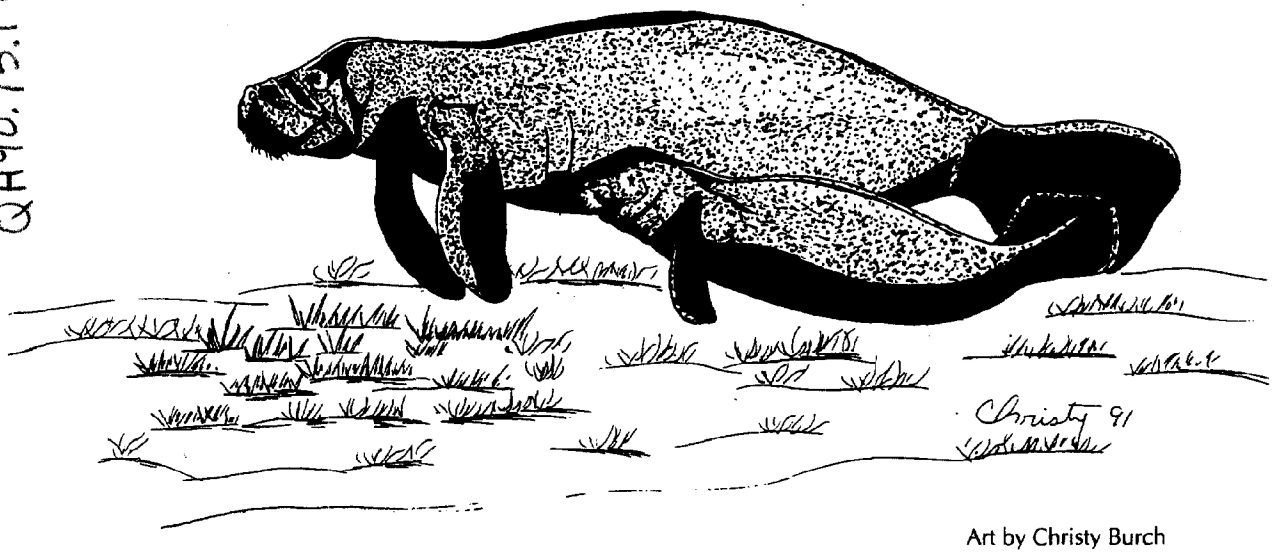
cm-281

TOMOKA MARSH

AQUATIC PRESERVE MANAGEMENT PLAN

QH90.75.F6T66 1992



Art by Christy Burch
Age 13, 1991

1992

QH
90.75
.F6
T66
1992

DEPARTMENT OF NATURAL RESOURCES

TOMOKA MARSH

AQUATIC PRESERVE MANAGEMENT PLAN

(CABINET READY DRAFT)

JANUARY 1992

VIRGINIA WETHERELL

Executive Director

Department of Natural Resources

This plan was prepared by the
Bureau of Submerged Lands and Preserves
Division of State Lands

Funds for this management plan were provided by the Department of Environmental Regulation, Office of Coastal Management using funds made available through the National Oceanic and Atmospheric Administration under the Coastal Zone Management Act of 1972, as amended.

This document was printed on recycled paper.

EXECUTIVE SUMMARY

The Tomoka Marsh Aquatic Preserve comprises approximately 8,000 acres of submerged land located on Florida's central Atlantic Coast in Volusia and Flagler counties.

Tomoka Marsh Aquatic Preserve was designated an aquatic preserve on October 21, 1969, for the purpose of preserving the biological resources of the estuarine system. The major habitats found within the preserve include marshes, tidal flats, oyster bars, soft mud and sandy bottoms, and open water. The preserve designation is intended to protect habitats critical to an extensive array of invertebrates, fish, birds, and other wildlife. Listed species found within or in close proximity to the preserve include three mammals, thirteen birds, two reptiles, one fish, and seven plants.

The main objective of the resource management program for Tomoka Marsh Aquatic Preserve is to protect the preserve's natural resources for the benefit of future generations. The management of the preserve will be directed towards the maintenance and improvement of essentially natural conditions. On site management activities include actions by field personnel to protect plant communities, animal life, geologic features, archaeological sites, and water resources of the preserve. Management activities will also focus on cumulative impacts and encroachments.

The Tomoka Marsh Aquatic Preserve has been divided into several management areas. The classification of each management area is based upon the resource value of submerged lands associated with existing and future uses on the adjacent uplands. The intent of these management areas is to make potential development activities and uses of the preserve compatible with resource protection goals. The major uses of the preserve are commercial and recreational navigation, and, adjacent land uses and their attendant facilities (e.g., docks, marinas, etc.). Because of the close proximity of the Tomoka and Halifax Rivers to existing and rapidly developing urban ares, maintaining and improving the health of the preserve involves minimizing adverse impacts from all uses within and adjacent to the preserve, including discharges associated with upstream areas.

This management plan outlines the management role of the Department of Natural Resources' central office and field staff. Criteria for the review of specific development proposals within the preserve's boundaries are also provided. Public and private uses that are allowable pursuant to statutory direction and other applicable authorities of the aquatic preserve are discussed. These uses are subject to the approval of the Board of Trustees or their designee. Approval is normally predicated upon demonstration that the proposed use is environmentally sound, and in the opinion of the Board, necessary for the public.

Various federal, state, regional, and local organizations oversee laws and regulations which apply to all of these lands and waters within the aquatic preserve. One of the objectives of the aquatic preserve program, therefore, is to complement agency programs whenever it is in the preserve's interest. Both field personnel and central office staff will coordinate extensively with many agencies to assure effective management protection.

To enhance management and protection of the aquatic preserve, research and education programs will be developed. These programs will operate in close coordination with similar programs established in the area. Research and education needs for the aquatic preserve are defined.

The management of the preserve and protection of the resources included within its boundaries will be enhanced by continually identifying and resolving specific program needs. Meeting these needs, which may include legislative support, administrative rule changes, resource protection capabilities, and funding and staffing needs, will relieve some stress on the resources and personnel involved in the management of the preserve. In the future, the field staff will develop and submit a status report that summarizes the program's needs and suggests measures to resolve those needs.

TABLE OF CONTENTS

CHAPTER I **INTRODUCTION** 1

CHAPTER II **MANAGEMENT AUTHORITY**

A. Statutory Authority 9
B. Administrative Rules 11
C. Other Applicable Plans & Programs 13

CHAPTER III **DESCRIPTION OF AQUATIC PRESERVE**

A. Location and Boundaries 15
B. Climate 20
C. Geology 21
D. Hydrology 21
E. Water Quality 22
F. Biological Communities 24
   1. Marshes 24
   2. Tidal Flats 30
   3. Algae 31
   4. Seagrasses 31
G. Listed Species 32
H. Archaeological and Historical Resources 37
I. Paleontological 38

CHAPTER IV **REGIONAL LAND USE AND DEVELOPMENT**

A. Adjacent Upland Uses 41
B. Uses of the Preserve 47
C. Planned Use 47

CHAPTER V **SITE SPECIFIC MANAGEMENT ISSUES AND NEEDS**

A. Management Issues & Special Needs 49
B. Management Initiatives 60

CHAPTER VI **MANAGEMENT AREAS**
A. Introduction 63
B. Management Area Classifications 64
C. Minimum Criteria for Allowable Uses 66
D. Management Areas 70

CHAPTER VII **MANAGEMENT ACTION PLAN**
A. Resource Management 86
B. Resource Protection 89
C. Research 92
D. Environmental Education 94

CHAPTER VIII **MANAGEMENT COORDINATION NETWORK**
A. Federal Agencies 97
B. State Agencies 99
C. Regional Agencies 103
D. Local Agencies 105

CHAPTER IX **STAFFING AND FISCAL NEEDS** 111

CHAPTER X **RESOURCE AND PROGRESS MONITORING PROGRAM**
A. Resource Monitoring 115
B. Progress Monitoring 115

BIBLOGRAPHY 117

LIST OF FIGURES AND TABLES

Figure 1. Florida Aquatic Preserve System Map 3

Figure 2. Aquatic Preserve Boundary Map 5-7

Figure 3. Tomoka Watershed 17

Figure 4. Vegetation Map 25-27

Figure 5. Adjacent Land Use Map 43-45

Figure 6. Tomoka River Manatee Sanctuary 53

Figure 7. Manatee Protection Zones 55

Figure 8. Manatee Protection Zones 57

Figure 9. Management Area Map 81-83

Table 1. Listed Wildlife Species 33-34

Table 2. Management Coordination Network 108-109

Table 3. Anticipated Budget 113

LIST OF APPENDICES

Appendix A. Administrative Codes 123

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

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

CHAPTER I

INTRODUCTION

The Tomoka Marsh Aquatic Preserve, located on Florida's central Atlantic Coast in Volusia and Flagler counties (Figure 1) represents one of 42 aquatic preserves in Florida. This preserve, a contiguous coastal estuarine and marine area (Figure 2), was established by the Florida Board of Trustees of the Internal Improvement Trust Fund by a resolution on October 21, 1969 and designated by the Florida Legislature in 1970 for the purpose of preserving the biological resources of the estuarine system. The preserve is approximately 8,000 acres in size and includes only the sovereignty submerged lands located below the mean high water line (MHWL).

The Tomoka River system has long been recognized as one of the state's exceptional water resources. All of Tomoka Marsh Aquatic Preserve is designated an Outstanding Florida Water (OFW) by the Florida Department of Environmental Regulation (DER). The purpose of the OFW program is to recognize waterbodies of the state having outstanding quality. The adjacent uplands are largely used for residential, preservation or recreational purposes. Increasing urbanization confirms the need for an integrated management program by state, regional, and local governments to accomplish a goal of long-term resource protection for the preserve.

This management plan developed for Tomoka Marsh Aquatic Preserve is only one of many steps that will be necessary to accomplish this goal. It is intended primarily to serve as a useful guide to the manager and others in maintaining the natural integrity of the preserve. As more information is learned about this preserve and ambient conditions analyzed, management strategies outlined in this plan may need to be adjusted.

The process of developing this management plan involved collecting an inventory of resource information, coordinating with other plans that have been developed for the area, and identifying resource problems and management issues relating to the present and future uses of the preserve and adjacent uplands. Supporting policies were developed to be consistent with statutory authority and the overall intent of the Aquatic Preserve Program for helping to ensure that the submerged land resources of the river remain for future generations to enjoy.

Fifteen management plans, covering 21 of the 42 designated aquatic preserves in the state, have been adopted by reference into the existing aquatic preserves rule, Chapter 18-20, Florida Administrative Code (F.A.C.). This management plan will be subsequently incorporated into rule following its approval by the Board of Trustees of the Internal Improvement Trust Fund.

Specifically, this plan is divided into chapters according to their management application:

Chapter II cites the statutory authorities upon which this resource management program and plan are built.

Chapter III provides a description of the Tomoka Marsh Aquatic Preserve and details the physical and biological components of the preserve as well as any cultural resources. Additional information includes the current and future uses of this preserve and use of the adjacent uplands.

Chapter IV discusses regional land use and development.

Chapter V discusses specific needs and issues particular to the Tomoka Marsh Aquatic Preserve. Management initiatives have been developed in addressing each need and/or issue.

Chapter VI delineates various management areas within the preserve. These areas are defined by taking into account the biological resources, the physical parameters, and the aesthetic values, in conjunction with the use of the adjacent uplands.

Chapter VII 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 VIII identifies local, regional, state and federal agencies, their authorities and programs, and how they relate and assist in protection and management of the preserve. It also identifies non-governmental organizations, interest groups and individuals that can assist in management.

Chapter IX projects future staffing and fiscal needs necessary for providing effective management and protection of the preserve, as well as supporting research and environmental education.

Chapter X outlines a monitoring program for recording and reporting resource changes, and establishes a tracking system for detailing the progress and accomplishments in resource management.

FIGURE 1. Florida Aquatic Preserves

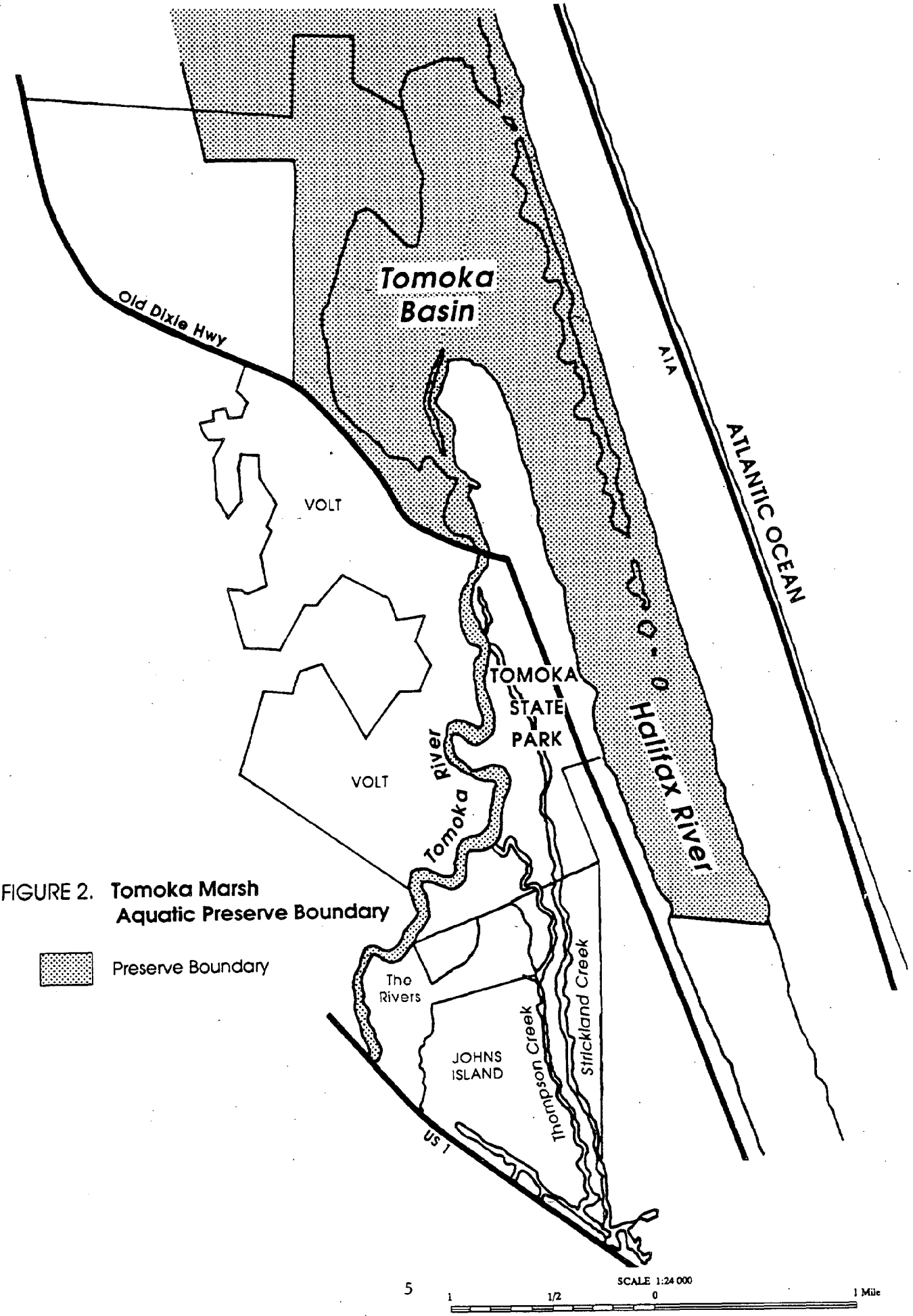


FIGURE 2. **Tomoka Marsh Aquatic Preserve Boundary**

Preserve Boundary

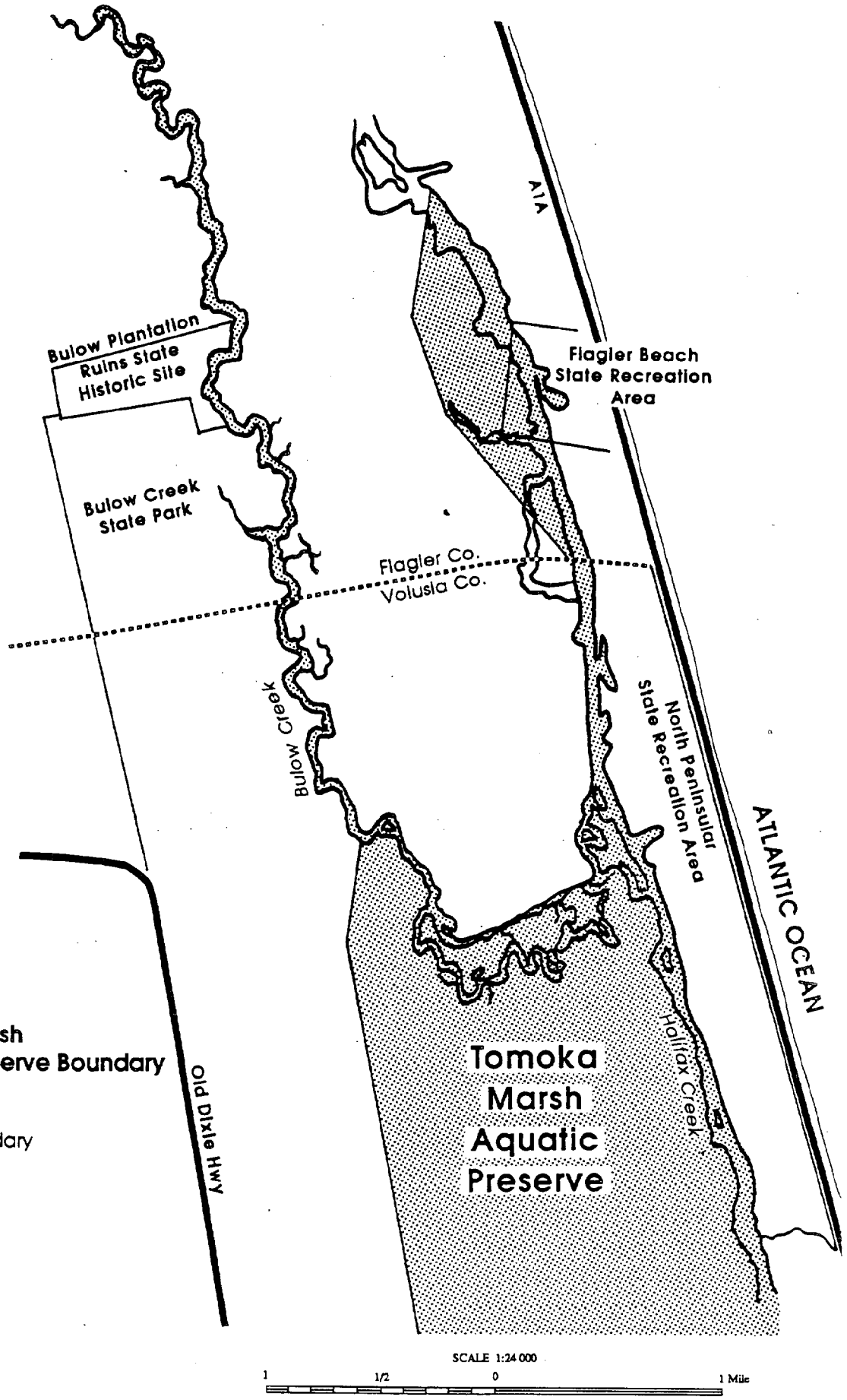


FIGURE 2. **Tomoka Marsh Aquatic Preserve Boundary** (continued)

Preserve Boundary

CHAPTER II

MANAGEMENT AUTHORITY

A. STATUTORY AUTHORITY

The fundamental laws providing management authority for the Tomoka Marsh 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 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.

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 mark the direction for management of aquatic preserves. Management will emphasize the maintenance of essentially natural conditions, and will include only sovereign or state-owned submerged lands and lands leased by the state and specifically authorized for inclusion as part of a preserve.

Management responsibilities for aquatic preserves may be fulfilled directly by the Trustees or by staff of the Division of State Lands of the Department of Natural Resources through delegation of authority. Other governmental bodies may also participate in the management of aquatic preserves under appropriate instruments of authority issued by the Trustees. The Division staff, however, serve as the primary managers who implement provisions of the management plans and rules applicable to the aquatic preserves. Staff evaluate proposed uses or activities in the preserve, and assess the possible impacts on the natural resources. Project reviews are primarily evaluated in accordance with the criteria in Sections 258.35-46 F.S., and 18-20, Florida Administrative Code, (Rules of Florida Aquatic Preserves), and in accordance with the policies set forth in this plan.

Staff comments on proposed uses are submitted for consideration in developing recommendations to be presented to the Trustees. This mechanism provides a basis for the Trustees to evaluate public interest and project merits within the context of potential environmental impacts upon the aquatic preserves. 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.

BACKGROUND

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 had a stimulating effect on this widespread concern.

In 1967, 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. That same year, the legislature provided the statutory authority (Section 253.03, F.S.) for the Board of Trustees to exercise proprietary control over state-owned lands. Also in 1967, government focus on protecting Florida's productive waterbodies from development led the Board of Trustees to establish a moratorium on the sale of submerged lands to private interests. That same year, an Interagency Advisory Committee (IAC) on submerged lands was created to develop strategies for the protection and management of state 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. Later that same year, the IAC 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 IAC and adopted, by resolution, eighteen of the water bodies as aquatic preserves, which included Tomoka Marsh Aquatic Preserve. Other preserves were individually adopted at various times through 1989.

B. 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. The general rules in Chapter 18-20, F.A.C., are supplemental to the rules in Chapter 18-21, F.A.C., in the regulation of activities in aquatic preserves.

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

Chapter 18-20, F.A.C., 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. 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."

C. RELATIONSHIP TO OTHER APPLICABLE PLANS AND PROGRAMS

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.

The Conceptual State Lands Management Plan, adopted on March 17, 1981, and amended by the Trustees on July 7, 1981 and March 15, 1983, contain 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 management plans and policies of the Aquatic Preserves Program.

The Local Government Comprehensive Plans (LGCP) for Volusia and Flagler counties are required by the Local Government Comprehensive Planning and Land Development Regulation Act to have a comprehensive management plan with elements relating to different governmental function (i.e., housing, physical facilities, conservation, land use, coastal zone protection, etc.). Each plan, in effect, is intended to guide the future development of the county. Cities and counties are to adopt land development regulations and conform to the criteria, policies, and practices of their comprehensive plan, which must be updated periodically as required by recent statutory amendments.

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

Volusia and Flagler counties' LGCPs have been submitted to the state for review. Volusia County's Comprehensive Plan has been accepted by the State Department of Community Affairs, while the comprehensive plans of Flagler County, the city of Flagler Beach, and the city of Ormond Beach have not yet been formally accepted.

CHAPTER III

DESCRIPTION OF AQUATIC PRESERVE

A. LOCATION AND BOUNDARIES

The preserve is located in southeastern Flagler County and northeastern Volusia County and is comprised of six distinct areas: 1) approximately seven miles of the Halifax River, north from the southern boundary of Ormond by the Sea; 2) Smith Creek, south and west of Flagler Beach State Park; 3) Bulow Creek; 4) the Tomoka River, east of U.S. 1; 5) the Tomoka Basin; and 6) a 1100-acre mosquito impoundment area consisting mainly of tidal marshes interspersed with ditches. Two municipalities border the preserve: the city of Flagler Beach and the city of Ormond Beach. Figure 2 represents the gross boundary of the preserve; the actual preserve includes only those state-owned submerged lands located waterward of the mean high water line (MHWL) within this boundary. The aquatic preserve is best described in terms of its components:

Halifax River

The Halifax River is a long, wide, shallow estuarine lagoon bounded on the west by the Florida mainland and on the east by a barrier island. The estuary is created by the mixing of saline water from the Atlantic Ocean, introduced through the Matanzas inlet to the north and the Ponce DeLeon Inlet to the south, with fresh water from the Tomoka River, Bulow Creek, and the upper Halifax River drainage basin.

The average depth of the Halifax River segment of the preserve is approximately 3.7 feet at mean low water. Average width is approximately 3,000 feet. The shallow configuration of the overall lagoonal system makes it particularly vulnerable to adverse effects from stormwater runoff, siltation, chemical and heavy metal contamination.

The Atlantic Intracoastal Waterway (ICW) channel in the Halifax River is 125 feet wide and has been dredged to a depth of 12 feet.

Smith Creek

Smith Creek, the northernmost reach of the preserve, is located in Flagler County. A section of the natural channel of the creek was dredged to accommodate the ICW. The remaining natural channel of Smith Creek is shallow, with numerous oyster beds. The southwestern segment of the creek, north of Tomoka Basin, is primarily salt marsh, interspersed with small islands, both natural and created. A portion of Smith Creek is bounded on the east by Flagler Beach State Recreation

Area, and on the west by Bulow Creek State Park. Flagler County has recently acquired 376 acres along Smith Creek just north of the preserve boundary. The lower reaches of Smith Creek are schooling grounds for redfish and an autumn stop-over for migratory waterfowl. Bald eagles, woodstorks and numerous other wading birds also frequent the area.

Bulow Creek

Much of Bulow Creek's drainage basin is located within Flagler County. Bulow Creek is a shallow, meandering waterway interspersed with several islands. From its origin in vast wetlands, the creek flows south for about 4 miles, between John Anderson Highway (County Road 201) to the east and Interstate 95 to the west, then turns generally eastward below the bridge at Walter Boardman Lane. From here the creek meanders eastward along the south side of Highbridge Road until it turns north and crosses under Highbridge Road at its confluence with the Halifax River, just south of the Flagler County boundary. Three canals (Iroquois Canal, Little Canal, and Korona Canal) connect Bulow Creek to large wetland areas located to the west of I-95.

Bulow creek is noted for bird-watching, canoeing, crabbing, and fishing. It has a maximum water depth of about 8 feet, although sandbars, such as the one located at the mouth of the Cysco Canal, just north of the bridge at Walter Boardman Lane, often require canoeists to portage. Alligators, osprey, and wading birds are often observed along the creek. Woodstorks frequent the area located north of Walter Boardman Lane. Other noticeable wildlife in this reach of the preserve include brown pelicans, snowy egrets, little blue heron, kingfishers, rails, raccoons, and white-tailed deer.

Tomoka River

The Tomoka River watershed drains an area of about 150 square miles, making it one of the largest sub-basins within the Florida East Coast Basin. Man-made drainage, including the Tiger Bay Canal and the Thayer Channel, has increased the boundary of the Tomoka watershed. These canals cut through ridge lines to drain landlocked swamps to the west of the Rima Ridge, an ancient sand dune ridge line that extends north and south from the southern edge of Hull Cypress Swamp to the north, and the Lake Ashby area to the south. The approximate boundary of the Tomoka watershed is depicted in Figure 3.

