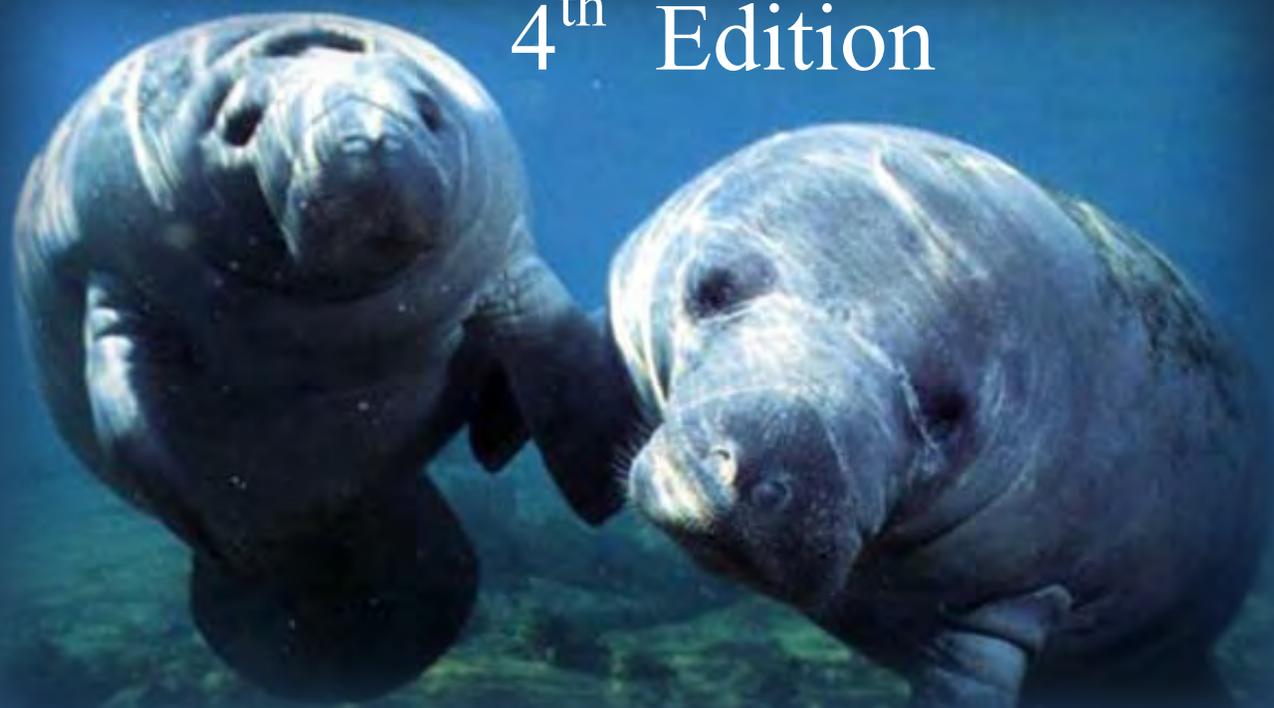




Manatee Protection Plan

4th Edition



City of Jacksonville
Planning and Development Department
November 2017

Executive Summary

This document is the third revision to the Duval County Manatee Protection Plan (MPP). A MPP is a comprehensive planning document that addresses the long-term protection of the Florida manatee through law enforcement, education, boat facility siting, and habitat protection initiatives on a county-wide basis. The original MPP was developed by the Jacksonville Waterways Commission for the Jacksonville City Council. Jacksonville University (JU) conducted much of the research on which that plan was based. In 1999, the MPP was approved by the Jacksonville Waterways Commission as well as the State of Florida and the U.S. Fish and Wildlife Service (USFWS). In 2004, it became apparent that a revision was needed to the MPP because of differing interpretations of the plan, and a revision was adopted in 2006. The Florida Fish and Wildlife Conservation Commission (FWC) encourages reassessments of MPPs every five to seven years. The purpose of revising this MPP is to collect and evaluate updated information on manatee use and boat activity in the City of Jacksonville (COJ) and provide guidance targeted at reduction of human-related threats to manatees and manatee habitat. Both the 1999 and 2006 versions of the MPP included a provision that defined five or more watercraft-related mortalities in all COJ waters within a 12 month period as an unacceptable level of manatee mortality. Between 2000 and 2010, the level of watercraft-related manatee deaths was at this unacceptable level for over half of those 10 years. It was apparent that the MPP needed major reassessment and revision to address county-wide manatee management goals.

