6 in some natural flow channels, and -10 feet MLW in Gasparilla Pass itself. Currently there are no docks or structures in this management zone. Unauthorized markers for a propeller dredged channel are located in the central extents of the seagrass beds. Significant propeller dredging is associated with the dockage on Little Gasparilla Island caused by boaters attempting to shortcut the natural and marked channels. A utility corridor is located in association with the Boca Grande Bridge. Bird nesting and roosting sites are located in the aquatic preserve extents of Coon Key, the adjacent unnamed island and Bird Key. The seagrass beds of this area are the major sports and commercial fishing grounds of Placida Harbor and of the Lemon Bay Aquatic Preserve. In this area seagrass beds extend to depths of -7 feet MLW. The estuarine shallows as utilized in shellfish harvesting and crab trapping in the conditionally approved waters.

Allowable Uses: Utility easements in the designated corridor.

Within the context of these management areas, additional site specific issues are discussed in the next chapter.

## **CHAPTER V**

### **SITE-SPECIFIC MANAGEMENT ISSUES**

The first part of this chapter deals with management issues involving specific activities, as opposed to permitted structures, that directly affect the biological integrity of the Lemon Bay Aquatic Preserve. The issues that are specific to this area include, but are not limited to, increasing boat traffic, protection of designated species and their habitats, removal of littoral vegetation, dredging and stormwater and wastewater discharges. Other issues may arise as future use intensifies, and these will be identified as they develop.

The second part of the chapter establishes management initiatives for these issues, providing additional management direction not set forth by Chapter 258, F.S., Chapter 18-20, F.A.C., or Chapter V of this plan. These management initiatives are intended to be used as a tool by the Department of Natural Resources in managing the preserve, and in encouraging the local governments and/or other agencies to provide the necessary restrictions for resolving those issues and/or needs.

#### **A. MANAGEMENT ISSUES AND SPECIAL NEEDS**

##### **1. INCREASING BOAT TRAFFIC**

Many of the issues defined in this chapter involve the increasing boat traffic in Lemon Bay. All of the Lemon Bay Aquatic Preserve is used intensively by boaters. Water skiing and jet skiing are becoming more common in the preserve, along with their associated impacts. As the population of Florida grows, the traffic from boats and jet skis is expected to increase.

This trend poses a number of problems, both from the standpoint of the expected impacts on the biological resources and from related safety issues. The biological aspects include: (1) an increase in turbidity, with the resultant loss of seagrasses sensitive to lowered levels of incident light penetration, (2) increased wake generated erosion of shorelines with resultant turbidity and subsequent loss of wetland vegetation, (3) increasing risk of collisions with manatees, and (4) increasing disturbance of existing and potential breeding and roosting areas for bird populations.

Boat generated turbidity is currently being studied in a cooperative project conducted by the National Marine Fisheries Service, U.S. Fish and Wildlife Service and DNR in the Indian River Lagoon Aquatic Preserves (Kenworthy et al., 1987).

Observations in the Lemon Bay Aquatic Preserve during resource inventory review indicate that turbidity is generated by two types of boating activity:

- a) direct propeller dredging of shallow bottom habitats by vessels of all sizes.
- b) propeller wash and wave wake disturbance from large vessels operating at high throttle in deeper waters.

Safety problems include the dramatic increase in boat use coupled with the narrow navigable deep water corridor. Additionally there is a tendency for concentration of conflicting boating activities in specific locations resulting in an overcrowded, diminished public safety. Safety is a particular concern in areas where maneuverable jet skis are in close proximity with larger, less maneuverable water ski boats.

## **2. PROTECTION OF DESIGNATED AQUATIC ANIMALS**

Species whose existence is threatened are currently designated by four agencies: the Florida Game and Fresh Water Fish Commission (GFWFC), the Florida Department of Agriculture and Consumer Services (DACS), the U.S. Fish and Wildlife Service (USFWS), and the Convention of Trade in Endangered Species of Wild Fauna and Floras (CITES). Each agency has its own focus, and the regulations regarding what level of protection is given to which species reflects this orientation. For example, the GFWFC does not designate plant species, whereas the DACS addresses plants only.

Designated species are afforded some protection by other agencies as well. These measures do overlap and reinforce each other. The DNR is actively involved in protecting manatees and sea turtles, both of which are designated by the GFWFC and the FWS.

**a) West Indian Manatee:** The most recognizable, and perhaps the best known, of the designated animal species found in Lemon Bay is the West Indian manatee.

According to Chapter 16N-22, F.A.C., DNR affords the manatee some level of protection by imposing boat speed restrictions in certain areas of the coastal waters of Florida. No Manatee Protection Zones have been established to date in the Lemon Bay Aquatic Preserve. This current absence of slow speed zones is insufficient to protect manatees in the preserve.

Recent studies of manatee use of the Lemon Bay Aquatic Preserve identify feeding areas and travel paths within the preserve. Principle feeding areas are located in



Placida Harbor, (OW-P/1 and SF-MF-C/1), both the PR-P/1 zones and the upper sections of the preserve north of Englewood (SF/1 and SF-MF/1). Major travel routes include The Cutoff (P/1), the southern SF-MF/1 areas, the northern SF/1 and Stump Pass (PR-P/1). Manatees utilize the natural deep channels and the man-made dredged channels to access shallow water feeding and resting areas. Manatees must travel through these waterways to access tributary creeks.

The entire Lemon Bay Aquatic Preserve is used intensively by boaters (e.g., seasonal and weekend recreational use and high-speed test boats from the Mercury Motors Corporation) and, since the ICW is exempt from speed restrictions, a large number of these boats travel very fast through this narrow waterway. Many of these fast-traveling boats motor outside of the ICW itself in order to pass slower vessels. In narrow portions of the IC waterway represents a "gauntlet" through which the manatees must pass.

Nabor and Patton (1989) found that the whole of Lemon Bay is proving to be critical habitat for manatees. They propose that Lemon Bay be designated as a Category IV Managed Nature Reserve/Wildlife Sanctuary with channel exempt slow speed (no wake) zones established throughout Lemon Bay and its associated creeks. Forked Creek is recommended to be an idle speed zone.

Nabor and Patton conclude that the Cutoff area is an important migratory corridor for manatees and that a slow speed zone should be established for the ICW between south Lemon Bay marker G9 through Placida Harbor to Gasparilla Sound marker G19. Both Placida Harbor and the grassflat areas in Gasparilla Sound near the Boca Grande Bridge are proposed as slow speed (no wake) areas by this Mote Marine Laboratory study.

Additional manatee protection will be forthcoming through the state and local levels. On October 24, 1989, the Governor and Cabinet approved a number of recommendations from DNR designed to improve manatee protection and boating safety. It is DNR's goal to coordinate with local governments toward effectively implementing these recommendations.

One recommendation of the Nabor and Patton report dealt with the development of rules to implement speed zones in 13 counties identified as having significant manatee activity. Sarasota County is designated as a "key" manatee protection county. Charlotte County has a high number of recorded manatee sightings, but is not currently designated as a key manatee protection county due to the relatively lower numbers of recorded manatee/boat impacts. DNR has requested that each of these "key" counties either select one of DNR's speed zone options or develop their own site specific manatee protection plan. If accepted, the county plans will be recommended for rulemaking. Proposed manatee protection speeds zones have been developed for Sarasota County which include a 25 MPH speed in the ICW and slow speeds outside the channel. The draft rule was presented at a

public workshop in July 1991 and a public hearing in November, 1991 and is anticipated to be presented to the Governor and Cabinet in December 1991.

**b) Sea Turtles (Atlantic loggerhead, green and ridley):** These endangered (green, ridley) and threatened (loggerhead) sea turtles are found primarily in association with Gulf passes, seagrass beds and beaches of the Lemon Bay Aquatic Preserve and the associated State Recreation Areas. The loggerhead and green sea turtles have been observed during the resource inventory and the loggerhead turtle nests on the beaches of the barrier islands of Lemon Bay.

These species have been impacted by loss of nesting and feeding habitat to beach development, beach alterations, coastal hardening, dredging, water quality degradation and filling.

Specific management measures include protection of nesting and potential nesting sites from human, vehicular and domestic animal disturbance during critical nesting periods, protection of critical nesting and seagrass feeding habitats by regulation from loss to development, dredging and shoreline hardening, restoration of sandy habitats on State and other preserve lands by removal and maintenance of removal of exotic pest plants and unnatural structures and cooperation with local government in adopting applicable beach lighting and beach use regulations.

**c) Snook:** The life cycle of this species of special concern is linked to healthy mangrove, seagrass and unvegetated bottom habitats. Early life stages enter estuarine tributaries and high marsh habitats for protection, feeding and osmoregulation. Adults forage in vegetated and unvegetated estuarine habitats, sheltering in mangrove prop-root habitat.

This species has been impacted by habitat loss to development and dredging and water quality degradation from associated upland discharges of stormwater, wastewater effluent and biocides (pesticides, herbicides).

Specific management measures for this species include prohibition of mangrove cutting, enforcement on propeller dredging of seagrass beds, acquisition of nursery grounds located below and above MHWL as preserves, designation of the upper reaches of the tributary creeks of Lemon Bay as aquatic preserve and OFW, encouragement of restoration of natural hydroperiod in the water management of the Lemon Bay basin, and encouragement of littoral shelf planting designs both in the preserve and in adjacent non preserve waters.

### 3. PROTECTION OF DESIGNATED WADING AND SHORE BIRDS

The Port Charlotte Beach State Recreation Area, the Don Pedro Island State Recreation Area, several bay islands (Bird Key, Coon Key, Thorton Key, etc.) and several tributary creek islands provide undisturbed wetland and upland areas that currently act as rookeries or are potential rookery habitat for a number of colonially nesting bird species, including several listed species.

The protected status for both State Recreation Area parcels is not expected to change; however, both areas are subject to increasingly active boating traffic, with concomitant boat beaching and recreational use. The high level of use by recreational boaters and water skiers in the adjacent waters to the Port Charlotte Beach State Recreation Area currently precludes use of this area as a fully functional rookery, frightening birds from potential nesting sites and disturbing shallow areas essential for feeding.

**a) Roseate Spoonbill:** This species of special concern wading bird utilizes the Lemon Bay Aquatic Preserve as a foraging and roosting habitat. It is found in association with mangrove fringes and islands, shallow seagrass beds, shallow productive unvegetated mudflats and high marsh habitats. At this time no documented nesting of spoonbill is occurring in preserve boundaries. Survival of this species in the Lemon Bay ecosystem depends upon protection of the above habitats from loss to alteration and degradation.

Specific management measures include prohibition of mangrove cutting, protection of seagrass, mudflats and high marsh, protection by posting and patrol of identified roosting areas from visual and acoustic disturbances, acquisition of roosting areas above MHWL as preserves, encouragement of restoration of natural hydroperiod in the water management of the Lemon Bay basin, and encouragement of littoral shelf and planting designs both in the preserve and in adjacent non preserve waters.

**b) Snowy Plover and Piping Plover:** The endangered snowy plover requires large open areas of dry sandy beaches for breeding and both dry and tidal unvegetated sand flats for feeding. The piping plover, a species of special concern, also feeds and roosts in the same habitats. Both species have been observed to feed and roost in the Lemon Bay Aquatic Preserve. The utilization by man of the critical habitats of these species for recreation, dredging and construction coupled with habitat loss to Australian pine has severely impacted these birds. Survival of this species in the Lemon Bay ecosystem depends upon protection of the above habitats from loss to alteration and degradation.

Specific management measures include protection of nesting and potential nesting sites from human, vehicular and domestic animal disturbance during critical nesting periods, protection of critical nesting and feeding habitats by regulation from loss to development, dredging and shoreline hardening, restoration of sandy habitats on State and other preserve lands by removal and maintenance of removal of exotic pest plants and recognition that multiple use recreation is not a compatible use on breeding beaches during breeding season.

**c) Little Blue and Tricolor Herons, Reddish and Snowy Egrets:** These species of special concern wading birds utilize the Lemon Bay Aquatic Preserve as a foraging and roosting habitat and for the little blue, snowy and tricolor nesting habitat. They are found in association with mangrove fringes and islands, shallow seagrass beds, shallow productive unvegetated mudflats oyster bars, clam beds, and high marsh habitats. Nesting of all but the reddish egret has been documented near the aquatic preserve. The reddish egret occurs in the preserve and was seen nesting just south of the preserve boundaries within the last 3 years. Survival of these species in the Lemon Bay ecosystem depends upon protection of the above habitats from loss to alteration and degradation.

Specific management measures include prohibition of mangrove cutting, protection of seagrass, mudflats and high marsh, protection by posting and patrol of identified roosting and nesting areas from visual and acoustic disturbances, acquisition of roosting and nesting areas above MHWL not currently in state ownership as preserves, encouragement of restoration of natural hydroperiod in the water management of the Lemon Bay basin, and encouragement of littoral shelf planting designs both in the preserve and in adjacent non preserve waters.

**d) American Oystercatcher:** This threatened shorebird requires broad open areas of sandy beaches for breeding and a mudflats and mollusk beds for feeding. This species has been observed to feed and roost in the Lemon Bay Aquatic Preserve. No documented nesting was observed during the resource inventory. The utilization by man of the critical habitats of these species for recreation, shellfish harvesting, dredging and construction coupled with shellfish bed loss to declining water quality and unnatural hydroperiods. Survival of this species in the Lemon Bay ecosystem depends upon protection of potential nesting, roosting and feeding habitats from loss to alteration and degradation.

Specific management measures include protection of potential nesting sites from human, vehicular and domestic animal disturbance during critical nesting periods, protection of critical roosting and feeding habitats by regulation from loss to development, dredging and shoreline hardening, restoration of sandy habitats on state and other preserve lands by removal, maintenance of removal of exotic pest plants, acquisition of roosting areas above MHWL as preserves, designation of the

upper reaches of the tributary creeks of Lemon Bay as aquatic preserve and OFW, encouragement of restoration of natural hydroperiod in the water management of the Lemon Bay basin, and encouragement of oyster bar protection both in the preserve and in adjacent non preserve waters.

**e) Bald Eagle:** This endangered raptor utilizes the Lemon Bay Aquatic Preserve for feeding and pre- and post-feeding roosting. It feeds over all natural bottoms but concentrates in seagrass beds and oyster bar areas. Bald eagles have been observed to hunt and feed in both Lemon Bay and Placida Harbor. Nesting is located in mature pine forest immediately adjacent to the preserve.

Loss of nesting habitat to development, and in Charlotte County, malicious vandalism; declines in large prey species abundance due to loss of estuarine habitat; disturbance by man; and declines in water quality are the major threats to this species in the Lemon Bay Aquatic Preserve.