The natural headwaters of the Tomoka River originate in low lying areas south of Interstate 4 (I-4) and west of Interstate 95 (I-95). From its natural headwaters, the river flows generally northward for about 9 miles, about 1/2 of a mile west of and generally parallel to I-95, to just north of its intersection with S.R. 40. From here the Tomoka River runs in a generally northeasterly direction until its confluence with the Halifax River estuary at the Tomoka Basin.

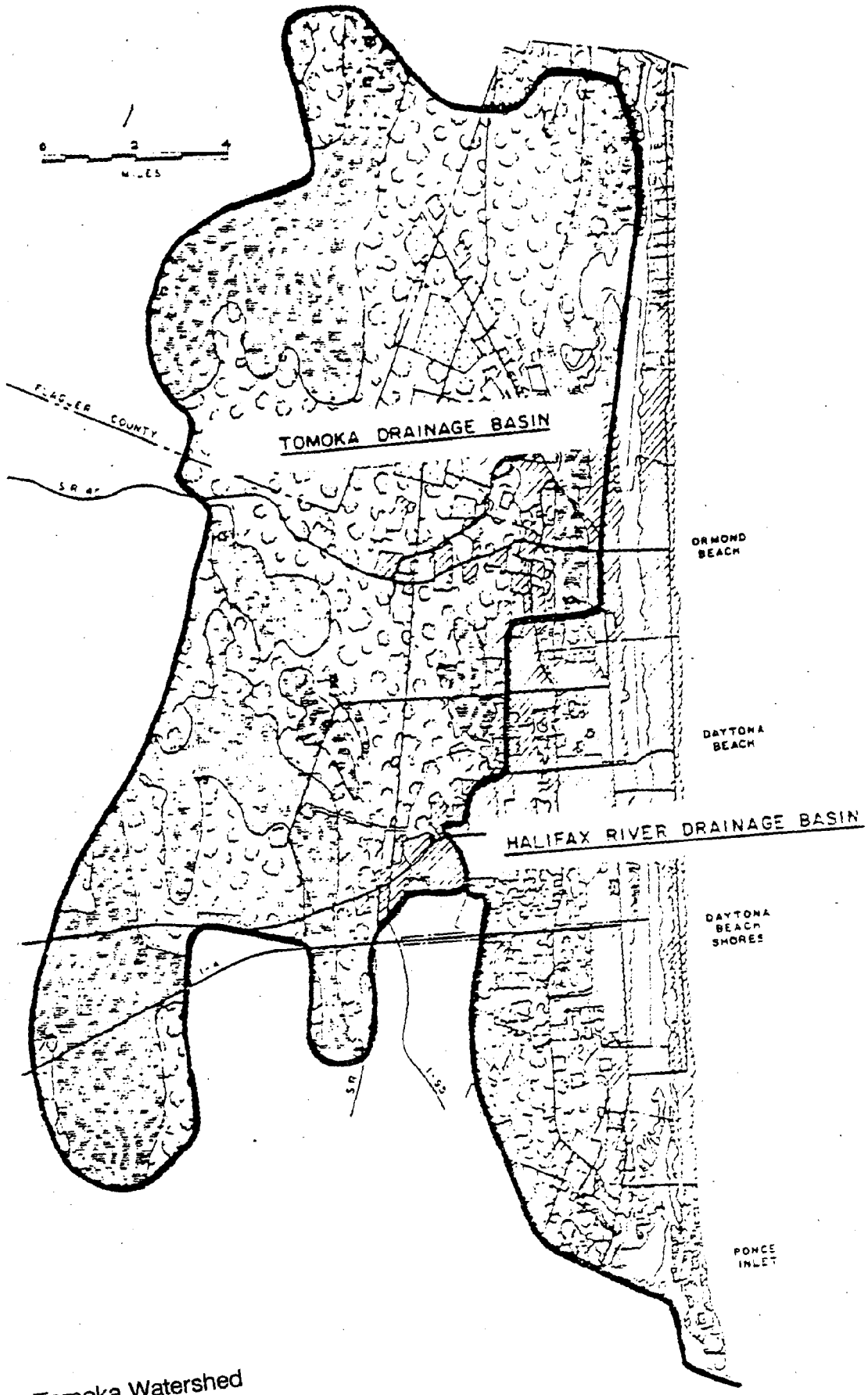


FIGURE 3. Tomoka Watershed

The upstream reach of the Tomoka River has three primary natural tributaries: Priest Branch, the Little Tomoka River, and Groover Branch. These three tributaries drain the northern and western areas of the watershed, east of the Rima Ridge. Numerous other tributaries and canals, varying in size, flow into the Tomoka River.

Misner's Branch is a smaller natural tributary which drains a generally north-south corridor, located generally between Nova Road on the east and Clyde Morris Boulevard on the west. Its headwaters begin south of Ormand Beach.

Thompson Creek is a natural tributary up to approximately the future Wilmette Avenue extension. South of this point the creek has been dredged. This tributary drains a larger north-south corridor, located generally between Ridgewood Avenue on the east and Nova Road on the west. Its headwaters begin in Holly Hill. Thompson's creek north of North of US 1 is part of the Tomoka River Manatee Sanctuary.

Strickland Creek is a man-made waterway which extends from the confluence of Thompson Creek and Dodson Creek north through properties included in the John's Island tract and Tomoka State Park. It enters the Tomoka River just south of the bridge at Old Dixie Highway. The creek is much wider and deeper than Thompson Creek and gives the appearance of a natural waterway. Strickland Creek is utilized extensively by manatee, and is part of a designated Manatee Sanctuary (Figure 6).

Bear Creek is a natural drainage feature which enters the Tomoka River north of the Ormond Beach Airport and south of U.S. 1. This waterway drains the area between the airport and U.S. 1 and some of the area to the east of U. S. 1, including portions of Tomoka Estates and National Gardens housing developments.

The Lamoureaux Canal is a man-made feature which drains approximately 9 square miles in the northeastern section of the Tomoka drainage basin. It enters the east side of the Tomoka Basin via the salt marsh.

Tomoka Basin

The Tomoka Basin is 376 acres of shallow estuarine bay, located at the confluence of the Tomoka and Halifax Rivers. Water depth throughout most of the Tomoka Basin is approximately three feet or less, depending upon the tide, There are, however, some deeper holes located throughout the basin and it is relatively deep around the "point" at Tomoka State Park. A small island (approximately 3.7 acres) is located in the southeast section of the basin, adjacent to Tomoka State Park.

Tomoka Marsh Mosquito Impoundment

An 1100-acre marsh was impounded by the East Volusia Mosquito Control District in 1968 to control the production of saltmarsh mosquitoes. The impounded marsh is located between the Tomoka Basin and Bulow Creek, to the south and north, respectively, and is bordered on the west by uplands and to the east by upland spoil created from the Intercostal Waterway. The impoundment has not been actively managed since 1980 and is permanently opened to the estuary by seven 39 inch culverts and two breaches in the impoundment dike wall.

Within an impounded area, unfavorable conditions may occur which decrease the productivity of the impounded area. The combination of high temperature, high organic content, and shallow water depths typically result in low dissolved oxygen levels in the near-dawn hours, the time of greatest biological oxygen demand. Under these conditions, mortalities or severe stress can affect species which require relatively high levels of oxygen. Although the marsh inside the impoundment is disturbed, culverts and breaches in the deeper perimeter ditches and other interior ditches provide access to marsh habitat for many fish from the estuary.

Access to estuarine marsh habitat is significant to the health of an estuary because 1) it provides important habitat for juveniles of many species; 2) it exports detritus and other natural plant nutrients that are consumed by the estuary; and 3) it provides numerous "cleansing" functions, such as natural storm water treatment. Impoundments also significantly change the salinity, water levels, vegetation, and hydrology of both the impounded area and the adjacent or nearby estuary.

B. CLIMATE

The preserve is located within subtropical east central Florida, which has an average annual temperature of 70 degrees Fahrenheit (Lichter, 1972). The nearby Atlantic Ocean moderates extreme conditions with predominant inshore winds, which blow from the ocean onto the land approximately 22.9 percent of the time in coastal Volusia County (Ormond Beach, 1990).

Volusia County has an average annual rainfall of approximately 52 inches, as measured at the National Oceanic and Atmospheric Administration's (NOAA) station at the Daytona Beach Regional Airport. Large variations occur in levels of yearly rainfall. Rainfall during a wet year may amount to twice that which occurred during a dry year. The maximum annual rainfall recorded in Volusia County was 67.3 inches in 1941, while the minimum recorded annual rainfall recorded was 31.4 inches in 1956 (Volusia-Flagler Sierra Group, 1989).

C. GEOLOGY

The rise and fall of sea level has played a continuing role in the condition of the region and the present estuary and barrier island. In the late Pleistocene, sea level was higher than it is today, and the present chain of barrier islands existed as offshore sand bars. The Atlantic Coastal Ridge functioned as a barrier island that protected a shallow lagoon which is now known as the Pamlico Terrace. When the sea level dropped at the beginning of the glacial age, the current estuary and barrier islands were exposed. These barrier islands had partially lithified through the precipitation of calcium carbonate. As the sea level rose during the deglaciation of the continent, the estuary became brackish through partial inundation by oceanic water. A subsequent drop in sea level, exposed the site of today's estuary. Deposition of sediments through fresh water transport and wind partially filled the estuary until the last great ice sheets melted, and the sea level rose to form what is today's Halifax River and Smith Creek.

Where beachfront development has occurred on the barrier island, it has either destroyed or significantly altered large portions of the natural dune system which serve to protect the island during storm events. The natural dune system also functions to protect both the estuary and the mainland.

D. HYDROLOGY

Intense development on the barrier island has affected the hydrology of the area in varying degrees by stormwater drainage, septic tank leachate, package plant effluent, and dredge and fill operations. Other freshwater impacts include pesticides, herbicides, bacteria, and nutrients transported as they run off from agricultural, residential, and urban lands.

The hydrology of the preserve is influenced substantially by the wide, shallow nature of the Halifax River (lagoon) and of the Tomoka Basin. Bridges, causeways, pilings, revetments, and spoil islands are man-made features which can have a significant direct impact on the hydrology of a waterway and indirectly affect water quality.

Most of the estuaries' watershed has been modified by mosquito control, residential development or silvicultural drainage. Silvicultural areas west of the preserve represent the earliest stage of these alterations. Major artificial drainage networks typically allow larger amounts of fresh water to flow into the estuary more quickly and with more silt deposition and nutrient loadings than would have under the natural drainage conditions. Natural drainage patterns include freshwater input via creeks and rivers; groundwater seepage; and sheet flow, where surface water is slowed and filtered as it flows through natural upland and wetland vegetation.

Tidal action affects the Tomoka Basin, the Tomoka River, and all of the tributaries for a distance of about 10 miles upstream from the Halifax River, although the U. S. Geological Service flow records indicate that at 5 feet mean sea level (MSL) gravity driven flow and tidally driven flow normally separate. Above 5 feet MSL, flow is largely downstream, except during extreme wind and rain conditions. Below 5 feet MSL, flow reversals and water stacking may occur. When this happens, typically during fall "northeasters," suspended water columns may deposit large quantities of sediment on the bottom.

The Tomoka Basin is influenced almost equally by both the Matanzas Inlet, to the north, and the Ponce DeLeon Inlet, to the south. For example, the average net tidal flow into the Tomoka Basin from Matanzas Inlet, approximately 25 miles to the north, is 211 cubic feet per second. Because of low gradients and poorly integrated drainage from nearby former marine terraces, water movement in the Halifax River (lagoon) is influenced more by tidal flushing than by surface runoff (Ormond Beach, 1988).

E. WATER QUALITY

Water quality directly affects the plants and animals naturally adapted to living in the Tomoka Marsh Aquatic Preserve. The Florida Department of Environmental Regulation (FDER) conducted extensive water quality testing in the Halifax River during 1986 and 1987, from the Tomoka Basin south to Bethune Point at Daytona Beach. Water quality was found to decline progressively from the Tomoka Basin south, with the poorest water quality found between Daytona Beach and Port Orange. Water quality progressively improved north of the Tomoka Basin.

Point and non-point sources of pollution, compounded by low flow rates and the shallow nature of tidal estuary, affect water quality within the preserve. Manmade modifications (including: boat ramps, finger canals, marinas, stormwater outfalls, upstream drainage facilities, and wastewater treatment outfalls) are also among the many variables that influence the water quality of the preserve (Ormond Beach, 1990). The timing, quantity, and chemical constituents associated with these pollution sources are different and therefore will have differing impacts on the estuarine system.

Point source pollutants are those which enter the receiving water body at a specific point, such as a ditch or discharge pipe. They are generated at an easily definable location, such as a wastewater treatment plant or factory, and are generated from a particular process, i.e., the treatment of domestic sewage or dry cleaning/commercial laundry operations. Sewage, industrial, and utility discharges are three general types of point source pollution. The FDER is the agency responsible for permitting and monitoring point source discharges to waters of the state.

Non-point source pollution is that which is generated over a large area and which generally enters the receiving water gradually along a certain length of the waterway. In some cases, non-point source pollution may enter the receiving water body at a specific point (e.g., culverted stormwater runoff from parking lots, farm fields, etc.). Non-point sources generally are less well defined than point sources in terms of the location and the processes which created the effluent. The six basic categories of non-point pollution are: urban stormwater runoff, construction, agriculture, silviculture, residual waste, and hydrologic modification.

Urban stormwater runoff generally results from rainfall striking and flowing off impervious surfaces such as buildings, roads, and parking lots. The water picks up dust, dirt, litter, and residual products from automobiles. Other predominant constituents of urban stormwater include suspended solids, oil, grease, microorganisms, heavy metals, and biologically/chemically demanding substances.

Construction related activities have the potential of introducing a number of pollutants to aquatic systems through site runoff, especially on small waterfront lots which are typical of the Tomoka Basin. Runoff can occur during the land clearing, construction, and landscaping processes. Exposed soil is subject to erosion during the land clearing process. During the construction process, substances such as sanitary wastes, petroleum products, trash, and cement are common constituents of site runoff. Landscaping activities may contribute suspended sediments, nutrients, herbicides and pesticides to site runoff. Package wastewater treatment facilities which discharge to percolation ponds or drainage fields may pose potential water quality problems. One package treatment plant (Tymber Creek) is located adjacent to the Tomoka River a short distance upstream from the preserve boundary north of US 1.

Septic tank systems are another potential non-point pollution source. Areas with high concentrations of septic tanks are found on the barrier island in unincorporated Volusia County and Ormond-by-the-Sea and on the mainland in several subdivisions. Subdivisions with septic tanks located on the Tomoka River directly south of the Preserve boundary include Tomoka Estates, Twin Rivers, Hidden Hills, Tidewater and Broadwater. In areas where percolation is rapid, even properly functioning septic tanks have a significant potential to degrade water quality. The close proximity of numerous housing developments to major water bodies creates the possibility of ground water and, eventually, surface water (via lateral subsurface flow) contamination by improperly functioning septic tanks or associated drainfields.

F. BIOLOGICAL COMMUNITIES

Knowledge of the importance of ecological communities and their associated floral and faunal structure, as well as the interdependency between communities, has greatly increased in recent years. Public awareness of the numerous services that ecosystems provide "for free" is increasing as is cognizance of the global magnitude and ramifications of vegetative community destruction.

The Tomoka Marsh Aquatic Preserve is a valuable nursery area for fishes, shrimps, and crabs caught commercially and recreationally in the Atlantic Ocean. Other species not directly important to commercial fishing but necessary to the food chain also depend on the estuary and the diversity of habitats within. The preserve is also important habitat for resident and transient wildlife species. Marshes, tidal flats, seagrass beds, algal beds, and deepwater areas provide refuge from predation and from extremely adverse environmental conditions, such as drought, storms, and from the effects of development-related activities. Other habitat benefits include sites for feeding, resting, mating and nesting.

The preserve is utilized by over 50 species of fish, including snook and redfish, as well as manatees, marine turtles, bottlenose dolphins , wood storks and other wading birds and a variety of other wildlife. The variety and abundance of wildlife found in the preserve can be attributed to the diversity and availability of a number of biological communities present in the preserve: salt marsh, tidal flats, marine macroalgae, seagrass, and black mangrove. The following plant communities are presented separately, although they are ecologically interdependent.

1. MARSHES

Salt marsh comprises one of the most extensive communities within the Tomoka Marsh Aquatic Preserve (Figure 4). Although many salt marshes often are dominated by a single floral species, salt marsh vegetation within the preserve typically has smooth cordgrass (Spartina alterniflora) as the first emergent vegetation, succeeded landward by black needle rush (Juncus roemerianus), which occurs in large vegetative bands or zones. Salt flats, located farther landward, are only intermittently flooded by tidal water. High evaporation, transpiration, and percolation rates result in high salinities in the interstitial water, with consequent domination by halophytes, such as saltgrass (Distichlis spicata), annual glasswort (Salicornia bigelowii), perennial glasswort (Salicornia virginica), and saltwort (Batis maritima). Soils are typically level, saturated or inundated consisting of coarse textured sands or organics underlain by clay or sand.

Salt marsh vegetation is frequently the dominant biological community within the estuarine environment, especially north of tropical and subtropical ranges of mangrove swamps. This occurs because the naturally turbid estuarine water limits the amount of light penetration to bottom sediments, thus limiting seagrass

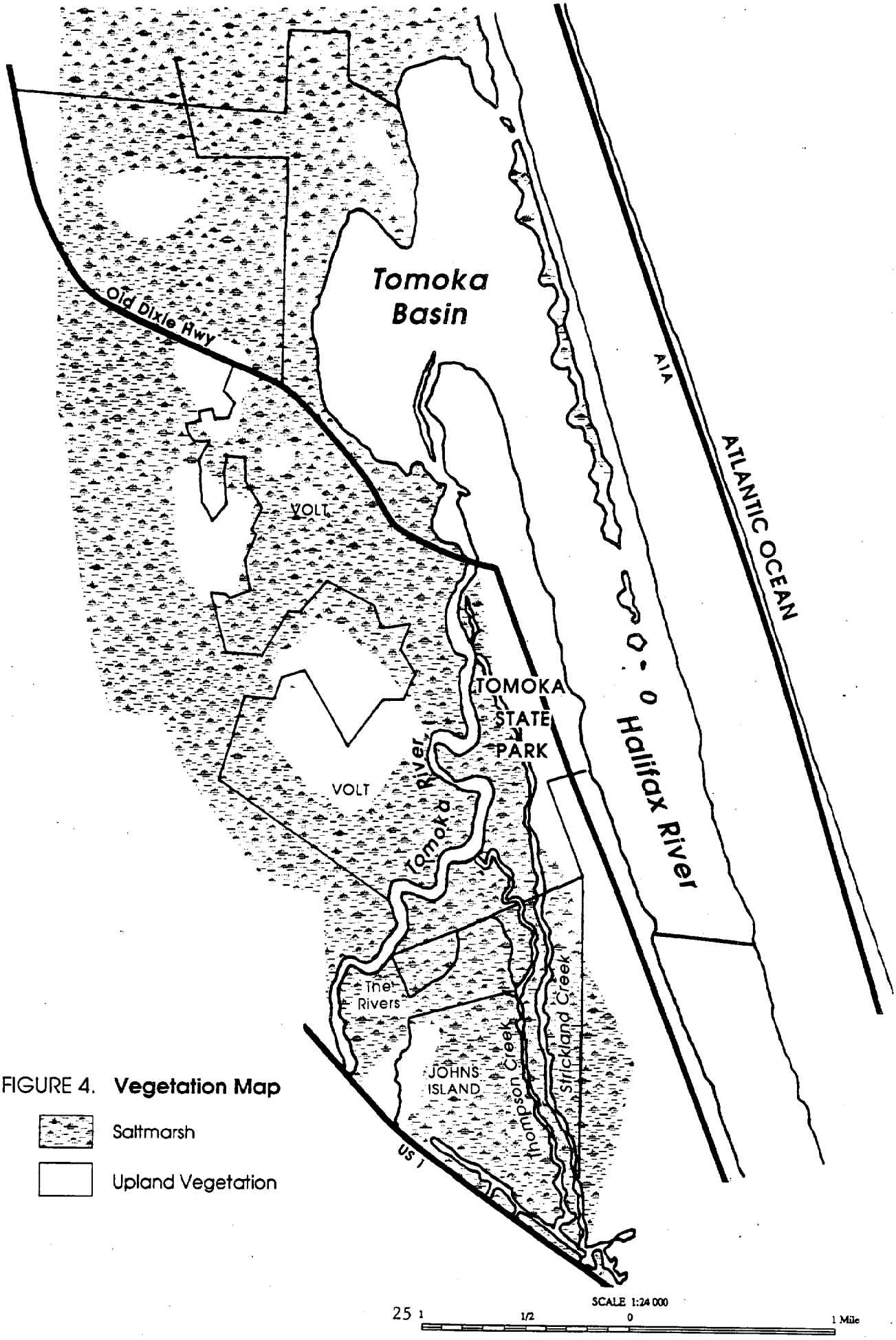


FIGURE 4. **Vegetation Map**

Saltmarsh

Upland Vegetation

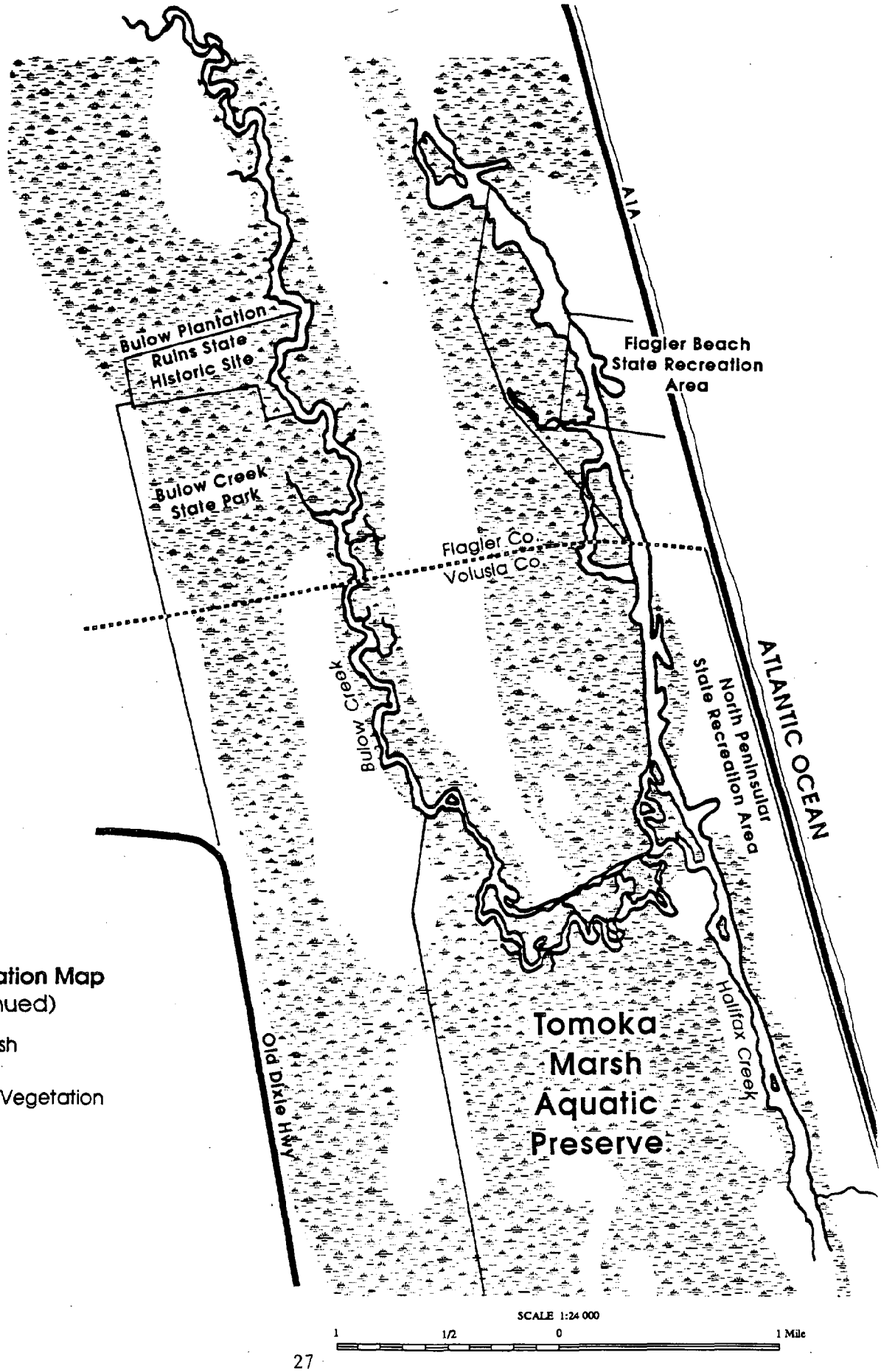


FIGURE 4. **Vegetation Map** (continued)

Saltmarsh

Upland Vegetation

proliferation and creating a situation favorable to the emergent salt marsh vegetation which can establish itself in the upper intertidal areas (Nybakken, 1982).

Salt marshes foster a food chain that starts with vegetation fragments decomposing into detritus. Detrital matter leaves the marsh and enters the estuary where it serves as the base for the estuarine and marine food cycle. Amphipods, bacteria, clams, crabs, insect larvae, mussels, etc., consume detritus and are subsequently consumed by successively larger creatures. Salt marshes are noted for high productivity and for the shelter and habitat they provide for juvenile and adult fish, birds, invertebrates, and mammals. Salt marsh grasses also protect the shoreline from erosion and remove suspended nutrients and sediments from the water.

As salt marsh vegetation traps nutrients and sediments, the rate of deposition of detritus around individual plant bases is accelerated. As deposition or accretion continues, an environment emerges which is less and less marine and more terrestrial, with salt marsh flora replaced by upland plant species. This succession continues with a series of vegetative zones occurring progressively farther from the water, as the marsh reduces the surface water area by slowly converting it to dry land (Nybakken, 1982).

Extensive areas of salt marsh within the preserve have been ditched for mosquito control. Under natural conditions, depressions within the marsh are intermittently inundated by unusually high tides or by rainfall. Mosquito production is a natural part of marsh ecosystem which becomes a problem when developed areas occur in close proximity to natural areas.

