

# Flagler County Manatee Protection Plan

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December 2014  
1st Revision - June 2015

## EXECUTIVE SUMMARY

This document represents Flagler County's Manatee Protection Plan (MPP) which is intended to assist in protecting manatees and their habitats to ensure their continued survival. Specific objectives include: reducing the number of boat-related mortalities; creation of a boat facility siting plan, protecting manatee habitat; promoting boating safety; and increasing public awareness of the need to protect manatees and their habitat.

Flagler County has been in discussions with the Florida Fish and Wildlife Conservation Commission (FWC) and the U.S. Fish and Wildlife Service (FWS) regarding manatee protection since 2006. It was in 2006 that the County received a Biological Opinion (BO) from FWS to the U.S. Army Corps of Engineers (USACE) recommending denial of five multi-slip projects within Flagler County. The BO referenced five projects within Flagler County and expressed the FWS' position regarding Flagler County and the Marine Mammal Protection Act and Endangered Species Act. In summary, the BO stated that due to the "threat" to manatees from the additional proposed slips the FWS could not recommend approval. During the years of 2003, 2006, and 2007 Flagler County saw a small spike in watercraft related manatee deaths (2 in each of those years). In 2007 the FWC identified Flagler County within the Manatee Management Plan (MMP) as an area with little or no manatee protection regulations and therefore would require evaluation to determine if Manatee Protection Zones were warranted. Through coordination with FWS and FWC, and the agreement of adopting a Manatee Protection Plan, the permits were eventually issued. In 2011, after years of coordination between the agencies and Flagler County, FWS re-initiated Section 7 Consultation with the USACE and requested the permits be revoked. None of the marina developments included in the BO were ever constructed. Since then, two other permit applications were subsequently denied based on protection of manatees through the requirement of a MPP.

Manatee Protection Zones (boat speed restriction zones) are a management tool that have historically been used in areas where watercraft related manatee deaths are high. Flagler County is not recognized as an area with high watercraft related manatee deaths, but the County does recognize that the number of deaths in the early to mid-2000's increased to a number of concern (but still not what would be considered high, historically). Flagler County took its first large step towards overall protection of manatees in 2012 by instituting Manatee Protection Zones over 5.4 miles of the

Intracoastal Waterway (ICW) in the areas identified as requiring additional protections. The speed zones became enforceable in 2013. Flagler County has started the process and intends to establish an additional zone which is approximately 0.5 miles in length and provides shore to shore manatee protection around the mouth of the Lehigh Canal.

Flagler County's intent is to utilize this MPP and its recommendations as a means to provide adaptive management practices in regards to manatee protection. The findings of this study represent a solid baseline of data. The creation of a Manatee Protection Plan Yearly Status Report updating the number of newly constructed slips and/or ramps, watercraft related manatee deaths and locations of deaths, law enforcement status within the Manatee Protection Zones, land acquisitions along the ICW, and other pertinent manatee related information can be utilized as a guide to create adaptive management techniques which will truly provide useful protection of manatees. The creation of protocol for inter-agency coordination between Flagler County, FWS, FWC, and other stakeholders will provide assurances that all manatee related issues are kept within open discussion and the yearly status reports are reviewed by each that is involved.

This plan does not pertain to single family docks; only projects proposing expansion or construction of new facilities of five or more slips. Among the components of this MPP are:

- An inventory of boat facilities (marinas, multi-family residential facilities, & boat ramps).
- An assessment of boating activity patterns.
- Manatee sighting and mortality information.
- Information on Aquatic Preserves and Outstanding Florida Waters.
- Manatee protection measures, such as boating speed zone regulations.
- A Boat Facility Siting Plan.
- An education and awareness program for the public, boaters, and children.
- Recommendations and schedule for future review.

**TABLE OF CONTENTS**

**EXECUTIVE SUMMARY ..... I**

TABLE OF CONTENTS ..... III

LIST OF FIGURES ..... IV

LIST OF TABLES ..... VI

LIST OF APPENDICES ..... VII

LIST OF ABBREVIATIONS ..... VII

LIST OF DEFINITIONS ..... VIII

**1.0 INTRODUCTION ..... 1**

1.1 GEOGRAPHIC SETTING ..... 2

1.2 COUNTY DEMOGRAPHICS ..... 3

1.3 RESIDENTIAL AND COMMERCIAL DEVELOPMENT WITHIN THE COUNTY ..... 4

1.4 MANATEE RELEVANT WATERWAYS, WATER QUALITY, AND RECREATION ..... 5

1.5 MANATEE PROTECTION ZONES ..... 7

1.6 MANATEE NATURAL HISTORY IN FLORIDA ..... 12

1.7 LAND DEVELOPMENT REVIEW ..... 13

1.8 MANATEE PROTECTION PLAN OBJECTIVE ..... 14

**2.0 FLAGLER COUNTY MANATEE HABITAT ..... 14**

2.1 PELLICER AND TOMOKA MARSH AQUATIC PRESERVES ..... 14

2.2 THE ATLANTIC INTRACOASTAL WATERWAY IN FLAGLER ..... 18

2.3 FLAGLER COUNTY PRESERVATION LANDS ..... 26

2.4 FRESHWATER AVAILABILITY ALONG THE ICW IN FLAGLER COUNTY ..... 33

2.5 FORAGE OPPORTUNITIES FOR MANATEES IN FLAGLER COUNTY ..... 40

**3.0 INFORMATION ASSESSMENT ..... 46**

3.1 MANATEE DISTRIBUTION ..... 46

3.2 AERIAL SURVEYS ..... 47

3.3 MANATEE MORTALITY ..... 52

3.3.1 WATERCRAFT RELATED MANATEE MORTALITIES ..... 62

3.4 BOAT ACTIVITY ..... 64

3.4.1 BOATING ACCIDENT STATISTICS ..... 68

3.4.2 BOATING STUDIES IN FLAGLER COUNTY ..... 70

3.5 EXISTING BOATING FACILITY INVENTORY ..... 73

3.5.1 COMMERCIAL AND RESIDENTIAL MARINAS ..... 73

3.5.2 RAMPS AND TRANSIENT SLIPS ..... 73

3.5.3 COMMERCIAL FACILITIES ..... 73

3.5.4 MARINELAND & MATANZAS RIVER REGION – SECTION A ..... 75

3.5.5 PALM COAST REGION – SECTION B ..... 77

3.5.6 FOX CUT REGION – SECTION C ..... 79

3.5.7 SMITH CREEK NORTH OF SR100 REGION – SECTION D ..... 80

3.5.8 SMITH CREEK SOUTH OF SR100 REGION – SECTION E..... 83

3.5.9 LAKE CRESCENT REGION – SECTION F ..... 84

3.6 MANATEE COINCIDENCE DATA..... 85

3.7 INFORMATION ASSESSMENT DISCUSSIONS..... 86

**4.0 BOAT FACILITY SITING PLAN ..... 90**

4.1 COUNTY AND MUNICIPALITY JURISDICTION ..... 91

4.2 BOAT FACILITY SITING PLAN DEVELOPMENT CRITERIA..... 92

4.3 BOAT FACILITY SITING PLAN RECOMMENDATIONS ..... 92

4.4 EXISTING MARINA EXPANSION ..... 111

4.5 SINGLE FAMILY DOCKS AND MULTI-FAMILY FACILITIES LESS THAN 5 SLIPS ..... 111

**5.0 EDUCATION PLAN..... 111**

5.1 INFORMATIONAL KIOSKS ..... 113

5.2 BOATING GUIDE PAMPHLETS ..... 113

**6.0 MANATEE PROTECTION ZONES AND LAW ENFORCEMENT ..... 113**

**7.0 IMPLEMENTATION PLAN ..... 114**

7.1 MANATEE PROTECTION PLAN ADOPTION ..... 114

7.2 MANATEE PROTECTION PLAN STATUS REPORT ..... 114

7.3 MANATEE PROTECTION ZONE LAW ENFORCEMENT YEARLY REPORT..... 115

7.4 MANATEE PROTECTION PLAN FUNDING ..... 115

7.5 MANATEE PROTECTION PLAN RECOMMENDATIONS ..... 116

**REFERENCES ..... 118**

**LIST OF FIGURES**

FIGURE 1: LOCATION OF FLAGLER COUNTY, FLORIDA ..... 3

FIGURE 2: DRAINAGE BASINS ..... 6

FIGURE 3: MANATEE PROTECTION ZONES ..... 8

FIGURE 4: MANATEE PROTECTION ZONE SECTION B..... 9

FIGURE 5: MANATEE PROTECTION ZONE SECTIONS C & D..... 10

FIGURE 6: MANATEE PROTECTION ZONE SECTION E ..... 11

# FLAGLER COUNTY MANATEE PROTECTION PLAN

FIGURE 7: ADDITIONAL PROPOSED MANATEE PROTECTION ZONE .....	12
FIGURE 8: ICW AQUATIC PRESERVES AND OUTSTANDING FLORIDA WATERS.....	15
FIGURE 9: LAKE CRESCENT OUTSTANDING FLORIDA WATERS .....	16
FIGURE 10: OVERVIEW OF MPP PLANNING SECTIONS .....	20
FIGURE 11: AERIAL VIEW OF MPP PLANNING SECTION A .....	21
FIGURE 12: AERIAL VIEW OF MPP PLANNING SECTION B .....	22
FIGURE 13: AERIAL VIEW OF MPP PLANNING SECTION C .....	23
FIGURE 14: AERIAL VIEW OF MPP PLANNING SECTION D .....	24
FIGURE 15: AERIAL VIEW OF MPP PLANNING SECTION E.....	25
FIGURE 16: AERIAL VIEW OF MPP PLANNING SECTION F.....	26
FIGURE 17: PRESERVATION LANDS SECTION A.....	28
FIGURE 18: PRESERVATION LANDS SECTION B.....	29
FIGURE 19: PRESERVATION LANDS SECTION C.....	30
FIGURE 20: PRESERVATION LANDS SECTION D .....	31
FIGURE 21: PRESERVATION LANDS SECTION E .....	32
FIGURE 22: PRESERVATION LANDS SECTION F.....	33
FIGURE 23: FRESHWATER SOURCES SECTION A .....	35
FIGURE 24: FRESHWATER SOURCES SECTION B .....	36
FIGURE 25: PALM COAST WATER TREATMENT EFFLUENT DISCHARGE POINTS.....	37
FIGURE 26: FRESHWATER SOURCES SECTION C.....	38
FIGURE 27: FRESHWATER SOURCES SECTION D .....	39
FIGURE 28: FRESHWATER SOURCES SECTION E.....	40
FIGURE 29: MANATEE FORAGE MAP SECTION A .....	42
FIGURE 30: MANATEE FORAGE MAP SECTION B .....	43
FIGURE 31: MANATEE FORAGE MAP SECTION C .....	44
FIGURE 32: MANATEE FORAGE MAP SECTION D .....	45
FIGURE 33: MANATEE FORAGE MAP SECTION E.....	46
FIGURE 34: AERIAL SURVEY MAP SECTION A .....	48
FIGURE 35: AERIAL SURVEY MAP SECTION B .....	49
FIGURE 36: AERIAL SURVEY MAP SECTION C .....	50
FIGURE 37: AERIAL SURVEY MAP SECTION D.....	51
FIGURE 38: AERIAL SURVEY MAP SECTION E .....	52
FIGURE 39: FWRI FLAGLER COUNTY MANATEE MORTALITY CATEGORIES .....	53
FIGURE 40: MANATEE MORTALITIES SECTION A.....	54
FIGURE 41: MANATEE MORTALITIES SECTION B .....	55
FIGURE 42: MANATEE MORTALITIES SECTION C.....	56
FIGURE 43: MANATEE MORTALITIES SECTION D.....	57
FIGURE 44: MANATEE MORTALITIES SECTION E .....	58
FIGURE 45: MANATEE MORTALITIES SECTION F .....	59
FIGURE 46: MANATEE MORTALITIES DUE TO WATERCRAFT COLLISIONS, 1999-2013.....	62
FIGURE 47: BOATING DENSITY OVERVIEW .....	72
FIGURE 48: OVERALL BOATING FACILITIES MAP .....	75

FIGURE 49: BOATING FACILITIES SECTION A..... 77  
 FIGURE 50: BOATING FACILITIES SECTION B..... 78  
 FIGURE 51: BOATING FACILITIES SECTION C..... 80  
 FIGURE 52: BOATING FACILITIES SECTION D ..... 82  
 FIGURE 53: BOATING FACILITIES SECTION E ..... 83  
 FIGURE 54: BOATING FACILITIES SECTION F ..... 84  
 FIGURE 55: BOAT FACILITY SITING PLAN RECOMMENDATIONS – COUNTY OVERVIEW..... 98  
 FIGURE 56: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION A NORTH ..... 99  
 FIGURE 57: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION A SOUTH ..... 100  
 FIGURE 58: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION B NORTH..... 101  
 FIGURE 59: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION B SOUTH ..... 102  
 FIGURE 60: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION C NORTH..... 103  
 FIGURE 61: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION C SOUTH ..... 104  
 FIGURE 62: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION D NORTH..... 105  
 FIGURE 63: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION D SOUTH ..... 106  
 FIGURE 64: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION E NORTH ..... 107  
 FIGURE 65: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION E SOUTH ..... 108  
 FIGURE 66: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION F NORTH ..... 109  
 FIGURE 67: BOAT FACILITY SITING PLAN RECOMMENDATIONS – SECTION F SOUTH..... 110

**LIST OF TABLES**

TABLE 1: MANATEE WATERWAY TYPES IN FLAGLER COUNTY ..... 19  
 TABLE 2: FLAGLER COUNTY MANATEE MORTALITY SPECIFIC DATA ..... 59  
 TABLE 3: WATERCRAFT RELATED MANATEE DEATHS 1999-2013 ..... 63  
 TABLE 4: BOAT REGISTRATION 2013 EAST COAST ATLANTIC COUNTIES ..... 64  
 TABLE 5: BOAT REGISTRATION 2013 ENTIRE STATE..... 65  
 TABLE 6: BOAT REGISTRATION DATA FLAGLER COUNTY 2000-2013..... 67  
 TABLE 7: BOAT TYPES FLAGLER COUNTY 2000-2012..... 68  
 TABLE 8: BOATING ACCIDENT STATISTICS 2013 ..... 68  
 TABLE 9: FLAGLER COUNTY BOATING ACCESS INVENTORY ..... 74  
 TABLE 10: FLAGLER COUNTY MPP RECOMMENDATIONS..... 116



**LIST OF APPENDICES**

APPENDIX 1: EDUCATION PLAN ..... 119

**LIST OF ABBREVIATIONS**

- BOCC** Board of County Commissioners
- BFSP** Boat Facility Siting Plan
- DLE** Division of Law Enforcement
- FAC** Florida Administrative Code
- FDEP** Florida Department of Environmental Protection
- FIND** Florida Inland Navigation District
- FLUM** Future Land Use Map
- FS** Florida Statute
- FWC** Florida Fish and Wildlife Conservation Commission
- ICW** Intracoastal Waterway
- MML** Mote Marine Laboratory
- MMPA** Marine Mammal Protection Act
- MPP** Manatee Protection Plan
- NMFS** National Marine Fisheries Service
- NOAA** National Oceanic and Atmospheric Administration
- PWC** Personal Watercraft (e.g., Jet Ski, Sea Doo)
- SAV** Submerged Aquatic Vegetation
- SJRWMD** St. Johns River Water Management District
- USACE** U.S. Army Corps of Engineers
- USCG** U.S. Coast Guard
- USFWS** U.S. Fish and Wildlife Service

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## LIST OF DEFINITIONS

**Blatant Non-compliance** - blatant non-compliance was defined as a vessel in-use at a speed greater than one speed category faster than the posted limit through a significant portion of a speed-regulated area. (Example: a vessel traveling at Planing Speed within a Slow Speed Zone).

**Boat** - a vehicle designed for operation as a watercraft propelled by sails, or one or more electric or internal combustion engine(s). A boat shall not be considered as a recreational vehicle even though it has facilities for temporary living quarters. For the purpose of this plan, the word "boat" does not include canoes and kayaks.

**Boat Facility** - a public or private structure or operation where boats are moored and/or launched, including commercial, recreational, and residential marinas, and public boat ramps. A dry storage facility is considered part of a boat facility if the dry storage facility has the capability of launching vessels into adjacent waters. For the purpose of this plan, docks with less than five (5) wet slips are not considered boat facilities.

**Boat Facility Siting Plan** – A component of a Manatee Protection Plan, which is a county wide guidance document for future development, construction and expansion, of boat facilities. The plan specifies preferred locations for boat facility development based upon an evaluation of manatee protection needs, potential natural resource impacts, and zoning and future land use compatibility. The purpose of developing a boat facility siting plan is to reduce threats to manatees and other living resources, such as seagrasses, mangroves, wetlands and oysters, from boating activities and infrastructure development impacts.

**Boat Ramp** - A sloped surface structure, or man-made improvement to a shoreline area that facilitates the launching and landing of boats into a water body.

**Boat Slip** - a boat slip is a space, mooring, or parking space which can accommodate one boat or vessel in the water or on land (examples include, lifts, trailers, blocks, anchorage, beached or blocked, hoist, floating platforms, davits, boat lifts). For the purposes of this plan, a boat trailer parking space is a boat slip. Slips that do not contribute to boat traffic, such as courtesy slips for boat ramps and dry storage facilities, are exempt from the Boat Facility Siting Strategy. Structures authorized only for fishing or observation, are not considered slips.

**Boat Yard** - a boat facility (wet or dry slips) used only for boat repair and/or boat building.

**Build-out** - A term referring to maximum planned development for a community, in terms of the physical structures, use of land and approximate number of people which can be accommodated within the community.

**Channel of the Intracoastal Waterway** - all waters within the navigable channel of the Intracoastal Waterway in Flagler County, Florida, and which navigable channel is a part of the inland waterways, and which said navigable channel is located by buoys or other markers placed by the U.S. Coast Guard (USCG).

**Compliance (compliant)** - Any vessel in-use that was determined to maintain a speed that was consistent with the posted speed at a study site.

**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.

**Dry Slip** - a space designed for the storage of single watercraft in an upland location with access to a waterway from the upland location.

**Dry Storage Facility** - an upland structure used for storing watercraft. A dry storage facility may be either a water-dependent or a water-related use.

**Existing Facility** - A boat facility that is permitted and/or authorized, constructed, and in operation as of the effective date of this plan. Permits and authorizations must be in place from state and local permitting agencies. Facilities permitted but not yet constructed are also considered existing. This definition does not include unauthorized structures.

**Lane** - A part of a boat ramp that allows for the launching and landing of one boat at a time. A boat ramp can have more than one lane.

**Linear Shoreline or Shoreline** - the mean high water line in tidally influenced areas and the ordinary high water line along waterways that are not tidally influenced. Linear shoreline shall be calculated using survey quality aerial photographs or by accurate field survey. The calculation of linear shoreline is based upon contiguous shoreline that is owned or legally controlled by the applicant.

**Manatee Protection Plan** – a State-approved summary of manatee data, strategies, and management actions aimed at protecting manatees in a specific area or county. They

are important for the long-range planning necessary to insure the survival of the manatee in a rapidly growing state.

**Marina, Commercial** - a commercial watercraft complex on and/or adjacent to a waterway which provides services available to the general public including but not limited to: rental of wet slips or dry storage space and associated boat lifting and/or launching, boat rentals, sale of marine fuel and lubricants, wastewater pump-out facilities, sale of fishing bait and equipment, and/or charter boat operations. Additional services may include the construction, reconstruction, repair, or maintenance of boats, marine engines and/or marine equipment; sale or lease of watercraft and seafood processing.

**Marina, Residential** - a watercraft complex containing five (5) or more wet slips located on a waterway used primarily for recreational purposes, and where vessel mooring is clustered in a common area, rather than docks located behind individual residences. No sales, fueling or repair facilities shall be associated with these marinas. A private residential marina contains wet slips and/or dry slips used only as accessory to a principal multi-family development use. A public/private residential marina has a portion of its wet slips and/or dry slips designated for rental by the general public, with the remaining wet slips and/or dry slips used accessory to a principal multi-family development use.

**Mean High Waterline** - the intersection of the tidal plain or mean high water with the shore. Mean high water is the average height of high waters over a nineteen-year period.

**Mooring** - a location where one vessel is berthed or stored when not in use.

**Powerboat** - a boat propelled or powered by machinery or any mechanical devices.

**Priority Manatee Areas** - documented areas of recurrent use by manatees based upon aerial survey data, telemetry data, mortality data, and/or photo-identification studies.

**Ramp (as a mooring)** – refers to the trailer parking capacity of a boat ramp facility.

**Residential Multi-family Dock** - a Boat Facility on a common riparian parcel that is intended to be used for private recreational or leisure purposes by persons or groups of persons with real property interest. Such as, a multi-family residential dwelling such as a duplex, a condominium, or single-family residences (attached or detached), or a development such as a single-family or mobile home subdivision.

**Riparian Rights** - those rights incident to lands bordering upon navigable waters, as recognized by the courts and common law (Ch. 18-21.003(53), FAC).

**Single-Family Dock** - a fixed or floating structure, including moorings, used for berthing buoyant vessels, accessory to a single-family residence, with no more than two (2) boatslips per residence. Notwithstanding, a shared single-family dock may contain up to four (4) boat slips. Said docks cannot be rented, leased or sold to a party unless said party rents, leases, or buys the associated single-family residence. A single-family dock may include a fishing or observation pier.

**Technical Non-compliance** - A vessel that was considered to be in technical violation of the posted speed at a study site, as defined by:

*< A vessel traveling at a speed which was determined to be one speed category faster than the posted speed limit (Example: a vessel traveling at Slow Speed within the Idle Speed Zone).*

*< A vessel traveling at any excessive speed, but for only a relatively small distance within the posted area (Example: a speeding vessel extending a short distance into an Idle Speed Zone before slowing to the posted speed, or a vessel which accelerates out of an Idle Speed Zone before leaving the posted area).*

**Trailer** - A trailer-type of mooring refers to a boat with trailer that was visible from a waterway. While this provides an estimate of trailered vessels in Flagler County, it is understood that the term is both subjective and provides only a rough estimate of trailered vessels in the County.

**Travel Corridor** - a waterway through which manatees travel, either daily or seasonally, between feeding areas and sources of fresh or warm-water, resting or feeding locations, or other habitat areas.

**Vessel (or boat or watercraft)** - a vehicle designed for operation in the water that is propelled by sails or one or more electric, jet or internal combustion engine(s). These terms may refer to any size vessel including a personal watercraft to freighters or cruise ships. For purposes of this plan, the word "boat" does not include human-powered vessels, such as canoes or kayaks.

**Warm-water Refuge** - a natural or manmade warm-water habitat which maintains a temperature equal to or greater than minimum required for manatee survival (approximately 68F or 20C).

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

**Water-Dependent Uses** - Water-dependent uses shall include those uses whose primary function is derived by direct water access such as, but not limited to commercial marinas, commercial charter fishing, touring and diving boat piers, water-skiing, sailing, and similar instructional operations, dredging, hauling, marine repair and other related uses.

**Wet Slip** - a Space designed for the mooring of a single watercraft in water. Such spaces may extend from a dock or pier, however any piers authorized for fishing or observation are not considered wet slips.

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## 1.0 Introduction

Flagler County is located in Northeast Florida, south of St. Johns County and north of Volusia County (Figure 1). Flagler County's Intracoastal Waterway (ICW) is characterized by a significant percentage of conservation areas, or other areas prohibited from development of waterfront facilities. The length of the ICW in Flagler County is approximately 18.5 miles of waterway. The setting within Flagler County also includes approximately 19 miles of coastline along the Atlantic Ocean.

The Florida manatee (*Trichechus manatus latirostris*) inhabits the waters of the ICW year round. Few manatees are observed during the winter months (November, December, January, February, and March). Manatees are more often observed from late April through early October with highest concentrations occurring during spring and summer months (May, June, July and August). Florida manatees exhibit an array of activities in these waters including traveling, resting, and cavorting (mating).

Manatees are protected under the Marine Mammal Protection Act of 1972 (as amended in 1996), the Endangered Species Act (ESA) of 1973, and the Florida Manatee Sanctuary Act (1978), through the Florida Fish & Wildlife Conservation Commission (FWC).

In 1989, Florida's Governor and Cabinet identified counties experiencing excessive watercraft-related mortality of manatees and mandated that these counties take positive measures to reduce this problem.

Specifically, thirteen key counties - Brevard, Broward, Citrus, Collier, Miami-Dade, Duval, Indian River, Lee, Martin, Palm Beach, St. Lucie, Sarasota, and Volusia - were to develop manatee protection plans which would address the multitude of threats facing manatees. Presently, all "Key Counties" have state-approved Manatee Protection Plans (MPP) in place. Flagler County was not identified as one of the "Key Counties" requiring a MPP. In 2007 the FWC identified Flagler County within the Manatee Management Plan (MMP) as an area with little or no manatee protection regulations and therefore would require evaluation to determine if manatee protection zones were warranted. In 2012, after much coordination between FWC, FWS, and Flagler County, 5.4 miles of the ICW and canals in Flagler County became Manatee Protection Zones. As a next step in protection of manatees, Flagler County has determined the adoption of this MPP and the addition of approximately 0.5 miles more Manatee Protection Zone will serve to help provide future protection to the species.

This MPP is intended to assist in protecting manatees and their habitats to ensure their continued survival. These objectives are derived from the USFWS Florida Manatee Recovery Plan (third revision October 2001), the Governor and Cabinet's 1989 desire to improve boating safety and manatee protection for Florida waterways, and the 2007 State of Florida Manatee Management Plan (MMP). Specific objectives include: reducing the number of boat-related mortalities; creation of a boat facility siting plan, protecting manatee habitat; promoting boating safety; and increasing public awareness of the need to protect manatees and their habitat. The objective of the Manatee Recovery Plan is the downlisting and ultimate delisting of the Florida manatee from its endangered and/or protected status.

Among the components of this MPP are:

- An inventory of boat facilities (marinas, docks, boat ramps, etc.)
- An assessment of boating activity patterns
- Manatee sighting and mortality information
- Information on aquatic preserves, Outstanding Florida Waters, etc.
- Manatee protection measures, such as boating speed zone regulations
- Future boat facility siting planning
- An education and awareness program for the public, boaters, and children
- Recommendations and schedule for future review

The FWC has the authority to review and approve MPPs developed by individual counties. Flagler County has also coordinated with the USFWS to receive comments on this MPP.

This document fulfills the requirements for completion of a comprehensive Manatee Protection Plan in Flagler County.

## ***1.1 Geographic Setting***

Flagler County lies in the northeastern part of Florida, about sixty miles south of Jacksonville and 25 miles north of Daytona Beach. Flagler County is about 23 miles wide at its widest point east to west, and 29 miles long at its longest point north to south. The Atlantic Ocean beachfront area is approximately 19 miles long and forms the eastern county-boundary, and Crescent Lake forms a significant portion of its western boundary.

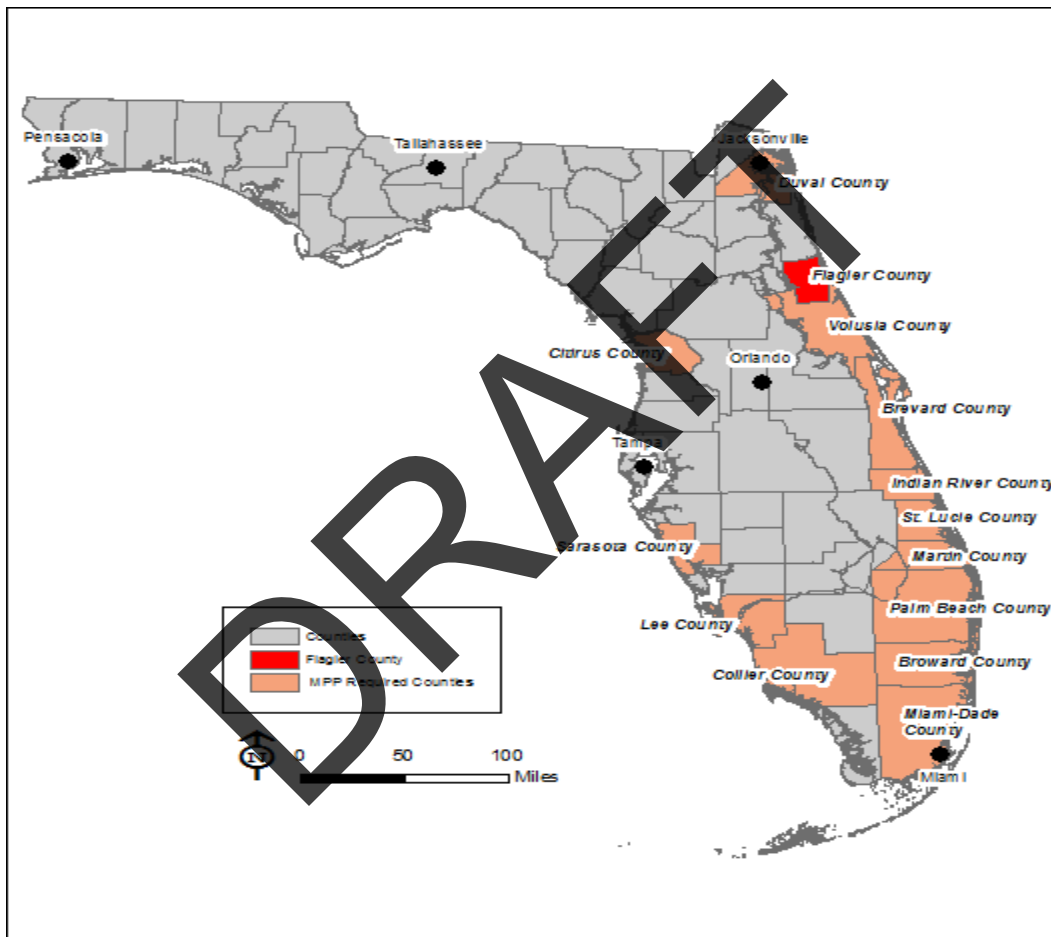
In total, Flagler County occupies approximately 571 square miles consisting of approximately 485 square miles of land area and 86 square miles of water area. This County includes the incorporated cities of Beverly Beach, Bunnell, Flagler Beach, Marineland, and Palm Coast. The



City of Bunnell, the county seat, is located at the approximately geographical center of the County at U.S. 1 and SR 100 crossroad.

Flagler County can be divided into three major geographic areas: the barrier island east of the ICW, the coastal area east of U.S. Highway 1 and the ICW, and western Flagler County west of U.S. Highway 1.

**Figure 1: Location of Flagler County, Florida**



## ***1.2 County Demographics***

The 2010 U.S. Census Bureau lists the population of Florida at 18,801,310 (48.9 percent male and 51.1 percent female). Of the 67 counties in Florida, Flagler County ranked 35th with a resident population of 95,996 people (0.5 percent of the state total, 48.0 percent male, 52.0 percent female) as of 2010. Of this 95,996 people, 75,180 live in the City of Palm Coast (78% of the total population). The remaining 22 percent of the residents live in the City of Bunnell, the

City of Flagler Beach, the town of Marineland, the town of Beverly Beach, or unincorporated areas of the County. Countywide 54.1 percent of the population is between the age of 21 and 64, and 27.4 percent of the population is age 65 or greater. Countywide the average annual household income was \$48,134 (2000 census data).

### ***1.3 Residential and Commercial Development within the County***

The coastal area east of U.S. Highway 1 contains portions of the cities of Bunnell and Palm Coast and the cities of Flagler Beach, Beverly Beach, and Marineland are located entirely east of the interstate. In addition to the incorporated areas, there are five areas of unincorporated Flagler County that include the planned communities of Plantation Bay, Matanzas Shores, Palm Coast Plantation and Hammock Dunes; and unincorporated Painters Hill and Hammock areas along A1A. Presumably, most of the urban development activity in Flagler County has occurred in this area due to the following factors:

- The traditional development pattern of the Florida Atlantic coast.
- Flagler County's attractive natural resources and recreation opportunities.
- A relatively affordable supply of housing within a reasonable commute of employment opportunities in other counties.
- A developed and connected roadway system providing access to SR A1A, Interstate 95, U.S.1, SR 100, Palm Coast Parkway.

Current land development patterns show that most of the residential development in the coastal area is occurring in the City of Palm Coast and surrounding unincorporated areas where central water and sewer facilities are available. Other residential development occurs in the incorporated areas of Flagler Beach, Beverly Beach or Bunnell, and older, small subdivisions or isolated single-family residences along A1A, SR 100, Old Dixie Highway, Old Kings Road and John Anderson Highway. There are many factors that have resulted in the residential development of the coastal area. The primary reason is the aforementioned close proximity to the Atlantic Ocean and the Intracoastal Waterway. This location provides for a pleasant climate and appealing lifestyle. Additionally there are numerous parks and recreational facilities and a growing commercial base in Palm Coast. The coastal area also contains numerous opportunities for business development and excellent schools.

The Flagler coastal area is characterized by an overall low-density residential land use pattern. The eastern, coastal region of the county also has many regional inducements for continued growth. The eastern seaboard of Florida has traditionally experienced growth because of tourism/retirement and proximity to the ocean and Intracoastal Waterway. Flagler County has

traditionally been a tourism and retirement destination. Given the changes in the global economy, Flagler County now has additional attributes (proximity to Interstate I-95, Florida East Coast rail line, close proximity to Jacksonville and Orlando Metropolitan Statistical Areas) that could be alluring for development of industrial and technological uses. These assets help local governments in the development of balanced, sustainable communities.

The region of Flagler County west of US 1 occupies approximately over 60 percent of the total land area. This area is characterized by farming and timber production. Small rural communities that have existed for many years include St. Johns Park, Espanola, Haw Creek and Cody's Corner. Rural subdivisions (one acre minimum) include Flagler Estates, Daytona North and Smokerise.

The Atlantic Intracoastal Waterway (ICW) in Flagler County begins just north of the Town of Marineland at Mile Marker 796. From Marineland south for about 15 miles the ICW is a land cut waterway with the first 4-5 miles being fairly sparsely developed. About 5 miles south of Marineland the ICW runs through the City of Palm Coast. Palm Coast is known for its extensive canal system allowing residents' access to the ICW. Following the ICW southward, it passes through the towns of Beverly Beach and Flagler Beach and then flows into Volusia County. There is no ocean access inlet in Flagler County, the closest one being approximately 3 miles to the north of Marineland at Matanzas Inlet in St. Johns County. The closest ocean access by water south of Flagler County is at Ponce Inlet in Volusia County, a distance of approximately 26 miles.

## ***1.4 Manatee Relevant Waterways, Water Quality and Recreation***

The Tolomato/Matanzas River basin is located within northeast Florida, in portions of Duval, St. Johns, and Flagler counties, and has a contributing drainage area of approximately 127,000 acres, within 37 basins. Portions of the Tolomato/Matanzas River planning unit are designated as Class II waters, which is the standard for commercial and recreational shellfish harvesting.

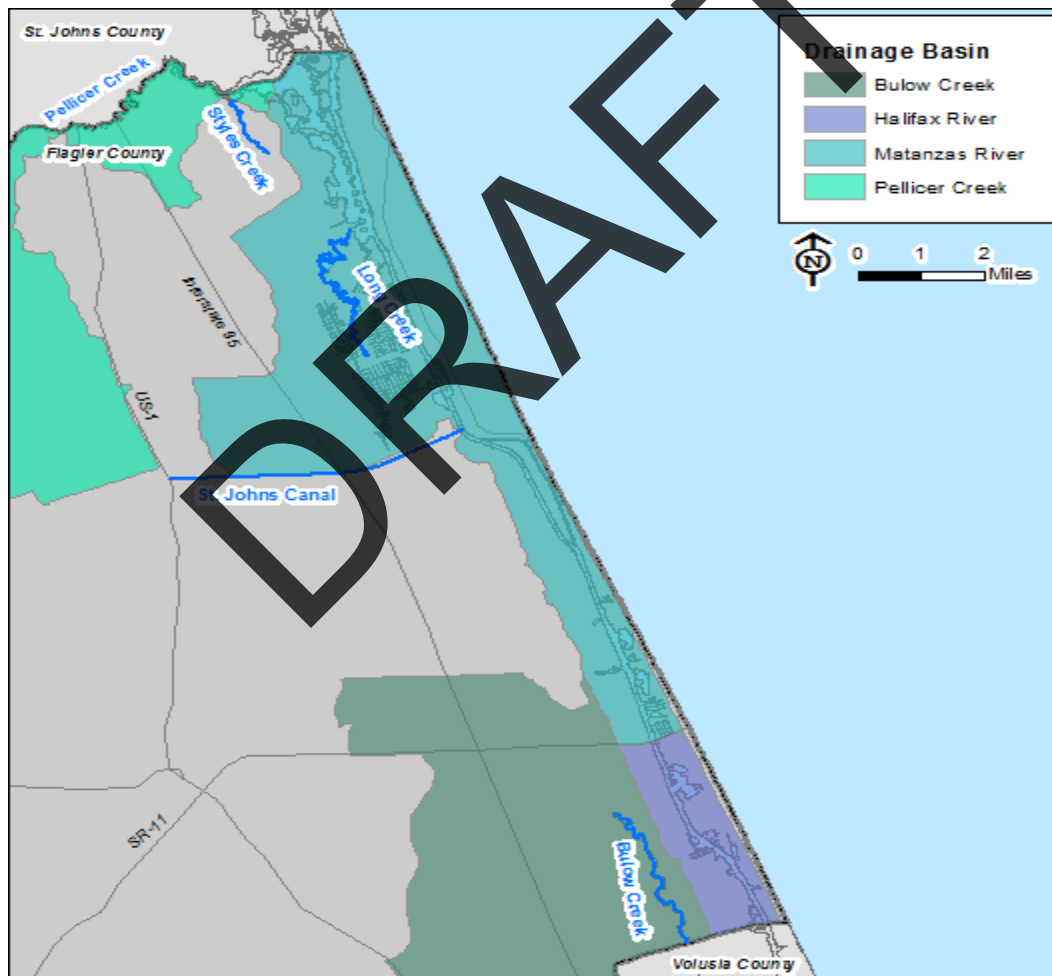
The Pellicer Creek planning unit is located south of St. Augustine and includes southern St. Johns County and northern Flagler County. Commercial shell fishing for oysters and clams has historically occurred in the southern St. Johns County portion of this planning unit. Pellicer Creek, which forms the boundary between St. Johns and Flagler counties, is one of two natural watershed drainage features in this planning unit (Longs Creek). Pellicer Creek is designated by the state of Florida as an Outstanding Florida Water (OFW). The Pellicer Creek planning unit consists of vast wetlands, many miles of which were drained for pine plantations or real estate

# FLAGLER COUNTY MANATEE PROTECTION PLAN

development, and to reduce mosquito breeding sites. Water access to Pellicer Creek is characterized by a large, shallow estuarine lagoon known as Pellicer Flats.