Specific management measures include protection of mangroves and seagrass beds, protection by posting and patrol of identified roosting and nesting areas from visual and acoustic disturbances, active enforcement against eagle molesters, acquisition of roosting and nesting areas above MHWL as preserves, designation of the upper reaches of the tributary creeks of Lemon Bay as aquatic preserve and OFW, encouragement of restoration of natural hydroperiod in the water management of the Lemon Bay basin, and encouragement of littoral shelf planting designs both in the preserve and in adjacent non preserve waters.

**f) Wood Stork:** This endangered wading bird utilizes the Lemon Bay Aquatic Preserve as a foraging and roosting habitat. It is found in association with mangrove fringes and islands, seagrass beds, oyster bars, productive unvegetated mudflats and tributary stream marshes. At this time no documented nesting of wood stork is occurring in preserve boundaries. Survival of this species in the Lemon Bay ecosystem depends upon protection of the above habitats from loss to alteration and degradation.

Specific management measures include prohibition of mangrove cutting, enforcement on propeller dredging of seagrass beds, protection by posting and patrol of identified roosting areas from visual and acoustic disturbances, acquisition of roosting areas above MHWL as preserves, designation of the upper reaches of the tributary creeks of Lemon Bay as aquatic preserve and OFW, encouragement of restoration of natural hydroperiod in the water management of the Lemon Bay basin, and encouragement of littoral shelf and planting designs both in the preserve and in adjacent non preserve waters.

**g) Brown Pelican:** This threatened species is found throughout Lemon Bay in all aquatic habitats. Nesting occurs exclusively in natural mangrove canopies. Past experience has demonstrated that this species is susceptible to reproductive damage from pesticides. Nesting is documented on at least two islands in the Lemon Bay Aquatic Preserve and regular roosting sites are located on both mangrove islands and mangrove fringes throughout the preserve.

Specific management measures for this species include prohibition of mangrove cutting, enforcement on propeller dredging of seagrass beds, protection by posting and patrol of identified roosting and nesting areas from visual and acoustic disturbances, acquisition of roosting and nesting areas above MHWL as preserves, designation of the upper reaches of the tributary creeks of Lemon Bay as aquatic preserve and OFW, encouragement of restoration of natural hydroperiod in the water management of the Lemon Bay basin, and encouragement of littoral shelf planting designs both in the preserve and in adjacent non preserve waters.

**h) Least Tern:** This threatened tern requires open areas of dry sandy beaches for breeding and a healthy estuary for feeding. This species has been observed to feed and roost in the Lemon Bay Aquatic Preserve and nest on adjacent sandy islands in the Gasparilla Sound-Charlotte Harbor Aquatic Preserve. The utilization by man of the critical habitats of these species for recreation, dredging and construction coupled with habitat loss to Australian pine has severely impacted this species. Survival of this species in the Lemon Bay ecosystem depends upon protection of the nesting, roosting and feeding habitats from loss to alteration and degradation.

Specific management measures include protection of nesting and potential nesting sites from human, vehicular and domestic animal disturbance during critical nesting periods, protection of critical nesting and feeding habitats by regulation from loss to development, dredging and shoreline hardening, restoration of sandy habitats on state and other preserve lands by removal and maintenance of removal of exotic pest plants.

#### **4. PROTECTION OF DESIGNATED PLANT SPECIES**

**a) Leather Fern:** The endangered golden leather fern and threatened giant leather fern are plants of brackish and freshwater plants of the wetlands of the Lemon Bay Aquatic Preserve. Both are found in primary resource protection areas of the preserve and in adjacent wetlands above the MHWL. Both plants are impacted by development of wetlands, wave wash erosion, declines in water quality from upland runoff and unauthorized vegetative cutting of littoral vegetation. Survival of these species in the Lemon Bay ecosystem depends upon protection

of existing sites and restoration of areas invaded by exotic vegetation and/or damaged by human activity.

Specific management measures include protection of existing fern sites on State lands from disturbance from human activities and collecting, restoration of suitable habitats on state and other preserve lands by removal and maintenance of removal of exotic pest plants and affirmative planting, identification of sites external of current state lands for potential acquisition, prohibition of mangrove cutting, enforcement of water quality standards, designation of the upper reaches of the tributary creeks of Lemon Bay as aquatic preserve and OFW, encouragement of restoration of natural hydroperiod in the water management of the Lemon Bay basin, and encouragement of littoral shelf planting designs incorporating these species both in the preserve and in adjacent non preserve waters.

## **5. PROTECTION OF LITTORAL VEGETATION**

The littoral vegetation of the Lemon Bay Aquatic Preserve, including mangroves, cordgrass and blackrush, is a vital component of the estuarine environment providing the detrital base to organic food chains, significant habitat for arboreal, intertidal and subtidal organisms, nesting sites, cover and foraging grounds for birds and the habitats for less apparent reptiles and mammals. The relationship between littoral vegetation and its associated marine life cannot be overemphasized. The mangrove forest and salt marsh provides protected nursery areas for fishes, crustaceans and shellfish that are important to both commercial and sports fisheries.

The detritus provided by decomposition of regularly shed mangrove leaves and littoral marsh grass blades is the food base for micro-crustaceans and other detrital processors which are consumed by larger crustaceans, small fishes and other first order predators. The animals in turn are the prey of larger fish species such as snook, snapper, tarpon, jack, sheepshead, spotted sea trout and redfish.

In Lemon Bay, the major consistent source of mortality to littoral vegetation is human development and destruction. Currently there are 229 mangrove cutting violations in the Lemon Bay Aquatic Preserve. Although abused by man, the littoral vegetation provides shoreline protection by stabilization and considerable storm protection. The sports fisheries and commercial fisheries of Lemon Bay are, in concert with the other submerged habitats of seagrass, algal beds, sand and mud flats and oyster bars, utterly dependent upon this littoral habitat.

## **6. ON-GOING CHANNEL DREDGING**

Dredging is an activity that is briefly discussed in Chapter IV that is directly related to the increase in boat traffic and degradation of the aquatic preserve. Since Lemon Bay supports large beds of seagrass in very shallow waters, there are few sites suitable for dredging of new navigation channels. It is probable that the increasing boat use in this area will result in an increase in dredging applications in order to obtain water deep enough to accommodate large boats.

Currently unauthorized propeller and small hydraulic dredging of access channels has occurred in northern Lemon Bay and Placida Harbor. This activity is associated predominantly with barrier island development and the development of mainland residential property on shallow tributary creeks. Historically vessels and engines were utilized by residents of the Lemon Bay Aquatic Preserve which were designed for use in very shallow sheltered estuarine waters.

As deeper channel dredging has occurred in Lemon Bay, the number of larger, deep draft vessels using the waters has increased. The boat operators are often non-residents, inexperienced in shallow water navigation. Also, current advertising gives a misleading impression about the suitability of the local waters for these inappropriate water craft. The result is a conflict between the ability of the natural resources to support deep draft boat use and the expectations of a small number of users. Conversion of the PRPA bottoms of the Lemon Bay Aquatic Preserve to deep channels is a potential and ongoing threat to the integrity of the habitat, fishery, scientific and aesthetic values of the preserve.

## **7. POTENTIAL CLOSURE OF SHELLFISHING AREAS**

Currently approximately two fifths of the Lemon Bay Aquatic Preserve is designated as conditionally approved shellfish waters. With successive evaluations of water quality by the DNR Shellfish Environmental Assessment office in Punta Gorda, areas of Lemon Bay formerly open to the taking of clams and oysters have been closed due to water quality degradation.

The decline in water quality is associated with upland development of areas without proper treatment of wastewater effluent. Specifically the siting of septic systems in soils unsuitable for drainfields, discharges from the numerous package plant systems of the area and untreated stormwater runoff has rendered former shellfish beds unsafe for human health.



## **8. PROTECTION OF TRIBUTARY STREAMS**

The tributary streams of the Lemon Bay Aquatic Preserve are essential to the estuarine water quality of the preserve. These streams provide unique nursery and nesting habitat for invertebrate and vertebrate species including listed species. The creeks of Lemon Bay range from pristine to heavily developed. Resource inventory surveys indicate that these streams are the principle dumping points for stormwater runoff in the Lemon Bay system.

The quality of an aquatic preserve depends upon its water quality and the water quality of an estuary depends upon the water quality of incurrent waters from passes and its freshwater tributaries. Water quality sampling indicates that the discharges to tributary streams of Lemon bay are the principle source of water quality degradation in the bay ecosystem. When the tributaries are polluted at their headwaters it is inevitable that the receiving estuary will subsequently be polluted.

The current mainland boundaries of the Lemon Bay Aquatic Preserve are arbitrarily located at bridges and Section lines which artificially sever the streams and do not protect stream headwaters. As a result significant pollution of headwaters is occurring in the Lemon Bay estuarine basin. Adequate protection of these tidal stream habitats depends on proper land use management in the upper reaches of the watershed.

## **9. IMPACTS FROM NON-WATER-DEPENDENT STRUCTURES**

The placement of non-water-dependent structures in the aquatic preserve is contrary to Section 18-20.004(1)(f), F.A.C.. Such structures are demonstrated to cause harmful shading to seagrass and alga beds. Frequently activities associated with such structures result in harmful discharge (wastewater, cleaning agents, etc.) to the waters of the preserve. Construction of these structures often results in loss of littoral shoreline far in excess of permitted access to the preserve. Currently there are 31 non-water dependent structures in the Lemon Bay Aquatic Preserve.

## **10. LACK OF PROTECTION FOR OUTPARCELS**

For a variety of reasons and at different times approximately 52 areas of submerged state lands were sold to private interests by the Board of Trustees of the Internal Improvement Trust Fund. Some of these areas of submerged lands (known as outparcels) were filled and or dredged for development. Others have not been altered significantly to date.

Although these areas are in direct water column contact with the preserve and often possess resources of equivalent value, outparcels are not subject to the same

protection of habitat and water quality that is provided for preserve lands. Because of this difference of protection impacts to water quality, fisheries and habitat can be instituted in these outparcels which subsequently impact the preserve.

## **11. CONTINUING MAINTENANCE DREDGING OF PASSES**

The maintenance of the Gulf of Mexico passes and associated existing dredged channels is a matter of continuing effort and chronic impact to the water quality and benthic bottoms of the preserve. Local land form evolution and sediment deposition have historically altered Gulf pass configurations and rapidly refilled dredged channels. Past methods of channel construction and spoil deposition can not continue to be utilized in preserves without severe water quality impacts and habitat loss. New methods of channel maintenance which work with coastal dynamics are necessary to provide deep navigable water while protecting the preserve.

### **B. MANAGEMENT INITIATIVES**

This section of the plan contains a number of management initiatives that address the issues identified as being particular to the Lemon Bay Aquatic Preserve. The management initiatives listed below represent action statements directed at specific resource management problem(s). In some cases, the authority to accomplish a specific action may not be addressed under the authority of submerged lands and aquatic preserves statutes and rules, but may lie within the authority of another agency or local government. The department, through its overall management program for this preserve, will pursue a cooperative working relationship to encourage the appropriate authorities to implement actions needed to accomplish a specific management initiative.

The management initiatives, or actions, are presented below, along with their corresponding purpose and resulting benefit to the aquatic preserve resources. The actions are grouped into eight categories relating to: boating, marinas, channel dredging, waterfront structures, vegetation, wastewater, stormwater and land use planning.

#### **1. BOATING RELATED INITIATIVES**

- a) Pursue designating additional minimum wake zones in shallow areas** of the Intracoastal Waterway to decrease turbidity, propeller scars in seagrass beds and manatee accidents. This will protect the health and size of the seagrass beds and corresponding habitat, as well as manatees.

**b) Work with the Division of Marine Resources to limit boat speeds in shallow areas** throughout the preserve similar to the proposed Sarasota County manatee protection speed zones, including possible slow speeds outside the marked channels in the bay and specified commercial fishing exemptions, to decrease turbidity, propeller scars in seagrasses and manatee accidents, and to protect seagrass habitats and manatees.

**c) Place "Caution: Shallow Seagrass" signs** along shallow areas of the Intracoastal Waterway where propeller scarring is common to decrease turbidity, propeller scars and manatee accidents and protect the seagrasses and manatees.

**d) Pursue ways to restrict barge and ferry traffic to areas with adequate water depth** to decrease turbidity and protect seagrass habitats.

**e) Restrict boat drafts to allow 1 foot of water clearance at MLW** above submerged bottoms at private, commercial and public docks, marinas and navigation channels, and post the allowable draft. This is to decrease turbidity and propeller scarring, to protect seagrass habitats.

**f) Pursue a restriction on jet skis and boats within 500 feet, including beaching of watercraft, from identified bird rookery areas** to decrease noise, to protect designated bird species habitats.

**g) Recommend two deep water mooring areas** in the preserve and require registered vessels to regularly empty their holding tanks at a Coast Guard approved pump-out facility. This will decrease turbidity, seagrass damage and nutrient/bacteria contamination which is important to protect all the aquatic biological communities.

**h) Increase surveillance and enforcement of boating laws** for speed, wake and propeller damage, possibly seeking authority to levy additional penalties, to decrease turbidity, seagrass damage and manatee accidents.

## **2. MARINA RELATED INITIATIVES**

**a) Restrict fueling facilities except at commercial docks and marinas** with approved spill prevention procedures and equipment, to decrease fuel associated damage to all the aquatic habitats.

**b) Recommend the use of upland dry boat slips** for the expansion of existing or new marinas, to decrease loss of mangrove, seagrass and benthic invertebrate habitats and decrease fuel and anti-fouling paint contamination of preserve waters.

**c) Encourage additional approved holding tank pump-out facilities** to be built at private and public marinas and dock facilities, to decrease nutrient/bacteria contamination of preserve waters.

### **3. CHANNEL DREDGING RELATED INITIATIVES**

**a) Prohibit new dredging** and the conversion of the PRPA bottoms of the preserve to deeper channels for the sole purpose of providing access for greater draft boats, to decrease loss of seagrass and benthic invertebrate habitats.

**b) Encourage new methods of channel maintenance** which work with coastal dynamics and discourage and/or prohibit past methods of channel maintenance and spoil disposal, to decrease loss of seagrass and benthic invertebrate habitats and manatee feeding areas.

### **4. WATERFRONT STRUCTURE RELATED INITIATIVES**

**a) Limit the number, location and size of docks** and other waterfront structures to those compatible with the resources, to decrease loss of mangrove, seagrass and benthic invertebrate habitat and to decrease turbidity and seagrass shading.

**b) Prohibit docks in shallow areas** with inadequate water depth for boat access, to decrease turbidity, seagrass propeller scarring and loss of benthic invertebrate habitat, fish spawning/nursery areas and manatee feeding areas. Recommend alternative fishing piers in areas with less than 3 feet MLW, and when dock lengths required to gain 3 feet MLW would exceed those allowed by Chapters 18-20 and 18-21 F.A.C.

