

## **APPENDICES**

**APPENDIX A**

**2010 COMPREHENSIVE PLAN'S RELATIONAL LISTING OF  
LAND USE CATEGORIES AND ZONING DISTRICTS**

<u>Land Use</u>	<u>Primary Zoning Districts</u>	<u>Secondary Zoning Districts</u>
<u>RESIDENTIAL LAND USES</u>		
RR (Rural Residential)	RR (Rural Residential) RLD-A (Resid. Low Density A) RLD-B (Resid. Low Density B)	CO (Commercial Office) CN (Commercial Neighborhood) AGR (Agriculture) PBF-1 (Public Bldgs. and Facilities 1) PBF-2 (Public Bldgs. and Facilities 2) CSV (Conservation) PUD (Planned Unit Development)
LDR (Low Density Residential)	RR (Rural Residential) RLD-A (Resid. Low Density A) RLD-B (Resid. Low Density B) RLD-C (Resid. Low Density C) RLD-D (Resid. Low Density D) RLD-E (Resid. Low Density E) RLD-F (Resid. Low Density F) RLD-G (Resid. Low Density G) RLD-MH (Resid. Low Density MH)	CO (Commercial Office) CN (Commercial Neighborhood) AGR (Agriculture) PBF-1 (Public Bldgs. and Facilities 1) PBF-2 (Public Bldgs. and Facilities 2) CSV (Conservation) PUD (Planned Unit Development)
MDR (Medium Density Resid.)	RLD-G (Resid. Low Density G) RLD-MH (Resid. Low Density MH) RMD-A (Resid. Medium Density A) RMD-B (Resid. Medium Density B) RMD-C (Resid. Medium Density C) RMD-D (Resid. Medium Density D) RMD-E (Resid. Medium Density E) RMD-MH (Resid. Medium Density MH)	CO (Commercial Office) CRO (Commercial, Residential, Office) CN (Commercial Neighborhood) AGR (Agriculture) PBF-1 (Public Bldgs. and Facilities 1) PBF-2 (Public Bldgs. and Facilities 2) CSV (Conservation) PUD (Planned Unit Development)
HDR (High Density Residential)	RMD-E (Resid. Medium Density E) RHD-A (Resid. High Density A) RHD-B (Resid. High Density B)	CN (Commercial Neighborhood) CCG-1 (Commercial Comm./General 1) CO (Commercial Office) CRO (Commercial, Residential, Office) PBF-1 (Public Bldgs. and Facilities 1) PBF-2 (Public Bldgs. and Facilities 2) CSV (Conservation) PUD (Planned Unit Development)

COMMERCIAL LAND USES

RPI (Residential-Professional-Institutional)	RMD-E (Resid. Medium Density E) CO (Commercial Office) CRO (Commercial, Residential, Office)	RLD-G (Resid. Low Density G) RLD-MH (Resid. Low Density MH) RMD-A (Resid. Medium Density A) RMD-B (Resid. Medium Density B) RMD-C (Resid. Medium Density C) RMD-D (Resid. Medium Density D) RMD-MH (Resid. Medium Density MH) AGR (Agriculture) CN (Commercial Neighborhood) PBF-1 (Public Bldgs. and Facilities 1) PBF-2 (Public Bldgs. and Facilities 2) CSV (Conservation) PUD (Planned Unit Development)
NC (Neighborhood Commercial)	CO (Commercial Office) CN (Commercial Neighborhood)	AGR (Agriculture) PBF-1 (Public Bldgs. and Facilities 1) PBF-2 (Public Bldgs. and Facilities 2) PUD (Planned Unit Development) CSV (Conservation)
CGC (Community/General Commercial)	CO (Commercial Office) CN (Commercial Neighborhood) PBF-2 (Public Bldgs. and Facil. 2) CCG-1 (Comm. Community/General 1) CCG-2 (Comm. Community/General 2)	AGR (Agriculture) PBF-1 (Public Bldgs. and Facilities 1) PBF-3 (Public Bldgs. and Facilities 3) PUD (Planned Unit Development) CSV (Conservation) ROS (Recreation and Open Space) IBP-1 (Industrial Business Park 1)
RC (Regional Commercial)	CCG-1 (Comm. Community/General 1) CR (Commercial Regional)	RHD-A (Residential High Density A) RHD-B (Residential High Density B) CRO (Comm., Residential & Office) CCG-2 (Comm. Community/General 2) IBP-1 (Industrial Business Park 1) PBF-1 (Public Bldgs. and Facilities 1) PBF-2 (Public Bldgs. and Facilities 2) PBF-3 (Public Bldgs. and Facilities 3) PUD (Planned Unit Development) CSV (Conservation)
CBD (Central Business District)	RMD-E (Resid. Medium Density E) RHD-A (Resid. High Density A) RHD-B (Resid. High Density B) CRO (Comm., Residential & Office) CCG-1 (Comm. Community/General 1) CCG-2 (Comm. Community/General 2) CCBD (Comm. Central Business District) IBP-1 (Industrial Business Park 1) IBP-2 (Industrial Business Park 2) IL (Industrial Light)	PBF-1 (Public Bldgs. and Facilities 1) PBF-2 (Public Bldgs. and Facilities 2) CSV (Conservation) PUD (Planned Unit Development)

INDUSTRIAL LAND USES

BP (Business Park)	IBP-1 (Industrial Business Park 1) IBP-2 (Industrial Business Park 2)	AGR (Agriculture) PBF-1 (Public Bldgs. and Facilities 1) PBF-2 (Public Bldgs. and Facilities 2) PUD (Planned Unit Development) CSV (Conservation)
LI (Light Industrial)	IBP-1 (Industrial Business Park 1) IBP-2 (Industrial Business Park 2) IL (Industrial Light) PBF-2 (Public Bldgs. and Facilities 2)	PBF-1 (Public Bldgs. and Facilities 1) PBF-3 (Public Bldgs. and Facilities 3) CCG-1 (Comm. Community/General 1) CCG-2 (Comm. Community/General 2) AGR (Agriculture) CSV (Conservation) PUD (Planned Unit Development)
HI (High Industrial)	IBP-2 (Industrial Business Park 2) IL (Industrial Light) IH (Industrial Heavy) PBF-1 (Public Bldgs. and Facilities 1) PBF-2 (Public Bldgs. and Facilities 2) PBF-3 (Public Bldgs. and Facilities 3)	CCG-1 (Comm. Community/General 1) CCG-2 (Comm. Community/General 2) AGR (Agriculture) CSV (Conservation) PUD (Planned Unit Development)
WD/WR (Water Dependent/ Water Related)	IW (Industrial Water)	PBF-1 (Public Bldgs. and Facilities 1) PBF-2 (Public Bldgs. and Facilities 2) PBF-3 (Public Bldgs. and Facilities 3) AGR (Agriculture) CSV (Conservation) PUD (Planned Unit Development)

OTHER LAND USES

CSV (Conservation)	CSV (Conservation)	ROS (Recreation and Open Space) AGR (Agriculture) PUD (Planned Unit Development)
AGR (Agriculture)	AGR (Agriculture) PBF-2 (Public Bldgs. and Facil. 2)	PBF-1 (Public Bldgs. and Facilities 1) PBF-3 (Public Bldgs. and Facilities 3) CSV (Conservation) PUD (Planned Unit Development)
PBF (Public Bldgs. and Facil.)	PBF-1 (Public Bldgs. and Facil. 1) PBF-2 (Public Bldgs. and Facil. 2) PBF-3 (Public Bldgs. and Facil. 3)	AGR (Agriculture) CSV (Conservation) PUD (Planned Unit Development)
ROS (Recreation & Open Space)	ROS (Recreation & Open Space)	PBF-1 (Public Bldgs. and Facil. 1) AGR (Agriculture) CSV (Conservation) PUD (Planned Unit Development)

**SOURCE: Jacksonville Planning and Development Department; May, 1992**

## APPENDIX B

### EXCERPTS FROM THE NORTHEAST FLORIDA COMPREHENSIVE REGIONAL POLICY PLAN

Regional Issue: Protection of Endangered Species

Regional Goal: 10.2.1 By 1991, prevent extinction and further reductions in the population size of endangered, threatened and species of special concern of plant and animal species that occur within the region.

Policies

- 10.2.1.1 Habitat of viable populations of threatened, endangered, or species of special concern of plants or animals should be protected for future generations. Animal species shall be referenced from the lists of U.S. Fish and Wildlife Service (USFWS) and Florida Game and Freshwater Fish Commission (FGFWFC) as published in the FGFWFC Official List of Endangered and Potentially Endangered Flora and Fauna in Florida. Plant species shall be referenced from the USFWS, categories UR1 and UR3. Silviculture and agriculture using BMPs, which specifically include practices for the protection of threatened, endangered, and listed species habitat consistent with this policy, should not be considered destruction of referenced species' habitat unless State or federal law otherwise provides. Habitat of viable populations referenced herein should be protected by local, regional, and State regulatory programs. These programs should include acquisition; or by creation of incentives such as exchange or transfer of development rights, waiver of zoning code requirements which, as an example, require setbacks of minimum numbers of parking spaces or granting of mitigation credit, if the credit would be acceptable to regulatory agencies and a regulatory strategy should be developed to accomplish this policy.
- 10.2.1.2 Development proposed adjacent to Outstanding Florida Waters, wildlife sanctuaries, wildlife refuges, national forests, state preserves, parks, gardens, sanctuaries, forests, and publicly-owned wildlife management areas in the region should be environmentally compatible in order to conserve wildlife populations and referenced plants.
- 10.2.1.6 Marinas and ports should not be located in or adjacent to manatee designated sanctuaries, foraging areas, or in or adjacent to fresh water or warm water discharge habitat areas.
- 10.2.1.9 Manatee protection plans should be included as part of the Coastal Zone or Conservation Element of the local comprehensive plan.

Regional Goal: 10.2.2 By 1991, the region's population should have environmental education programs available to them.

Policies

- 10.2.2.1 An educational program should be adopted in primary, secondary, and post-secondary school curricula concerning the wildlife and ecological relationships of Florida and the Northeast Florida region. Use of environmental agency programs should be encouraged in all civic and community groups throughout the region.

## APPENDIX C

### EXCERPTS FROM THE CONSERVATION/COASTAL MANAGEMENT ELEMENT GOALS, OBJECTIVES, AND POLICIES

#### GOAL 2

**Preserve, conserve, appropriately use, protect, and improve the quality and quantity of current and projected water resources, including waters that flow into estuarine waters or oceanic waters, estuarine waters, groundwater, and other waters in the City.**

#### **Issue: Water Quality Standards, Monitoring, and Compliance**

Water quality criteria specify concentrations of water constituents which, when not exceeded, are designed to protect the aquatic organisms, aquatic ecosystems, and prescribed water uses with an adequate degree of safety against common pollution sources and biological disruption measurable by set protocols. Such criteria may not directly address all pollutants nor do they directly regulate effects on habitat, also critical to productivity. Factors which are detrimental to water quality include industrial, commercial and residential wastewater disposal, agricultural and urban stormwater runoff, dredging, filling, channelization, shoreline modification, and shipping-related activities.

Water quality classifications are developed by the States to protect the actual or projected uses of the water. Thus monitoring of the ambient surface water and groundwater quality criteria provides a quantitative yardstick to measure the condition of our waters and their suitability for publicly designated uses.

The Water Quality Attainment Plan, adopted by City Council in October 1987, provides background data and descriptions of current conditions, and outlines general goals and objectives to be considered in meeting the attainment of water quality standards in Jacksonville.

**Objective 2.1 Surface water, including estuarine water, and groundwater of the City shall meet water quality standards contained in Rule 17-3, F.A.C., and benthic habitat shall be of a quality to satisfy the objectives of Rule 17-3, F.A.C.**

#### **Policies**

- 2.1.1 The city shall continue to implement programs, ordinances, and rules in accordance with Chapter 360, Ordinance Code.
- 2.1.2 The City shall monitor water quality and develop new water quality standards and/or treatment criteria where state standards and criteria are not adequate to protect water quality.
- 2.1.3 ~~EQD shall participate in the publication of the annual report of the lower St. Johns River Initiative. This reports summarizes current ecological issues for the river, restoration plans and successes to date. Beginning in 1998, and once every two years thereafter, the AWQD shall publish its "Duval County Surface Water Summary Report." The report will also summarize current water quality protection and improvement efforts being implemented by the City.~~
- 2.1.4 Beginning in 1993, once every four years, BESD shall conduct a biological assessment of the major tributaries of the St. Johns River and other major rivers within Duval County. This assessment will include identification and inventory of benthic habitat problem areas and a plan and implementation schedule to improve each problem area.

- 2.1.10 The EPB shall not lower its adopted current water quality classifications in Jacksonville. Beginning with the next DEP triennial review, BESD shall conduct a triennial review of water quality standards and water quality classifications to ensure that the water quality goals of the City are met.
- 2.1.11 ~~The City will continue to coordinate with the SJRWMD in implementing the Surface Water Improvement and Management (SWIM) plan and other relevant programs for the Lower St. Johns River. The City will continue to coordinate with the FDEP and SJRWMD on implementing the Total Maximum Daily Loads (TMDL) program, the lower St. Johns River Comprehensive Restoration Plan and other relevant programs for the lower St. Johns River by actively participating in interagency meetings and work groups, by coordinating monitoring, assessment and enforcement programs, by submitting contracts for work on the City portion of the lower basin, and by revising and commenting on revised SWIM plans.~~

**Issue: Shipyard and Vessel Maintenance Impacts**

Shipyard activities often are responsible for serious water quality impacts. Lack of proper containment of air, water, sand, and grit blasting materials and paint, rust, and metal particles result in entry of these materials into the river. The anti-corrosive and anti-fouling paints being removed are toxic to marine life, and often contain high levels of heavy metals. Practices must be improved to ensure protection of water and sediment quality in marine maintenance/construction areas.

- 2.1.14 The BESD will continue to coordinate with DEP through the Specific Operating Agreement regarding authority delegated by DEP to BESD for regulatory activities and other specific programs within Duval County.

**Objective 2.4** The City shall, in coordination with the Jacksonville Port Authority (JPA), the Jacksonville Planning and Development Department (JPDD), BESD, the Florida Inland Navigation District, and the U.S. Army Corps of Engineers, develop a plan for dredging-related activities for the navigational channel terminal facilities and access channels. This plan shall provide for the navigational channel terminal facilities and access channels. This plan shall provide for the protection of environmental resources while allowing for dredging and related activities necessary to maintain an operational port. This plan may be called "The Plan for Dredging and Dredged Material Disposal for Navigation and Port Facilities", and will hereinafter be referred to as the "Dredging Plan".

**Policies**

- 2.4.1 By 1994, The Jacksonville Port Authority, in conjunction with other port facilities shall have adopted a "Dredging Plan" which at a minimum addresses: seasonal impacts on sensitive life stages of finfish and shellfish; protection of endangered species, threatened species and species of special concern; disposal of dredged materials, including site selection, spoil leachate and runoff control; compensation and mitigation of habitat loss; and BMPs during dredging and disposal to preclude water quality violations.
- 2.4.3 By 1994, the City of Jacksonville, through Memorandum of Agreement with JPA, Corps of Engineers (COE), DEP and individual dredging operators, will ensure that all contract dredging activities shall follow the Dredging Plan and otherwise be in compliance with the Dredging Plan. By January 1994, EPB will adopt local pollution control rules regulating port and navigation dredging and request the DEP implement those regulations under the provisions of the local pollution control statute. BESD will request that DEP give direct notice of permit applications.