The Halifax River planning unit includes portions of Flagler and Volusia counties along the northeast Florida coast and encompasses an area of nearly 208,000 acres, within 33 basins. Major drainage into the ICW comes from Bulow Creek, the Tomoka River, and Spruce Creek, and their natural tributaries. Rose Bay, which is a large embayment partially isolated from the main part of the Halifax River by an abandoned causeway and the present U.S. 1 causeway, also contributes drainage to the Halifax River. Both the Tomoka River and Spruce Creek basins are listed as OFWs.

Figure 2: Drainage Basins



Overall, the Intracoastal Waterway (ICW) is a brackish, estuarine system along the length of Flagler County. The water column is characterized by ocean (salt) water inputs from the inlets

north and south of the county and with freshwater inputs from the uplands to the west, from the canal residential areas in Palm Coast and Flagler Beach and from rainwater. Significant sources of natural freshwater from upland drainage to the ICW in Flagler County include Pellicer Creek in the extreme north portion of the county and Long's Creek about 5 miles to the south of Pellicer Creek. Long's Creek is closely adjacent to major urban areas of Palm Coast.

No freshwater springs or other significant point-sources of freshwater are documented within the ICW in Flagler County. The mouth of Pellicer Creek located adjacent to the Pellicer Creek Aquatic Preserve provides a freshwater input to the Northern portion of the ICW via a large tidal lagoon system, part of which is part of the Pellicer Creek Aquatic Preserve. The mouth of Long Creek is similar morphologically although it runs through a residential area of Palm Coast that is considerably more developed than that of Pellicer Creek and its surrounding areas.

The ICW south of Jacksonville and south to Fort Pierce was designed and built to be 12 feet deep by 125 feet wide to allow for safe, protected shipping lanes and recreation. Although during March to November, with the peak months of May through September, Flagler County's climate and water temperature is favorable when compared to northern climate, recreational boating is primarily along the ICW. Recreational opportunities along the ICW in Flagler County include fishing, picnicking, sunbathing, swimming, sightseeing, water skiing or similar recreational activities.

An additional relevant manatee waterway is the portion of Lake Crescent and Dead Lake which are located within the boundaries of Flagler County. Dunns Creek flows from the St. Johns River in Putnam County into Lake Crescent and provides a navigable waterway for manatees to traverse into the lake. Dead Lake is attached to Lake Crescent and receives flow from Bull Creek. The Haw Creek also drains into Lake Crescent within Flagler County and is designated as an Outstanding Florida Water. Lake Crescent is known for its premier largemouth bass and speckled perch fishing. Large beds of tapegrass (*Vallisneria americana*) thrive along the shoreline of Lake Crescent and Dead Lake when water quality conditions are favorable. The beds expand and contract on a regular basis. Tapegrass is a freshwater submerged aquatic vegetation (SAV) that provides forage for manatees.

## ***1.5 Manatee Protection Zones***

There are approximately 5.4 miles of Manatee Protection Zones (enforceable speed zones) on the navigable portion of the ICW in Flagler County. The zones are located in the vicinity of the Hammock Dunes Bridge, the Flagler Beach Bridge, and the southern end of the county near Gamble Rogers State Park. The manatee protection boat speed zones near the Hammock Dunes Bridge and in the southern portion of the county were placed by the FWC in 2012. As a result

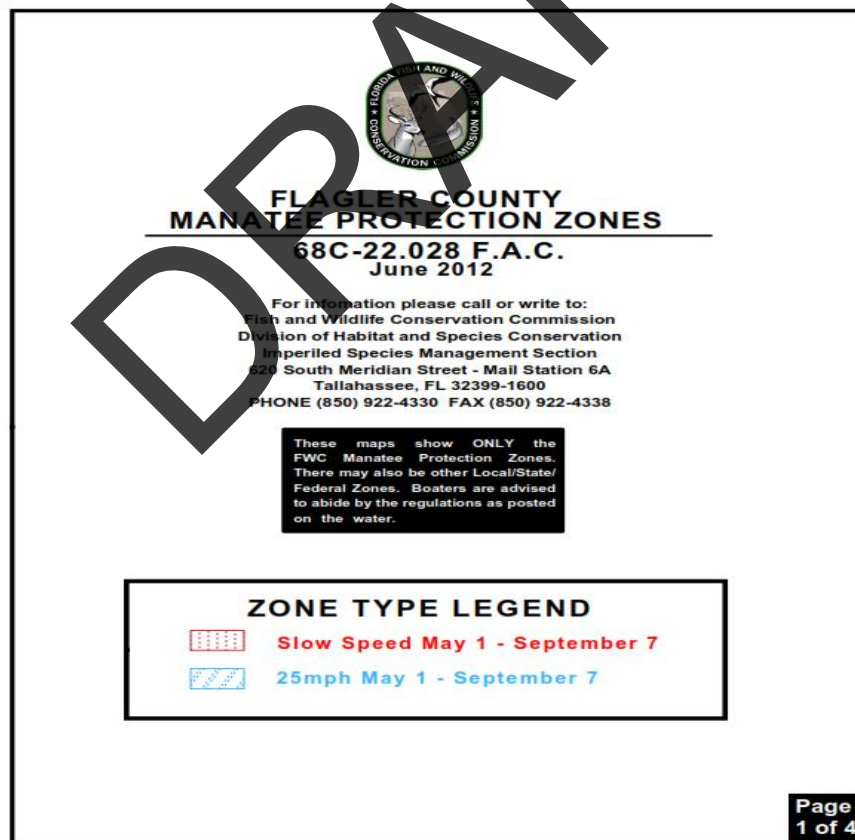
# FLAGLER COUNTY MANATEE PROTECTION PLAN

these speed zones became enforceable in 2013. The speed zone that was created in and around the Hammock Dunes/ Palm Coast Parkway Bridge encompasses approximately 0.6 miles of navigable ICW. The speed zone around the Flagler Beach/SR 100 Bridge covers approximately 2.7 miles of navigable ICW. The most southern zone starts at the Flagler County border and extends north/northwest for 2.1 miles on the navigable ICW. All manatee speed zones are in effect from May 1 through September 7.

Flagler County is currently in the process of establishing an additional 0.5 miles of Manatee Protection Zone within the Lehigh Canal zone and would result in shore to shore, warm season, middle zone protection.

The speed zones depicted in the following figures documents the Manatee Protection Zones in place today. A depiction of the approximate limits of the 0.5 mile zone which is currently being established is also included.

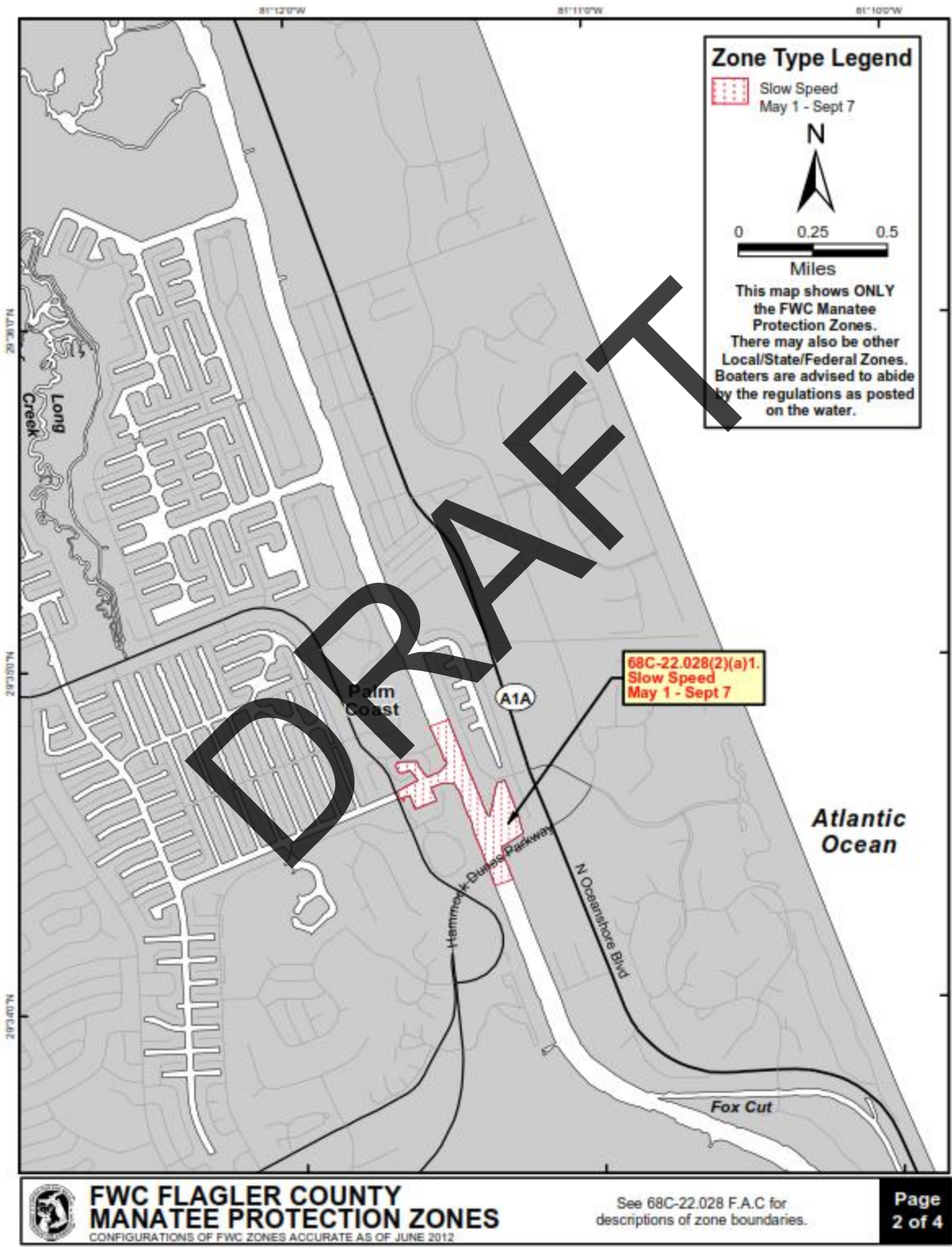
**Figure 3: Manatee Protection Zones. Source: FWC**





# FLAGLER COUNTY MANATEE PROTECTION PLAN

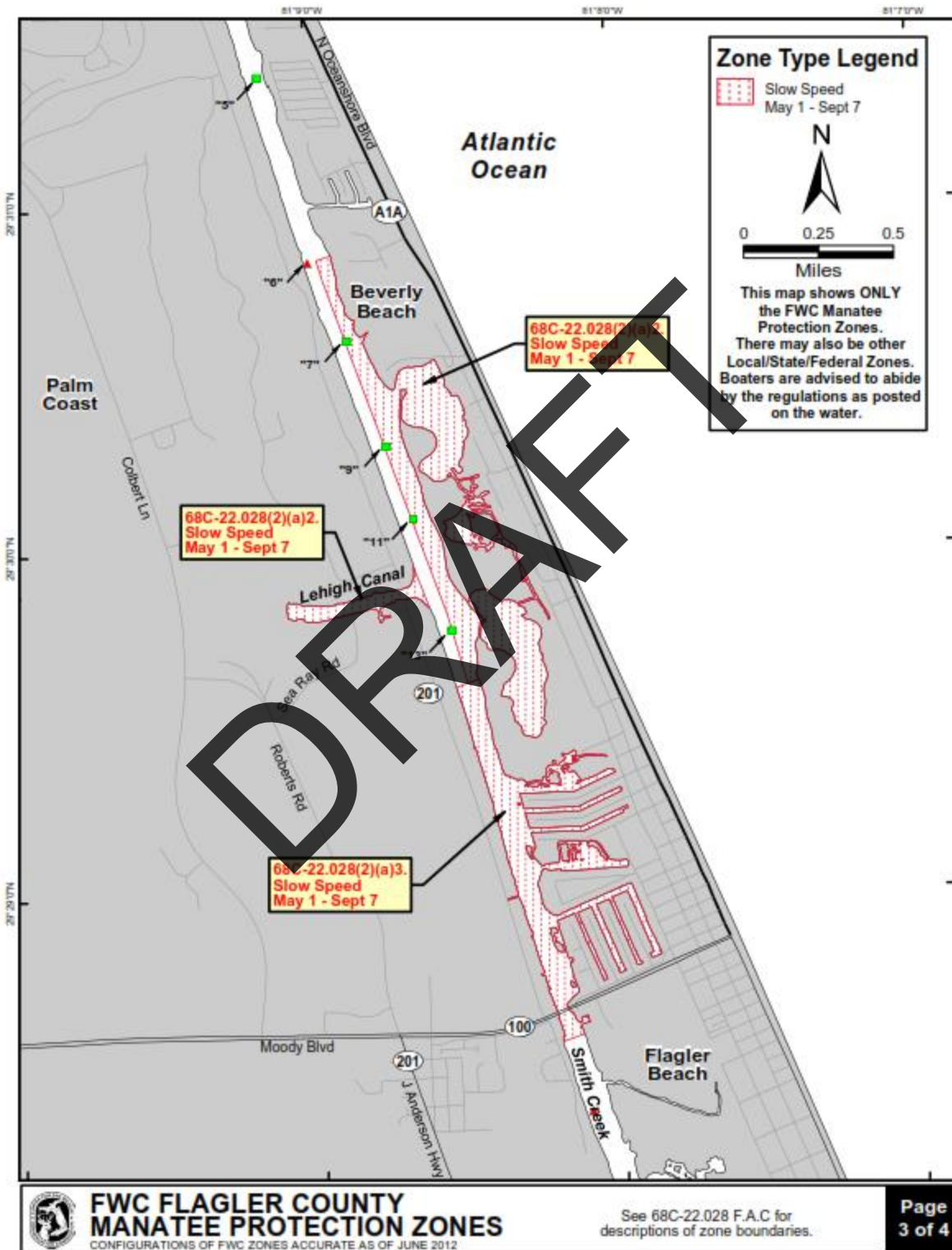
Figure 4: Manatee Protection Zone Section B & C. Source: FWC





# FLAGLER COUNTY MANATEE PROTECTION PLAN

Figure 5: Manatee Protection Zone Section D. Source: FWC



# FLAGLER COUNTY MANATEE PROTECTION PLAN

**Figure 6: Manatee Protection Zone Section E. Source: FWC**

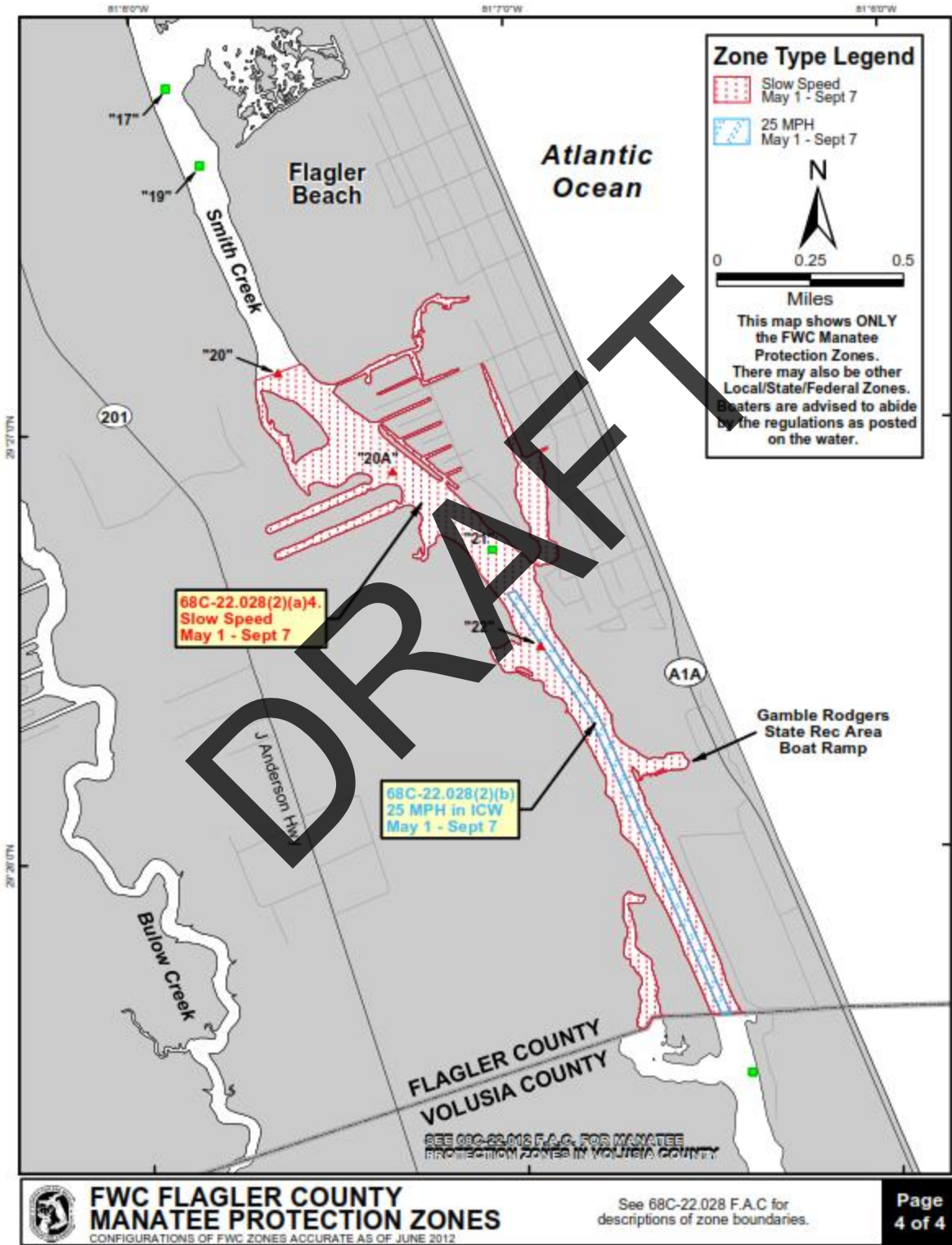
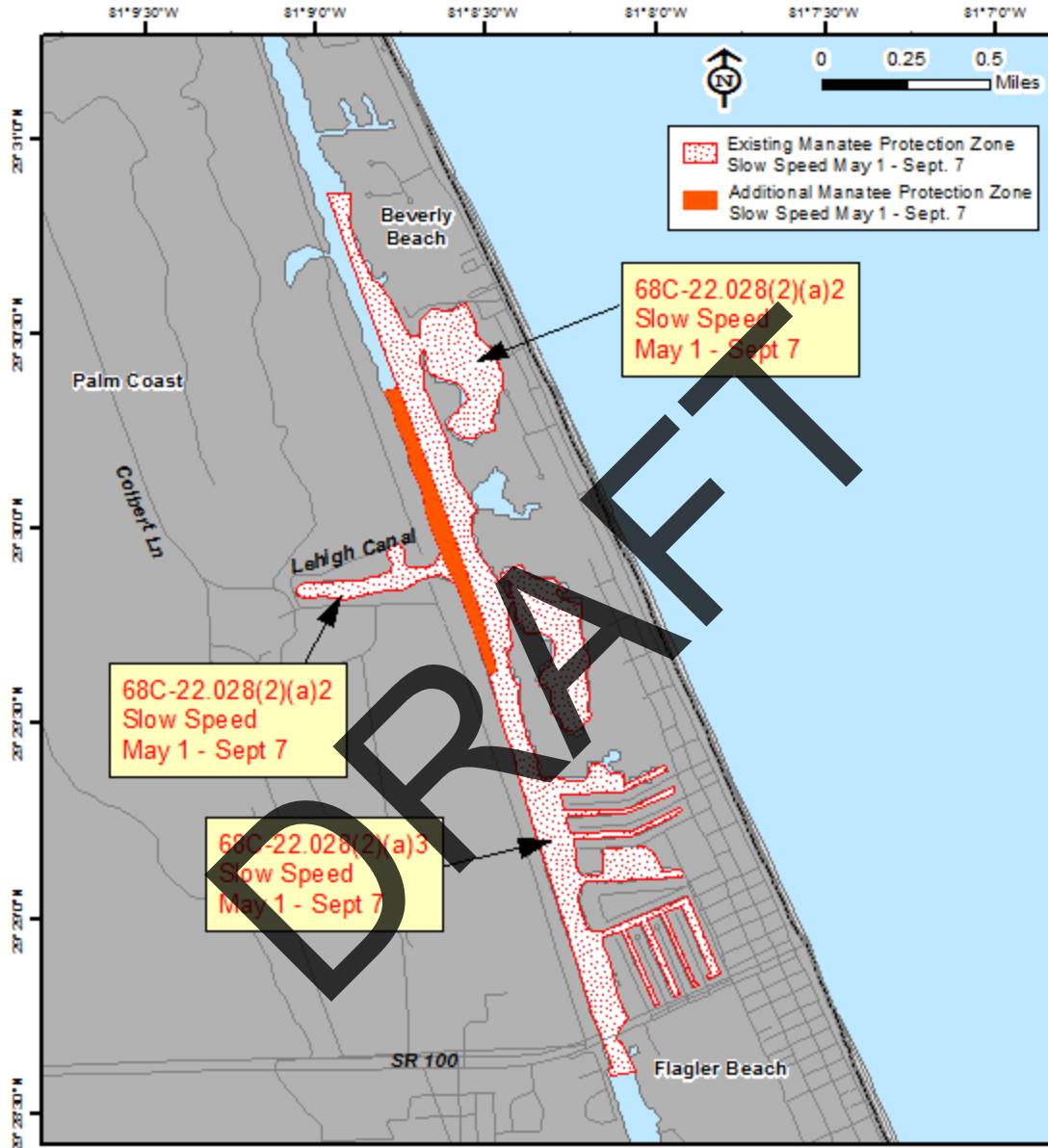


Figure 7: Additional Proposed Manatee Protection Zone



## 1.6 Manatee Natural History in Florida

The Florida Manatee is one of two subspecies of the West Indian Manatee that ranges from Brazil to Mexico and the Southeastern United States and Caribbean. The Florida manatee’s range for most of the year includes slow-moving waters in coastal estuaries and rivers throughout the southeast. However, in the colder months manatee survival is dependent on water temperatures that are above 68 degrees Fahrenheit and most manatees aggregate at

warm-water refuges once temperatures approach 68 degrees Fahrenheit (Laist and Reynolds, 2004). Natural warm-water refuges include springs that have a typically consistent output of water at a temperature of approximately 72 degrees Fahrenheit and thermal basins which are areas with slow, local cooling processes which temporarily retain warmer water during colder weather. Some researchers believe that the historic winter habitat for the manatee was south of Sebastian Inlet on the east coast and Charlotte Harbor on the west coast. Flagler County's temperatures are not conducive to a winter manatee habitat. Anthropogenic warm-water refuge sites have allowed manatees adaptation into some northern areas of the state. Manatees are well known and documented to having congregated at the warm-water effluent sites of up to 10 power-plants throughout the state which is believed to have altered their historic over-wintering range. Flagler County has no known warm water refuge sites.

## ***1.7 Land Development Review***

In general, Flagler County and the municipalities in the County rely on state and federal regulations and permitting criteria to protect the natural resources of the shoreline. The County and each municipality have, or share, Land Development Code standards that allow them to regulate activities on planned development sites. State and/or federal regulations provide protection for wetlands, and permits must be obtained for projects that involve water management systems and/or discharges from these systems into jurisdictional waters. Regulations also dictate conditions concerning the construction of vertical bulkheads and other erosion control structures that could affect shoreline vegetation. No changes in shoreline standards appear to be needed in order to protect manatees and/or manatee habitat.

The majority of the submerged lands in Flagler County that are accessible to manatees are lands that are owned or controlled by the State of Florida, also known as sovereign submerged lands. Projects on/over submerged lands (e.g., marinas, utility installations) are reviewed by the FDEP Bureau of State Lands for compliance with various environmental and public interest criteria and in many instances must be approved by the Governor and Cabinet sitting as Trustees of the Internal Improvement Trust Fund. Additionally, dredge/fill activities proposed on submerged lands are independently reviewed by federal agencies, including the USACE, USFWS, NMFS and USCG. In addition to these state and federal reviews, Flagler County and the City of Palm Coast have developed and implemented an approval process through which

proposed projects must be reviewed and approved by the County and/or City prior to construction.

## ***1.8 Manatee Protection Plan Objective***

Flagler County is renowned for its beaches and access to the Matanzas River and Intracoastal Waterway and ecotourism is a driving force in the local economy. Manatee protection serves this element of ecotourism and Flagler County's residents recognize the importance of intact ecosystems and waterways for their quality of life. A key component of manatee protection is the protection of habitat; as such management resources should be focused on identifying and protecting the highest quality habitat that is used by manatees in Flagler County. It is equally important to understand how manatees use the available habitat in Flagler County to implement effective management and protection measures. The objective of this plan is to allow for reasonable recreational and commercial use of Flagler County's Intracoastal Waterway while balancing the protection of manatees.

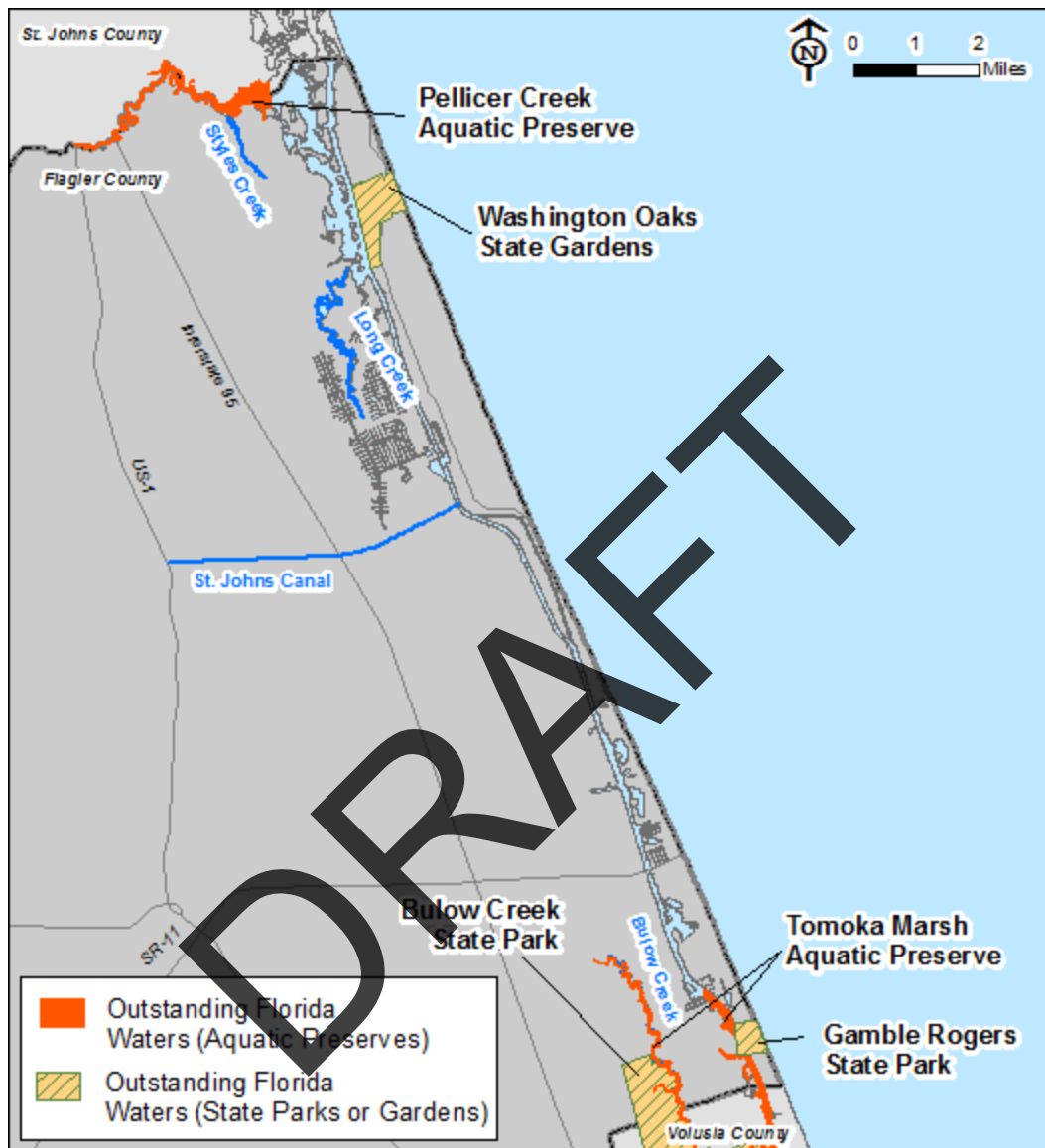
## **2.0 Flagler County Manatee Habitat**

### ***2.1 Pellicer and Tomoka Marsh Aquatic Preserves***

Flagler County has two primary estuarine areas. The Matanzas Estuary and Bulow Creek portion of the Tomoka Marsh Aquatic Preserve receive freshwater from Pellicer Creek and Bulow Creek respectively. Both Pellicer Creek and Bulow Creek are aquatic preserves. The endangered West Indian manatee is a summer resident of the area, traveling in the Matanzas River, Bulow Creek, Halifax and Tomoka Rivers.

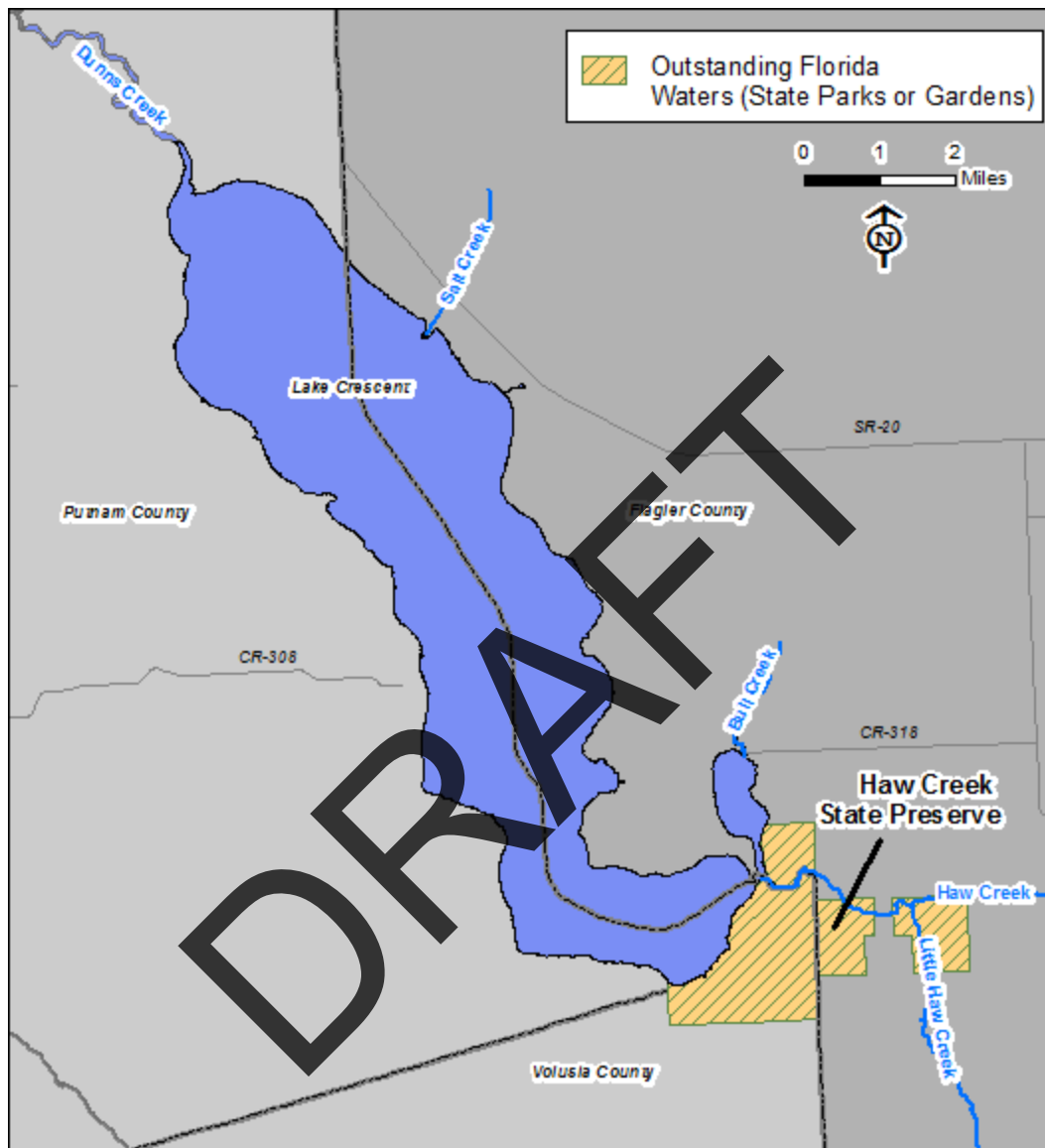
# FLAGLER COUNTY MANATEE PROTECTION PLAN

Figure 8: ICW Aquatic Preserves and Outstanding Florida Waters





**Figure 9: Lake Crescent Outstanding Florida Waters**



Pellicer Creek flows into the Matanzas River, which is part of the Intracoastal Waterway. The Matanzas River provides on-water access to the Atlantic Ocean by way of the Matanzas Inlet, located approximately 2.5 miles north of Pellicer Creek and Flagler County. The long, narrow chain of barrier islands outside the preserve, acts as the first line of defense for the mainland against storm surges. Inlets have formed along these islands during storms, forming temporary shallow inlets that later closed due to siltation. Human modification of the existing inlets has allowed saline water to mix with fresh water, creating the estuarine environment that now exists. Matanzas Inlet is the only natural uncontrolled inlet in Florida and one of the few on the



east coast of the United States. Pellicer Creek is part of the northern watershed in the Upper East Coastal Basin. The majority of the watershed in this basin is drained by relatively small creeks or branches. The Hulett, Pringle, Stevens, Dave, and Schoolhouse Branches all drain into the aquatic preserve from the west. Styles Creek flows south out of Pellicer Creek, near the Matanzas River. From the Matanzas River lagoon area, the flow of water eventually empties into the Atlantic Ocean by way of the Matanzas Inlet. The undisturbed salt marsh portrays one of the most pristine estuarine/riverine systems along Florida's east coast providing exceptional biological and aesthetic value to the state and resulting in its designation as a State Canoe Trail.

The Tomoka Marsh Aquatic Preserve is an estuarine system comprised of six distinct areas which include portions of the Halifax River, Smith Creek, Bulow Creek, the Tomoka River, the Tomoka Basin and a 1,100 acre mosquito impoundment area.

Approximately seven miles of the Halifax River, north from the southern boundary of Ormond by the Sea is designated aquatic preserve. The Halifax is a long, wide, shallow estuarine lagoon bounded on the west by the Florida mainland and on the east by a barrier island. The mixing of salt water from the Atlantic Ocean introduced through the Matanzas inlet to the north and the Ponce DeLeon Inlet to the south, with fresh water from the Tomoka River, Bulow Creek, and the upper Halifax River drainage basin creates the estuary. The Atlantic Intracoastal Waterway (ICW) channel is part of the Halifax River. The ICW is 125 feet wide and had been dredged to a depth of 12 feet.

Smith Creek is a shallow, estuarine creek with numerous oyster beds. Portions of the natural channel of the creek were dredged to accommodate the ICW. The remaining natural channel is primarily salt marsh, interspersed with small islands, both natural and created.

Bulow Creek is a shallow meandering waterway bordered by marsh and floodplain hardwood trees. From its origin in vast wetlands to the north, the creek flows south for about 4 miles meandering to its confluence with the Halifax River. Large expanses of black needle rush (*Juncus roemerianus*) border the creek.

The Tomoka River (in Volusia County) watershed drains an area of about 150 square miles, making it one of the largest sub-basins within the Florida East Coast Basin. Man-made drainage in the form of numerous canals has increased the boundary of the Tomoka watershed. The natural headwaters of the Tomoka River originate in low-lying areas south of Interstate 4 (I-4) and west of Interstate 95 (I-95). From its natural headwaters, the river flows generally north-northeast until its confluence with the Halifax River at the Tomoka Basin. The Tomoka River east of U.S. 1 is designated as aquatic preserve.

The 1100-Acre Mosquito Impoundment consists mainly of tidal marshes interspersed with open water with perimeter and some interior ditches. The impoundment has not been actively managed since 1980 and is permanently opened to the Halifax River and other areas by large culverts and two breaches in the impoundment dike walls. Although the marsh inside the impoundment is disturbed, the culverts and breaches provide access for many species of fish. The area is utilized by fisherman and for commercial crabbing. Numerous wading birds including wood stork, roseate spoonbill, snowy egret, great egret, great blue heron, and white ibis are often observed feeding in the area. Shorebirds such as black-bellied plover, spotted sandpiper, least tern, royal tern, and several species of gull also utilize the area.

## ***2.2 The Atlantic Intracoastal Waterway in Flagler County***

The ICW in Flagler County spans approximately 18 miles from the St. Johns/Flagler county line to the Flagler/Volusia county line.

The ICW in Flagler County is comprised of the southern end of the Matanzas River in the northern portion of Flagler County and averages around 400 feet wide from bank to bank. The dredged portion of the ICW beginning just north of Palm Coast averages 300 feet wide bank to bank. In the southern reaches of Flagler County, the ICW returns to a more natural river system as the northern portion of the Halifax River and widens. The channel in the ICW was dredged to 10 feet depth and 125 feet width in the 1960's and has been periodically maintained with dredging in the intervening years. There is no documented presence of significant seagrass beds along the ICW in Flagler County but some forage opportunity does exist in the form of marsh grasses and other vegetation that are accessible during high tides.

Throughout the ICW and the extensive marsh systems and canal systems in Flagler County, there exists potential for manatee habitat, especially as a travel corridor. Much of the high marsh found to the west of the ICW could be considered "potential manatee habitat" as manatee access to those areas is dependent on limited-depth feeder channels and extreme high-tide occurrences. The canal systems in Palm Coast and Flagler Beach function as manatee habitat in as much as it serves as a travel corridor and calm water respite area, but consistent fresh, warm water nor a dependable, long-term food source are available in the canal areas.