**c) Require the use of littoral vegetation plantings** with all shoreline stabilization projects, to decrease the loss of submerged/emergent vegetation and benthic invertebrate habitats and fish spawning/nursery areas.

**d) Prohibit the construction of new non water dependant structures,** to decrease habitat losses.

**e) Recommend against the replacement of grandfathered and/or authorized non water dependant structures** when they become less than 50% functional, to increase habitat restoration.

**f) Remove illegal non water dependant structures,** to increase habitat restoration.

**g) Increase surveillance and enforcement of project compliance** with permit conditions, possibly seeking authority to levy additional penalties, to decrease habitat losses.

## **5. VEGETATION RELATED INITIATIVES**

**a) Prohibit mangrove trimming in the aquatic preserve** except as authorized by the Board of Trustees mangrove trimming policy or as associated with a permitted dock or pier.

**b) Prohibit against the removal of emergent littoral vegetation**, to decrease loss of habitat functions such as bird feeding areas, fish spawning/nursery areas, erosion control, etc.

**c) Require, where appropriate, revegetation of the shoreline with native vegetation** through the permit review process, to increase habitat restoration.

**d) Require the removal of noxious non native plant species** through the permit review process, to increase and enhance habitat restoration.

## **6. WASTEWATER RELATED INITIATIVES**

**a) Recommend against wastewater and reverse osmosis plant discharges to aquatic preserve waters**, to decrease nutrient, bacterial and other contaminants to preserve waters, to protect water quality and all the aquatic biological communities.

**b) Assist local governments with ensuring proper operation of franchise wastewater treatment systems** within the preserve and watershed, to decrease associated contaminants from reaching the preserve waters and tributary streams, to protect water quality and all the aquatic biological communities.

**c) Assist local governments with eliminating the siting of new septic systems in unsuitable soils**, either those that perc too slow or too fast, to decrease associated contaminants from reaching preserve, tributary and groundwaters, to protect water quality and all the aquatic biological communities.

**d) Request local governments to require that all rebuilt septic systems meet current standards**, to decrease contaminants from reaching preserve, tributary and groundwaters, to protect water quality and aquatic communities.

## **7. STORMWATER RELATED INITIATIVES**

- a) Work with the DER, WMD and local authorities to prevent additional stormwater discharges to the aquatic preserve or tributaries, to decrease nutrients, sediment and other toxics from reaching preserve waters, to protect water quality and aquatic communities.**
- b) Encourage local governments to remove existing untreated stormwater discharges to the aquatic preserve or tributaries, or retrofit existing untreated systems with detention/retention areas, to decrease associated contaminants from reaching preserve and tributary waters to protect water quality and aquatic communities.**
- c) Request local governments to require onsite stormwater retention and buffer areas for new development sites, to decrease associated contaminants from reaching preserve and tributary waters to protect water quality and aquatic communities.**

## **8. LAND USE PLANNING AND MANAGEMENT INITIATIVES**

- a) Identify and encourage the designation of additional critical mangrove, salt marsh and other coastal wetland habitats below the MHWL as part of the aquatic preserve, to protect existing submerged/emergent vegetative communities and associated fish spawning/nursery and bird rookery/feeding areas.**
- b) Work with DER to designate the tributary creeks and adjacent wetlands as OFW (Outstanding Florida Waters), to protect the associated freshwater biological communities and water quality.**
- c) Encourage the acquisition and/or donation of out parcel submerged lands to state ownership through project mitigation requirements, enforcement penalties and/or tax incentives, to decrease the fragmentation of quality submerged habitats.**
- d) Encourage local governments to identify critical habitats on future land use maps to decrease the fragmentation of quality habitats and protect the associated biological communities.**
- e) Encourage state and/or local government acquisition and preservation of critical mangrove, salt marsh habitats above and below the MHWL, to decrease the fragmentation of quality habitats and protect the associated biological communities.**

**f) Assist local governments with siting new commercial areas** away from sensitive biological habitats adjacent to the bay and its tributaries, to decrease the loss of mangrove and salt marsh communities and associated designated species habitats.

**g) Assist local governments and/or regional agencies with initiatives to restore natural hydrological conditions** in the watershed, to restore mangrove, salt marsh and other wetland habitats.

**h) Assist local governments with sea turtle protection** and the identification of nesting areas and adoption of applicable beach light and use regulations, to decrease the loss of nesting areas, to protect the species.

The Lemon Bay Aquatic Preserve management action plan, which identifies the tasks for accomplishing these initiatives, is given in the next chapter.

## **CHAPTER VI**

### **MANAGEMENT ACTION PLAN**

This chapter establishes the guidelines for managing and protecting Lemon Bay Aquatic Preserve's natural and cultural resources for the benefit of present and future generations (Section 258.35, F.S.).

Before an effective program can be designed to manage and protect the preserve's natural resources, it is important to know what resources are present, where they are located, what their functions are, and which of these functions are the most important. Additionally, it is important to know which activities and parameters are affecting the resources, either positively or negatively. This information is used to identify the actions needed to adequately manage and protect the natural resources. To be effective, the management strategy for the aquatic preserve must include a combination of components - resource management, resource protection, research, and environmental education.

In general, the role of the Aquatic Preserve Program in managing the Lemon Bay Aquatic Preserve serves the following functions: (1) overseeing activities that affect the natural resources within the bay; (2) providing information on the ecological functions and economic importance of the bay; (3) educating the public on the inherent and economic values of the resources; (4) conducting field surveys of proposed project sites to collect accurate biological and physical information; (5) ensuring that the field data is considered in permit-related issues and planning decisions; (6) ensuring that all statutes and rules regarding the bay's natural resources are complied with; (7) ensuring that violations are enforced by the appropriate authorities; (8) coordinating resource management and enforcement activities with other agencies; (9) conducting or assisting with pertinent research projects; and (10) developing a comprehensive management program for the preserve that is periodically updated.

The specific actions needed to manage and protect the aquatic resources in Lemon Bay are: A. Managing the Resources; B. Protecting the Resources; C. Conducting Research and D. Informing and Educating the Public and Policy Makers about Lemon Bay Aquatic Preserve resources and activities. For each category, specific objectives are identified, along with the tasks needed to accomplish them.

How well and how soon these actions are accomplished depends on the level of staff and funding support given to the Lemon Bay Aquatic Preserve by the state legislature. The list given below is a complete list of actions needed to adequately protect and manage the preserve according to the intent of the Florida Aquatic Preserve Act and Chapter 18-20 Florida Administrative Code.



## **A. MANAGING THE RESOURCES**

The overall goals of resource management within the aquatic preserve are: (1) maintaining current, detailed resource inventories, (2) maintaining an up-to-date inventory of physical alterations from human activities, (3) restoring and enhancing littoral zone habitats; (4) improving water quality; and (5) establishing a DNR aquatic preserve office within Lemon Bay Aquatic Preserve.

The five resource management goals are accomplished by the following objectives and tasks:

### **GOAL A/1: MAINTAIN RESOURCE INVENTORIES.**

**OBJECTIVE A/1-1:** Up-date the existing resource inventory of submerged and emergent vegetation every 5 years.

**Task A/1-1.1:** Compile existing data on seagrasses, attached algae, mangroves, marsh grasses, and other shoreline vegetation in the preserve.

**Task A/1-1.2:** Conduct an inventory of resources in identified critical areas, on an on-going basis.

**Task A/1-1.3:** Record and maintain resource inventory data on sectional aerial photos.

**OBJECTIVE A/1-2:** Identify areas used by designated species, on an on-going basis.

**Task A/1-2.1:** Compile existing data on designated species habitats within the preserve.

**Task A/1-2.2:** Conduct inventory of designated species habitats, on an on-going basis.

**Task A/1-2.3:** Record and maintain resource inventory data on sectional aerial photos.

**OBJECTIVE A/1-3:** Identify areas used by colonial nesting birds, on an on-going basis.

**Task A/1-3.1:** Compile existing data on colonial nesting bird areas within the preserve.

**Task A/1-3.2:** Conduct inventory of colonial bird nesting areas on an on-going basis.

**Task A/1-3.3:** Record and maintain resource inventory data on sectional aerial photos.

**OBJECTIVE A/1-4:** Create an inventory of benthic invertebrates on un-vegetated bottoms, on an on-going basis.

**Task A/1-4.1:** Compile existing data on benthic invertebrates within the preserve.

**Task A/1-4.2:** Conduct inventory of benthic invertebrates, on an on-going basis. The level of detail of the inventory will depend on the expertise of available field staff and the amount of assistance available from the DNR Marine Research Institute.

**Task A/1-4.3:** Record and maintain resource inventory data on sectional aerial photos.

**OBJECTIVE A/1-5:** Up-date inventory of baseline physical substrate and water column conditions.

**Task A/1-5.1:** Compile existing data on physical substrate and water column conditions.

**Task A/1-5.2:** During other resource inventories, collect information on physical substrate and water column conditions.

**OBJECTIVE A/1-6:** Create an inventory of areas used by manatees in Lemon Bay Aquatic Preserve.

**Task A/1-6.1:** Compile existing data on areas used by manatees, using information from DNR Marine Research Institute, The Littoral Society and other local groups and agencies.

**Task A/1-6.2:** Share information on manatee use of the preserve between agencies and local interest groups.

**Task A/1-6.3:** Up-date inventory of manatee areas, on an on-going basis, during other inventories.

**Task A/1-6.4:** Record and maintain inventory data on sectional aerial photos.

**OBJECTIVE A/1-7:** Create a Geographic Information System (GIS) data base on the computer to mesh the different resource inventory data bases.

**Task A/1-7.1:** Acquire computer and software needed to create the GIS at regional DNR aquatic preserve office.

**Task A/1-7.2:** Train local and regional DNR field staff to input data and use the GIS.

**Task A/1-7.3:** Transfer resource inventory data from data sheets and photos to GIS data base.

**Task A/1-7.4:** Up-date GIS data base as new resource inventories are conducted.

**GOAL A/2: MAINTAIN INVENTORY OF PHYSICAL ALTERATIONS OCCURRING IN THE AQUATIC PRESERVE DUE TO HUMAN ACTIVITIES.**

**OBJECTIVE A/2-1:** Create inventory of physical alterations due to human activities, on an on-going basis.

**Task A/2-1.1:** Compile existing photos and data on physical alterations in the preserve associated with human activities.

**Task A/2-1.2:** Conduct inventory of docks and piers in the preserve, on an on-going basis. The inventory will include at a minimum: the length of the access structure waterward of MHWL, the area of the terminal structure, the height above MHWL, water depth at the terminal end, number of boats, functional condition, accessory facilities, use category of riparian property, and the biological resources within 25 feet.

**Task A/2-1.3:** Conduct inventory of dredged areas, on an on-going basis. The inventory will include at a minimum: the length, width and depth of the dredged area, depth profiles of the surrounding area, traditional use of the area, biological resources of dredged and surrounding area and review of data previously collected at the site.

**Task A/2-1.4:** Conduct inventory of shoreline stabilization activities in the preserve, on an on-going basis. The inventory will include at a minimum: the total length of riparian shoreline, the length of the shoreline stabilization, the techniques and materials to be used, biological resources and review of previously collected data at the site.

**Task A/2-1.5:** Record and maintain inventory on sectional aerial photos.

### **GOAL A/3: RESTORE AND ENHANCE LITTORAL ZONE HABITATS.**

**OBJECTIVE A/3-1:** Restore and enhance unvegetated, eroding and disturbed shoreline areas.

**Task A/3-1.1:** Identify unvegetated, eroding and disturbed shoreline areas during resource inventories and permit reviews.

**Task A/3-1.2:** Encourage private property owners and managers of publicly owned lands to revegetate disturbed shorelines with natural plantings such as mangroves and Spartina.

**OBJECTIVE A/3-2:** Enhance natural shoreline functions in sea walled areas where natural habitat no longer exists.

**Task A/3-2.1:** Identify sea walls without riprap or plantings at the base, during resource inventories and permit reviews.

**Task A/3-2.2:** Encourage private landowners and managers of publicly owned lands to place riprap or other structures to encourage invertebrate and fish use at the base of the sea wall if it is submerged and natural habitat no longer exists.

**Task A/3-2.3:** Encourage private landowners and managers of publicly owned lands to plant mangroves or Spartina at the base of the sea wall if it is exposed or in shallow water.

### **GOAL A/4: IMPROVE WATER QUALITY.**

**OBJECTIVE A/4-1:** Encourage and support actions by FDER and the water management district which help improve and protect water quality in Lemon Bay and its tributaries.

**Task A/4-1.1:** Recommend that Lemon Bay be added to the SWIM program of the Southwest Florida Water Management District.

**Task A/4-1.2:** Encourage local governments and the water management district to consider primary, secondary and cumulative impacts to waters of the aquatic preserve caused by point source, nonpoint source and stormwater discharges when making management decisions.

**Task A/4-1.3:** Work with local mosquito control districts to assure that the arthropod control plans are in compliance with Section 388.4111, F.S. and that arthropod control activities are consistent with this management plan.

**Task A/4-1.4:** Encourage private marinas and public docking facilities to establish additional sewage pumpout stations and publicize the location of existing stations.

**Task A/4-1.5:** Require placement of a grassed berm just upland of new sea walls that are being replaced, to allow infiltration of runoff water from the yard.

**Task A/4-1.6:** Require proper stormwater retention and routing for new public roads and parks or improvements to existing roads and parks.

**GOAL A/5: ENCOURAGE USES OF ADJACENT UPLANDS WHICH PROTECT AND ENHANCE THE RESOURCES IN THE AQUATIC PRESERVE.**

**OBJECTIVE A/5-1:** Assure that local government comprehensive plans and amendments include provisions which protect the aquatic preserve resources.

**Task A/5-1.1:** Identify and contact the appropriate staff of local governments, the regional planning council and Florida Department of Community Affairs (FDCA) who are involved with developing the comprehensive plans and amendments governing the Lemon Bay Aquatic Preserve area.

**Task A/5-1.2:** Work with local government, regional planning council and FDCA staff to include appropriate resource protection provisions in comprehensive plans, up-dates and amendments.

**OBJECTIVE A/5-2:** Assure that local government ordinances include provisions which protect the aquatic preserve resources.

**Task A/5-2.1:** Contact appropriate local government and regional planning council staff involved with ordinance adoption and revision.

**Task A/5-2.2:** Work with local government and regional planning council staff to include appropriate resource protection provisions in the new and amended ordinances.

## **B. PROTECTING THE RESOURCES**

To maintain the biological integrity of the aquatic preserve, it is necessary to protect the resources that comprise the system. Two primary sets of tools are available to protect the resources. Before activities or projects are begun, the criteria given in the Aquatic Preserve rules and regulations can be used to guide environmentally sound projects. After damage has been done to the resources from illegal activities, enforcement can be used to recover losses.