**Objective 2.5 The EQD shall develop a program for management of vessel construction, repair and maintenance areas to prevent water and sediment contamination.**

**Policies**

- 2.5.1 EQD shall review maintenance standards and BMPs for ship repair facilities and determine their applicability for the City of Jacksonville. EPB shall develop standards and adopt rules for BMPs for each ship repair facility in the City of Jacksonville not later than 2000.
- 2.5.2 EQD shall develop a list of special maintenance problem pollutants and EPB shall establish restrictions on their use and disposal.
- 2.5.3 EQD will continue to review literature and federal, state and local regulations related to the manufacture, sale, distribution and use of tributyltin (TBT) antifouling paint to determine whether standards are adequate to protect the City's Aquatic environment. If not, EQB will consider adoption of local standards.

**GOAL 3**

**Manage, preserve, and enhance viable native ecological communities in order to protect and improve the functions of natural systems and the distribution, productivity and diversity of native plants, animals and fisheries, particularly those species which are endangered, threatened, of special concern, or have high ecological, recreational, scientific, educational, aesthetic, or economic value.**

**Objective 3.7 The City shall implement an area-specific Manatee Protection Plan, as approved by the State on June 24, 1999, in order to ensure both immediate and long-term plans for manatee and manatee habitat protection including enforced speed limits, careful siting and design of boat facility and port facilities, and changes in boating equipment.**

**Policies**

- 3.7.1 The City shall review the motorboat speed zones previously adopted to protect the manatee. Enforcement of such zones will be coordinated with the FF&WCC, the USFWS, the FDEP and the JSO Marine Unit. To ensure that enforcement is adequate and consistent, at least annually the Jacksonville Waterways Commission shall agenda a meeting with these agencies to review the motorboat speed zones, enforcement efforts, boat facility siting criteria, educational opportunities and innovative technology.
- ~~3.7.1 The City shall review the protection zones previously adopted to protect the manatee. he FFWCC and the Office of Sheriff's Marine Unit. These three agencies shall meet with the Jacksonville Waterways Commission at least annually to ensure that enforcement is adequate and consistent.~~
- 3.7.2 Port expansion and construction activities shall not proceed without consideration of modifications of construction activities, and if necessary, mitigation of any threats to the survival of manatees or any other listed species.
- 3.7.3 All new port facilities shall be designed to prevent the crushing of manatees between vessels and docking structures. Existing port facilities shall be evaluated as to their potential for causing injury to manatees, and recommendations concerning retrofitting with fenders or other features to minimize the hazard to manatees, shall be made by 1994.
- 3.7.4 The City shall meet with the Manatee Coordinator of the U.S. Fish and Wildlife Service and the DEP to develop informative brochures and signs to increase public awareness and compliance with laws protecting

manatees and other listed species. The brochures will be distributed at boating stores, bait shops, etc. Signs will be placed at all public boat ramps in the vicinity of areas known to be frequented by manatees.

- 3.7.5 In preparing the Manatee Protection Plan, the City shall consider innovative measures to protect the manatee, such as, but not limited to, requiring propeller guards.

**Objective 3.8 The City shall institute programs to support the protection, management, and improvement of local fisheries and fish habitat in order to increase ecological, recreational, scientific, educational, aesthetic, and economic values and therefore make Jacksonville a more desirable place in which to live and work.**

- 3.8.1 The BESD shall implement programs, ordinances, and rules as described in the water quality section of this element in order to protect and improve water quality to provide appropriate habitat for healthy populations of fish and wildlife.
- 3.8.2 The City shall participate through the SWIM Act to recommend and receive funding for fisheries habitat improvement efforts in the lower St. Johns River basin.
- 3.8.6 As part of the Special Management Areas Program, the BESD shall ensure that valuable grassbeds and nursery areas utilized by fish species important to commercial and recreational fishing in the City are identified and mapped by 1993. This shall be accomplished as part of the SWIM Plan for the Lower St. Johns River. By 1994, the City shall develop a management strategy for these areas to protect their special values.
- 3.8.9 The BESD will continue to aggressively pursue inclusion of significant aquatic biological studies in the SWIM Plan for the Lower St. Johns River.

## GOAL 10

**To provide for the siting and operation of boat facilities in such a manner as to protect water quality, maintain propagation of fish and wildlife, and maintain fishing, recreation, and swimming in a manner consistent with the Future Land Use Element, the Recreation and Open Space Element of the 2010 Comprehensive Plan, and the Manatee Protection Plan, as approved on June 24, 1999, by the Florida Department of Environmental Protection, now succeeded by the Florida Fish and Wildlife Conservation Commission.**

**Issue: Manatee Protection Plan and Boat Facilities Siting Plan**

~~The City must prepare a Manatee Protection Plan, including a Boat Facilities Siting Plan, pursuant to Chapter 9J-5 F.A.C. The Manatee Protection Plan has been approved by the City Council and the Florida Department of Environmental Protection; approval by the State is pending before the DCA. A plan for siting of boat facilities, including marinas, is included therein. In the plan, boat facility is defined as any boat facility construction for the following purposes: a) the expansion of an existing boat facility or structure, private or publicly owned, b) the construction of a new boat facility or structure, private or publicly owned. Boat facilities include publicly or privately owned docks, marinas, boat housing structures, and related construction.~~

The City has prepared a Manatee Protection Plan, including a Boat Facilities Siting Plan, pursuant to Chapter 9J-5 F.A.C. The Manatee Protection Plan has been approved by the City Council and the Florida Fish and Wildlife Conservation Commission, the Department of Environmental Protection and the DCA. A plan for siting of boat facilities, including commercial marinas, is included therein. The Manatee Protection Plan is part of the Background Data and Analysis of the Comprehensive Plan, and was enacted by the Jacksonville City Council pursuant to local ordinance 1997-0651, and as subsequently updated. In the plan, boat facilities are defined as ~~commercial port facilities, marinas with wet or dry storage, boat ramps or other launching~~ **launching** facilities, ~~or multi-family~~

~~residential docks for motorized vessels, and marinas including both commercial and multi-family residential boat facilities. The siting criteria will apply to the expansion of existing or construction of marinas, boat ramps, and port facilities, either private or publicly owned. The siting criteria do not apply to boat ramps serving exclusively non-motorized vessels, such as canoes and kayaks.~~

## DEFINITIONS

~~*Boat Facilities* - Marinas with wet or dry storage, boat ramps or other launching facilities, or multi-family residential docks. **Port facilities, boat ramps or other launching facilities for motorized vessels, and marinas including both commercial and multi-family residential boat facilities. Any dock with more than 5 slips is a boat facility.**~~

**Objective 10.1** Boat facilities shall be sited in a manner which is compatible with existing and future land uses and consistent with the Boat Facilities Siting Plan of the Manatee Protection Plan **as approved by the FDEP (now FWC) on June 24, 1999.**

## Policies

- 10.1.1 The location of future boat facilities shall be consistent with the recommendations within the Future Land Use and Recreation and Open Space Elements of the 2010 Comprehensive Plan, as well as any District Plan, and any other special study or plan.
- 10.1.2 New boat facilities shall be prohibited in the following areas:
- A. Areas approved or conditionally approved by the Florida Department of Environmental Protection for shellfish harvesting.
  - B. Areas described by the Inter-State Shellfish Sanitation Conference (ISSSC) buffer zone calculation.
  - C. Areas designated in the Conservation/Coastal Management Element as potential areas to be opened for shellfish harvesting.
  - D. The Nassau River/St. Johns River Marshes Aquatic Preserve north of the St. Johns River and west of the Atlantic Ocean. This preserve is described in Official Records Volume 3183, pages 547-552, current public records of Duval County, Florida and in Official Records Book 108, pages 232-237, current public records of Nassau County, Chapter 18-20.002 (7) (a) (2) F.A.C., and other Aquatic Preserves, as designated by the State.
  - E. Outstanding Florida Waters north of the St. Johns River and west of the Atlantic Ocean.
  - F. Class II Waters.
  - G. Other new boat facility prohibition areas specified in Special Management Area management plans and the Manatee Protection Plan.
- 10.1.3 New or expanding boat facilities shall preserve ant historical and archaeological sites found on the property, and sensitively incorporate them into their development plans in accordance with the Historic Preservation Element, or mitigate impacts in accordance with the guidelines of the State Historic Preservation Officer's procedures.

- 10.1.4 The City's boat facility siting plan shall incorporate manatee protection measures as specified in Policy 10.8.5 and direct construction toward the following areas:
- A. Locations where there is quick access to deep, open water;
  - B. Locations in or near well-flushed, deep water areas where the least maintenance or dredging is required;
  - C. Locations as close as possible to public demand.
  - D. All structures and other activities shall be within the riparian rights area of the applicant and shall be designed in a manner that will not restrict or otherwise infringe upon the riparian rights of adjacent upland riparian owners.
  - E. Areas where the water quality benefits of existing water circulation are maximized.
  - F. Areas of minimal manatee use and mortality (except where otherwise provided within specified boat facility siting zones).
  - G. Areas with no or minimal amounts of native submerged aquatic vegetation and/or *Juncus roemerianus* or *Spartina alterniflora*.
  - H. The facility shall be adjacent to speed zones as designated in the Manatee Protection Plan.

10.1.5 The City shall review the application for any proposed boat facilities to ensure consistency the Conservation/Coastal Management Policy 10.1.2 and Objectives 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, and 10.8 and each of their policies. Development orders will not be issued for boat facilities that do not satisfy the standards contained in those objectives and policies.

10.1.6 If there is an increase in manatee mortality as defined within Appendix D of the Manatee Protection Plan within a boat facility siting zone or on a county-wide basis, the need for more restrictive speed zones and the appropriateness of siting additional, or expanding, boat facilities in the vicinity shall be assessed. If the increase is at an unacceptable level according to the standards contained in Appendix D, no further boat facilities shall be permitted in that zone until its classification is reassessed. An unacceptable level of manatee mortalities means:

a) 3 or more watercraft-caused mortalities, or 5 or more mortalities from any cause except natural, within the last 12 months within a boat facility siting zone (or averaged for two zones if near a zone boundary) OR

b) 5 or more watercraft-caused mortalities in all county waters (without regard to boat facility siting zone or size of vessel), or 10 or more mortalities from all causes except natural in all county waters, within the last 12 months.

10.1.7 Permit applications for all boat facilities, including single-family docks and dry storage, shall be evaluated in the context of cumulative impacts on manatees and other freshwater and marine resources within the project Boat Facility Zone. If there is an increase in manatee mortality in the area, the need for more restrictive speed zones and the appropriateness of siting additional, or expanding, boat facilities in the vicinity shall be assessed. If there is a marked increase in mortality within the zone, no further boat facilities shall be

permitted in the zone until the boat facility siting zone classification in question is reassessed upon annual review as required by Policy 10.8.1.

- 10.1.8 The following criteria were applied to establish and classify zones for considering the suitability for marina, boat ramp, multi-family docks, other motorboat launching facilities, and port usage:
- A. The proposed facility will have nor or minimal adverse impacts on manatee movements or on known areas of high manatee use or high manatee mortality.
  - B. The proposed facility shall have no or minimal dredging and thereby reduce or eliminate impacts to benthic communities and native submerged vegetation and/or *Juncus roemerianus* or *Spartina alterniflora*.
  - C. The proposed facility is compatible with local land use and zoning.

The established zones are depicted in the Future Land Use Element. These zones are defined in the Definitions Section of the Conservation/Coastal Management Element.

**Objective 10.2 New or expanding boat facilities shall be sited and built with adequate upland support services.**

**Policies**

- 10.2.1 Parking facilities at new and expanding boat facilities shall meet standards applicable to parking facilities at City marinas as described in the Recreation and Open Space Element of the 2010 Comprehensive Plan.
- 10.2.2 Access consistent with the Levels of Service established within the Traffic Circulation Element shall be provided by all new marinas.
- 10.2.3 New or expanding boat facilities must locate non-water dependent facilities such as, but not limited to, parking areas, bait shops, and restaurants on upland areas. Exceptions may be allowed in cases where it is clearly in the public interest or sensitive upland areas may be affected.

**Objective 10.3 New or expanding boat facilities shall provide adequate protection against storm surges, winds, hurricanes, petroleum, chemicals, or other hazardous material spills.**

**Policies**

- 10.3.1 New boat facilities shall provide effective measures for protection of life and property against hurricanes. New structures shall comply with all applicable construction codes.
- 10.3.2 All boat facilities shall demonstrate the capability to promptly contain and dispose of any spills of petroleum or other hazardous materials within their boundaries. An Environmental Protection Board Rule will be developed by 1992 ensuring implementation and compliance with this policy.

**Objective 10.4 All boat facilities must ensure protection of water quality.**

**Policies**

- 10.4.1 New boat facilities or expanding boat facilities shall demonstrate the capability to control and treat storm water run-off by demonstrating compliance with the requirements of the SJRWMD and the DEP.

10.4.2 All marinas must handle sewage in accordance with applicable standards by means of an on-site pump-out with adequate on-site treatment facilities, connection to a wastewater treatment plant, or as otherwise required. An Environmental Protection Board Rule will be developed by 1992 and the Land Development Regulations will be amended.

10.4.3 Prior to construction, all new or expanding boat facilities must demonstrate that construction and operation of the facility will comply with State water quality standards and any other local regulations.

**Objective 10.5 New or expanding boat facilities must provide adequate depth for vessels anticipated, and shall provide for safe access to channels.**

**Policies**

10.5.1 New or expanding boat facilities shall demonstrate adequate water depths by demonstrating compliance with the requirements of the DEP.

10.5.2 New or expanding boat facilities shall delineate ingress and egress points by channel markers indicating speed limits and other applicable regulations. All markers shall be in accordance with Section 327.40(1), F.S. and 33 CFR Part 66.

**Objective 10.6 New or expanding boat facilities must be designed to minimize environmental disruptions and mitigate for such disruptions when unavoidable.**

**Policies**

10.6.1 Construction and operation of boat facilities shall be designed to minimize or eliminate adverse impacts on fish and wildlife habitat. Special attention and consideration shall be given to endangered and threatened species habitat.

10.6.2 To the maximum extent possible, shoreline stabilization must be accomplished with preservation or establishment of appropriate native wetland vegetation. Rip rap materials, pervious interlocking brick systems and other similar stabilization methods must be utilized in lieu of vertical sea walls wherever feasible.

10.6.3 Piling construction and other non-dredge fill techniques shall be utilized where possible to minimize habitat destruction.

10.6.4 Mitigation of impacts to fish and wildlife and water quality shall be as required by DEP and the USCOE or local regulations, if developed, pursuant to the policies in this element.

10.6.5 Marinas shall continue to distribute a manatee awareness booklet which contains reminders for protection of the manatee and its habitat, and shall maintain informational signs explaining the manatee protection zones established in the manatee protection plan mandated by the Governor and Cabinet.