Table 1 below documents the amount of linear feet and miles and the total percent of shoreline type found in the county.

**Table 1: Manatee Waterway Types in Flagler County**

Shoreline Type	Total Linear Ft	Total Miles	Percent of Total
Intracoastal Waterway	191,519	36.3	22%
Marina	15,325	2.9	2%
Canal	336,325	63.7	40%
Natural Waterway	95,672	18.1	11%
Tidal	104,681	19.8	12%
Lake	106,743	20.2	13%
<b>Total</b>	<b>850,265</b>	<b>161.0</b>	<b>100%</b>

Flagler County and the FWC have previously determined five Waterway Regions which segregate areas (sections) for mapping, data analysis, and planning use. The areas include Section A – Marineland & Matanzas River, Section B – Palm Coast, Section C – Fox Cut, Section D – Smith Creek North of SR 100, and Section E – Smith Creek South of SR 100. Lake Crescent was not assessed by the FWC, but has been included in this study as Section F – Lake Crescent due to the potential for use by manatees. An overview map of these sections can be found below. Descriptions of each region can be found in Sections 3.5.4 through 3.5.9.

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# FLAGLER COUNTY MANATEE PROTECTION PLAN

Figure 10: Overview of MPP Planning Sections

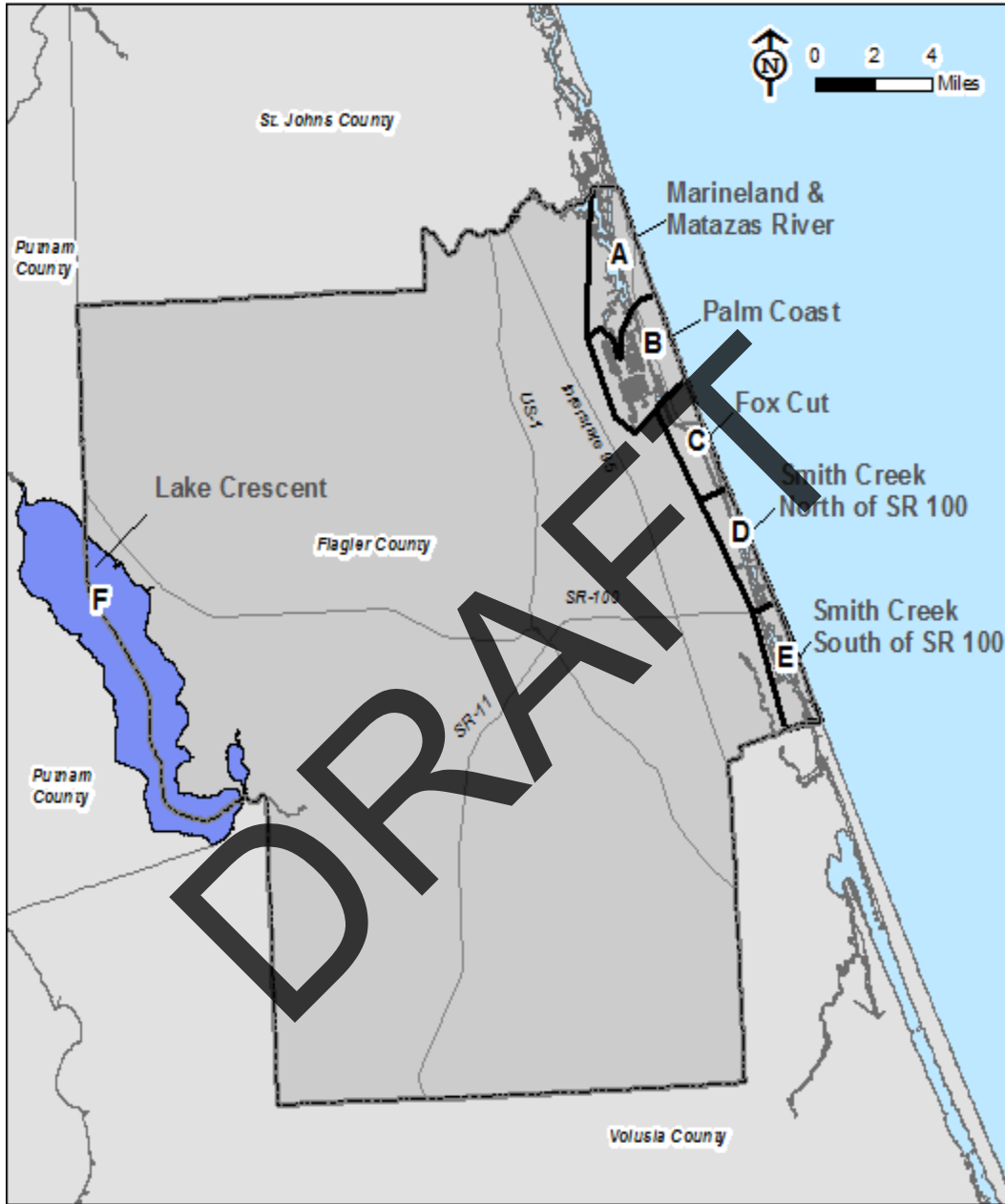


Figure 11: Aerial View of MPP Planning Section A





Figure 12: Aerial View of MPP Planning Section B



Figure 13: Aerial View of MPP Planning Section C





Figure 14: Aerial View of MPP Planning Section D



Figure 15: Aerial View of MPP Planning Section E



Figure 16: Aerial View of MPP Planning Section F



### ***2.3 Flagler County Preservation Lands***

Flagler County's ICW is characterized by a significant percentage of conservation areas, or other areas prohibited from development of waterfront facilities. The length of waterfront on the ICW in Flagler County is approximately 37 miles when measuring each side of the 18.5 mile length of the waterway. There are 14.9 miles (40%) of waterfront properties facing the ICW that are prevented from future waterfront facility development. Factors that drive this analysis include ownership and use as state, county, or city parks, ownership by the Florida Inland Navigation District, and areas controlled that are effected by conservation easement and deed



restrictions. Also, the entirety of Bulow Creek from the Volusia/Flagler lines through to its navigable northern extent have had private docks banned by County ordinance. The figures below document the Preservation Lands found within Flagler County.

In addition to the currently protected parcels, Flagler County's Land Acquisition Program continues to pursue parcels for acquisition as it has since 1988. A study was started in 2003, and a partnership with state agencies was completed in 2011, for potential parcel acquisitions as part of the Flagler County Blueways Florida Forever project. A total of 5,015 acres including multiple parcels in eastern Flagler County were identified as potential land acquisition properties. The Flagler County Blueway project consists of multiple properties clustered from south of Pellicer Creek on the north to the Flagler County line on the south. The project essentially follows the Intracoastal Waterway and includes most undeveloped and available land east of I-95 in Flagler County. The St. Johns River Water Management District (SJRWMD) and Flagler County are considered partners on this project. The Flagler County Blueways identified parcels are included on the Preservation Lands that follow. The parcels identified are presently private owned and it is not certain they will be purchased in the future. The goal of the project is to identify funding sources to purchase the parcels from the private owners.

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# FLAGLER COUNTY MANATEE PROTECTION PLAN

Figure 17: Preservation Lands Section A

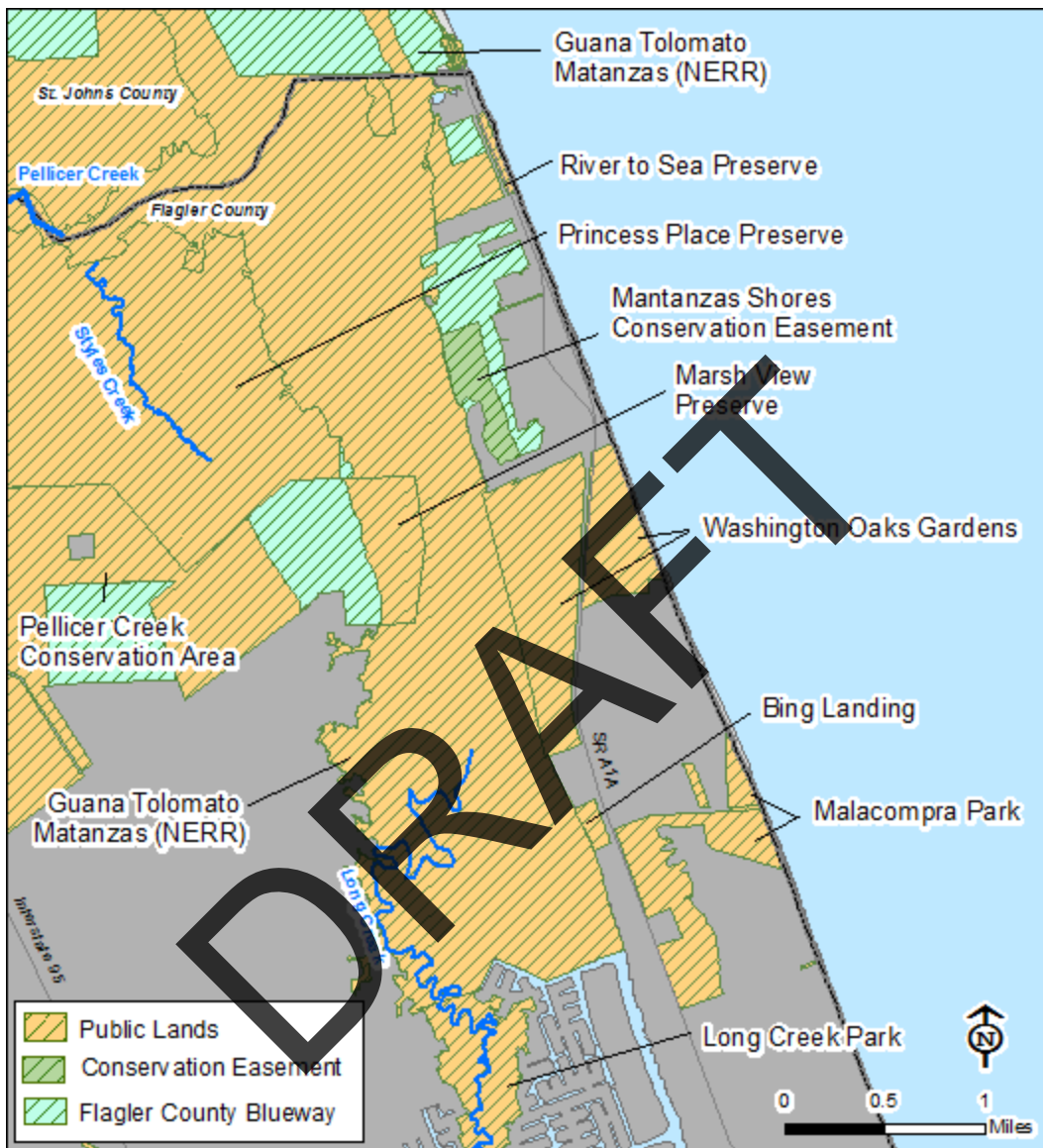


Figure 18: Preservation Lands Section B

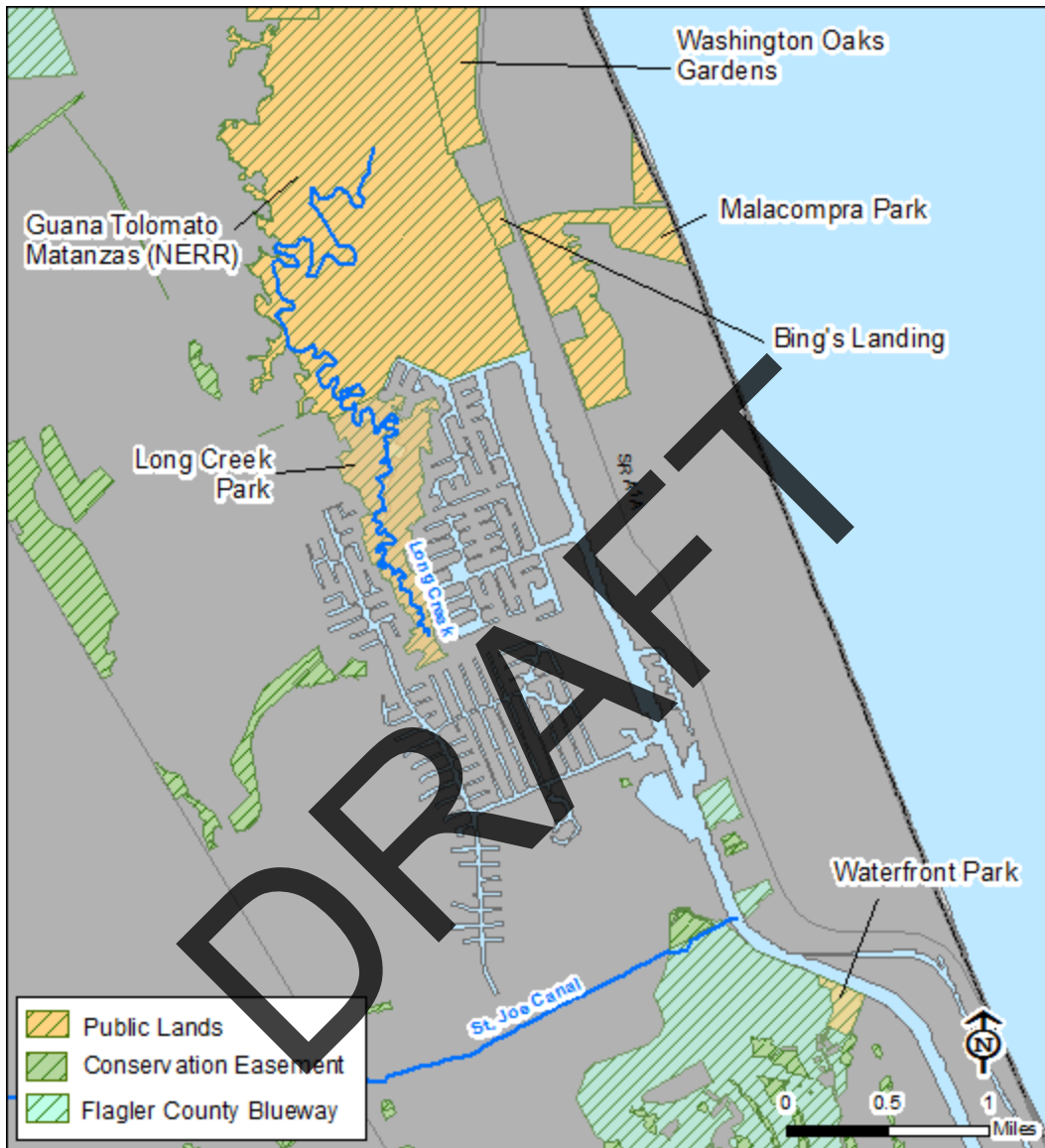


Figure 19: Preservation Lands Section C

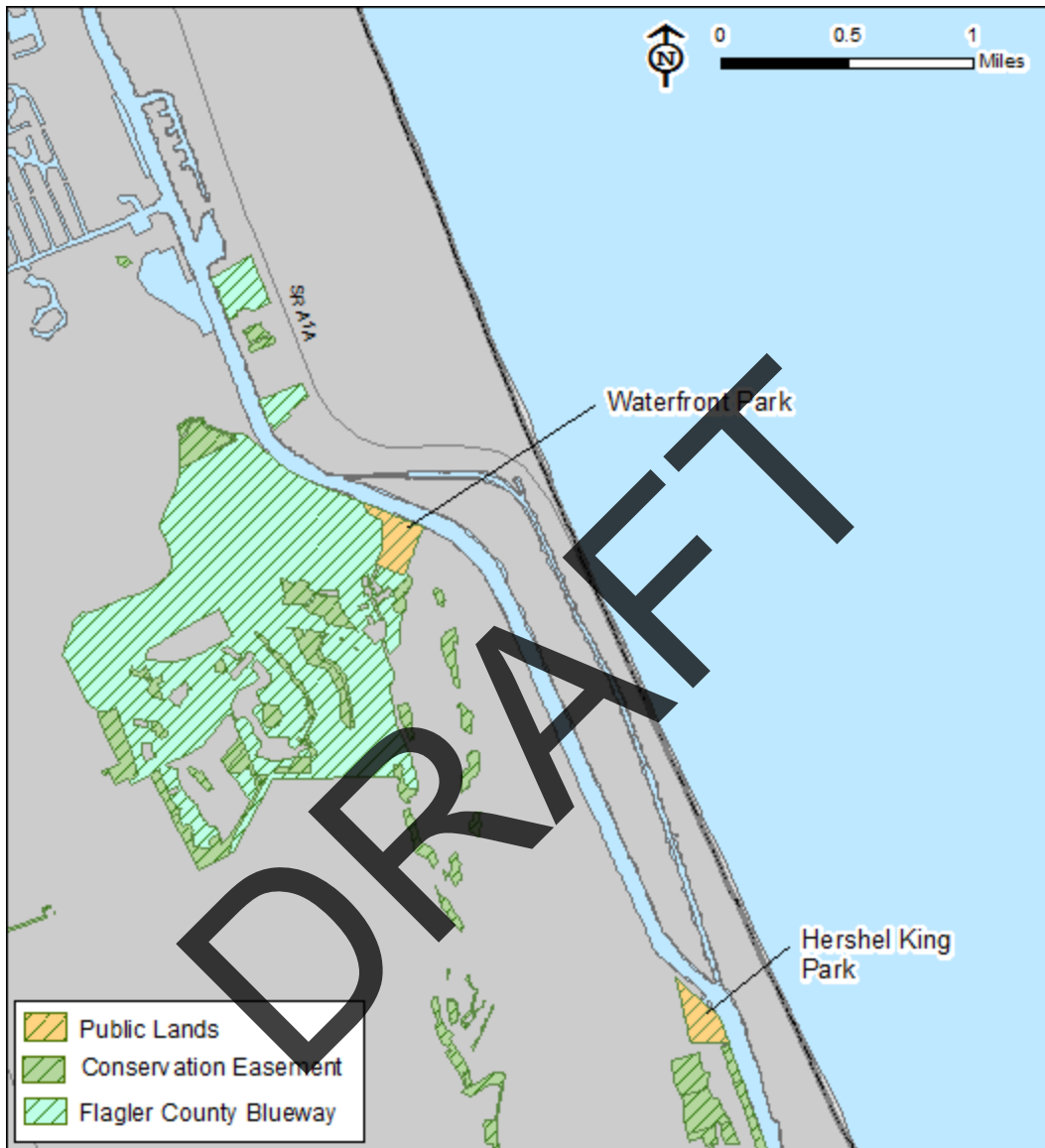


Figure 20: Preservation Lands Section D

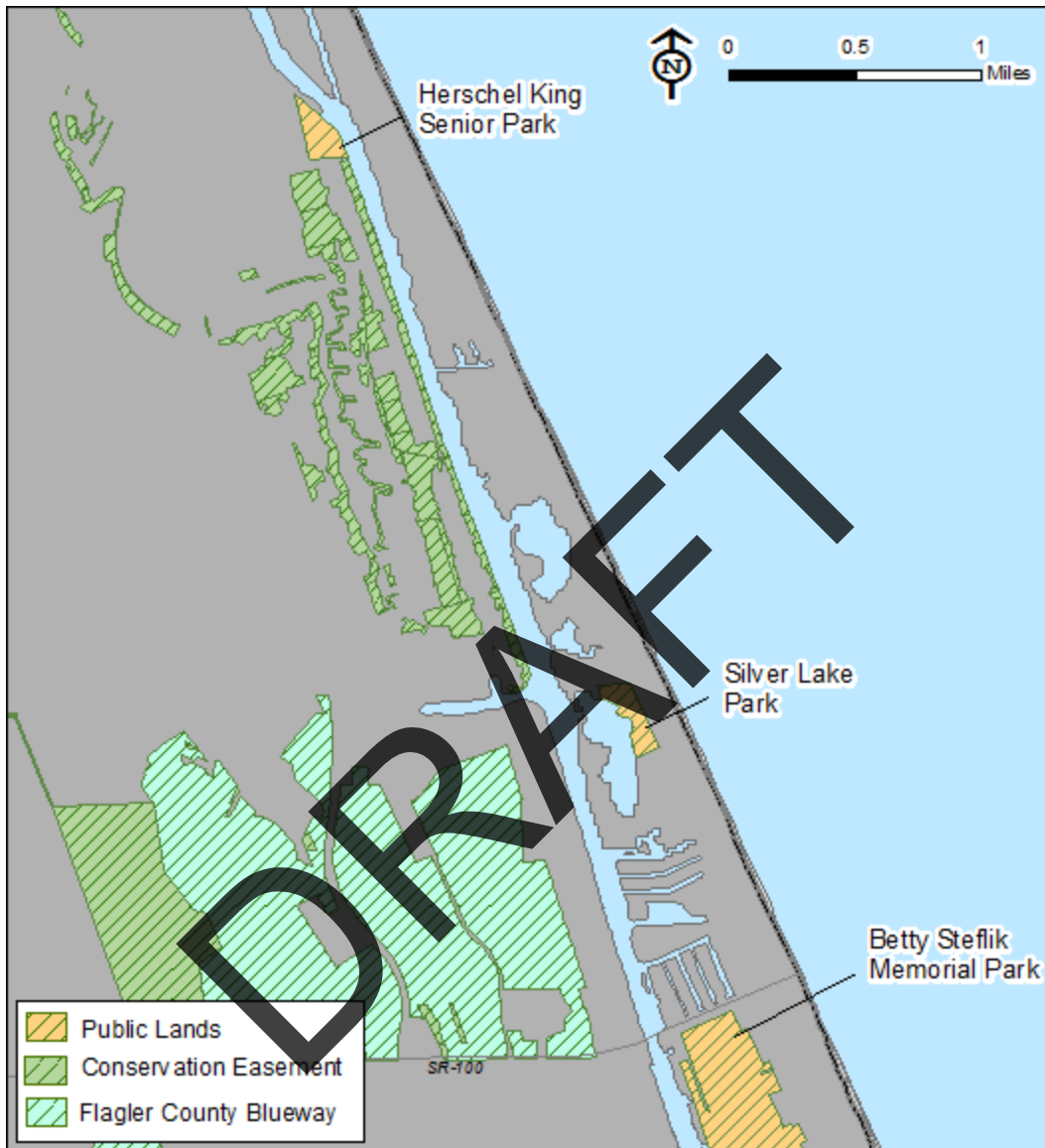




Figure 21: Preservation Lands Section E

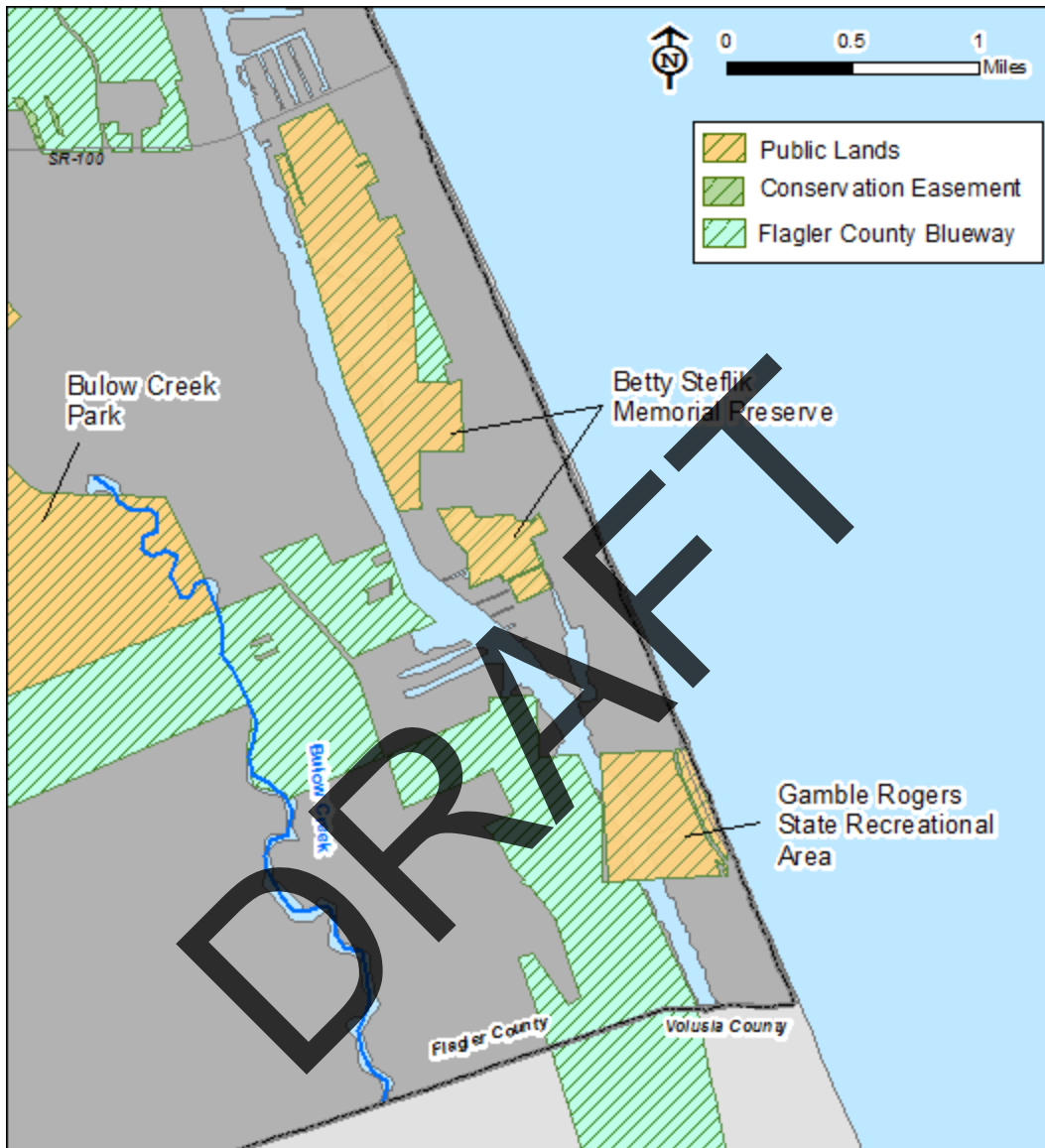
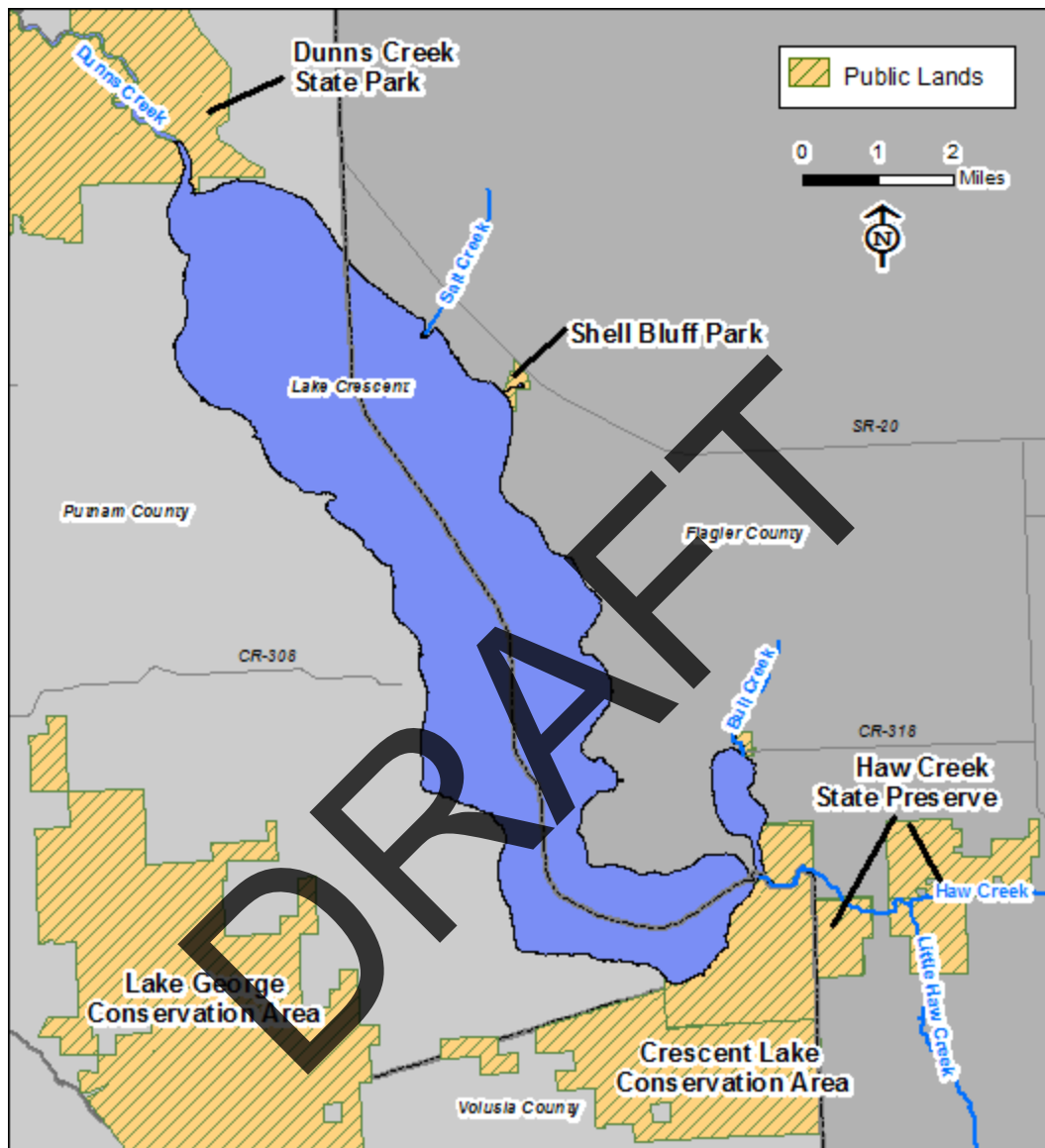


Figure 22: Preservation Lands Section F



#### 2.4 Freshwater Availability along the ICW in Flagler County

Availability of freshwater appears to be an important factor in determining sustainable manatee habitat although it is not clear if the access to freshwater sources is necessary for manatee survival. Manatees appear to be capable of assimilation of sufficient freshwater for survival through diet but aggregation of manatees in relation to the presence of natural or anthropogenic sources of freshwater has been documented.

Significant sources of natural freshwater from upland drainage to the Intracoastal Waterway in Flagler County include Pellicer Creek in the extreme north portion of the county and Long's Creek about 5 miles to the south. Both of these freshwater source areas are found within large conservation areas. It is likely that smaller, insignificant sources from seeps and small drainage creeks exist along the ICW. Also, extensive canal systems and mosquito drainage ditches throughout the City of Palm Coast and Flagler Beach contribute some freshwater drainage to the ICW. There is no documentation of freshwater springs located along the ICW in Flagler County.

These freshwater sources provide freshwater mixing to the estuarine habitat throughout the creek. Importantly, the freshwater component of flow from Pellicer and Long's creek freshwater systems occur as a mixed salt and freshwater inflow (brackish water) to the ICW in habitat that is likely too shallow to provide meaningful manatee occurrence based on the extensive tidal flats and shallow oyster reefs that exist between the larger creeks and the ICW. The urban canals in Palm Coast and Flagler Beach are, for the most part, armored with seawalls and any metabolic freshwater utilized by migrating manatee populations is from anthropogenic sources like garden hoses, stormwater runoff and leaking sprinkler systems. Mosquito drainage ditches in manatee accessible areas are dominated by the already brackish water from the ICW and as such, provide an inconsistent source of metabolic freshwater for migrating manatee populations.

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Figure 23: Freshwater Sources Section A



**Figure 24: Freshwater Sources Section B**



The City of Palm Coast operates three water treatment plants which have the ability to discharge concentrate from the treatment process into the ICW. This section contains two water treatment discharge locations. There had been concern that these discharges could become a warm water attractant for manatees during cold weather events. The City has worked to eliminate these discharges. The discharge has been blended back into reclaimed water and utilized for residential and golf course irrigation, meaning it's no longer discharged to the ICW. Discharges are still authorized, and the City of Palm Coast Utility Department conducted a 2009 study to ascertain whether these discharges caused a temperature

differential. The results of the test determined that there was no temperature difference between the discharge and the background water temperature, and thus no danger of these discharges attracting manatees. Figure 25 demonstrates the location of Palm Coast's two discharge points both of which are located within the manatee protection speed zone.

**Figure 25: Palm Coast Water Treatment Effluent Discharge Points**

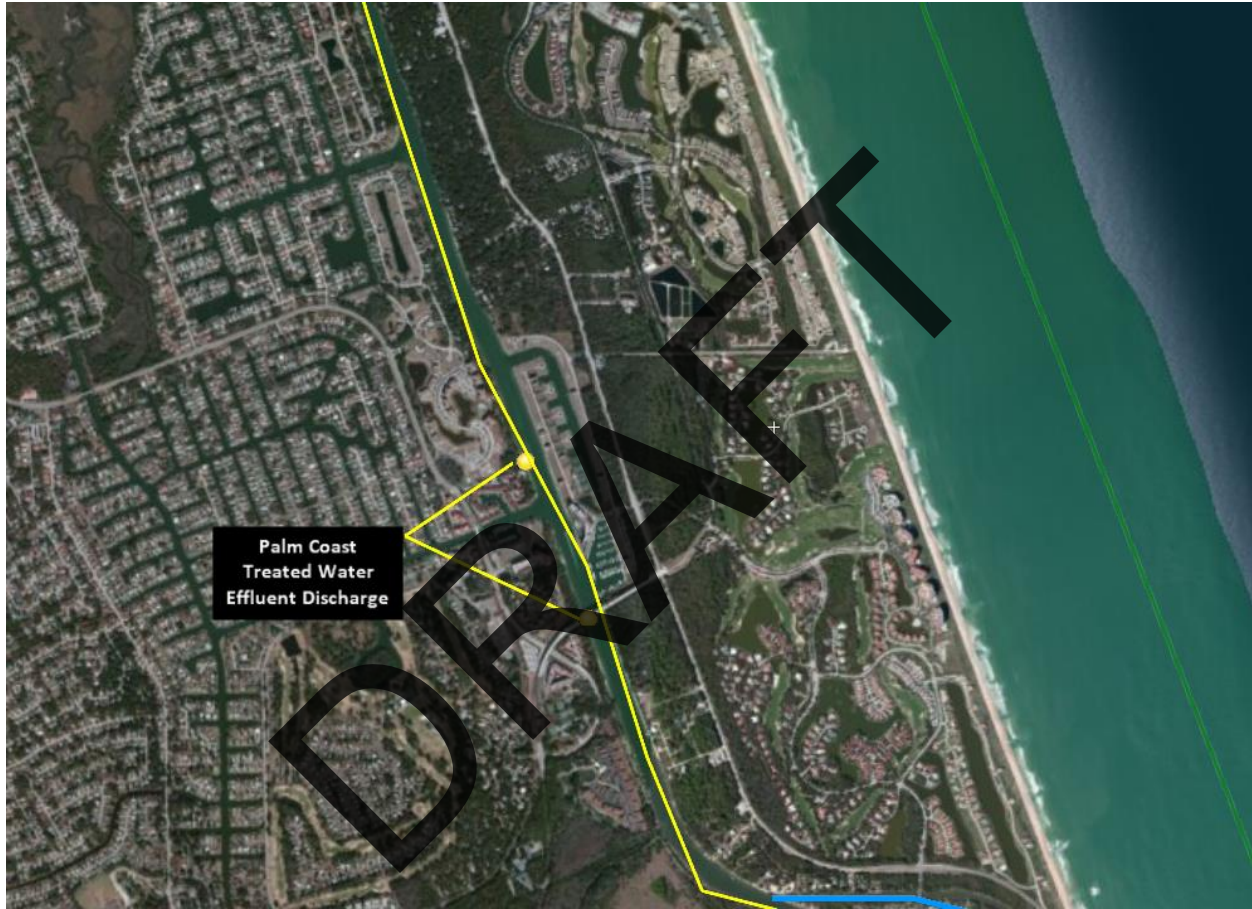


Figure 26: Freshwater Sources Section C

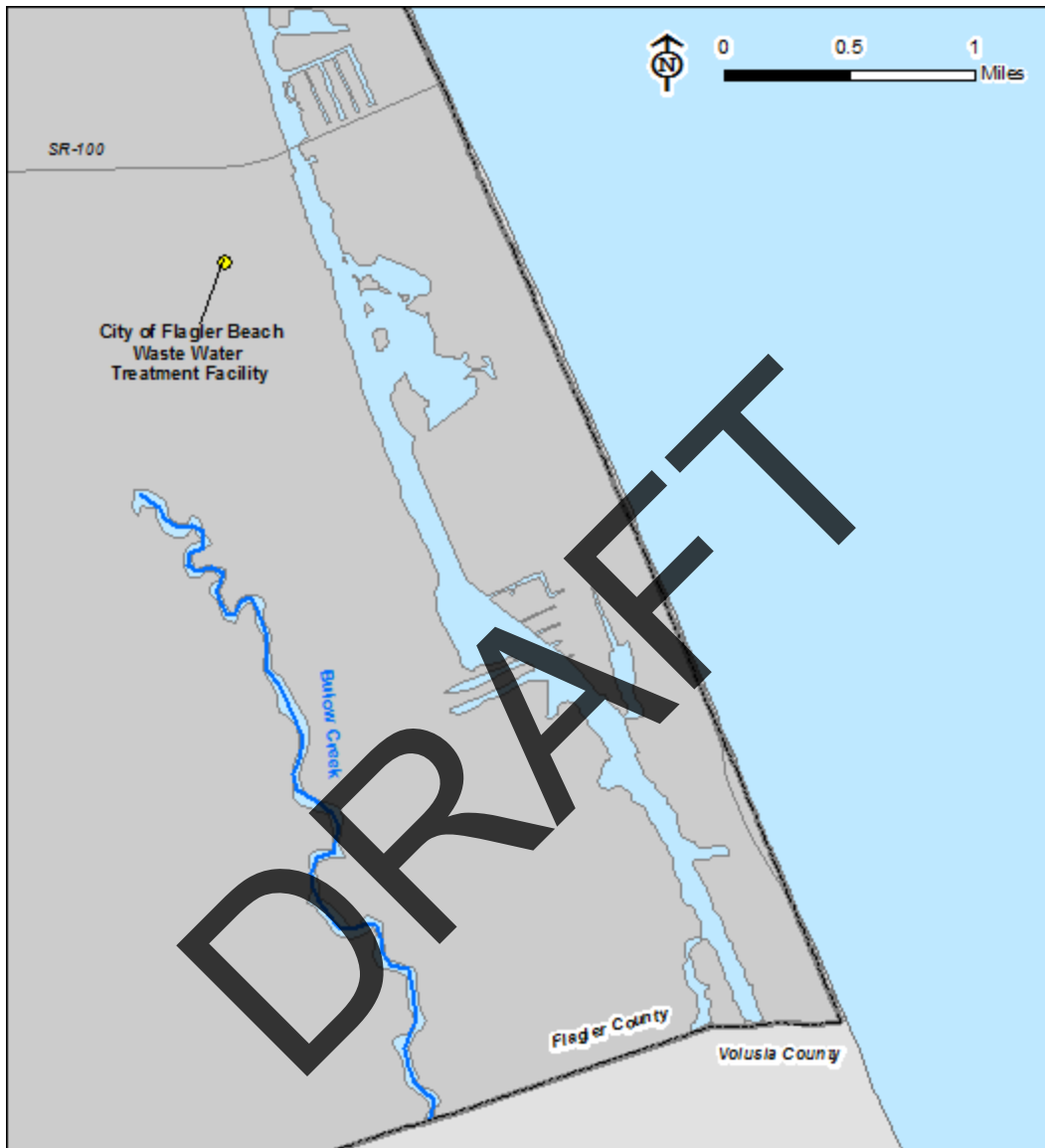




Figure 27: Freshwater Sources Section D – No Freshwater Sources



Figure 28: Freshwater Sources Section E



### ***2.5 Forage Opportunities for Manatees in Flagler County***

Manatees favor calm, shallow, warm near-shore marine, estuarine, and freshwater systems in Florida and forage primarily on submerged aquatic vegetation found throughout. They have demonstrated tendencies to return to the same warm-water sites and forage sites annually and will congregate at these sites for foraging or warm-water refuge.