Since it is not feasible to target all the individual species of organisms in the preserve adequately, the primary thrust of the resource protection element is to protect the habitats that house the organisms. Therefore, the resource protection goals for the aquatic preserve are to use regulatory and enforcement mechanisms to: (1) protect the existing aquatic communities including: submerged vegetation (seagrasses and algae), emergent vegetation (mangroves, smooth cordgrass), oyster bars and clam beds, and (2) protect designated species habitat.

The objectives and tasks needed to accomplish the resource protection goals are given below.

### **GOAL B/1: PROTECT EXISTING AQUATIC COMMUNITIES.**

**OBJECTIVE B/1-1:** Minimize potential damage to submerged and emergent vegetation and oyster bars and clam beds through the review of and comment on applications for use of state-owned land in the aquatic preserve.

**Task B/1-1.1:** Conduct thorough surveys of proposed project sites and immediately adjacent areas. The survey of the submerged bottom will include at a minimum: a description of all communities/habitats, the bottom substrate, water depth profiles, tidal amplitude/stage and a physical description of the surrounding area. The survey of the shoreline (where appropriate) will include at a

minimum: a description of the vegetation, a description of any existing structures and notation of any nesting bird and designated species use.

**Task B/1-1.2:** Determine if each proposed project site is located in a Primary Resource Protection Area. Primary Resource Protection Areas are areas of significant resources, including, but not limited to: 1) seagrasses and algae, 2) mangroves and marsh grass, 3) harvested bivalves, 4) unvegetated soft-bottom communities, 5) hard-bottom communities, 6) designated species, and 7) nesting sites for solitary or colonial birds.

**Task B/1-1.3:** Assess the uniqueness of the resources and the potential primary, secondary and cumulative impacts of the proposed project during application review.

**Task B/1-1.4:** Place draft restrictions on letters of consent for single family docks requiring at least 12" of clearance between the bottom of the boat to be moored at the dock and the submerged vegetation at mean low water. In areas with inadequate water depths, the riparian access will be limited to a fishing pier.

**Task B/1-1.5:** Provide project review comments from aquatic preserve field staff to the appropriate regional DNR planner in a timely manner.

**Task B/1-1.6:** Coordinate project review and information with other appropriate agencies that have regulatory authority for the projects.

**Task B/1-1.7:** Include data collected during the review of proposed projects in the resource inventory updates and on the sectional aerial photos.

**OBJECTIVE B/1-2:** Ensure that structures and projects that have been authorized and built are in compliance with the authorized conditions.

**Task B/1-2.1:** Request that the regional DNR planners forward copies of all letters of consent, easements agreements, lease agreements, and other forms of authorizations for applications in the preserve to the local aquatic preserve office.

**Task B/1-2.2:** Report violations of authorized uses to the appropriate DNR enforcement agent.

**Task B/1-2.3:** Inform other appropriate agencies with regulatory authority of projects which are not in compliance with authorized conditions.

**OBJECTIVE B/1-3:** Ensure that structures and projects that have been built or are occurring have been authorized.

**Task B/1-3.1:** Report activities that do not appear to have been authorized to the appropriate DNR enforcement agent.

**Task B/1-3.2:** Inform other appropriate agencies with regulatory authority of projects that do not appear to have been authorized.

**Task B/1-3.3:** Pursue removal of illegal structures that have significant adverse impacts on unique resources within the preserve.

**OBJECTIVE B/1-4:** Ensure that human use of the preserve does not create turbidity levels that adversely affect submerged vegetation.

**Task B/1-4.1:** Establish an ordinance to reduce the speed of boats traveling in shallow areas outside the Intercoastal Waterway.

**Task B/1-4.2:** Require that all dredge and fill projects use effective turbidity control practices.

**Task B/1-4.3:** Place "Caution - Seagrass" signs along navigation channels near areas where heavy propeller scarring occurs in adjacent seagrass beds.

**OBJECTIVE B/1-5:** Ensure that rebuilt structures and projects comply with current regulations.

**Task B/1-5.1:** Require conditions on the consents of use for structures and projects that are being rebuilt to bring the projects into compliance with existing rules and regulations.

**GOAL B/2: PROTECT DESIGNATED SPECIES HABITAT.**

**OBJECTIVE B/2-1:** Ensure that identified designated species habitats are given maximum protection through the permit-review process.



**Task B/2-1.1:** Recommend modifications to proposed projects that will eliminate or reduce adverse impacts to the habitat of designated species on state-owned submerged lands and adjacent uplands.

**Task B/2-1.2:** Work with the Florida Game and Freshwater Fish Commission non-game biology program to coordinate efforts to protect rookeries and major foraging areas in the aquatic preserve.

### **C. CONDUCTING RESEARCH**

Effective management of biological systems, such as the Lemon Bay Aquatic Preserve, relies significantly on information about how those systems function. This information is collected through both basic and applied research. Dynamic systems, like Lemon Bay, are in a constant process of change and therefore it is important to continually up-date the base of scientific information. Because of the resource management needs, the research program within the Bureau of Submerged Lands and Preserves is primarily focused on research applicable to specific issues within the preserves. Complementary, basic research is conducted by the DNR Marine Research Institute.

The goals of the research program for the preserve are to: (1) determine the changes that are occurring in the aquatic communities within the preserve, (2) determine the changes that are occurring in the manatee use of the area, and (3) encourage on-going research on specific issues within the preserve.

Site specific research conducted by aquatic preserve staff within the Lemon Bay Aquatic Preserve will be coordinated with the research efforts of FDNR Marine Research Institute and other appropriate agencies and institutions.

Given below are the objectives and tasks needed to accomplish the five research goals.

#### **GOAL C/1: DETERMINE CHANGES THAT ARE OCCURRING IN THE AQUATIC COMMUNITIES IN THE PRESERVE.**

**OBJECTIVE C/1-1:** Determine changes that occur in littoral habitats between times of resource inventories.

**Task C/1-1.1:** Develop, and put in writing, uniform procedures and techniques to be used consistently to conduct resource inventories.

**Task C/1-1.2:** Compare results of the next resource inventory with those of the inventory used to prepare this plan.

**Task C/1-1.3:** Identify specific locations within the preserve where positive or negative changes have occurred to habitats or functions between the times of the inventories.

**Task C/1-1.4:** Identify possible causes of the changes.

**Task C/1-1.5:** Determine management and research actions needed to correct the identified problems.

**OBJECTIVE C/1-2:** Assess the impacts of permitted projects on the natural communities within the preserve.

**Task C/1-2.1:** Conduct additional resource inventories at sample project sites, before and periodically after project construction. The sample sites should include dock, dredging and shore stabilization sites. The site inventories should be repeated every 6 months for 2 to 5 years, as needed to assess impacts.

**Task C/1-2.2:** Analyze changes to communities before and after project installation.

**Task C/1-2.3:** Determine design, management and research actions needed to correct identified problems.

**OBJECTIVE C/1-3:** Determine changes that occur in designated species habitat between time of inventories.

**Task C/1-3.1:** Compare resource inventory results of designated species habitat as often as possible during each five year period.

**Task C/1-3.2:** Identify specific locations where positive or negative changes have occurred to habitats or functions between times of the inventories.

**Task C/1-3.3:** Identify potential causes of the changes.

**Task C/1-3.4:** Identify management and research actions needed to correct problems.

**GOAL C/2: DETERMINE CHANGES THAT ARE OCCURRING TO MANATEE USE OF THE AQUATIC PRESERVE OVER TIME.**

**OBJECTIVE C/2-1:** Determine changes that occur in manatee use of the aquatic preserve over time.

**Task C/2-1.1:** Review existing data on manatee use of the preserve, working with the DNR Marine Research Institute and the Littoral Society.

**Task C/2-1.2:** Identify specific locations where changes in manatee use in the preserve have occurred between times of the inventories.

**Task C/2-1.3:** Analyze results of on-going manatee inventories and compare to previous inventory results.

**Task C/2-1.4:** Identify potential causes of changes in manatee use of the preserve.

**Task C/2-1.5:** Determine management and research actions needed to correct identified problems.

**GOAL C/3: ENCOURAGE ON-GOING RESEARCH WITHIN THE PRESERVE.**

**OBJECTIVE C/3-1:** Develop a program for site and activity specific research within the Lemon Bay Aquatic Preserve.

**Task C/3-1.1:** Identify short and long term research needs for the preserve and up-date the list every year.

**Task C/3-1.2:** Work with DNR Marine Research Institute and educational institutions to develop a program and schedule to conduct research.

**Task C/3-1.3:** Provide local logistical support to Marine Research Institute and educational institutions, when possible, to conduct research.

**D. INFORMING AND EDUCATING THE PUBLIC AND POLICY MAKERS**

The integrity of the biological systems within the Lemon Bay Aquatic Preserve can be affected, both directly and indirectly, by the public's enjoyment of the preserve. Conversely, the public's enjoyment of the preserve depends on the biological health

of the resources. Without a biologically "healthy" bay, water quality will deteriorate, fisheries will fail due to loss of habitat, and many species of wading birds will disappear.

One of the primary aims of the Aquatic Preserve Program, therefore, is to educate the public and policy makers about the importance of the resources in the preserve and the effects of certain actions on the functions of those resources.

The public that affects and is affected by the health of the resources in the preserve is composed of a number of segments: (1) students (elementary, secondary, college, etc.); (2) waterfront property owners; (3) user groups (e.g., fisherman, boaters, developers and marine contractors); (4) visitors and new residents; and (5) special interest groups (e.g., Audubon Society, boating clubs). The policy makers include local, regional, and state government agencies that are involved in making decisions regarding the bay. To be effective, the information/education program needs to be responsive to each of these groups of people.

The goals of the environmental information and education element for the preserve are: (1) to provide information to the public and policy makers about the Lemon Bay Aquatic Preserve and its resources and (2) to educate the public and policy makers about the preserve and its management. It is important for individuals to understand the significance of preserving our natural and cultural resources when they are making policy and personal decisions that affect the resources. The intended result is to help the public and policy makers become responsible users of the preserve. Two DNR publications, Environmental Education in Florida: Needs and Goals, and A Guide for Environmental Education, are available references to aid in accomplishing this goal.

The objectives and tasks supporting these two primary information/education goals follow.

#### **GOAL D/1: PROVIDE INFORMATION TO THE PUBLIC AND POLICY MAKERS ABOUT LEMON BAY AQUATIC PRESERVE AND ITS RESOURCES.**

**OBJECTIVE D/1-1:** Produce educational literature and materials that inform the public and policy makers about the bay's natural and cultural resources, including listed species, and the importance of preserving and protecting them.

**Task D/1-1.1:** Draft brochures, pamphlets, posters, booklets and signs describing the program's purposes and the aquatic preserve's ecosystems and related local activities.

**Task D/1-1.2:** Work with central office staff to produce final versions of informational materials.

**OBJECTIVE D/1-2:** Provide information to existing environmental education programs at public and private schools and educational centers about the preserve, its resources and activities.

**Task D/1-2.1:** Provide the county school boards with information on the aquatic preserve's environmental education programs and available assistance for their existing educational programs.

**Task D/1-2.2:** Provide Manatee Community College and the American Littoral Society with information about the preserve's education programs and available assistance.

**OBJECTIVE D/1-3:** Provide information to the general public about the Lemon Bay Aquatic Preserve, its resources and activities.

**Task D/1-3.1:** Distribute brochures, posters, etc. to commercial marinas, bait shops and local convenience stores.

**Task D/1-3.2:** Put up display boards at public boat ramps with aquatic preserve and resource information.

**Task D/1-3.3:** Construct a small shelter with informational displays at a central location adjacent to the preserve. The shelter can also be used for field trips and presentations.

**OBJECTIVE D/1-4:** Provide information to the general public about the importance of proper boat sewage pump-out procedures.

**Task D/1-4.1:** Develop brochures and posters on impacts of improperly disposed of boat wastes, regulations and locations of local pump-out stations.

**Task D/1-4.2:** Distribute brochures and posters about proper boat waste procedures to commercial marinas and fueling stations and display at public launch sites.

**OBJECTIVE D/1-5:** Inform policy makers about the preserve, its resources and activities.

**Task D/1-5.1:** Distribute information about the preserve resources and activities to local government planning and resource management offices.

**OBJECTIVE D/1-6:** Inform the general public and policy makers about current activities in the preserve.

**Task D/1-6.1:** Prepare and distribute news releases on current activities and resources within the preserve.

**Task D/1-6.2:** Prepare and distribute news releases on current enforcement of illegal activities and denial of permits within the preserve.

**GOAL D/2: EDUCATE THE PUBLIC AND POLICY MAKERS ABOUT LEMON BAY AQUATIC PRESERVE AND ITS RESOURCES.**

**OBJECTIVE D/2-1:** Establish informational workshops for environmental educators about the bay's natural resources, including listed species.

**Task D/2-2.1:** Participate in, schedule and/or coordinate two instructional workshops for public and private school teachers and environmental educators per year.

**Task D/2-2.2:** Coordinate with and assist local environmental and school groups, such as the American Littoral Society and Manatee Community College, on their scheduled interpretive talks.

**OBJECTIVE D/2-2:** Establish and conduct educational programs in locations where no appropriate programs currently exist.

**Task D/2-2.1:** Notify the county school boards of the fields staff's intent to establish environmental education programs in their jurisdictional area.

**Task D/2-2.2:** Conduct off-site classroom instruction with field trips to the preserve for educators.

**Task D/2-2.3:** Conduct or assist with informal seminars, classes and workshops about current resource management issues, resource utilization and regulatory activities in the preserve. The workshops should be a forum for public discussion and should include both public and private interests.

**OBJECTIVE D/2-3:** Improve understanding of local policy makers and staff of the environmental conditions and management of the resources within the aquatic preserve.

**Task D/2-3.1:** Develop and initiate meetings of an inter-agency coordination committee to coordinate activities affecting Lemon Bay.

**Task D/2-3.2:** Make presentations at regular meetings of local government planning and resource management committees.

**Task D/2-3.3:** Conduct informal workshops for local policy makers and staff about the aquatic preserve, its natural resources and the management of the resources.

**OBJECTIVE D/2-4:** Establish an on-site environmental education center with displays in the aquatic preserve.

**Task D/2-4.1:** Identify the needs, size and location for a local environmental educational center.

**Task D/2-4.2:** Work with local educational institutions, groups and governments to construct, supply and staff an environmental learning center adjacent to the preserve.

**Task D/2-4.3:** Request Bureau funding support for materials, supplies and partial operating expenses for environmental learning center.