Natural salt marsh is classified as either high marsh or low marsh. High marsh is rarely inundated by tidal water, in contrast to low marsh, which is flooded either daily or on a regular basis.

a. High marsh

High marsh is typically found on a relatively sandy substrate, where water percolates rapidly. The infrequent inundation and rapid percolation, in combination with high evapotranspiration rates, results in a highly saline environment. Halophilic plants, including saltgrass (Distichlis spicata), annual glasswort (Salicornia bigelowii), perennial glasswort (Salicornia virginica), and saltwort (Batis maritima) are dominant high marsh vegetation in undisturbed areas.

b. Low marsh

Low marsh is typically found on muck soils, such as Turnbull muck, which is flat soil formed in clayey and sandy estuarine deposits. Some low marsh, however, can be located in hard-packed sandy soils.

In undisturbed areas of the preserve, primary vegetation consists of smooth cordgrass (Spartina alterniflora) and black needle rush (Juncus roemerianus). When low marsh is flooded by tidal action, its shallow ponds, ditches and tidal creeks are important feeding areas and habitat for arthropods, such as crabs and shrimp, as well as for finfish, such as mosquito fish, sheepshead, minnows, and killifish. The Atlantic salt marsh snake, which is designated as "threatened" by both the U. S. Fish and Wildlife Service and by the Florida Game and Fresh Water Fish Commission is an inhabitant of this area.

The abundance of small invertebrates and vertebrates in the low marsh makes it a natural feeding area for waterfowl, wading birds, raptors, aquatic mammals, and some wildlife from adjacent upland habitats. Predatory fish lurk near the edges of these marshes to prey upon shrimp, crabs, and small finfish, especially when the outgoing tide carries many of these smaller creatures into deeper waters.

Revegetated ruderal spoil areas were created when dredged spoil material was deposited on low marsh areas during the 1950s and 1960s. These spoil areas are largely revegetated with high marsh grasses and succulents and often have a high unnatural berm of spoil material, which separates the low salt marsh from the adjacent estuary. The berm is comprised primarily of sea ox-eye daisy (Borricia frutescens). When water is entrapped behind these unnatural berms, mosquito propagation is enhanced, as there are few or no natural predators, such as the mosquito fish to consume the mosquito larvae. To correct this situation, natural estuarine processes should be restored by ecologically-compatible management techniques, such as Open Marsh Water Management to enhance tidal flow onto and off the marsh.

The black mangrove (Avicennia germinans), the most cold-tolerant mangrove, is the only species of mangrove found in the preserve. Although a few black mangroves had existed as far north as South Ponte Vedra in St. Johns County, the preserve is considered to be the northernmost extent of its range, especially since the severe freezes of the 1980's. At this time, only relict populations of black mangroves exist within the preserve, although they could recolonize in the absence of severe freezes.

2. TIDAL FLATS

Tidal flats are located throughout the Tomoka Basin. They comprise a variety of shallow aquatic habitats which are largely void of either seagrasses, attached estuarine algae, or emergent salt marsh vegetation. They may be found along lagoonal beaches, in areas waterward of salt marshes, within submerged spoil areas, and on natural shoals. Mollusks, such as the American oyster (Crassotrea virginica) and the southern hardshell clam (Mercenaria campechiensis) inhabit areas on or adjacent to tidal flats. Arthropods, such as the blue crab (Callinectes sapidus), edible shrimps (Penaeus setiferus and Penaeus aztecus), and finfish, such as flounder and mullet, also inhabit tidal flats.

Intertidal mud and sand flats are usually colonized by microscopic algae, which is an important element of the food chain in estuarine areas where submerged grasses are lacking.

A variety of birds are attracted to tidal flats to feed on the numerous invertebrates and small finfish. Many of these birds are noted for forming extensive nesting colonies in adjacent upland areas. Successful propagation may depend upon the vitality of the tidal flats, the availability of nearby nesting sites, and the safe and undisturbed ingress to and egress from feeding and nesting sites. Tidal flats not only serve as feeding sites, but also as "loafing" areas for these birds (Barnett et al., 1980). Research is needed to determine the complete ecological role and value of tidal flats, which has not yet been determined.

3. ALGAE

Algae represent the non-vascular vegetation in the preserve. There are over 60 species of red, brown,, and green algae that typically grow in sediment, or attach to seagrass, seawalls or rip-rap. Some of these algal species can begin as attached forms and eventually break off to form drifting algae mats that become substrata for numerous invertebrates, associated algae, and fish. Drift algal communities may provide better refuge for many organisms than do seagrasses (Eiseman and Benz, 1975; Benz et al., 1979; Gore et al., 1981; Kulczycki et al., 1981; Virnstein and Howard, 1987).

Little work has been done on algal species within the preserve. The species most likely to occur in the preserve include: Gracilaria sp., Neoagardhiella sp., Ulva sp., and Enteromorpha sp..

Because aggregates of attached algae exhibit many of the ecological attributes associated with seagrasses (Nelson et al., 1989), this community should be afforded a similar level of protection.

4. SEAGRASSES

Seagrasses are among the most productive estuarine communities and provide a vital habitat for adult and juvenile fish, mollusks, and crustaceans. Seagrasses play an integral part in the cycling of nutrients in the estuarine environment. They are consumed directly by urchins, gastropods, fish, and manatee (Zieman, 1982). Decomposition of seagrasses contributes to the food source of detritus feeders, which in turn are consumed by fish and other marine life. Seagrasses are used as an attachment site for many forms of epiphytic algae and Foraminifera, which may be a more important food source for fish and juvenile shrimp then are the seagrasses themselves (Zieman and Wetzel, 1980; Dawes, 1981).

When a loss of seagrasses occurs, reductions in such features as water quality, habitat, survival of many larval and juvenile fish and invertebrates, and the availability of food throughout the food chain can take place. Most losses of seagrasses are caused by dredge and fill activities. Even if the fill is not placed directly on top of seagrass beds, mortality may result from increased water turbidity. Unconsolidated particles of fill may be continually resuspended into the water column, inhibiting recolonization by seagrasses. Excessive nutrients from point and non-point sources of pollution can cause phytoplankton blooms or dramatic epiphytic algal growth that may shade seagrasses and cause reduced overall productivity. Propeller cuts (prop. dredging) directly reduce aerial coverage of seagrass beds, by chopping and digging out the grasses directly.

Little seagrass appears to occur within the preserve. Little is known of the species, location, seasonality, or extent of seagrasses present in the preserve. It is not known if seagrasses were ever an important feature in the Tomoka and Halifax Rivers. If they were present, past dredging activities, persistent resuspension of unconsolidated particles, and other factors may have contributed to the decline of seagrass beds and may inhibit recolonization of seagrasses. Studies are needed to determine the following: 1) which species are present and their location; 2) what the seasonal growth, reproduction, and termination patterns are; 3) whether sea grass beds are increasing, decreasing, or maintaining equilibrium in terms of size; and 4) whether modification of existing land use patterns, wastewater treatment facilities, and stormwater infrastructure will improve or worsen the existing situation (DNR, 1988).

G. LISTED SPECIES

Listed species are those which are designated by the U.S. Fish & Wildlife Service, Game and Fresh Water Fish Commission, and the Florida Natural Areas Inventory as being endangered, threatened, or as species of special concern. Endangered species inhabiting the preserve include the West Indian manatee (*Trichechus manatus*) and the wood stork (*Mycteria americana*). Threatened species include the bald eagle *Haliaeetus leucocephalus*, Atlantic salt marsh snake (*Nerodia fasciata taeniata*), and the Atlantic loggerhead sea turtle (*Caretta caretta*). Species of special concern include the brown pelican (*Pelecanus occidentalis*), snowy egret (*Egretta thula*), roseate spoonbill (*Ajaia ajaja*), and the common snook (*Centropomus undecimalis*). Another protected species which inhabits the Tomoka Marsh Aquatic Preserve is the bottlenose dolphin (*Tursiops truncatus*). A complete list of listed species which have been documented in or adjacent to the preserve is provided in Table 1.

TABLE 1
LISTED WILDLIFE SPECIES

COMMON NAME	FDA/GFC	FWS	CITES
Plants			
Carolina Holly	T		
Ilex ambigua			
Florida Coontie	CE		II
Zamia floridana (=Z. pumila)			
Green-fly Orchid	T		II
Epidendrum conopseum	T		II
Prickly-Pear Cactus			
Opuntia stricta	T		II
Dwarf Palmetto Bluestem			
Sabal minor	T		
Florida Privet			
Forestiera segregata		C1	
Giant Leather Fern			
Acrostichum daneifolium	T		
Golden Polypody			
Phlebodium aureum	T		
Reptiles			
Atlantic Salt Marsh Snake	T	T	
Nerodia fasciata taeniata			
American Alligator	SSC	TSA	II
Alligator mississippiensis			
Eastern Indigo Snake	T	T	
Drymarchon corais couperi			
Florida Pine Snake	SSC	C2	
Pituophis melanoleucus mugitus			
Gopher Tortoise	SSC	C2	
Gopherus polyphemus			
Mammals			
River Otter			II
Lutra canadensis			

COMMON NAME	FDA/GFC	FWS	CITES
Round-tailed Muskrat *Neofiber alleni*		C2	
West Indian Manatee *Trichecus manatus latirostris*	E	E	I
Bobcat *Lynx rufus*	II		
Fish			
Snook *Centropomus undecimalis*	SSC		
Birds			
Bachman's Sparrow *Aimophila aestivalis*		C2	
Bald Eagle *Haliaeetus leucocephalus*	T	E	I
Brown Pelican *Pelecanus occidentalis*		SSC	
Least Tern *Sterna antillarum*	T		
Little Blue Heron *Egretta caerulea*	SSC		
Florida Scrub Jay *Aphelocoma coerulescens*			
Northern Harrier *Circus cyaneus*		II	
Osprey *Pandion haliaetus*	II		
Roseate Spoonbill *Ajaia ajaja*		SSC	
Snowy Egret *Egretta thula*		SSC	
Southeastern American Kestrel *Falco sparverius paulus*	T	C2	II
Tricolored Heron *Egretta tricolor*	SSC		
Wood Stork *Mycteria americana*	E	E	

1. FDA: Florida Department of Agriculture and Consumer Services
   GFC: Florida Game and Fresh Water Fish Commission
   E: Endangered
   T: Threatened
   SSC: Species of Special Concern
   CE: Commercially Exploited

2. FWS: U.S. Fish and Wildlife Service
   E: Endangered
   T: Threatened
   TSA: Threatened due to similarity of appearance
   C1: A candidate for federal listing, with enough substantial information on biological vulnerability and threats to support proposals for listing.
   C2: A candidate for listing, with some evidence of vulnerability, but for which not enough data exists to support listing.

3. CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora.
   I: Appendix I Species
   II: Appendix II Species

The Halifax River and Smith Creek are an important travel corridor for the West Indian manatee. The Tomoka River and its downstream tributaries are especially significant to the slow-moving manatees as quiet places to eat, rest, drink fresh water, mate and give birth. The Tomoka River system was the site of the first documented manatee birth in the wild. In 1989, the Florida legislature designated the Tomoka River, Strickland, Thompson and Dodson Creeks as a Manatee Sanctuary.

Motorboats pose an increasing threat to manatee. Most documented boat-related manatee mortality occurs when the manatee is struck by the boat hull. Other injuries and fatalities occur when the manatee is cut by propellers. Researchers believe that excessive and noisy boat traffic or personal watercraft may cause pregnant manatees to abort or to deliver still-born calves.

The wood stork is another endangered species observed utilizing the preserve as feeding habitat. Wood storks, which consume large quantities of fish, are seen feeding in the shallow water areas and wetlands associated with the Tomoka Basin, the Tomoka River, and their tributaries. Although no wood stork rookeries have been documented near the preserve, the tall cypress trees along the reach of the Tomoka River between U. S. 92 and S. R. 40 are believed to comprise a potential rookery area.

The Atlantic salt marsh snake is a small, slender, heavily keeled subspecies endemic the Florida east coast. It inhabits salt marshes and mangrove swamps and tolerates a wide range salinities. It ranges from the Tomoka Marsh Aquatic Preserve south to Indian River County. The salt marsh snake is thought to occupy fiddler crab burrows. It feeds in shallow water at low tide upon small fish which have been trapped by the tide. Although primarily nocturnal, it is known to feed during the day at low tides (Ormond Beach, 1988). The primary threat to the Atlantic salt marsh snake is habitat destruction, such as dredge and fill activities; East Volusia County Mosquito Control staff reported that it utilized rotary ditched areas in Mosquito Lagoon (Paul Haydt, pers. comm.).

The Atlantic loggerhead sea turtle is the primary sea turtle to nest along the coastal beach on the barrier island, which is adjacent the eastern side of the preserve. Loggerheads spend a portion of their juvenile years in estuarine waters, such as the Halifax River. They are omnivorous, feeding on crabs, mollusks, jellyfish, shrimp, and vegetation. Sea turtles have been known to swallow plastic bags or balloons, which resemble jellyfish, but if swallowed, can choke or block the turtles' digestive tract. Within the estuary, sea turtles are vulnerable to the hazards posed by plastic litter, water pollution, and collisions with boats and barges.

The eastern brown pelican is a colonial nester, congregating in large numbers on small islands. Brown pelicans are often observed utilizing the spoil islands within the preserve as resting places, but nesting activities have not been observed.

Common snook are numerous in the Tomoka River system during the second half of September through November. Snook are vulnerable to cold weather, as was evidenced by a massive fish kill in Strickland Creek after a severe freeze in January of 1977. Several individuals reported killed were in excess of 25 pounds.

From 1977 to 1981, the Florida snook population declined by 70 percent from its previous rate. The Florida Game and Fresh Water Fish Commission subsequently designated snook as species of special concern, at the request of the FDNR. The FDNR's Bureau of Marine Research presented information at the first Snook Symposium which prompted the Governor and Cabinet to prohibit snook fishing during June and July of 1982. The closed season for snook was expanded to include January, February, and August (DNR,1987).

Snook populations are also vulnerable to losses from heavy recreational fishing. They face a significant loss of habitat as the result of coastal development, which has severely diminished the estuarine habitat productivity throughout the state. Mortalities can also result from the use of chemical pest control sprays, such as Baytex and Malathion adjacent to or in close proximity to spawning or nursery areas (DNR,1987).

The bottlenose dolphin (Tursiops truncatus) is protected under the Marine Mammal Protection Act as defined in the Florida Statutes. They inhabit the preserve year-round, but are more numerous during the spring and autumn menhaden runs. During that time, the large mammals can be observed chasing and feeding upon menhaden and other small fish in the shallow tidal flats of the Tomoka Basin and in the deeper waters of the Tomoka and Halifax Rivers.

Habitat destruction, increased boat traffic, and water pollution have been tentatively linked to decreased bottlenose dolphin populations. Little is known about the bottlenose dolphin population that inhabits the preserve or about the effects of these variables upon local populations. Research does indicate, however, that between 200 and 600 bottlenose dolphins are believed to be permanent residents of the nearby Indian River Lagoon and that between 9 and 18 dolphins die there each year.

H. ARCHAEOLOGICAL AND HISTORICAL RESOURCES

Nineteen prehistoric sites have been identified near the preserve. These sites include the Cotten Site, the Summer Haven Site and the remains of the Timucuan village, Nocoroco.

The Nocoroco site had as many as 200 palmetto-thatched huts, a common granary, and a council meeting house. Nocoroco was situated at the tip of the peninsula that is now Tomoka State Park. The area has been heavily eroded over the years, and today the oyster shells found just off the point represent a part of the village itself. Tomoka State Park is addressing this problem in two ways: it proposes to stabilize the shoreline by planting vegetation, and it proposes to minimize the effects of visitors on the upland vegetation by constructing walkways to confine all foot travel.

A recent grant award by the Division of Historical Resources will provide for an archaeological reconnaissance survey of 320 acres of the Tomoka peninsula. Archaeologists will record new sites as well as record sites that were discovered in the 1940's. The project will produce an inventory of prehistoric and historical sites present on a 1 1/2-mile-long stretch of the peninsula.

Because most of the identified prehistoric sites are on state-owned land, they will be managed in a manner that will preserve and maintain their value for future generations.

Several prehistoric and historical sites were noted in the archaeological and historical survey of the Halifax Plantation Development of Regional Impact (DRI) report (Daniel et al., 1980). The development of areas that do not require DRI's or that are not state-owned, however, are of concern, because it is difficult to ensure

the protection of archaeological or historical interests from destruction during development. It is very likely that undiscovered sites, particularly from early periods, occur next to or within the aquatic preserve boundary.

I. PALEONTOLOGICAL

The Tomoka Marsh Aquatic Preserve and its surrounding uplands contain numerous paleontological and other irreplaceable links to the past. These assets provide a unique record of the area's prehistoric heritage and an opportunity to understand ecosystems which have occurred in geological history, including the discovery of species which may not have been known to exist in the area.

Many birds and land mammals had evolved considerably by the time parts of what is now peninsular Florida emerged as land. The present-day preserve and its surrounding land area was still inundated during this era, but evidence of Oligocene terrestrial creatures exists at a 28 million year old fossil site in Alachua County. Land creatures recovered included Mesohippus, a diminutive three-toed horse; rodents; snakes; turtles; and oreodonts (pig-like creatures that ate grass).

The end of the Oligocene Epoch, about 24.5 million years ago, marked the beginning of the Miocene Epoch which lasted about 19.5 million years and ended about 5 million years ago. The first half of the Miocene hosted an increase in species diversity and abundance on the portion of the Florida peninsula that was exposed as land and in the shallow marine-estuarine waters that covered what is now present-day Volusia and Flagler counties.

Large sharks, such as Carcharodon, Megalodon, and sea cows, such as Metaxytherium were abundant in the marine and estuarine waters. Primitive bears (Indaretos) and early sabrecats (Machairodus) had migrated to the exposed upland peninsula from Eurasia and South America, respectively, by the late Miocene.

The Bone Valley Formation extends north and south along the eastern Volusia County mainland parallel to the ICW. Bisected by the Tomoka River, it was created during the final 8 to 10 million years of the Miocene and the first part of the Pliocene epochs. Its consists of the remains of fish, mollusks, and marine mammals which died and were buried in silt and clay that eroded from the land. As the sea level receded, terrestrial animals used the area until the sea rose again and their remains are found there as well.

The Pliocene Epoch lasted 3.2 million years, beginning 5 million years ago and ending 1.8 million years ago with the beginning of the Pleisocene Epoch. The Pleistocene lasted about 1.7 million years, until about 10,000 years ago. During the last part of the Pliocene and the first part of the Pleistocene, the sea levels vacillated up and down approximately 30 times, ranging from 20 feet above the present sea level to 300 feet below it.

Many species which arrived in the area during the Pleistocene are present today, including birds and reptiles. Other animals present during the Pleistocene, but not surviving today include edentates (armadillos from South America), glyptodonts, and sloths. Glossotherium, the ground sloth, migrated to Florida during the late Pliocene, while Eremotherium, the giant sloth, came here during the Pleistocene. Eremotherium was the largest land animal to inhabit Florida, attaining a length of as much as twenty feet. Horses, mammoths, mastodons, giant tortoises, and llamas also inhabited Florida during the Pleistocene.

A significant local paleontological discovery occurred in 1968 when an Ormond Beach diver and amateur paleontologist found a giant sloth skull in the lower Tomoka River. Later, two nearly intact giant sloth skeletons were recovered from the portion of the Bone Valley Formation known as the Daytona Bone Bed. These were the first giant sloth skeletons found in the United States and are internationally significant.

CHAPTER IV

REGIONAL LAND USE AND DEVELOPMENT

A. ADJACENT UPLAND USES

Based on existing development conditions, upland uses adjacent to the preserve are categorized as follows: single-family residences, multi-family residences, commercial, public recreation, and preservation. These broad categories identify the general upland use adjacent to state-owned submerged lands and do not reflect county and municipal zoning terminology. Figure 5 shows the county's classification of adjacent land uses bordering the preserves.

Single-family residential: Extensive single-family development exists on the barrier island. Areas along the Halifax River, within the city of Ormond Beach, are nearly built-out. In unincorporated sections of both Flagler and Volusia counties which abut the Halifax River and Smith Creek, there is increasing pressure to develop marginal and submarginal sites adjacent to the preserve. This problem is most acute along the Halifax River in the unincorporated community of Ormond By The Sea, where fill has been deposited in waters of the state or jurisdictional wetlands in order to create lots large enough to build upon.

On the mainland, single-family development along the Halifax River within the city of Ormond Beach is near build-out, except for property within the State Park system.

Single-family residential development occurs along the Tomoka River segment of the preserve at Tomoka Estates. The entire shore of the Tomoka Basin is relatively undeveloped. One house has been built along the southwest bank of the basin and several others are planned or underway. Other single-family units are under construction in the vicinity of "The Sanctuary," a proposed residential subdivision near the intersection of Old Dixie Highway and Addison Drive.

The 187 acre Bellemeade tract, which has been on the Conservation and Recreational Lands acquisition list for a number of years, has been proposed for residential development. In June 1989, the Ormond Beach City Commission denied a special exception request to allow the construction of "The Rivers", a 683-unit townhouse project. In August, 1989 the commission rejected another development proposal for the site.

The development of the Bellemeade tract has been affected by the Ormond Beach Comprehensive Plan and Ordinance No. 89-74, which established a

moratorium on the issuance of development orders for certain projects that are inconsistent with the Comprehensive Plan. The south-western portion of the Bellemeade site is designated as Surburban Low Density Residential (SLDR) on the city's Future Land Use map while the northeast area is designated as Rural Estates. The City Commission determined in December 1989 that the project, as proposed, was substantially inconsistent with its comprehensive plan. They recommended several measures to minimize impacts to aesthetics, fish, and wildlife values. Their recommendations included clustering development on the property closest to U.S. 1 and providing a conservation area or very low densities in the uplands on the northeast portion of the site.

The city's Future Land Use Element designates the upland portion of the Bellemeade property located northeast of the borrow pit lake as Rural Estate while the area southwest of the lake is designated SLDR.

Within the SLDR land use classification, density allowances are calculated on a site-specific basis, depending on a parcel's environmental characteristics and availability of centralized water and sewer.

Multi-family residential: Two multi-family residential areas are adjacent the preserve on the barrier island. One area, which consists of several condominiums, is located near the Flagler/Volusia county line. The other area is located in the southern section of the preserve.

Commercial: Two commercial areas are located within the preserve. One marina is located on the barrier island, adjacent to the Halifax River, in unincorporated Volusia County. The marina's 47 boat slips, however, are located within the municipal boundary of the city of Ormond Beach which extends waterward from the MHWL. Another small marina is located on the mainland, between US 1 and Tomoka Estates, adjacent to the Tomoka River segment of the preserve.

Public Recreation: The Tomoka Marsh Aquatic Preserve connects a vast mosaic of parks and public recreation areas located on both sides of the Intracoastal Waterway, including the Tomoka State Park (915 acres), Bulow Creek State Park (2,645 acres), the North Peninsula State Recreation Area (442 acres), Flagler Beach State Recreation Area (144 acres), and Bicentennial (Buttenheim) Park. John's Island (640 acres) was purchased by Volusia County and the city of Ormond Beach. It is currently under consideration for acquisition in the Conservation and Recreational Lands (CARL) program as an addition to Tomoka State Park.