The abundance of submerged aquatic vegetation (SAV) appears to be a factor in influencing manatee distribution and in general, characterizes preferred manatee habitat and aggregation

areas. Similarly, manatees are limited to near-shore marine environments where the presence of aquatic macrophytes are limited by sunlight attenuation at relatively shallow depths in marine environments. Research has shown that manatees demonstrate a preference for shallow seagrass beds adjacent to deep water access and that “disproportionately large numbers” of cow-calf pairs are likely in such habitat. There are no known seagrass beds in Flagler County and as such the lack of a stable food supply only lends itself to a migratory through way for manatees. Large beds of tapegrass (*Vallisneria americana*) thrive along the shoreline of Lake Crescent and Dead Lake when water quality conditions are favorable. The beds expand and contract on a regular basis. Tapegrass is a freshwater submerged aquatic vegetation (SAV) that provides forage for manatees.

Saltmarsh vegetation such as smooth cordgrass (*Spartina alterniflora*) is available to manatee populations based on tidal influence, and as such manatee instantaneous distribution can be influenced by tides. The saltmarsh areas within Flagler County are documented on Figures 25-29. For instance, during high-tides, manatees can be found feeding on emergent macrophytes, while at lower tides they are found resting in deeper channels.

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Figure 29: Manatee Forage Map Section A



Figure 30: Manatee Forage Map Section B

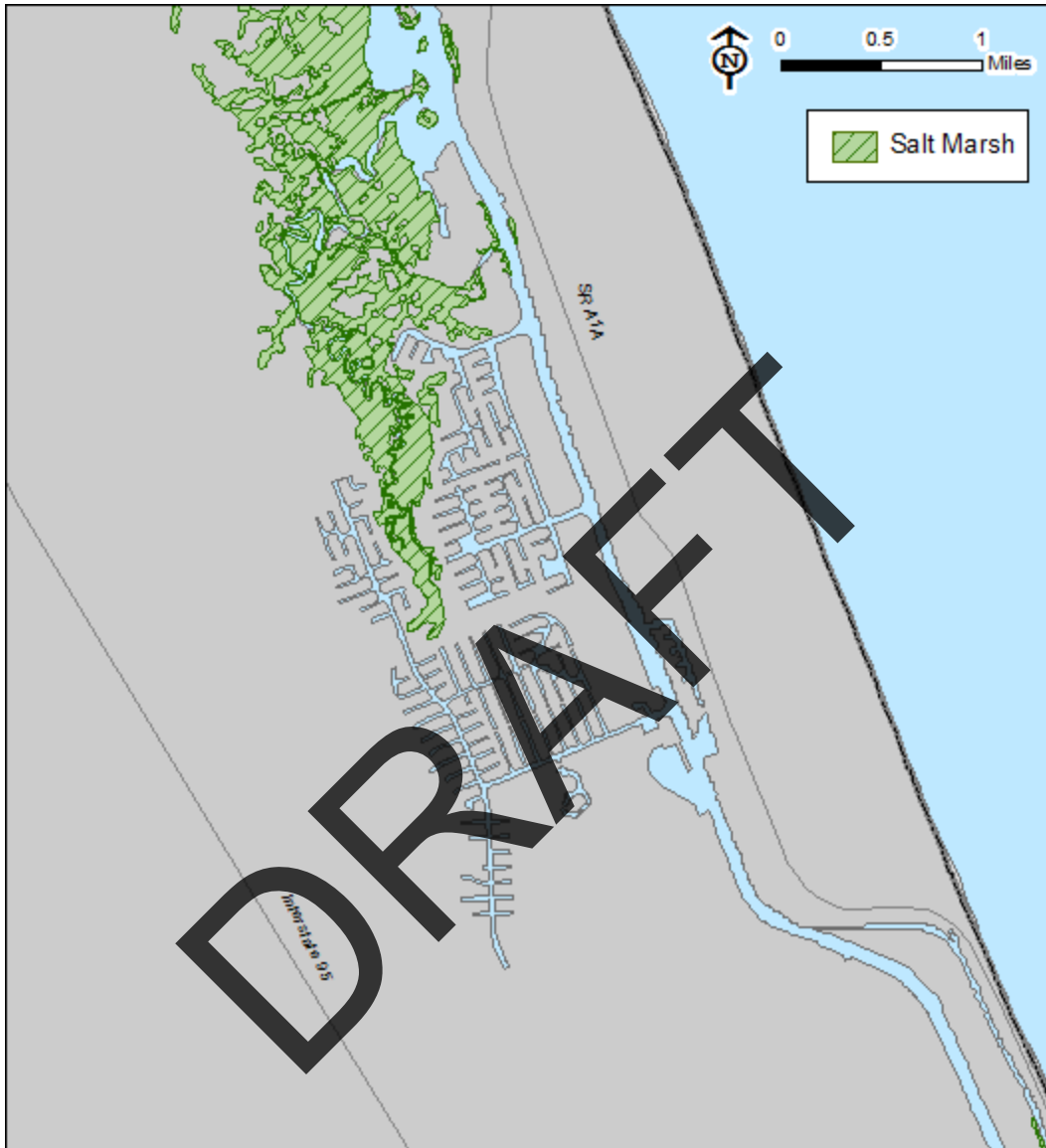


Figure 31: Manatee Forage Map Section C



Figure 32: Manatee Forage Map Section D

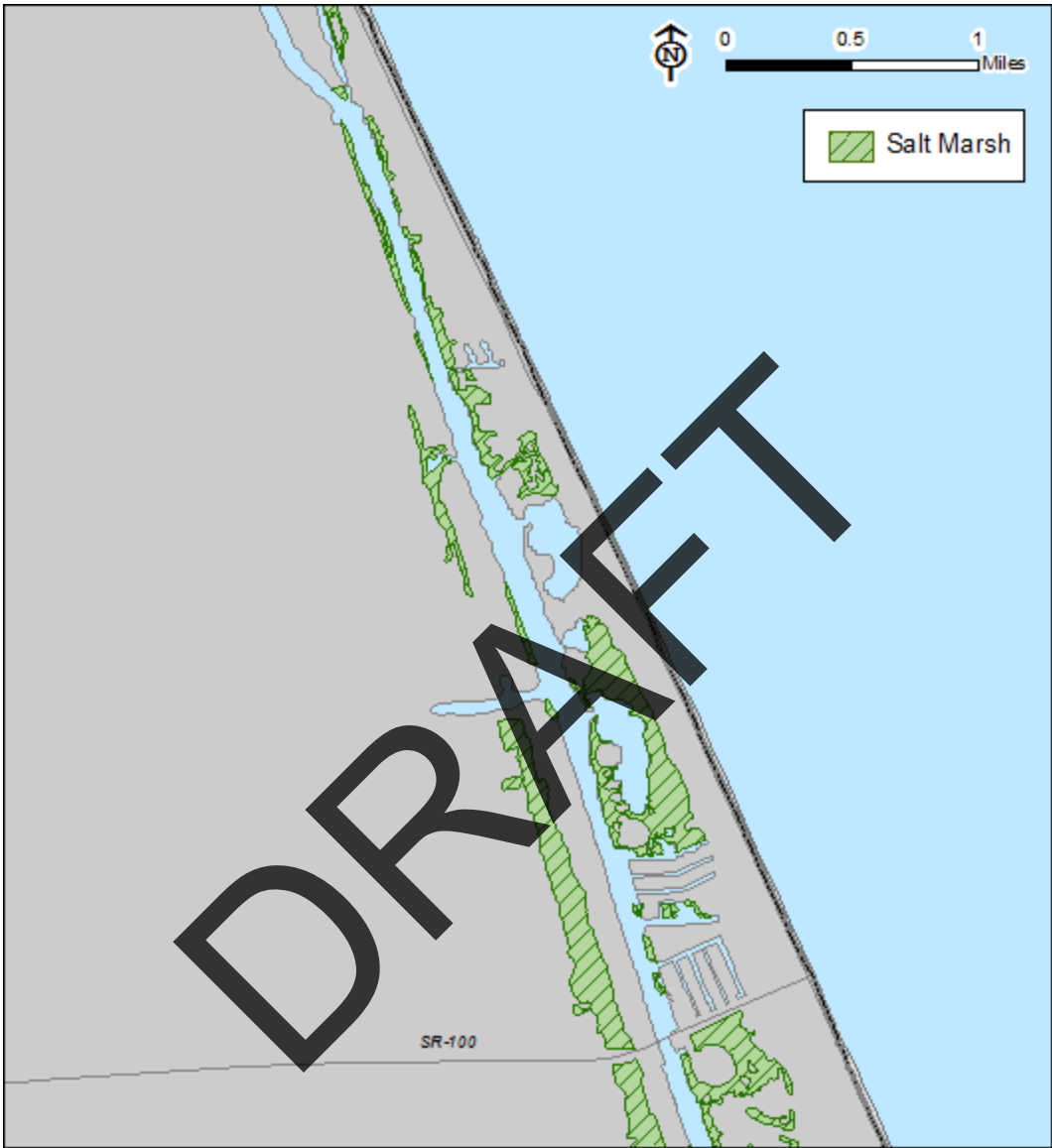
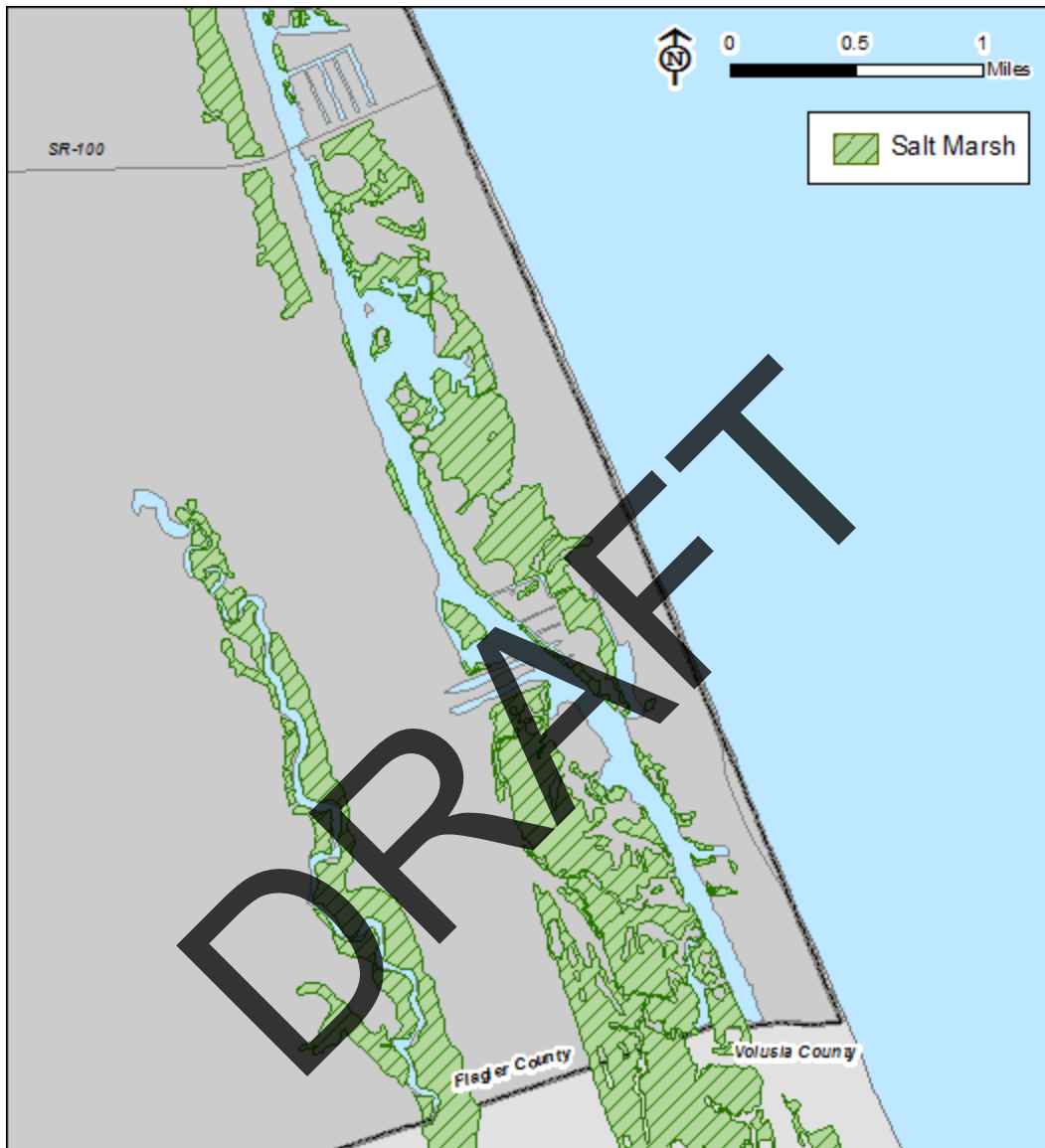




Figure 33: Manatee Forage Map Section E



### 3.0 Information Assessment

#### 3.1 Manatee Distribution

The distribution and population of manatees in Flagler County is solely dependent on water temperatures, which is dependent on the time of year. This is due to water temperatures in the ICW and Lake Crescent only being conducive to manatees during the late spring through early fall time period, and due to the fact that no warm water sources of refuge are located within the ICW or Lake Crescent in Flagler County. It is commonly believed that Flagler

County's manatee population is mostly transient (migratory) due to the lack of seagrass, no inlets, no natural warm-water refugia, and no natural freshwater accessibility.

## ***3.2 Aerial Surveys***

The FWC Fish and Wildlife Research Institute (FWRI) completed aerial manatee surveys of Flagler County to help understand the distribution of manatees in the ICW in the County. The aeriels were flown by FWC staff twice a month for two years, from November 2005 through September 2007. A total of 47 survey flights were flown. Each flight surveyed approximately 8.7 square kilometers of Flagler County coastal waters. Observations were entirely visual, and can be used to generally represent the relative abundance and distribution of manatees at the time the survey was flown. The aerial surveys effectively document the even distribution of manatees throughout Flagler County waters. This even distribution is considered due to and supported by the ecological constraints mentioned in Section 3.1 above and document the transient nature of manatee movement through Flagler County waters. No aerial surveys have been completed for Lake Crescent. The results are documented in the manatee sightings figures below.

DRAFT

Figure 34: Aerial Survey Map Section A. Data Source: FWRI

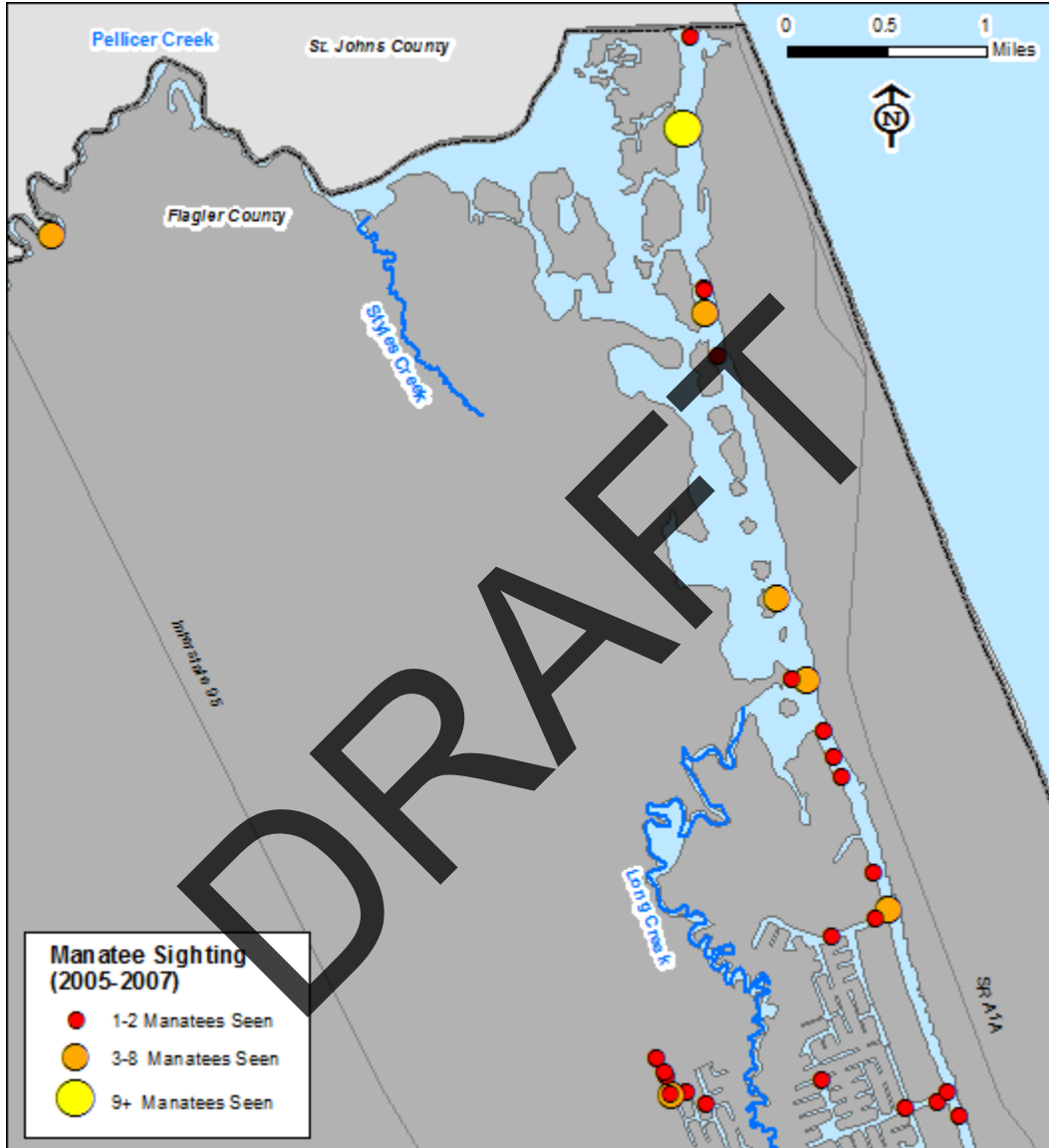


Figure 35: Aerial Survey Map Section B. Data Source: FWRI

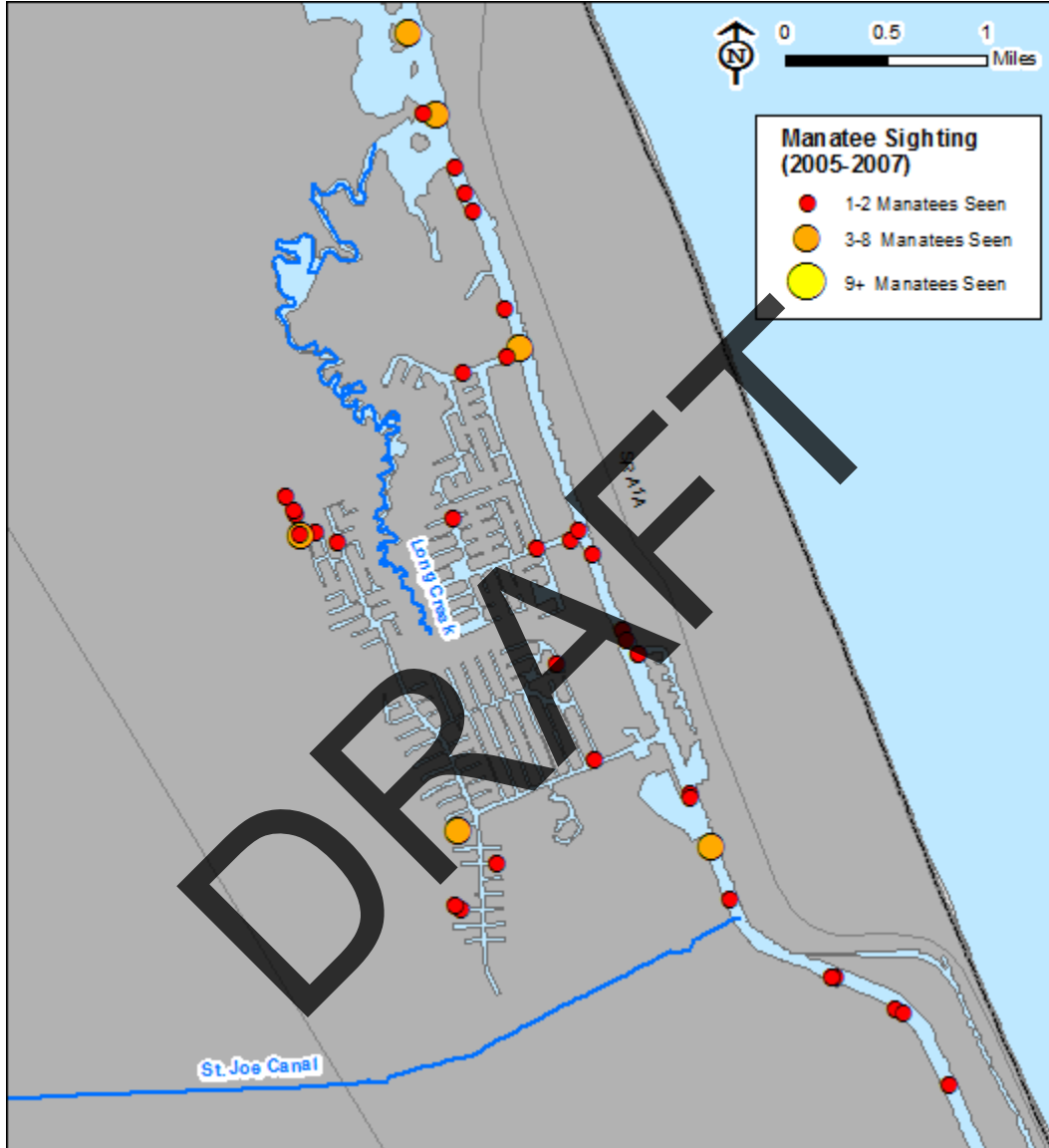


Figure 36: Aerial Survey Map Section C. Data Source: FWRI

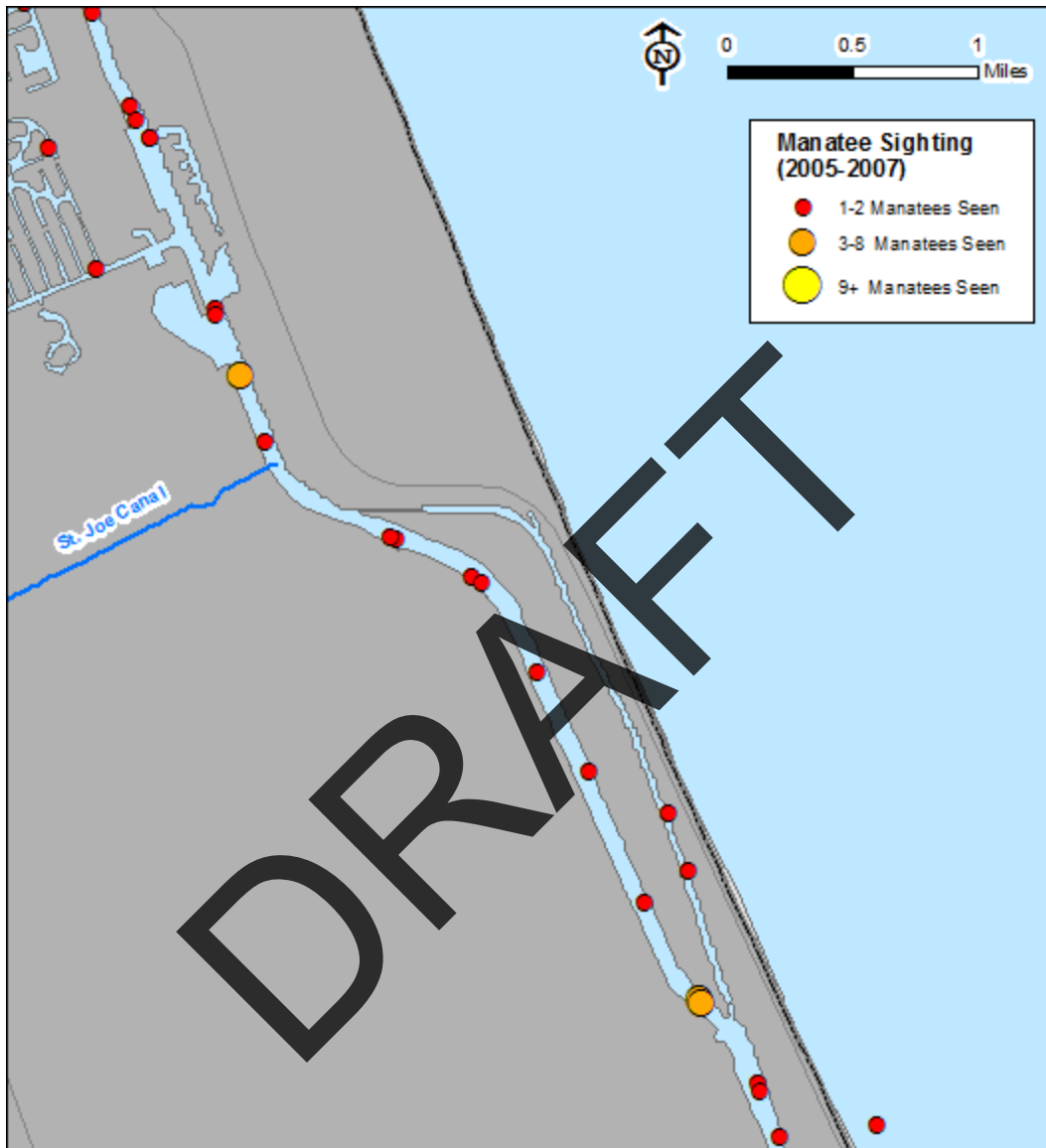


Figure 37: Aerial Survey Map Section D. Data Source: FWRI

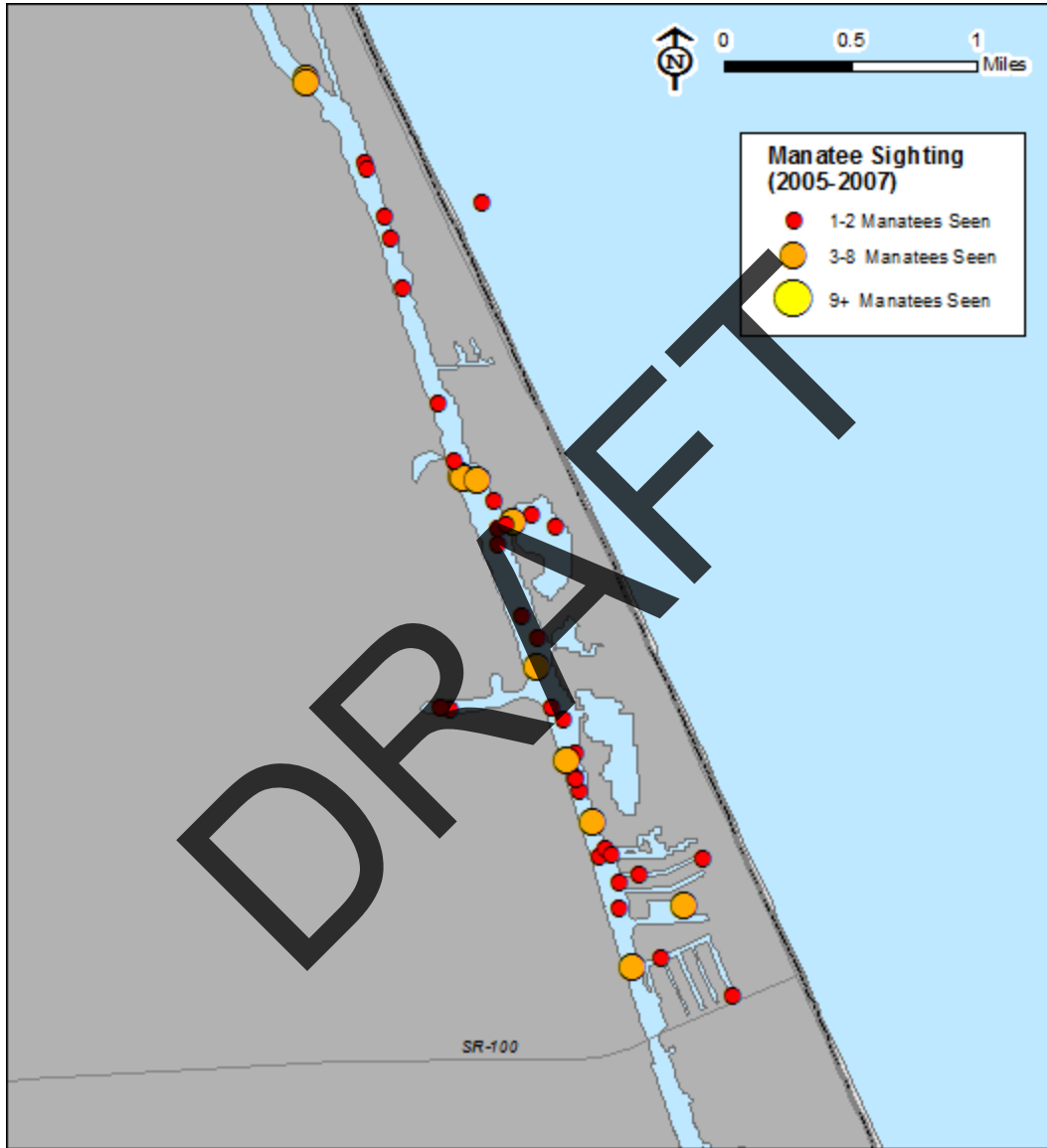
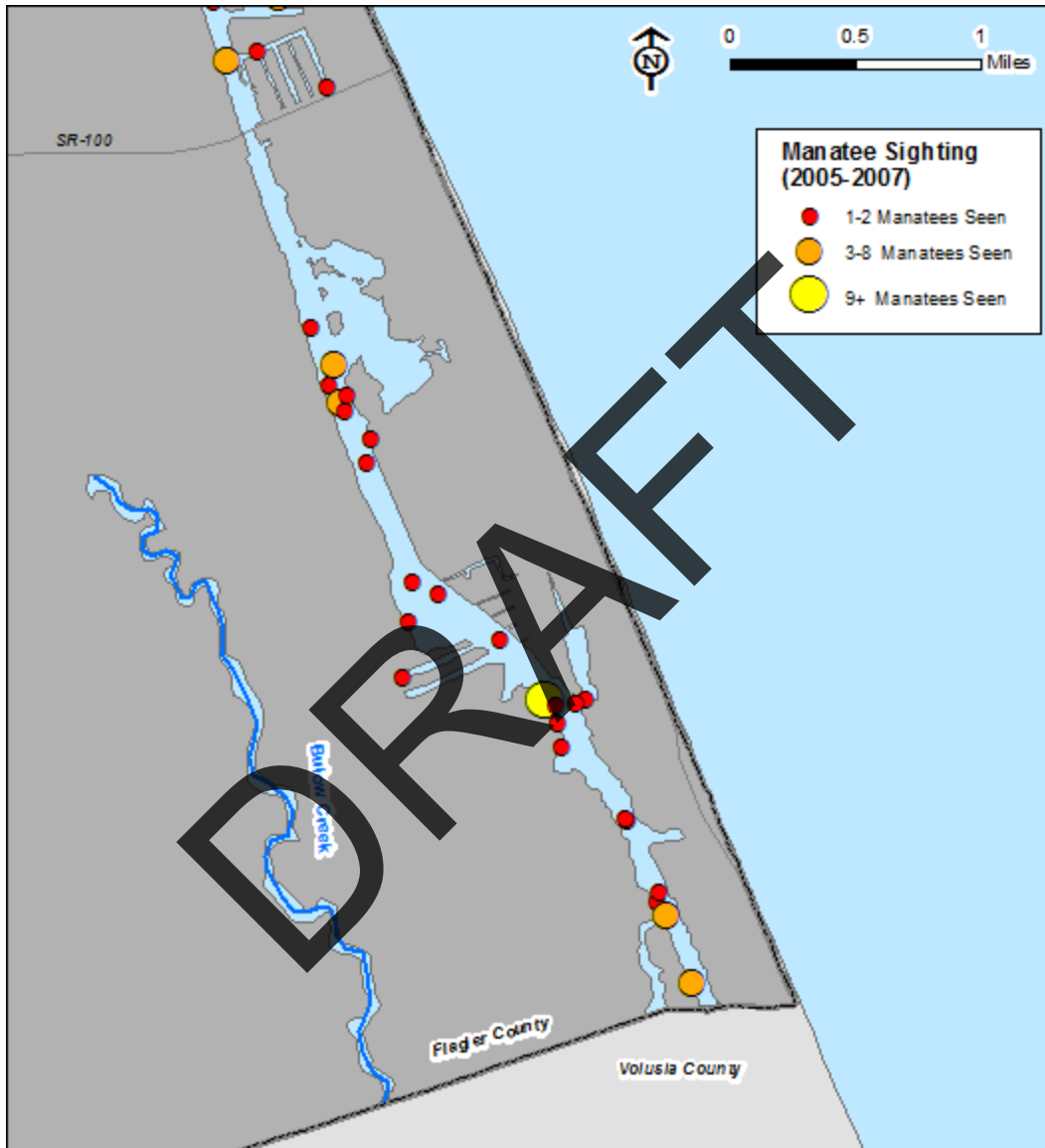




Figure 38: Aerial Survey Map Section E. Data Source: FWRI



### 3.3 Manatee Mortality

Manatee carcasses have been routinely recovered and examined by either state or federal entities since 1974. A Manatee Carcass Salvage Program was initiated by federal entities, and that program was transferred to the State of Florida (FWC) in July 1986. In 1992, a dedicated state laboratory and necropsy facility was constructed to perform post-mortem examinations. Currently, staff from four field stations collect carcasses from the southeastern United States

and transport them to the FWC Marine Mammal Pathobiology Laboratory (MMPL) in St. Petersburg, Florida.

Manatee mortality in Flagler County has been observed within the ICW and in smaller natural and man-made tributaries and canals and lakes. Also, at least 6 manatee mortalities were reported in the Atlantic Ocean since 1974.

**Figure 39: FWRI Flagler County Manatee Mortality Categories**

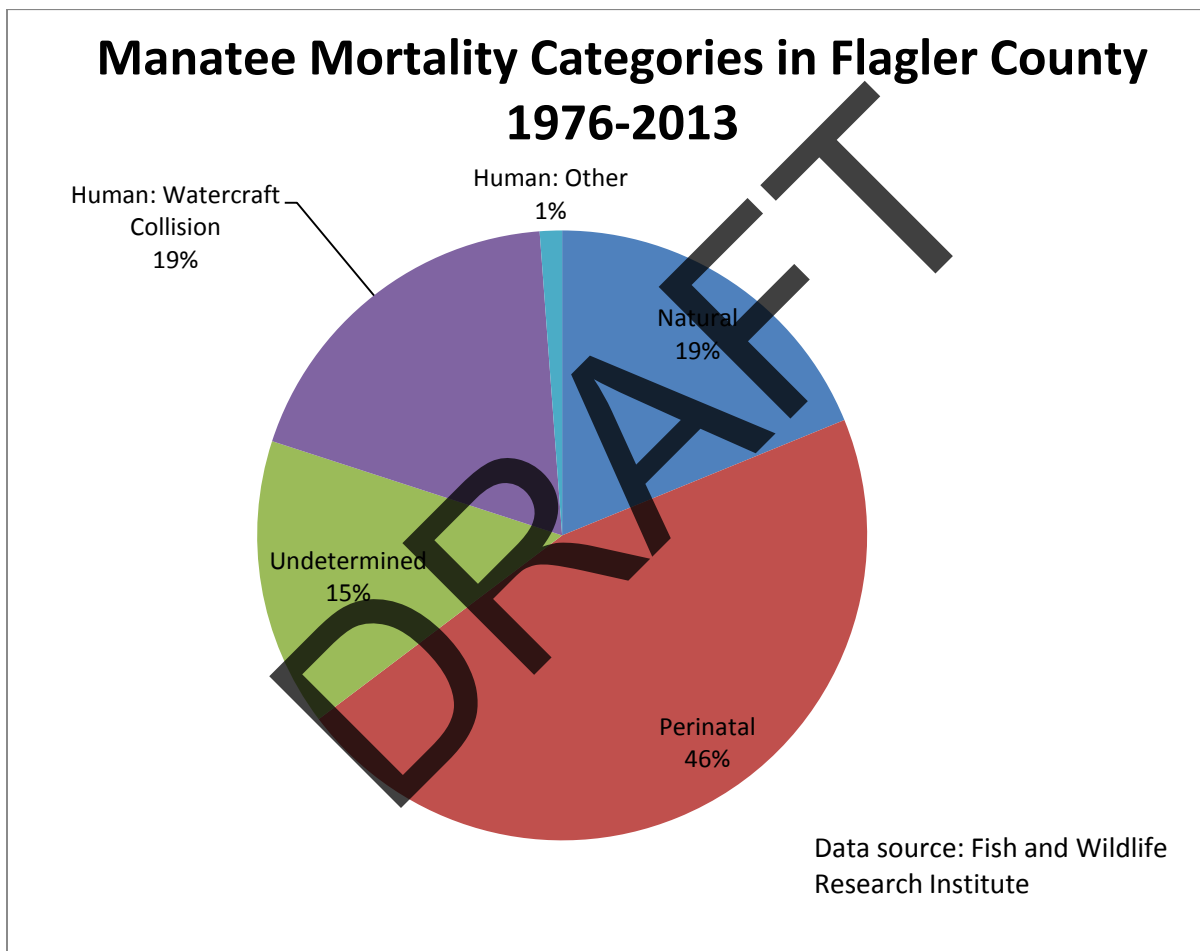


Figure 39 provides graphic representation of manatee mortality categories for Flagler County as reported by FWC staff. There have been a total of eighty-three reported manatee mortalities between 1976 and 2013 in Flagler County. Perinatal deaths account for approximately 46 percent of manatee mortality in Flagler County. Mortalities attributed to human related causes by FWC staff account for approximately 19 percent of reported mortalities in the 37 year period. Mortalities attributed to natural causes account for 19 percent of the reported

# FLAGLER COUNTY MANATEE PROTECTION PLAN

mortalities. Approximately 15 percent of manatee mortalities within the county are from undetermined causes.