How effective this Management Action Plan is at guiding the protection and management of the resources within the Lemon Bay Aquatic Preserve depends on how well these goals, objectives and tasks are carried out. Good coordination between agencies and citizen support groups and adequate staffing and funding support are critical to the success of the program. The roles of agencies and citizen groups involved with managing and protecting the preserve are given in the next chapter, "Chapter VII - Management Coordination Network". How much will be accomplished by available staffing and funding levels is estimated in "Chapter VIII - Staffing and Funding Needs".

## CHAPTER VII

### MANAGEMENT COORDINATION NETWORK

This chapter presents a general overview of the various federal, state, regional, and local agencies that regulate or hold any interest in the management or use of the Lemon Bay Aquatic Preserve. A reference matrix of these regulatory programs and their jurisdictions is presented in Table 2, located at the end of this chapter. One function of the aquatic preserve program is to coordinate with those agencies to achieve common goals relevant to aquatic preserve management.

#### A. FEDERAL AGENCIES

A number of federal agencies have property interests, construction activities, regulation programs, research activities, and land/wildlife management programs that deal either directly or indirectly with the aquatic preserves. These federal agencies include: U.S. Army Corps of Engineers, U.S. Coast Guard, U.S. Environmental Protection Agency, U.S. Geological Survey, U.S. Fish and Wildlife Service, and the National Marine Fisheries Service.

The U.S. Army Corps of Engineers (COE) has jurisdiction over inland navigable waters under the Rivers and Harbors Act of 1899. A revision of the Rivers and Harbors Act in 1968 extended the Corps' jurisdiction allowing the agency to consider the fish and wildlife, conservation, pollution, aesthetics, ecology, and other relevant factors of a project. The Corps Regulatory Program expanded in 1972 with the Federal Water Pollution Control Act Amendments, also known as the Clean Water Act (CWA). Section 404 of this act requires the Corps to control dredge and fill activities. In 1977, amendments to the CWA extended this jurisdictional responsibility to wetlands. The Corps also contributes 50% of the funds reimbursed to the Water Management Districts by the Department of Natural Resources for aquatic plant control.

The Lemon Bay Aquatic Preserve is monitored by the U.S. Coast Guard (USCG) for boating safety (including search and rescue operations) and navigational problems, and to enforce maritime laws. The Coast Guard Auxiliary, an organization of volunteers, performs boating safety inspections, conducts boating classes and assists in search and rescue operations.

The U.S. Environmental Protection Agency (EPA) has jurisdiction over surface waters in the state. Enforcement authority was given under the Clean Water Act of 1968 and broadened under the 1977 revision. In general, the EPA is responsible for pollution control and abatement, including: air, water, noise, solid waste, toxic waste, and radiation. The agency reviews permits issued by the Department of



Environmental Regulation for the treatment, disposal, and storage of hazardous waste. Authority is divided between EPA and USCG regarding the discharge of oil or hazardous substances into surface water.

The U.S. Geological Survey (USGS) performs surveys and research pertaining to topography and geology as well as monitoring the mineral and water resources of the Lemon Bay Aquatic Preserve region.

The U.S. Fish and Wildlife Service (USFWS) is responsible for fish and wildlife and their habitat as authorized in the; Coastal Barrier Resources Act (COBRA), National Environmental Protection Act, Migratory Bird Act, Endangered Species Act, and the Fish and Wildlife Coordination Act (FWCA). Under provision of the FWCA, USFWS must be consulted before COE can submit a plan for Congressional approval. The USFWS comments on the impacts of proposed projects on endangered species, migratory birds, and other fish and wildlife and their habitats. They are directed to prepare environmental impact assessments or statements for proposed projects by the COE and are authorized to issue "Jeopardy Opinion" against any proposed project which will negatively affect an endangered species (Barile et al., 1987).

The National Marine Fisheries Service (NMFS), under the Department of Commerce, is involved with fisheries management.

In accordance with the federal consistency review process, the Bureau of Submerged Lands and Preserves reviews the federal programs and activities as to how they affect the objectives of the aquatic preserve management program. This review is coordinated through the Florida Department of Environmental regulation's office of Coastal Management in order to enforce the provisions of the Federal Coastal Zone Management Act of 1972, as amended.

## **B. STATE AGENCIES**

Eight state agencies have programs that affect the resources or regulate activities within the aquatic preserves: Department of Natural Resources, Department of Environmental regulation, Department of Health and Rehabilitative Services, Game and Freshwater Fish Commission, Department of Community Affairs, Marine Fisheries Commission, Department of State, and the Department of Transportation.

Although not a state agency, the Office of Planning and Budgeting of the Governor's Executive Office, in conjunction with the DER's office of Coastal Management, is responsible for administering project reviews applicable to Florida's Coastal Management Program Federal consistency evaluation process. This process includes all projects in the state that involve federal permitting, federal assistance or control federal activities.

Each project must undergo this additional review to determine if the project is consistent with established programs, policies, and rules of the State, including aquatic preserves.

The Florida Department of Natural Resources' (DNR) areas of responsibility include state lands, sovereignty submerged lands, and marine resources (e.g., marine research projects, sea turtle and manatee protection). The Florida Marine Patrol enforces safe boating laws as well as commercial and recreational fishing regulations. Authority granted under Chapters 18-20, and 18-21, F.A.C., gives DNR responsibility to regulate commercial and residential docks and other structures and activities conducted on submerged lands. Under Chapter 16C, F.S., DNR responsibility for various aquatic plant control programs, including permit review for mechanical, biological, and chemical control of aquatic plants. Permits are also necessary under Chapter 16C-52, F.S., "Aquatic Plant Importation, Transportation, Cultivation, and Possession", for any persons cultivating, revegetating, or collecting aquatic plants. Under Section 161 F.S., the Division of Beaches and Shores has authority to regulate the location of construction and excavation activities and vegetation protection below the Coastal Construction Control Line, as well as conduct beach and inlet planning activities.

The Florida Department of Environmental Regulation (DER) has a broad range of responsibilities and receives its authority from State Law and some delegated from EPA. Generally, the DER responsibilities include water management, water quality, potable water, air quality, coastal management, wetland protection, power plant siting, hazardous and solid wastes.

The responsibilities are accomplished through the following regulatory mechanisms: (1) establishment of state standards designed to protect natural systems and prevent harmful pollutants from entering these systems; (2) application of these standards through the permitting of potential sources of pollution and monitoring discharges for compliance; and (3) initiation of enforcement action for non-compliance with these standards.

The DER's rules significant to the aquatic preserve management program are Chapters 17-3, 17-4, and 17-12, F.A.C. Authority for these rules is based in Chapter 403, F.S. Chapter 17-3, F.A.C., addresses water quality standards with the most stringent category being "Outstanding Florida Waters" (OFW). As an OFW, ambient conditions of the waterbody become the water quality standards, not a set of prescribed values. The Lemon Bay Aquatic Preserve became an OFW prior to its designation as an aquatic preserve. Chapter 17-4, F.A.C., addresses permit requirements and Chapter 17-12, F.A.C., covers dredge and fill activities.

Section 253.77, F.S., as amended by the Warren S. Henderson Wetlands Protection Act of 1984, requires that any person requesting the use of state-owned lands shall have prior approval of the Trustees. An interagency agreement between DNR and

DER provides for DNR staff comments into the DER permitting process for environmental impacts in aquatic preserves.

The Florida Department of Health and Rehabilitative Services (HRS) has responsibilities to protect the public's health by overseeing functions that involve water supply, onsite sewage disposal, septic tank cleaning, and solid waste control. Authority for these responsibilities are found in Chapters 154, 381, and 386, F.S., and in the 10 D Series of F.A.C., known as the "Sanitary Code." The local county health department has jurisdiction overseeing these responsibilities.

Also affecting the public's health and the aquatic preserve program is the arthropod (mosquito) control program, which is usually administered through the local mosquito control district. Each of these public health programs holds the potential to create significant impacts upon the aquatic preserves.

The Florida Game and Fresh Water Fish Commission (GFWFC) authority is provided in the rules and regulations of Chapters 39.101 and 39.102, F.A.C. This authority involves the implementation of specific regulations and their enforcement for protecting all wildlife and their habitats. As such, the GFWFC is the state coordinator for species designated for protection in Florida.

The Florida Department of Community Affairs (DCA) and the Regional Planning Councils are authorized under Section 380.06, F.S., for administering the Development of Regional Impact (DRI) review program. The DRI process was established to provide a review and monitoring procedure for development projects potentially affecting the health, safety or welfare of citizens of more than one county.

Additionally, the DCA designates Areas of Critical State Concern (ACSC) which is intended to protect the areas of the state where development has endangered or may endanger resources of regional or statewide significance. Under an ACSC designation, the local governments are required to notify the DCA of any application for a development permit. The entire land development process will require the state's supervision until that local government modifies its land development practices to conform to the ACSC requirements.

The DCA also oversees the development of Local Government Comprehensive Plans (LGCP) for both counties and municipalities, as required by the Local Government Comprehensive Planning and Land Development Regulation Act, Chapter 163, Part II, F.S. Subsection 163.3203 (5), F.S., provides that DCA shall adopt rules for the review of local government land development regulations. Within one year of submission for review by DCA, local governments are required to adopt land development regulations which are consistent with their comprehensive plans, pursuant to Subsection 163.3167 (2), F.S. The two elements within these plans that bear most directly on the aquatic preserve program are the Coastal Zone Management Element and the Conservation Element.

The Florida Marine Fisheries Commission (MFC) was established as the rulemaking authority pursuant to Section 370.027, F.S. The seven members appointed by the Governor are delegated full rulemaking authority over marine life (subject to approval by the Trustees,), with the exception of endangered species. This authority covers the following areas: (a) gear specifications, (b) prohibited gear, (c) bag limits, (d) size limits, (e) species that may not be sold, (f) protected species, (g) closed areas, (h) quality control codes, (i) open/closed seasons, and (j) special considerations related to egg-bearing individuals, and (k) relaying to clams and oysters. The MFC is also instructed to make annual recommendations to the Trustees regarding marine fisheries research priorities.

The Florida Department of State (DOS), Division of Historical Resources (DHR) has the responsibility granted under Chapter 267, F.S., regarding the preservation and management of Florida's archaeological and historical resources. This responsibility includes those cultural resources located on state-owned lands including aquatic preserves.

The Florida Department of Transportation (DOT) has responsibilities that include right-of-way and surface water runoff in the areas of roads, bridges, and causeways. The DOT also updates a state-wide aerial photographic survey every four years, rotating on a district basis.

### **C. REGIONAL AGENCIES**

At the regional level, the management coordination network includes the Southwest Florida Water Management, the Southwest Florida Regional Planning Council, and the West Coast Inland Navigation District. These organizations conduct activities that are on a broader scale than those of local governments.

The Southwest Florida Water Management District (SWFWMD) was created by Chapter 61-69, Laws of Florida, as a public corporation for carrying out Chapter 378, F.S., and is governed by provisions of Chapter 373, F.S. Chapters 40D-4 and 40D-40 were adopted to ensure continued protection of the water resources of the District including wetlands and other natural resources. The rules in these chapters are to implement the surface water management permit system mandated in Part IV of Chapter 373, F.S. The statutes resulted from passage of Chapter 84-79, Laws of Florida, the Warren G. Henderson Wetlands Protection Act of 1984.

SWFWMD has jurisdiction over and administers the permitting program for water use, well construction, stormwater discharge, surface water management, groundwater withdrawals, water level control and provides control of exotic plants (primarily hydrilla and water hyacinths) in cooperation with the COE.

It is the intent of the Florida Legislature (Chapter 87-97, Section I-6, Laws of Florida) through the Surface Water Improvement Management (SWIM) Act, that the water management districts "design and implement plans and programs for the improvement and management of surface water." Lemon Bay is not a designated SWIM waterbody.

The Southwest Florida Regional Planning Council (SWFRPC) serves as a regional planning body for county and municipal governments. Its many functions include: (1) providing assistance to local governments with planning expertise, (2) serving as the regional representative for the DRI review process, (3) serving as a regional clearinghouse for state and federal projects and programs, (4) assisting local governments in securing grants, (5) conveying information from the local governments to the state and federal levels, and (6) preparing and administering the Regional Comprehensive Policy Plan.

The West Coast Inland Navigation District (WCIND), which is part of the "Gulf Intracoastal Waterway, is a multi-county district created by the Legislature. It was created to provide spoil sites for maintenance of the Atlantic Intracoastal Waterway. Presently, WCIND holds spoil easements over two spoil islands within the Lemon Bay Aquatic Preserve.

#### **D. LOCAL AGENCIES**

The Lemon Bay Aquatic Preserve spans two counties (Charlotte and Sarasota) which have areas of jurisdiction within the Lemon Bay basin and zoning regulations over the adjacent uplands. Appendix 2 lists those ordinances, both proposed and passed by these local governments, that relate to the management and protection of resources within the aquatic preserve.

The Sarasota County Natural Resources Department, Coastal Zone Division is the lead agency in Sarasota County for reviewing and permitting all coastal projects within unincorporated areas of Sarasota County. A permitting system has been designed to reduce damage to coastal waters and shores and to preserve their natural beauty, yet maintain property rights. Anyone proposing a coastal project is required to apply for and be granted a coastal permit or variance prior to beginning work.

There are two types of coastal projects that directly effect Lemon Bay. The first category includes construction and maintenance of docks, piers, boat ramps, boat basins, moorings, pilings, seawalls, rock revetments, retaining walls, regrading the shoreline, and maintenance dredging. Those projects waterward of the mean high water line, or within swamp or overflow lands, encompass the majority of coastal permit applications.

The second category is upland projects on the Gulf seaward of the Gulf beach Setback Line (formerly the CCSL) and beach cleaning and grooming. Other upland areas where the County review for any building proposal or excavation or filling is required, is within an area 20 feet landward of the mean high water line or from the most landward extent of swamp and overflow lands of any bay, bayou, tidal creek, stream, canal, lake or river.

The Coastal Zone Division is also involved with environmental monitoring, habitat restoration and enhancement of wetlands, sea turtle monitoring and tagging program, boating regulations and safety and the creation and maintenance of artificial reefs.

The Charlotte County participation in regulation and protection of Lemon Bay is principally the responsibility of a single environmental planner. The County Board of Commissioners does have four committees that consider related issues and citizen input. The four committees include the marine advisory, the beaches and shores, the environmentally important lands acquisition, and recreation and parks committees. Current regulatory language is limited to the Conservation and Coastal Elements of the County Comprehensive Plan. These policies provide for cooperation with FDNR in their management of the State Aquatic Preserves, the Charlotte Harbor State Reserve, Don Pedro State Park and the Port Charlotte State Recreation Area. The effectiveness and cooperation of the county's relevant programs would be strengthened if this management plan for Lemon Bay Aquatic Preserve was incorporated by reference into the Charlotte County Comprehensive Plan.