OCLC: 26478765 Rec stat: n
Entered: 19920825 Replaced: 19950607 Used: 19921119
$ Type: a Bib lvl: m Source: d Lang: eng
Repr: Enc lvl: I Conf pub: 0 Ctry: flu
Indx: 0 Mod rec: Govt pub: s Cont: b
Desc: a Int lvl: Festschr: 0 Illus: b
F/B: 0 Dat tp: s Dates: 1992, %

1258

$ 1 040 FBA 'c FBA %
$ 2 043 n-us-fl %
$ 3 092 574.9759 '2 20 %
$ 4 090 'b %
$ 5 049 NO@M %
$ 6 245 00 Tomoka Marsh aquatic preserve management plan : 'b (cabinet ready draft) / 'c prepared by the Bureau of Submerged Lands and Preserves, Division of State Lands. %
$ 7 260 [Tallahassee] : 'b Dept. of Natural Resources, 'c [1992]. %
$ 8 300 132 p. : 'b maps ; 'c 28 cm. %
$ 9 500 "January 1992." %
$ 10 504 Includes bibliographical references (p. 117-121). %
$ 11 651 0 Tomoka Marsh (Fla.) %
$ 12 650 0 Marshes 'z Florida. %
$ 13 650 0 Aquatic resources 'z Florida 'z Tomoka Marsh. %
$ 14 650 0 Marine parks and preserves 'z Florida 'z Tomoka Marsh 'x Management. %
$ 15 710 1 Florida. 'b Bureau of Submerged Lands and Preserves. %

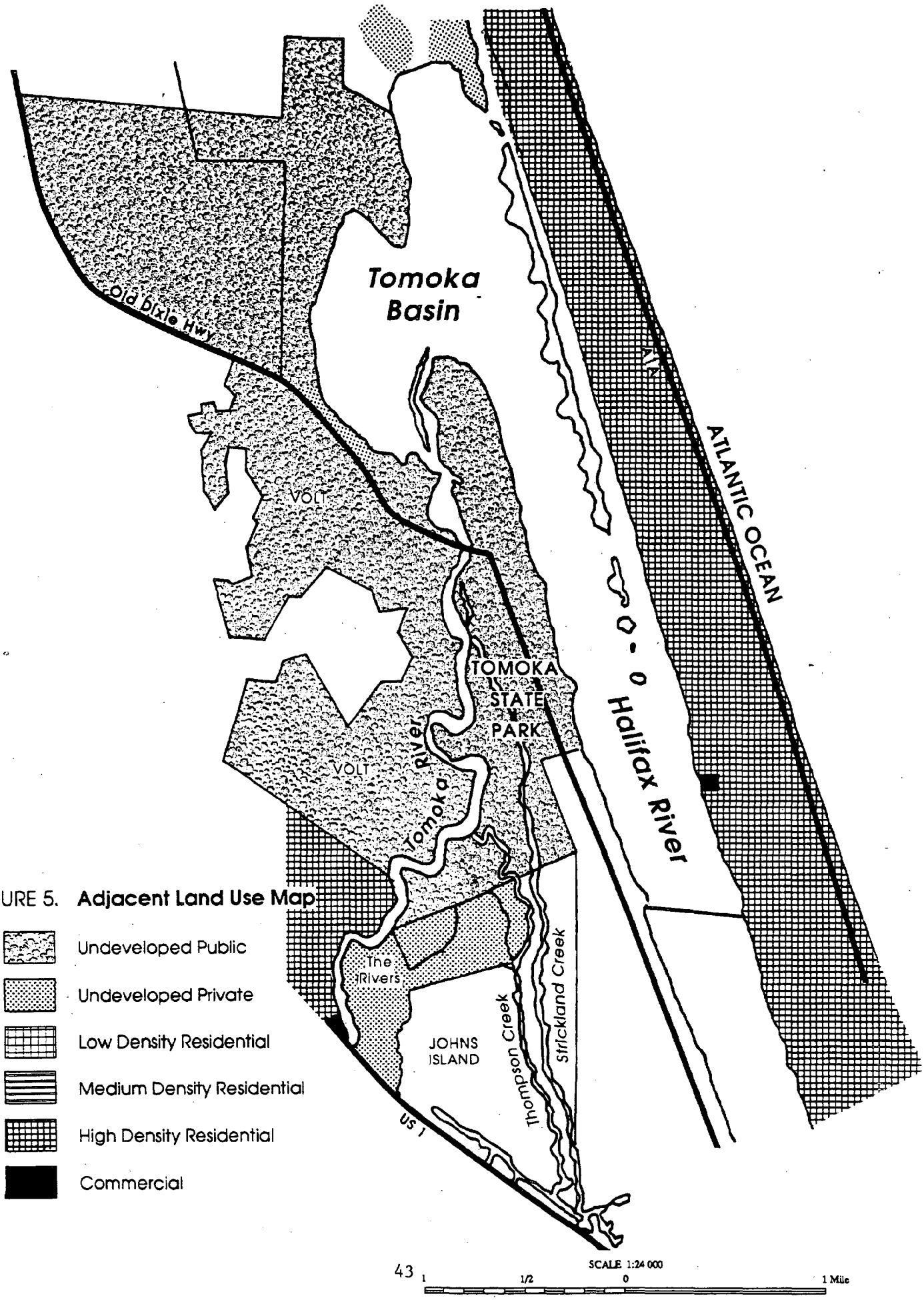


FIGURE 5. **Adjacent Land Use Map**

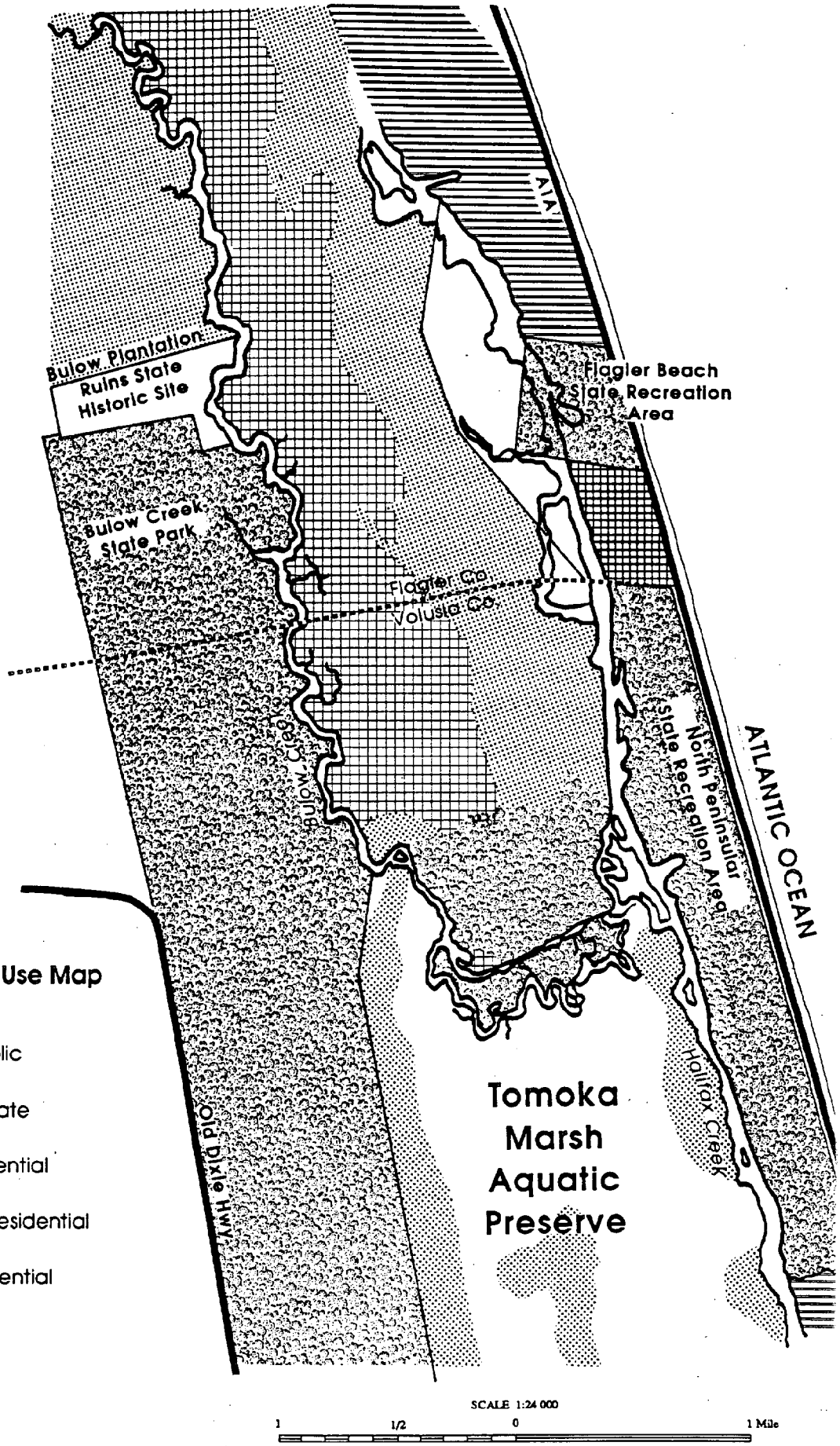


FIGURE 5. **Adjacent Land Use Map** (continued)

- Undeveloped Public
- Undeveloped Private
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial

Preservation: The 2,582 acre Volusia Land Trust (VOLT) tract is the only undeveloped tract of land designated for preservation adjacent to the preserve. The tract was held by Volusia County until May 1991, when it was acquired by the state of Florida as an addition to Tomoka State Park. The 642-acre John's Island tract, located south of the preserve, was acquired by Volusia County and the city of Ormond Beach in 1988 and will be held until it becomes an addition to Tomoka State Park.

B. USES OF THE PRESERVE

The uses of the preserve can be divided into five general categories: private, commercial, public utilities, public recreation, and open water.

Private: Private uses include numerous docks and seawalls associated with single and multi-family residences.

Commercial: There are two marinas located adjacent to the preserve as described above. There is some commercial fishing in the preserve, as well as crabbing, but neither is extensive. Since this segment of the lagoon is classified as "unclassified" for harvesting oysters or clams, there are no shellfish leases approved under Chapter 370, F.S., nor can any oyster or clam aquaculture leases be issued under Chapter 253, F.S.

Public utilities: There are several submerged cables and/or pipes that cross this segment of the preserve which provide utility services from the mainland to the barrier island.

Public recreation: The preserve is used for recreational boating and fishing, jet skiing, water skiing, canoeing, bird watching and scenic observation. Public access points to the preserve consist of boat ramps located at Tomoka State Park, Granada Riverfront Park, Sanchez Park, Highbridge, Flagler Beach State Recreation Area, and at S.R. 100. The Halifax River segment of the preserve is heavily used by boats navigating the ICW, which access the preserve at inlets located at Matanza's Inlet to the north and Ponce Inlet to the south.

C. PLANNED USE

Most residential and commercial parcels are developed and their current use is not expected to change substantially by the year 2000. Local Government Comprehensive Plans deal specifically with projected upland use, but as the region's population increases, there will be a concomitant increase in both public and private uses of the preserve.

The U.S. Census population figures for Flagler and Volusia counties reflect an increase in total numbers from 1970 to 1990. Annual population estimates are produced by the Bureau of Economic and Business Research (University of Florida) for the state's counties and municipalities. The information for Flagler and Volusia counties is as follows:

Total Resident Population

County	1970	1980	1990
Flagler	4,500	10,913	21,428
Volusia	169,487	258,762	378,400

Percent Increase in Total Population

County	1970	1980	1990
Flagler	NA	43%	96%
Volusia	35%	53%	38%

These dramatic increases in population growth affect water resources and wildlife habitat and generally increase the potential for environmental degradation.

Volusia County's Comprehensive plan was accepted by the state Department of Community Affairs (DCA). Flagler County, the city of Flagler Beach, and the city of Ormond Beach have adopted comprehensive plans, but they have not yet been accepted by the DCA.

The Aquatic Preserve Program reviewed the Local Government Comprehensive Plans for the county and cities to determine if the local governments were proposing environmental safeguards with regard to the development of boating services (e.g., ramps, marinas). Though both counties recognize shortages in boating facilities to adequately serve their respective needs, the LGCP's include environmental constraints that are designed to preserve and protect natural resources.

CHAPTER V

SITE SPECIFIC MANAGEMENT ISSUES AND NEEDS

The first part of this chapter addresses management issues involving specific activities which directly affect the biological integrity of the Tomoka Marsh Aquatic Preserve, in contrast to structural modifications which also affect the biological integrity of the preserve. Management issues include, but are not limited to: increased motorboat traffic; increased use of personal watercraft; protection of designated species; eradication of invasive exotic vegetation from spoil areas; restoration of the presently abandoned mosquito impoundment area; land acquisition for marsh preservation; preservation of the littoral vegetation within the preserve; encouraging the provision of septage pumping and treatment facilities at existing marinas operating within the preserve; and fish stocking programs. Other issues may arise in the future and they will be addressed as they develop. The second part of this chapter establishes management initiatives for these current issues. These management initiatives are intended to provide additional management direction to supplement those already set forth in Chapter 258, F.S., Chapter 18-20, F.A.C., or Chapter VI of this Plan.

A. MANAGEMENT ISSUES AND SPECIAL NEEDS

1. INCREASING MOTORBOAT TRAFFIC

Boaters from other areas in Florida, as well as tourists from out-of-state are attracted to the preserve. The number of boat registrations in both Volusia and Flagler counties has increased dramatically in recent years. The increase in the numbers of boats, their size, and speed potential presents the challenge of providing for safe boating experiences for as many people as possible while minimizing the negative impacts to the preserves floral and faunal communities (especially listed species), water quality, and to the recreational experiences of other users.

Boating safety is a major concern as the number of boats steadily increases on a finite area of waterway. In 1990, the state's boating accident fatality rate increased by 20 percent over the 1989 rate. In 1990, Florida recorded 1086 boating accidents with 88 recreational and 11 commercial fatalities. Thus, the state's 1990 boating-related fatality rate was 14.2 per 100,000 vessels; the total vessel and property damage was $4,314,211.

As of June 1990, Florida had 718,054 registered boats and an estimated 100,000 boats which do not require registration. An estimated 300,000 boats from out-of-

state navigated the state's waters. The DNR projects more than 1,600,000 watercraft on Florida's waterways by the year 2000.

Increased boating activity also threatens the safety of manatees. Watercraft-related manatee deaths account for 45 percent of the total manatee mortality in Volusia County. It is the leading cause of human-related manatee deaths.

2. INCREASED USE OF PERSONAL WATERCRAFT/AIRBOATS

The increased use of personal watercraft is a serious concern in terms of potential impacts to fish and wildlife (especially listed species), other resource users, and public safety. Personal watercraft are noted for their speed and maneuverability, which make them potentially hazardous to boats which are not as responsive.

Personal watercraft, along with airboats, create significant noise disturbances that affect wildlife, particularly during nesting seasons.

Consideration will be given to prohibiting personal watercraft and airboats from areas inhabited by listed species, and shallow areas where disturbance to bottom sediments would create excessive turbidity.

The city of Ormond Beach prohibited the use of personal watercraft in all tributaries and canals connected to the Tomoka River by enacting Ordinance No. 89-38 and Ordinance No. 89-63. Policy 2.1.7 of the Coastal Management Element of the Ormond Beach Comprehensive Plan requires that, by 1993, the city consider prohibiting personal watercraft from the Tomoka River.

3. PROTECTION OF LISTED SPECIES

Endangered and threatened species as well as species of special concern are 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 (CITES). Each agency has its own focus, as indicated by the regulations it provides to given species. For example, the GFWFC does not address plant species, but the DACS addresses only plants.

Designated species are also provided protection by other agencies, with overlapping protective measures reinforcing each other. For example, the DNR actively protects manatee and all sea turtles which are listed by the USFWS and the GFWFC. As another example, the snook was designated a species of special concern by the GFWFC, but regulation of snook fishing is determined by the Marine Fisheries Commission (MFC) and enforcement is primarily provided by the DNR's Florida Marine Patrol (FMP).

Manatee: The most recognizable and best known of the listed faunal species found in the Tomoka Marsh Aquatic Preserve is the West Indian manatee. Manatees use the Tomoka River system as a place to rest, feed, drink fresh water, mate, and give birth. In 1989, with the support of both the city of Ormond Beach and Volusia County, the state legislature amended Chapter 370, F.S. to include the Tomoka River, Strickland Creek, Thompson Creek, and Dodson Creek under the Manatee Sanctuary Act. Figure 6 depicts the boundary of the Tomoka River Manatee Sanctuary.

Protection zones for manatees within the sanctuary include two idle boat speed zones, one which extends south from the "point" of Tomoka State Park to the mouth of Strickland Creek and another at the portion of the Tomoka River adjacent to Tomoka Estates. These two zones existed prior to the sanctuary designation. A slow zone in the Tomoka River extends between the two idle zones. Strickland, Thompson and Dodson Creeks are designated slow speed zones. In spite of implementing these boat speed zones, 4 human-related manatee deaths have been documented in the preserve area since 1989.

In May 1991, additional Manatee Protection Zones (Figures 7 and 8) were established for Volusia County which included areas along the Halifax and Tomoka Rivers which were not previously protected. These boat speed zones established under Rule 16N-22.012 to further protect manatees known to reside in the area. Efforts should be made to enforce all manatee protection zones.

For a number of years, a tributary of the Tomoka River was the site of the only witnessed and documented birth of a free-ranging manatee. There have been a number of documented manatee calf deaths recorded from the Tomoka River system. Since female manatees seek quiet areas as birthing places, it is critical that these areas remain as undisturbed as possible.

Protecting manatee habitat also benefits numerous other faunal species (e.g. shrimp, crabs, and finfish) and their habitats. Thus, protection of manatee habitat concurrently provides many long-term economic and recreational benefits to man, as well.

Wood Storks: Wood storks have been documented feeding in Smith Creek, the Tomoka Basin, the Tomoka River, in its tributaries, and in nearby drainage ditches. Wood storks have a specialized feeding technique called tactolocation or grope-feeding. They typically wade through six to twenty inch deep water with their beak immersed an partially open. The mandibles snap shut when prey, usually a small fish, is encountered. Successful feeding is dependant upon heavy concentrations of small fish, which are typical of an isolated wetland with an intermittent hydrological connection. Wood stork nesting is believed to be triggered by increased concentrations of small fish.

Protection of the food base, primarily small fish, appears to be an essential element to ensuring the future of the wood stork. Pesticides, such as DDT were linked to the decimation of many bird species, including the wood stork, during the post-war years. Contemporary pesticide use is not believed to be a major threat to wood storks, although mosquito spraying can reduce the number of small fish which are available for prey (Ormond Beach, Fish & Wildlife, 1988, pp. 127-130).

4. ERADICATION OF INVASIVE EXOTIC VEGETATION

Within the preserve, the encroachment of exotic vegetation is most obvious wherever dredged spoil material has been deposited. Australian pine invaded upland areas on several spoil islands located along the western bank of the intercoastal waterway (ICW). Although severe freezes killed most of the trees, it did not extirpate the species.

Exotic species compete with native species which typically have a higher wildlife utilization value. Spoil islands should be surveyed to determine species and abundance of exotic plants present in the preserve. Consideration should be given to planting native species on these spoil areas .

5. RESTORATION OF THE MOSQUITO IMPOUNDMENT

Active management of the 1,100 acre Tomoka Marsh Mosquito Impoundment ceased in the early 1980's, when the pumping station was closed and the five tidal gates were removed. Since that time, all flushing has been either from stormwater runoff or from natural tidal movement through the gateways and through breeches in the dikes.

The negative effects of allowing this large marsh to remain a nearly isolated wetland include depriving the estuary of natural detrital matter and salt marsh habitat, and significantly altering the hydrology of the area. The mosquito impoundment should be restored to a functioning salt marsh.

6. PRESERVATION OF SALT MARSH COMMUNITIES

The salt marsh area extending along the southeast side of the Tomoka River between Tomoka State Park and U.S. 1 has been altered by mosquito ditching, but otherwise remains intact and is a vital part of a functioning wildlife corridor. The corridor extends between the Goldy-Bellemeade tract (which includes John's Island) to the south and the extensive public lands to the north. The 187 acre Bellemeade tract is proposed for purchase through the state's Conservation and Recreational Lands (CARL) program. The Bellemeade tract is the only major portion of this extensive wildlife corridor which is not in public ownership. Any disruption of this estuarine tidal marsh is inappropriate from ecological and aesthetic perspectives.

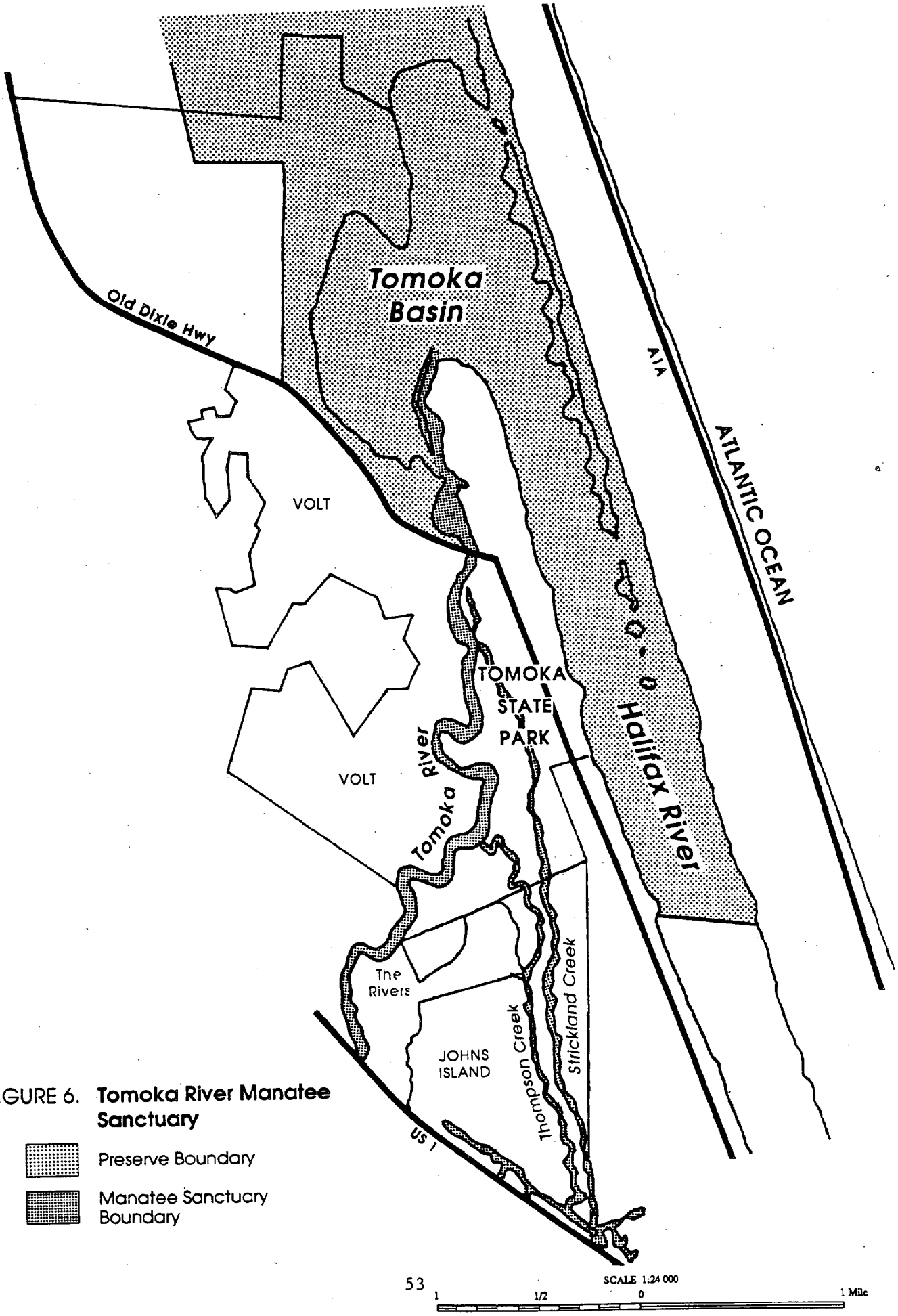


FIGURE 6. **Tomoka River Manatee Sanctuary**

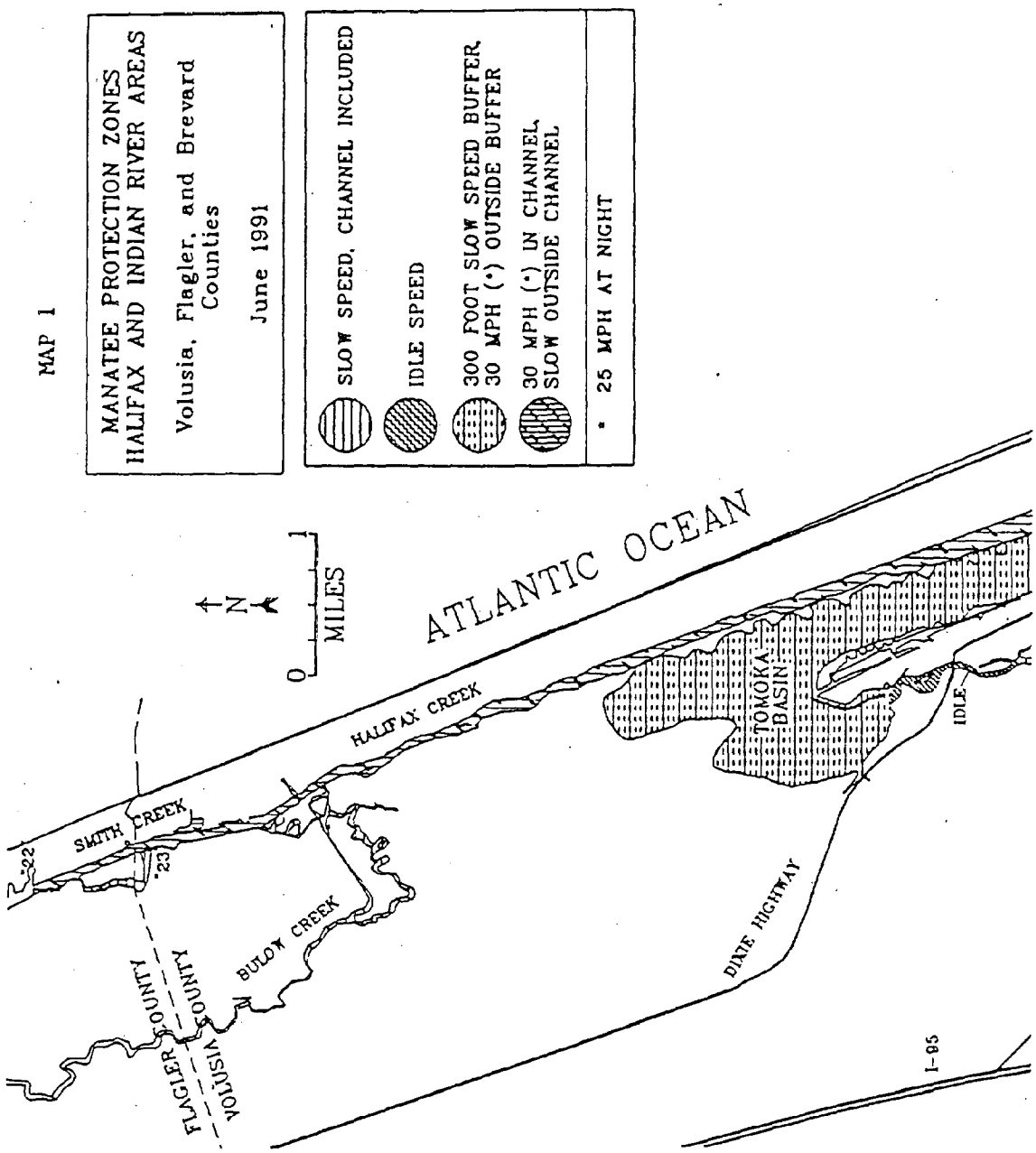


FIGURE 7. **Manatee Protection Zones**

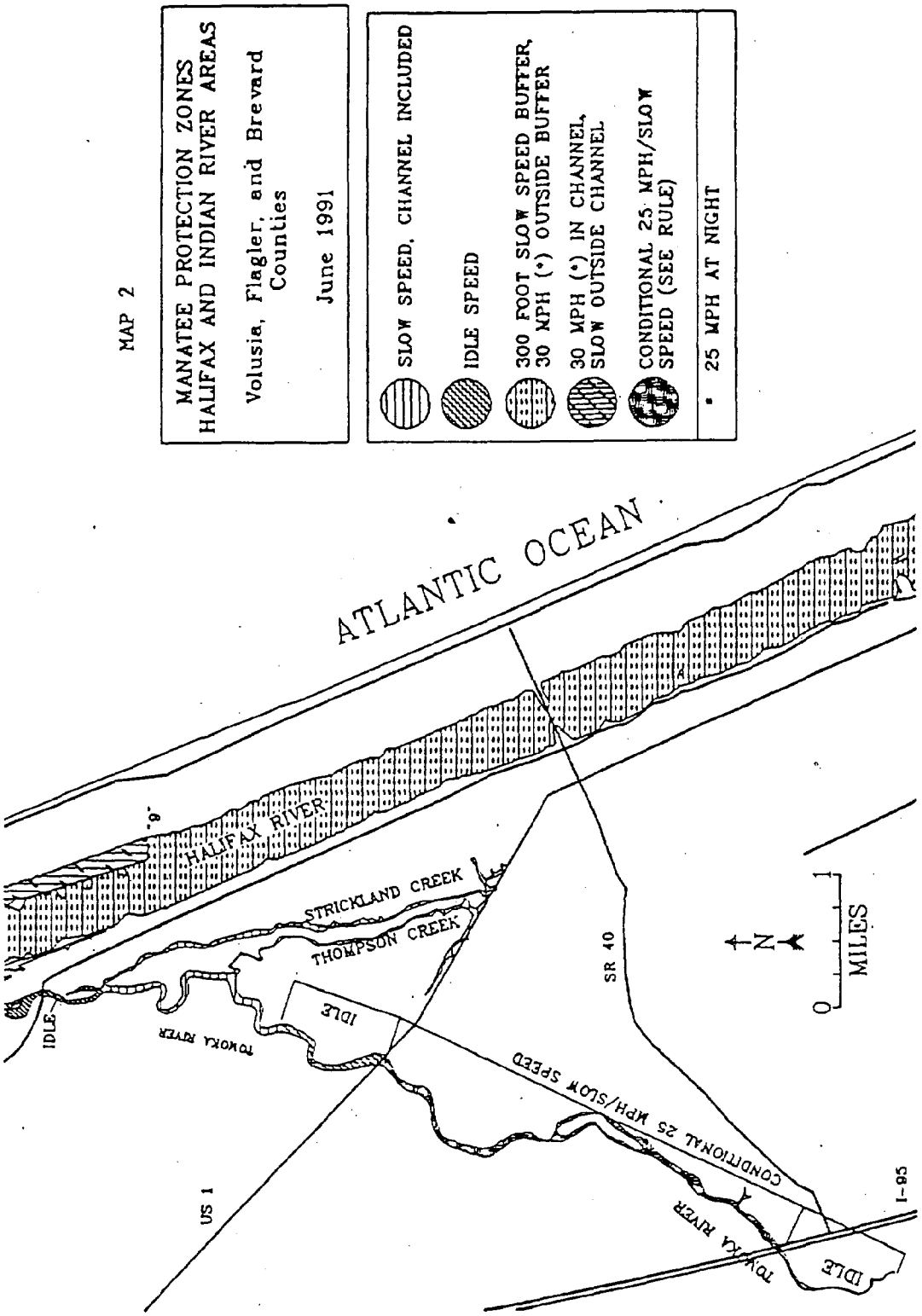


FIGURE 8. **Manatee Protection Zones**

7. PRESERVATION AND RESTORATION OF LITTORAL VEGETATION ALONG THE HALIFAX RIVER

Littoral vegetation provides a number of valuable ecological functions which include protecting the shoreline from erosion, providing habitat for wildlife, and filtering sediments from the water column. Past disturbances, including the construction of the ICW and housing development, have resulted in the loss of significant littoral vegetation within the preserve, along the east bank and west banks of the Halifax River.