10.6.6 In reviewing applications for new boat facilities or expansion of existing boat facilities, ways to improve, mitigate, or restore adverse environmental impacts caused by previous activities shall be explored. This may include shallowing dredged areas, restoring wetland or submerged vegetation, or marking navigational channels. Such mitigation or restoration may be required as a condition of approval for new or expanded facilities.

- 10.6.7 To reduce shading of water bodies which results in lower biological productivity, construction of open wet slips shall be preferred over covered wet slips. In manatee habitat, innovative dock construction techniques shall be encouraged to minimize impacts on submerged aquatic vegetation and/or *Juncus roemerianus* or *Spartina alterniflora* and to promote manatee safety.

**Objective 10.7** The City must ensure adequate enforcement of the above objectives and reduce permitting overlaps among agencies.

**Policies**

- 10.7.1 New marinas shall be inspected at least once during construction, and all marinas must be inspected at least once each year to ensure compliance with all requirements. The RESD will design and implement a water quality monitoring program for marinas within the City. If it can be determined that the docking facility and/or the riparian uplands are causing water quality violations, then the lessee will be given written notice to correct the problems, in accordance with the RESD's August 1986 Water Pollution Activity Enforcement Standard Operating Procedure.
- 10.7.2 The City shall enter into interagency agreements with regulatory and planning agencies to carry out enforcement and planning and regulatory functions effectively and efficiently.

**Objective 10.8** By 1992, the City shall implement an area-specific manatee protection plan in order to ensure both immediate and long-term plans for manatee and manatee habitat protection including enforced speed limits, careful siting and design of marina and port facilities, and changes in boating equipment.

**Policies**

- 10.8.1 The City shall review the protection zones previously adopted to protect the manatee. The Florida Marine Patrol, the FGFWFC, the USFWS, the DEP, and the Office of Sheriff's Marine Unit shall meet with the Jacksonville Waterways Commission at least annually to review the speed zones, boat facility siting criteria, educational opportunities, and innovative technologies, such as propeller guards.
- 10.8.2 Port expansion and construction activities shall not proceed without consideration of modifications of construction activities, and, if necessary, mitigation of any threats to the survival of manatees or any other listed species.
- 10.8.3 All new port facilities shall be designed to prevent the crushing of manatees between vessels and docking structures. Existing port facilities shall be evaluated as to their potential for causing injury to manatees and recommendations concerning retrofitting with fenders or other features to minimize the hazard to manatees shall be made by 1996. A time line shall be established to ensure that, where recommended, port facilities are retrofitting with fenders (providing a cantilever of at least 4 feet under maximum compression) by 1998.
- 10.8.4 The City shall continue to meet with the Manatee Coordinator of the U.S. Fish and Wildlife Service and the DEP, to develop additional informative brochures and signs to increase public awareness and compliance with laws protecting manatees and other listed species as deemed appropriate. The brochures will continue to be distributed at boating stores, bait shops, etc. Signs and/or kiosks placed at public boat ramps in the vicinity of areas known to be frequented by manatees will be maintained and updated as appropriate.
- 10.8.5 In order to provide protection for manatees, boat facilities shall be constructed away from the following

areas:

- A. Areas of high manatee concentration;
- B. Areas where wetlands supporting manatee habitat will be disturbed;
- C. Areas of highly productive habitat; and
- D. Areas of high manatee mortality.
- E. Sensitive, undisturbed natural areas frequented by manatees.

## APPENDIX D

### FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION MANATEE PROTECTION PLAN STANDARDS

#### STANDARD I

In determining whether the expansion of an existing facility poses a greater threat to manatees, the following factors should be assessed: The nature and magnitude of the project, boating activity patterns, mortality trends within the sphere of influence of the project, impacts to native submerged aquatic vegetation and *Spartina sp.* or *Juncus sp.*, manatee use patterns and the degree to which manatees concentrate in the area, and whether new dredging is needed.

#### STANDARD II

An unacceptable level of manatee mortalities as above means 3 or more watercraft-caused mortalities (except as provided hereunder), or 5 or more mortalities from any cause except natural, within the last 12 months within a boat facility siting zone (or averaged for two zones if near a zone boundary). Watercraft-caused mortalities attributable to large vessels shall not be factored into consideration of boat facilities (on the basis of the 3 or more watercraft-caused threshold) which are not port-related and not constructed for the purpose of berthing large vessels. (Watercraft-caused mortalities shall be attributable to large vessels when evidence of crushing, propeller injuries, or other factors demonstrate that a death was likely caused by a large vessel, on the basis of findings by the Florida Department of Environmental Protection. For the purposes of this plan, a large vessel is regarded as that which exceeds 55 feet in length and 75 gross tons in weight, and/or has a propeller with a diameter of 42 inches or greater.) However, an unacceptable level of manatee mortalities shall be considered as above specifically in the permitting of port-related development and expansion, and in consideration of facilities for the berthing of large, non-recreational vessels, if and when 3 or more watercraft-caused mortalities are attributable to large vessels within a boat facility siting zone.

#### STANDARD III

An unacceptable level of manatee mortalities as above means 5 or more watercraft-caused mortalities in all county waters (without regard to boat facility siting zone or size of vessel), or 10 or more mortalities from all causes except natural in all county waters, within the last 12 months.

#### STANDARD IV

All construction and dredging shall comply with Florida Department of Environmental Protection (FDEP) permitting requirements, in addition to the following guidelines: No significant adverse impacts to native, submerged aquatic vegetation (SAV), *Spartina sp.*, or *Juncus sp.* should be allowed, whether by dredging or shading. The applicant shall demonstrate that proposed projects have avoided or minimized impacts to the above vegetation through design and construction standards, and through the utilization of innovative construction techniques (with information on such techniques supplied by the Florida Department of Environmental Protection's Bureau of Protected Species Management). No new dredging shall be allowed in said vegetation areas unless the applicant demonstrates that no alternative site or design is available or feasible, in which case such dredging shall comply with all FDEP requirements. A facility shall require only minimal dredging to provide a water depth at mean low water that is 3 feet greater than the expected draft of vessels using the facility, but in no instance shall dredging result in permanent adverse impacts outside of the proposed dredged area to SAV, *Spartina*, or *Juncus* species. Should minimal impacts be unavoidable for multi-slip facilities meeting all other FDEP requirements, these shall be offset by in-kind mitigation.

## **STANDARD V**

Minimally-acceptable speed zones considered adequate to promote manatee protection shall include a Slow Speed or Idle Speed zone immediately adjacent to a marina facility with 30 or more new or additional wet or dry slips, and a boat ramp with two or more lanes. Idle or Slow Speed zones may be established in combination with other appropriate zones within the sphere of influence of a project. In consideration of cumulative impacts, the magnitude of the project, mortality trends, waterway characteristics, manatee use patterns, the nature of the manatee habitat, and other factors should be taken into consideration in determining the adequacy of speed zones within the sphere of influence of a boat facility upon annual review.

**APPENDIX E**

**DUVAL COUNTY INTERIM MANATEE PROTECTION PLAN  
BOATING SAFETY AND MANATEE PROTECTION ZONES  
ADOPTED NOVEMBER 17, 1992**

**TO REPORT**  
manatee harassment  
dead or injured manatees  
tagged manatees  
regulatory zone violations  
**CALL: 1-800-342-5367 RESOURCE ALERT**

For more information concerning  
Boating Safety  
or  
Manatee Protection Zones,  
please contact:

District 8 Florida Marine Patrol  
(904) 359-6580

Florida Game and Freshwater  
Fish Commission  
(904) 353-6331

Florida Dept. of Environmental Protection  
(904) 488-6058

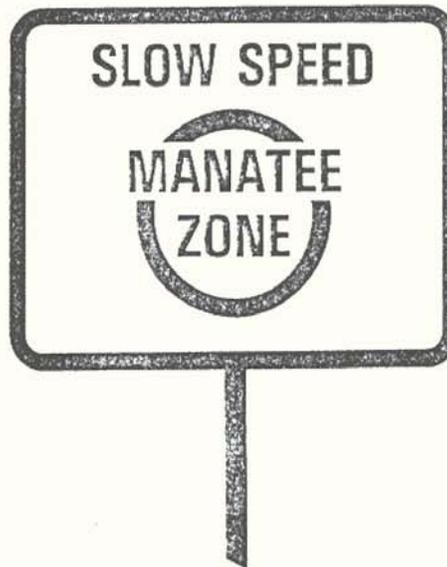
Florida Inland Navigation District  
(407) 627-3386

For information concerning manatees,  
please contact:

Save the Manatee Club  
(407) 539-0990

Florida Dept. of Environmental Protection  
(813) 896-8626

**DUVAL COUNTY  
BOATING SAFETY  
AND  
MANATEE  
PROTECTION  
ZONES**



On November 17, 1992, The Governor and the Cabinet adopted a Manatee Protection Plan for Duval County which included a number of boat speed regulatory zones designed to minimize the number of accidental strikes by boats to manatees. The plan is now Florida Law Section 16N-22.027 F.A.C. In addition there currently exists several boat speed regulatory areas for boating safety. This brochure gives the locations and regulatory levels of these zones.

These regulatory zones will be designated by signs along the waterway. The signs will provide information concerning the beginning of the zone, the regulated speed, the area of the regulation, and the end point of the zone. We encourage you to study this brochure before leaving the dock so that you are more aware of the regulatory zones that you will encounter and the specific regulations of each one.

Regulatory zones are enforced by several law enforcement agencies including the Florida Marine Patrol. The maximum fine for speeding in a manatee protection zone is \$500.00 and/or 6 months in jail.

#### SPEED DEFINITIONS

**Idle Speed, No Wake** - A vessel that is operating at idle speed is proceeding at the minimum speed that will maintain the steerageway of the vessel.

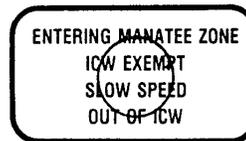
**Slow Speed, Minimum Wake** - A vessel that is operating at slow speed is completely off plane, has settled into the water and is proceeding without wake or with minimum wake. Slow speed also means no speed greater than that which is reasonable and prudent to avoid either intentional or negligently annoying, molesting, harassing, disturbing, colliding with, injuring or harming manatees and which comports with the duty of all persons to use due care under the circumstances.

**25 MPH Maximum Speed** - A vessel that is operating at a minimum of 25 mph is not operating at an unsafe speed for the specific waterway conditions, does not have an elevated bow which restricts visibility and is not producing an excessive wake which unreasonably or unnecessarily endangers other vessels or natural resources of the state.

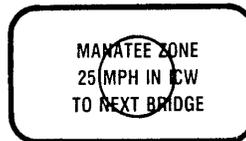
2

#### PROTECTION ZONES

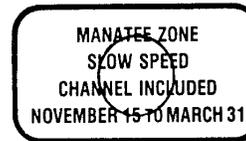
Boating collisions cause many deaths and injuries each year in Florida waters. Accidental strikes by boats may cause manatee deaths or injuries. To minimize these hazards, boaters should stay in deep water navigation channels and reduce speed when operating in shallow waters outside navigation channels or in congested areas. To alert the boater and protect the manatee, a number of signs are utilized for marking regulatory speed zones. These signs are illustrated and defined below. The protection zones in Duval County are displayed on the following pages.



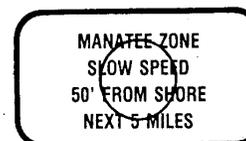
Sign marking the beginning of a regulated zone where the channel is exempt.



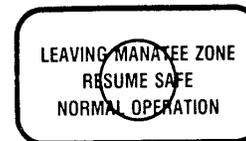
Sign marking a regulated channel area and stating how far the regulation extends.



Sign marking a seasonally regulated zone with the channel included.



Sign indicating a slow speed zone along the shoreline.

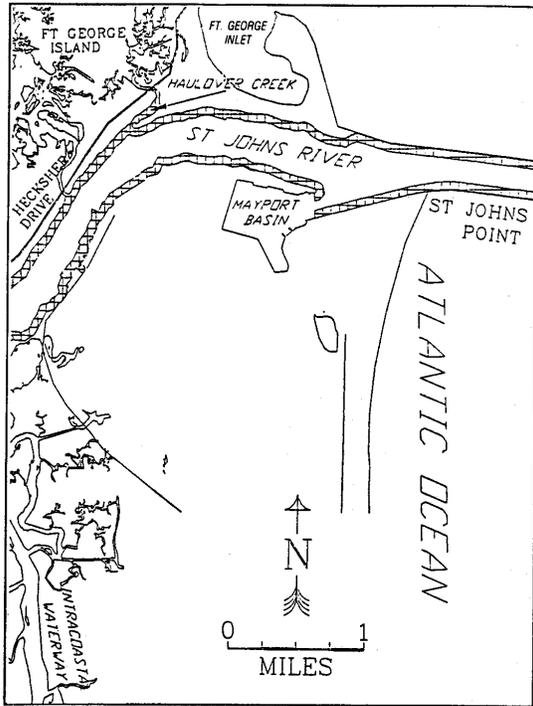


Sign marking the end of a regulated zone.