Other policies mandate that seagrass beds are protected, manatees and their feeding areas are protected, endangered and threatened species are mapped and a computerized data base of their habitats be maintained, a Conservation Overlay be adopted, a water quality monitoring program be implemented and that Charlotte County will identify and recommend for purchase by the State of Florida, those floodplains that warrant acquisition under the Conservation and Recreational Lands Program, or the Save Our Rivers Program or the Save Our Coast Program.

#### **E. CITIZEN SUPPORT GROUPS**

The American Littoral Society is a national organization which focuses attention on the shore and adjacent wetlands, bays and rivers. Members include professional and amateur naturalists interested in and concerned for the coastal environment. The society's goal is to encourage a better understanding of aquatic environments and provide a unified voices advocating the protection of the delicate fabric of life along the shore.

The Florida Chapter of the Littoral Society is over five years old. Currently, there is an office located in Sarasota. A regional Englewood Branch Office was located on Lemon Bay for two years, but was closed in July 1991 due to lack of funding support. The focus of the office was on educational programs to educate school children, to offer informational seminars to the community and work with other established groups in the area to form a Coalition For Action.

The Littoral Society in Englewood helped coordinate the Lemon Bay Conference, the Lemon Bay Manatee Project and Sea Turtle Volunteers. Coastal Clean Ups have been organized and local data sheets on debris picked up have been included in statewide reports. Volunteers for the sea turtle program contribute data for long term population studies on the Loggerhead Sea Turtle and the sighting forms for the Lemon Bay Manatee Project have been instrumental in setting No Wake Zones in certain areas.

The Society has implemented public education through articles and advertisements in local newspapers concerning the effects of habitat destruction and creek development on Lemon Bay.

The Lemon Bay Conservancy is an entirely non-profit organization for the preservation, protection and acquisition of natural areas important in maintaining the ecological balance of Lemon Bay and adjacent waters, with headquarters in Englewood, Florida. It is the oldest Land Trust organization in Florida.

The Conservancy holds regular meetings in autumn, winter and spring which involve a wide variety of upland and wetland conservation topics. Members are active in a variety of projects and have assisted as volunteers in the Lemon Bay Resource Inventory. The Conservancy was active in the designation both of the aquatic preserve and the Outstanding Florida Waters for Lemon Bay.

## TABLE 2: MANAGEMENT COORDINATION NETWORK

LOCAL AGENCIES	REGIONAL AGENCIES
LGT Local Governments (Cities, Towns, Municipalities) CGT County Governments LDD Local Drainage Districts MCD Mosquito Control Districts ICD Inlet Commissions/Districts SWC Soil and Water Conservation Districts	RPC Regional Planning Council WMD Water Management Districts FIN Florida Inland Navigation District
STATE AGENCIES	FEDERAL AGENCIES
DCA Florida Department of Community Affairs DER Florida Department of Environmental Regulation DNR Florida Department of Natural Resources GFC Florida Game and Freshwater Fish Commission HRS Florida Department of Health and Rehabilitative Services DOS Florida Department of State DOT Florida Department of Transportation FMP Florida Marine Patrol FSG Florida Sea Grant MFC Marine Fisheries Commission DAC Florida Department of Agriculture and Consumer Services	CG United States Coast Guard COE United States Army Corps of Engineers EPA United States Environmental Protection Agency FWS United States Fish and Wildlife Service NMF National Marine Fisheries Service GS United States Geological Survey

Source: modified from the Indian River Lagoon Joint Reconnaissance Report, 1987



	Local										Regional										State										Federal				
	LGT	CGT	LDD	MCD	ICD	SVC	RFC	VMD	FIN	DAC	DCA	DER	DNR	CFR	IHS	DOS	DOT	FMP	ESG	MFC	CG	COE	EPA	FWS	NMF	GS									
Dredge and Fill Permitting	●	●						●																											
Docks, Fishing Piers, Seawalls	●	●																																	
Marinas	●	●																																	
Submerged Lands Management																																			
Habitat Protection	●	●																																	
Mangroves/Wetlands Protection	●	●																																	
Seagrass Protection	●	●																																	
Habitat Restoration	●	●																																	
Mangroves/Wetlands Restoration	●	●																																	
Seagrass Restoration																																			
Resource Inventory																																			
Manatees/porpoises	●	●																																	
Endangered Species	●	●																																	
Shellfish/Aquaculture																																			
Public Awareness/Education	●	●																																	
Research																																			
Fisheries Research																																			
Fisheries Management																																			
Recreational Fishing																																			
Commercial Fishing																																			
Wildlife Management																																			
Mosquito Impoundments		●																																	
Historical/Archeological Sites	●	●																																	
Water Quality	●	●																																	
Nonpoint Source Pollution	●	●																																	
Point Source Pollution	●	●																																	
Oil/Chemical Spills	●	●																																	
Drainage/Freshwater Control	●	●																																	
Emergency Response	●	●																																	
Upland Development	●	●																																	
Land Use Planning	●	●																																	
Navigational/Boating	●	●																																	
Recreational Areas	●	●																																	
Bridges and Roads	●	●																																	

## CHAPTER VIII

### STAFFING AND FUNDING NEEDS

#### A. INTRODUCTION

The success of the legislatively mandated Aquatic Preserve Program depends on the availability of adequate staffing and funding support to accomplish the management objectives for the preserves. Historically, the Aquatic Preserve Program has been largely dependent on federal coastal zone grant funds for its operation. As a result, funding for both field and central office positions has been limited. To meet legislative intent, permanent, increased levels of support are essential.

To date, and since its 1986 designation, the Lemon Bay Aquatic Preserve has been managed by existing DNR staff in the regional Southwest Florida Aquatic Preserves Office. The office is located in Lee County, 13 miles by boat and 60 miles by car from the preserve. Seven other aquatic preserves are also managed out of the regional DNR office. The staffing arrangement reduces the effectiveness of managing each individual aquatic preserve because of the large workload and size of the area covered.

The management goals set forth in this plan are designed to meet the mandated intent of maintaining the Lemon Bay Aquatic Preserve resources in essentially natural conditions for the benefit of future generations. Accomplishing the goals, objectives and tasks set forth in the plan requires sufficient funding, staffing and equipment. Currently, there is no legislative funding for staffing for the Lemon Bay Aquatic Preserve.

The total needed tasks for successfully managing the preserve are given in Chapter VI, Management Action Plan. The effectiveness of the program depends on what percent of the total tasks are completed.

#### B. STAFFING OPTIONS

As guidance for agency and legislative budgetary actions, three options for different levels of support for the Lemon Bay Aquatic Preserve are presented below. The options include: 1) using existing staff levels, with less than 1 person assigned to the preserve; 2) adding a 1 full time manager for the preserve; and 3) adding full staff levels, including a manager, a resource protection specialist, an education specialist and a secretary. For each option, the percent of the total tasks that would be accomplished by the identified staff is given.

To accomplish 100% of the management tasks for the Lemon Bay Aquatic Preserve would require about 7,000 hours of staff time each year.

### **OPTION 1: USING EXISTING STAFF LEVELS**

Under current staffing levels, only the following goals can effectively be accomplished:

Goal A/5: Encourage upland uses which protect/enhance the resources in the preserve.

Goal B/1: Protect existing aquatic communities, the following objectives -  
Objective B/1-1: Minimize damage to submerged resources by reviewing/commenting on proposed use applications.  
Objective B/1-2: Ensure structures/projects that have been built are in compliance with authorized conditions.  
Objective B/1-3: Ensure structures/projects that have been or are being built have been authorized.

Plus, additional resource inventory information will be gathered from field notes collected during these tasks.

These tasks require 3 to 4 days of staff time per month or 350 hours a year. With current staff commitments, about 10% of the total tasks included in this management plan are accomplished.

### **OPTION 2: ADDING A FULL TIME PRESERVE MANAGER**

With an on-site, full time manager for the Lemon Bay Aquatic Preserve, the following tasks could be accomplished:

Goal A/1: Maintain resource inventories, the following tasks -  
Task A/1-1.1: Compile existing resource inventory data on submerged/emergent vegetation.  
Task A/1-2.1: Compile existing data on designated species.  
Task A/1-3.1: Compile existing data on colonial nesting birds.  
Task A/1-4.1: Compile existing data on benthic invertebrates.  
Task A/1-5.1: Compile existing data on physical substrate and water quality.  
Task A/1-6.1: Compile existing data on manatee use of the preserve.

Goal A/2: Maintain inventory of physical alterations in preserve, the following objectives -

Objective A/2-1: Compile existing photos/data on physical alterations.

Goal A/3: Restore/enhance littoral zone habitats, the following tasks -

Task A/3-1.1: Identify disturbed shorelines during resource inventories.

Task A/3-2.1: Identify seawalls without riprap/natural habitat at base during resource inventories.

Goal C/2: Determine changes in manatee use of the preserve over time, the following task -

Task C/2-1.1: Review existing data on manatee use of the preserve.

Goal C/3: Encourage on-going research, the following task -

Task C/3-1.1: Identify short/long term research needs.

Goal D/1: Provide information about the preserve/resources, the following task -

Task D/1-3.1: Distribute information to marinas, etc.

Goal D/2: Educate the public/policy makers about the preserve/resources, the following task -

Task D/2-3.2: Conduct workshops for local policy makers/staff.

Plus the activities covered in Option 1: Goal A/5 and Objectives B/1-1, B/1-2, and B/1-3.

The tasks with a full time manager would require about 1,800 hours of work per year and would accomplish 30% of the total management activities in this plan.

### **OPTION 3: ADDING COMPLETE STAFF LEVELS FOR THE PRESERVE**

Full staff for the Lemon Bay Aquatic Preserve, with four people, would accomplish all the management goals, objectives and tasks in this plan, including:

Goal A/1: Maintain resource inventories.

Goal A/2: Maintain inventory of physical alterations.

Goal A/3: Restore/enhance littoral zone habitats.

Goal A/4: Improve water quality.

Goal A/5: Encourage upland uses which protect/enhance the resources of the preserve.

Goal B/1: Protect existing aquatic communities.

- Goal B/2: Protect designated species habitat.
- Goal C/1: Determine changes in aquatic communities.
- Goal C/2: Determine changes in manatee use.
- Goal C/3: Encourage on-going research.
- Goal D/1: Provide information about preserve/resources.
- Goal D/2: Educate public/policy makers about preserve/resources.

All these goals would be achievable with full staffing, except where completion of the tasks relies on outside funding, assistance and/or initiatives. Examples of outside initiatives include: S.W.I.M. designation, G.I.S. development and creating an environmental education center.

With full staffing, creative use of volunteers and interest groups would also enhance management of the preserve. It must be realized that many of these goals represent on-going work, rather than specific finished products. In such cases, the sustained management of the preserve is important.

This optimal, complete staffing for the preserve would include the following 4 people: 1 aquatic preserve manager (Environmental Specialist III), 1 environmental educator (Environmental Specialist II), 1 resource protection specialist (Environmental Specialist II) and 1 secretary/administrative assistant.

Additional technical support would be provided by the regional office, which will house expertise and equipment not justified at each individual preserve office. The regional office would include the library, laboratory and G.I.S. equipment.

The complete staff level could be achieved by a 2 year phase-in period. Besides allowing time to acquire funding, this schedule will allow the responsibilities of the aquatic preserve manager to be phased-in. The manager will be able to learn the area and program details before receiving staff supervision responsibilities. A phased-in staffing and budget for the Lemon Bay Aquatic Preserve is given in Table 3.

An annual review of the accomplishments of the program relative to the tasks listed in Chapter VI will help to determine if the initial staffing estimates are accurate.

To successfully accomplish the legislatively mandated goals of the Aquatic Preserve Program and the Lemon Bay Aquatic Preserve Management Plan, full staffing with continued funding is essential.

If less than adequate support levels are provided, priorities must be set for accomplishing the goals, objectives and tasks in this plan. Guidelines for monitoring the accomplishments of the program are given in the following chapter.

**TABLE 3**

**OPTION 3: COMPLETE STAFFING AND FUNDING NEEDS  
FOR THE LEMON BAY AQUATIC PRESERVE**

<b><u>SALARY</u></b>	<b><u>1st YEAR</u></b>	<b><u>2nd YEAR</u></b>	<b><u>CONTINUING</u></b>
Manager			
ES III (with benefits)	\$ 36,463	\$ 37,921	\$ 39,059
Resource Protection Specialist			
ES II (with benefits)	32,109	33,072	
Education Specialist			
ES II (with benefits)	32,109	33,072	
Secretary (with benefits)	7,872	15,745	16,217
	(1/2 FTE)	(1 FTE)	
<b>Subtotal Salary and Benefits</b>	<b>\$ 44,335</b>	<b>\$117,884</b>	<b>\$121,420</b>
<b><u>OPERATING CAPITAL OUTLAY</u></b>			
Vehicles	\$ 15,000	\$ 15,000	
Boats	14,000	14,000	
Office Equipment	8,000	10,000	
Education Materials	2,500	4,000	
Computer	5,000		
<b>Subtotal Operating Capital Outlay</b>	<b>\$ 44,500</b>	<b>\$ 43,000</b>	
<b><u>OPERATING EXPENSES</u></b>			
Rent/Office Supplies/Gas/Phone	\$ 15,000	\$ 25,000	\$ 25,000
Field Supplies	4,000	8,000	8,000
Educational Materials			2,000
Vehicle Maintenance			10,000
Office Equipment Maintenance			1,500
<b>Subtotal Operating Expenses</b>	<b>\$ 19,000</b>	<b>\$ 33,000</b>	<b>\$ 46,500</b>
<b>TOTAL</b>			
<b><u>SALARY &amp; OPERATING EXPENSES</u></b>	<b>\$107,835</b>	<b>\$193,884</b>	<b>\$167,920</b>

## **CHAPTER IX**

### **RESOURCE AND ACTIVITY MONITORING PROGRAM**

To ensure that Phase I of the management plan is effectively implemented, it will be necessary to institute two programs that will: (1) monitor changes in the biological resources over time, and (2) record any accomplishments achieved by the Lemon Bay Aquatic Preserve Program. These monitoring programs will consist of the following:

#### **A. RESOURCE MONITORING**

To monitor changes in the natural resources, a geographic information system (GIS) will be necessary. A GIS is a computer-based system that is used to capture, edit, display, and analyze geographic information. The first GIS programs were developed about 20 years ago to manage large collections of natural resource and environmental information. Since their development, they have been used in other areas such as utilities mapping, inventory management, and land use planning; however, their most important function continues to be natural resource management.

The Lemon Bay Aquatic Preserve Program has not been funded for GIS technology. Future use of GIS systems will include the periodic inventory, compilation, and analysis of temporal and spatial data concerning the present state of the natural resources within the preserve. Historical aerial photography will be computerized for comparison with later data to conduct a temporal analysis of resource abundance. Detailed monitoring of revegetation/restoration efforts can also be computer analyzed. The on-line access to these natural resource databases will facilitate informed management decisions concerning the use and protection of submerged lands and their resources. Cooperation and file sharing is possible with other agencies handling such data with identical and similar systems.