A number of very narrow, vegetated, and undeveloped lots exist on the barrier island south of Bicentennial Park. Those lots between the river and John Anderson Drive which are too narrow to build upon and which are not directly contiguous to other buildable lots (including lots separated only by the road), should be considered for fee simple acquisition. Where this is not feasible, conservation easements should be obtained to preserve as much vegetated shoreline as possible (Ormond Beach, Coastal Management Element, 1990, pp. 48, 268). The city of Ormond Beach municipal boundary extends along the mean high water line adjacent to the barrier island from the Granada bridge north for approximately three miles. The city prohibits any deposition of fill below 2 foot mean sea level and also prohibits the disturbance of salt marshes (Ormond Beach, Conservation Element, 1990, pp. 24, 25).

Areas of littoral vegetation on the west bank of the Halifax should also be protected. These areas are regulated under the city of Ormond Beach's Wetland's Protection Ordinance.

8. PUMP-OUT AND TREATMENT FACILITIES AT EXISTING FACILITIES

Two marinas presently operate within the preserve. Neither marina has either pump-out or septage treatment facilities. Both the Ormond Beach and the Volusia County comprehensive plans contain policies requiring existing marinas to provide facilities for any additional boat slips. The Ormond Beach plan also states that by 1995, all existing boat slips at marinas will be required to provide septage pump-out and treatment facilities.

9. FISH STOCKING PROGRAMS

For more than two years, the DNR has been trying to breed the more than 30 snook captured from the Tomoka system. Although the snook will spawn in captivity, this project has not yet achieved success in keeping the fry alive.

The Volusia County Council, acting as the Ponce DeLeon Inlet and Port Authority, has funded a three year study on redfish restocking in the nearby Halifax River system. More than 200,000 redfish fry have been released in Volusia County.

The restocking program has provided much information about the migratory characteristics of the local redfish population. For example some of the tagged redfish have been caught as far as 18 miles away from where they were released. Surveys assessing the feasibility of stocking redfish in the Tomoka system are currently being conducted by the Division of Marine Research. Releases into the Tomoka River system may be anticipated for the near future (Ken Neis, per. comm.).

B. MANAGEMENT INITIATIVES

This section of the plan contains a number of management initiatives that address the issues identified in the first half of this chapter. Adoption of these initiatives will provide specific direction for managing those issues not addressed directly by either statute or administrative rule. The major management initiatives for these issues include the following:

1. Protect manatees, boaters, marine life and riparian wildlife from the negative impacts of increased boat traffic within the preserve, particularly within the Tomoka River Manatee Sanctuary, by enforcing adherence to established speed zones.

2. Cooperate with the city of Ormond Beach to promote and encourage low-impact recreational use of the Tomoka River system.

3. Cooperate with the city of Ormond Beach to publicize and enforce the city's Ordinance No. 89-63 which prohibits the use of personal watercraft in the tributaries of the Tomoka River.

4. Cooperate with Volusia County and the city of Ormond Beach to monitor the use of boats and personal watercraft in the Tomoka River portion of the preserve and consider the prohibition of personal watercraft and airboats from the Tomoka River and other areas within the preserve where they are inappropriate due to ecological or safety factors.

5. Cooperate with Volusia County and Flagler County to consider prohibiting personal watercraft and airboats from the Tomoka Basin, from Bulow Creek, and from the portions of Smith Creek that are not a part of the Intracoastal Waterway.

6. Protect all biological resources and water quality by prohibiting the construction of any new marinas within the preserve, especially within the Tomoka River system.

7. Cooperate with Volusia County, Florida Inland Navigation District (FIND), and the Halifax River Task Force to eradicate the invasive exotic plants from the spoil islands.

8. Cooperate with Volusia County, the East Volusia Mosquito Control District, the Halifax River Task Force, HRS, and private landowners to developing plans for restoration and enhancement of natural marsh functions in the 1,100 acre mosquito impoundment and other areas disturbed by ditching.

9. Protect all biological resources and water quality by preserving the remaining littoral vegetation along the east bank of the Halifax River. Promote acquisition of the remaining lots which are too narrow for housing development.

10. Protect all biological resources and water quality by requiring new boat slips at existing marinas to provide septage pump-out and treatment facilities. Cooperate with Volusia County and Ormond Beach in implementing their policy of requiring all existing boat slips to provide pump-out and treatment services by 1995.

11. Encourage fisheries restocking programs in the preserve when supporting baseline information warrants such programs.

12. Promote the revegetation of unvegetated shorelines within the preserve.

13. Encourage the restoration of disturbed or lost submerged habitat within the preserve.

14. Promote the acquisition of significant habitat adjacent to the preserve through cooperation with local governments, the Conservation and Recreational Lands program and other land acquisition programs.

CHAPTER VI

MANAGEMENT AREAS

A. INTRODUCTION

This chapter divides the Tomoka Marsh Aquatic Preserve into separate management areas and delineates the general rule criteria that apply for allowable uses (e.g., activities and structures) associated with each area. Each management area is classified by the value of natural and cultural resources (e.g., types, occurrence) on submerged lands adjacent to the differing types of upland use (e.g., residential, commercial).

The purpose of this chapter is four-fold: (1) to provide a better understanding of the general rule criteria designed to preserve and protect resources and habitat, (2) to identify the types of allowable uses on state-owned submerged lands within a preserve, (3) to provide local planners with a guide for land use decisions, and (4) to provide both the staff of the Bureau of Submerged Lands and Preserves and other agencies a continuity of direction in the management of the preserve. As such, this intent will afford habitat protection while lending some measure of predictability for allowable public and private uses in the aquatic preserve.

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 the 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 program has jurisdiction over the use of state-owned submerged lands within the boundaries of a given preserve. Activities which occur outside the boundaries of an aquatic preserve or which do not directly affect state-owned submerged lands are not within the jurisdiction of the Aquatic Preserve Program (e.g., adjacent upland uses, regulation of commercial fishing).

There are a number of differences between the rules governing uses of state-owned submerged lands within an aquatic preserve relative to those not within an aquatic preserve. The principal 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.

B. MANAGEMENT AREA CLASSIFICATIONS

A key component of the management program for any aquatic preserve is the division of the preserve into management areas. The classification of management areas in an aquatic preserve is based upon the resource value of submerged lands within the preserve associated with existing and future land uses on the adjacent uplands as designated in the local government comprehensive plan(s). As in the delineation of upland uses through zoning, the delineation of a preserve into management areas is two-fold: (1) to identify areas of public and private uses, and (2) to provide standards with which proposed uses and activities must comply. The intent of these management area classifications is to make potential development activities compatible with resource protection goals.

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. As mentioned earlier, the Aquatic Preserve Program has no jurisdiction over the designated use of the 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. Specific land uses to be incorporated in the classification of submerged lands management areas include:

Agriculture (AG): This category represents state-owned submerged lands adjacent to land designated on a future land use map for a county and/or municipality as agriculture. It is intended to include sparsely populated areas used primarily for agricultural and/or forestry purposes.

Single-Family (SF): This category represents state-owned submerged lands adjacent to land designated on a 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 preserve solely for private recreational activities.

Multi-Family (MF): This category represents state-owned submerged lands adjacent to land designated on a 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 preserve solely for private recreational activities. The associated residences include townhouses, trailer parks, condominiums, apartments, and any other group of multi-family dwellings. This category also includes a group of single-family property owners (i.e., homeowners association) that proposes to use state-owned submerged lands for the mutual benefit of the group.

Commercial-Industrial (CI): This category represents state-owned submerged lands adjacent to land designated on a future land use map for

a county and/or municipality as commercial or industrial. The category is also intended to incorporate uses associated with structures that charge fees or generate revenue. Examples of commercial uses include: marinas, restaurants, fish houses, and yacht clubs that charge membership fees.

Public Recreation (PR): This category represents state-owned submerged lands adjacent to land designated on a future land use map for a county and/or municipality as public recreation/preservation and is utilized for the purposes of public recreation. It is intended to include (1) areas where structures are used by the general public at no charge and (2) federal, state, and municipal parks that charge a nominal fee. Military property, while not always open to the public, is included in this category since the buildings and grounds are often designated as public facilities.

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

Each of the land use classifications listed above is assigned an appropriate number to identify the resource value of the adjacent submerged lands. The methodology used to determine this resource value shall be consistent with the latest methodology approved by the Bureau of Submerged Lands and Preserves.

If an area within the preserve is identified 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 Sections 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 identified as a **Secondary Resource Protection Area (SRPA)** and 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.

As stated previously, resource values are to be incorporated into the classification of management areas. For instance, if a submerged area within the preserve is determined to have a resource value of 1 and the adjacent uplands is zoned as single-family residential (SF), then this management area would be classified as **SF/1**.

In the following section of this chapter, minimum criteria are outlined for a number of uses and activities that can occur in this segment of the preserve. These minimum criteria, provided by Chapter 18-20, F.A.C., apply to the uses and activities designated for each management area.

C. MINIMUM CRITERIA FOR ALLOWABLE USES

Chapter 18-20, F.A.C., provides the minimum standards with regard to the utilization of state-owned submerged lands within an aquatic preserve as authorized by the Board of Trustees and DNR. It should also be noted that other regulatory agencies' rules and jurisdictions over activities may 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., states that all docking facilities within an aquatic preserve shall meet the following standards and criteria:

1. no dock shall extend waterward of the mean or ordinary high water line more than 500 feet or 20 % of the width of the waterbody at that particular location, whichever is less;

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 shall be determined on a case-by-case basis;

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 the protection and enhancement of the aquatic preserve shall prevail.

Additional policies include all docking structures to access a depth of -4 feet at 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: Section 18-20.004(5)(b), F.A.C., states that private residential single docks, as defined by Section 18-20.003(23), F.A.C., shall conform to the following specific design standards and criteria:

1. any main access pier shall be limited to a maximum width of four feet;

2. must be designed and constructed to ensure maximum light penetration;

3. can extend from the shoreline to a maximum depth of -4 feet at (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 be 160 square feet;

7. dredging to obtain navigable water depths is strongly discouraged.

In the interests of clarification, 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: Section 18-20.004(5)(c), F.A.C., states that private residential multi-slip docks, as defined by Section 18-20.003(24), F.A.C., shall conform to the following 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 waterbody 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/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 (= PRPA), except as allowed pursuant to Section 258.42(3)(e)1, F.S., while dredging in Resource Protection Area 3 (= SRPA) shall be strongly discouraged;

3. water depths adjacent to and within the proposed mooring area shall have a minimum clearance of one foot between the deepest draft vessel and the submerged bottom at MLW;

4. main access piers and connecting walks shall not exceed six feet in width;

5. terminal platforms shall not exceed eight feet in width;

6. finger piers shall not exceed three 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 facilities shall also apply to private residential multi-slip docks.

Commercial-Industrial Docking Facilities and Marinas: Section 18-20.004(5)(d), F.A.C., states that commercial, industrial, and other revenue generating/income related docking facilities, as defined by Section 18-20.003(10), F.A.C., 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 shall not be located in Resource Protection Areas 1 and 2 (= PRPA); however, main access piers may be allowed to pass through Resource Protection Area 1 or 2 that are located along the shoreline to reach an acceptable Resource Protection 3 (= SRPA), provided that such crossing will generate minimal environmental impact;

3. the siting of docking facilities shall take into account the access of boat traffic to avoid marine seagrass beds or other aquatic resources in the surrounding area;

4. the siting of new facilities within the preserve shall be secondary to the expansion 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 an alternative to multiple wet slip docking;

6. marina siting will be coordinated with local governments to ensure consistency with local plans and ordinances;

7. marinas shall not be sited within state designated manatee sanctuaries;

8. in any areas 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.

Lease or Transfer of Lands: Section 18-20.004 (1)(b), F.A.C., states 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 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 navigation channel; (3) installation

or maintenance of approved navigational 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 and quantity of the preserve and which are consistent with the Florida Aquatic Preserves Act (Sections 258.35 - 258.46, F.S.). Section 18-20.004(1)(f), F.A.C., states 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., states that utility cables, pipes, and other such structures shall be constructed and located in a manner that will cause minimal disturbance to submerged resources (e.g., seagrass beds, oyster bars) and do not interfere with traditional uses. It will be the policy to place additional utilities into designated corridors or existing easements within the Tomoka Marsh Aquatic Preserve if no other reasonable alternative exists.

Spoil Disposal: Section 18-20.004(3)(d), F.A.C., states 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 or utility of the preserve.

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 mooring of vessels will be permitted, and (5) dredging is prohibited when associated with pier construction and maintenance.

Ramps: Boat ramps will be reviewed on a case-by-case basis. Determining factors to be reviewed include: (1) the elimination or alteration of natural resources or habitat (e.g., seagrasses, shoreline vegetation, nesting areas), (2) the amount of dredging and/or filling of submerged lands, and (3) accessibility to the ramp from water and land routes.

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 delineated with boundaries, descriptions, and allowable uses. Specific criteria and supporting rationale for each special management area are also provided. Due to changes that may occur from the rezoning of adjacent uplands and altering biological conditions on submerged lands, the final decision on approving, modifying or denying uses of the submerged lands within the preserve will be made based on field surveys and assessments of project sites. Figure 9 is a map of all management areas within this segment of the preserve. The purpose of providing this map is to give some general guidance and an understanding of where the management areas lie within the preserve.

For the purposes of this plan, the following conditions will apply: (1) the Atlantic Intracoastal Waterway (AIW) is exempt from aquatic preserve rules and regulations, pursuant to Section 258.42, F.S., and functions only as a boundary between management areas; and (2) certain activities are generally permissible in all management areas. These activities include shoreline stabilization, maintenance dredging, and maintenance of channel markers.

Some management areas may have a specific activity occurring within that is not reflective of the overall upland use. As an example, an upland parcel consists of a marina surrounded by single-family homes adjacent to extensive seagrasses. The marina may have preceded residential development and the aquatic preserve designation; therefore, it would be unreasonable to remove the facility. Marina expansion and new commercial-type activities, however, will not be allowed in this management area because of the presence of seagrasses and/or the upland zoning restrictions. In such cases, the specific activity will be recognized as a "non-conforming use". This term simply recognizes the specific activity as such and is not to be interpreted as a termination of vested rights should a change in ownership occur nor does it imply that future non-conforming uses will be allowed.

MANAGEMENT AREA SF/1

(Single-Family/Primary Resource Protection Area)

All SF/1 management areas are assigned because of the presence and utilization of the areas by designated species. All SF/1 areas listed below are located within either a state-designated manatee sanctuary or else in a documented manatee travel corridor. All un-armored shoreline areas are habitat for designated wading birds, such as the tri-colored heron, little blue heron, and snowy egret. Several site-specific areas may be used by wood storks, brown pelicans, least terns, the Atlantic salt marsh snake, and other listed species. The rare swallow-tailed kite is also known to inhabit these areas. There are five designated areas in this category.

1. Tomoka River, west bank

Boundary: The Tomoka Estates subdivision, in unincorporated Volusia County, from the northeastern boundary of the existing commercial property, continue northeasterly along the MHWL on the northwestern bank of the Tomoka River to the southeastern most boundary of the Volt Tract.

Description: This area generally comprises residential lots along the Tomoka River most of which are within the Tomoka Estates subdivision. A portion of this subdivision was extensively dredged to provide canal-front lots with navigable access to the Tomoka River. This area is within the designated Tomoka River Manatee Sanctuary. Boats are limited to "idle" speed in this area. Manatees are known to frequent this reach of the Tomoka River and adjoining canals as they travel upstream to feed, rest, mate, and obtain freshwater to drink. Manatees have been reported to drink freshwater from garden hoses provided by residents in this area. The northernmost portion of this subdivision borders expansive tidal marsh areas which are a part of an extensive network of conservation, recreation, and preservation lands.

2. Tomoka River, east bank

Boundary: Approximately 100 feet of the Bellemeade tract, located within the city of Ormond Beach, that portion of the property which extends along the southeast bank of the Tomoka River, as depicted on the Ormond Beach Future Land Use Map (June 1990).

Description: On the eastern bank of the Tomoka River, this area is also within the Tomoka River Manatee Sanctuary. The uplands associated with this area are proposed for development, but to date, are not developed. Other portions of the property border Tomoka State Park, and John's Island conservation areas. The development site is also proposed for purchase through the state's Conservation and Recreational Lands (CARL) program. The site is considered an important link in the regional network of conservation, recreation and preservation lands.

3. Halifax River, Ormond Beach (mainland)

Boundary: Begin at the southern boundary of the preserve, at the western MHWL of the Halifax River (generally, just east of Oak Forest Drive) within the mainland portion of the city of Ormond Beach, and proceed generally north by northwest along the MHWL to the southern boundary of Tomoka State Park.

Description: The majority of the lots located in this section are developed and the area is not expected to undergo any major changes in the near future. The

shoreline has been altered in some areas and replaced with vertical bulkheads, while other areas of shoreline are vegetated with marsh grasses. This area of the Halifax River represents a manatee travel corridor.

4. Halifax River, Smith Creek (barrier island)

Boundary: On the barrier island, waterward of the MHWL along the east bank of the Halifax River and Smith Creek, beginning at the southernmost boundary of the preserve and proceeding generally north by northwest to the northernmost boundary of the preserve, excluding the areas of SOL adjacent to North Peninsula State Recreation Area, Flagler Beach State Recreation Area, multi-family units, and local parks.

Description: Residential lots bordering the southern half of this area are almost completed developed. There are numerous docks and boat houses which exceed the size limits for structures within aquatic preserves. The northern section is changing rapidly with development pressure for single family residences, vertical bulkheads and/or riprap, boat docks, and boat houses. Many of the lots in this area are very narrow -often too narrow to be considered a buildable lot. There is a considerable economic incentive for individual property owners to construct a vertical bulkhead waterward of the MHWL and backfill waters of the state to obtain a buildable lot. Much of the undeveloped shoreline along the eastern MHWL of the Halifax River and Smith Creek is well vegetated with marsh grasses and, in a few areas, black mangroves. Drainage into the estuary from stormwater runoff, golf courses, septic leachate, and effluent from package waste water treatment plants has long been considered as a potential surface water quality problem.

A small non-conforming (commercial) marina is located in the southern section of this boundary area. The uplands associated with this marina are located in unincorporated Volusia County while the docking structures are located within the city of Ormond Beach.

There are several small parks within this segment of the preserve which utilize city ROW's at the end of a street. One larger park, Sunset Park, provides residents a scenic view of the preserve via a boardwalk which parallels the shoreline. A covered deck with bench seats is also provided for passive recreation.

This area of the preserve is a documented manatee travel corridor. Other listed species such as the wood stork, bald eagle, brown pelican, little blue heron, and snowy egret are known to utilize this area.

5. Smith Creek, Volusia County

Boundary: Along the west bank at the MHWL of Smith Creek from the Volusia Flagler county line, proceed south approximately one half mile in Volusia County.

Description: This area is relatively undeveloped and consists of salt marsh, spoil areas, and several islands. Numerous listed wading birds and bald eagles utilize this area and it is within the manatee travel corridor.

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

MANAGEMENT AREA MF/1

(Multi-Family/Primary Resource Protection Area)

Boundary: On the barrier island, from the eastern MHWL of the Halifax River at the Volusia/Flagler County line, proceed generally north by northeast waterward along the MHWL in Flagler County within the city of Flagler Beach for approximately one quarter mile.

Description: This area includes one group of condominium units with a golf course. A portion of the shoreline adjacent to the multi-family structures has been armored while other areas of shoreline are vegetated to some extent with marsh grasses. Wading birds feed in this area, particularly the designated tri-colored and little blue herons. This area is also included in the manatee travel corridor.

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 piers.

MANAGEMENT AREA C/1

(Commercial/Primary Resource Protection Area)

There are two commercial areas in this category.

1. Tomoka River, west bank

Boundary: From the MHWL at the northeastern corner of the US 1 bridge over the Tomoka River, in unincorporated Volusia County, proceed generally east and northeast, along the MHWL of the western bank of the Tomoka River, to the southernmost boundary of Tomoka Estates Subdivision.

Description: This area fronts on US Highway 1, north of the Tomoka River, along a commercial corridor. Existing commercial activities at the site include boat launching, rentals, storage, sales and bait shop. There are several finger piers and most of the shoreline has been altered with a vertical bulkhead. US 1 represents the southernmost boundary of the aquatic preserve along the Tomoka River, although the river extends for many miles upstream. This area of the Tomoka is a designated manatee sanctuary. It is an important manatee travel corridor, as well as habitat for feeding, resting, and mating. The marina was constructed prior to the Tomoka's designation as a manatee sanctuary. Boats are limited to "idle" speeds in this area.

2. Tomoka River, east bank

Boundary: From the MHWL at the southeastern corner of the US 1 bridge over the Tomoka River, within the municipal boundaries of the city of Ormond Beach, proceed approximately 100 feet northeast along the MHWL of the Tomoka River.

Description: This area fronts the US 1 commercial corridor, south of the Tomoka River. It is presently undeveloped. The city of Ormond Beach comprehensive plan recommends professional office uses for this area, which are low impact commercial. A portion of the shoreline was disturbed during construction of the bridge, but otherwise remains undisturbed. The area is within a manatee sanctuary. Boats are limited to "idle" speed in this area. The rare swallow-tailed kite has also been observed in this area.

Allowable Uses: Utility easements (in designated corridors), a single two-slip dock built in accordance with the standards and criteria for private residential single docks, and piers.
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/1

(public recreation/primary resource protection area)

There are six designated areas within this category, each is described below.

1. Tomoka State Park

Boundary: This area includes lands waterward of the MHWL bordering Tomoka State Park along the eastern bank of the Tomoka River, the southern section of the Tomoka Basin, and the western bank of the Halifax River.

Description: The eastern bank of the Tomoka River bordering Tomoka State Park is characterized by extensive estuarine tidal marsh interspersed with mosquito control ditches. The shoreline in this area is typically smooth cordgrass, black needle rush, or sea-oxeye daisy mixed with glassworts and saltwort. A rim of sea-oxeye is typical in areas where a thin layer of spoil has been deposited. The marsh supports an abundance of wildlife including a number of designated species, including the endangered wood stork and manatee. Manatee have been observed feeding on smooth cord grass, by pushing or pulling a portion of their upper body out of the water. This section of the Tomoka River, along with its tributaries Strickland and Thompson Creeks, are a designated manatee sanctuary. Boats are limited to "slow" speed along this reach.

The reach of Halifax River which borders the park is predominantly comprised of spoil areas, although an area near the southern boundary is relatively undisturbed. Osprey nests have been documented in the tall trees along this shoreline. The Halifax River is a documented manatee travel corridor.

2. The VOLT tract

Boundary: Along the western boundary of the Tomoka basin, only those lands waterward of the MHWL which border the VOLT tract.

Description: This area comprises some bottomland hardwood hammocks and a vast expanse of estuarine tidal marsh which has been altered by mosquito control ditches. Old Dixie Highway and its associated causeway and drainage facilities are the only other major disruptive features in the marsh. The Volt property is an integral part of a wildlife corridor that extends from the Goldy-Bellemeade tract, north to Flagler Beach State Recreation Area to the north. The corridor includes Tomoka State Park and a vast expanse of conservation and preservation lands, generally along the Tomoka River and its tributaries and wetlands. Wildlife using these corridors include, but are not limited to, black bear, whitetail deer, turkey, and bobcats. Listed species include bald eagle, woodstork, and little blue heron.

3. North Peninsula State Recreation Area

Boundary: This area includes the submerged lands waterward the MHWL, west to the ICW, bordering the North Peninsula State Recreation Area.

Description: The North Peninsula State Recreation Area, comprises 442 acres located in unincorporated Volusia County. The park extends from the MHWL of the ICW to the Atlantic coastal beach. The eastern portion of the property, along the Atlantic Ocean, provides beach access and recreational opportunities while the western side, which includes approximately three miles of shoreline along the Halifax River, is designated for preservation and conservation. Shoreline characteristics along this segment include dense stands of marsh vegetation, some mosquito control ditches, and spoil sites created during construction and maintenance of the ICW. The area is a documented manatee travel corridor and is utilized by a number of listed species including scrub jays.