3

**DUVAL COUNTY  
MANATEE PROTECTION ZONES**

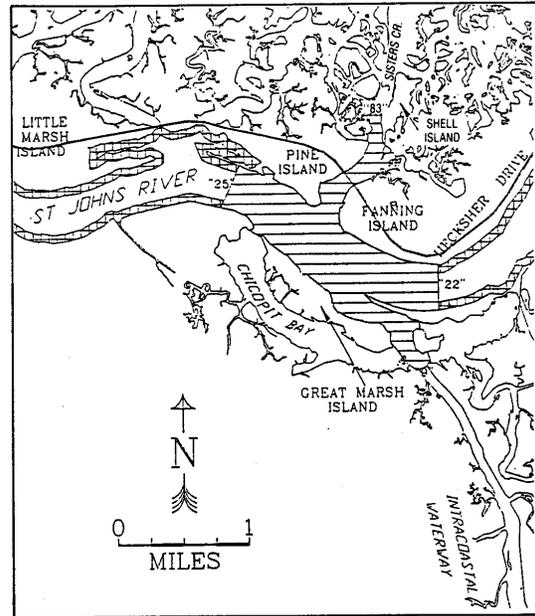
MAP 1



300' SLOW SPEED BUFFER

**DUVAL COUNTY  
MANATEE PROTECTION ZONES**

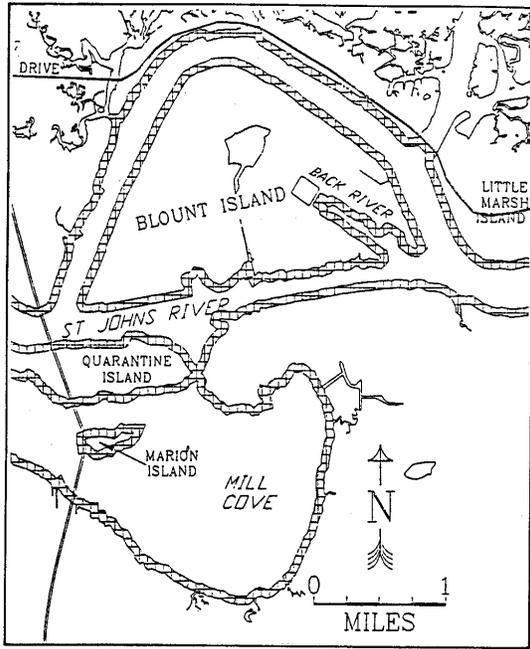
MAP 2



 SLOW SPEED, CHANNEL INCLUDED  
 300' SLOW SPEED BUFFER

**DUVAL COUNTY  
MANATEE PROTECTION ZONES**

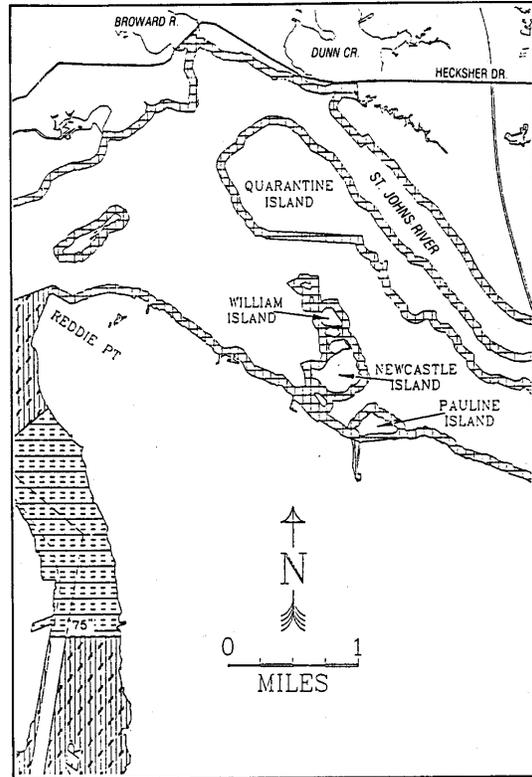
MAP 3



 300' SLOW SPEED BUFFER

**DUVAL COUNTY  
MANATEE PROTECTION ZONES**

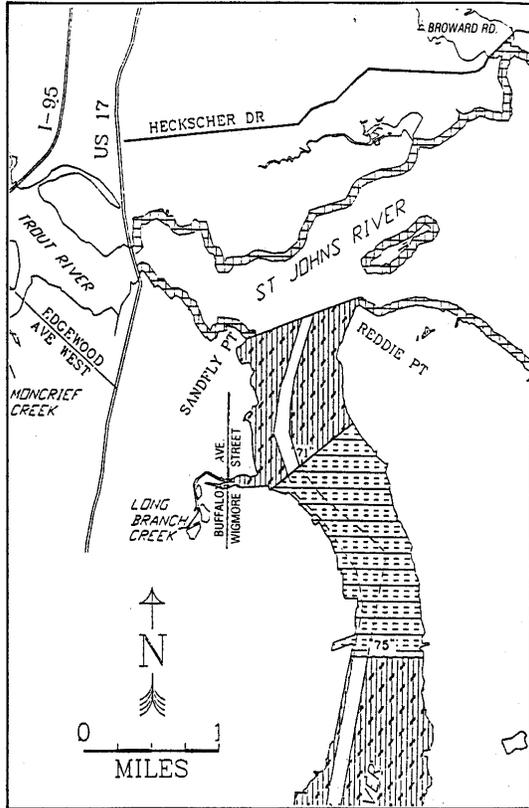
MAP 4



-  SLOW SPEED, SPECIFIED CHANNEL EXEMPT
-  300' SLOW SPEED BUFFER
-  SEASONAL SLOW SPEED: CHANNEL INCLUDED  
NOVEMBER 15 - MARCH 31; SLOW SPEED,  
CHANNEL EXEMPT REMAINDER OF YEAR.

**DUVAL COUNTY  
MANATEE PROTECTION ZONES**

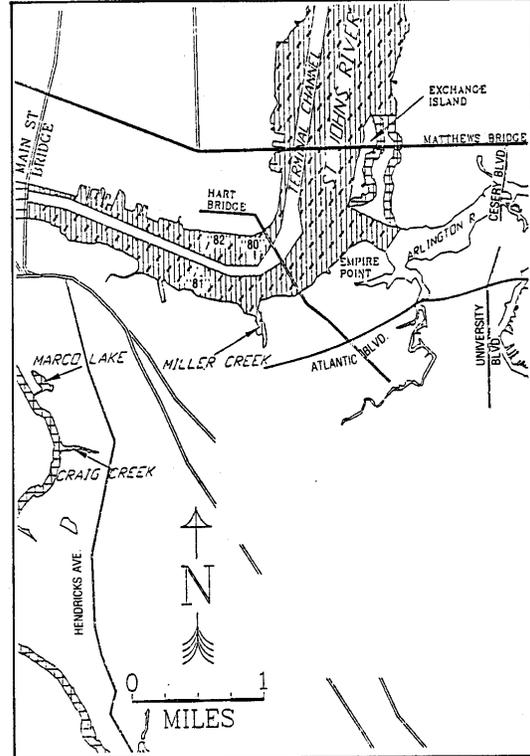
MAP 5



-  SLOW SPEED, SPECIFIED CHANNEL EXEMPT
-  300' SLOW SPEED BUFFER
-  SEASONAL SLOW SPEED, CHANNEL INCLUDED  
NOVEMBER 15 - MARCH 31; SLOW SPEED, CHANNEL  
EXEMPT REMAINDER OF YEAR.