#### **B. ACTIVITY MONITORING**

For this phase of the management plan to be effectively implemented, it is necessary to monitor the accomplishments and progress of the Lemon Bay Aquatic Preserve Program on a regular basis. The purpose of this element is to detail the program's accomplishments in its pursuit of the objectives outlined in Chapter VI. This information, to be submitted in an annual report each fiscal year to the Bureau Chief, will include an update of the biological resources' status within the preserve as well as identifying current human activities. This report will detail the following:

1. The state of the natural environment of the aquatic preserve.
  - a. Through the use of resource inventories and the GIS system, document the status of each biological resource (e.g., seagrass loss or gain).
  - b. Identify the current number of structures/activities either started or completed in the preserve. These structures/activities will be categorized as follows:
    - 1) authorized projects (e.g., private residential single docks, multi-family fishing piers),
    - 2) unauthorized projects, and
    - 3) projects not in compliance with the original authorization.
2. A list of accomplishments of those tasks outlined in Chapter VI.
  - a. Each task will be listed and the activities required to complete that task will be detailed. If the task was not done or not completed, an explanation will be given. If the explanation was due to insufficient funding/staff, then this fact will be detailed so that an update of Chapter VIII can be made.
3. Any new goals and/or objectives will be reflected in an update of Chapter VI.



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**Administrative Codes**

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(R. 3/87)  
18-20.002

**CHAPTER 18-20  
FLORIDA AQUATIC PRESERVES**

- 18-20.001 Intent.
- 18-20.002 Boundaries and Scope of the Preserves.
- 18-20.003 Definitions.
- 18-20.004 Management Policies, Standards and Criteria.
- 18-20.005 Uses, Sales, Leases, or Transfer of Interests in Lands, or Materials, Held by the Board. (Repealed)
- 18-20.006 Cumulative Impacts.
- 18-20.007 Protection of Riparian Rights. (Repealed)
- 18-20.008 Inclusion of Lands, Title to Which Is Not Vested in the Board, in a Preserve.
- 18-20.009 Establishment or Expansion of Aquatic Preserves.
- 18-20.010 Exchange of Lands.
- 18-20.011 Gifts of Lands.
- 18-20.012 Protection of Indigenous Life Forms.
- 18-20.013 Development of Resource Inventories and Management Plans for Preserves.
- 18-20.014 Enforcement.
- 18-20.015 Application Form. (Repealed)
- 18-20.016 Coordination with Other Governmental Agencies.
- 18-20.017 Lake Jackson Aquatic Preserve.

*Library References: Riparian rights in navigable waters. I. Henry Dean, 55 Fla. Bar J. 247, 250 (Mar., 1981).*

**18-20.001 Intent.**

(1) All sovereignty lands within a preserve shall be managed primarily for the maintenance of essentially natural conditions, the propagation of fish and wildlife, and public recreation, including hunting and fishing where deemed appropriate by the board, and the managing agency.

(2) The aquatic preserves which are described in 73-534, Laws of Florida, Sections 258.39, 258.391, 258.392 and 258.393, Florida Statutes, future aquatic preserves established pursuant to general or special acts of the legislature, and in Rule 18-20.002, Florida Administrative Code, were established for the purpose of being preserved in an essentially natural or existing condition so that their aesthetic, biological and scientific values may endure for the enjoyment of future generations.

(3) The preserves shall be administered and managed in accordance with the following goals:

(a) To preserve, protect, and enhance these exceptional areas of sovereignty submerged lands by reasonable regulation of human activity within the preserves through the development and implementation of a comprehensive management program;

(b) To protect and enhance the waters of the preserves so that the public may continue to enjoy the traditional recreational uses of those waters such as swimming, boating, and fishing;

(c) To coordinate with federal, state, and local agencies to aid in carrying out the intent of the Legislature in creating the preserves;

(d) To use applicable federal, state, and local management programs, which are compatible with the intent and provisions of the act and these rules, and to assist in managing the preserves;

(e) To encourage the protection, enhancement or restoration of the biological, aesthetic, or scientific values of the preserves, including but not limited to the modification of existing manmade conditions toward their natural condition, and discourage activities which would degrade the aesthetic, biological, or scientific values, or the quality, or utility of a preserve, when reviewing applications, or when developing and implementing management plans for the preserves;

(f) To preserve, promote, and utilize indigenous life forms and habitats, including but not limited to: sponges, soft coral, hard corals, submerged grasses, mangroves, salt water marshes, fresh water marshes, mud flats, estuarine, aquatic, and marine reptiles, game and non-game fish species, estuarine, aquatic and marine invertebrates, estuarine, aquatic and marine mammals, birds, shellfish and mollusks;

(g) To acquire additional title interests in lands wherever such acquisitions would serve to protect or enhance the biological, aesthetic, or scientific values of the preserves;

(h) To maintain those beneficial hydrologic and biologic functions, the benefits of which accrue to the public at large.

(4) Nothing in these rules shall serve to eliminate or alter the requirements or authority of other governmental agencies, including counties and municipalities, to protect or enhance the preserves provided that such requirements or authority are not inconsistent with the act and this chapter.

*Specific Authority 120.53, 258.43(1) FS, Law Implemented 258.35, 258.36, 258.37, 258.39, 258.393 FS, Chapter 80-280 Laws of Florida, History—New 2-23-81, Amended 6-7-85, Formerly 16Q-20.01, Transferred from 16Q-20.001.*

**18-20.002 Boundaries and Scope of the Preserves.**

(1) These rules shall only apply to those sovereignty lands within a preserve, title to which is vested in the board, and those other lands for which the board has an appropriate instrument in writing, executed by the owner, authorizing the inclusion of specific lands in an aquatic preserve pursuant to Section 2(2) of Chapter 73-534, Laws of Florida, Sections 258.40(1) and 258.41(5), Florida Statutes, future aquatic preserves established through general or special acts of the legislature, and pursuant to Rule 18-20.008, Florida Administrative Code. Any publicly owned and maintained navigation channel authorized by the United States Congress, or other public works project authorized by the United States Congress, designed to improve or maintain commerce and navigation shall be deemed to be excluded from the

provisions of this chapter, pursuant to Subsection 258.40(2), Florida Statutes. Furthermore, all lands lost by avulsion or by artificially induced erosion shall be deemed excluded from the provisions of this chapter pursuant to Subsection 258.40(3), Florida Statutes.

(2) These rules do not apply to Boca Ciega Bay, Pinellas County or Biscayne Bay Aquatic Preserves.

(3) These rules are promulgated to clarify the responsibilities of the board in carrying out its land management functions as those functions apply within the preserves. Implementation and responsibility for environmental permitting of activities and water quality protection within the preserves are vested in the Department of Environmental Regulation. Since these rules are considered cumulative with other rules, a person planning an activity within the preserves should also consult the other applicable department rules (Chapter 18-21, Florida Administrative Code, for example) as well as the rules of the Department of Environmental Regulation.

(4) These rules shall not affect previous actions of the board concerning the issuance of any easement or lease; or any disclaimer concerning sovereignty lands.

(5) The intent and specific provisions expressed in 18-20.001(e) and (f) apply generally to all existing or future aquatic preserves within the scope of this chapter. Upon completion of a resource inventory and approval of a management plan for a preserve, pursuant to 18-20.013, the type designation and the resource sought to be preserved may be readdressed by the Board.

(6) For the purpose of clarification and interpretation, the legal description set forth as follows do not include any land which is expressly recognized as privately owned upland in a pre-existing recorded mean high water line settlement agreement between the board and a private owner or owners. Provided, however, in those instances wherein a settlement agreement was executed subsequent to the passage of the Florida Coastal Mapping Act, the determination of the mean high water line shall be in accordance with the provisions of such act.

(7) Persons interested in obtaining details of particular preserves should contact the Bureau of State Lands Management, Department of Natural Resources, 3900 Commonwealth Blvd., Tallahassee, FL 32303 (telephone 904-488-2297).

(a) The preserves are described as follows:

1. Fort Clinch State Park Aquatic Preserve, as described in the Official Records of Nassau County in Book 108, pages 343-346, and in Book 111, page 409.

2. Nassau River — St. Johns River Marshes Aquatic Preserve, as described in the Official Records of Duval County in Volume 3183, pages 547-552, and in the Official Records of Nassau County in Book 108, pages 232-237.

3. Pellicer Creek Aquatic Preserve, as described in the Official Records of St. Johns County in Book

181, pages 363-366, and in the Official Records of Flagler County in Book 33, pages 131-134.

4. Tomoka Marsh Aquatic Preserve, as described in the Official Records of Flagler County in Book 33, pages 135-138, and in the Official Records of Volusia County in Book 1244, pages 615-618.

5. Wekiva River Aquatic Preserve, as described in Section 258.39(30), F.S.

6. Mosquito Lagoon Aquatic Preserve, as described in the Official Records of Volusia County in Book 1244, pages 619-623, and in the Official Records of Brevard County in Book 1143, pages 190-194.

7. Banana River Aquatic Preserve, as described in the Official Records of Brevard County in Book 1143, pages 195-198, less those lands dedicated to the U. S. A. prior to the enactment of the act, until such time as the U. S. A. no longer wishes to maintain such lands for the purpose for which they were dedicated, at which time such lands would revert to the board, and be managed as part of the preserve.

8. Indian River — Malabar to Sebastian Aquatic Preserve, as described in the Official Records of Brevard County in Book 1143, pages 199-202, and in the Official Records of Indian River County in Book 368, pages 5-8.

9. Indian River — Vero Beach to Fort Pierce Aquatic Preserve, as described in the Official Records of Indian River County in Book 368, pages 9-12, and in the Official Records of St. Lucie County in Book 187, pages 1083-1086.

10. Jensen Beach to Jupiter Inlet Aquatic Preserve, as described in the Official Records of St. Lucie County in Book 218, pages 2865-2869.

11. North Fork, St. Lucie Aquatic Preserve, as described in the Official Records of Martin County in Book 337, pages 2159-2162, and in the Official Records of St. Lucie County in Book 201, pages 1676-1679.

12. Loxahatchee River — Lake Worth Creek Aquatic Preserve, as described in the Official Records of Martin County in Book 320, pages 193-196, and in the Official Records of Palm Beach County in Volume 1860, pages 806-809.

13. Biscayne Bay — Cape Florida to Monroe County Line Aquatic Preserve, as described in the Official Records of Dade County in Book 7055, pages 852-856, less, however, those lands and waters as described in Section 258.165, F. S., (Biscayne Bay Aquatic Preserve Act of 1974), and those lands and waters within the Biscayne National Park.

14. Lignumvitae Key Aquatic Preserve, as described in the Official Records of Monroe County in Book 502, pages 139-142.

15. Coupon Bight Aquatic Preserve, as described in the Official Records of Monroe County in Book 502, pages 143-146.

16. Cape Romano — Ten Thousand Islands Aquatic Preserve, as described in the Official Records of Collier County in Book 381, pages 298-301.

17. Rookery Bay Aquatic Preserve, as described in Section 258.39(31), F.S.
18. Eastern Bay Aquatic Preserve as described in Section 258.39(28), Florida Statutes.
19. Pine Island Sound Aquatic Preserve, as described in the Official Records of Lee County in Book 648, pages 732-736.
20. Matlacha Pass Aquatic Preserve, as described in the Official Records of Lee County in Book 800, pages 725-728.
21. Gasparilla Sound — Charlotte Harbor Aquatic Preserve, as described in Section 258.392, F.S.
22. Cape Haze Aquatic Preserve, as described in Section 258.39(29), F.S.
23. Cuckernach Bay Aquatic Preserve, as described in Section 258.391, F.S.
24. St. Martins Marsh Aquatic Preserve, as described in the Official Records of Citrus County in Book 276, pages 238-241.
25. Alligator Harbor Aquatic Preserve, as described in the Official Records of Franklin County in Volume 98, pages 82-85.
26. Apalachicola Bay Aquatic Preserve, as described in the Official Records of Gulf County in Book 46, pages 77-81, and in the Official Records of Franklin County in Volume 98, pages 102-106.
27. St. Joseph Bay Aquatic Preserve, as described in the Official Records of Gulf County in Book 46, pages 73-76.
28. St. Andrews State Park Aquatic Preserve, as described in the Official Records of Bay County in Book 379, pages 547-550.
29. Rocky Bayou State Park Aquatic Preserve, as described in the Official Records of Okaloosa County in Book 593, pages 742-745.
30. Yellow River Marsh Aquatic Preserve, as described in the Official Records of Santa Rosa County in Book 206, pages 568-571.
31. Fort Pickens State Park Aquatic Preserve, as described in the Official Records of Santa Rosa County in Book 220, pages 60-63, in the Official Records of Escambia County in Book 518, pages 659-662, less the lands dedicated to the U. S. A. for the establishment of the Gulf Islands National Seashore prior to the enactment of the act, until such time as the U. S. A. no longer wishes to maintain such lands for the purpose for which they were dedicated, at which time such lands would revert to the board and be managed as part of the preserve.
32. For the purpose of this section the boundaries of the Lake Jackson Aquatic Preserve, shall be the body of water in Leon County known as Lake Jackson in Sections 1, 2, 3, 5, 10, 11 and 14, Township 1 North, Range 1 West and Sections 11, 12, 13, 14, 15, 21, 22, 23, 26, 27, 28, 29, 32, 33, 34, and 35, Township 2 North, Range 1 West lying below the ordinary high water line. Such lands shall include the submerged bottom lands and the water column upon such lands, as well as all publicly owned islands, within the boundaries of the preserve. Any privately held upland within the boundaries of the preserve shall be deemed to be excluded therefrom; provided that the Board may

negotiate an arrangement with any such private upland owner by which such land may be included in the preserve.

33. Terra Ceia Aquatic Preserve, as described in Section 258.393, Florida Statutes.

34. Future aquatic preserves established pursuant to general or special acts of the legislature. *Specific Authority 120.53, 258.43(1) FS. Law Implemented 258.39, 258.391, 258.392, 258.393, 258.40, 258.41, 258.42, 258.43, 258.44, 258.45 FS. History—New 2-23-81, Amended 8-7-85, Formerly 16Q-20.02, Transferred from 16Q-20.002.*

**18-20.003 Definitions.** When used in these rules, the following words shall have the indicated meaning unless the context clearly indicates otherwise:

(1) "Act" means the provisions of Section 258.35 through 258.46, F.S., the Florida Aquatic Preserve Act.

(2) "Activity" means any project and such other human action within the preserve requiring board approval for the use, sale, lease or transfer of interest in sovereignty lands or materials, or which may require a license from the Department of Environmental Regulation.