A county maintained public boat launch is located at Highbridge Park within this segment where Highbridge Road crosses the Halifax River.

4. Flagler Beach State Recreation Area

Boundary: This section includes those submerged lands waterward of the MHWL, east and west of the ICW along Smith Creek, which border Flagler Beach State Recreation Area (FBSRA).

Description: A boat basin bisects FBSRA shoreline along the eastern bank of Smith Creek into northern and southern sections. The northern section is vegetated with marsh grasses but also has a few small areas of sand beach. The shoreline along the southern section has been disturbed by spoil deposition. It is relatively unvegetated and has considerable erosion. A bulkhead forms the northern boundary of the boat basin, while the southern boundary consists of marsh grasses, ditches, and spoil sites. A portion of the park's boundary extends across the ICW and encompasses approximately 50 acres of marsh which has been disturbed by mosquito ditching. This reach of Smith Creek is included in the manatee travel corridor and park staff have reported numerous manatee sightings as well as utilization of the area by other listed species.

5. Bulow Creek State Park, Bulow Plantation Ruins State Historic Site

Boundary: This section includes Bulow Creek and areas along the west bank of the Halifax River which border Bulow Creek State Park and Bulow Plantation Ruins State Historic Site. Bulow Creek meanders from its confluence with the Halifax approximately 5 miles to the preserves northernmost boundary.

Description: The Halifax River segment encompasses approximately 2 miles and is predominantly estuarine tidal marsh interspersed with mosquito control ditches. This segment, along the Halifax River, borders the Mound Grove addition to Bulow Creek State Park. The area is included within the manatee travel corridor and is

also habitat for numerous designated species including the bald eagle, wood stork, roseate spoonbill, snowy egret and little blue heron. The southernmost reach of Bulow Creek, which runs generally south of Walter Boardman Bridge and east to the confluence with the Halifax, includes the natural stream channel, tidal flats, tidal marsh and mosquito control ditches. The area is habitat for numerous listed wading birds as mentioned above. The shoreline along Bulow Creek, north of the Walter Boardman Bridge, is dominated by cabbage palm and meanders through extensive estuarine tidal marsh. Several seepage streams drain into the creek from the northern section of the park.

Several residential out-parcels represent non-conforming uses in the area of the Mound Grove addition. One area consists of two homes located along Highbridge Road at Mound Grove and Cobb's Corner, and another is located at on the south side of the Highbridge crossing at the Halifax River. The section of Highbridge Road bordering Mound Grove is a county-designated scenic roadway.

6. Bicentennial (Buttenheim) Park.

Boundary: On the barrier island, in Ormond by the Sea in unincorporated Volusia County, along the MHWL, west to the ICW, from the eastern shore of the Halifax River. Generally along that reach of John Anderson Drive that is north of Rivocean Drive and south of Sandra Drive.

Description: This shoreline is part of a tract of land which extends from the MHWL of the eastern shore of the Halifax River, east across the barrier island to the Atlantic coastal beach, interrupted by John Anderson Drive and A1A. The park contains both active and passive recreation and is habitat for scrub jays.

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

MANAGEMENT AREA P/1

(Preservation/Primary Resource Protection Area)

There are five designated areas in this category.

1. Tomoka River, east bank

Boundary: Waterward of the MHWL along the east bank of the southern reach of the Tomoka River, south of Tomoka State Park and north of U.S. 1, excluding areas designated as commercial or residential.

Description: The shoreline if this area is predominantly estuarine tidal marsh interspersed with mosquito control ditches. This reach of the Tomoka River is a designated manatee sanctuary. Boat speeds are limited to "slow" speed. The area provides feeding habitat for the endangered wood stork, and other listed species such as the little blue heron and snowy egret.

The uplands associated with this area are proposed for residential housing, but to date, are not developed. A portion of the shoreline contiguous to the southern reach of this segment is designated for single family residential development.

2. Tomoka Basin, southwest section

Boundary: Waterward of the MHWL along the south west shoreline of the Tomoka Basin generally along the east side of Old Dixie Highway, east of addison Drive and south to just west of the Tomoka River.

Description: This area consists of relatively narrow single family residential lots situated between estuarine tidal marsh and Old Dixie Highway. Tidal marsh exists to the west of the highway as well. Most of this area is adjacent to public-owned VOLT conservation area. This section of the highway is a county-designated scenic roadway. Marsh habitat is utilized by listed species and manatee utilize deeper areas of the Tomoka Basin.

3. Mosquito Impoundment

Boundary: Those submerged lands waterward of the MHWL located generally north of the Tomoka Basin, east of the eastern boundary of Bulow Creek State Park, south of Bulow Creek, and west of Halifax Creek.

Description: This area includes an approximate 1100 acre mosquito impoundment. Several upland spoil areas are located within the mosquito impoundment, such as Bryan Island and Tiger Hammock. Spoil areas are also located adjacent the west side of the AIW. Much of the area has been disturbed by both the construction of mosquito control dikes and ditches as well as by the deposition of spoil material from the AIW. A unimproved roadway extends east and west across the mosquito impoundment, generally north of Bryan Island and south of Tiger Hammock. Some of the spoil areas adjacent to the AIW are relatively high - one mound is approximately 17 feet high MSL.

Several upland parcels within the mosquito impoundment are privately owned. One non-conforming structure is located in the southern section on the Tomoka Basin, generally east of Bryan Island. One residential structure, known locally as "the Jones house," is not served by power, water, or by other utilities.

The mosquito impoundment is used extensively by waterfowl. The mosquito control dikes and ditches have severely modified the marsh area, creating a more isolated wetlands than existed under natural conditions. This alteration has, in effect, removed much of the impoundment from natural interaction with the rest of the estuary.

Roads along the impoundment are used by the public to access crabbing, shrimping, and fishing areas within the impoundment and along the Halifax River and Tomoka Basin.

4. Flagler Beach, barrier island

Boundary: Waterward of the MHWL from the northernmost boundary of the preserve south to the northernmost boundary of Flagler Beach State Recreation Area.

Description: The shoreline of this area is characterized by estuarine tidal marsh. Single family residential units are situated along a man-made basin and canal which is located behind the marsh area. This reach of the preserve is within a manatee travel corridor. Marsh habitats are utilized by wood storks and numerous other wading birds.

5. Bulow Creek, northern section

Boundary: Waterward of the MHWL along Bulow Creek, north of the northern boundary of Bulow Plantation Ruins State Historic Site along Bulow Creek, to the northern boundary of the preserve.

Description: This section of the preserve includes the northern reach of Bulow Creek. It is located in a relatively undeveloped area of Flagler County. Several canals, just north of Bulow Ruins, drain extensive marsh lands into the creek. The shoreline is similar to Bulow Creek as described in the public lands section.

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

MANAGEMENT AREA OW/1

(Open Water/Primary Resource Protection Area)

There are two designated categories in this area.

1. Tomoka Basin

Boundary: The Tomoka Basin is located east of the Halifax River and Tomoka State Park, north and northeast of Old Dixie Highway, and south of Bryan Island and the mosquito impoundment.

Description: The Tomoka Basin, is a large shallow bay containing large expanses of shallow tidal flats and oyster bars. Some deep water habitat is located within the basin, one area is located adjacent to the northern section of Tomoka State Park.

2. Halifax River

Boundary: The Halifax River extends generally north and south in coastal Volusia County between Smith Creek, at the Flagler County line, to Ponce deLeon Inlet, 24 miles to the south. It is located between the barrier island and mainland peninsular Florida. The reach of the Halifax River located within the preserve begins at the Flagler County boundary and extends southeasterly for approximately 8 miles to the southern boundary of the preserve. The southern boundary of the preserve begins generally at the MHWL east of the southernmost point of Oak Forest Drive on the barrier island, runs east across the AIW to a point waterward of the MHWL on the barrier island, near where Sand Castle Drive intersects John Anderson Drive.

A series of spoil islands are located in a generally north-south direction along the west side of the AIW in the Halifax River, extending from the mosquito impoundment area about 2/3 of the distance south to the southern boundary of the preserve. The spoil islands, located within the municipal boundaries of the city of Ormond Beach, are comprised of both salt marshes and high excessively drained spoil areas (some as high as 9 feet MSL). Many of the wetland areas have been recently modified by open water marsh management techniques connecting isolated marsh areas to open water to allow natural predators to control mosquito propagation. Smooth cordgrass has been planted where these ditched inlets connect to the Halifax River to control erosion. Upland native vegetation, including saw palmetto and cabbage palms, are characteristic of the islands. Some islands are infested exotic Australian pines.

Allowable Uses: Utility easements (in designated corridors).

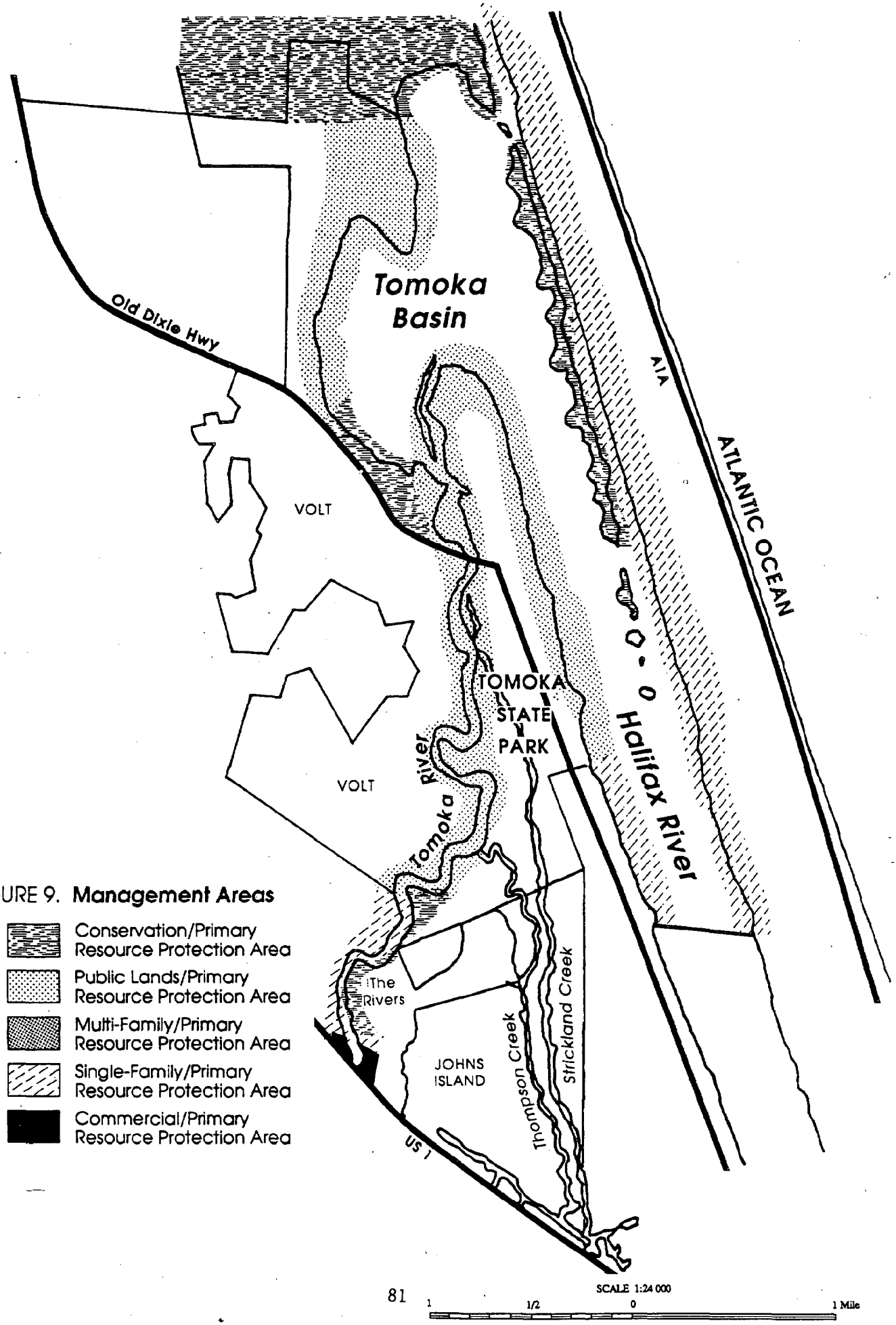


FIGURE 9. **Management Areas**

- Conservation/Primary Resource Protection Area
- Public Lands/Primary Resource Protection Area
- Multi-Family/Primary Resource Protection Area
- Single-Family/Primary Resource Protection Area
- Commercial/Primary Resource Protection Area

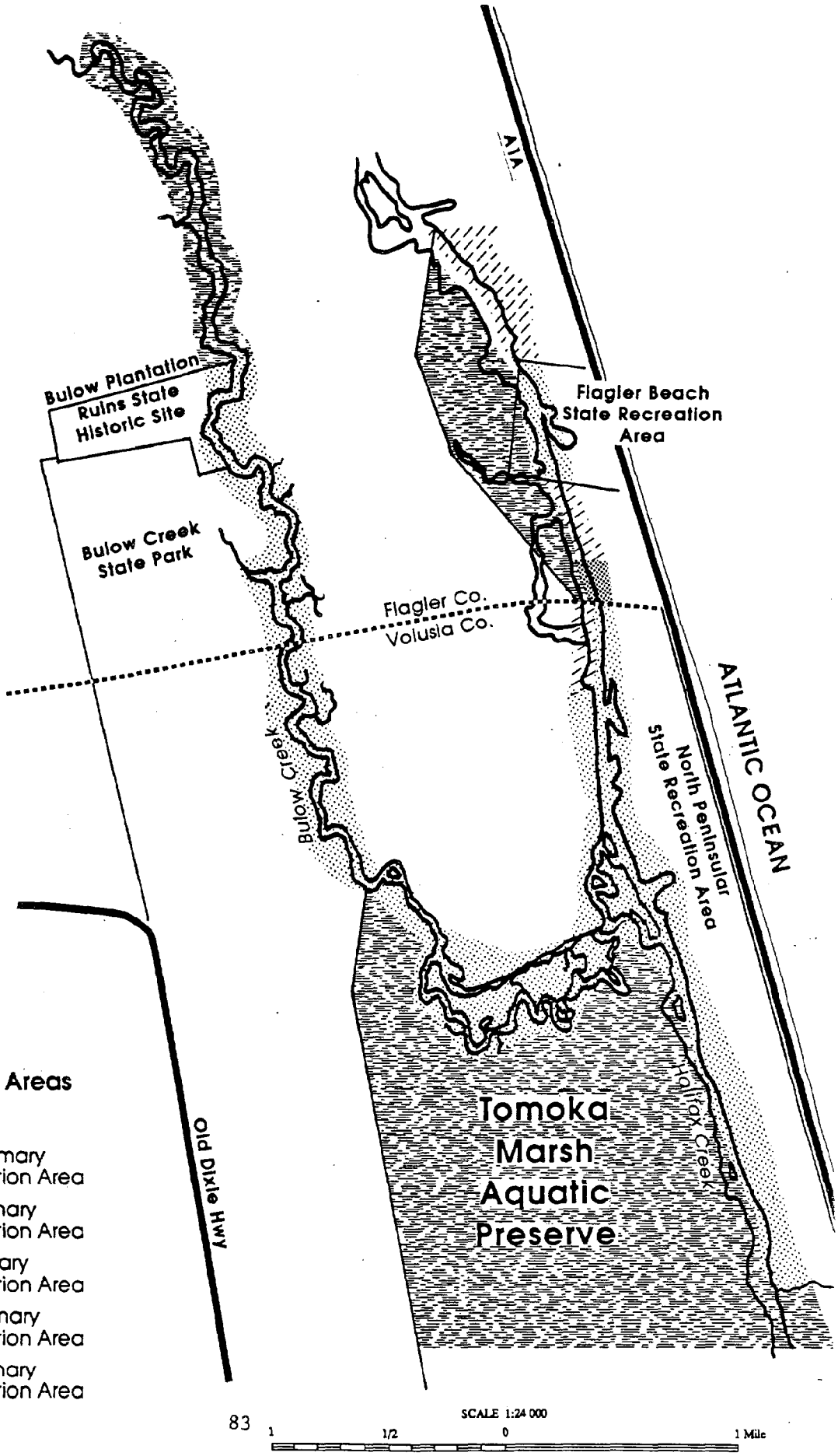


FIGURE 9. **Management Areas** (continued)

- Conservation/Primary Resource Protection Area
- Public Lands/Primary Resource Protection Area
- Multi-Family/Primary Resource Protection Area
- Single-Family/Primary Resource Protection Area
- Commercial/Primary Resource Protection Area

CHAPTER VII

MANAGEMENT ACTION PLAN

This chapter establishes the guidelines which allow for the management and protection of the Tomoka Marsh Aquatic Preserve's natural, archaeological, historical, and cultural resources for the benefit of future generations (Section 258.35, F.S.). The implementation of goals, objectives and tasks outlined in this chapter will be commensurate with the funding and staffing level provided for this aquatic preserve program.

Before an effective program can be designed to manage and protect natural resources, the function, importance, and location of the resources must be defined. Additional efforts will consist of identifying those activities or parameters that affect these resources, either positively or negatively. This information will form the foundation from which action will be initiated to manage and protect these resources. The management strategies for an aquatic preserve program must consist of a variety of components such as, resource identification, resource management, resource protection, research, and environmental education.

In general, the role of the management program for this preserve includes: (1) providing information on the ecological functions and economic importance of the natural resources within the preserve, (2) overseeing those activities that affect the natural resources within the preserve, (3) ensuring that accurate biological and other pertinent information is considered in permit-related issues and planning decisions, (4) ensuring that all statutes and rules regarding the preserve's natural resources are followed and that the correction of violations are required and verified by the appropriate authorities, (5) conducting site surveys for specific activities, (6) coordinating with other resource management and enforcement agencies, (7) educating the public on the inherent and economic values associated with natural resources, (8) conducting or cooperating with other entities to conduct pertinent research projects, and (9) developing a comprehensive management program that can be periodically updated.

For all the following goals, objectives and tasks, the Department of Natural Resources will, when appropriate and practical, participate with other agencies and organizations dedicated to protecting the local resources. In order to avoid duplication of effort the Department will initiate programs only when they do not overlap or compete with programs operated by other governmental agencies or non-profit corporations.

A. RESOURCE MANAGEMENT

The overall goals of resource management within aquatic preserves are: (1) maintaining current and detailed resource inventories, (2) assessing the impact of both direct and indirect human activities on the resources, (3) establishing habitat restoration programs, and (4) cooperating with other agencies in water quality improvement.

GOAL A.1: MAINTAIN RESOURCE INVENTORIES

Objective A.1.1: To maintain a resource inventory of submerged and emergent vegetation.

Task A.1.1.1: Conduct an inventory of submerged grasses, attached algae, marsh grasses, and other shoreline vegetation by using available satellite imagery (e.g., LANDSAT, SPOT, etc.), aerial photography, Loran coordinates, and groundtruthing efforts.

Task A.1.1.2: This inventory shall be conducted once every three years.

Task A.1.1.3: The database generated from this inventory will be used to create biological resource maps.

Objective A.1.2: To conduct an inventory of designated species and their habitats.

Task A.1.2.1: Conduct an inventory of designated species and other protected species and their habitats by using data from existing literature and current research studies, if available.

Task A.1.2.2: This inventory shall be conducted once every three years.

Objective A.1.3: To conduct an inventory of wading birds and their habitats in the preserve.

Task A.1.3.1: Conduct an inventory of birds that feed, roost, loaf, and nest throughout the preserve by using existing literature, field observations and, if any, current research studies. The inventory may also include information on migratory birds which utilize the preserve.

Task A.1.3.2: This inventory shall be conducted once every three years.

GOAL A.2: ASSESS THE EFFECT OF HUMAN ACTIVITIES AND CUMULATIVE IMPACTS

Objective A.2.1: To inventory and assess the effects of human activities on the natural resources, including the impact on endangered, and threatened species, and species of special concern.

Task A.2.1.1: Conduct a survey of all dock/pier structures to determine if there is a direct relationship between the presence of structures and the absence of natural resources. This survey shall contain at a minimum:

a) the length of the structure waterward of the MHWL;
b) the size of the terminal platform, if applicable;
c) the height (elevation) of the structure above the MHWL;
d) the water depth at the structure's terminus;
e) the number, size, and drafts of boats using the structure;
f) the functional condition of the structure;
g) any accessory facilities and ancillary uses associated with the structure;
h) the structure's use category (e.g., single-family, commercial); and
i) an inventory of the biological resources within 25' of the identified structure.

Task A.2.1.2.: Coordinate with Division of Marine Resources to determine if boating activity is affecting manatee utilization within the Aquatic Preserve or associated waters.

Objective A.2.2: To inventory and assess cumulative impacts on the natural resources.

Task A.2.2.1: A survey of all docks/piers, dredged areas, shoreline stabilization, and other applicable human uses will be conducted. These surveys shall be conducted as follows:

a) the docks/piers inventory will be conducted in accordance with Task A.2.1.1.

b) a survey of all dredged areas will be made and include at a minimum:
   1) the length, width, and depth of the dredged area;
   2) depth profiles of the surrounding area;
   3) traditional use of the area;
   4) biological resources in the dredged and surrounding area; and
   5) review of information on pre-existing resource conditions, if available.

c) a survey of all shoreline stabilization projects will be conducted and include at a minimum:
   1) the total length of riparian shoreline,
   2) the length of shoreline stabilization,
   3) the technique and materials used in stabilizing the shoreline, and
   4) review of existing and pre-existing biological resources, if available.

GOAL A.3: RESTORE ESTUARINE HABITAT

Objective A.3.1: To identify suitable unvegetated and disturbed shoreline areas as restoration sites.

Task A.3.1.1: All suitable shoreline areas will be revegetated with appropriate native vegetation.

Objective A.3.2: To coordinate with the Department of Environmental Regulation (DER) and the water management districts in restoring estuarine habitat preserve.

Task A.3.2.1: Submit proposals to DER which utilize Pollution Recovery Trust Funds to restore estuarine habitat.

Objective A.3.3: To coordinate with the local mosquito control districts in identifying previously disturbed saltmarsh areas as suitable habitat restoration/enhancement sites.

Task A.3.3.1: Reintroduce estuarine habitat by restoring natural tidal flow or utilizing ecologically compatible management techniques such as Open Marsh Water Management.

GOAL A.4: IMPROVE WATER QUALITY

Objective A.4.1: To coordinate with DER, the water management districts, and local governments toward improving water quality in the preserve.

Task A.4.1.1: Coordinate with DER and local governments in assessing impacts from septic tank leachate and wastewater discharges.

Task A.4.1.2: Assist the St. Johns River Water Management District, local governments, citizen groups and individuals in developing special basin

criteria for the Tomoka River and associated waterbodies to increase stormwater pollution treatment and increase management of surface water discharges into the aquatic preserve.

Task A.4.1.3: Coordinate with the local mosquito control districts to review arthropod control management plans submitted in compliance with Section 388.4111, F.S., and to assess the effect of the mosquito impoundment on the ecology of the preserve.

GOAL A.5: COORDINATE WITH LOCAL GOVERNMENTS ON LAND USE PLANNING

Objective A.5.1: To coordinate with local planning departments, regional planning councils, and the Department of Community Affairs to develop/revise/evaluate local government comprehensive plans and amendments.

Task A.5.1.1: Establish role as field representative for DNR Aquatic Preserves with local governments.

Task A.5.1.2: Contact local planners to assist in the development of policies and ordinances that regulate activities affecting state-owned submerged lands.

B. RESOURCE PROTECTION

In order to maintain the biological integrity of the aquatic preserve, it is imperative to protect the resources that comprise the system. Since it is not feasible to target all of the organisms adequately, the primary thrust of the resource protection element is the protection of the various habitats that make up the preserve. The goals of the aquatic preserve program pertaining to resource protection therefore include (1) protection of the existing submerged vegetation (e.g., submerged grasses, and attached algae), (2) protection of emergent vegetation (e.g., marsh grass), and (3) protection of habitat of designated species.

GOAL B.1: PROTECTION OF SUBMERGED AND EMERGENT VEGETATION

Objective B.1.1: To minimize potential damage to submerged and emergent vegetation through the review of applications for use of state-owned land in the aquatic preserve.

Task B.1.1.1: Field staff will develop a written policy describing a scientifically based, standardized method to inventory the submerged and emergent biological resources at the proposed project site. At a minimum, this policy will contain the following information:

a) The area to be surveyed:
   1) will be described as a polygon, and
   2) will include the proposed location of the activity/structure and the adjacent area surrounding the project. The size of this adjacent area shall be determined by the methods described in the written policy.

b) How the survey is to be performed:
   1) Two areas within the survey area will be assessed:

      i. the submerged bottom, including:
         * a description of all communities/habitats,
         * a description of the bottom type,
         * depth profiles,
         * tidal amplitude and stage (where appropriate), and
         * a physical description of the surrounding waterbody;

      ii. the shoreline (where appropriate), including:
         * a description of the vegetation,
         * a description of any existing structures,
         * notation of any nesting birds, and
         * notation of any area that is considered prime habitat for listed or protected species.

c) A definition of a Primary Resource Protection Area. This definition will be used to determine if significant resources exist within the expected area of impact. It will consider, but is not limited to:
   1) submerged grasses and algae,
   2) littoral zone vegetation,
   3) unvegetated soft-bottom communities,
   4) designated species, and
   5) nesting sites for solitary or colonial birds.

Task B.1.1.2: Coordinate with the appropriate regional DNR planner in order to process the field staff comments in a timely manner.

Task B.1.1.3: Coordinate, when possible, with other appropriate agencies that have regulatory authority for these projects.

Objective B.1.2: To ensure that structures and projects that have been authorized are in compliance with the authorized conditions.

Task B.1.2.1: Coordinate with the appropriate regional DNR planner to receive copies of all letters of consent, easement agreements, lease agreements, and other forms of authorizations.

Task B.1.2.2: Report variations from the authorized conditions to the appropriate DNR enforcement agent.

Task B.1.2.3: Coordinate, when possible, with other appropriate agencies that have regulatory authority for these projects.

Objective B.1.3: To 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: Coordinate, when possible, with other appropriate agencies that have regulatory authority for these projects.

Objective B.1.4: To ensure that human use of the preserve does not create turbidity levels that adversely affect submerged vegetation.

Task B.1.4.1: Seek to establish an ordinance to reduce the speed of boats traveling outside the AIW.

Task B.1.4.2: Require that all dredge and fill projects use effective turbidity control practices.