**DUVAL COUNTY  
MANATEE PROTECTION ZONES**

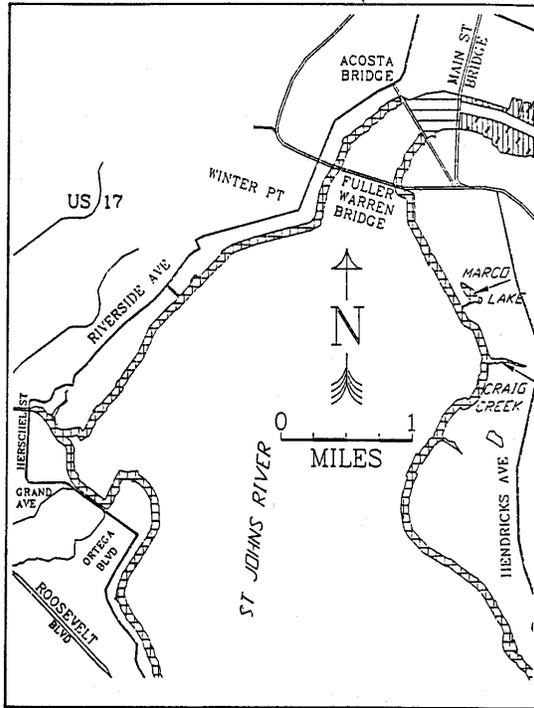
MAP 6



-  SLOW SPEED, SPECIFIED CHANNEL EXEMPT
-  SLOW SPEED, CHANNEL INCLUDED
-  300' SLOW SPEED BUFFER

**DUVAL COUNTY  
MANATEE PROTECTION ZONES**

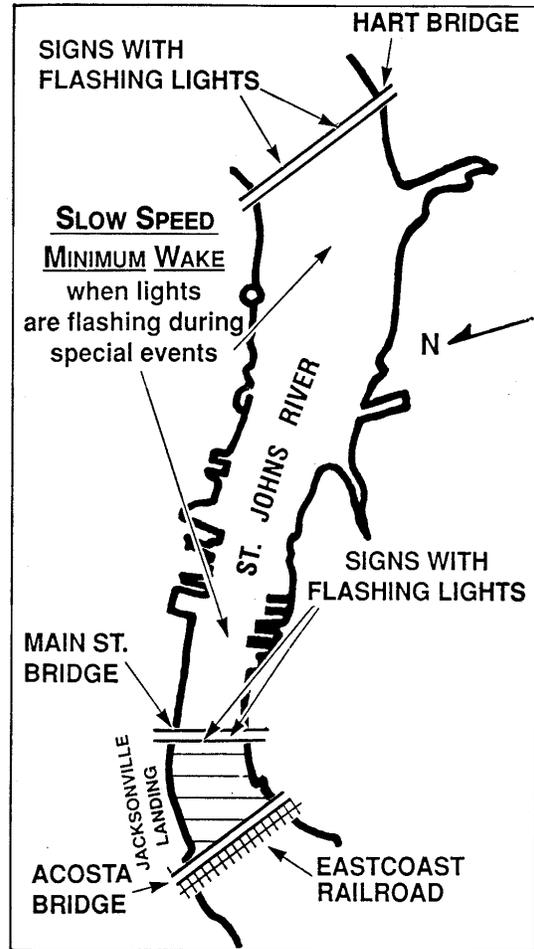
MAP 7



-  SLOW SPEED, SPECIFIED CHANNEL EXEMPT
-  SLOW SPEED, CHANNEL INCLUDED
-  300' SLOW SPEED BUFFER

**DUVAL COUNTY  
BOATING SAFETY ZONES**

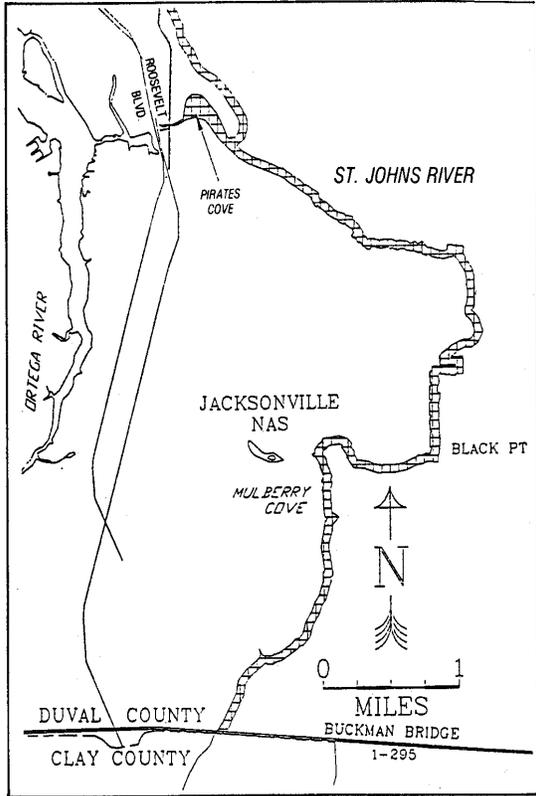
MAP 6-A



-  SLOW SPEED, MINIMUM WAKE CHANNEL INCLUDED

**DUVAL COUNTY  
MANATEE PROTECTION ZONES**

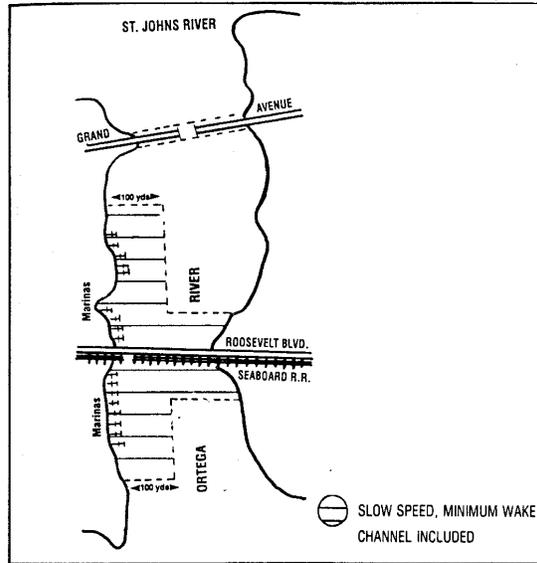
MAP 8



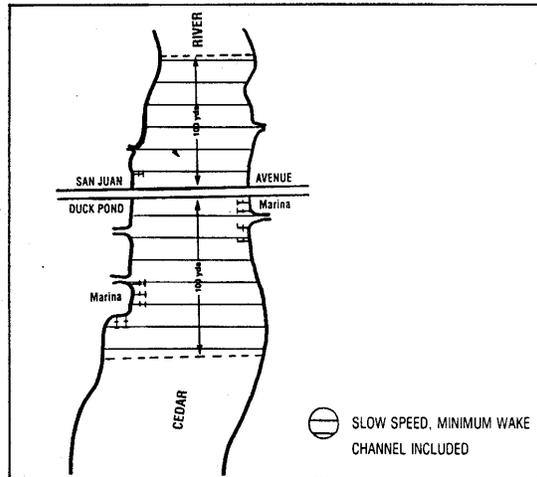
300' SLOW SPEED BUFFER

**DUVAL COUNTY  
BOATING SAFETY ZONES**

MAP 8-A

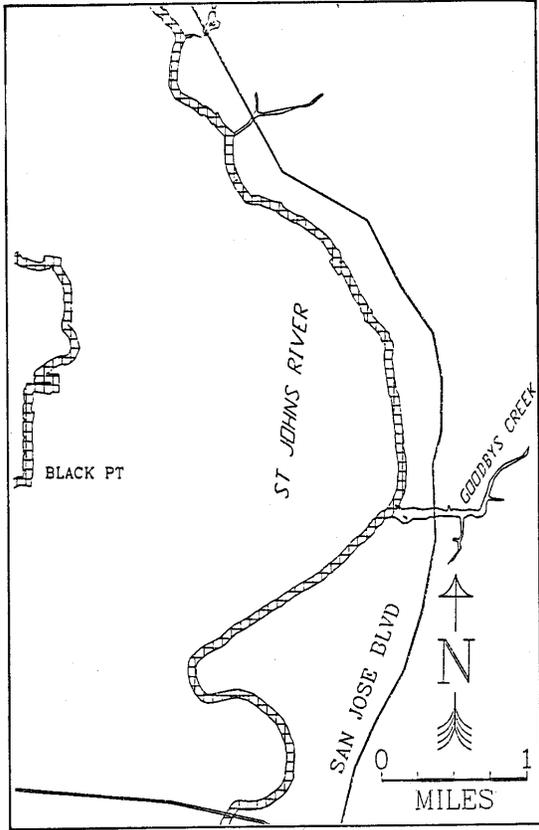


MAP 8-B



**DUVAL COUNTY  
MANATEE PROTECTION ZONES**

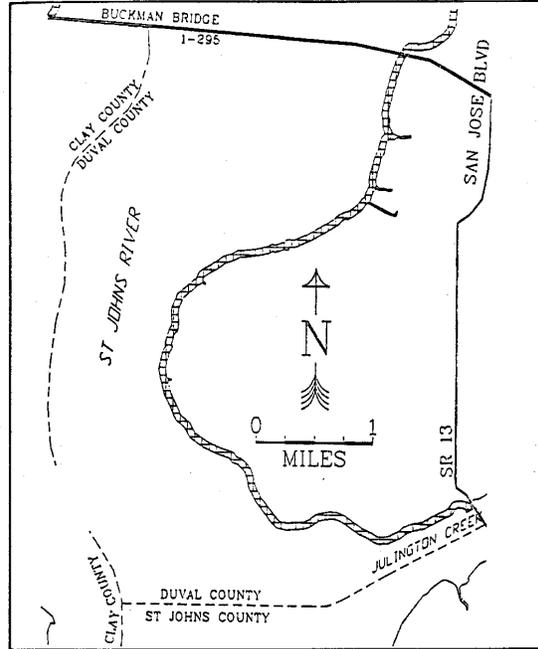
MAP 9



 300' SLOW SPEED BUFFER

**DUVAL COUNTY  
MANATEE PROTECTION ZONES**

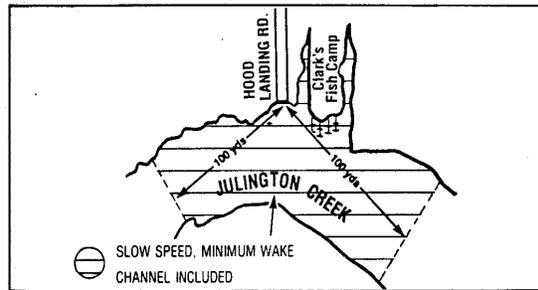
MAP 10



 300' SLOW SPEED BUFFER

**DUVAL COUNTY  
BOATING SAFETY ZONES**

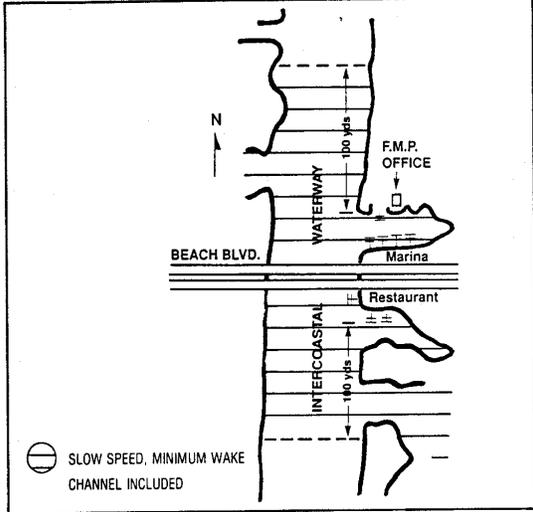
MAP 10-A



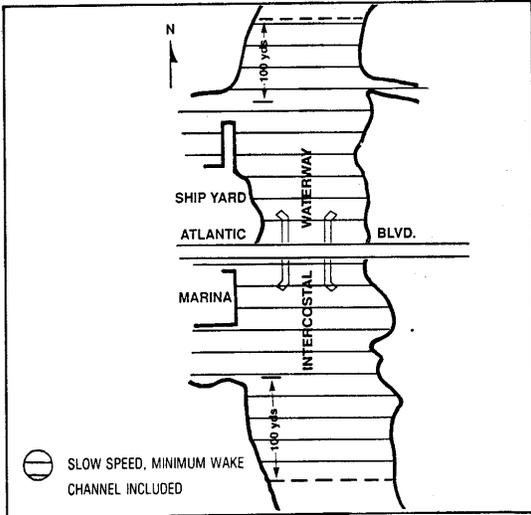
 SLOW SPEED, MINIMUM WAKE  
CHANNEL INCLUDED

**DUVAL COUNTY  
BOATING SAFETY ZONES**

MAP 11



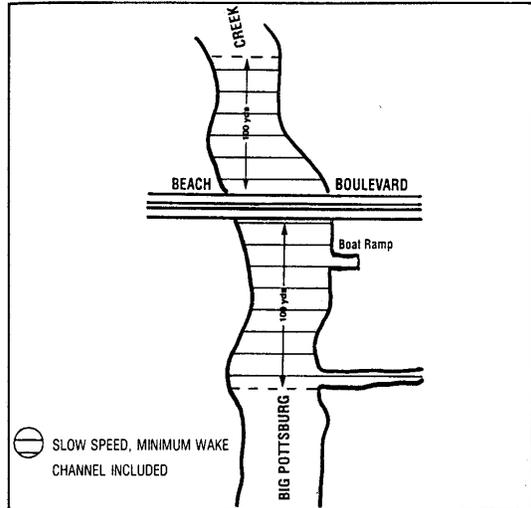
MAP 11-A



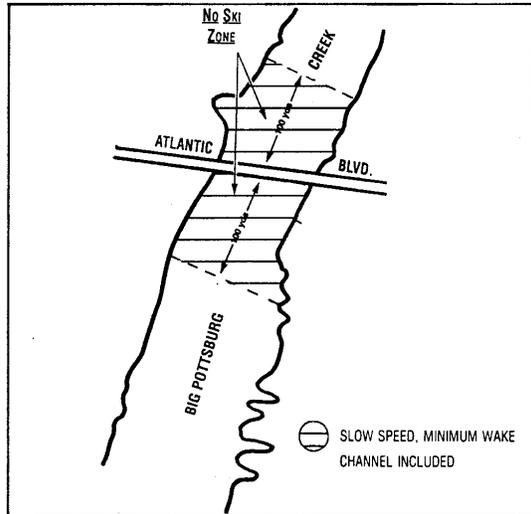
16

**DUVAL COUNTY  
BOATING SAFETY ZONES**

MAP 12



MAP 12-A



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## WEST INDIAN MANATEE FACT SHEET

- POPULATION:** highly endangered
- REPRODUCTION:** mature at approximately 5 years of age; gestation approximately 13 months; one calf born every 2-3 years; cows nurse calves up to 2 years.
- PROBLEMS:** boat/barge collisions; habitat loss; crushing/drowning in flood gates and canal locks; cold-related illnesses; ingestion of fish hooks and monofilament line; entanglement in crab trap lines and fishing trawl nets; pollution.
- PROTECTION:** violators of state and federal laws protecting manatees are subject to fines up to \$20,000 and prison sentences up to 1 year.
- BEHAVIOR:** gentle and slow moving; surfaces to breathe every 3-4 minutes; spends time eating, resting, and traveling; often shy and reclusive; has no system of defense and is completely harmless.
- HABITAT:** shallow, slow-moving, rivers, estuaries; saltwater bays; canals; coastal areas; particularly where seagrass beds flourish.
- RANGE:** **Winter-**manatees concentrate in natural warm-water springs of industrial power plant warm-water outfalls in Florida. **Summer-**move widely throughout entire habitat; sometimes swim just offshore to travel or graze; sometimes travel as far as the lower Carolinas on the East Coast and to Louisiana on the Gulf Coast
- FOOD:** submerged (e.g. Hydrilla), emergent (e.g. Spartina), and floating (e.g. Water-hyacinths) aquatic plants.

### FOR FURTHER INFORMATION WRITE OR CALL:

Florida Dept. of Environmental Protection  
Division of Marine Resources  
Protected Species Management  
3900 Commonwealth Blvd.  
Tallahassee, FL 32399  
(904) 922-4330

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The 1990 Florida Legislature directed the Florida Inland Navigation District (F.I.N.D.) to be responsible for posting and maintaining regulatory markers for manatee protection zones along the east coast of Florida. Duval County is responsible for posting and maintaining signs for boating safety. F.I.N.D. is an independent special taxing district created in 1927 to assist the federal government in the construction, maintenance and operation of the Atlantic Intracoastal Waterway. F.I.N.D.'s district includes the eleven coastal counties from Dade to Duval.

Please contact the District if you observe signs that are in need of maintenance or repair. We wish to maintain our signs so that they are effective and do not become a boating hazard.

This brochure is produced by the Florida Inland Navigation District to educate the boating public about boating safety and manatee protection zones. Brochures are available for other counties with approved Interim Manatee Protection Plans. The brochures are free and may be obtained by contacting the District at 1314 Marcinski Road, Jupiter, FL 33477. Telephone (407) 627-3386.



# F.I.N.D.

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## Appendix F

### Registered Vessels in north east Florida and The State of Florida.

County	Year	Total Pleasure	Total Commercial	Total Dealers	Grand Total	% Change
Clay	2000	9,535	146	46	9,727	
	2001	11,481	167	62	11,710	16.93
	2002	11,969	171	57	12,197	3.99
	2003	12,459	158	80	12,697	3.94
	2004	12,471	165	89	12,725	0.22
	2005	12,709	161	84	12,954	1.77
Duval	2000	33,637	657	189	34,483	
	2001	32,807	687	269	33,763	-2.13
	2002	33,113	628	267	34,008	0.72
	2003	33,268	624	250	34,142	0.39
	2004	33,072	622	233	33,927	-0.63
	2005	33,223	611	237	34,071	0.42
St. Johns	2000	10,533	384	85	11,002	
	2001	10,394	333	123	10,850	-1.40
	2002	10,741	337	105	11,183	2.98
	2003	11,055	317	95	11,467	2.48
	2004	11,348	304	98	11,750	2.41
	2005	12,015	314	114	12,443	5.57
Putnam	2000	7,376	245	39	7,660	
	2001	8,171	264	47	8,482	9.69
	2002	8,422	277	32	8,731	2.85
	2003	8,480	297	35	8,812	0.92
	2004	8,463	310	36	8,809	-0.03
	2005	8,694	319	34	9,047	2.63
Nassau	2000	3,997	153	14	4,164	
	2001	4,984	177	19	5,180	19.61
	2002	5,199	178	18	5,395	3.99
	2003	5,334	181	19	5,534	2.51
	2004	5,466	180	20	5,666	2.33
	2005	5,675	183	18	5,876	3.57
Florida	2000	840,684	27,897	11,496	880,077	
	2001	902,964	29,537	11,110	943,611	6.73
	2002	922,597	29,023	10,099	961,719	1.88
	2003	939,968	28,542	9,715	978,225	1.69
	2004	946,072	27,559	9,276	982,907	0.48
	2005	973,859	27,204	9,305	1,010,370	2.72

Source: DHSMV. Florida Vessel Owners: Facts and Figures 2006.  
 Vessel Statistics by County 2000, 2001, 2002, 2003, 2004 and 2005.  
<http://www.hsmv.state.fl.us/dmv/vslfacts.html>

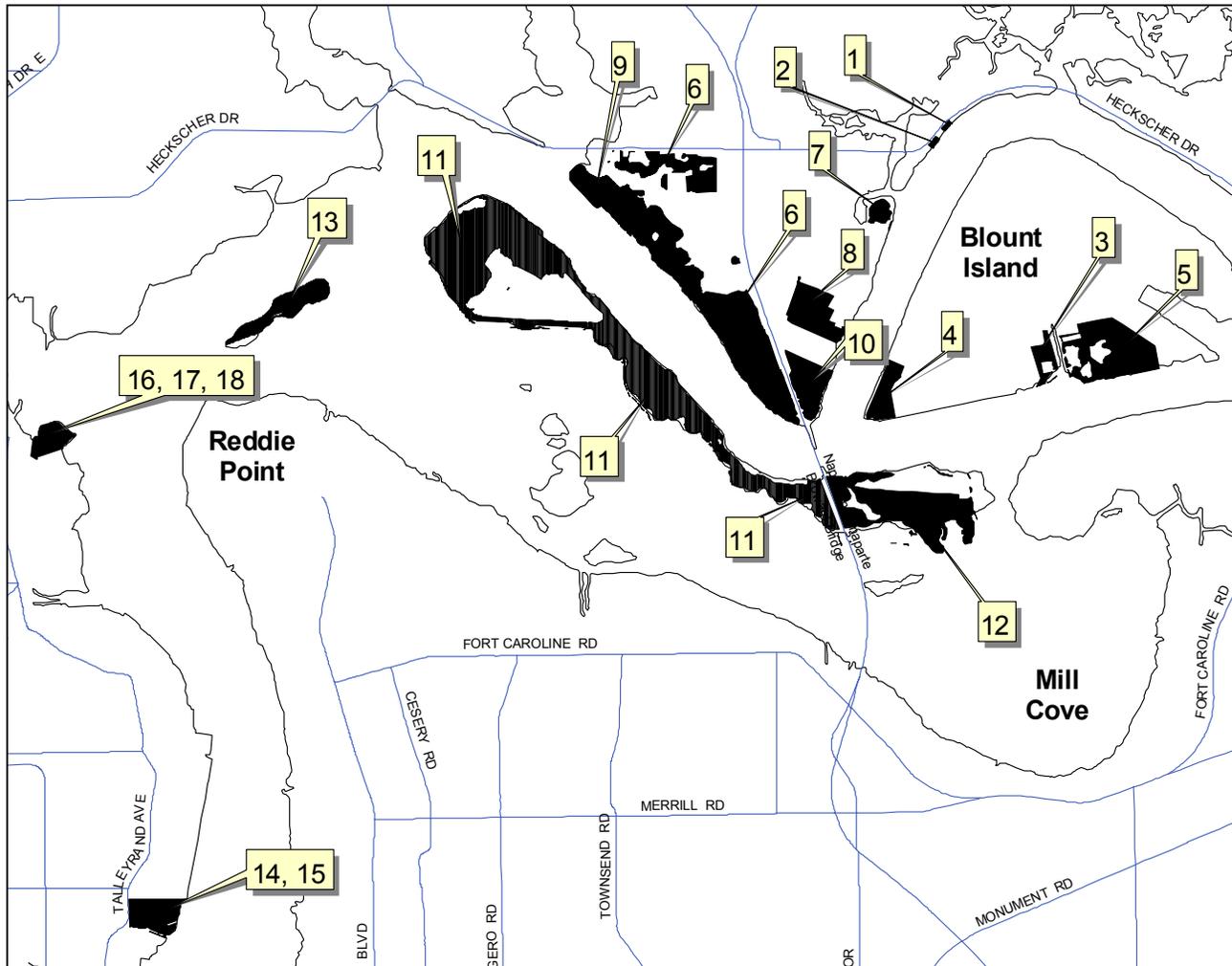
## APPENDIX G

### **Inventory of developable parcels within 25 feet of the water, in Land Use categories and zones where boat facility siting is preferred or acceptable with conditions (As analyzed by the Jacksonville Planning and Development Department, 2005):**

1. There are 19 developable parcels in Duval County where a Port facility could be developed. Of those, 11 are owned by government entities or utilities. They vary in size from 1 acre to 406 acres, and 5 are below 5 acres, a reasonable minimum for a viable port facility. Parcels included have not been reviewed as to whether they contain sufficient upland to realistically accommodate Port development.

2. The average acreage of all existing commercial marinas in Duval County listed in Table 7 is 1.84 acres. There are 14 developable parcels of that size or greater in Duval County where a Marina facility could be developed. Seven parcels are within the ownership of government entities unlikely to develop them as Marinas, i.e., The Federal Government, US Navy, and the Jacksonville Seaport Authority. Parcels included have not been reviewed as to whether they are of a configuration or contain sufficient upland to realistically accommodate Commercial Marina development.

3. Two recent residential developments of less than 100 units in Duval County (Villa Riva and La Terraza) with multi-family residential boat facilities averaged 4.7 acres. There are 14 parcels in the County of that size or greater where Multi-family Residential boat facility could be developed. Three parcels are within the ownership of The City of Jacksonville, an entity unlikely to develop them as Multi-Family Residential boat facilities. Parcels included have not been reviewed as to whether they are of a configuration or contain sufficient upland to realistically accommodate Multi-family Residential boat facility development.