Watercraft collisions account for a total of 16 verified mortalities within Flagler County waters between 1976 and 2013. The locations of all verified manatee deaths in Flagler County between 1976 and 2013 are illustrated below in Figures 40 - 45. Typically, maps displaying the spatial distribution of recovered carcasses should be approached with caution because plotted points only represent points of recovery, not necessarily points where animals were injured or expire.

**Figure 40: Manatee Mortalities Section A. Data Source: FWC**

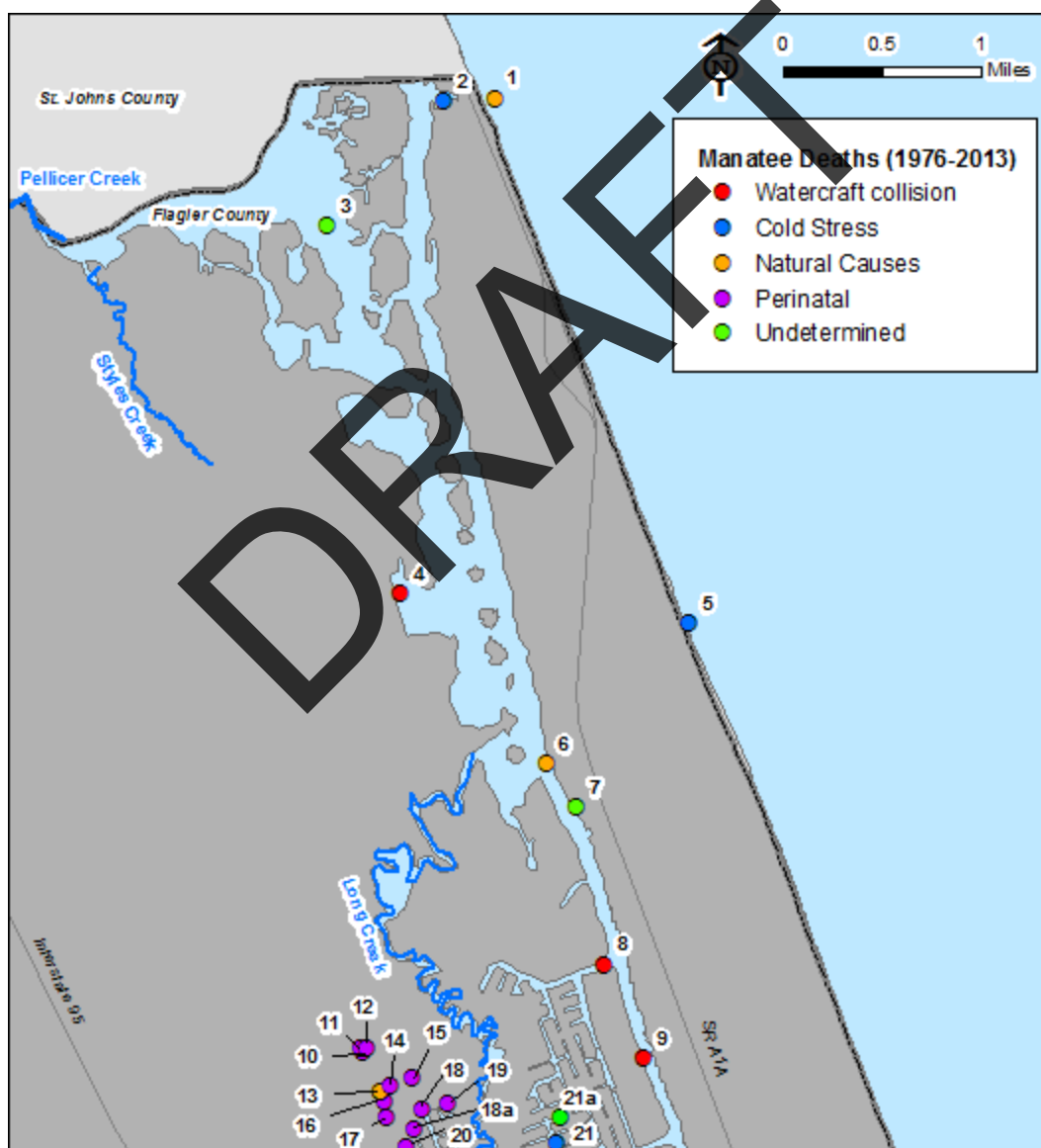


Figure 41: Manatee Mortalities Section B. Data Source: FWC

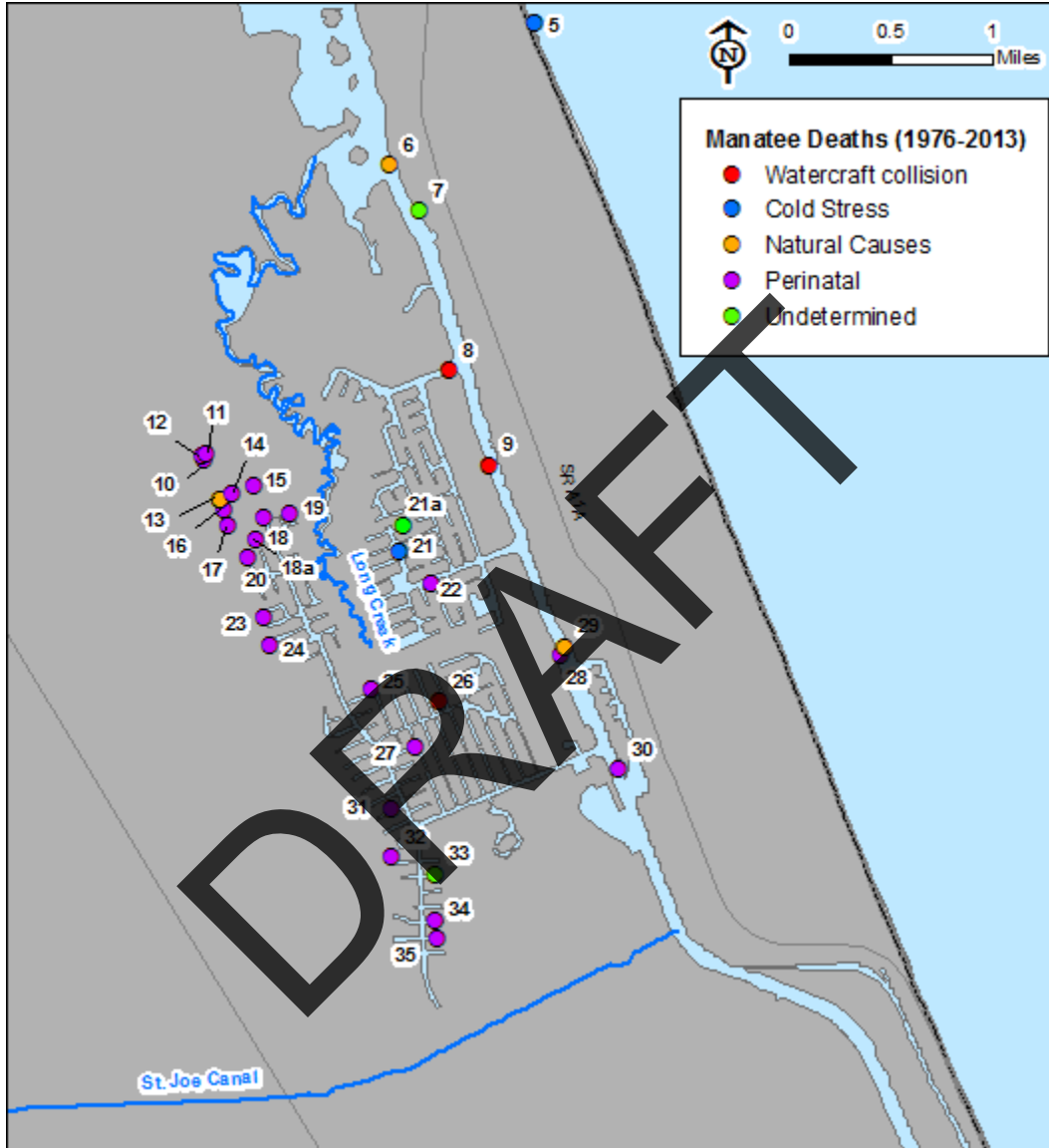


Figure 42: Manatee Mortalities Section C. Data Source: FWC

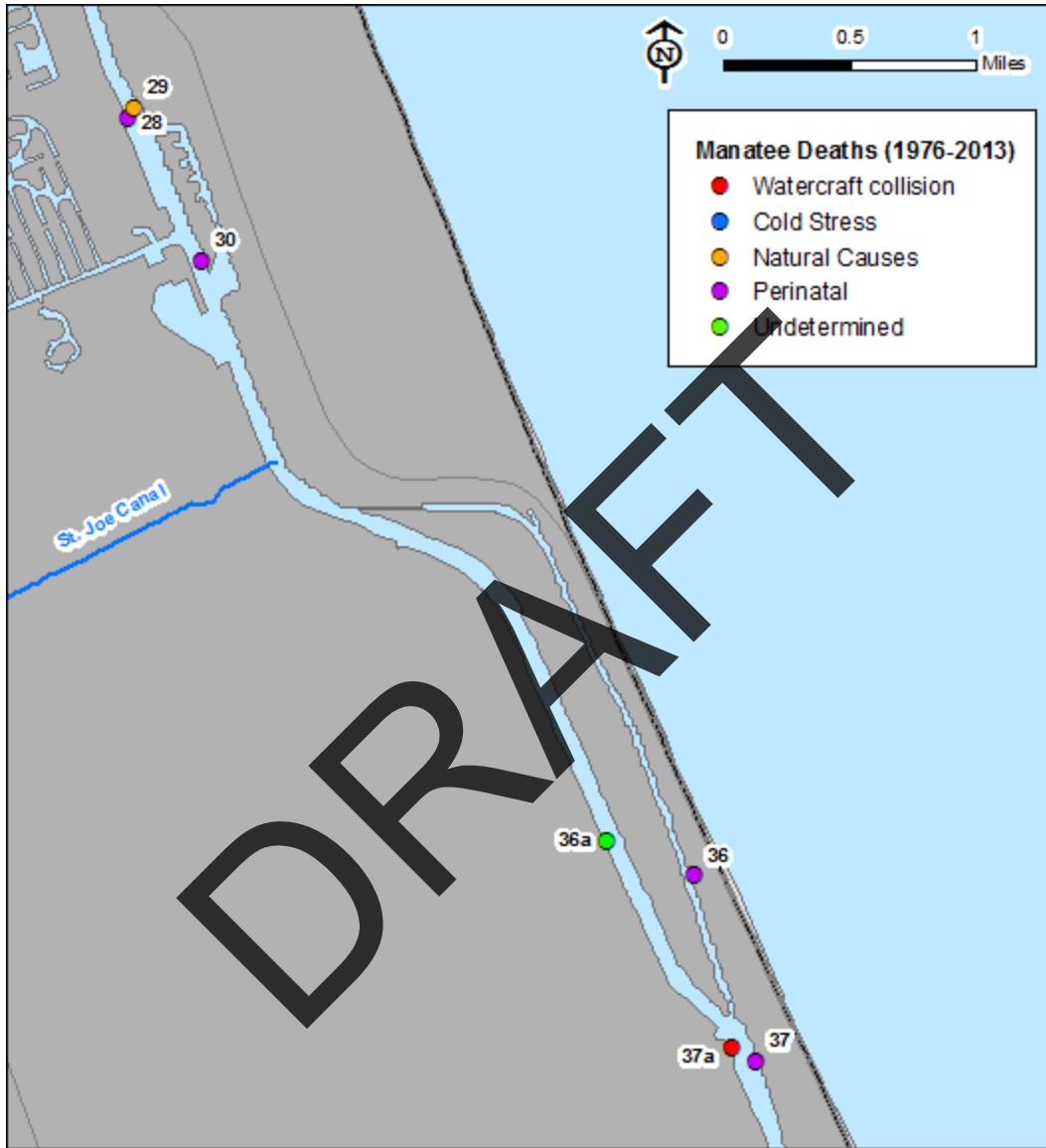


Figure 43: Manatee Mortalities Section D. Data Source: FWC

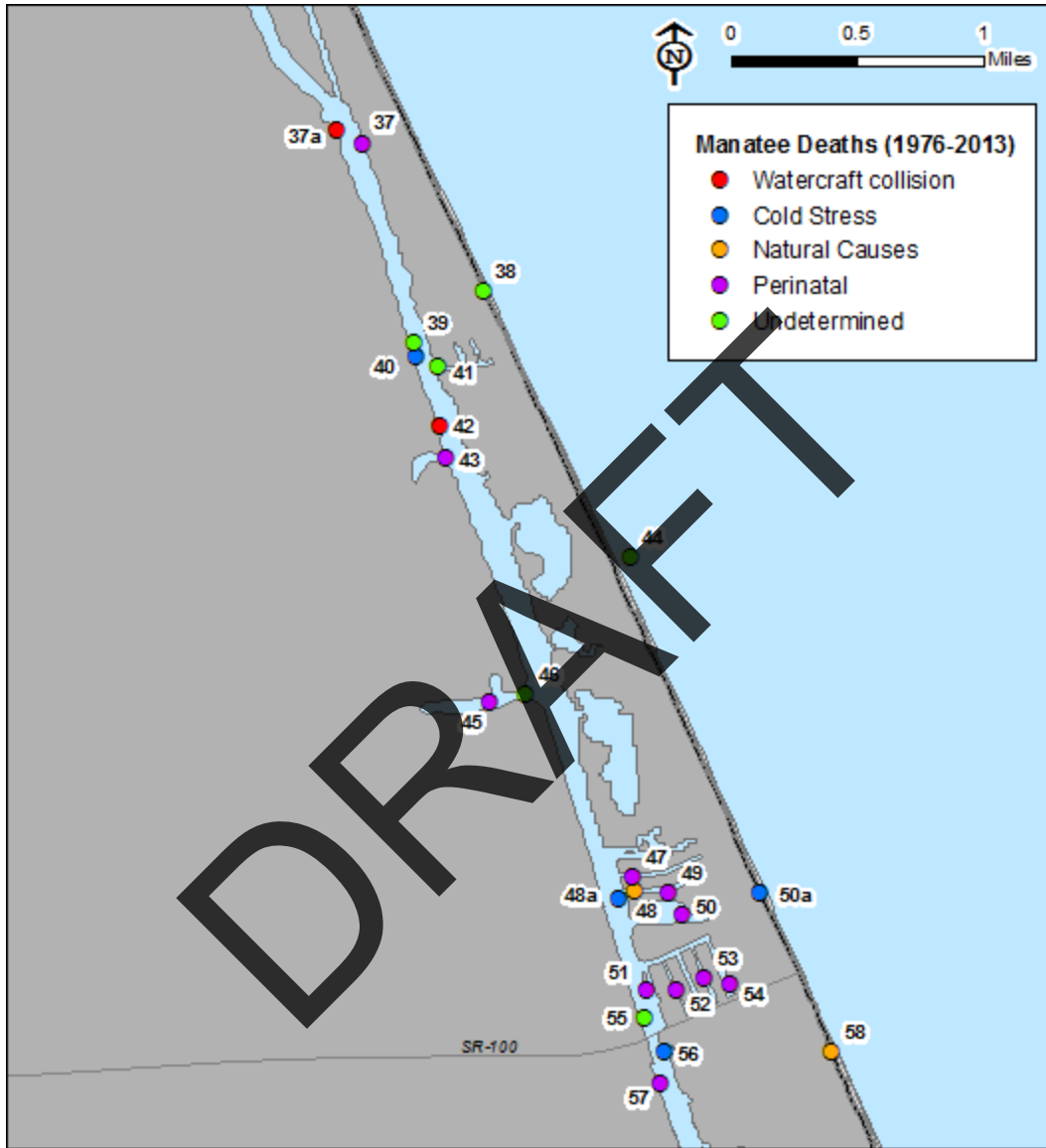
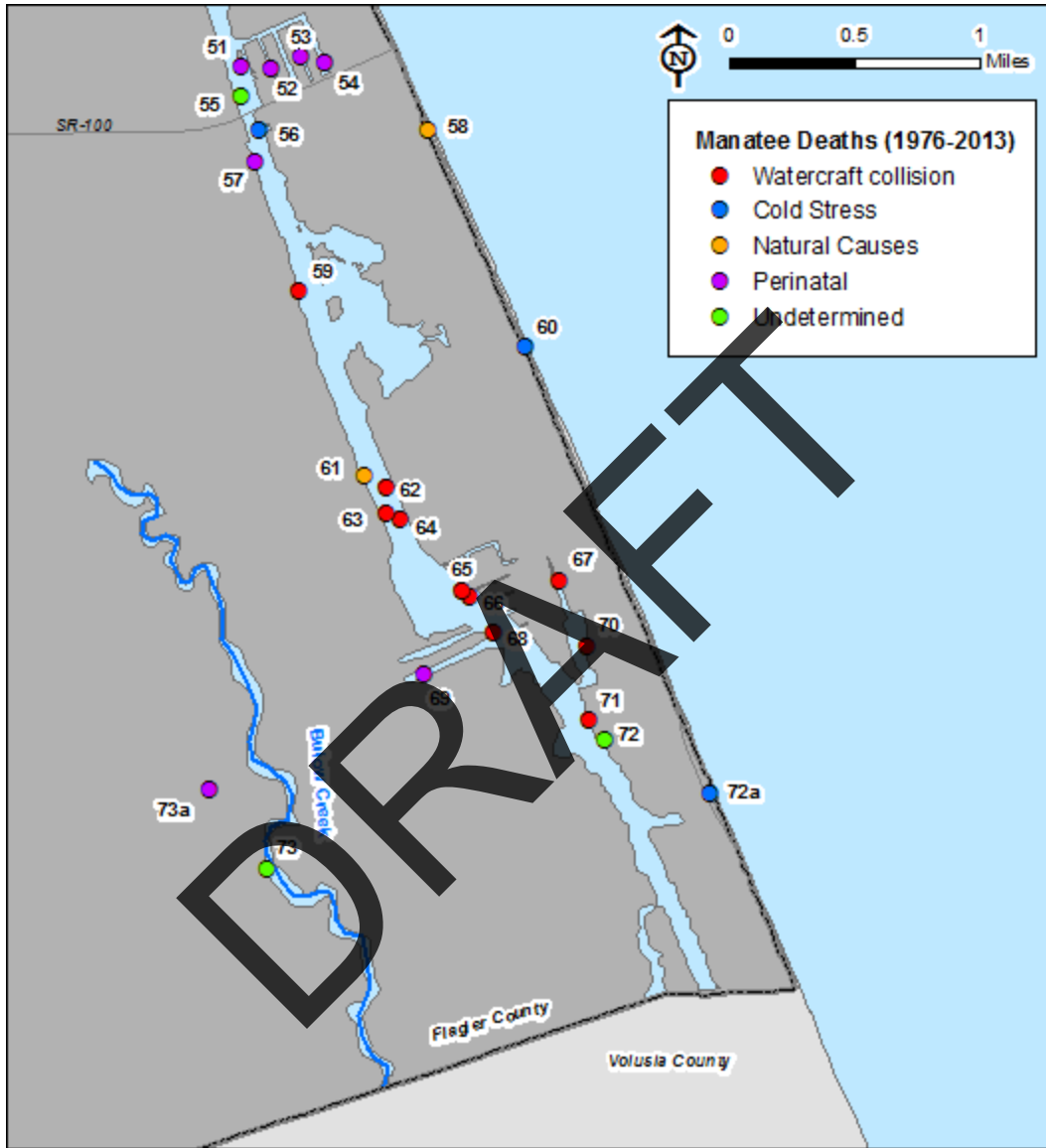


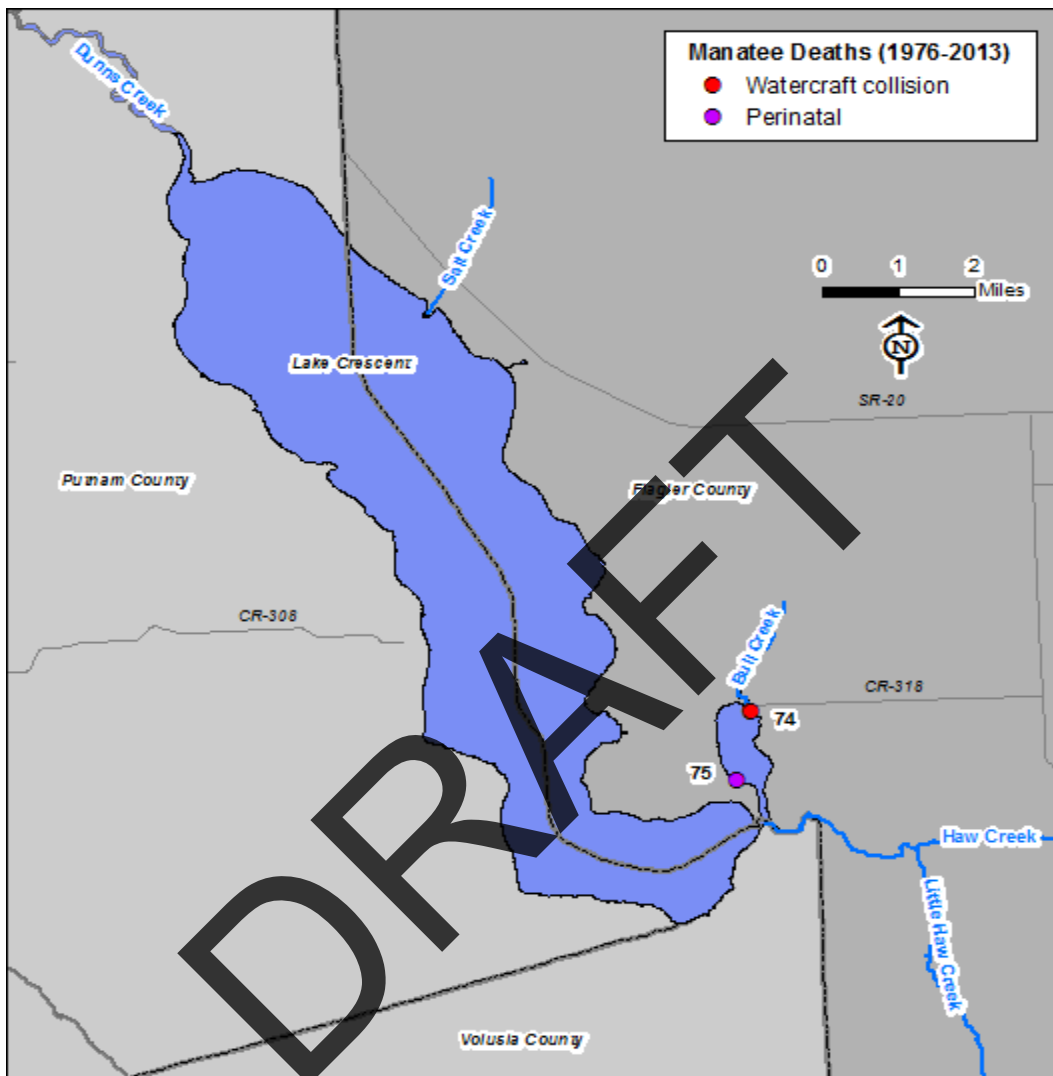
Figure 44: Manatee Mortalities Section E. Data Source: FWC





# FLAGLER COUNTY MANATEE PROTECTION PLAN

**Figure 45: Manatee Mortalities Section F. Data Source: FWC**



**Table 2: Flagler County Manatee Mortality Specific Data. Data Source: FWC**

Map ID	Reported Date	Sex	Mortality Reason	Carcass Length (cm)
1	2/19/1989	M	Natural	233
2	1/5/2004	F	Cold Stress	219
3	7/3/2005	M	Undetermined	352
4	12/6/1992	F	Watercraft collision	208
5	1/18/1996	M	Cold Stress	234
6	2/9/1996	M	Natural	175
7	10/17/2008	U	Undetermined	178
8	5/12/1990	F	Watercraft collision	279

# FLAGLER COUNTY MANATEE PROTECTION PLAN

9	1/11/1995	M	Watercraft collision	263
10	4/21/1992	F	Perinatal	108
11	5/7/2003	F	Perinatal	114
12	7/19/2004	M	Perinatal	152
13a	5/12/1995	M	Perinatal	135
13b	5/13/1995	F	Perinatal	147
13c	5/14/1995	F	Natural	308
14	7/26/2000	F	Perinatal	128
15	5/13/2008	F	Perinatal	149
16	5/7/2003	M	Perinatal	102
17	9/28/2001	F	Perinatal	135
18	5/7/1999	M	Perinatal	123
18a	11/20/2010	M	Perinatal	133
19	7/21/2002	M	Perinatal	133
20	8/20/2007	M	Perinatal	125
21	3/10/2007	M	Cold Stress	215
21A	10/3/2012	F	Undetermined	131
22	5/8/1991	M	Perinatal	109
23	7/6/1991	F	Perinatal	148
24	4/21/2003	M	Perinatal	133
25	6/6/1997	M	Perinatal	104
26	6/10/1998	M	Watercraft collision	272
27	4/16/2003	F	Perinatal	127
28	5/24/1976	M	Perinatal	114
29	6/11/1998	M	Natural	228
30	4/10/1987	F	Perinatal	124
31	9/15/1990	F	Perinatal	148
32	11/3/2001	F	Perinatal	138
33	6/8/2000	M	Undetermined	273
34	8/9/2006	F	Perinatal	128
35	6/21/2004	F	Perinatal	136
36	8/21/2003	F	Perinatal	123
36a	5/25/2012	F	Undetermined	210
37	8/6/2005	M	Perinatal	134
37a	6/4/2012	M	Watercraft collision	249
38	2/13/2001	M	Undetermined	330
39	7/28/2007	M	Undetermined	295
40	11/24/2009	M	Cold Stress	266
41	9/16/2006	F	Undetermined	333

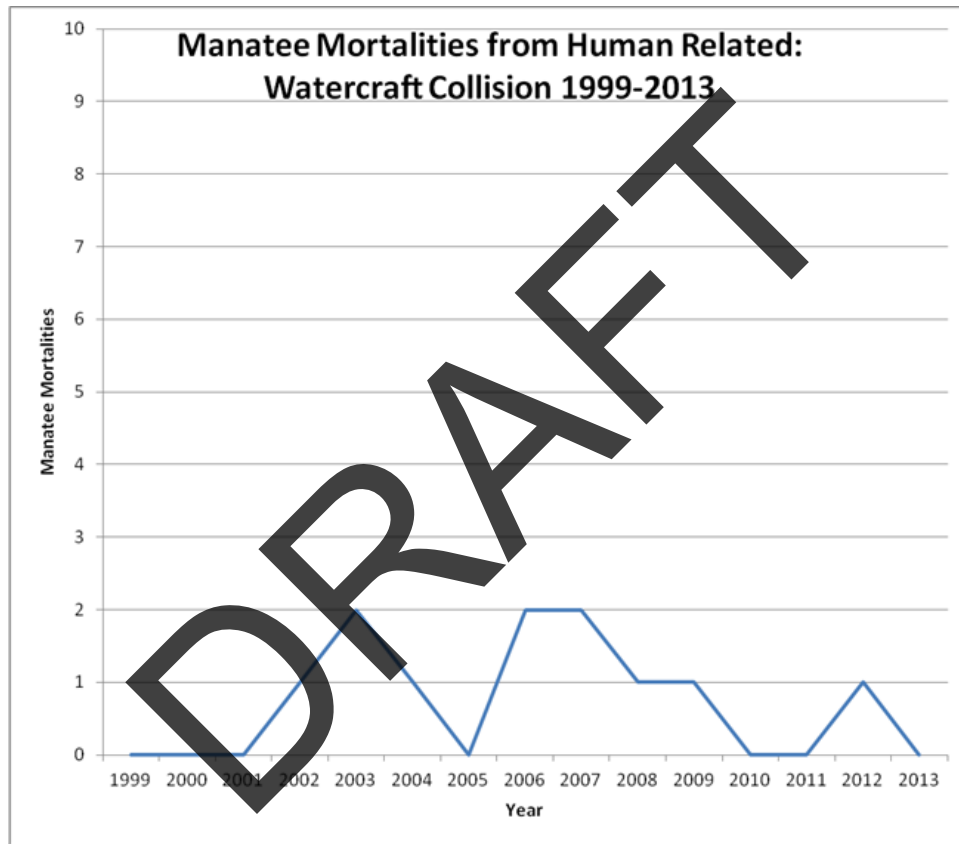
# FLAGLER COUNTY MANATEE PROTECTION PLAN

42	9/29/2006	M	Watercraft collision	271
43	8/9/1998	M	Perinatal	111
44	2/8/1990	M	Undetermined	273
45	3/24/1993	F	Perinatal	120
46	1/18/1987	M	Undetermined	226
47	10/2/1980	F	Perinatal	123
48	4/3/1976	F	Natural	300
48a	1/9/2010	M	Cold Stress	295
49	7/26/2002	M	Perinatal	117
50	8/14/1997	F	Perinatal	133
50a	1/31/2013	F	Cold Stress	194
51	5/30/2009	M	Perinatal	117
52	6/13/2007	F	Perinatal	139
53	5/3/2009	M	Perinatal	124
54	7/19/2003	M	Perinatal	120
55	7/10/2008	F	Undetermined	196
56	1/30/2009	F	Cold Stress	192
57	9/2/1996	M	Perinatal	125
58	4/1/2009	F	Natural	245
59	5/20/2007	M	Watercraft collision	214
60	12/24/1989	F	Cold Stress	180
61	9/27/2008	F	Natural	338
62	7/14/2009	M	Watercraft collision	307
63	5/29/1994	F	Watercraft collision	245
64	11/13/1993	M	Watercraft collision	153
65	6/5/2007	M	Watercraft collision	324
66	7/23/2006	M	Watercraft collision	308
67	5/24/2003	F	Watercraft collision	267
68	7/22/2004	M	Watercraft collision	296
69	8/16/2008	M	Perinatal	123
70	5/25/2003	F	Watercraft collision	125
71	5/10/2002	F	Watercraft collision	275
72	4/22/2001	M	Undetermined	321
72a	12/13/2012	M	Cold Stress	225
73	5/6/2007	M	Undetermined	216
73a	9/10/2012	M	Perinatal	150
74	3/1/2008	F	Watercraft collision	221
75	4/16/1990	M	Perinatal	149

**3.3.1 Watercraft Related Manatee Mortalities**

Flagler County is not recognized as an area with high watercraft related manatee deaths, but the County does recognize that the number of deaths in the early to mid-2000’s increased to a number of concern (with spikes to 2 deaths each year in 2003, 2006, & 2007). Flagler County has averaged 0.69 watercraft related manatee mortalities since 1999.

**Figure 46. Watercraft Collision Mortalities 1999-2013. Data Source: FWC**



As stated above, Flagler County has experienced 11 watercraft related manatee deaths since 1999. This equals an average of 0.69 manatee deaths per year. Statewide this ranks Flagler County 20<sup>th</sup> in watercraft related manatee deaths per year over the same time period. Table 3 below documents each County’s average number of watercraft related manatee deaths over the time period of 1999-2013.

# FLAGLER COUNTY MANATEE PROTECTION PLAN

**Table 3: Watercraft Related Manatee Deaths 1999-2013. Data Source: FWC**

County	Total	Average/yr	Rank
Lee	220	13.75	1
Brevard	161	10.0625	2
Volusia	82	5.125	3
Collier	80	5	4
Duval	75	4.6875	5
Hillsborough	57	3.5625	6
Charlotte	52	3.25	7
Pinellas	50	3.125	8
Citrus	48	3	9
Palm Beach	48	3	9
Broward	46	2.875	11
Sarasota	39	2.4375	12
Monroe	38	2.375	13
Manatee	35	2.1875	14
Indian River	31	1.9375	15
Dade	30	1.875	16
Martin	30	1.875	16
Glades	18	1.125	18
St. Lucie	14	0.875	19
St. Johns	11	0.6875	20
Pasco	11	0.6875	20
<b>Flagler</b>	<b>11</b>	<b>0.6875</b>	<b>20</b>
Clay	7	0.4375	23
Hernando	6	0.375	24
Dixie	5	0.3125	25
Putnam	5	0.3125	25
Lake	4	0.25	27
Levy	4	0.25	27
Gilchrist	3	0.1875	29
Wakulla	3	0.1875	29
Okeechobee	2	0.125	31
Franklin	2	0.125	31
Seminole	2	0.125	31
Taylor	2	0.125	31
Hendry	1	0.0625	35
Nassau	1	0.0625	35
Bay	0	0	
DeSoto	0	0	
Escambia	0	0	
Gulf	0	0	
Okaloosa	0	0	
Santa Rosa	0	0	
Walton	0	0	

Based upon aerial surveys and manatee mortality data collected, the following conclusions can be made:

- Manatee use of the Flagler County waterways is widespread and the Flagler County waterways support a primarily seasonal manatee population with greatest abundance during non-winter months. Watercraft related manatee deaths have occurred primarily during the summer months. The documented winter deaths are each identified as cold stress related.
- The largest number of watercraft related manatee deaths have occurred within Section E – Smith Creek south of SR 100 (10 of the total 16 verified watercraft related manatee deaths).
- Manatees in Flagler County are widely dispersed and move freely between each area and within the canals and lakes, particularly during non-winter months.
- Some Flagler County waterways are used by manatees for nursing and calving. The most significant locations for these types of activities appear to be the man-made canals within the City of Palm Coast and Flagler Beach.
- Watercraft-related manatee mortality in Flagler County was at an elevated level between 2002 and 2009.

### **3.4 Boat Activity**

According to 2013 Florida Department of Highway Safety and Motor Vehicles (FDHSMV) data Flagler County currently ranks 13<sup>th</sup> (last) out of 13 Florida East Coast Atlantic counties in number of registered boating vessels, and 39<sup>th</sup> in overall abundance statewide. Recreational boats in Flagler County represent 1.66% of the total registered recreational boats found within the 13 East Coast Atlantic counties and 0.62% of the registered commercial boats found within the same region. A general increase (56%) in registered vessels over the past thirteen years is seen in Table 6, with an increase of 1,747 registered vessels in Flagler County over the same time period. As depicted in the tables, Flagler County is much lower in boater registration than many counties throughout the state including landlocked counties.