GOAL B.2: PROTECTION OF DESIGNATED SPECIES HABITAT

Objective B.2.1: To comply with Objective C.2.1 through the implementation of Tasks C.2.1.1 and C.2.1.2.

Objective B.2.2: To ensure that these habitats are given maximum protection through the permit-review process.

Task B.2.2.1: Recommend modifications to proposed projects in order to take into account known habitat of designated species over state-owned submerged land.

Task B.2.2.2: Field staff will coordinate with the Florida Game and Fresh Water Fish Commission and U.S. Fish and Wildlife Service when designated species habitat or "significant use areas" could be affected by proposed activities.

Task B.2.2.3: Adopt measures to insure the protection of habitat of special significance to manatee.

C. RESEARCH

Effective management of any biological system relies almost entirely on information as to how that system functions, and research is the foundation upon which this information is based. Estuarine/lagoonal systems are incompletely understood, and it is essential that some of the gaps in this understanding are filled. Therefore, the goals of the research program within the Bureau of Submerged Lands and Preserves are primarily directed toward applied research, rather than toward basic, or theoretical, research. The goals of the research program are: (1) to gain a better understanding of those factors that are essential to the continued biological integrity of the major habitats (beds of submerged vegetation, marshes, and tidal flats) within the aquatic preserve, and (2) to gain a better understanding of those factors that govern the continued survival and propagation of designated species that use the aquatic preserve for any portion of their life cycle.

GOAL C.1: DETERMINE THE FACTORS THAT AFFECT THE INTEGRITY OF ESTUARINE HABITATS

Objective C.1.1: To determine the primary factors that affect the survival of submerged grasses and algal beds.

Task C.1.1.1: Pursue, at the bureau level, funding to conduct research on the life cycles of algal and submerged grass species present.

Task C.1.1.2: Whenever possible, participate in research on the biology and ecology of the submerged grass and algal species present.

Objective C.1.2: To determine the primary factors that affect the survival of marsh plant species.

Task C.1.2.1: Whenever possible, participate in research on the biology and ecology of the marsh plant species present.

Task C.1.2.2: Pursue, at the bureau level, funding to conduct research on the colonization rates of all marsh plant species.

Objective C.1.3: To determine the primary factors that affect the functioning of tidal flats.

Task C.1.3.1: Whenever possible, participate in compiling an inventory of the benthic infauna present in tidal flats.

Task C.1.3.2: Whenever possible, participate in research on the changes in tidal flat configurations.

Task C.1.3.3: Whenever possible, participate in research on the rates of colonization by submerged and emergent vegetation on tidal flats.

GOAL C.2: DETERMINE THE FACTORS WHICH AFFECT SURVIVAL AND PROPAGATION OF DESIGNATED SPECIES

Objective C.2.1: To determine which portions of the preserve serve as habitat for designated species.

Task C.2.1.1: Coordinate with the Florida Game and Fresh Water Fish Commission, the U.S. Fish and Wildlife Service, the Florida Audubon Society, and any other relevant group to determine which designated species use what portion of the aquatic preserve for various aspects of their biology and ecology.

Task C.2.1.2: If additional information is necessary, establish a system of seasonal monitoring sites to determine the preserve's use by designated species, particularly by birds.

Objective C.2.2: To determine the patterns and trends in manatee use of the aquatic preserve.

Task C.2.2.1: Whenever possible, participate in research on the factors that affect the continued survival of manatees.

Task C.2.2.2: Coordinate with and, if necessary, lend assistance on a local level to the Division of Marine Resources' manatee research and protection program.

Objective C.2.3: To determine the species composition, distribution, abundance, seasonality, and size classes of marine turtles that utilize the aquatic preserve.

Task C.2.3.1: Whenever possible, participate in research on the biology and life history of marine turtles and the factors affecting their recovery in the aquatic preserve.

Task C.2.3.2: Coordinate with and, if necessary, lend assistance on a local level to the Division of Marine Resources' marine turtle research and conservation program.

D. ENVIRONMENTAL EDUCATION

The integrity of the biological system within the Tomoka Marsh Aquatic Preserve can be affected, both directly and indirectly, by the public's enjoyment of the preserve. Without a biologically "healthy" preserve, 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 as to the importance of the factors that affect the integrity of the preserve. This public is composed of a number of segments: (1) students [e.g., elementary, college]; (2) waterfront property owners; (3) visitors and new residents; (4) user groups [e.g., boaters, developers and marine contractors]; (5) special interest groups (e.g., Audubon Society, boating clubs); and (6) local, regional, and state government agencies that are involved in making decisions which may affect the aquatic preserve.

The overall goal of environmental education is to instruct individuals as to the importance of preserving natural and cultural resources of the preserve so they may consider all issues prior to making decisions that affect these resources. In general, the purpose of this element is to educate the public hoping they 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.

GOAL D.1: EDUCATE THE PUBLIC TOWARD WISE RESOURCE USE

Objective D.1: To establish and conduct educational programs that describe general information on the preserve's ecosystem and/or specific topics related to the preserve.

Task D.1.1: Conduct or assist in informal seminars, classes, workshops for public discussion of current resource management issues, resource utilization, and regulatory activities. Public forums such as these should involve private and public interests.

Objective D.2: To produce educational literature and materials that inform the public of the preserve's natural and cultural resources and the importance of preserving and protecting these resources.

Task D.2.1: Develop brochures, pamphlets, and/or booklets that describe to the public: (1) the purpose of and activities conducted at the local aquatic preserve office; and (2) general information on the preserve's ecosystem. If feasible, this task will include video presentations.

Task D.2.2: Upon approval from DNR Office of Communication, submit newspaper articles or radio announcements designed to educate the general public about the ecological functions and economic importance of the natural resources within a preserve.

CHAPTER VIII

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 Tomoka Marsh Aquatic Preserve. A reference matrix of these regulatory programs and their jurisdictions is presented in Table 2. One function of the aquatic preserve program is to coordinate with these agencies to achieve common goals relevant to aquatic preserve management.

It should be noted that many of the following federal, state, and local agencies with jurisdictions in the preserve may impose additional permit requirements on activities previously outlined in Chapter IV of this plan.

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 was expanded in 1972 to include the Federal Water Pollution Control Act Amendments, now known as the Clean Water Act (CWA), which expanded the Corps' role from regulating "navigable waters" to "waters of the United States." 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 **U. S. Coast Guard (USCG)** provides technical assistance primarily through its police powers over waterways; port safety, security, marine environmental protection, and its search and rescue duties. Other assistance is provided through the following: preliminary investigation of surface water pollution, developing, installing, maintaining and regulating navigational aids, boat safety and licensing, and federal law enforcement. The nearest USCG station is located at New Smyrna Beach, near the Ponce DeLeon Inlet.

If a local government wishes to post navigation signs in navigable waters which fall under the jurisdiction of the state government, the Coast Guard provides comment to the state regarding the suitability of the zone. While the Coast Guard comments on these zones, it does not enforce those speed zones designated by the state.

USCG permits are not required for speed zone sign structures, although U. S. Army Corps of Engineers and Florida Department of Environmental Regulation permits are required. To minimize the number of waterway obstructions, the Coast Guard will consider requests to mount boat speed signs on federally maintained aids to navigation. Coast Guard permission is required to install the signs on these navigation aids, and specific application procedures and requirements have been established.

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 wastes. Authority is divided between EPA and USCG regarding the discharge of oil or hazardous substances into surface water. Although the EPA has broad regulatory powers which it rarely exercises, the agency does regulate pipeline crossings, wastewater treatment outfalls, and other significant outfall structures.

The **U.S. Geological Survey (USGS)** performs surveys and research pertaining to topography and monitors mineral and water resources.

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 USFWS participates in DRI reviews, and review of local comprehensive plans, programs, projects, or ordinances as they affect fish, plants, and wildlife. USFWS staff may also be asked to provide expert testimony at administrative hearings. The Jacksonville office has jurisdiction over northeast Florida, extending as far south as Orange and Brevard counties.

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 **Department of Natural Resources (DNR)** areas of responsibility include acquiring and managing state lands, including 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. Chapters 369.20-369.22, F.S. authorizes the Bureau of Aquatic Plants to regulate 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.A.C., "Aquatic Plant Importation, Transportation, Cultivation, and Possession", for any persons cultivating, revegetating, or collecting aquatic plants.

The DNR uses the 10-year high water mark to determine jurisdiction. The DNR rarely approves a project if the COE and a local government oppose it. Where applicable, aquatic preserve managers are asked for comments. The DNR has enacted new regulations to determine which projects can be approved "in-house," as opposed to requiring approval of the Governor and the Cabinet. The DNR is moving to a position of opposing most dredging that causes any negative impact. The DNR defers water quality issues to the DER.

A DNR consent to use submerged lands is required for construction of vertical bulkheads and revetments below the jurisdictional 10-year high water mark. A DNR submerged land lease is required for dredge, fill, and dock projects below this jurisdictional line.

Chapter 370, F.S. addresses saltwater fisheries and the protection of marine animals. These laws are enforced primarily by the Department of Natural Resources or by the DNR's Florida Marine Patrol (FMP), but may also be enforced by the Florida Game and Fresh Water Fish Commission (FGFWFC), local sheriff's deputies, or local police officers. Chapter 370, F. S., addresses protection of: 1) marine turtles, 2) the West Indian manatee, which is declared the "Florida State Marine Mammal", 3) mammalian dolphins (porpoises), and 4) manta rays. Section 370.12(5), F.S., addresses the Motorboat Revolving Trust Fund, which provides $250,000 for DNR's manatee and marine mammal recovery effort; manufacture and erection of informational and regulatory signs; production, publication, and distribution of educational materials; participation in manatee and marine mammal research programs, including carcass salvage and other programs; and other programs to assist the recovery of other endangered species and to prevent the endangerment of other marine mammal species.

In 1989, the legislature amended the Manatee Sanctuary Act to include "Thompson Creek, Strickland Creek, Dodson Creek, and the Tomoka River." The DNR was required to establish rules designating the sanctuary and regulating the speed and operation of motorboat traffic on these waterways, not later than December 31, 1989. The Governor and Cabinet adopted the rules proposed by the DNR on October 24, 1989, establishing "slow speed" zones in Dodson, Strickland, and Thompson creeks; establishing a "slow speed" zone in the portion of the Tomoka River which extends from its confluence with the Halifax River to the U. S. 1 bridge; and establishing a "caution zone" in the portion of the Tomoka River which extends from the U. S. 1 bridge upstream to the I-95 bridge. The terms "caution zone" and "slow speed" are defined in Chapter 16N-22.002, F.A.C.

The **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.

These 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 most pertinent to the aquatic preserve management program are Chapters 17-301, 17-302, 17-4, and 17-312, F.A.C. Authority for these rules is based in Chapter 403, F.S. Chapter 17-301 and 17-302, F.A.C., addresses water quality standards with the most stringent category being "Outstanding Florida Waters" (OFW). The Tomoka Marsh Aquatic Preserve became an OFW by legislative action in 1979. Chapter 17-4, F.A.C., addresses permit requirements and Chapter 17-312, 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. As a result of this amendment, an interagency agreement between DNR and DER provides for comments from DNR staff, on behalf of the Board of Trustees, into the DER permitting process for proposed activities in aquatic preserves.

The **Department of Health and Rehabilitative Services (HRS)** has responsibilities to protect the public's health by overseeing functions that involve water supply, on-site sewage disposal, septic tanks , solid waste control, and hazardous wastes. Authority for these responsibilities is found in Chapters 154, 381, and 386, F.S., and in the 10D Series of F.A.C., known as the "Sanitary Code." Within each county, HRS functions as the county's health department and oversees these jurisdictional 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. Section 388.291, F.S., provides the HRS with supervisory authority over mosquito control districts. The mosquito districts must submit work plans and detailed work plan budgets to the HRS for the control of mosquitos or other arthropods, which include midges, sand flies, dog flies, yellow flies, and horse flies. Each of these public health programs holds the potential to create significant impacts upon the aquatic preserves. With environmental permitting, DNR approved management plans and restrictive pesticide labeling, the potential for significant

negative impacts is reduced. Both Volusia and Flagler Counties have mosquito control programs.

The **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 **Department of Community Affairs (DCA)** and the Regional Planning Councils are authorized under Section 380.06, F.S., to administer 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). These designations are 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 submit new or existing land development regulations to DCA for review and approval. According to Section 380.05, F.S., the entire land development process will require the state's supervision until that local government modifies its land development practices to conform to the principles guiding development within an ACSC.

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 three elements within these plans that bear most directly on the aquatic preserve program are the Coastal Zone Management Element, the Conservation Element, and the Future Land Use Element.

The **Marine Fisheries Commission (MFC)** was established as a 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 of clams and oysters. The MFC is also instructed to make annual recommendations to the Trustees regarding marine fisheries research priorities.

The **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 State, Division of Historical Resources, assists local governments with historic preservation issues. This includes assistance with the development of pertinent and effective goals, objectives, and policies for comprehensive plans. The primary emphasis is on helping local governments identify, evaluate, and maintain or mitigate damage to significant historic resources within the local jurisdiction. Projects with state or federal involvement (e.g., Community Development Block Grants, 201 Wastewater Treatment Plants, airports, Land and Water Conservation Fund Grants, Developments of Regional Impact (DRIs), US Army Corps of Engineers and FDER permit applications, etc.) must be submitted to the Division of Historic Resources for review, to determine possible impacts on significant historic resources.

The **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.

The Florida Department of Transportation (DOT) regulations have a profound impact upon the environment through location of roadways and specifications for culverts, detention and retention facilities, and spanning water courses or wetlands. The DOT indirectly regulates growth and development by designating roadways a certain classification.

C. REGIONAL AGENCIES

At the regional level, the management coordination network includes the St. Johns River Water Management District, the East Central Florida Regional Planning Council, and the Florida Inland Navigation District. These organizations conduct activities that are on a broader scale than those of local governments.

The **St. Johns River Water Management District (SJRWMD)** 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 40C-4 and 40C-40, Florida Administrative Code, 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.

SJRWMD has jurisdiction over and administers the permitting program for water use, well construction, stormwater discharge, groundwater withdrawals, surface water management, water level control and provides control of exotic plants (primarily hydrilla and water hyacinths) in cooperation with the COE. The SJRWMD's activities also include land acquisition, with over 50 percent of their budget targeted for this purpose.

It is the intent of the Florida Legislature (Chapter 87-97, Section 1-6, 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." The Tomoka Marsh Aquatic Preserve is ranked 7th in the SWIM priority ranking process. Because of limited funds to implement the SWIM plans that have been developed for higher priority rankings, it is doubtful that the SJRWMD can develop a SWIM plan for Tomoka Marsh Aquatic Preserve in the foreseeable future.

The **East Central Florida Regional Planning Council (ECFRPC)** serves as the regional planning body for Volusia County and for the city of Ormond Beach. ECFRPC 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 **Northeast Florida Regional Planning Council** serves as the regional planning body for Flagler County and performs the same functions as the ECFRPC.

The **Florida Inland Navigation District (FIND)** was created by the Florida Legislature in 1927. The legislature authorized FIND to purchase the existing Florida Coastal Canal, to convey it to the United States, and to perform other conditions imposed by the federal government.

The District's primary function has been to provide the cooperation which the United States requires as a prerequisite to federal waterway improvements. The federal government and the State both act through FIND, whereby the United States agrees to construct and maintain the Intracoastal Waterway (ICW) through the Army Corps of Engineers and FIND agrees to furnish it, free of cost, the necessary rights-of-way and areas for the deposit of dredged material in connection with subsequent maintenance.

The 1985 Florida Legislature enacted Section 374.976 F.S. which recognized "the continuing need for inland navigation districts to undertake programs necessary to accomplish the purposes of construction, maintenance, and operation of Florida's inland waterways." Each inland navigation district, except the district created pursuant to Section 374.301 F.S. is empowered and authorized to undertake programs intended to alleviate the problems associated with its waterway or waterways. FIND may act as a local interest sponsor for any project designated as a "Section 107, River and Harbor Act of 1960" project; sponsor or participate financially or otherwise, in beach renourishment projects, provided that any such project is a benefit to public navigation in the district; sponsor or furnish assistance and financial support, including grants, to local governments within the district for planning and carrying out public navigation, public recreation, and boating safety projects, whether waterway-wide or of a purely local nature.

In 1991 the Florida legislature enacted Section 374.977 F.S. which provided FIND with the responsibility of posting and maintaining signs for manatee protection along the East Coast of Florida.

D. LOCAL AGENCIES

The Tomoka Marsh Aquatic Preserve spans two counties (Flagler and Volusia) and two municipalities, all of which have areas of jurisdiction within the Tomoka Marsh Aquatic Preserve and zoning regulations over the adjacent uplands. The municipalities include the city of Ormond Beach and the city of Flagler Beach. Appendix D lists those ordinances, both proposed and passed by these local governments, that relate to the management and protection of resources within the aquatic preserve.

Volusia County regulates estuarine waters through the imposition of minimum standards for stormwater runoff and wetland protection. The County Building Department is responsible for permitting seawalls, revetments, and docks in the unincorporated areas of the county. The Department of Environmental Management performs surface water quality monitoring and is in the process of attaining a Quality Assurance Quality Control certificate for its water quality testing program from the state, to make water quality test results defensible to any challenges. This certificate will ensure that sampling and testing are performed consistently, which will facilitate accurate comparison of different study results. The Sheriff's Department patrols the County's waterways ensuring boater safety, enforcing the laws of the state, assisting boaters, and watching for pollution and safety problems.

The **Halifax River Task Force (HRTF)** was created by the Volusia County Council to address resource management issues associated with the Halifax River and its tributaries. The HRTF is comprised of representatives from local and state

government, environmental groups and interested citizens. Individual members serve on a number of subcommittees which address specific topics in detail. Subcommittees include government regulation, water quality, waterflow and shoreline, environmental education, public awareness/special events, estuarine ecology and adopt-a-shore. The HRTF seeks solutions to water quality and stormwater management problems, sponsors river clean-ups, environmental education and river awareness events, and works for the general improvement of the Halifax River and its tributaries.

The **East Volusia Mosquito Control District (EVMCD)** surveys and controls mosquitoes within Volusia County. EVMCD operates under the authority and procedures established by Chapter 388, F.S., and is governed by the Volusia County Council. Flagler County contracts with EVMCD for the provision of certain inspections and aerial spraying within Flagler County. EVMCD also assists the city of Ormond Beach by providing information regarding appropriate stormwater retention/ detention facility design. The EVMCD is also responsible for maintaining existing mosquito control structures and ditches and spraying to control mosquitoes. The EVMCD practices open marsh water management techniques.

The **Ponce DeLeon Inlet and Port Authority** undertakes a number of projects which both affect and monitor estuarine water quality as well as projects to affect the recreational use of the estuary.

The **Volusia Land Trust (VOLT)** is a nonprofit landholding trust recognized as a public charity under federal tax law. VOLT is governed by an eight-member board of trustees. The VOLT property is comprised of 2582 acres of saltmarsh with adjacent bottom land hammock land which extends to the west side of the lower Tomoka River and the Tomoka Basin northward to Bulow State Park, abutting the Tomoka Marsh Aquatic Preserve. This property was donated by the Bellemead Corporation in 1984 and is intended to become a part of the State park system.

The city of Ormond Beach Department of Engineering, the Department of Public Utilities, Department of Parks and Beautification, and the Building Department all affect estuarine waters. The engineering and Public Utilities Departments affect the estuarine waters of the Halifax and Tomoka rivers through their jurisdiction over drainage, streets, and the wastewater treatment plant. The Engineering Department also has jurisdiction over clearing, grading, excavating, and filling, all of which potentially affect estuarine surface water quality. The Engineering Department will begin monitoring surface water quality in the Halifax River, the Tomoka River, and certain tributaries. The Parks and Beautification Department is responsible for litter control, which affects the surface water quality, aesthetics, as well as fish and wildlife. The Building Department is charged with enforcing city ordinances.

Flagler County regulates estuarine waters through the imposition of minimum standards for stormwater runoff and wetland protection. The County Building Department is responsible for permitting seawalls, revetments, and docks in the unincorporated areas of the county.

TABLE 2: MANAGEMENT COORDINATION NETWORK

LOCAL 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

STATE 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

REGIONAL AGENCIES

RPC	Regional Planning Council
WMD	Water Management Districts
FIN	Florida Inland Navigation District

FEDERAL AGENCIES

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	SWC	RPC	WMD	FIN	DAC	DCA	DER	DNR	GFC	HRS	DOS	DOT	FMP	FSG	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 IX

STAFFING AND FISCAL NEEDS

Historically, the Aquatic Preserve Program has been largely dependant on federal coastal zone grant funds for the development of management plans, with very little of this funding allocated toward staffing. Consequently, the number of both field positions and central office positions have been limited. Since 1986, funding from the Florida Legislature for the Aquatic Preserve Program has also been limited. In order to provide effective management and protection of the resources of Tomoka Marsh Aquatic Preserve, adequate funding for staff and operational costs is required.

The Tomoka Marsh Aquatic Preserve is currently managed as a regional unit of the Central Florida Aquatic Preserve Program. The regional office oversees the management objectives for the Wekiva River Aquatic Preserve, and the St. Johns River aquatic preserve segment. With limited funding, a regional management approach is more economical in that it provides maximum utility of vehicles, boats and administrative assistance. At the present time there is one permanent (FTE) and five temporary (OPS) positions in the program. All OPS positions are funded by a DER Pollution Recovery Trust Fund Grant. DER funded staff are responsible for meeting the special project requirements of the grant. Of the five OPS positions, four are field positions, and one position has both field and administrative duties.

Currently, there is no legislative funding for additional staffing for the aquatic preserves located in central Florida. These aquatic preserves are located in a rapidly growing region, with numerous complex issues related to growth management, water quality, and resource protection. At the present time, only minimal additional equipment is needed, but additional staff is required to adequately address the numerous resource management issues associated with the preserves. The Wekiva, St. Johns, Tomoka and Halifax rivers are amongst the most heavily used recreational water ways in Central Florida. At minimum one law enforcement officer should be assigned to this region. It is anticipated that one additional full time biological position, one full time administrative assistant, and one law enforcement officer would provide the minimum staffing to adequately manage these aquatic preserves. An annual review of the program tasks accomplished (Chapter VII) would help to determine if this staffing estimate is adequate to meet the legislative intent of the program.

A budget covering projected staff time, equipment, travel and other expenses for the central Florida aquatic preserves, which would include Tomoka Marsh Aquatic Preserve, is provided in Table 3. The proposed budget is required to fulfill the short range needs of the preserve as described in this management plan, and accomplish the Department goal of on-site management for all aquatic preserves by 1991, as expressed in the Agency Functional Plan.

TABLE 3

PROPOSED 2 YEAR BUDGET TO MEET STAFFING NEEDS FOR TOMOKA MARSH AQUATIC PRESERVE AND OTHER REGIONAL AQUATIC PRESERVES IN CENTRAL FLORIDA

SALARY	1st YEAR	2nd YEAR
ES II (with benefits)	$ 33,836	34,851
Law Enf. Off. (with benefits)	20,940	21,600
Adm. Asst. (with benefits)	17,255	17,773
Subtotal	$ 89,286	74,224
OPERATING CAPITAL OUTLAY		
Office equipment	$ 3,500	1,000
Computer	2,600	
Subtotal	$ 6,100	1,000
OPERATING EXPENSES		
Office,gas,phone, etc.	$ 5,000	7,000
Law Enforcement equipment	7,500	9,000
TOTAL COST	**$ 107,886**	**91,224**

CHAPTER X

RESOURCE AND PROGRESS MONITORING PROGRAM

To ensure that this 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 Tomoka Marsh 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) is highly recommended. 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.

Until such time as a GIS system is available for this unit, staff will rely on interpretation of historical and current aerial photography and on-site inspection and monitoring. On-site field data collections will include the periodic inventory, compilation, and analysis of temporal and spatial data concerning the present state of the natural resources within the preserve. Cooperation and information sharing with other agencies processing similar data will also be undertaken.

B. PROGRESS MONITORING

For this management plan to be effectively implemented, it is necessary to monitor the accomplishments and progress of the Tomoka Marsh 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 VII. This information, to be submitted in a report once every three years to the Bureau Chief, will include an update of the biological resources' status within the preserve, or within various segments of 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, or other available data, document the status of each biological resource (e.g.,submerged grasses 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 VII.

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 IX can be made.

3. Any new goals and/or objectives will be reflected in an update of Chapter VII.

BIBLIOGRAPHY

Anderson and Price. 1900. The Walks, Drives and Sails of Ormond. Ormond, Florida.

Barnett, B.S., R.T. Fernald, A. Goetzfried, and S.R. Lan. 1980. "The Fish and Wildlife Resources of the Charlotte Harbor area." Office of Environmental Services, Florida Game and Fresh Water Fish Commission, Vero Beach, Florida.

Briley-Wild and Associates. 1989. "City of Ormond Beach Wastewater Treatment Plant Effluent Reuse System." OB 89114-2R.

Brothers, Mike. undated article. "The Ormond Beach Mound."

Brown, Mark, Schaefer, Joseph, and Brandt, Karla. 1989. Buffer Zones For Water, Wetlands and Wildlife In The East Central Florida Region. Center For Wetlands, University of Florida, Gainesville, Florida.

Brown, Robin C. 1988. Florida's Fossils, Guide to Location, Identification and Enjoymnent. Pineapple Press, Sarasota, Florida.

Cowardin, Lewis M., Carter, Virginia, Golet, Francis C., and LaRoe, Edward T. undated. Classification of Wetlands and Deepwater Habitats of the United States. U. S. Fish and Wildlife Service, U. S. Geological Survey, University of Rhode Island, and National Oceanic and Atmospheric Administration.

C. Vargas & Associates. 1988. "Volusia County Coastal Management Element Subtasks 4.1 And 4.2 Working Papers."

Daniel, R., F. Sicius, D. Ferro. 1980. "An Archaeological and Historic Survey of the Proposed Halifax Plantation Development, Volusia and Flagler Counties". Florida Department of State, Bureau of Historic Sites and Properties. Tallahassee, Florida.

Dawes, C.J. 1981. Marine Algae of the West Coast of Florida. University of Miami Press, Coral Gables, Florida.

Department of Environmental Regulation. 1991. "Report to the Environmental Regulation Commission on the Proposed Designation of Tomoka River & Spruce Creek as Outstanding Florida Waters." prepared by the Bureau of Surface Water Management, Department of Environmental Regulation. Tallahassee, Florida.

Department of Environmental Regulation. undated material. "The Water's Edge, A Guide to Florida's Coastal Management Program." Prepared by The Citizen Committee on Florida's Coastal Management, written and produced by Wilderness Graphics, Inc. for the Department of Environmental Regulation. Tallahassee, Florida.