(3) "Aesthetic values" means scenic characteristics or amenities of the preserve in its essentially natural state or condition, and the maintenance thereof.

(4) "Applicant" means any person making application for a permit, license, conveyance of an interest in state owned lands or any other necessary form of governmental approval in order to perform an activity within the preserve.

(5) "Beneficial biological functions" means interactions between flora, fauna and physical or chemical attributes of the environment, which provide benefits that accrue to the public at large, including, but not limited to: nutrient, pesticide and heavy metal uptake; sediment retention; nutrient conversion to biomass; nutrient recycling and oxygenation.

(6) "Beneficial hydrological functions" means interactions between flora, fauna and physical geological or geographical attributes of the environment, which provide benefits that accrue to the public at large, including, but not limited to: retardation of storm water flow; storm water retention; and water storage, and periodical release;

(7) "Biological values" means the preservation and promotion of indigenous life forms and habitats including, but not limited to: sponges, soft corals, hard corals, submerged grasses, mangroves, saltwater marshes, fresh water marshes, mud flats, marine, estuarine, and aquatic reptiles, games and non-games fish species, marine, estuarine, and aquatic mammals, marine, estuarine, and aquatic invertebrates, birds and shellfish.

(8) "Board" means the Governor and Cabinet sitting as the Board of Trustees of the Internal Improvement Trust Fund.

(9) "Channel" means a trench, the bottom of which is normally covered entirely by water, with the upper edges of its sides normally below water.

(10) "Commercial, industrial and other revenue generating/income related docks" means docking facilities for an activity which produces income, through rental or any other means, or which serves as an accessory facility to other rental, commercial or industrial operations. It shall include, but not be limited to docking for: marinas, restaurants, hotels, motels, commercial fishing, shipping, boat or ship construction, repair, and sales.

(11) "Department" means the State of Florida Department of Natural Resources, as administrator for the board.

(12) "Division" means the Division of State Lands, which performs all staff duties and functions related to the administration of lands title to which is, or will be, vested in the board, pursuant to section 253.002, F.S.

(13) "Dock" means a fixed or floating structure, including moorings, used for the purpose of berthing buoyant vessels either temporarily or indefinitely.

(14) "Essentially natural condition" means those functions which support the continued existence or encourage the restoration of the diverse population of indigenous life forms and habitats to the extent they existed prior to the significant development adjacent to and within the preserve.

(15) "Extreme hardship" means a significant burden, unique to the applicant and not shared by property owners in the area. Self-imposed circumstances caused to any degree by actions of any person subsequent to the enactment of the Act shall not be construed as an extreme hardship. Extreme hardship under this act shall not be construed to include any hardship which arises in whole or in part from the effect of other federal, state or local laws, ordinances, rules or regulations. The term may be inherent in public projects which are shown to be a public necessity.

(16) "Fill" means materials from any source, deposited by any means onto sovereignty lands, either for the purpose of creating new uplands or for any other purpose, including spoiling of dredged materials. For the purpose of this rule, the placement of pilings or riprap shall not be considered to be filling.

(17) "Lease" means a conveyance of interest in lands, title to which is vested in the board, granted in accordance with specific terms set forth in writing.

(18) "Marina" means a small craft harbor complex used primarily for recreation.

(19) "Oil and gas transportation facilities" means those structures necessary for the movement of oil and gas from the production site to the consumer.

(20) "Person" means individuals, minors, partnerships, corporations, joint ventures, estates, trusts, syndicates, fiduciaries, firms, and all other associations and combinations, whether public or private, including governmental entities.

(21) "Pier" means a structure in, on, or over sovereignty lands, which is used by the public primarily for fishing, swimming, or viewing the preserve. A pier shall not include a dock.

(22) "Preserve" means any and all of those areas which are exceptional areas of sovereignty lands and the associated water body so designated in Section 258.39, 258.391, and 258.392, F.S., including all sovereignty lands, title to which is vested in the board, and such other lands as the board may acquire or approve for inclusion, and the water column over such lands, which have been set aside to be maintained in an essentially natural or existing condition of indigenous flora and fauna and their supporting habitat and the natural scenic qualities and amenities thereof.

(23) "Private residential single dock" means a dock which is used for private, recreational or leisure purposes for a single family residence, cottage or other such single dwelling unit and which is designed to moor no more than two boats.

(24) "Private residential multi-slip dock" means a docking facility which is used for private recreational or leisure purposes for multi-unit residential dwellings which shall include but is not limited to condominiums, townhouses, subdivisions and other such dwellings or residential areas and which is designed to moor three or more boats. Yacht clubs associated with residential developments, whose memberships or utilization of the docking facility requires some real property interest in the residential area, shall also be included.

(25) "Public interest" means demonstrable environmental, social, and economic benefits which would accrue to the public at large as a result of a proposed action, and which would clearly exceed all demonstrable environmental, social, and economic costs of the proposed action. In determining the public interest in a request for use, sale, lease, or transfer of interest in sovereignty lands or severance of materials from sovereignty lands, the board shall consider the ultimate project and purpose to be served by said use, sale, lease, or transfer of lands or materials.

(26) "Public navigation project" means a project primarily for the purpose of navigation which is authorized and funded by the United States Congress or by port authorities as defined by Section 315.02(2), F.S.

(27) "Public necessity" means the works or improvements required for the protection of the health and safety of the public, consistent with the Act and these rules, for which no other reasonable alternative exists.

(28) "Public utilities" means those services, provided by persons regulated by the Public Service Commission, or which are provided by rural cooperatives, municipalities, or other governmental agencies, including electricity, telephone, public water and wastewater services, and structures necessary for the provision of these services.

(29) "Quality of the preserve" means the degree of the biological, aesthetic and scientific values of the preserve necessary for present and future enjoyment of it in an essentially natural condition.

(30) "Resource management agreement" means a contractual agreement between the board and one

or more parties which does not create an interest in real property but merely authorizes conduct of certain management activities on lands held by the board.

(31) "Resource Protection Area (RPA) 1" — Areas within the aquatic preserves which have resources of the highest quality and condition for that area. These resources may include, but are not limited to corals; marine grassbeds; mangrove swamps; salt-water marsh; oyster bars; archaeological and historical sites; endangered or threatened species habitat; and, colonial water bird nesting sites.

(32) "Resource Protection Area 2" — Areas within the aquatic preserves which are in transition with either declining resource protection area 1 resources or new pioneering resources within resource protection area 3.

(33) "Resource Protection Area 3" — Areas within the aquatic preserve that are characterized by the absence of any significant natural resource attributes.

(34) "Riparian rights" means those rights incident to lands bordering upon navigable waters, as recognized by the courts of this state and common law.

(35) "Sale" means a conveyance of interest in lands, by the board, for consideration.

(36) "Scientific values" means the preservation and promotion of certain qualities or features which have scientific significance.

(37) "Shore protection structure" means a type of coastal construction designed to minimize the rate of erosion. Coastal construction includes any work or activity which is likely to have a material physical effect on existing coastal conditions or natural shore processes.

(38) "Sovereignty lands" means those lands including, but not limited to: tidal lands, islands, sandbars, shallow banks, and lands waterward of the ordinary or mean highwater line, to which the State of Florida acquired title on March 3, 1845, by virtue of statehood, and of which it has not since divested its title interest. For the purposes of this rule sovereignty lands shall include all submerged lands within the boundaries of the preserve, title to which is held by the board.

(39) "Spoil" means materials dredged from sovereignty lands which are redeposited or discarded by any means, onto either sovereignty lands or uplands.

(40) "Transfer" means the act of the board by which any interest in lands, including easements, other than sale or lease, is conveyed.

(41) "Utility of the preserve" means fitness of the preserve for the present and future enjoyment of its biological, aesthetic and scientific values, in an essentially natural condition.

(42) "Water dependent activity" means an activity which can only be conducted on, in, over, or adjacent to, water areas because the activity requires direct access to the water body or sovereignty lands for transportation, recreation, energy production or transmission, or source of

water and where the use of the water or sovereignty lands is an integral part of the activity.

*Specific Authority 258.43(1) FS Law Implemented 258.37, 258.43(1) FS. History—New 2-25-81. Amended 8-7-85. Formerly 16Q-20.03. Transferred from 16Q-20.003.*

18-20.004 Management Policies, Standards and Criteria. The following management policies, standards and criteria are supplemental to Chapter 18-21, Florida Administrative Code (Sovereignty Submerged Lands Management) and shall be utilized in determining whether to approve, approve with conditions or modifications or deny all requests for activities on sovereignty lands in aquatic preserves.

#### (1) GENERAL PROPRIETARY

(a) In determining whether to approve or deny any request the Board will evaluate each on a case-by-case basis and weigh any factors relevant under Chapter 253 and/or 258, Florida Statutes. The Board, acting as Trustees for all state-owned lands, reserves the right to approve, modify or reject any proposal.

(b) There shall be no further sale, lease or transfer of sovereignty lands except when such sale, lease or transfer is in the public interest (see Section 18-20.004(2) Public Interest Assessment Criteria).

(c) There shall be no construction of seawalls waterward of the mean or ordinary high water line, or filling waterward of the mean or ordinary high water line except in the case of public road and bridge projects where no reasonable alternative exists.

(d) There shall, in no case, be any dredging waterward of the mean or ordinary high water line for the sole or primary purpose of providing fill for any area landward of the mean or ordinary high water line.

(e) A lease, easement or consent of use may be authorized only for the following activities:

1. a public navigation project;
2. maintenance of an existing navigational channel;
3. installation or maintenance of approved navigational aids;
4. creation or maintenance of a commercial/industrial dock, pier or a marina;
5. creation or maintenance of private docks for reasonable ingress and egress of riparian owners;
6. minimum dredging for navigation channels attendant to docking facilities;
7. creation or maintenance of a shore protection structure;
8. installation or maintenance of oil and gas transportation facilities;
9. creation, maintenance, replacement or expansion of facilities required for the provision of public utilities; and
10. other activities which are a public necessity or which are necessary to enhance the quality or utility of the preserve and which are consistent with the act and this chapter.

(f) For activities listed in paragraphs 18-20.004(1)(e)1.—10. above, the activity shall be



adopts by reference federal and state permitting procedures and requires a minimum upland natural vegetative buffer between development and wetlands.

e. Number 89-55, Open Space/Habitat Reservation Ordinance, 1989 - The ordinance defines which development and lands within the county are subject to this ordinance; establishes an open space/habitat reservation requirement; provides that the owner of land subject to the open space/habitat reservation may satisfy that requirement by paying a specified sum to the trust fund for open space/habitat acquisition; creates the trust fund; establishes the priorities by which the trust fund will acquire lands; and establishes a non-binding commitment by the Board of County Commissioners to expand the funding base for the trust fund. The ordinance requires that all development which meets the county's review committee thresholds, must preserve and maintain in its natural state for perpetuity, 5% of all habitat on site utilized by endangered and threatened species. In lieu of this requirement, the developer must contribute to the open space/habitat reservation trust fund the amount of \$100 per acre of the developed parcel.

## **B. SARASOTA COUNTY**

### **1. Apoxsee-The Revised and Updated Sarasota County Comprehensive Plan, 1988**

a. Chapter 2, Environment, Guidelines for Evaluating Land Development Proposals in Native Habitats - This section of the chapter lists the environmental values and functions, and management guidelines for conserving the values and functions, for each of nine habitat types.

b. Chapter 2, Environment, Environmental Plan - The purpose of this chapter is to provide guidance in conserving, maintaining, and where necessary, restoring the natural environment of Sarasota County. The five goals of the Environmental Plan are: 1) to conserve, maintain and, where deemed necessary in the public interest, restore the barrier island systems of Sarasota County; 2) to protect and enhance wherever possible, the quality of the estuarine environment throughout the county; 3) to maintain and improve the functional and structural integrity of the natural estuarine ecosystems and related coastal components through coordinated management of human impacts in surrounding uplands and freshwater systems and, further, to identify and address the impacts of growth so as to minimize or eliminate any adverse effects on the Charlotte Harbor area; 4) to lessen the impact of destructive storms on human life, public facilities, private structures and coastal natural resources in the county; and 5) to conserve, protect, maintain, and, where necessary, restore the natural resources of Sarasota County to ensure their continued high quality and critical value to the quality of life in the county.

### **2. Sarasota County Ordinances**

a. Number 72-57, Fish and Wildlife Conservation, 1972 - The ordinance pertains to fish and wildlife conservation, particularly shrimp, and regulates the taking, shipment and transportation of shrimp from certain salt waters of the state; prescribes the means by which the shrimp may be taken; provides a closed season and imposes a penalty for violations.

- b.** Number 72-84, Water and Navigation Control Authority, 1972 - The ordinance creates the county Water and Navigation Control Authority. The ordinance provides for the power and authority to regulate and control submerged bottom lands, islands, sandbars, swamp and overflow lands and other sovereignty lands in the county and prohibits dredging, pumping of sand, extension of lands, construction or extension of islands, creating obstructions in, on or under, any of the navigable waters of the county without obtaining a permit from the county Water and Navigation Control Authority.
- c.** Number 72-127, Water Safety Services, 1972 - The ordinance relates to water safety services, including authorizing the appropriation of funds and the establishment of a department or section within the county to provide water safety services.
- d.** Number 73-6, Safe Operation of Motorboats, 1973 - The ordinance relates to regulating the safe operation of motorboats in or upon the waters of the county; specifies the areas and means of enforcement; recognizes the priority of state and federal regulations; and provides for penalties for violations.
- e.** Number 73-23, Amends Ordinance Number 72-84, Water and Navigation Control Authority, 1973 - The amendment extends the jurisdiction of the Authority to include all of Sarasota County.
- f.** Number 80-88, Safe Operation of Motorboats and Other Watercraft, 1988 - The ordinance regulates the safe operation of motorboats and other watercraft in or upon the waters of the county; states the purpose, area and means of enforcement; provides for the priority of federal and state regulations; requires careful and prudent operation of boats; prohibits operation of boats under the influence of drugs or alcoholic beverages; prohibits the creation of a dangerous wake; prohibits speeds greater than are reasonable under the circumstances; and regulates boating, water skiing, diving and spear fishing in certain channels and marked areas.
- g.** Number 82-82, Operation of MotorBoats and Watercraft, 1982, Amended by Ordinance 87-73 - The ordinance authorizes certain signs to regulate boats and watercraft.
- h.** Number 89-70, Safe Operation of Motorboats, Including Personal Watercraft, and Watercraft, Amends Ordinance Number 80-88, 1989 - The amendment includes regulations for personal watercraft and regulates operation of motorboats or watercraft in marked swimming or bathing areas and provides for regulation of motorboat and watercraft speed near shore of the Gulf of Mexico.