**Table 4: Boat Registration 2013 East Coast Atlantic Counties. Source: FDHSMV**

COUNTY	Recreational	Commercial	TOTAL
DADE	59,031	1,829	61,537
BROWARD	40,208	937	41,657
PALM BCH	36,852	1,046	38,142
BREVARD	32,185	822	33,456
DUVAL	27,072	663	27,840

# FLAGLER COUNTY MANATEE PROTECTION PLAN

MONROE	24,422	2,515	27,100
VOLUSIA	25,898	702	26,828
MARTIN	14,871	541	15,606
ST. JOHNS	12,854	379	13,308
ST. LUCIE	11,983	499	12,564
IND.RIVER	9,983	415	10,449
NASSAU	5,755	160	5,937
<b>FLAGLER</b>	<b>4,989</b>	<b>65</b>	<b>5,073</b>
<b>TOTAL</b>	<b>306,103</b>	<b>10,573</b>	<b>319,497</b>

**Table 5: Boat Registration 2013 Entire State. Source: FDHSMV**

COUNTY	RECREATIONAL	COMMERCIAL	TOTAL
DADE	59,031	1,829	61,537
PINELLAS	45,166	1,178	46,929
LEE	42,370	1,097	43,736
BROWARD	40,208	937	41,657
HILLSBOROUGH	40,140	716	41,004
PALM BCH	36,852	1,046	38,142
BREVARD	32,185	822	33,456
DUVAL	27,072	663	27,840
POLK	26,961	406	27,455
ORANGE	26,567	222	26,991
VOLUSIA	25,898	702	26,828
MONROE	24,422	2,515	27,100
PASCO	22,633	423	23,241
SARASOTA	20,989	368	21,577
COLLIER	20,816	819	21,775
LAKE	20,049	181	20,326
CHARLOTTE	19,876	568	20,545
MARION	17,879	217	18,169
BAY	17,406	771	18,315
OKALOOSA	17,354	470	17,978
SEMINOLE	16,975	238	17,305
MANATEE	16,592	663	17,425
LEON	16,276	345	16,638
ESCAMBIA	15,317	334	15,753
CITRUS	15,004	557	15,618
MARTIN	14,871	541	15,606



# FLAGLER COUNTY MANATEE PROTECTION PLAN

SANTA ROSA	13,875	253	14,162
ST. JOHNS	12,854	379	13,308
ST. LUCIE	11,983	499	12,564
CLAY	11,557	143	11,725
ALACHUA	10,024	238	10,320
IND.RIVER	9,983	415	10,449
HERNANDO	8,681	189	8,885
HIGHLANDS	8,069	69	8,172
OSCEOLA	7,851	129	7,998
PUTNAM	7,407	270	7,720
NASSAU	5,755	160	5,937
WALTON	5,262	143	5,419
<b>FLAGLER</b>	<b>4,989</b>	<b>65</b>	<b>5,073</b>
OKEECHOBEE	4,625	161	4,801
JACKSON	4,607	27	4,635
WAKULLA	4,400	337	4,743
COLUMBIA	4,221	40	4,273
SUMTER	4,052	37	4,098
LEVY	3,798	299	4,128
TAYLOR	3,561	151	3,726
HENDRY	2,702	118	2,853
SUWANNEE	2,645	30	2,683
GULF	2,535	281	2,819
GADSDEN	2,311	35	2,348
FRANKLIN	2,298	1,061	3,370
WASHINGTON	2,266	22	2,288
BRADFORD	2,217	10	2,227
DIXIE	2,183	286	2,485
BAKER	2,174	9	2,184
DESOTO	2,143	75	2,220
HOLMES	2,081	19	2,103
GILCHRIST	1,587	31	1,619
HARDEE	1,501	18	1,520
CALHOUN	1,499	31	1,530
JEFFERSON	1,317	18	1,340
GLADES	1,158	33	1,193
MADISON	1,139	7	1,146
LIBERTY	1,091	27	1,122
LAFAYETTE	912	8	921

# FLAGLER COUNTY MANATEE PROTECTION PLAN

UNION	889	6	895
HAMILTON	871	7	882
<b>TOTAL</b>	<b>863,982</b>	<b>24,764</b>	<b>894,830</b>

**Table 6: Boat Registration Data Flagler County 2000-2013. Source: FDHSMV**

Year	Recreational	Recreational Percent Annual Increase	Commercial	Commercial Percent Annual Increase
2013	4989	-1.83%	65	-4.41%
2012	5082	-1.76%	68	-10.53%
2011	5173	-1.75%	76	-1.30%
2010	5265	-1.20%	77	-7.23%
2009	5329	13.33%	83	-5.68%
2008	4702	-8.84%	88	-2.22%
2007	5158	4.94%	90	5.88%
2006	4915	4.73%	85	-2.30%
2005	4693	2.29%	87	2.35%
2004	4588	4.25%	85	-8.60%
2003	4401	5.16%	93	19.23%
2002	4185	7.12%	78	-7.14%
2001	3907	23.76%	84	-25.00%
2000	3157		112	

Recreational Overall Percent Increase 2000-2013			58.03%
Commercial Overall Percent Increase 2000-2014			-41.96%

# FLAGLER COUNTY MANATEE PROTECTION PLAN

**Table 7: Boat Types Flagler County 2000-2012. Source: FDHSMV**

Year	Class A-1		Class A-2		Class 1		Class 2		Class 3		Class 4		Class 5		Canoes	Deal	Subtotals		Totals
	< than 12'		12-15'11"		16'-25-11"		26'-39'11"		40'-64'11"		65'-109'11"		110' OR More				P	C	
	P	C	P	C	P	C	P	C	P	C	P	C							
2012	835	1	1186	26	2534	30	384	9	79	1	2	1	0	0	62	21	5082	68	5171
2011	864	1	1171	30	2612	35	400	8	67	2	2	0	0	0	57	27	5173	76	5276
2010	873	2	1184	30	2654	35	423	7	69	3	1	0	0	0	61	21	5265	77	5363
2009	868	3	1210	32	2693	36	429	7	67	4	1	1	0	0	61	29	5329	83	5441
2008	718	5	1194	26	2320	40	350	10	64	6	2	0	0	0	55	30	4703	87	4820
2007	799	4	1199	31	2618	40	421	9	68	5	3	1	0	0	50	32	5158	90	5280
2006	738	4	1200	25	2471	41	384	9	70	5	2	0	0	0	51	22	4916	84	5022
2005	726	5	1172	27	2327	41	350	9	66	4	1	0	0	0	52	30	4694	86	4810
2004	663	4	1226	29	2244	35	345	10	62	6	2	0	0	0	47	35	4589	84	4708
2003	629	3	1234	35	2090	41	341	9	64	4	0	0	0	0	44	41	4402	92	4535
2002	618	3	1224	30	1915	32	321	8	66	4	1	0	0	0	41	46	4186	77	4309
2001	567	9	1194	25	1758	37	296	8	55	4	3	0	0	0	35	49	3908	83	4040
2000	440	3	1015	28	1424	31	228	7	48	42	2	0	0	0	1	38	3158	111	3307

### 3.4.1 Boating Accident Statistics

A summary of boating accident statistics for the state of Florida and Flagler County for the year 2013 (data received from FWC Division of Law Enforcement - LE) is provided in Table 8. Only two (2) boating accidents were reported in 2013 in Flagler County, placing the County 40<sup>th</sup> overall in boating accidents and representing only 0.27% of all statewide reported boating accidents. This number is consistent with Flagler County's ranking in regards to boat registrations and also population in general. The number of accidents is somewhat consistent throughout the state with the number of boat registrations. The counties with the highest number of boats and accidents is also consistent with the highest number of watercraft related manatee deaths.

**Table 8: Boating Accident Statistics 2013. Source: FWC - LE**

County	Total Vessels	Reportable Accidents	Fatalities	Injuries	Property Damage	Rank	Accident Rate
Alachua	10,320	0	0	0	\$0	51	0
Baker	2,184	0	0	0	\$0	52	0
Bay	18,315	13	0	12	\$228,650	17	1:1,409
Bradford	2,227	0	0	0	\$0	53	0
Brevard	33,456	24	2	19	\$189,600	7	1:1,394
Broward	41,657	50	1	29	\$270,510	4	1:833
Calhoun	1,530	0	0	0	\$0	54	0
Charlotte	20,545	12	1	10	\$93,500	18	1:1,712
Citrus	15,618	17	0	17	\$60,800	14	1:919

# FLAGLER COUNTY MANATEE PROTECTION PLAN

Clay	11,725	9	0	10	\$27,350	22	1:1,303
Collier	21,775	22	3	12	\$120,224	9	1:990
Columbia	4,273	0	0	0	\$0	55	0
Desoto	2,220	1	1	0	\$0	44	1:2,220
Dixie	2,485	2	2	6	\$5,200	38	1:1,243
Duval	27,840	19	4	6	\$529,280	10	1:1,465
Escambia	15,753	6	3	6	\$5,250	26	1:2,626
<b>Flagler</b>	<b>5,073</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>\$4,100</b>	<b>40</b>	<b>1:2,537</b>
Franklin	3,370	6	1	2	\$69,900	27	1:562
Gadsden	2,348	0	0	0	\$0	56	0
Gilchrist	1,619	0	0	0	\$0	57	0
Glades	1,193	5	0	2	\$154,000	28	1:239
Gulf	2,819	1	1	1	\$2,500	46	1:2,819
Hamilton	882	0	0	0	\$0	58	0
Hardee	1,520	0	0	0	\$0	59	0
Hendry	2,853	2	0	0	\$6,450	39	1:1,427
Hernando	8,885	5	0	2	\$18,865	29	1:1,777
Highlands	8,172	3	1	3	\$6,250	34	1:2,724
Hillsborough	41,004	19	0	13	\$91,200	11	1:2,158
Holmes	2,103	0	0	0	\$0	60	0
Indian River	10,449	10	1	2	\$44,00	19	1:1,045
Jackson	4,635	2	0	2	\$0	43	1:2,318
Jefferson	1,340	0	0	0	\$0	61	0
Lafayette	921	0	0	0	\$0	62	0
Lake	20,326	8	1	5	\$33,450	24	1:2,541
Lee	43,736	30	1	14	\$215,504	6	1:1,446
Leon	16,638	0	0	0	\$	63	0
Levy	4,128	1	0	1	\$0	48	1:4,128
Liberty	1,122	0	0	0	\$0	64	0
Madison	1,146	0	0	0	\$0	65	0
Manatee	17,425	9	0	9	\$44,200	20	1:1,936
Marion	18,169	2	0	3	\$4,480	42	1:9,085
Martin	15,606	18	3	8	\$309,951	12	1:867
Miami-Dade	61,537	104	4	50	\$1,660,557	1	1:592
Monroe	27,100	100	5	56	\$937,500	2	1:2271
Nassau	5,937	2	0	1	\$2,600	41	1:2,969
Okaloosa	17,978	24	4	13	\$590,670	8	1:749
Okeechobee	4,801	4	0	1	\$54,400	33	1:1,200
Orange	26,991	7	0	3	\$67,500	25	1:3,856

# FLAGLER COUNTY MANATEE PROTECTION PLAN

Osceola	7,998	5	1	3	\$62,000	30	1:1,600
Palm Beach	38,142	56	3	20	\$927,650	3	1:681
Pasco	23,241	9	1	6	\$95,400	21	1:2,582
Pinellas	46,929	47	8	22	\$456,600	5	1:998
Polk	27,455	5	1	5	\$33,500	31	1:5,491
Putnam	7,720	3	0	0	\$23,000	35	1:2,573
Santa Rosa	14,162	2	1	7	\$173,000	36	1:7,081
Sarasota	21,577	15	1	10	\$121,300	16	1:1,438
Seminole	17,305	5	1	2	\$15,000	32	1:4,326
St. Johns	13,308	9	3	6	\$54,001	23	1:1,479
St. Lucie	12,564	17	0	5	\$292,800	15	1:739
Sumter	4,098	0	0	0	\$0	66	0
Suwannee	2,683	1	0	1	\$3,500	45	1:2,683
Taylor	3,726	1	0	0	\$4,000	47	1:3,726
Union	895	0	0	0	\$0	67	0
Volusia	26,828	18	0	10	\$88,650	13	1:1,490
Wakulla	4,743	1	0	1	\$0	49	1:4,743
Walton	5,419	1	0	0	\$3,500	50	1:5,419
Washington	2,288	2	1	2	\$75	37	1:1,144

### 3.4.2 Boating Studies in Flagler County

The primary boating data used for this review was collected by MOTE Marine Laboratory (MML) from August 2007 through February 2009 using aerial surveys. The MML flew 20 surveys during this time period. The data were collected in four survey quarters: Winter (December – February), Spring (March – May), Summer (June – August), and Fall (September – November). Each quarter contained five flights consisting of two weekday flights and three weekend flights. The boat data used in this analysis was a subset of the overall dataset for multiple counties.

The survey differentiated vessel size categories per the standard FWC Law Enforcement size classes, and designated as: Less than 16 feet, 16 feet - 25 feet, 26 feet – 39 feet, 40 feet – 64 feet, 65 feet – 109 feet, and greater than 110 feet.

Vessel speeds were identified as: Anchor / Drift, Human-Powered (Oar/Paddle), Under Sail, Idle / Slow, Plowing, Cruising, and Planing. The speed definitions for vessels under power were taken from Gorzelany (1999, 2000) and were originally adapted from the Florida Administrative Code 62N-22. Individual speed categories were defined as follows:

#### Idle Speed

The minimum speed that maintains steerage of a vessel, or the speed at which a vessel is normally docked. Little or no displacement of water is observable from either the bow or stern, and the vessel remains level in the water at all times. This typically corresponds to a speed of less than 5 miles per hour (Gorzelany, 1998).

## **Slow Speed**

The speed at which all vessels are completely off plane and fully settled in the water. Some minimal water displacement at either the bow or stern (or both) may be observed. Because this will vary greatly from vessel to vessel, this speed has also been defined as approximately 5 to 9 miles per hour (Gorzelany, 1998).

## **Plowing Speed**

An intermediate speed between slow speed and planing speed; the bow of the vessel typically rides higher than the stern, and substantial displacement of water occurs. Depending on the size and type of vessel, plowing may occur at a variety of speeds, but is most often observed between 10 and 20 miles per hour (Gorzelany, 2000). This speed designation is used specifically for vessels with planing-type hulls.

## **Cruising Speed**

A qualitative speed designation uniquely applied to a relatively fast-moving vessel with a non-planing-type hull (e.g.; a pontoon boat or displacement hull vessel). It is identified by noticeable water displacement from the bow and/or stern and an observed speed faster than the previously defined slow speed designation. Similar to those at plowing speed, vessels at cruising speed most often travel at speeds between 10-20 miles per hour (Gorzelany, 2000).

## **Planing Speed**

A vessel traveling at sufficient speed to partially raise the vessel out of the water during travel. Vessel planing speeds vary widely depending upon vessel size and hull design; however the majority of planing vessels typically travel at speeds in excess of 15 miles per hour (Gorzelany, 1996).

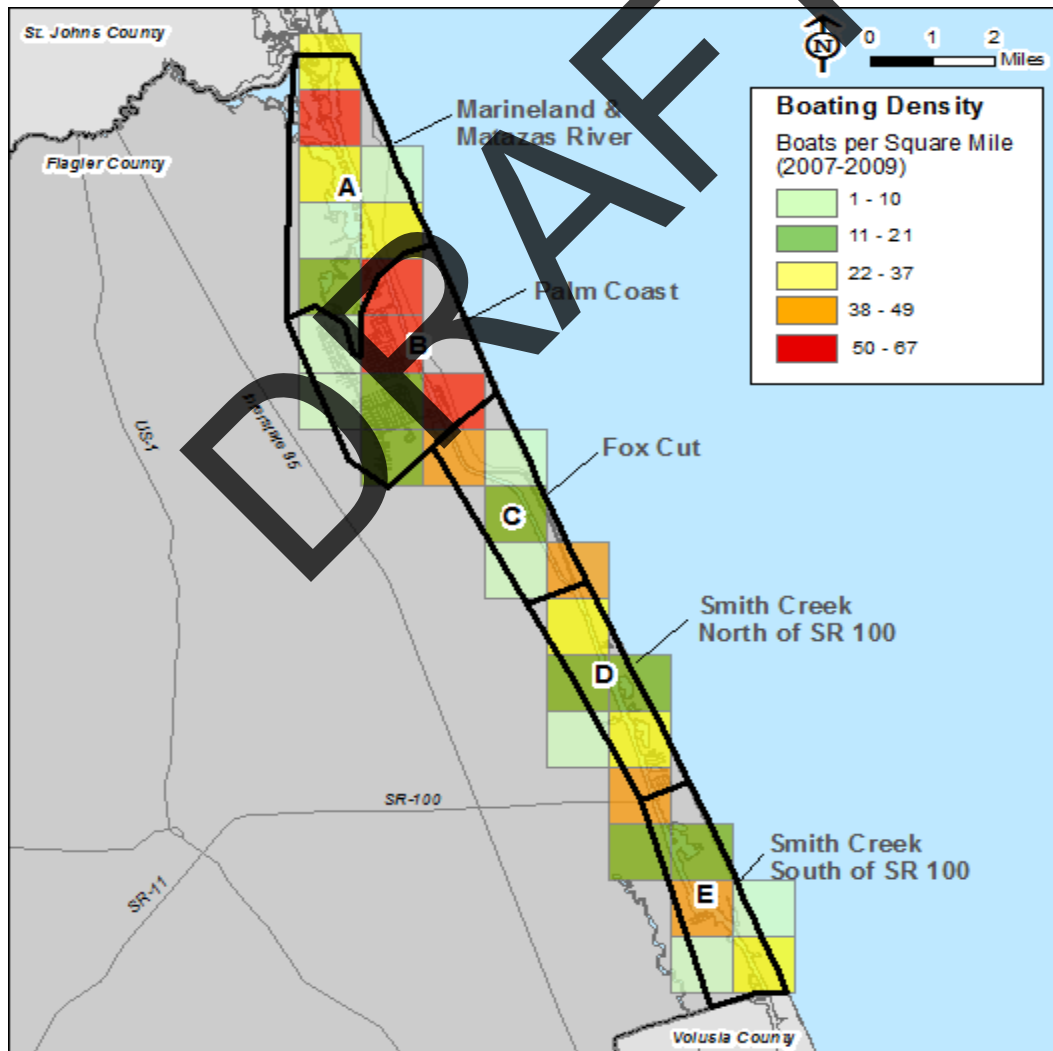
In regards to manatees, the important category of boats are those under power and at a speed of plowing, cruising, or planing. The power boat data set included a total of 732 boats in Flagler County. The Flagler County power boat data was further subdivided to include vessels that were classified as plowing, cruising or planing. This “Fast Boats” subset included a total of

# FLAGLER COUNTY MANATEE PROTECTION PLAN

277 boats, or approximately 38% of the dataset. Results from this survey were utilized to complete the boating density figure below.

The MML boat surveys document that the areas of heavy boat concentrations in Flagler County waters are near the existing marinas, within the canals (which are primarily at full build out), within areas that are known for recreational angling, or are near existing boat ramps. Flagler County has instituted Manatee Protection Zones in the areas of known high boat traffic density. The Manatee Protection Zones were previously described in Section 1.5. No boating studies have been completed for Lake Crescent. Due to its known use as a destination for largemouth bass and speckled perch recreational anglers, the assumption is made that Lake Crescent is primarily used by small bass boats (less than 20' in length) and pontoon boats.

**Figure 47: Boating Density Overview. Source: MML**





### ***3.5 Existing Boating Facility Inventory***

A study utilizing permitting data, current Flagler County Property Appraiser data, FWC data, 2014 aerial imagery, and ground-truthing was completed as part of this Manatee Protection Plan to inventory the existing boat slips and boat ramps (with appropriate number of parking spaces) presently found in Flagler County. The data was compiled to create an inventory of all existing facilities with 5 or more slips, boat ramps, and transient mooring slips such as restaurants in Flagler County. Facility type designations were established for Commercial Marina (CM) & Residential Marina (RM), Boat Ramp (BR), Transient Slip (TS), and Commercial Facility (CF). In this analysis of all facility types combined, there was a total of 711 wet slips, 72 dry slips, and 168 boat ramp boat trailer parking spaces for a grand total of 951 inventoried slips.

#### ***3.5.1 Commercial and Residential Marinas***

Thirteen (13) marinas were identified, of which nine (9) were multi-family residential marinas, two (2) were multi-family residential/commercial marinas, and two (2) were commercial marinas. Total slip capacity for each boat facility type was indicated by the sum of all wet slips and dry slips. A total of 748 slips (676 wet and 72 dry) was identified for this grouping of boat facilities. Slip occupancy was found to vary widely and frequently, as a few marinas appear to be at occupancy and a few marinas appear to be near empty.

#### ***3.5.2 Ramps and Transient Slips***

Eight (8) boat ramps were identified along with two (2) transient slip facilities (restaurants). Total slip capacity for each ramp was indicated by the sum of available boat trailer parking spaces. For the transient slip facilities (restaurants), total moorings were used to indicate total slip capacity. There was a total of 211 slips (168 boat trailer parking spaces and 43 transient slips) that were identified for this grouping of boat facilities.

#### ***3.5.3 Commercial Facilities***

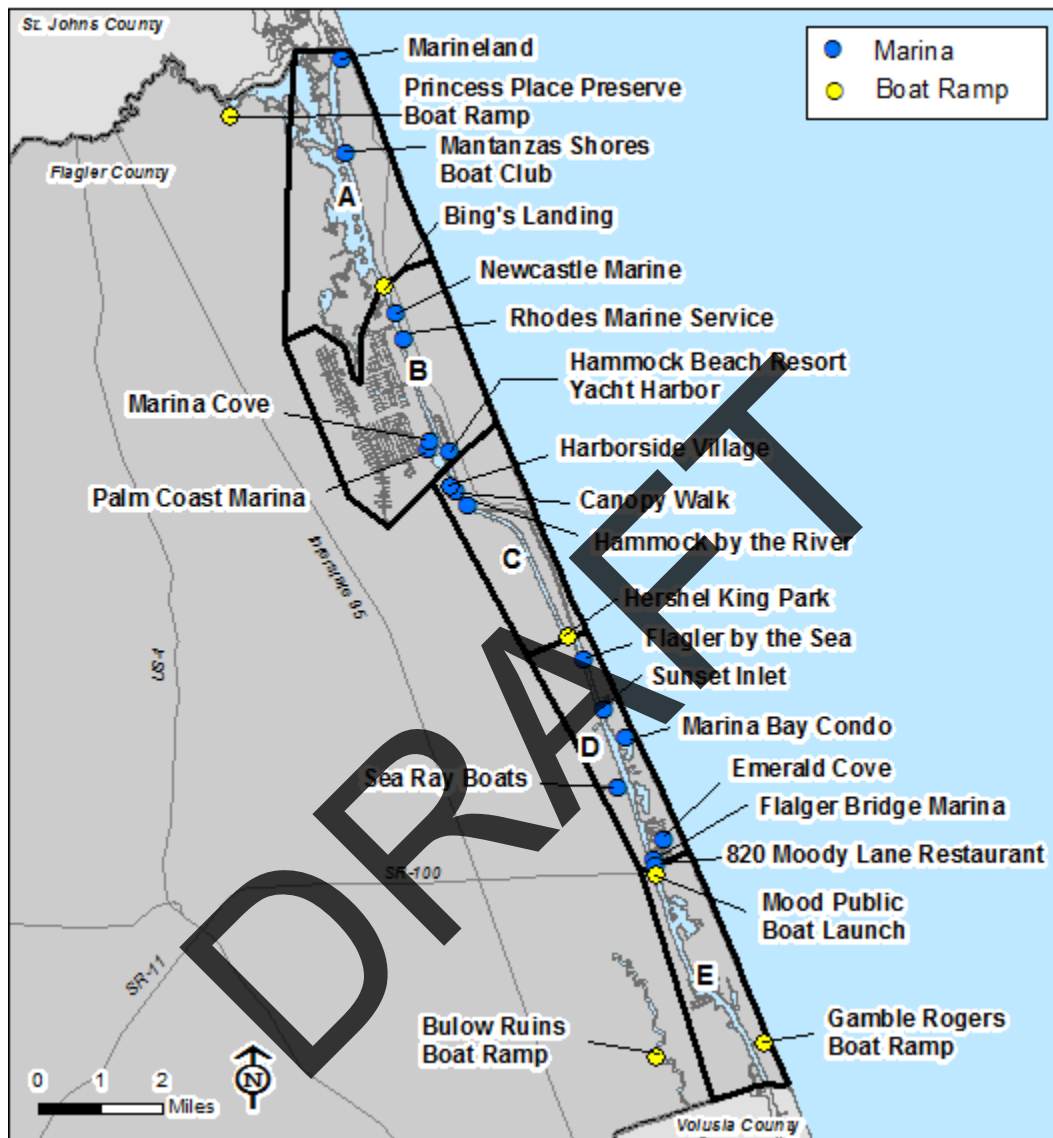
Three (3) commercial facilities were identified. Total slip capacity for the commercial facilities was 12 wet slips that were identified for this grouping of boat facilities.

# FLAGLER COUNTY MANATEE PROTECTION PLAN

**Table 9: Flagler County Boating Access Inventory**

FACILITY NAME	TYPE	ADDRESS	WET SLIPS	DRY SLIPS	RAMP LANES	RAMP PARKING	TOTAL SLIPS
Bing's Landing	BR	5862 N. Oceanshore Blvd	0	0	2	46	0
Bull Creek Fish Camp	TS, BR	3861 CR 2006 W	20	0	1	10	20
Bulow Ruins State Park	BR	3501 Old Kings Rd S	0	0	1	2	0
Canopy Walk	RM	550 Canopy Walk	69	0			69
Emerald Cove	RM	N. Flagler Ave	9	0			9
Flagler Bridge Marina	CM	127 Lehigh Ave	82	72			154
Flagler by the Sea	RM	2982 N. Oceanshore Blvd	6	0			6
Gamble Rogers State Park	BR	3100 S. Oceanshore Blvd	0	0	1	40	0
Hammock Beach Yacht Harbor	CM, RM	106 Yacht Harbor Dr	209	0			209
Hammock by the River	RM	11 Hammock Oak Ct	9	0			9
Harborside Village Marina	RM	100 Palm Harbor Pkwy	30	0			30
Herchel King Park	BR	150 Waterfront Park Rd	0	0	2	45	0
Mantanzas Shores Boat Club	RM	400 San Juan Dr	6	0	0	0	6
Marina Bay	RM	100 Marina Bay Dr	45	0			45
Marina Cove	RM	Marina Point Place	65	0			65
Marineland	CM	9507 N. Oceanshore Blvd	25	0			25
Moody Public Boat Launch	BR	825 Moody Ln	0	0	4	22	0
Newcastle Marine	CF	5658 N. Oceanshore Blvd	1	0			1
Palm Coast Marina	CM, RM	15 Palm Coast Resort Blvd	80	0			80
Princess Place Preserve	BR	1281 Princess Place Rd	0	0	2	Open Field	0
Rhodes Marine Service	CF	5478 N. Oceanshore Blvd	1	0			1
Sea Ray Boats	CF	100 Sea Ray Dr	10	0			10
Shell Bluff Park	BR	14331 SR 100 W	0	0	1	3	0
Sunset Inlet	RM	Morning Light Ct	31	0			41
820 Moody Lane Restaurant	TS	820 Moody Ln	23	0			23
<b>Total</b>			<b>701</b>	<b>72</b>	<b>14</b>	<b>168</b>	<b>793</b>

Figure 48: Overall Boating Facilities Map



### 3.5.4 Marineland & Matanzas River Region – Section A

The northern-most analysis region is approximately four (4) miles long and extends from an area just south of Bing’s Landing Park to the northern county line. The entire western side of the Intracoastal Waterway (ICW) in this region, roughly 22,000 linear feet, has been effectively removed from development via the public acquisitions of Pellicer Flats and Princess Place Preserve. The eastern side of the ICW contains non-development areas of Washington Oaks State Gardens (1.3 miles of shoreline), Matanzas Shores Conservation Area (0.716 miles of

shoreline), and River to Sea Preserve (0.6 miles of shoreline). Out of approximately 8 miles of shorelines roughly 6.7 miles, or 84%, have no potential for development of boating facilities.

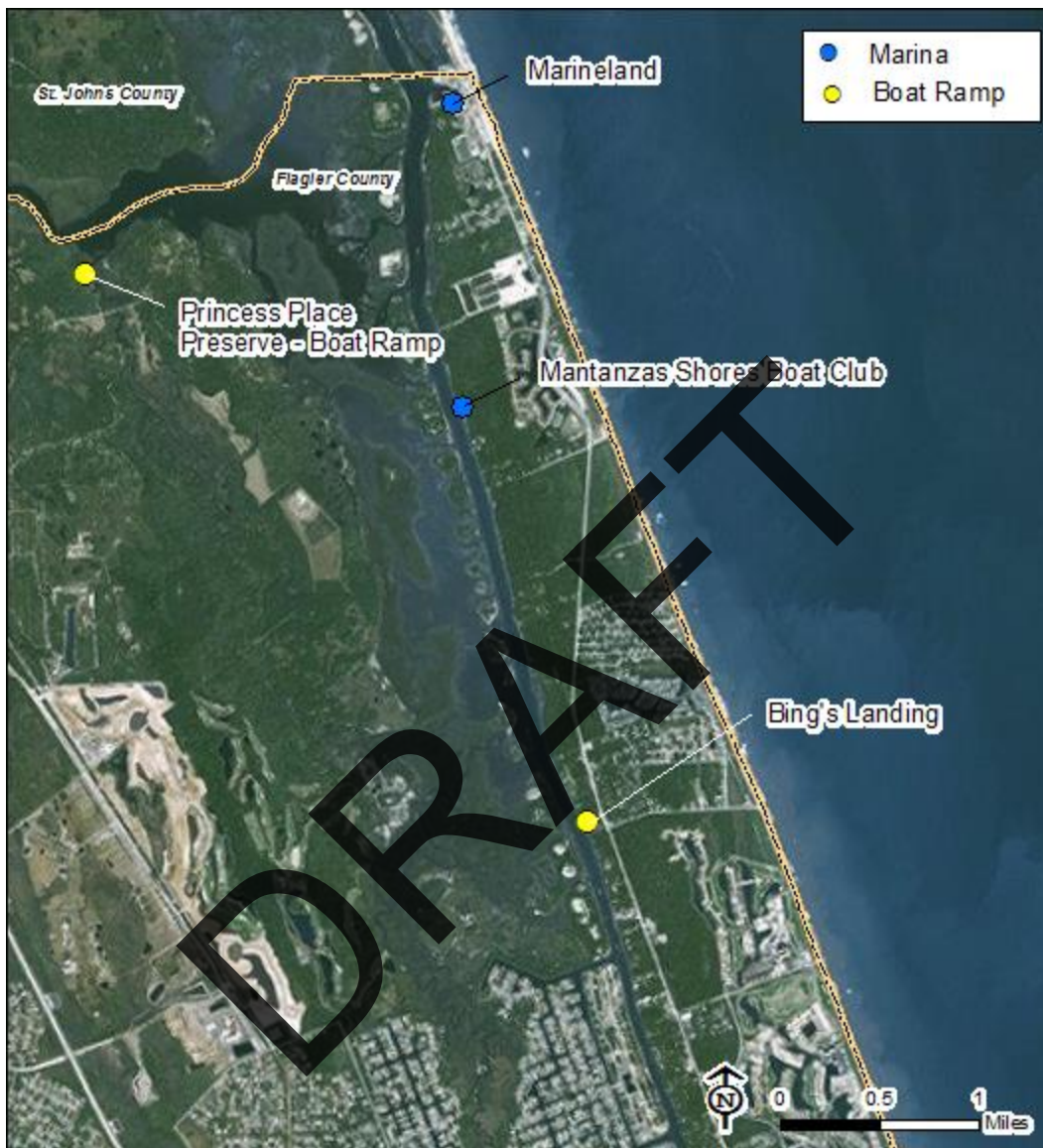
A commercial marina facility is located in the Town of Marineland. This facility currently has 25 boat slips with 55 more planned. A small residential marina is located within the Matanzas Shores Subdivision. This marina currently has 6 transient residential boat slips for subdivision residents only.

Princess Place Preserve is located in this planning section. Two small canoe/kayak launches are located within Princess Place. No motorized boats are launched from these ramp and no designated trailer spaces are located within the park.

This region also contains Bings Landing Park. Bing's Landing is a County owned public two lane boat ramp which contains 46 boat trailer parking spaces. Further expansion of this Park to provide additional trailer parking spaces would be very difficult. The property to the north is developed with a single family home, and while the park itself does contain some undeveloped areas, this park also contains the ruins of Joseph Hernandez's plantation home. The home's ruins and surrounding property is on the U. S. Department of the Interior's National Register of Historic Places.

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Figure 49: Boating Facilities Section A



**3.5.5 Palm Coast Region – Section B**

To the south of the Marineland & Matanzas River region is the Palm Coast region. It is approximately three miles in length. Its northern boundary is south of Bing’s Landing Park, while the southern boundary is approximately the Hammock Dunes Bridge.

Existing boating facilities include the Marina at Hammock Beach Resort which contains 209 total wet slips and the Palm Coast Marina with 81 total wet slips. These two marinas are the largest commercial/residential mixed use marinas in Flagler County. The marinas are

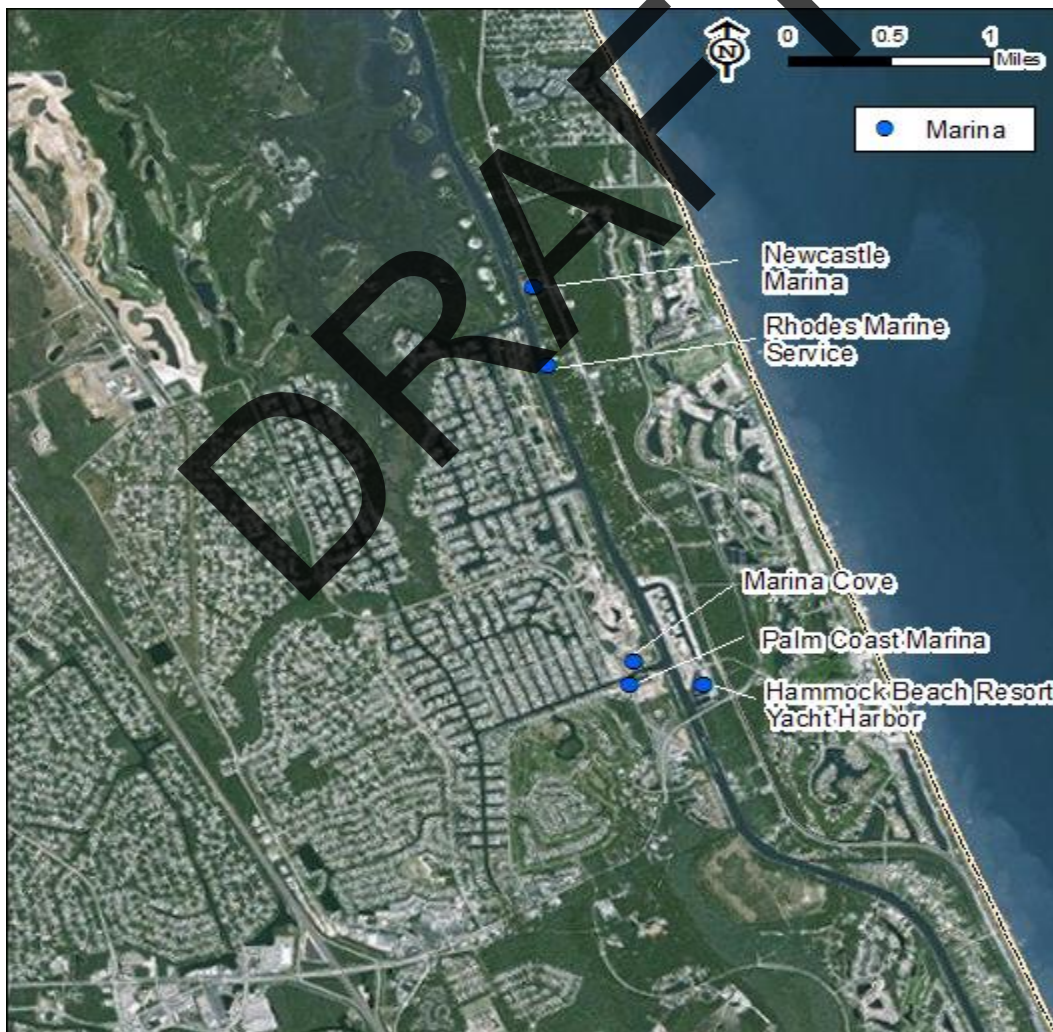


predominately used by residential owners and guests of the mixed residential uses associated with each. Both do provide transient slips (commercial slips) for non-owners also.

This region also contains the Marina Cove residential marina. This marina is strictly for Marina Cove residential owners and guests. This marina has 65 total wet slips.

This region also contains to commercial facilities, the Newcastle Marine, a +/-4.5 acre defunct large yacht manufacturing facility with 300' of ICW waterfront and a marine railway and the Rhodes Marine Service which also has a marine railway and caters to smaller vessels. Both commercial facilities are located on parcels which could be expanded for use as a boating facility in the future.

**Figure 50: Boating Facilities Section B**



### ***3.5.6 Fox Cut Region – Section C***

This section is approximately 3.5 miles in length, extending from the Hammock Dunes Bridge south to the Herschel King Park. The Harborside Village is located south of the Hammock Dunes Bridge. The Harborside Village has a residential marina facility associated with the Harborside Village Condominiums. The facility currently has 30 wet slips available for condo owners and guests only. Canopy Walk is a residential marina facility associated with the Canopy Walk Condominiums. This facility has 69 existing wet slips available for condo owners and guests only. The permit for Canopy Walk limits the vessel size within this residential marina to a 25 foot maximum length. The Hammock by the River subdivision and residential marina are also located in this region. This is a small neighborhood dock with 9 slips available for owners and guests only.

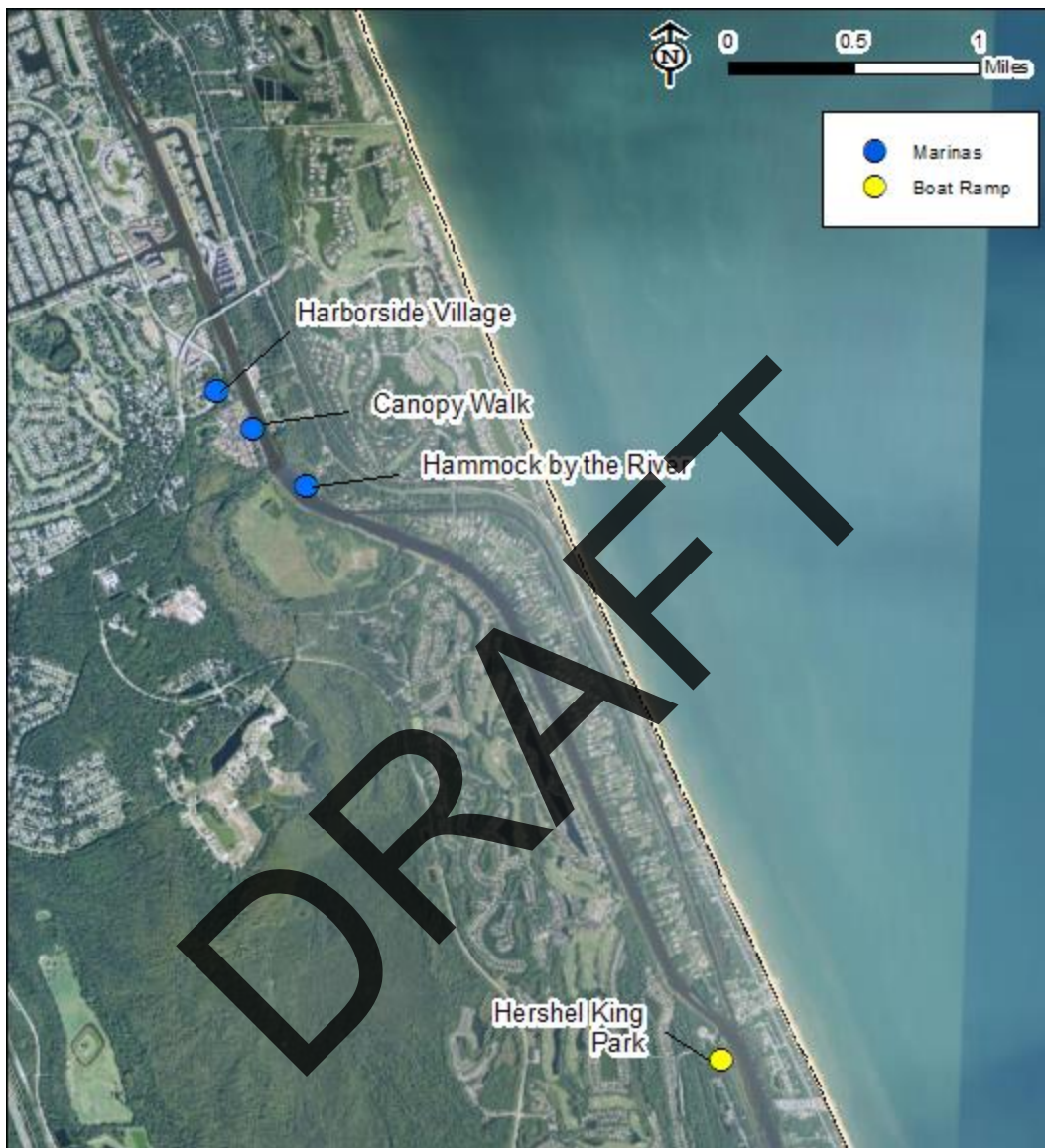
Waterfront Park is located on the west side of the ICW in this section. This 20 acre park is owned and operated by the City of Palm Coast and does not provide slips nor a boat ramp. It is utilized as an ICW observation and fishing area. Waterfront Park has an undeveloped shoreline of 4,200'.