A MPP attempts to balance boater waterway access with impact to manatees from boat traffic, and is intended to increase the predictability of permitting outcomes for boat facility development. The Boat Facility Siting strategy is a primary component of a MPP, however it relies heavily on the other components of the plan. Manatees are most likely to be struck by boats in areas where there is high manatee abundance and high boat traffic. A Boat Facility Siting strategy is intended to direct new boat slips in areas where the risk of boat and manatee interaction is relatively low and discourage new boat slips in areas of relatively high risk. This MPP includes updated manatee data, boating activity data (boat traffic studies and marina inventories), and details about manatee habitat, law enforcement, port facilities, and education and outreach. Current data and information in each of these areas has been collected and analyzed to develop this revision of the MPP, including revised boat facility siting recommendations that are based on this updated data analysis.

Additionally, recommendations are made in this MPP that address plan implementation, funding to perform MPP implementation tasks, continued and improved education and awareness, increased law enforcement and plan revision guidelines. Ultimately, this MPP will be adopted by reference in the COJ Coastal Management Element of the Comprehensive Land Use Plan.

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List of Acronyms

ACOE - US Army Corps of Engineers
ATM - Applied Technology and Management, Inc.
COJ - City of Jacksonville
DOACS - Department of Agriculture and Consumer Services
DRI - Development of Regional Impact
FAC - Florida Administrative Code
FDEP - Florida Department of Environmental Protection
FDHSMV - Florida Department of Highway Safety and Motor Vehicles
FIND - Florida Inland Navigation District
FLUM - Future Land Use Map
FOCUS - Future Opportunities, Continuous Upgrade Strategy
FS - Florida Statutes
FWC - Florida Fish and Wildlife Conservation Commission
FWC-LE - Florida Fish and Wildlife Conservation Commission Division of Law Enforcement
FWRI - Florida Wildlife Research Institute, Florida Fish and Wildlife Conservation Commission
ICW - Intracoastal Waterway
ISM - Imperiled Species Management Section, Florida Fish and Wildlife Conservation Commission
JaxPort - Independent Jacksonville Agency related to waterborne traffic and commerce
JEA - Jacksonville Electric Authority
JMTX - Jacksonville Marine Transportation Exchange
JSO - Jacksonville Sheriff's Office
JU - Jacksonville University
JWC - Jacksonville Waterways Commission
LRC - Learning Resources Center
LSJRB - Lower St. Johns River Basin
MMP - State of Florida Manatee Management Plan
MMPA - Marine Mammal Protection Act
MMPL - Florida Wildlife Research Institute Marine Mammal Pathobiology Lab
MPP - Manatee Protection Plan
MRIP - Master Recreation Improvement Plan
NEFRC - Northeast Florida Regional Council
NMFS - National Marine Fisheries Service
NOAA - National Oceanic and Atmospheric Administration
NPS - National Park Service
PSA - Public Service Announcement
SAV - Submerged Aquatic Vegetation
SCORP - Florida Statewide Comprehensive Outdoor Recreation Plan
SJR - St. Johns River
SJRWMD - St. Johns River Water Management District
USCG - US Coast Guard
USFWS - US Fish and Wildlife Service
USFWS-ES - US Fish and Wildlife Service North Florida Ecological Services Office
USFWS-LE - US Fish and Wildlife Service Law Enforcement
USGS - US Geological Service

List of Definitions

Acceptable With Conditions - specific areas designated in the Boat Facility Siting Strategy where development may occur at a level of five (5) slips for every 100 feet of shoreline owned.