Department of Natural Resources. 1989. Florida's Rivers Assessment. Tallahassee, Florida.

Department of Natural Resources. 1987. "Letting Snook Off The Hook." Tallahassee, Florida.

Department of Natural Resources. 1990. "Tomoka State Park Unit Management Plan, Division Draft." Tallahassee, Florida.

Eiseman, N.J., and M.C. Benz. 1975. "Marine Algae of the Indian River. I." Species of algal drift community collected from April 1974 to April 1975. Tech. Rep.1, Harbor Branch Foundation, Fort Pierce, Florida.

Flagler County Planning Department. 1988. "Comprehensive Plan, Coastal Management."

Flagler County Planning Department. 1987. "Comprehensive Plan, Conservation Element."

Flagler County Planning Department. 1989. "Comprehensive Plan, Future Land Use Element."

Flagler County Planning Department. 1989. "Comprehensive Plan, Intergovernmental Coordination Eleme Element."

Gilbrook, Michael J. and Gisondi, Elizabeth. 1989. "Guide To Listed Species In The East Central Florida Region." East Central Florida Regional Planning Council, Winter Park, Florida.

Gilbrook, Michael J. 1989. "Marina Siting In The Coastal Estuaries Of East Central Florida." contract CZM 200, East Central Florida Regional Planning Council, Winter Park, Florida.

Hine, Albert C. 1988. "Evaluation Of The Volusia County Coastline: Dominant Processes, Shoreline Change, Stabilization Efforts, And Recommendations For Beach Management." University of South Florida, St. Petersburg, Florida.

Magley, Wayne. 1989. "Halifax River (Volusia County) Supplemental Water Quality Data, Water Quality Technical Series Volume 3, Number 21, Department of Environmental Regulation, Tallahassee, Florida.

Marsh, William. 1978. Environmental Analysis For Land Use And Site Planning. McGraw-Hill Book Company, New York.

Nybakken, J. W.. 1982. Marine Biology, An Ecological Approach. Harper & Row Publishers, Inc., New York.

Ormond Beach Planning Department. 1990. "Coastal Management Element, Year 2010 Comprehensive Plan, City of Ormond Beach, Florida."

Ormond Beach Planning Department. 1990. "Conservation Element, Year 2010 Comprehensive Plan, City of Ormond Beach, Florida."

Ormond Beach Planning Department. 1990. "Cultural Affairs, Recreation and Open Space Element, Year 2010 Comprehensive Plan, City of Ormond Beach, Florida."

Ormond Beach Planning Department. 1988. "Estuaries, Background Working Paper, Year 2010 Comprehensive Plan."

Ormond Beach Planning Department. 1988. "Fish & Wildlife, Background Working Paper, Year 2010 Comprehensive Plan."

Ormond Beach Planning Department. 1990. "Future Land Use Element, Year 2010 Comprehensive Plan, City of Ormond Beach, Florida."

Ormond Beach Planning Department. 1990. "Intergovernmental Coordination Element, Year 2010 Comprehensive Plan, City of Ormond Beach, Florida."

Ormond Beach Planning Department. 1988. "Mining And Minerals, Background Working Paper, Year 2010 Comprehensive Plan."

Ormond Beach Planning Department. 1988. "The Halifax River, Background Working Paper, Year 2010 Comprehensive Plan."

Ormond Beach Planning Department. 1988. "The Tomoka River, Background Working Paper, Year 2010 Comprehensive Plan."

Ormond Beach Planning Department. 1990. "Utilities Element, Year 2010 Comprehensive Plan, City of Ormond Beach, Florida."

Russell & Axon, Engineers-Planners-Architects, Inc. and Briley-Wild & Associates, Consulting Engineers. 1980. "North Coastal Volusia County, 201 Facilities Plan." prepared by Russell & Axon and Briley-Wild for Daytona Beach, Daytona Beach Shores, Holly Hill, Ormond Beach, Port Orange, Sounth Daytona, and The Town of Ponce Inlet. EPA Project No. C-120620010.

Russo, Michael, Ballo, J. R., Austin, R. J., Newsom, Lee, Scudder, Sylvia, and Rowland, Vicki. 1989. "Phase II Archaeological Excavations At The Riverbend Site (8V02567), Volusia County, Florida." prepared by Piper Archaeological Research, Inc. for Charles Burkett & Associates, St. Petersburg, Florida.

Salvesen, David. 1990. Wetlands, Regulating and Mitigating Development Impacts. The Urban Land Institute, Washington, D. C.

Schropp, S. J. and Windom. 1988. "A Guide To The Interpretation Of Metal Concentrations In Estuarine Sediments." Coastal Management Section of the Department of Environmental Regulation and Skidaway Institute of Oceanography, Tallahassee, Florida.

So, Frank, Stollman, Israel, Beal, Frank, and Arnold, David. C. 1979. The Practice of Local Government Planning. The International City Management Association, Washington, D. C.

Strickland, Alice. undated. The Valiant Pioneers, A History of Ormond Beach, Volusia County, Florida. sponsored by the Volusia County Historical Commission, the Board of County Commissioners, Volusia County, and the Ormond Beach Historical Society.

U. S. Department of Agriculture. 1980. "Soil Survey of Volusia County, Florida."

U. S. Fish and Wildlife Service. 1989. "The Florida Manatee (Trichechus manatus latirostris) Recovery Plan." prepared by the Florida Manatee Recovery Team, for the U. S. Fish and Wildlife Service, Atlanta, Georgia.

Volusia Council of Governments. 1974. "Stormwater Management, Phase I, Volusia County, Florida." Contract No. CPA-FL-04291039, Report No. SMVCF-PI-74-04.

Volusia Council of Governments. 1978. "208 Water Quality Management Program."

Volusia County Historical Commission. 1955. Centennial History of Volusia County, Florida, 1854-1954. edited by Ianthe B. Habel for the Volusia County Historical Commission. College Publishing Company, Daytona Beach, Florida.

Volusia County Planning And Zoning Department. 1989. "Future Land Use Support Document."

Volusia County Planning And Zoning Department. 1989. "The Volusia County Comprehensive Plan."

Volusia County Planning And Zoning Department. 1987. "North Peninsula Study Area 2A."

Volusia-Flagler Sierra Group. 1989. "Petition For The Designation of Tomoka River, Volusia County As Outstanding Florida Waters (revised).

Yaro, Robert D., Arendt, Randall G., Dodson, Harry L., and Brabec, Elizabeth A. Dealing With Change in the Connecticut River Valley: A Design Manual for Conservation and Development. Lincoln Institute of Land Policy and the Environmental Law Foundation.

Zieman, J.C. 1980. "Methods and Rates of Productivity in Seagrasses", in: R.C. Phillips and C.P. McRoy eds. Handbook of Seagrass Biology. Garland STMP Presss, New York. pp. 87-116.

Zieman, J.C. 1982. The Ecology of the Seagrasses of South Florida: A Community Profile. FWS/OBS-82/25, U.S. Fish and Wildlife Service, Office of Biological Servies, Washington, D.C.

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 to navigable waters; L. 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), FS.

18. Estero 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. Cockroach 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

designed so that the structure or structures to be built in, on or over sovereignty lands are limited to structures necessary to conduct water dependent activities.

(g) For activities listed in paragraphs 18-20.004(1)(c)7., 8., 9. and 10. above, it must be demonstrated that no other reasonable alternative exists which would allow the proposed activity to be constructed or undertaken outside the preserve.

(h) The use of state-owned lands for the purpose of providing private or public road access to islands where such access did not previously exist shall be prohibited. The use of state-owned lands for the purpose of providing private or public water supply to islands where such water supply did not previously exist shall be prohibited.

(i) Except for public navigation projects and maintenance dredging for existing channels and basins, any areas dredged to improve or create navigational access shall be incorporated into the preempted area of any required lease or be subject to the payment of a negotiated private easement fee.

(j) Private residential multi-slip docking facilities shall require a lease.

(k) Aquaculture and beach renourishment activities which comply with the standards of this rule chapter and Chapter 18-21, Florida Administrative Code, may be approved by the board, but only subsequent to a formal finding of compatibility with the purposes of Chapter 258, Florida Statutes, and this rule chapter.

(l) Other uses of the preserve, or human activity within the preserve, although not originally contemplated, may be approved by the board, but only subsequent to a formal finding of compatibility with the purposes of Chapter 258, Florida Statutes, and this rule chapter.

(2) PUBLIC INTEREST ASSESSMENT CRITERIA

In evaluating requests for the sale, lease or transfer of interest, a balancing test will be utilized to determine whether the social, economic and/or environmental benefits clearly exceed the costs.

(a) GENERAL BENEFIT/COST CRITERIA:

1. any benefits that are balanced against the costs of a particular project shall be related to the affected aquatic preserve;

2. in evaluating the benefits and costs of each request, specific consideration and weight shall be given to the quality and nature of the specific aquatic preserve. Projects in the less developed, more pristine aquatic preserves such as Apalachicola Bay shall be subject to a higher standard than the more developed urban aquatic preserves such as Boca Ciega Bay; and,

3. for projects in aquatic preserves with adopted management plans, consistency with the management plan will be weighed heavily when determining whether the project is in the public interest.

(b) BENEFIT CATEGORIES:

1. public access (public boat ramps, boatslips, etc.);

2. provide boating and marina services (repair, pumpout, etc.);

3 improve and enhance public health, safety, welfare, and law enforcement;

4. improved public land management;

5. improve and enhance public navigation;

6. improve and enhance water quality;

7. enhancement/restoration of natural habitat and functions; and

8. improve/protect endangered/threatened/unique species.

(c) COSTS:

1. reduced/degraded water quality;

2. reduced/degraded natural habitat and function;

3. destruction, harm or harassment of endangered or threatened species and habitat;

4. preemption of public use;

5. increasing navigational hazards and congestion;

6. reduced/degraded aesthetics; and

7. adverse cumulative impacts.

(d) EXAMPLES OF SPECIFIC BENEFITS:

1. donation of land, conservation easements, restrictive covenants or other title interests in or contiguous to the aquatic preserve which will protect or enhance the aquatic preserve;

2. providing access or facilities for public land management activities;

3. providing public access easements and/or facilities, such as beach access, boat ramps, etc.;

4. restoration/enhancement of altered habitat or natural functions, such as conversion of vertical bulkheads to riprap and/or vegetation for shoreline stabilization or re-establishment of shoreline or submerged vegetation;

5. improving fishery habitat through the establishment of artificial reefs or other such projects, where appropriate;

6. providing sewage pumpout facilities where normally not required, in particular, facilities open to the general public;

7. improvements to water quality such as removal of toxic sediments, increased flushing and circulation, etc.;

8. providing upland dry storage as an alternative to wetslip; and

9. marking navigation channels to avoid disruption of shallow water habitats.

(3) RESOURCE MANAGEMENT

(a) All proposed activities in aquatic preserves having management plans adopted by the Board must demonstrate that such activities are consistent with the management plan.

(b) No drilling of oil, gas or other such wells shall be allowed.

(c) 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 grass beds and do not interfere with traditional public uses.

(d) Spoil disposal within the preserves shall be strongly discouraged and may be approved only

structures shall be constructed and located in a manner that will cause minimal disturbance to submerged land resources such as oyster bars and submerged grass beds and do not interfere with traditional public uses.

(d) Spoil disposal within the preserves shall be strongly discouraged and may be approved only where the applicant has demonstrated that there is no other reasonable alternative and that activity may be beneficial to, or at a minimum, not harmful to the quality and utility of the preserve.

(4) RIPARIAN RIGHTS

(a) None of the provisions of this rule shall be implemented in a manner that would unreasonably infringe upon the traditional, common law and statutory riparian rights of upland riparian property owners adjacent to sovereignty lands.

(b) The evaluation and determination of the reasonable riparian rights of ingress and egress for private, residential multi-slip docks shall be based upon the number of linear feet of riparian shoreline.

(c) For the purposes of this rule, a private, residential, single docking facility which meets all the requirements of Rule 18-20.004(5) shall be deemed to meet the public interest requirements of Rule 18-20.004(1)(b), Florida Administrative Code. However, the applicants for such docking facilities must apply for such consent and must meet all of the requirements and standards of this rule chapter.

(5) STANDARDS AND CRITERIA FOR DOCKING FACILITIES

(a) All docking facilities, whether for a single or multi-slip residential or commercial, shall be subject to the following standards and criteria:

1. no dock shall extend waterward or the mean or ordinary high water line more than 500 feet or 20 percent of the width of the waterbody at that particular location whichever is less;

2. certain docks may fall within areas of special or unique importance. These areas may be of significant biological, scientific, historic and/or aesthetic value and require special management considerations. Modifications may be more restrictive than the normally accepted criteria. Such modifications shall be determined on a case-by-case analysis, and may include, but shall not be limited to changes in location, configuration, length, width and height;

3. the number, lengths, drafts and types of vessels allowed to utilize the proposed facility may also be stipulated; and

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

(b) Private residential single docks shall conform to the following specific design standards and criteria:

1. any main access dock shall be limited to a maximum width of four (4) feet;

2. the dock decking design and construction will insure maximum light penetration, with full consideration of safety and practicality;

3. the dock will extend out from the shoreline no further than to a maximum depth of minus four (−4) feet (mean low water);

4. when the water depth is minus four (−4) feet (mean low water) 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, when necessary, shall be designed to allow for maximum water circulation and shall be built in such a manner as to be part of the dock structure;

6. terminal platform size shall be no more than 160 square feet; and

7. dredging to obtain navigable water depths in conjunction with private residential, single dock applications is strongly discouraged.

(c) 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 waterbody 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 use 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/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 Area 1 or 2, except as allowed pursuant to Section 258.42(3)(e)1., Florida Statutes, while dredging in Resource Protection Area 3 shall be strongly discouraged;

3. docking facilities shall only be approved in locations having adequate existing water depths in the boat mooring, turning basin, access channels, and other such areas which will accommodate the proposed boat use in order to insure that a minimum of one foot clearance is provided between the deepest draft of a vessel and the bottom at mean low water;

4. main access docks and connecting or cross walks shall not exceed six (6) feet in width;

5. terminal platforms shall not exceed eight (8) feet in width;

6. finger piers shall not exceed three (3) feet in width, and 25 feet in length;

7. pilings may be utilized as required to provide adequate mooring capabilities; and

8. the following provisions of Rule 18-20.004(5)(d) shall also apply to private residential multi-slip docks.

(d) Commercial, industrial and other revenue generating/income related docking facilities shall conform to the following specific design standards and criteria:

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 be prohibited in Resource Protection Area 1 or 2, except as allowed pursuant to Sections 258.42(3)(e)1., Florida Statutes; while dredging in Resource Protection Area 3 shall be strongly discouraged;

3. the docking facilities shall not be located in Resource Protection Area 1 or 2; however, main access docks may be allowed to pass through Resource Protection Area 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;

4. beginning July 1, 1986 new docking facilities may obtain a lease only where the local governments have an adopted marina plan and/or policies dealing with the siting of commercial/industrial and private, residential, multi-slip docking facilities in their local government comprehensive plan;

5. the siting of the docking facilities shall also take into account the access of the boat traffic to avoid marine grassbeds or other aquatic resources in the surrounding areas;

6. the siting of new facilities within the preserve shall be secondary to the expansions of existing facilities within the preserve when such expansion is consistent with the other standards;

7. the location of new facilities and expansion of existing facilities shall consider the use of upland dry storage as an alternative to multiple wet-slip docking;

8. marina siting will be coordinated with local governments to insure consistency with all local plans and ordinances;

9. marinas shall not be sited within state designated manatee sanctuaries; and

10. in any areas 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.

(e) Exceptions to the standards and criteria listed in Rule 18-20.004(5), Florida Administrative Code, may be considered, but only upon demonstration by the applicant that such exceptions are necessary to insure reasonable riparian ingress and egress.

(6) MANAGEMENT AGREEMENTS

The board may enter into management agreements with local agencies for the administration and enforcement of standards and criteria for private residential single docks.

(7) In addition to the policies, standards and criteria delineated in subsections (1) through (6), the provisions of the following management plans apply to specific aquatic preserves and are incorporated herein by reference. Where regulatory criteria in 18-20, F. A. C., may differ with specific policies in the management plans listed herein, the general rule criteria shall prevail.

	Date Adopted
Alligator Harbor	September 23, 1986
Banana River	September 17, 1985
Cockroach Bay	April 21, 1987
Estero Bay	September 6, 1983
Charlotte Harbor (Cape Haze, Gasparilla Sound-Charlotte Harbor, Matlacha Pass and Pine Island Sound)	May 18, 1983
Indian River-Malabar to Vero Beach	January 21, 1986
Indian River Lagoon (Vero Beach to Fort Pierce and Jensen Beach to Jupiter Inlet)	January 22, 1985
Loxahatchee River-Lake Worth Creek	June 12, 1984
Nassau River-St. Johns River Marshes and Fort Clinch State Park	April 22, 1986
North Fork of the St. Lucie River	May 22, 1984
St. Joseph Bay	June 2, 1987
St. Martins Marsh	September 9, 1987
Terra Ceia	April 21, 1987
Wekiva River	August 25, 1987

Specific Authority 258.43(1) FS. Law Implemented 258.41, 258.42, 258.43(1), 258.44 FS. History—New 2-25-81, Amended 8-7-85, Formerly 16Q-20.004, Transferred from 16Q-20.004, Amended 9-4-88.

18-20.005 Uses, Sales, Leases, or Transfer of Interests in Lands, or Materials, Held by the Board.

Specific Authority 258.43(1) FS. Law Implemented 253.02, 253.12, 258.42 FS. History—New 2-25-81, Repealed 8-7-85, Formerly 16Q-20.05, Transferred from 16Q-20.005.

18-20.006 Cumulative Impacts. In evaluating applications for activities within the preserves or which may impact the preserves, the department recognizes that, while a particular alteration of the preserve may constitute a minor change, the cumulative effect of numerous such changes often results in major impairments to the resources of the preserve. Therefore, the department shall evaluate a particular site for which the activity is proposed with the recognition that the activity may, in conjunction with other activities adversely affect the preserve which is part of a complete and interrelated system. The impact of a proposed activity shall be considered in light of its cumulative impact on the preserve's natural system. The department shall include as a part of its evaluation of an activity:

(1) The number and extent of similar human actions within the preserve which have previously affected or are likely to affect the preserve, whether considered by the department under its current authority or which existed prior to or since the enactment of the Act; and

(2) The similar activities within the preserve

which are currently under consideration by the department; and

(3) Direct and indirect effects upon the preserve and adjacent preserves, if applicable, which may reasonably be expected to result from the activity; and

(4) The extent to which the activity is consistent with management plans for the preserve, when developed; and

(5) The extent to which the activity is permissible within the preserve in accordance with comprehensive plans adopted by affected local governments, pursuant to section 163.3161, F.S., and other applicable plans adopted by local, state, and federal governmental agencies;

(6) The extent to which the loss of beneficial hydrologic and biologic functions would adversely impact the quality or utility of the preserve; and

(7) The extent to which mitigation measures may compensate for adverse impacts.

Specific Authority 258.43(1) FS. Law Implemented 258.36, 258.43, 258.44 FS. History—New 2-25-81. Formerly 16Q-20.06, Transferred from 16Q-20.006.

18-20.007 Protection of Riparian Rights.

Specific Authority 258.43(1) FS. Law Implemented 258.123, 258.124(8), 258.44 FS. History—New 2-25-81, Repealed 6-7-85, Formerly 16Q-20.07, Transferred from 16Q-20.007.

18-20.008 Inclusion of Lands, Title to Which Is Not Vested in the Board, in a Preserve.

(1) Lands and water bottoms which are within designated aquatic preserve boundaries, or adjacent thereto and which are owned by other governmental agencies, may be included in an aquatic preserve upon specific authorization for inclusion by an appropriate instrument in writing executed by the agency.

(2) Lands and water bottoms which are within designated aquatic preserve boundaries or adjacent thereto, and which are in private ownership, may be included in an aquatic preserve upon specific authorization for inclusion by an appropriate instrument in writing executed by the owner.

(3) The appropriate instrument shall be either a dedication in perpetuity, or a lease. Such lease shall contain the following conditions:

(a) The term of the lease shall be for a minimum period of ten years.

(b) The board shall have the power and duty to enforce the provisions of each lease agreement, and shall additionally have the power to terminate any lease if the termination is in the best interest of the aquatic preserve system, and shall have the power to include such lands in any agreement for management of such lands.

(c) The board shall pay no more than $1 per year for any such lease.

Specific Authority 258.43(1) FS. Law Implemented 258.40, 258.41 FS. History—New 2-25-81, Formerly 16Q-20.08, Transferred from 16Q-20.008.

18-20.009 Establishment or Expansion of Aquatic Preserves.

(1) The board may expand existing preserves or establish additional areas to be included in the aquatic preserve system, subject to confirmation by the legislature.

(2) The board may, after public notice and public hearing in the county or counties in which the proposed expanded or new preserve is to be located, adopt a resolution formally setting aside such areas to be included in the system.

(3) The resolution setting aside an aquatic preserve area shall include:

(a) A legal description of the area to be included. A map depicting the legal description shall also be attached.

(b) The designation of the type of aquatic preserve.

(c) A general statement of what is sought to be preserved.

(d) A statement that the area established as a preserve shall be subject to the management criteria and directives of this chapter.

(e) A directive to develop a natural resource inventory and a management plan for the area being established as an aquatic preserve.

(4) Within 30 days of the designation and establishment of an aquatic preserve, the board shall record in the public records of the county or counties in which the preserve is located a legal description of the preserve.

Specific Authority 258.43(1) FS. Law Implemented 258.41 FS. History—New 2-25-81, Formerly 16Q-20.09, Transferred from 16Q-20.009.

18-20.010 Exchange of Lands. The board in its discretion may exchange lands for the benefit of the preserve, provided that:

(1) In no case shall an exchange result in any land or water area being withdrawn from the preserve; and

(2) Exchanges shall be in the public interest and shall maintain or enhance the quality or utility of the preserve.

Specific Authority 258.43(1) FS. Law Implemented 258.41(5), 258.42(1) FS. History—New 2-25-81, Formerly 16A-20.10, Transferred from 16Q-20.010.

18-20.011 Gifts of Lands. The board in its discretion may accept any gifts of lands or interests in lands within or contiguous to the preserve to maintain or enhance the quality and utility of the preserve.

Specific Authority 258.43(1) FS. Law Implemented 258.42(5) FS. History—New 2-25-81, Formerly 16Q-20.11, Transferred from 16Q-20.011.

18-20.012 Protection of Indigenous Life Forms. The taking of indigenous life forms for sale or commercial use is prohibited, except that this prohibition shall not extend to the commercial taking of fin fish, crustacea or mollusks, except as prohibited under applicable laws, rules or regulations. Members of the public may exercise their rights to fish, so long as not contrary to other statutory and regulatory provisions controlling such activities.

Specific Authority 258.43(1) FS. Law Implemented 258.43(1) FS. History—New 2-25-81, Formerly 16Q-20.12, Transferred from 16Q-20.012.

18-20.013 Development of Resource Inventories and Management Plans for Preserves.

(1) The board authorizes and directs the division to develop a resource inventory and management plan for each preserve.

(2) The division may perform the work to develop the inventories and plans, or may enter into agreements with other persons to perform the work. In either case, all work performed shall be subject to board approval.

Specific Authority 258.43(1) FS. Law Implemented 253.03(7), 253.03(8) FS. History—New 2-25-81, Amended 6-7-85, Formerly 16Q-20.13, Transferred from 16Q-20.013.

18-20.014 Enforcement. The rules shall be enforced as provided in Section 258.46.

Specific Authority 258.43(1) FS. Law Implemented 258.46 FS. History—New 2-25-81, Formerly 16Q-20.14, Transferred from 16Q-20.014.

18-20.015 Application Form.

Specific Authority 253.43(1) FS. Law Implemented 258.43 FS. History—New 2-25-81, Repealed 6-7-85, Formerly 16Q-20.15, Transferred from 16Q-20.015.

18-20.016 Coordination with Other Governmental Agencies. Where a Department of Environmental Regulation permit is required for activities on sovereignty lands the department will coordinate with the Department of Environmental Regulation to obtain a copy of the joint Department of Army/Florida Department of Environmental Regulation permit application and the biological survey. The information contained in the joint permit application and biological assessment shall be considered by the department in preparing its staff recommendations to the board. The board may also consider the reports of other governmental agencies that have related management or permitting responsibilities regarding the proposed activity.

Specific Authority 253.43(1) FS. Law Implemented 258.43 FS. History—New 2-25-81, Formerly 16Q-20.16, Transferred from 16Q-20.016.

18-20.017 Lake Jackson Aquatic Preserve. In addition to the provisions of Rules 18-20.001 through 18-20.016, the following requirements shall also apply to all proposed activities within the Lake Jackson Aquatic Preserve. If any provisions of this Rule are in conflict with any provisions of Rules 18-20.001 through 18-20.016 or Chapter 73-534, Laws of Florida, the stronger provision for the protection or enhancement of the aquatic preserve shall prevail.

(1) No further sale, transfer or lease of sovereignty lands in the preserve shall be approved or consummated by the Board, except upon a showing of extreme hardship on the part of the applicant or when the board shall determine such sale, transfer or lease to be in the public interest.

(2) No further dredging or filling of sovereignty lands of the preserve shall be approved or tolerated by the Board of Trustees except:

(a) Such minimum dredging and spoiling as may be authorized for public navigation projects or for preservation of the lake according to the expressed intent of Chapter 73-534, Laws of Florida; and

(b) Such other alteration of physical conditions as may be necessary to enhance the quality or utility of the preserve.

(3) There shall be no drilling of wells, excavation for shell or minerals, and no erection of structures (other than docks), within the preserve, unless such activity is associated with activity authorized by Chapter 73-534, Laws of Florida.

(4) The Board shall not approve the relocations of bulkhead lines within the preserve.

(5) Notwithstanding other provisions of this act, the board may, respecting lands lying within the Lake Jackson basin:

(a) Enter into agreements for and establish lines delineating sovereignty and privately owned lands;

(b) Enter into agreements for the exchange and exchange sovereignty lands for privately owned lands;

(c) Accept gifts of land within or contiguous to the preserve.

Specific Authority 258.39(26) FS. Law Implemented 258.39(26), 258.43 FS. History—New 6-7-85, Formerly 16Q-20.017, Transferred from 16Q-20.017.

NOAA COASTAL SERVICES CENTER LIBRARY
3 6668 14104 0404