Hershel King Park is a County owned two-lane boat ramp and basin along the western side of the ICW. The 17 acre facility provides 47 boat trailer parking slips with approximately 1800' of ICW frontage. This Park has room for boat trailer parking expansion.

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Figure 51: Boating Facilities Section C



**3.5.7 Smith Creek North of SR 100 Region – Section D**

This Region is approximately 4 miles in length and extends from south of Hershel King Park in its northern extent to the SR 100 Bridge to the south. The western side of the ICW in this Region is dominated by single family homes with docks. The eastern side of the ICW within this Region has single family docks in the northern section, very few docks in the mid-section in the City of Flagler Beach upland cut canals with single family homes to the south.

The Flagler by the Sea mobile home park is located within this region. This community has a small residential marina with 6 total wet slips. The Sunset Inlet residential marina is also located in this section. The Sunset Inlet Subdivision is 31 single family lots with slips already constructed. This subdivision is currently under construction. Also within this section is the 45 slip Marina Bay Condominium located within Silver Lake. This is a residential marina for Condo owners and guests only. Silver Lake is one of two bays along the east side of the ICW. The Emerald Cove residential marina is also located within this region. This is a small 9 slip residential marina for the Emerald Cove subdivision owners and guests only.

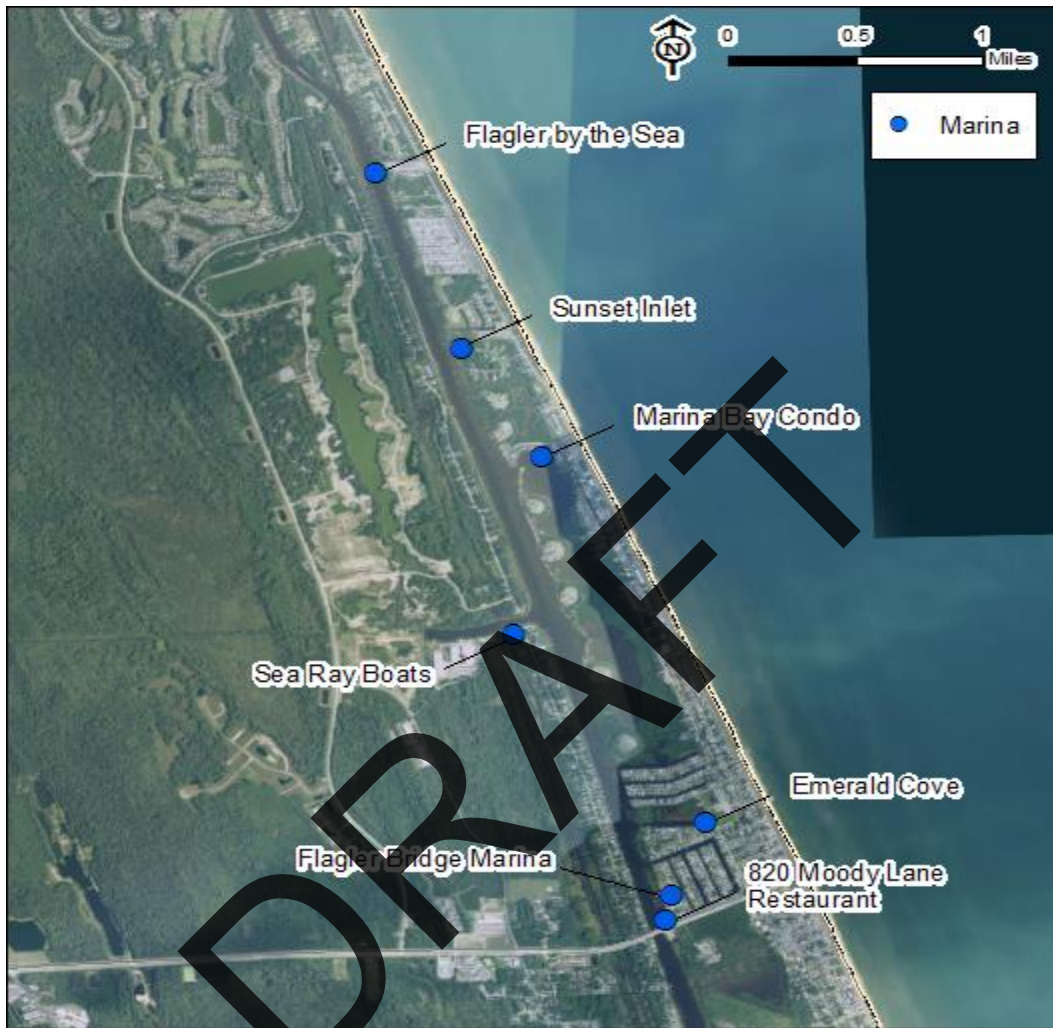
The industrial component is primarily identified with the Sea Ray boat manufacturing plant located northeast of Roberts Road. This facility is one of the largest private sector employers in the County and is rapidly growing and adding jobs. This commercial facility has 10 total wet slips. Sea Ray tests each vessel built at the Palm Coast facility on the Intracoastal Waterway. Typically, testing times are between 7:00 AM and 4:30 PM Monday through Thursday. There is a maximum of three (3) vessels being operated at the same period of time on the water. Vessels constructed and tested are in the 40+ foot range. These test runs may be anywhere from 90 to 180 minutes with speeds ranging from idle to the maximum posted speed.

The Sea Ray manufacturing plant has had a longstanding manatee awareness training program for its captains. This program instructs captains on how to recognize when manatees are present, how to avoid impacts, and what to do if an impact does take place. Sea Ray captains also maintain a manatee sighting log to record any observed animals.

The Flagler Beach Marina is a commercial marina located north of the SR100 Bridge. This small commercial marina is permitted for 82 wet slips and 72 dry storage slips. This marina currently trailers any dry slip boats within the grassed upland parking area. No dry storage facility is found onsite.

A defunct, closed restaurant property located at 820 Moody Lane, just north of the SR100 Bridge, is also located in this region. This closed restaurant has finger piers and moorings for a total of 23 small boats. This total was included as wet slips and identified as a transient slip facility.

Figure 52: Boating Facilities Section D



**3.5.8 Smith Creek South of SR 100 Region – Section E**

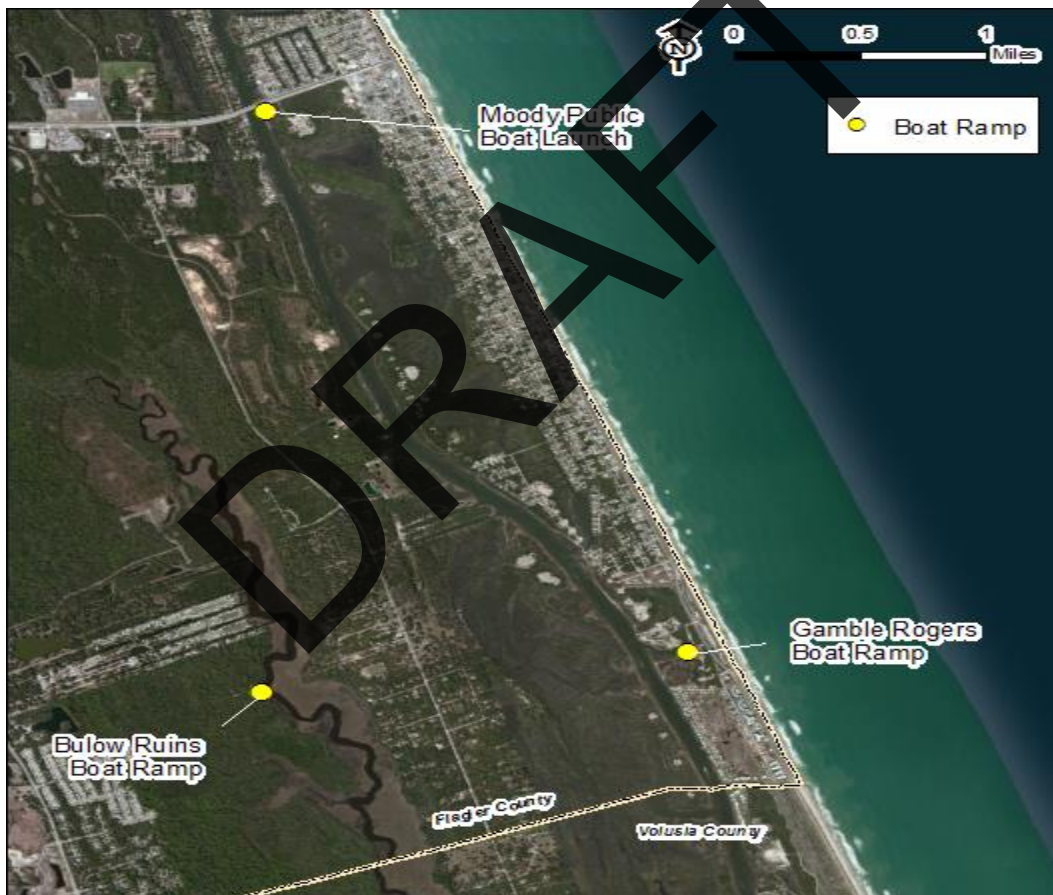
The southernmost Region is approximately four (4) miles long and extends from the SR 100 Bridge to the Flagler-Volusia County line. The Smith Creek South of SR 100 Region is dominated by single family homes and conservation lands. The outfall of Flagler Beach’s warm water discharge is located south of the Flagler Beach/SR 100 Bridge and is not a known manatee refuge area.

This area contains the Moody Public Boat Launch. This popular public boat launch has 4 ramp lanes and 22 parking spaces. This area also contains the Bulow Ruins State Park boat ramp. This is a one ramp launch that accommodates only small boats less than 16’ in length. Only 2 parking spaces are available here for boat trailers.



Gamble Rogers Memorial State Recreation Area at Flagler Beach is a 144 acre state park with frontage on the Atlantic Ocean and the ICW. The Recreation Area provides 34 campsites located on the primary dune of the beach east of SR A1A and is expanding. To the west of SR A1A, the Recreation Area contains hiking trails and a parking lot, but its dominant feature is a boat basin. A two lane boat ramp provides access to the ICW but is rarely used. The Recreation Area’s parking lot has undesignated boat trailer parking but appears that it would accommodate up to 20 boat trailers. This ramp has not been popular with boaters due to the entrance fee required to enter the Park and the Park’s proximity to the no fee Moody Boat Ramp and High Bridge Board Ramp just south of SR 100.

**Figure 53: Boating Facilities Section E**



### **3.5.9 Lake Crescent Region – Section F**

The Lake Crescent Region of Flagler County is dominated by conservation lands, agricultural use, and large wetland floodplain systems along its shore. Two County operated boat ramps are located on Lake Crescent and Dead Lake (Shell Bluff Park boat ramp and Bull Creek boat ramp)

Both ramps offer very minimal parking. The Bull Creek Fish Camp is also located in this region. This is a bait shop and restaurant owned by Flagler County adjacent to the Bull Creek boat ramp. Ten transient slips associated with the restaurant and bait shop are located here.

**Figure 54: Boating Facilities Section F**



### **3.6 Manatee Coincidence Data**

FWC staff provided analysis to Flagler County regarding recommended areas for installation of speed zones along the ICW in Flagler County. In their analysis, FWC utilized the Mote aerial boating survey data described in Section 3.4.2 and the FWRI manatee aerial survey data

described in Section 3.2 and calculated coincidence by multiplying the per survey manatee cover by the per survey boating cover. This geographic information system (GIS) analysis allowed the FWC to theorize areas where a higher threat of manatee watercraft interaction were likely to occur. Coincidence, in their analysis, is the area of potential spatial overlap between the two datasets, with the higher numbers representing a higher potential for manatee-boat interactions. This coincidence data was one of the datasets utilized in creating the speed zones analysis. Differences in manatee distribution may occur due to the availability of resources, fresh water, or foraging areas. However, due to the small sample size it may be random as many view Flagler County's lack of manatee resources and conclude that manatees are likely traversing through Flagler to reach resource areas. There are no known sea grass beds or warm water refuges in Flagler County and as such the waterways of Flagler County serve primarily as migration routes during the spring through early fall months for manatee population. The manatee coincidence data was also utilized for the preparation of the boat facility siting planning found within Section 4.0. FWC did not complete a coincidence study for Lake Crescent.

## **Coincidence Data Analysis by Planning Section**

### **Section A**

No watercraft mortalities have been identified in this region. Manatee observations indicate that density documented during summer was four times that documented during the winter months. This area had a relatively low coincidence level at 0.363 overall with a value of 0.396 in the warmer months.

### **Section B**

Three carcasses recovered within this region have been identified as watercraft related deaths. Manatee observations for this region were ironically relatively low at 0.215 and an overall warm season value of 0.232. However, warm season coincidence values were relatively high for the sections north of the Palm Coast canals with warm season coincidence at 0.916. Additionally, an area south of the Palm Coast canals to roughly 300' south of the Hammock Dunes Bridge experienced a warm season value of 1.459. This southern section from the canal to south of the bridge was one of the areas to receive a warm season slow speed zone from FWC.

### **Section C**

The density of manatees observed was 0.886 with a warm season value of 1.714. No watercraft mortalities have been recorded for this section.

## **Section D**

This section has seen one manatee carcass recovered that was attributed to watercraft related injuries. The coincidence value recorded for this section was 0.915 with warmer months at 1.326. This section has received warm season slow speed zones from the SR 100 Bridge to north of the Lehigh Canal. Of note, this section has witnessed the most manatees observed from 2005-2007 with 72 of the 234 manatees observed. The proposed additional 0.5 mile section of Manatee Protection Zone is found within this section at the mouth of the Lehigh Canal.

## **Section E**

The relative low coincidence values for this section (0.607 overall, 0.946 warm season) belies the fact that this section has witnessed the greatest number of watercraft related manatee deaths. These deaths have occurred despite a Volusia County speed zone being adopted in 1991, and all watercraft deaths have occurred after the installation of the speed zone.

## ***3.7 Information Assessment Discussions***

This section discusses the findings of the data included throughout Section 3 in regards to manatee and boating use overlap, water-craft related manatee deaths, existing marine facilities, and existing manatee protection measures. The discussions are described by planning section.

### **Marineland & Matanzas River Region – Section A**

*Manatee Protection Zones:* No manatee protection zones are located in this region.

*Existing Watercraft Access:* There are a total of approximately 77 motorboat access points in this area. This access consists of 46 boat trailer parking spaces at one boat ramp and 31 marina slips. The remainder of property within this region is primarily public lands or single family residential parcels.

*Boating Traffic:* The MML boating study verified the majority of boats in the region were located near or at the Marineland marina or Bing's Landing boat ramp. Boats routinely traverse the ICW in this area making their way north to St. Augustine or south towards Palm Coast. Boat traffic in this region would be considered light.

*Manatee Data:* Manatee use in this area seems primarily limited to traveling in the ICW. Only one water-craft related manatee death was identified in this region, occurring in 1992. Manatees have been regularly sighted in this area. The FWC coincidence data had a relatively low coincidence level at 0.363 overall with a value of 0.396 in the warmer months.



*Summary:* Shoreline land use in this area is predominately conservation and single family parcels. This is primarily a conservation area with regular manatee use and predominately low boat activity. FWC did not identify this area as requiring additional manatee protection.

## **Palm Coast Region – Section B**

*Manatee Protection Zones:* State manatee protection zone around the Hammock Dunes/ Palm Coast Parkway Bridge encompasses approximately 0.6 miles of navigable ICW.

*Existing Watercraft Access:* There are a total of approximately 357 motorboat access points in this area. This access consists of 355 marina slips and 2 commercial facility slips. This section includes the canal network found within the City of Palm Coast. This network of canals provides single family dock access to the ICW. The canals within the City are predominately at build-out capacity.

*Boating Traffic:* The MML boating study verified the majority of boats in the region were located near or at the existing large marinas just north of the Hammock Dunes Bridge. This area also includes the mouths of the canal networks to the ICW. Boat traffic in this area is the highest found within the County, primarily due to the existing marinas and number of single family docks.

*Manatee Data:* The manatee surveys for this area were relatively low. Only three water-craft related manatee death were identified in this region, all occurring in the 1990's. Manatees have been regularly sighted in this area. The FWC coincidence data was ironically relatively low at 0.215 and an overall warm season value of 0.232. However, warm season coincidence values were relatively high for the sections north of the Palm Coast canals with warm season coincidence at 0.916. Additionally, an area south of the Palm Coast canals to roughly 300' south of the Hammock Dunes Bridge experienced a warm season value of 1.459.

*Summary:* Shoreline land use in this area includes conservation, residential & commercial marinas, commercial facilities, and single family parcels. This area was identified as the highest boat traffic area in the County. Warm season speed zones around the Hammock Dunes Bridge have been in place since 2012.

## **Fox Cut Region – Section C**

*Manatee Protection Zones:* State manatee protection zone around the Hammock Dunes/ Palm Coast Parkway Bridge encompasses approximately 0.6 miles of navigable ICW, of which a small portion is within this section south of the bridge.



*Existing Watercraft Access:* There are a total of approximately 155 motorboat access points in this area. This access consists of 108 residential marina slips and 47 boat trailer parking spaces at one boat ramp. This section is primarily single family parcels.

*Boating Traffic:* The MML boating study verified the majority of boats in the region were located near the Hammock Dunes Bridge, which is also where the 3 marinas in this section are located. Boat traffic in this area is the highest near the bridge and marinas but then lowers as you head south around Fox Cut.

*Manatee Data:* The manatee surveys for this area were on average. Only one water-craft related manatee death was identified in this region, occurring recently in the 2012. Manatees have been regularly sighted in this area. The FWC coincidence data documented a density of manatees observed of 0.886 with a warm season value of 1.714.

*Summary:* Shoreline land use in this area includes predominately single family parcels and public lands. This area was identified as a moderate boat traffic area in the County. Warm season speed zones around the Hammock Dunes Bridge have been in place since 2012.

### **Smith Creek North of SR100 Region – Section D**

*Manatee Protection Zones:* State manatee protection zones around the Flagler Beach/SR 100 Bridge and within the Lehigh Canal covers approximately 2.7 miles of navigable ICW within this region. Also this region includes the proposed additional 0.5 mile speed zone which will be located at the mouth of the Lehigh Canal.

*Existing Watercraft Access:* There are a total of approximately 278 motorboat access points in this area. This access consists of 245 residential and commercial marina slips, 10 commercial facility slips, and 23 restaurant transient slips. This section includes the canal network found within the City of Flagler Beach. This network of canals provides single family dock access to the ICW. The canals within the City are predominately at build-out capacity.

*Boating Traffic:* The MML boating study verified the majority of boats in the region were located near the SR100/Flagler Beach Bridge, which is also where the larger marina and canals are located.

*Manatee Data:* The manatee surveys for this area were relatively high. Only one water-craft related manatee death was identified in this region, occurring in 2006. Manatees have been regularly sighted in this area. The FWC coincidence data recorded for this section was 0.915

with warmer months at 1.326. Of note, this section witnessed the most manatees observed from 2005-2007 with 72 of the 234 manatees observed.

*Summary:* Shoreline land use in this area includes conservation, residential & commercial marinas, restaurant, commercial facilities, and single family parcels. Warm season speed zones from the SR100/Flagler Beach Bridge north to Beverly Beach have been in place since 2012. An additional speed zone is proposed at the mouth of the Lehigh Canal.

## **Smith Creek South of SR100 Region – Section E**

*Manatee Protection Zones:* State manatee protection zone are located around the Flagler Beach/SR 100 Bridge and a southern zone starts at the Flagler County border and extends north/northwest for 2.1 miles on the navigable ICW.

*Existing Watercraft Access:* There are a total of approximately 42 motorboat access points in this area. This access consists of 42 boat trailer parking spaces at two boat ramps. The remainder of property within this region is primarily public lands or single family residential parcels.

*Boating Traffic:* The MML boating study verified a moderately high level of boats extending the entire length of this region even though boating access points are limited. It is anticipated this is due to the recreational fishing aspect of the vast saltmarshes found within southern Flagler and northern Volusia County.

*Manatee Data:* Manatee use in this area is spread out throughout the ICW. Ten water-craft related manatee death was identified in this region, with 8 occurring in the 2000's. Manatees have been regularly sighted in this area. The relative low coincidence values of manatees and boats for this section (0.607 overall, 0.946 warm season) belies the fact that this section has witnessed the greatest number of watercraft related manatee deaths. Warm season speed zones have been in effect since 2012.

*Summary:* Shoreline land use in this area is predominately conservation and single family parcels. This is primarily a conservation area with regular manatee use and predominately moderate boat activity. But due to the water-craft related manatee deaths which occurred in recent years, warm season speed zones were established in 2012.

## **Lake Crescent Region – Section F**

*Manatee Protection Zones:* No manatee protection zones are located in this region.

*Existing Watercraft Access:* There are a total of approximately 33 motorboat access points in this area. This access consists of 23 boat trailer parking spaces at two boat ramps and 10 transient restaurant/fish camp slips. The remainder of property within this region is primarily public lands, agriculture, large floodplain wetlands, or large single family residential parcels.

*Boating Traffic:* No boating studies have been completed for Lake Crescent. Lake Crescent is a freshwater lake connected to the St. Johns River by Dunn's Creek. The lake is known for its high quality largemouth bass and speckled perch recreational fishery. Boat use is primarily limited to small bass boats and pontoon boats.

*Manatee Data:* No manatee surveys have been completed for Lake Crescent. Only one watercraft related manatee death was identified in this region, occurring recently in 2008. Manatees have been regularly sighted in the lake and Dunn's Creek. Submerged Aquatic Vegetation (SAV) is found along the shoreline and shallow areas throughout the lake.

*Summary:* Shoreline land use in this area is predominately agriculture, conservation, floodplain wetland swamp, and large single family parcels. This is primarily a conservation/agricultural area with regular manatee use and predominately low boat activity.

## **4.0 Boat Facility Siting Plan**

The Boat Facility Siting Plan of the Flagler County Manatee Protection Plan is designed to minimize watercraft-related manatee mortalities by establishing requirements for siting new construction, rehabilitating, or expanding existing boat facilities. The required elements within this plan are designed such that subsequent boating activity will be less likely to affect manatees or their habitat in the affected areas. The approach is to fairly balance manatee protection, habitat conservation, and boating safety with commercial and recreational marine interests.

Under the Boat Facility Siting Plan, marine facilities within the jurisdiction of this document are required to adhere to the federal, state, and local management plans and rules, as well as the requirements listed below. All publicly owned land will be subject to their respective agency's policies.

The boat facility siting strategy objective is to minimize the overlap between boat traffic and potential manatee inhabited areas and to reduce the potential for adverse manatee/watercraft interaction. The intention is to minimize secondary and cumulative impacts to manatees and manatee habitat as a result of boat facilities, in a long term, comprehensive manner. The

following are factors to consider when developing recommendations for construction of a new facility or expansion of an existing facility, if applicable:

- Potential manatee use areas
- Areas of highly productive habitat
- Areas of high manatee mortality
- Identification of sensitive, undisturbed natural areas frequented by manatees
- Areas of minimal manatee use and mortality
- Areas with well flushed, deep water where the least dredging is required
- Areas with high demand for water access
- Travel time to high use boater destinations
- Existing Manatee Protection Zones

In addition to the recommendations in this strategy, all boat facility development must also conform with all applicable federal, state and local regulations in place at the time of permit application; and all boat facilities determined to be existing as defined in this MPP will continue to operate according to permitting guidelines.

#### ***4.1 County & Municipality Jurisdiction***

The Boat Facility Siting Plan of the MPP applies to unincorporated Flagler County. The incorporated areas of the County have been included as well, however as Flagler County is a non-charter county, meaning Flagler County is only authorized to exercise the powers of self-government prescribed in the Florida Constitution and state laws. The individual incorporated municipalities have the power of self-governance, and set their own regulations for development. As such, cities may adopt the MPP provisions as written, or adopt their own MPP and pursue approval from FWC. If a city fails to adopt this MPP, the State and Federal agencies may continue to not issue permits for new or expanding marine facilities within that city's jurisdiction. If a city wishes to adopt its own plan the city should submit the plan to state and federal authorities for approval. Once approved, the city's plan would operate independently from this MPP.

Those cities which decide to adopt this MPP will coordinate with Flagler County on project review and notice to FWC and FWS. Flagler County, as the entity legally bound to administer this MPP, will be the entity providing notice to permitting agencies regarding boat facility application compliance with the plan.

## ***4.2 Boat Facility Siting Plan Development Criteria***

Section 3 of this MPP documents the data assessment of manatee related information in regards to manatee abundance, watercraft-related manatee mortalities, existing marine facilities, boating survey data, and coincidence data for overlap of boats and manatees. The findings were utilized for the development of this Boat Facility Siting Plan. Each of the factors above were studied to characterize the potential risk to manatees if additional boat trips are added to the system from a given location. The factors which are considered when assessing the relative importance of specific areas to manatees and potential risks associated with watercraft activity, include natural resource data, documented or anticipated boating patterns, and/or physical waterbody characteristics. The most critical factors which represent the relative potential for manatee/watercraft overlap are:

- Manatee abundance
- Manatee calving and loafing areas
- Watercraft-related manatee mortality areas
- Proximity to known boating destinations
- Existing marine facility sizes and locations
- Presence of Manatee Protection Zones and Preservation Lands
- Marine facility types and boat traffic generated

For a thorough discussion of these and other factors considered to identify areas where boat activity interacts with high use manatee areas, and to determine what appear to be appropriate boat facility locations and slip densities, refer to Section 3 of this MPP.

## ***4.3 Boat Facility Siting Plan Recommendations***

This Boat Facility Siting Plan has been completed and incorporated into the MPP to help reduce the potential for adverse manatee/watercraft interaction. The recommendations herein apply to the construction of any new boating facility as defined in this MPP and/or the expansion of an existing boating facility.

- A.** Unless specified otherwise, the Boat Facility Siting Plan recommendations defined in 4.3.B below, and in figures 55-67, apply to any new boating facility, as defined in the MPP, with five (5) or more slips, or expansion of a boating facility. The Boat Facility Siting Plan recommendations do not apply to Boat Facilities with a total of four (4) or less slips.

**B. Marine Facility Slip Allocation Recommendations are as follows:**

- **Preferred** - Development in a Preferred area can have an unrestricted number of slips from a manatee management perspective. These areas were not identified by FWC or FWS as requiring additional manatee protection. The data assimilated in Section 3 also did not provide scientific reasoning for additional restrictions outside of those required as part of the state and federal permitting requirements.
- **Acceptable With Conditions** - Development in an Acceptable With Conditions (total slips per linear foot) area may occur at up to five (5) slips for every 100 feet of shoreline owned or controlled by the applicant. For example: A site has 342 feet of shoreline. In order to calculate the allowable number of slips, 342 is rounded up to the next one hundred foot increment (400), then divided by 100 which equals 4. That number is multiplied by the slip to shoreline ratio (5). In this example, 20 would be the allowable number of slips.

**C. Special Development Area – Development in the following locations is allowable as detailed below:**

- **Newcastle Marine Property** – This property (Flagler County Parcel ID # 40-10-31-3150-00000-0420) consists of the existing Newcastle commercial marine facility. This facility is currently closed. It formerly existed as a commercial boat building facility. The property is anticipated to be converted into a dry storage facility in the future. It is anticipated up to 200 dry slips will be proposed for this special development area.
- **Jose Park Property** – This property consists of multiple parcels (Flagler County Parcel ID #'s 40-10-31-3150-00000-0570, 40-10-31-3150-00000-0580, 40-10-31-3150-00000-0590, 40-10-31-3150-00000-0630, 40-10-31-3150-00000-0640, and 40-10-31-3150-00000-0650) known as the Jose Park property and is approximately 18 acres. The property is currently zoned as a mix of commercial and residential. A PUD was approved in 2005 for 150 boat slips. The project did receive a state permit for the marina from FDEP but did not complete its federal permit due to the downturn in the economy, and no construction occurred. It exists presently as undeveloped land, and the Rhodes Marine Service is located at the southern extent of the property and has 1 commercial facility slip. Contact was made with the owner of the Jose Park property in regards to future

use and timeframes. The owner acknowledged the desire to construct a development which would service the Hammock Dunes properties to the east and would include a predominately dry slip marina for boat storage utilized primarily by Hammock Dunes property owners. It is anticipated the development would include the construction of approximately 50 wet slips and a dry stack building able to hold approximately 150 boats. Therefore, it is anticipated up to 200 slips will be proposed for this special development area.

- **Villages at Palm Coast Property** – This property consists of three linear parcels (Flagler County Parcel ID #'s 05-11-31-5918-00000-00C0, 05-11-31-5918-00000-00F0, and 05-11-31-5918-00000-00G0) along the ICW owned by the Villages at Palm Coast Home Owners Association and Tidelands Condominium. The three parcels equal approximately 9.5 acres and are a part of the Villages at Palm Coast PUD. A denied USACE permit for the Tidelands Docks (described in the Executive Summary) is located within this parcel. The applicant was seeking a 100 wet slip linear marina for residential use only. The PUD includes slips as accessory to the residential communities and has granted 38 slips to date. Future slips are permissible to the City of Palm Coast Land Development Code. It is anticipated the northern parcel of this property will seek permits for wet slips in the future. The maximum limit on slips per the City of Palm Coast LDC would be 271. These would be accessories to the existing residential units and would only be allowed for owners and guests use.
- **Flagler County School Board Property** – This 20 acre parcel (Flagler County Parcel ID # 07-11-31-7085-00170-0000) is owned by the Flagler County School Board. It is anticipated a public marina will be constructed on this parcel in the future. The proposed use is for a total of 100 wet and dry slips (designation of total of each separately is unknown at this time).
- **Harbor View Marina Property** – This property consisting of multiple parcels (Flagler County Parcel ID #'s 35-11-31-0000-01010-0060, 02-12-31-0000-01010-0041, and 02-12-31-0000-01010-0050) is the location of the USACE revoked Harbor View Marina Permit (SAJ-2004-08169). The marina and upland development is part of an existing PUD. The PUD allows for the construction of an 83 wet slip marina basin. The proposed development also includes 135 single family residence lots along the proposed upland cut canal that could potentially

lead to 2 future boat slips for each lot. The maximum boat size in the marina basin will be 30 feet.

The owner of the parcel has indicated the desire to potentially modify the site plan for this parcel so as not to construct the planned freshwater canals with 135 single family residential lots with boat dock potential. In return the property owner would propose constructing a dry stack marina of a size not to exceed the 270 slips that would have been created from the 135 waterfront lots. (135 lots X 2 slips per dock). Therefore the project would include the 83 wet slip marina and a 270 slip dry stack marina facility.

- **McKinna – Grand Haven Marina Property** – This property consisting of multiple parcels (Flagler County Parcel ID #'s 02-12-31-0000-01010-0040, 02-12-31-0000-01010-0044, 02-12-31-0000-01010-0060, 02-12-31-0000-01010-0080, 02-12-31-4938-00000-0010, 02-12-31-4938-00000-0020, 02-12-31-4938-00000-0030, 02-12-31-4938-00000-0040, 02-12-31-4938-00000-0050, 02-12-31-4938-00000-0060, 02-12-31-4938-00000-0100, 02-12-31-4938-00000-0110, 02-12-31-4938-00000-0120, and 02-12-31-4938-00000-0130) is the location of the USACE revoked McKinna – Grand Haven Marina Permit (SAJ-2003-12778). This permit authorized the construction of a new boat basin and an 80 wet slip marina. The proposed development also included 200 dry storage slips.
- **Flagler Beach Marina Property** – This parcel (Flagler County Parcel ID # 12-12-31-2425-00840-0010) contains an existing commercial marina permitted for 82 wet slips and 72 dry storage slips. Currently the dry storage slips exist as outdoor parking within a grassed parking lot. Flagler Beach Marina pursued a permit modification through the FDEP to increase the number of dry slips by 128 to a total of 200. The FWC provided comment to FDEP to deny the permit modification citing manatee protection concerns. It is anticipated that the property owner will pursue expansion of the existing marina in the future.
- **820 Moody Lane Restaurant Property** – This parcel (Flagler County Parcel ID # 12-12-31-2425-00850-0010) is currently developed as a restaurant with 23 moorings (transient boat slips). It is anticipated the property will be proposed for a commercial marina in the future. This future development will consist of 80 wet slips.



- **Hammock Beach River Club Property** – This large parcel (Flagler County Parcel ID # 13-12-31-0000-01010-0000) is known as the Hammock Beach River Club. The Hammock Beach River Club is the last remaining large, undeveloped (unrestricted) ICW property left in Flagler County. The property is approximately 2,000 acres in size and has approximately 5,600 linear feet of ICW shoreline. This parcel is the location of the USACE revoked Hammock Beach River Club Permit (SAJ-1996-00918). This permit authorized the construction of a 10 wet slip residential marina. The proposed development also includes 74 single family residence lots along the ICW that could potentially lead to future boat slips for each lot. The SJRWMD permit for this development remains valid. The property owner was contacted in regards to the future use of the property. The owner anticipates applying for a modification of the existing permit to incorporate a more recreational, eco-tourism type development utilizing the vast amount of preservation land along Bulow Creek for hiking and other passive uses. The revised plan will potentially include a mix of single family slips as previously permitted and a residential marina including wet and dry slips. The developer envisions a total of 250 slips for the project (this includes single family lots, small residential marina, and approximately 100 dry slip storage). The developer does not have a set timeframe for permitting or construction, but did indicate it would be well into the future.
  - **Flagler County Hammock Beach Property** – This small parcel (Flagler County Parcel ID # 13-12-31-2850-0PL30-0000) is owned by Flagler County and is located within the Hammock Beach River Club described above. This parcel is anticipated to be a small public park and will include 2 boat ramp lanes and approximately 40 parking spaces.
- D. The boat facility siting recommendations do not apply to Boat Facilities accommodating human-powered vessels such as canoes and kayaks. These facilities are considered consistent with the MPP if the facility is consistent with all local, state and federal environmental standards in place at the time of permit application.
- E. Unforeseen boat facility siting matters that may arise which are not addressed by the boat facility siting strategy will be evaluated on a case by case basis through the Flagler County Growth Management. Review of any proposed marine facilities which do not meet the guidelines of this MPP will also require review and approval by FWS and FWC. If a proposal for new slips is inconsistent with the MPP, the State

and Federal permitting processes allow for an applicant to submit alternative manatee protection measures for FWC and USFWS consideration. Any proposed alternative protection measures submitted for FWC and USFWS evaluation under these circumstances will need to be unique, and provide reasonable assurance that adverse impacts and incidental take to manatees will not occur.