Aggregation Site - an area where manatees may be found in large numbers. These sites may include areas that are not traditional warm-water sites (natural spring or artificial warm-water discharge) such as areas and canals that serve as thermal basins or freshwater attractants.

Anchorage - in-water vessel storage either by anchor or fixed mooring device.

Boat Facility - public or private; commercial, industrial, recreational or residential; temporary, transitory or permanent; structure or location, with wet or dry storage boat slips that provide access to waterways (such as, but not limited to yacht clubs, multi-family or residential single-family residential docks, marinas, mooring fields, boat yards, dry storage facilities, boat ramps or other boat launching facilities). Unless specified otherwise in section five of this plan, the boat facility siting recommendations in this plan apply to any new Boat Facility with five (5) or more slips, or an expansion into a Boat Facility with five (5) or more slips.

Boat Facility Siting Strategy - a component of the Manatee Protection Plan which specifies appropriate locations and slip densities for Boat Facility development.

Boat Ramp - a man-made or natural feature with one or more lanes that facilitates the launching and retrieving of boats from a trailer into a water body. Boat ramp facilities might include temporary courtesy docks to facilitate boat launching and retrieval.

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.

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

Dock - a fixed or floating structure, including access walkways, terminal platforms, catwalks, mooring pilings, lifts, davits and other associated water-dependent structures, used for mooring and accessing vessels.

Dry Storage Facility - an upland structure, parking lot, or space used specifically for storing watercraft. Such as, but not limited to, in/out boat storage, boat repair, boat sales, or long term dry storage lots or facilities. For the purposes of this plan, a dry storage facility is considered a Boat Facility or part of a Boat Facility if the dry storage facility has the capability of launching vessels into adjacent waters or water access is provided adjacent to, or in close proximity to the facility.

Existing Boat Facility - For the purposes of this plan, the definition of an existing boat facility is 1) a facility that has produced boat traffic at some point within 10 years prior to the submittal date of an active request for authorization to renovate, modify or expand the facility; that has all required authorizations that clearly and accurately specify the number of slips; and has been constructed and operates with the type of use as authorized; or 2) a facility that has not been built but has all active, required authorizations that clearly and accurately specify the number of slips and the time period has not exceeded 10 years from the date of the original permit/authorization. A request to modify a boat facility that does not meet the above definitions will be evaluated on a case by case basis by the wildlife agencies (FWC and/or USFWS) to assess the number of slips that may be recognized as existing, and whether the boat facility will be considered a new or existing facility for the purposes of the plan.

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. Shoreline created by dredging after the 1999 effective date of the Duval County MPP shall not be used in a slip density calculation. Artificially created shorelines created before the 1999 effective date of the Duval County MPP must have received the proper authorization required at that time. Shoreline along man-made ditches (such as mosquito control, flood control ditches, etc.) shall not qualify as linear shoreline, regardless of their date of construction unless there is documentation of regular navigational use. 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.

Long-term Dry Storage Lots or Facilities - facilities that only provide storage for vessels that will be stored for long periods of time (at least six months). Boats are typically stored in these facilities seasonally, and are not used during the storage period. The vessels are typically “winterized” and are typically moved to other facilities when brought out of storage to be used.

Manatee Protection Plan - a county specific management plan developed, approved and used by federal, state and local governments to ensure the long term protection of manatees and their habitat within what is defined as the County boundaries.

Marina - a boat facility constructed and used for the purpose of sale, lease, or rent of boat dockage (dry storage or wet slips) that may be owned by private or governmental entities.

Mooring - any location where a vessel in the water is secured. It can be at anchor, tied off to a buoy in a “mooring field,” or tied off to a pier, dock, piling, or other physical structure or on a davit or boatlift.

Personal Watercraft - a vessel less than 16 feet in length which uses an inboard motor powering a water jet pump as its primary source of motive power and which is designed to be operated by a person sitting, standing, or kneeling on the vessel, rather than in the conventional manner of sitting or standing inside the vessel.

Port Facility - a facility that accommodates public or private freight/cargo transport and any other commercial or industrial ship related activity. Because of the complexity with port facility planning and development decisions, any port facility proposal will be reviewed and addressed on a case by case basis by federal, state and local wildlife agencies.