**1. Developable parcels that allow Ports according to land use type and BFSZ location.**

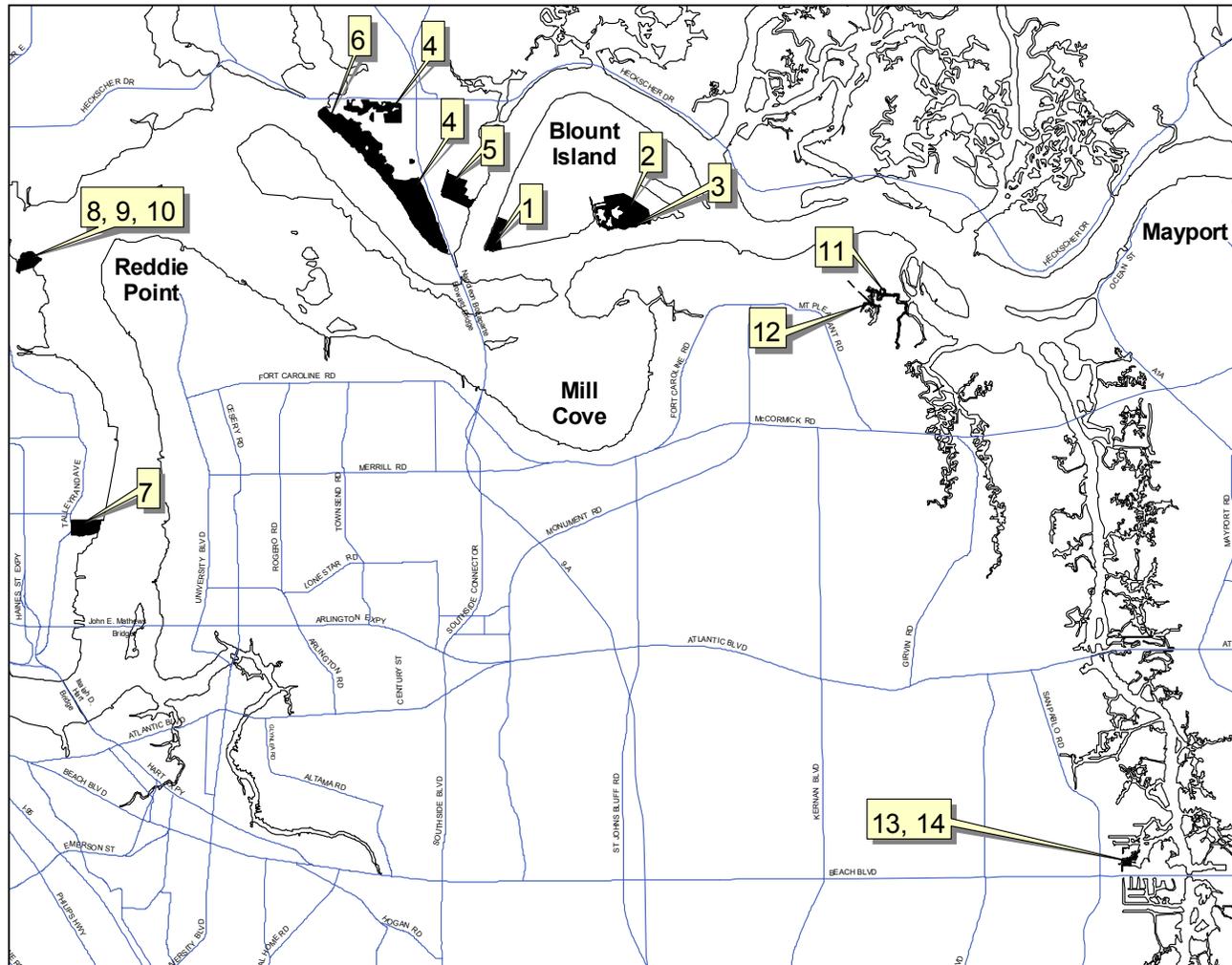
**1. Developable parcels that allow Ports according to land use type and BFSZ location.**

No.	LABEL	RE	LNAMEOWNER	FNAMEOWNER	PROP_USE_C	PUSE Def	AREA	ACRES
1	WD/WR	159950 0000	Jacksonville Seaport Authority		8600	County	50512.389	1.160
2	WD/WR	160799 0000	Jacksonville Seaport Authority		8600	County	63212.296	1.451
3	WD/WR	160257 1001	Florida power & Light Co.		9100	Utiilty	635861.025	14.597
4	WD/WR	160243 1000	Jacksonville Seaport Authority		9000	Leasehold Unit	1156549.046	26.551
5	WD/WR	160257 0500	United States of America	Department of the Navy	9000	Leasehold Unit	3818922.450	87.670
6	WD/WR	109231 0000	Jacksonville Seaport Authority		9999	To be appraised	11051181.137	253.700
7	WD/WR	108897 0000	Hawkins Aveue Corporation		4000	Vacant Indus	448183.309	10.289
8	WD/WR	109278 0000	General Portland Inc.		4000	Vacant Indus	2070933.620	47.542
9	WD/WR	108828 0000	Jacksonville Seaport Authority		9000	Leasehold Unit	2393353.852	54.944
10	WD/WR	109285 0000	Jacksonville Seaport Authority		8600	County	1803785.997	41.409
11	WD/WR	108818 1000	Jacksonville Seaport Authority		8600	County	17703568.510	406.418
12	WD/WR	108818 1000	Jacksonville Seaport Authority		8600	County	5769618.276	132.452
13	WD/WR	108929 0400	State of Florida II T F		8700	State	1855024.493	42.586
14	WD/WR	115323 0000	Kerr McGee Chemical Co.		4000	Vacant Indus	1440224.714	33.063
15	WD/WR	115332 0000	Seaboard Coast Line RR Co.		9100	Utiilty	201872.270	4.634
16	WD/WR	111101 0000					337434.573	7.746
17	WD/WR	111100 0000					541550.662	12.432
18	WD/WR	033331 0000	Southern Belle Frozen		4000	Vacant Indus	120970.819	2.777
The below parcel was removed from the list of possible new port locations because the land was divided up into very small uneven portions							61563.65	
19	WD/WR	108897 0000	Hawkins Aveue Corporation		4000	Vacant Indus	8	1.413

Source : City of Jacksonville Planning 2006.

BFSZ=Boat Facility Siting Zone

PUSE=Proposed use



2. Developable parcels that allow commercial marinas according to size (larger than 1.84), BFSZ location and PUSE code.

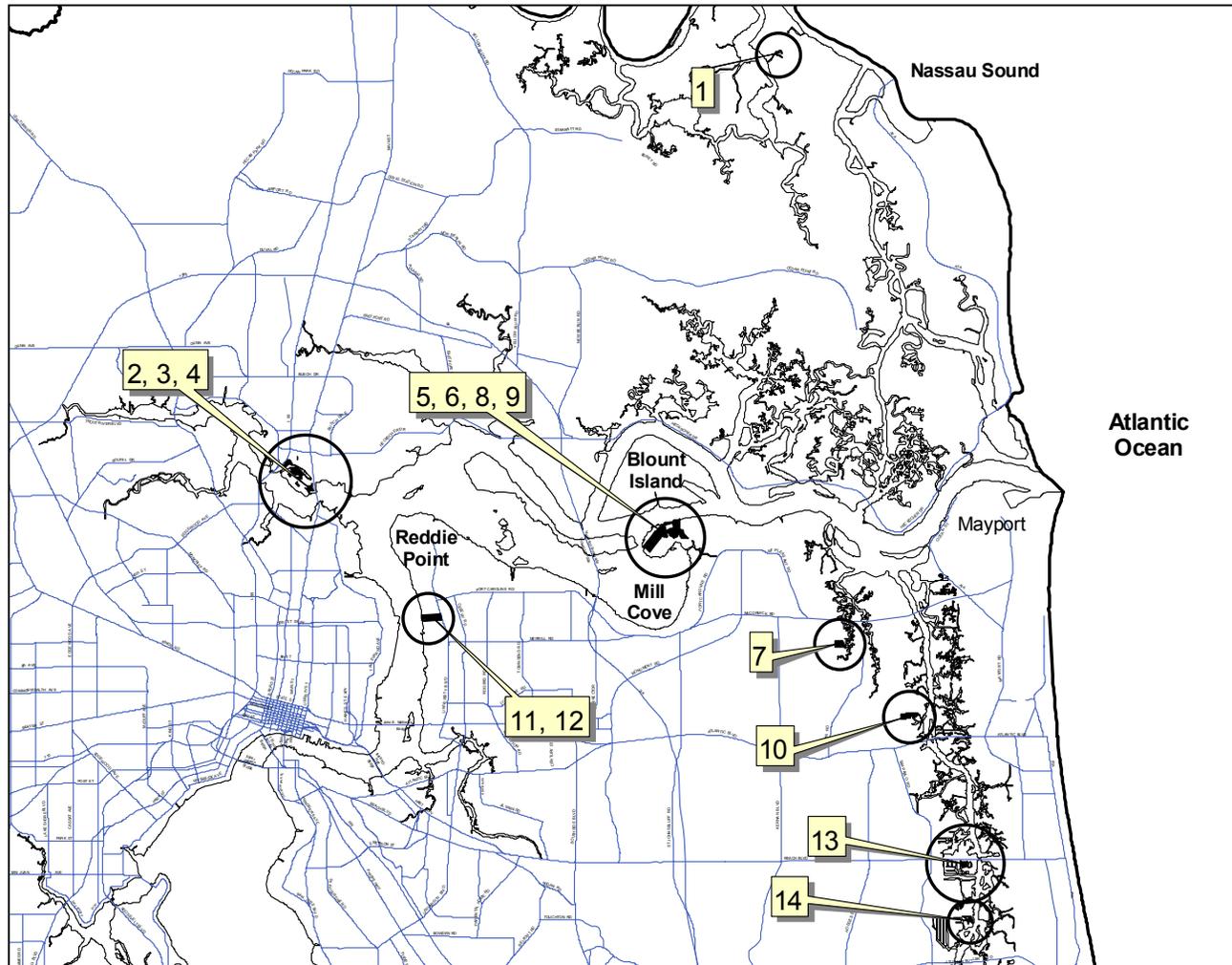
**2. Developable parcels that allow commercial marinas according to size (larger than 1.84), BFSZ location and PUSE code.**

No.	LABEL	RE	LNAMEOWNER	FNAMEOWNER	PROP_USE C	PUSE Def	AREA	ACRES
1	AGR-II	160286 0000	United States of America		7000	VACANT INSTIT	649419.757	14.909
2	AGR-II	160286 0000	United States of America		7000	VACANT INSTIT	141184.115	3.241
3	AGR-III	177022 0000	Palm Harbor Marina		9900	ACRG NOT ZND AG	253676.740	5.824
4	AGR-III	177022 0200	Dillmon	George Ray	9900	ACRG NOT ZND AG	92133.340	2.115
5	WD/WR	109278 0000	General Portland Inc.		4000	VACANT INDUS	2070933.620	47.542
6	WD/WR	115323 0000	Kerr McGee Chemical Co.		4000	VACANT INDUS	1440224.714	33.063
7	WD/WR	033331 0000	Southern Belle Frozen		4000	VACANT INDUS	120970.819	2.777
8	WD/WR	160243 1000	Jacksonville Seaport Authority		9000	LEASEHOLD INT	1156549.046	26.551
9	WD/WR	160257 0500	United States of America	Department of the Navy	9000	LEASEHOLD INT	3818922.450	87.670
10	WD/WR	160257 0500	United States of America	Department of the Navy	9000	LEASEHOLD INT	118011.774	2.709
11	WD/WR	108828 0000	Jacksonville Seaport Authority		9000	LEASEHOLD INT	2393353.852	54.944
12	WD/WR	109231 0000	Jacksonville Seaport Authority		9999	TO BE APPRAISED	11051181.137	253.700
13	WD/WR	111101 0000				0	337434.573	7.746
14	WD/WR	111100 0000				0	541550.662	12.432

Source : City of Jacksonville Planning 2006.

BFSZ=Boat Facility Siting Zone

PUSE=Proposed use



**3. Developable residential land use parcels within 25 Ft. of water (with land masses greater than 4.7 Acres and within BFSZs that allow marinas.**

**3. Developable residential land use parcels within 25 Ft. of water (with land masses > 4.7 Acres and within BESZs that allow marinas.**

No.	LABEL	RE	LNAMEOWNER	FNAMEOWNER	PROP USE C	PUSE Def	AREA	ACRES
1	LDR	044132 0000	Parker Trust		0000	Vacant Res	392137.648	9.002
2	LDR	180005 0000	Bennett	George M	0000	Vacant Res	234426.220	5.382
3	LDR	160257 0000	Boney	Walter T	0000	Vacant Res	548254.420	12.586
4	LDR	022108 0000	Broward	Albert Sidney Jr Life Trust	5600	Timber	1119737.326	25.706
5	LDR	160258 0010	City of Jacksonville		8600	County	931916.652	21.394
6	LDR	160259 0000	Jacksonville Seaport Authority		8600	County	1366808.015	31.378
7	LDR	160258 0000	City of Jacksonville		8600	County	2801504.611	64.314
8	LDR	162114 0000	Mount Pleasant Acres Co., Inc.		9900	ACRG NOT ZND AG	574728.014	13.194
9	LDR	167141 0000	Hodges	George H Jr.	9900	ACRG NOT ZND AG	903142.217	20.733
10	MDR	176989 0501	Moorings Condominium Assoc.		0400	Condominium	376050.519	8.633
11	MDR	022108 0000	Broward	Albert Sidney Jr Life Trust	5600	Timber	439996.023	10.101
12	RPI	128151 0000	Jacksonville University		7000	Vacant Institutional	230478.547	5.291
13	RPI	128152 0000	Jacksonville University		7000	Vacant Institutional	1124549.781	25.816
14	RR	159681 0355	Ball	John O	9900	ACRG NOT ZND AG	208416.229	4.785

Source : City of Jacksonville Planning 2006.

BFSZ=Boat Facility Siting Zone

PUSE=Proposed use

Note on definitions:

0400: a condo is present on the property. Do not assign this PUSE until there is one present.

9900: is Agricultural that is not zoned for agricultural, meaning rural/a vacant field.

098375-0000 and 098902-0000 were removed because only a very small portion of the acreage was close to the water.

## **GLOSSARY**

## GLOSSARY

***Aquatic Preserve*** - An exceptional area of submerged lands and associated waters which is to be maintained in its natural condition in accordance with Florida State Statutes.

~~***Boat Facilities*** - Boat facilities are defined as marinas with wet or dry storage, boat ramps or other launching facilities, or multi-family residential docks.~~

~~***Boat Facility*** - Port facilities, boat ramps or other launching facilities, **for motorized vessels, and marinas including both commercial and multi-family residential boat facilities. Any dock with more than 5 slips is a boat facility.**~~

***Boat facility siting plan*** - A City-wide plan for the development of boat facilities which specifies preferred locations for boat facility development based on an evaluation of natural resources, manatee protection needs, and recreation and economic demands. It is one component of a Manatee Protection Plan.

~~***Boat ramp*** - An area used to launch a vessel into the water.~~

~~***Boat Ramp*** - Facility to launch and retrieve boats from a trailer. Boat ramps serving exclusively non-motorized vessels such as canoes and kayaks are exempt from the boat facility siting criteria contained herein. For the purposes of this plan, a trailer parking space may be considered equivalent to a boat slip.~~

***Boat slip*** - For the purposes of marine/dock facilities and multifamily and single family docks, a boat slip is a component of a docking facility which can permanently accommodate no more than one boat or vessel.