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# FLAGLER COUNTY MANATEE PROTECTION PLAN

Figure 55: Boat Facility Siting Plan Recommendations – County Overview

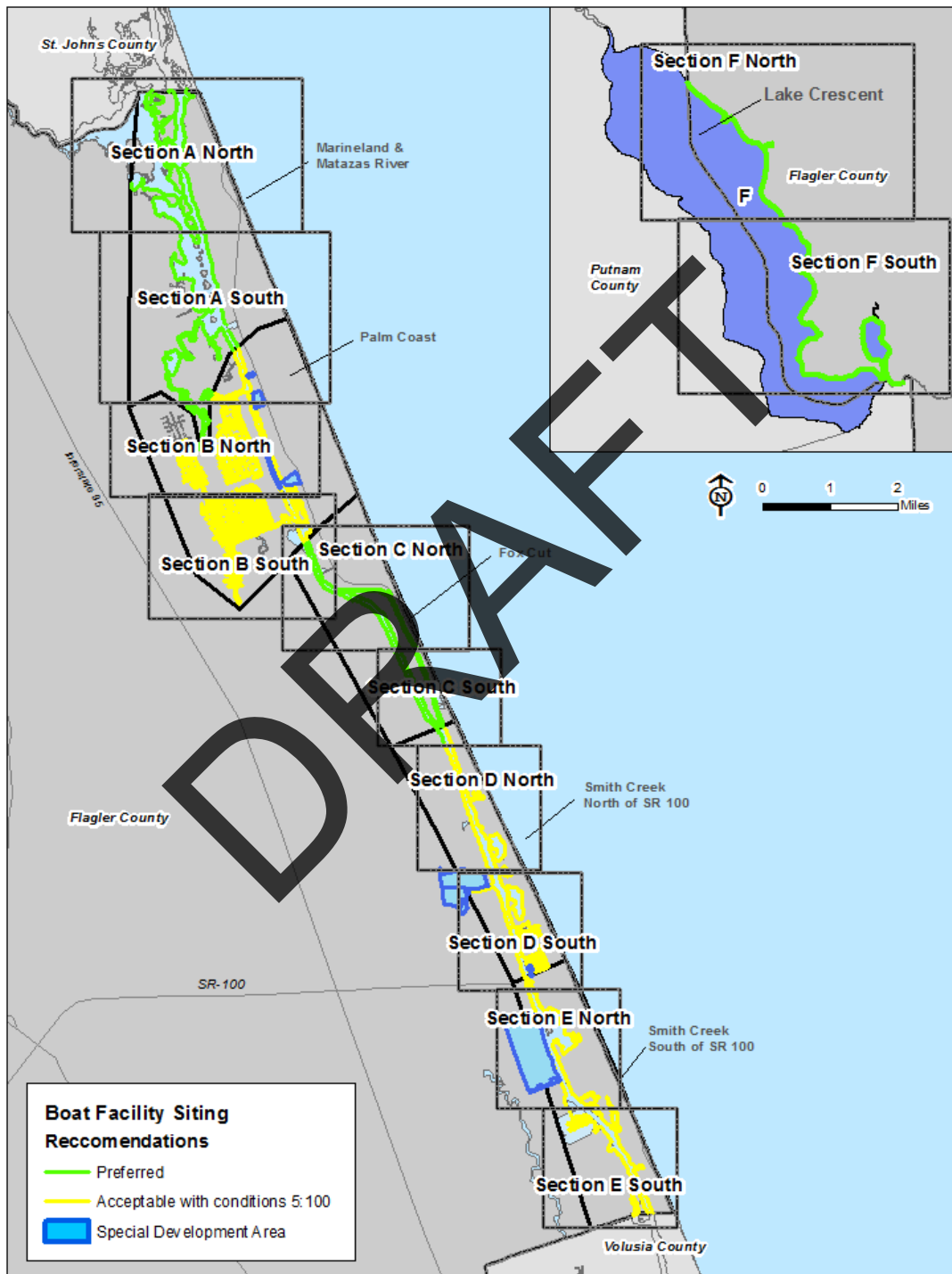


Figure 56: Boat Facility Siting Plan Recommendations – Section A North





Figure 57: Boat Facility Siting Plan Recommendations – Section A South





Figure 58: Boat Facility Siting Plan Recommendations – Section B North

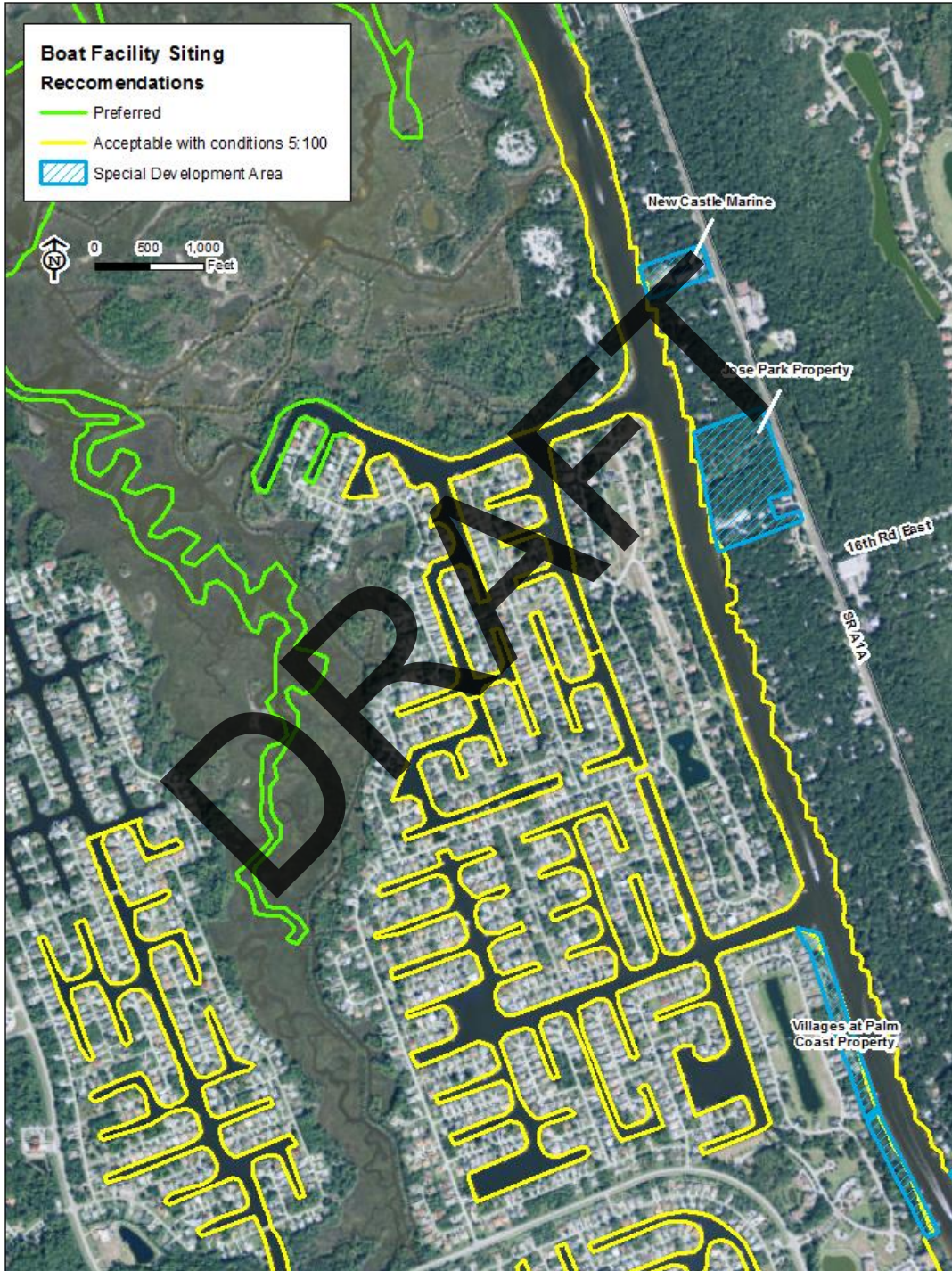




Figure 59: Boat Facility Siting Plan Recommendations – Section B South

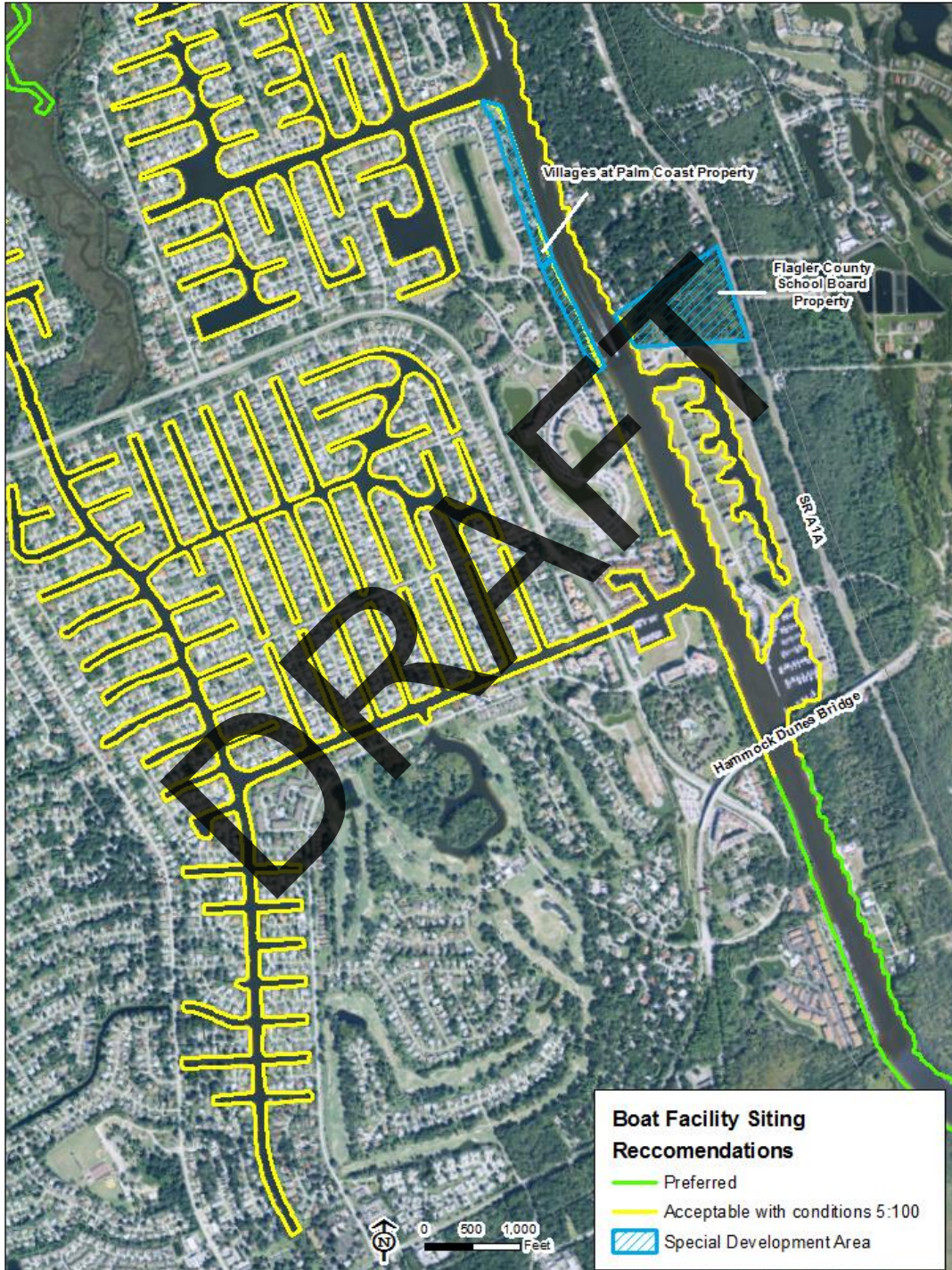




Figure 60: Boat Facility Siting Plan Recommendations – Section C North





Figure 61: Boat Facility Siting Plan Recommendations – Section C South



Figure 62: Boat Facility Siting Plan Recommendations – Section D North





Figure 63: Boat Facility Siting Plan Recommendations – Section D South





Figure 64: Boat Facility Siting Plan Recommendations – Section E North



Figure 65: Boat Facility Siting Plan Recommendations – Section E South

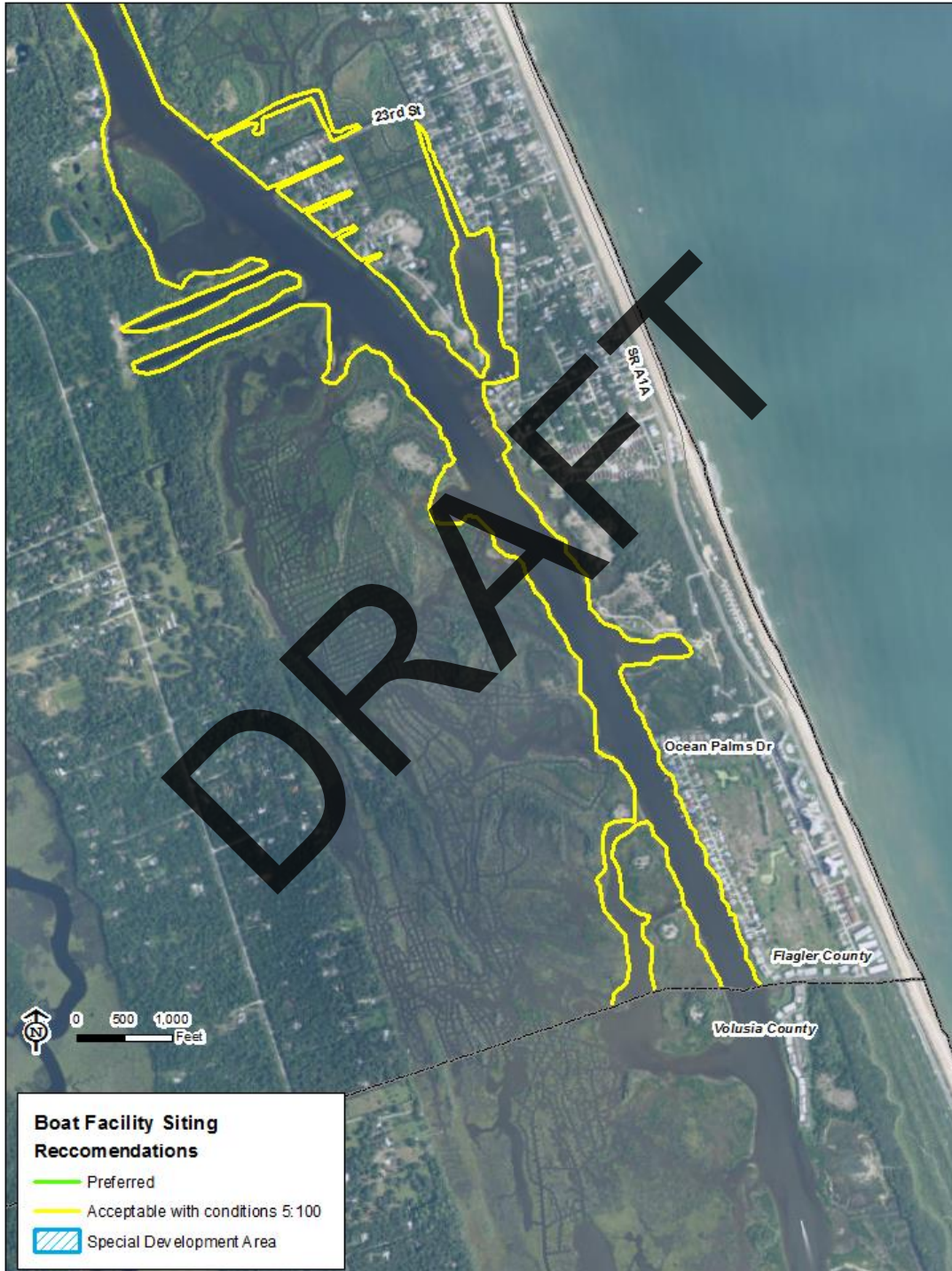
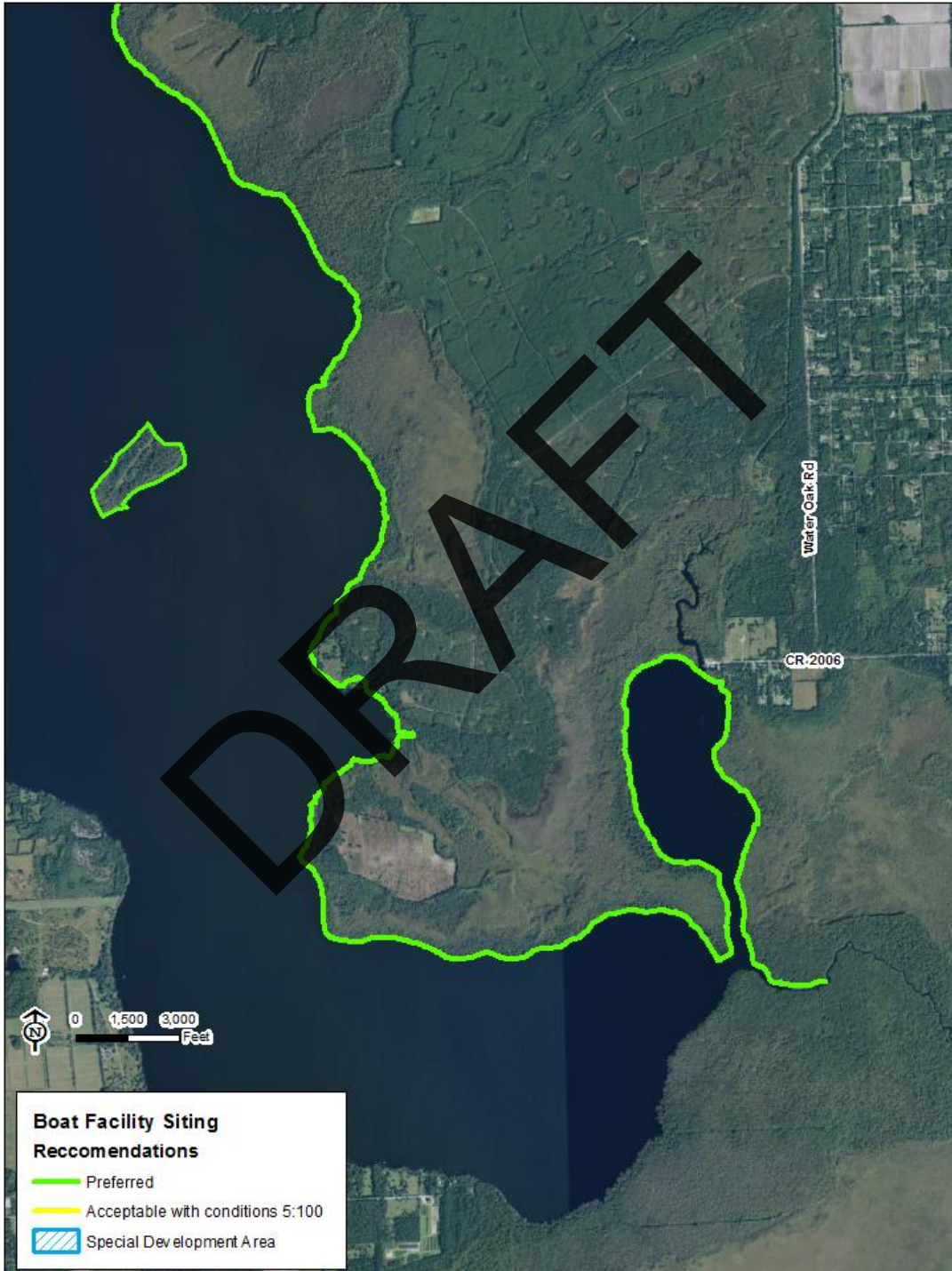




Figure 66: Boat Facility Siting Plan Recommendations – Section F North



Figure 67: Boat Facility Siting Plan Recommendations – Section F South



## ***4.4 Existing Marina Expansion***

Due to the nature of the ICW and the existing developed marina parcels in Flagler County, it is not anticipated that the existing marinas will have the capacity to dramatically expand in size in the future. The configuration of the existing marinas does not allow for large-scale expansions. It is anticipated that in the future potential re-configurations to the existing marinas to target the changing boating market will occur. The changes in the number of slips would be expected to be minimal. All marina expansion projects will be required to meet existing federal, state, and Flagler County rules and regulations prior to expansion. Any proposed marina expansion will be thoroughly reviewed by Flagler County Growth Management staff to ensure the development is consistent with the goals of this MPP.

## ***4.5 Single Family Docks and Multi-family Facilities Less than 5 Slips***

Additional single family dock and small residential dock facility (4 slips or less) construction is anticipated to continue to occur throughout the County. Many small parcels, primarily in the unincorporated ICW areas of the County provide the opportunity for single family docks and small residential docking facilities. The incorporated areas of the City of Palm Coast and Flagler Beach are for the most part completely developed and single family docks already exist with the lots. The primary areas of additional single family docks will come with the final construction of the remaining PUD's along the ICW. These include the build-out of the Grand Haven PUD, the Palm Coast Plantation PUD, the Harbor View Marina property, the Hammock Beach River Club PUD, the Flagler Beach Polo Club PUD, and the Bulow Preserve PUD.

Boat Facility Siting Plans generally do not pertain to the construction of a single family dock or a small multi-family (less than 5 slips) facility.

## **5.0 Education Plan**

In order to communicate with Flagler County citizens regarding the objectives incorporated into the Manatee Protection Plan for Flagler County, an Education component to the Manatee Protection Plan has been developed. The intent of the Education and Awareness component of the MPP is to increase knowledge, awareness, and understanding among Flagler County residents and visitors with respect to the presence of manatees in Flagler County's waterways. There are many successful models for Flagler County to follow in development of an education plan. The County will coordinate its efforts as appropriate with federal, state, and local agencies and organizations in providing information to the public regarding manatee safety issues. Completion of these initiatives is the responsibility of the county but may require additional, outside funding sources or partnerships and will be implemented once funding is



## FLAGLER COUNTY MANATEE PROTECTION PLAN

secured and/or partnerships are formalized. Partnering agencies in these efforts might include Florida Sea Grant, University of Florida- IFAS, Florida Fish and Wildlife Conservation Commission (FWC), University of Florida's Whitney Laboratory for Marine Bioscience (Whitney Lab), Florida Department of Environmental Protection (FDEP), Guana Tolomato Matanzas National Estuarine Research Reserve (GTM-NERR), St. Johns River Water Management District (SJRWMD), U.S. Fish and Wildlife Service (FWS), National Oceanic and Atmospheric Administration (NOAA), Flagler County School Board (FCSB), Flagler County Property Appraiser (FCPA), Flagler County Sheriff's Office (FSO), Flagler County Tax Collector (Tax Collector), Boy Scouts of America (Boy Scouts), Girl Scouts of the USA (Girl Scouts), Georgia Aquarium, private sector businesses and Save the Manatee Club (SMC).

Funding for some of these education and awareness initiatives may be paid for by Flagler County, but funding assistance will be sought in the form of grants and donations. Some funding mechanisms that are being considered include a portion of funds from enforcement related penalties, impact fees on waterfront development, and federal, state, and local grant programs.

Flagler County School District staff since 2010 have had access to an 18 lesson curriculum correlated to Florida's Sunshine State Standards for 3<sup>rd</sup> grade classes at Rymfire and Bunnell Elementary Schools. The program is jointly administered by the University of Florida, College of Veterinary Medicine and the Whitney Laboratory for Marine Bioscience and was developed by Florida SeaGrant staff at the University of Florida's Institute for Food and Agricultural Sciences (IFAS) program located in Bunnell. The program is based on a book called "Sam the Sea Cow" and introduces students to manatee biology and threats facing manatees while addressing math and science curriculum needs. The program includes lessons about adaptations, characteristics of mammals, what manatees need to survive and marine pollution. The curriculum is provided as Attachment 1.

Flagler County identifies each of the initiatives as short-term, near-term, and long-term. Short-term refers to beginning an initiative within the first two years of Plan implementation. Near-term initiatives will begin between three to five years from Plan implementation and long-term will begin later than 5 years from the date of Plan implementation. In Attachment 2, Flagler County's educational initiatives are listed along with their planned implementation timelines and proposed funding sources.

## ***5.1 Informational Kiosks***

One valuable source of manatee education for boaters is the inclusion of kiosks at high use public boat ramps. Flagler County currently does not have informational kiosks at any of the county owned and managed boat ramps. Due to the changes in boating speed zones and need for further manatee educational materials for the public, the incorporation of informational kiosks at Bings Landing Park, Herschel King Park, and Moody Public Boat Launch are proposed. The kiosks will include information about the speed zone areas and signage, speed limits, and current information on the status of the manatee in Flagler County along with biology of the species and conservation measures.

## ***5.2 Boating Guide Pamphlets***

Flagler County will also implement a boating guide pamphlet which can be distributed at the DMV, local marinas, boat ramps, and be available online. The pamphlet will include general boating safety information, habitat and resource protection, and parks and recreation. The pamphlet will also include navigation aid information, speed zone information (including a guide to markers and signs), locations of boat ramps, marinas, and waterside facilities. The pamphlet will also include emergency contact numbers and sheriff's office information. The pamphlet will be produced with assistance of the Flagler County Sheriff's Office and the Florida Fish and Wildlife Conservation Commission Enforcement Office.

## **6.0 Manatee Protection Zones and Law Enforcement**

Slow speed zones for boaters are considered by FWC and USFWS to be an important part of any Manatee Protection Plan. Although it is difficult to measure the direct "effectiveness" of speed zones in terms of manatee survivorship, the USFWS believes that a reduction in watercraft speed will result in a reduction of the risk of collision with manatees. According to the Army Corps of Engineers Manatee Programmatic Biological Opinion from 2011: "The enforcement of manatee speed zones is the primary conservation measure through which proposed projects could reduce the likelihood of take from watercraft collisions to an unlikely-to-occur level." It follows that based on this assumption, FWC relies heavily on the relationships between boats and manatees in the development of manatee protection plans. Related, manatee density and abundance in relation to boating density and abundance is assumed to play a key role in determining the likelihood for injury and fatality for manatees. Although a large vessel may cause injury or death to a manatee, even at slow speeds, for the purpose of this assessment it is assumed that speed zone restrictions generally reduce the likelihood and/or severity of injuries caused by boat collisions. Generally, the visible presence of law enforcement on the waterway

induces slower boat traffic. This visible presence of law enforcement officers on the water and the subsequent slowing of boat traffic is known as the “halo effect”.

On-water law enforcement in Flagler County is performed by officers from the Florida Fish and Wildlife Conservation Commission Law Enforcement Division and the Flagler County Sheriff Office (FCSO). FWC estimates approximately 1000 hours by its officers in and around Flagler County’s ICW. FCSO provides enforcement whenever FWC is not scheduled to patrol on water. FCSO hours for the first two months of the enforcement period are included below. FWC Law Enforcement hours were requested from their staff, but those figures have still not been released.

During the speed zone enforcement time period so far in 2015 (months of May and June) the FCSO has patrolled the Manatee Protection Zones for approximately 35 hours each month. In that 2 month period 58 verbal warnings and 19 written warnings have been issued by FCSO officers to boaters. No citations have been issued. No manatees have been struck by boaters during this period. The FCSO has provided a commitment to supply assistance in the enforcement of speed zones for manatee protection. The FCSO has agreed to provide monthly updates to Flagler County staff during the Manatee Protection Zone enforcement months of May 1<sup>st</sup> through September 7<sup>th</sup>.

## **7.0 Implementation Plan**

### ***7.1 Manatee Protection Plan Adoption***

Once the FWC and FWS have approved this MPP the County will move forward with adoption of the plan by resolution into the Flagler County Comprehensive Plan. The County will coordinate with and encourage the cities and municipalities within Flagler County to adopt this MPP into their respective Comprehensive Plans. It is anticipated the incorporation of the final MPP approved by FWC and FWS will be completed within 1 year of approval by the agencies. The MPP will be made available to the public through the Flagler County website. GIS shapefiles of the Boat Facility Siting Plan maps will be made available to allow for planning, development, and permitting of future properties.

### ***7.2 Manatee Protection Plan Status Report***

Flagler County staff will develop a MPP Status Report. This report will include a review all manatee related data, any new waterward development permitting and construction, manatee deaths related to human causes, speed zone law enforcement, education programs, and habitat protection. The review and report will be completed on a yearly basis. This report will

be submitted to the FWC Imperiled Species Management Section and FWS North Florida Ecological Services Office each year.

The MPP Status Report will specifically review of the types of watercraft-related deaths (large vessel deaths and small vessel deaths, if known) and their locations, the number of manatee deaths over time, and whether five watercraft deaths have occurred in that 12 month period. If 5 or more watercraft related deaths occur in a 12 month period consultation with FWC and FWS will be initiated to determine if additional manatee protection is warranted.

### ***7.3 Manatee Protection Zone Law Enforcement Yearly Report***

Flagler County staff will coordinate with Law Enforcement staff to develop a Law Enforcement Report. This report will include items such as total number of on water patrol hours, number of citations reported, boating accidents, water-craft related manatee deaths, and general speed zone compliance.

### ***7.4 Manatee Protection Plan Funding***

A critical component of any MPP is to maintain adequate funding for implementation of the plan. Flagler County will provide a yearly budget towards implementation of the MPP. To successfully implement the objectives of this MPP, Flagler County will:

- A. Continue to fund the Flagler County Sheriff's budget on an annual basis, which currently includes on water patrol activities for the Intracoastal Waterway, in conjunction with the FWC enforcement division; and
- B. Continue to fund the County's Growth Management division, which will oversee development and compliance with the MPP; and
- C. Continue to fund the Flagler County's Land Management division, which will provide a yearly status report and organize educational activities; and
- D. Provide funds through the General Fund to ensure consistent support for these activities; and
- E. Work to identify additional funding sources that might be available in order to implement specific MPP tasks. These other possible funding sources include governmental grant programs, corporate sponsors, private donations, public interest groups, etc.

**7.5 Manatee Protection Plan Recommendations**

Table 10 below is a summary of the recommendations and implementation of the Flagler County Manatee Protection Plan.

**Table 10: Flagler County MPP Recommendations**

<b>MPP Objective</b>	<b>Action</b>	<b>Anticipated Schedule</b>
Flagler County Comprehensive Plan will be amended to incorporate the Manatee Protection Plan	Submit County Resolution amendment to FWC	Within 1 year of approval of the MPP by FWC
Flagler County Growth Development will utilize the MPP during review of potential waterward developments	Distribute and coordinate with County development review staff. Provide GIS shapefiles of BFSP maps to development review staff.	Immediately upon approval
Inventory all waterward construction of slips, manatee mortalities, and habitat impact	Draft and update a Yearly MPP Status Report	Annually
Review Manatee Protection Zones for effectiveness in regards to manatee mortality and boat speeds	Engage Flagler County Sheriff's Office to draft and update a Yearly Law Enforcement Status Report	Annually
Keep the MPP current	Review the MPP in conjunction with FWC and FWS to determine if revisions are necessary; Requires compilation of data and reports described above	Every 5 years
Increase manatee habitat protection	Work with agencies involved with the Flagler County Blueways Project to source funding for the purchase and management of additional	Ongoing

## FLAGLER COUNTY MANATEE PROTECTION PLAN

	lands identified within the Flagler County Blueways study	
Implement Manatee Education Measures	Continue manatee education measures in place and follow implementation schedule for additional educational measures	Active and Ongoing
Facilitate law enforcement participation in manatee protection	Coordinate seasonally with law enforcement staff in regards to officer man hours on the water and briefing of findings	Seasonally/as Necessary

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## References

- Beeler IE, O'Shea TJ (1988) Distribution and Mortality of the West Indian Manatee (*Trichechus manatus*) in the Southeastern United States. Prepared for the U.S. Army Corps of Engineers, Jacksonville District.
- Best RC (1981) Food and feeding habits of wild and captive Sirenia. *Mammal Rev.* 11(1):3-29
- Calleson CS, Frohlich RK (2007) Slower boat speeds reduce risks to manatees. *Endangered Species Research* 3:295-304
- Craig BA, Reynolds JE III (2004) Determination of manatee population trends along the Atlantic coast of coast of Florida using a Bayesian approach with temperature-adjusted aerial survey data. *Marine Mammal Science* 20:386-400
- Deutsch CJ, Reid JP, Bonde RK, Easton DE, Kochman HI, O'Shea TJ (2003) Seasonal movements, migratory behavior and site fidelity of West Indian manatees along the Atlantic Coast of the United States. *Wildlife Monographs* 151:1-77
- Duval County Manatee Protection Plan 3<sup>rd</sup> Edition (2014) City of Jacksonville Waterways Commission. <http://www.coj.net/departments/planning-and-development/community-planning-division/plans-and-studies/manatee-protection-plan.aspx>
- Florida Fish and Wildlife Conservation Commission (2007) Florida Manatee Management Plan *Trichechus manatus latirostris*
- Gorzelany, Jay (2009) Aerial Surveys of Boating Activity in Flagler, St. Johns, and Duval Counties. Mote Marine Laboratory. Mote Technical Report No. 1366
- Gorzelany JF, Koelsch JK (1994) Habitat characterization of preferred manatee sites in the Sarasota area. Final report submitted to the Florida Dept. of Environmental Protection, Bureau of Protected Species Management
- Hartman DS (1974) Distribution, status, and conservation of the manatee in the United States. National Technical Information Service No. PB81-140725. Springfield, Virginia
- Hartman, DS (1979) Ecology and behavior of the manatee (*Trichechus manatus*) in Florida. *The Amer. Soc. Mammal Spec. Publ.* No. 5
- Irvine AB, Campbell HW (1978) Aerial census of the West Indian manatee, *Trichechus manatus*, in the southeastern United States. *Journal of Mammalogy* 59:613-617

## FLAGLER COUNTY MANATEE PROTECTION PLAN

Kinnaird MF (1983b) Site-specific analysis of factors potentially influencing manatee boat/barge mortality. Site-specific reduction of manatee boat/barge mortality. University of Florida, Florida Cooperative Fish and Wildlife Research Unit, Gainesville, Florida. Report No. 4, Agreement No. 14-16-0004-81-923

Koelsch JK (1997) The seasonal occurrence and ecology of Florida manatees (*Trichechus manatus latirostris*) in coastal waters near Sarasota, Florida. MS Thesis, University of South Florida, Tampa, Florida

Laist DW, Reynolds JE (2005a) Florida Manatees, warm-water refuges, and an uncertain future. Coastal Management 33:279–295

Laist DW, Reynolds JE (2005b) Influence of power plants and other warm water refuges on Florida manatees. Marine Mammal Science 21(4):739–764

Langtimm CA, Beck CA, Edwards HH, Ackerman BB, Fick-Child KJ, Barton SL, Hartley WC (2004) Survival estimates for Florida manatees from the photo-identification of individuals. Marine Mammal Science 20:438-463

Lefebvre LW, Marmontel M, Reid JP, Bathbun GB, Domning DP (2001) Status and biogeography of the West Indian manatee 425-474 In: Woods CA, Sergile FE (eds) Biogeography of the West Indies: new patterns and perspectives. CRC Press LLC. Boca Raton, Florida

O'Shea TJ (1988) The past, present, and future of manatees in the southeastern United States: realities, misunderstandings, and enigmas 184-204 In: Odom RR, Riddleberger KA, Ozier JC (eds) Proceedings of the Third Southeastern Nongame and Endangered Wildlife Symposium. Georgia Department of Natural Resources, Game and Fish Division, Social Circle, Georgia

Packard JM, Siniff DB, Cornell JA (1986) Use of replicate counts to improve indices of trends in manatee abundance. Wildl. Soc. Bull. 14:265-275

Pitchford TD, Rommel, Sentiel A, Pitchford ME (2003, revised 2005) Characterizing and Interpreting Watercraft-Related Wounds in Florida Manatees: A Retrospective Analysis of Florida Manatee Mortality Data for Evidence of Deaths Attributable to (Very) Large Vessels, 1990-1999.

Provancha, JA, Provancha MJ (1988) Long term trends in abundance and distribution of manatees (*Trichechus manatus*) in the northern Banana River, Brevard County, Florida. Marine Mammal Science 4(4): 323-338

## FLAGLER COUNTY MANATEE PROTECTION PLAN

Reid JP, Rathbun GB, Wilcox JR (1991) Distribution patterns of individually identifiable West Indian manatees (*Trichechus manatus*) in Florida. *Marine Mammal Science* 7:180-190

Rommel SA, Costidis AM, Pitchford TD, Lightsey JD, Snyder RH, Haubold EM (2007) Forensic methods for characterizing watercraft from watercraft-induced wounds on the Florida manatee (*Trichechus manatus latirostris*). *Marine Mammal Science* 23(1):110-132

Runge MC, Langtimm CA, Kendall, WL (2004) A stage-based model of manatee population dynamics. *Marine Mammal Science* 20:361-385

Runge MC, Sanders-Reed CA, Fannesbeck CJ (2007a) A core stochastic population projection model for Florida manatees (*Trichechus manatus latirostris*). Final report. US Geological Survey, Patuxent Wildlife Research Center. Laurel, Maryland

Runge, MC, Sanders-Reed CA, Langtimm CA, Fannesbeck CJ (2007b) A quantitative threats analysis for the Florida manatee (*Trichechus manatus latirostris*).

Sarasota County Manatee Protection Plan (2004)

<https://www.scgov.net/EnvironmentalPlanning/Pages/MPP.aspx>

Shane SH (1983) Abundance, distribution, and movements of manatees (*Trichechus manatus*) in Brevard County, Florida. *Bulletin of Marine Science* 33:19

USFWS (2001) Florida Manatee Recovery Plan *Trichechus manatus latirostri*, Third Revision. US Fish and Wildlife Service, Atlanta, Georgia

Wright, S.D., B.B. Ackerman, R.K. Bonde, C.A. Beck, and D.J. Banowetz. 1995. Analysis of watercraft-related mortality of manatees in Florida, 1979-1991. pp 259-268 In: Population Biology Of The Florida Manatee. U.S. Dept. of The Interior Information and Technology Report 1.

**APPENDIX 1**

**Flagler County Manatee Protection Plan Education Initiatives, Timelines, and Funding Sources**

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<b>Education and Awareness Initiative</b>	<b>Timeline</b>	<b>Objective</b>	<b>Funding Source and Administration</b>	<b>Potential Partnering Agencies</b>	<b>Educational Material Delivery Methods</b>
Boater Education Brochure and Map	Near-Term	Provide and distribute a brochure and map to registered boaters and property owners in the county	To Be Determined	Flagler County Tax Collector or Property Appraiser – for Distribution	FCCA or Tax Collector Mailing, Supply Marine Businesses, Supply Municipalities as necessary
Flagler County TV Spot	Short-Term	Reach broad segment of Flagler County with manatee conservation discussion	Flagler County Communications	Sea Grant, UF-IFAS, NOAA, FWC	Recurring broadcast spot on FCTV
Flagler County Website	Near-Term	Provide access to MPP and other manatee conservation information on County Website	Flagler County I.T., Flagler County Land Management	FWC, USFWS, NOAA, Sea Grant, UF-IFAS	Provide access to management and other documents to general public on-demand
Local Radio PSA	Near-Term	Reach broad	Flagler County	Local Radio	Provide a written or recorded radio spot for

Education and Awareness Initiative	Timeline	Objective	Funding Source and Administration	Potential Partnering Agencies	Educational Material Delivery Methods
	Term	segment of Flagler County with manatee conservation information and direct to website	Communications	Stations	local radio outlets
Manatee Alert for NOAA radio broadcast	Near-Term	Provide boater-specific waterway and manatee alerts	TBD	NOAA	Periodic broadcast on NOAA radio channels
Manatee conservation educational signs and kiosks at boat ramps	Short-term	Provide boaters with educational materials and reminders to “Share the waterway” with manatees	Funding – TBD, Administration – Flagler County Parks and Recreation	Flagler County	Strategic sign and kiosk placement at high-traffic boat ramps in Flagler County
“No feeding or watering” signs, brochures and information to residents	Short-term	Reminders and education of waterfront homeowners that feeding manatees	TBD	City of Palm Coast, Beverly Beach, Flagler Beach	Placement of signs in waterways and canals



Education and Awareness Initiative	Timeline	Objective	Funding Source and Administration	Potential Partnering Agencies	Educational Material Delivery Methods
	-	is harmful/illegal			
Grades K-5 Manatee Education Programs	Near-term (existing )	Continue to utilize the curriculum developed by Florida Sea Grant	Continue existing funding	Sea Grant	Continue to provide educational materials and curriculum in elementary schools
Manatee training for Law Enforcement officers.	Short-Term	Provide LE with tools to educate public during their interactions and for “manatee spotter/reporting” as necessary	TBD	FWC, FCSO, USFWS	Contact with citizens during on-water patrols
Increased on-water presence of Law Enforcement	Long-Term	Provide funding and develop intergovernmental cooperation and capacity for multi-agency on-water presence for maintaining safe speeds and “halo”	TBD	FWC, FCSO	On-Water presence by Law Enforcement officers has been shown to be a significant preventative for violations of speed zones.

Education and Awareness Initiative	Timeline	Objective	Funding Source and Administration	Potential Partnering Agencies	Educational Material Delivery Methods
	-	effect			
Tabling at Local Festivals and Environmental Fairs	Near-Term	Provide educational materials to the public	TBD	Festival Organizers and Sponsors	Brochures, Posters, Presenters
Volunteer Speaker's Forum	Long-Term	Create a forum for conservation professionals, students, and volunteers to discuss conservation issues including manatees	TBD	Local High Schools, and regional colleges, advocacy groups, and non-profit organizations	Spoken Word and Audio-visual presentations