***Boat yard*** - Any vessel storage, maintenance, or repair facility with haul-out capacity which is not necessarily located proximal to a waterbody.

***Caution zone*** - A zone frequently inhabited by manatees, requiring caution on the part of the vessel operators to avoid disturbing or injuring the manatees.

***Channel*** - A marked navigation channel unless otherwise described or designated, and is not intended to mean an access or side channel unless otherwise designated for the purpose of regulation.

***Class II waters*** - A water quality classification which is suitable for shellfish propagation or harvesting.

***Class III waters*** - A water quality classification which is suitable for recreation, fish and wildlife.

***Comprehensive Plan*** - An official document in ordinance form adopted by the local government setting forth its goals, objectives and policies regarding the long term development of the area within its jurisdiction. In the City, this refers to the text and maps adopted and emended by the City Council pursuant to Chapter 163 (Part II), et. seq., Florida Statutes as amended.

***Conveyance Structure*** - Any ditch, pipe, or culvert in which a manatee, adult or infant, could become trapped.

***Critical habitat*** - Federally designated areas, which, pursuant to the Endangered Species Act of 1973, have been determined to include physical and/or biological features that are essential to the survival of an endangered species (such as the manatee) which may require special management considerations or protection.

~~***Dedicated and Approved Manatee Observer*** – Approved by Florida Wildlife Commission (FWC).~~

**Designated channel** - A navigational channel designated by ordinance or rule which would allow an exemption to slow speed within the channel.

**Down-listing** - In order to down-list the manatee from "endangered" to "threatened", population modeling must indicate that the population is growing or is stable and that mortality is at acceptable levels or are decreasing, and that habitats are secure and threats to them are controlled or decreasing.

**Emergent aquatic vegetation** - Erect, rooted, herbaceous angiosperms that may be temporarily to permanently flooded at the base, but do not tolerate prolonged inundation of the entire plant; e.g. Spartina alterniflora and/or Juncus roemerianus.

**Endangered species** - A species which is in danger of extinction throughout all or a significant portion of its range due to 1) destruction, drastic modification or severe curtailment of habitat, or 2) its over utilization for commercial or sporting purposes, or 3) effect of disease or pollution, or 4) other natural or man-made factors.

**Essential habitat** - A criterion for determining areas where dock facilities should be limited. Essential habitat is any land or water area constituting elements necessary to the survival and recovery of the manatee population from endangered status which may require special management considerations and protective measures. The constituent elements include, but are not limited to: space for individual and population growth and for normal behavior; available food sources with adequate water depth and quality; warm and fresh water sources; sites for breeding and rearing of offspring; and habitats protected from disturbances that are representative of the geographical and seasonal distribution of the species.

**Idle speed zone** - A zone in which vessels create no wake and are not permitted to proceed at a speed greater than that necessary to maintain steerageway of the vessel. While operating within an idle speed zone, all vessel operators shall exercise a high degree of care for manatee presence.

**ISSC/Buffer Zone** - This zone is calculated using the ISSC (International Shellfish Sanitation Conference) calculation. To protect water quality over approved shellfish harvesting areas, no marinas are permitted within the ISSC buffer zone. The calculation is made once a marina is proposed in the vicinity of approved shellfish harvesting areas.

**Manatee Caution Zone** - An area manatees frequently inhabit on a somewhat regular basis and motorboat operators are advised to use caution so as not to strike a manatee.

**Manatee Protection Plan** - A comprehensive City wide plan to ensure the long range protection of manatees and their habitat.

**Manatee Protection Zone** - An area designated for the protection of manatees due to their concentration in the area, critical feeding area, or other reasons.

**Marina/Boat Facilities** - ~~Any facility used for the wet or dry storage, loading, unloading, and/or launching of boats which is not provided for the sole use of residences in a residential land use adjacent to a coastal waterbody. Marina/boat facilities include but are not limited to commercial marinas, commercial docking structures, and public and private boat launching facilities/boat ramps.~~

**Marina** - ~~A facility used for the wet or dry storage, loading, unloading, repair and/or launching of boats that is not a single family residential boat facility or port facility as herein defined. Multi-family residential boat facilities are included within the definition of marinas~~

**Miles** - Statute miles.

**Mitigation** - To mitigate, to make or become less severe or intense, moderate. The three types of mitigation in order of

priority, as defined by the United States Fish and Wildlife Service, are as follow:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing the impact by limiting the degree of magnitude of an action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected area.

**Mortality data** - Data which provide the cause of death for manatees.

**Motorboat** - Any boat or vessel propelled or powered by machinery.

**Multi-family Residential Boat facility** - A watercraft complex containing more than 5 wet and or dry slips provided for recreational use of upland homeowners or occupants adjacent to a coastal waterbody.

**Multi-slip docks** - ~~Moorings of three or more vessels.~~

**New Marina** - As referenced in Table 21, a boat facility proposed for development or expansion.

**Optimum sustainable population** - The level of population at which mortality and injury have been reduced to a point such that a species can be considered viable and self-sustaining. This level can only be determined when appropriate methodology and data are available to develop adequate population models.

**Outstanding Florida Waters (OFWs)** - Waterbodies which exhibit unique characteristics in terms of quality and value designated by the State for additional protection from further pollution and degradation.

**Recovery** - For the Florida manatee, as required by the Marine Mammal Protection Act of 1972, recovery will be achieved when "the health and stability of the marine ecosystem" can be maintained and when "optimum sustainable population" levels can be determined and maintained.

**Refuge** - A manatee protection area in which the United States Fish and Wildlife Service has determined that certain waterborne activity would result in the taking of one or more manatees, or that certain waterborne activities must be restricted to prevent the taking of one or more manatees, including but not limited to taking by harassment.

**Residential docking facilities** - Docks and wet slips provided for the sole use of the residents of a residential land use/development adjacent to a coastal waterbody.

**Salt Water Marshes** - Wetlands included as salt water marshes are predominated by one or more of the following plant species:

Cordgrasses	<u>Spartina spp.</u>
Needlerush	<u>Juncus roemerianus</u>
Seashore Saltgrass	<u>Distichlis spicata</u>
Saltwort	<u>Batis maritima</u>
Glassworts	<u>Salicornia spp.</u>
Fringerush	<u>Finbristylis castanea</u>
Salt Dropseed	<u>Sporobolus virginicus</u>
Seaside Daisy	<u>Borrchia frutescens</u>
Salt Jointgrass	<u>Paspalum vaginatum</u>

**Sanctuary** - A manatee protection area in which the United States Fish and Wildlife Service has determined that any waterborne activity would result in the taking of one or more manatees, including but not limited to taking by harassment. Sanctuaries are areas reserved exclusively for the manatees, where they may conduct activities such as; breeding,

nursing, and resting free from any harassment by humans.

**Seagrass** - Submerged vegetation found in estuaries of fresh and salt water mixes.

**Shoreline or Shore** - The interface of land and water.

**Single Family Residential Boat facility**- A facility containing wet slips and/or dry slips, not to exceed five in total, provided for the sole recreational use of the residents of a **single-family** residential land use/development adjacent to a coastal waterbody. Single family residential boat facilities may not be leased or sold to entities other than the upland owner. They are exempt from the boat facility siting criteria contained herein.

**Slow speed zone** - A zone in which vessels are completely off plane and proceeding with minimum wake. Slow speed also means no speed greater than that which is reasonable and prudent to avoid either intentionally or negligently annoying, molesting, harassing, disturbing, colliding with, injuring, or harming manatees.

**Slow Speed Zone with Designated Channel Exemption** - A zone which allows a designated navigation channel to be exempt from the slow speed zone along the course of the waterway. Any vessel leaving the designated channel would be required to travel at slow speed.

**Special Management Areas** - A specific geographical area which, because of its unique or especially sensitive environment, requires special management techniques.

**Submerged aquatic vegetation** - Vascular or non-vascular hydrophytes either rooted or non-rooted which lie entirely beneath the water surface, except for flowering parts in some species; e.g. Vallisneria americana and/or Eichornia crassipes.

**Threatened Species** - A species which may become an endangered species within the foreseeable future in all or a significant portion of its range due to 1) destruction, drastic modification or severe curtailment of habitat, or 2) its over utilization for commercial or sporting purposes, or 3) effect of disease or pollution, or 4) other natural or man-made factors.

**Vessel** - A craft, especially one larger than a rowboat, designed to navigate on water.

**Warm-water refuge** - A natural or manmade warm water habitat which maintains a temperature equal to or greater than minimum required manatees' survival (approximately 66° F or 19° C).

**Water-Dependent or Water-Related Uses** - Activities which can be carried out only on, in, or adjacent to, water areas because the use requires access to the water body for: waterborne transportation, including ports or marinas, recreation, electrical generating facilities, or water supply; or uses that provide goods and services directly associated with the waterway or water dependent use.

**Water-use access site** - Includes privately and publicly operated boat launching facilities which the public can use to enter the waterways.

**Waters** - Waters means waters of the State of Florida.

**Wharf fender** - Usually inflatable bumper which may be 10 feet by 5 feet in size. When lowered to the side of a vessel, leaves approximately 4 to 5 feet of space between the vessel and the bulkhead.

## **BIBLIOGRAPHY**

## **BIBLIOGRAPHY**

- Alvarez, T. 1963. The recent mammals of Tamaulipas, Mexico. Univ. Kans. Publ. Nat. Hist. 14(15):363-473.
- American Dredging Company. 1980. Biological Assessment. Florida manatee. Unpubl. Rep. 21 pp.
- Bartram, W. 1791. Travels of William Bartram. James and Johnson, Philadelphia. Dover reprint edition, 1955, 414 pp.
- Beck, C.A., R.K. Bonde, and G.B. Rathbun. 1982. Analysis of propeller wounds on manatees in Florida. J. Wildl. Manage. 46(2):531-535.
- Beeler, Elizabeth. Distribution and Mortality of West Indian Manatee in S.E. United States. Sirenia Project. National Ecology Center.
- \_\_\_\_\_ and T.J. O'Shea. 1988. Distribution and Mortality of the West Indian Manatee (*Trichechus manatus*) in the Southeastern United States: A Compilation and Review of Recent Information. Report Prepared for the U.S. Army Corps of Engineers Jacksonville District. Contract No. #14-16-0009-86-1815.
- Bengtson, J.L. 1981. Ecology of manatees (*Trichechus manatus*) in the St. Johns River, Florida. Ph.D. Thesis Univ. Minnesota, St. Paul. 126 pp.
- Best, R. C. 1981. Food and feeding habits of wild and captive Sirenia. Mammal Review. 11:3-29.
- Bonde, R. K., T.J. O'Shea, and C.A. Beck. 1983. A manual of procedures for the salvage and necropsy of carcasses of the West Indian manatee (*Trichechus manatus*). Natl. Tech. Inf. Ser., PB83-255273, Springfield, Va. 175 pp.
- Breen, L.L. 1981. Report on Banana River Manatee surveys, March, 1980 through March 1981. Merritt Island National Wildlife Refuge. Rep. to John F. Kennedy Space Center, unpubl. 11pp.
- Campbell, H.W. 1976. An Evaluation of manatee (*Trichechus manatus*) populations in the vicinity of the proposed Cross Florida Barge Canal with assessment of potential impacts. Appendix F in Cross Florida Barge Canal Restudy Report, Wildlife. U.S. Army Corps of Engineers, Jacksonville, Florida.
- \_\_\_\_\_ and A. B. Irvine. 1981. Manatee mortality during the unusually cold winter of 1976-1977. Pages 86-91 in R.L. Brownell, Jr. and K. Ralls, eds. The West Indian manatee in Florida. Proc. Workshop, Orlando, Florida, 27-29 March 1978. Fla. Dep. of Nat. Resour., Tallahassee, Florida.
- CH2MHILL. 1986. Aerial census of manatees in the vicinity of Six Mile Creek, in the lower middle St. Johns River, Florida. Prepared for St. Johns Harbor, Inc. 97pp.
- Citus County. April 1991. Citus County Manatee Protection Plan.
- City of Jacksonville. 1990. 2010 Comprehensive Plan;Conservation/Coastal Management Element.
- Collard, S.B., N. I. Rubenstein, J.C. Wright, and S.B. Collard, III. 1976. Occurrence of a Florida manatee at Pensacola Bay. Fla. Sci. 39(1):48.
- Dobberfuhr, D., 2002. Distribution of submerged aquatic vegetation in the lower St. Johns River 1998 atlas. Professional Paper SJ2002-PP1. SJRWMD, Palatka, FL. 44pp.
- Dobberfuhr, D. and N. Trahan., 2003. Distribution of submerged aquatic vegetation in the lower St. Johns River 2001

- atlas. Professional Paper SJ2003-PP1. SJRWMD, Palatka, FL. 51pp.
- Dobberfuhl, D. and C. Hart. 2004 (unpublished). Distribution of submerged aquatic vegetation in the lower St. Johns River 2004 atlas. Professional Paper SJ2004-PP1. SJRWMD, Palatka, FL.
- Domning, D.P. and L.A.C. Hayek. 1986. Interspecific and intraspecific morphological variation in manatees (*Sirenia:Trichechus*). *Marine Mammal Sci.* 2(2):87-144.
- DNR (Department of Natural Resources). September, 1989. Recommendations to improve boating safety and manatee protection for Florida Waterways.
- \_\_\_\_\_. August 1992. Endangered and Threatened Wildlife and Plants.
- \_\_\_\_\_. June, 1993. Duval County Boating Activity Study. Progress Report 1.
- \_\_\_\_\_. August 1982. Boat Facility Siting Guide.
- \_\_\_\_\_. 1989. Outdoor Recreation in Florida.
- \_\_\_\_\_. 1993. Marine Mammal Aerial Survey Logs, W.B. Brooks and Jana Pennington.
- Eberhardt, L.L. DNR. 1982. Censusing Manatees.
- \_\_\_\_\_. February 1987. Fernandina Marine Construction Management Manatee Sightings Program. 1st. Report.
- EPA (Environmental Protection Agency). 1980a. Draft Environmental Impact Statement. Florida Power Corp. Crystal River Units 4 and 5. Atlanta, Ga.
- \_\_\_\_\_. 1980b. Draft Environmental Impact Statement. Florida Power Corp. Crystal River Units 4 and 5. Technical Support Documents. Two Volumes.
- Etheridge, K., G.B. Rathbun, J.A. Powell, and H.I. Kochman. 1985. Consumption of aquatic plants by the West Indian manatee. *J. Aquat. Plant Manage.* 23:21-25.
- Fletemeyer, J. 1982. Final report on the 1981-82 manatee protection plan and data on the Port Everglade's winter manatee population. Nova Univ. Oceanographic Cent. 33 pp.
- Florida Marine Research Institute. 1974-1993 Manatee Mortality in Florida by cause of Death.
- FPC (Florida Power Corporation). 1974. Crystal River Power Plant: Environmental Considerations. Final Rept. to the Interagency Research Advisory Committee. St. Petersburg, Fla. Second Printing, 1977. Four Volumes.
- Frohlich, R.K. and L.W. Lefebvre. 1986. Movements of radio-tagged manatees in southwest Florida, update: 1 July 16 - December 1986. U.S. Fish and Wildl. Serv/Fla. Dept. of Nat. Resour. Unpubl. Rep. 5 pp.
- Gicca, Diderot. 1979. Alton Box Board Company manatee survey. Unpubl. Rep. 24 pp.
- Gill, W. 1981. Manatee found in Chesapeake Bay Virginia. *End. Spec. Tech. Bull. Dep. of the Interior, U S. Fish and Wildl. Serv. Endangered Species Program, Washington, D.C.* 6(1):6-7.

- Gunter, G. 1941. Occupance of the manatee in the United States with records from Texas. *J. Mammal.* 22:60-64.
- \_\_\_\_ and G. Corcoran. 1981. Mississippi manatees. *Gulf Res. Rep.* 7(1):97-99.
- \_\_\_\_ and A. Perry. 1983. A 1981 sighting of *Trichechus manatus* in Mississippi. *J. Mammal.* 64(3):513.
- Hain, James H. and Ellis Sarel. 1993. Characterization of Vessel Traffic at the St. Johns and St. Marys Channel Entrances, Northeast Florida. Marine Fisheries Service. Woods Hole, Ma. 02453.
- Haller, W. T., J.V. Shireman, and D. R. Canfield, Jr. 1982. Vegetative and herbicide monitoring study in Kings Bay, Crystal River, Fla. Proj. Rep., Contract No. DACW17-80-C-0062. U.S. Army Corps. of Eng. 170 pp.
- Hardisky, M. 1979. Marsh habitat development. A feasible alternative to dredged material disposal. *Ga. Coastline* 1(16):5-6.
- Hartman, D.S. 1974. Distribution, status, and conservation of the manatee in the United States. Rep. to U.S. Fish and Wildl. Serv., Natl. Fish and Wildl. Lab., Contract Rep. No. 14-16-0008-748, Natl. Tech. Inv. Serv. Publ. No. PB81-140725. 247 pp.
- \_\_\_\_. 1979. Ecology and behavior of the manatee (*Trichechus manatus*) in Florida. *The Amer. Soc. Mammal Spec. Publ. No. 5.* 153 pp.
- Hill, Kim. 1986. An aerial census of Manatees in the vicinity of Six-Mile Creek.
- Husar, S.L. 1977. The West Indian manatee (*Trichechus manatus*). U.S. Fish and Wildl. Serv. Res. Rept. No. 7, Washington, D.C. 22 pp.
- \_\_\_\_. 1978. *Trichechus manatus*. *The Amer. Soc. Mammal. Mammalian Species No.* 93:1-5.
- Irvine, A.B. 1980. A review of the biology of the West Indian manatee *Trichechus manatus* in the southeastern United States, and a report of the results of an aerial survey study of western Florida. U.S. Fish and Wildl. Serv., Natl. Fish and Wildl. Lab. 140 pp.
- \_\_\_\_. 1983. Manatee metabolism and its influence on distribution in Florida. *Boil. Conserv.* 25:315-334.
- \_\_\_\_ and H.W. Campbell. 1978. Aerial census of the West Indian manatee, *Trichechus manatus*, in the southeastern United States. *J. Mammal.* 59(3):613-617.
- \_\_\_\_ and M.D. Scott. 1984. Development and use of marking techniques to study manatees in Florida. *Fla. Sci.* 47(1):12-26.
- \_\_\_\_, J.E. Caffin, and H.I. Kochman. 1981. Aerial surveys for manatees and dolphins in western peninsular Florida: with notes on sightings of sea turtles and crocodiles. U.S. Fish and Wildl. Serv., Off. Biol. Serv., Washington, D.C. FWS/OBS-80/50. 20 pp.
- \_\_\_\_, M.D. Scott, and S.H. Shane. 1979. A study of the West Indian manatee, *Trichechus manatus*, in the Banana River and associated waters, Brevard County, Florida. Final draft. Contract Rep. to John F. Kennedy Center, NASA. Kennedy Space Center, Florida. Contract No. CC-63426A. 65 pp.
- Kasul, R.L. 1985. Information needs for evaluating permits on Corps of Engineers permits on manatee. Final Rep. Dep. of the Army, Waterways Exp. Station, Corps of Eng., Vicksburg, Miss. 16 pp.

- Jacksonville Electric Authority. January - June 1984. Manatee Watch Program. Conducted by Jacksonville University.
- Kinnaird, M.F. 1983a. Aerial census of manatee and boats over the lower St. Johns River and the Intracoastal Waterway in northeastern Florida. Site-specific Reduction of Manatee Boat/Barge Mortality Rep. No. 2. Prepared for U.S. Fish and Wildl. Serv. Coop. Agreement No. 14-16-0004-81-923. Fla. Coop. Fish and Wildl. Res. Unit, Gainesville, Fla. 56 pp.
- \_\_\_\_\_. 1983b. Site-specific analysis of factors potentially influencing manatee boat/barge mortality. Site-specific Reduction of Manatee Boat/Barge Mortality Rep. No. 4. Prepared for U.S. Fish and Wildl. Serv. Coop. Agreement No. 14-16-0004-81-923. Fla. Coop. Fish and Wildl. Res. Unit, Gainesville, Fla. 41 pp.
- \_\_\_\_\_ and J. Valade. 1983. Manatee use of two power plant effluent on the St. Johns River in Jacksonville, Florida. Site-specific Reduction of Manatee Boat/Barge Mortality Rep. No. 1. Prepared for U.S. Fish and Wildl. Serv. Coop. Agreement 14-16-0004-81-923. Fla. Coop. Fish and Wildl. Res. Unit, Gainesville, Fla. 62 pp.
- Kochman, H.I., G.B., Rathbun, and J.A. Powell. 1983. Use of the Kings Bay, Crystal River, Florida, by the West Indian manatee (*Trichechus manatus*). Pages 69-124 in Packard, J.M., ed. Proposed Research/Management Plan for Crystal River Manatee. Vol. III. Compendium. Tech. Rept. No. 7. Fla. Coop. Res. Unit, Univ. Fla., Gainesville, Fla. 346 pp.
- \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_. 1985. Temporal and spatial distribution of manatees in Kings Bay, Crystal River, Florida. *J. Wildl. Manage.* 49(4):921-924.
- Layne, J.N. 1965. Observations of marine mammals in Florida waters. *Bull. Fla. St. Mus.* 9(4):131-181.
- Lomolino, M. V. 1977. The ecological role of the Florida manatee (*Trichechus manatus latirostris*) in water hyacinth-dominated ecosystems. M.S. Thesis, University of Florida, Gainesville, FL.
- Lund, F. 1976. Manatee usage of the Hobe Sound National Wildlife Refuge, March - July 1976. Unpubl. Rep. 35 pp.
- McGehee, M.A. 1982. Manatees (*Trichechus manatus*): Abundance and distribution in and around several Florida power plant effluent during the winter of 1981-1982. Final Rep. Prepared for Fla. Power and Light Co. Contract No. 31534-86419. 67 pp.
- McNerney, B.B. 1982. Birth of a manatee: an eyewitness account. *Oceans* 15(6):12.
- Northeast Florida Regional Planning Council. 1987. Northeast Florida Comprehensive Regional Policy Plan.
- Odell, D.K. 1979. Distribution and abundance of marine mammals in the water of the Everglades National Park. *Proc. Conf. Sci. Res. in the National Parks, New Orleans, La., 9-12 Nov. 1976.* Nat. Park Serv. Series No. 5(1):673-678.
- \_\_\_\_\_. 1982. West Indian manatee. Pages 828-837 in J.A. Chapman and G.A. Feldhamer, eds. *Wild Mammals of North America. Biology, management and economics.* John Hopkins Univ. Press, London.
- O'Shea, T.J. and G.B. Rathbun. 1982. Summary report on a die-off of the West Indian manatee (*Trichechus manatus*) in Lee County, Florida, Spring 1982. Vols. I-III. 644 pp.
- \_\_\_\_\_, C.A. Beck, R.K. Bonde, H.I. Kochman, and D.K. Odell. 1985. An analysis of manatee mortality patterns in Florida, 1976-1981. *J. Wildl. Manage.* 49(1):1-11.

- Packard, J.M. 1981. Abundance, distribution, and feeding habits of (*Trichechus manatus*) wintering between St. Lucie and Palm Beach Inlets, Florida. Final Rep. Prepared for U.S. Fish and Wildl. Serv. Contract No. 14-16-0004-80-105. 139 pp.
- \_\_\_\_\_. 1983. Proposed research/management plan for Crystal River manatees. Vols I-III. Tech Rep. no. 7. Fla. Coop. Fish and Wildl. Res. Unit, Univ. Fla., Gainesville, Fla. 612 pp.
- \_\_\_\_\_. 1984. Impact of manatees *Trichechus manatus* on seagrass communities in eastern Florida. Acta Zool. Fennica 172:21-22.
- \_\_\_\_\_. 1985. Development of manatee aerial survey techniques. Manatee Population Res. Rep. No. 7, Tech. Rep. No. 8-7, Fla. Coop. Fish and Wildl, Res. Unit, Univ. Fla., Gainesville, Fla. 68 pp.
- \_\_\_\_\_, D.B. Siniff, and J.A. Cornell. 1986. Use of replicate counts to improve indices of trends in manatee abundance. Wildl. Soc. Bull. 14:265-275.
- \_\_\_\_\_, R.C. Summers, and L.B. Barnes. 1983. Correction factors for observability of manatees during aerial surveys. Manatee Population Res. Rep. No. 3. Tech. Rep. No.8, Fla. Coop. Fish and Wildl. Res. Unit, Univ. Fla., Gainesville, Fla. 10 pp.
- \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_. 1985. Variation of visibility bias during aerial surveys of manatees. J. Wildl. Manage. 49(2):347-351.
- Patton G.W. 1980. Studies of the West Indian manatee (*Trichechus manatus*) in Tampa Bay, Florida. Tech. Rep. to Mote Marine Lab. 65 pp.
- Prom, Steven. 1989. Citizens to Save Mandarin Park.
- Pulliam, J.W. 1985. Biological Opinion of the U.S. Fish and Wildl. Serv. on "interinlet area". Unpubl. Rep. 11 pp.
- Rathban, G.B., R.K. Bonde, and D. Clay. 1982. The status of the West Indian manatee on the Atlantic coast of north Florida. Pages 152-165 in R.R. Odum and J.W. Guthrie, eds. Proc. Symposium on Nongame and Endangered Wildlife. Ga. Dep. of Nat. Resour., Game and Fish Div., Tech. Bull. WL5.
- Reid, J.P. 1983. A survey of the 1983 winter manatee aggregation at the Fort Myers power plant, Lee County, Florida. Final Rep. to U.S. Fish and Wildl. Serv., Sirenia Proj. Appendix A in G. B. Rathbun, J.A. Powell and J.P. Reid. Movements of manatees (*Trichechus manatus*) using power plants effluent in southern Florida. Final Rep. Prepared for Fla. Power and Light Co. Order No. 88798-87154.
- \_\_\_\_ and G.B. Rathbun. 1986. 1985 Manatee identification catalog update. Unpubl. Progress Rep., U.S. Fish and Wildl. Serv., Sirenia Proj., Gainesville, Fla. 31 pp.
- Reynolds, J.E., III. 1977. Aspects of the social behavior and ecology of a semi-isolated colony of Florida manatees (*Trichechus manatus*). M.S. Thesis, Univ. Miami, Coral Gables, Fla. 206 pp.
- \_\_\_\_\_. 1986. Distribution and abundance of the West Indian manatee (*Trichechus manatus*) around selected Florida power plants following winter cold fronts, 1984-1986. Final Rep. Prepared for Florida Power and Light Co., Order No. 01249-83893. 51 pp.
- Rose, P.M. 1981. A preliminary report on the aerial census of the West Indian manatee (*Trichechus manatus*), in and around several "once through cooling" power plant effluent; December-March, 1977-78. Pages 22-23 in R.L.

- Brownell, Jr. and K. Ralls, eds. The West Indian manatee in Florida. Proc. Workshop, Orlando, Florida, 27-29 March 1978.
- Roseneau, J.C., G.L. Faulkner, C.W. Hendry, Jr., and R.W. Hull. 1977. Springs of Florida. Fla. Dep. Nat. Resource. Bureau of Geology Bull. No. 31 (Revised). 461 pp.
- Ross, Neil W. 1985. Environmental Impacts of Marinas and Their Boats. Marine Advisory Service, Sea Grant University of Rhode Island, Narragansett, Rhode Island.
- Sadusky, Sandy. February 1994. Personal Interview. Save The Manatee Club.
- Soskis, Jogue. 1992. Study of Boaters in Duval County Waters. The Recreation Department of the City of Jacksonville, Florida.
- Thayer, G.W., W.J. Kenworthy, and M.S. Fonseca. 1984. The ecology of eelgrass meadows of the Atlantic Coast: a community profile. U.S. Fish Wild. Serv. FWS/OBS-84/02. 147 pp. Reprinted September 1985.
- Twilly, R.R and J.W. Barko. 1990. The growth of submersed macrophytes under experimental salinity and light conditions. *Estuaries* 13:311-321.
- U.S. Fish and Wildlife Service, Sirenia Project. 1981. Summary of U.S. Fish and Wildlife Service Manatee research at Blue Spring Run, 1970-1981. Vols. I-III. 448 pp.
- U.S. Fish and Wildlife Service. 1994. 1993 Annual Progress Report for the Florida Manatee Recovery Plan. Prepared by the U.S. Fish and Wildlife's Jacksonville Field Office with the cooperation of the Florida Manatee Recovery Team, Jacksonville, Florida. 59 pp.
- U.S. Marine Mammal Commission. 1984. Habitat protection needs for the sub-population of West Indian manatees in the Crystal River area of northwest Florida. Rep. of the Marine Mammal Commiss. in consultation with it's committee of scientific advisors on marine mammals. 46 pp.
- Valade, J.A. 1980. Observations of manatees in the thermal discharges of the Jacksonville Electric Authority Generating Stations and Alton Box Board Corporation. Supplement to the Environmental Impact Statement for the Jacksonville Electric Authority's proposed coal fired generating station at the east port site. 21 pp.
- \_\_\_\_\_. 1991. The scientific study of the distribution of manatees in the waters of Duval County, Florida by aerial survey. City of Jacksonville, Department of Recreation and Public Affairs Administrative Services, Jacksonville, Florida.
- \_\_\_\_\_, K.I. Miller, and A. Q. White. 1984. Manatee watch program January - June 1984. Final Rep. Jacksonville Electric Authority. 232 pp.
- Weigle, B.L. 1983. A survey of West Indian Manatees, *Trichechus manatus*, warm water effluent in Tampa Bay, Florida. Final Rep. Order No. 86800-0257-3. Appendix B. in G.B. Rathbun, J.A. Powell, and J.P. Reid. Movements of manatees (*Trichechus manatus*) using power plant effluent in southern Florida. Final Rep. Prepared for Florida Power and Light Co. Order No. 88798-87154.
- White, A. Q., G. F. Pinto and A. P. Robison. 2002. Seasonal distribution of manatees, *Trichechus manatus latirostris*, in Duval County and adjacent waters, northeast Florida. *Florida Scientist*. 65(3): 208-221.