Preferred - a specific area designated in the Boat Facility Siting Strategy that can have an unrestricted number of slips from a manatee management perspective. Other local, state, or federal regulations may limit slip numbers for other reasons.

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.

Residential Single-family Dock - a Boat Facility used for private recreational or leisure purposes that is located on a single-family riparian parcel or that is shared by two adjacent single-family riparian owners if located on their common riparian property line. The Boat Facility may contain wet slips and/or dry slips, and provide mooring for the sole recreational use of the residents of a detached single-family home, adjacent to a coastal water body. Residential Single-family docks with four (4) or less slips are exempt from the Boat Facility Siting Strategy, but must conform with all applicable federal, state and local regulations in place at the time of permit application.

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).

Slip - See boat slip.

Special Development Area - a designated area in the Boat Facility Siting Strategy where slip development may occur as set out in section 5.2 of this plan. For the purpose of this plan, the special development areas are a Development of Regional Impact (DRI) Area downtown; a Working Waterfront Zone at the mouth of the Ortega River; a parcel of property North of Atlantic Boulevard on Pablo Creek addressed in City of Jacksonville Ordinance 2009 – 621-E; and seven (7) City of Jacksonville Public Boat Ramps (Wayne B. Stevens Park, Lighthouse Marine, Bert Maxwell Park, Lonnie Wurn, Oak Harbor, Beach Boulevard, and proposed Half Moon Island). Boat Facility siting recommendations for these areas are detailed in section 5.2G of this plan.

Temporary (or Courtesy) Slip - For the purposes of this plan, a slip this is used generally less than one day (but may include overnight), and does not contribute to boat traffic. Examples include, but are not limited to: slips used to facilitate launching and retrieving of boats at boat ramps, dry storage facilities, boat sale facilities and boat yards. Temporary slips are not counted when calculating slip densities.

Transitory Slip – For the purposes of this plan, a slip that is used generally less than one day (but may include overnight or multiple-day use) and contributes to boat traffic. Examples include, but are not limited to: slips at non-fee public facilities (e.g., public parks, etc.), slips at facilities used for water-dependent public transportation (e.g., water taxis), and slips designated day-use slips at restaurants and hotels. Transitory slips are counted when calculating slip densities.

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.

Unacceptable - a designated area in the Boat Facility Siting Strategy where development may occur at a level of one (1) slip for every 100 feet of shoreline owned or legally controlled.

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 68° F or 20° C).

Waters - waters of the State of Florida.

Wharf Fender - a structure or buoy that provides adequate standoff space between a vessel and a bulkhead, or between two vessels.

1 Introduction

The COJ is located in Duval County in Northeast Florida (Figure 1). The St. Johns River (SJR), with tributaries throughout Jacksonville, meanders north about 40 miles through the city before discharging into the Atlantic Ocean. Widths exceeding three miles in the southern reaches of the SJR, including its tributaries, comprise about 76 square miles of streams and waterways. The setting within Duval County also includes 16 miles of coastline along the Atlantic Ocean.

The Florida manatee, *Trichechus manatus latirostris*, inhabits the waters of the COJ year round. Few manatees are observed during winter (December, January and February). Manatees are more often observed from late March through November 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, feeding and cavorting (mating).

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. At this time all Key Counties have state-approved manatee protection plans in place. The first Duval County MPP was approved by the State of Florida in 1999. Minor revisions to the 1999 MPP were approved by the State of Florida in 2006. This MPP replaces both prior plans as a reference for development planning in the COJ, to the extent that such development may affect the Florida manatee.

A MPP is a comprehensive planning document that addresses the long-term protection of the Florida manatee through law enforcement, education, boat facility siting, and habitat protection initiatives. MPPs are the product of extensive coordination and cooperation between the local governments, the FWC, USFWS, and other interested parties. In general, MPPs are to include all relevant manatee data, information on boating (boat traffic studies and marina inventories), manatee habitat, law enforcement, port facilities, and education and outreach. The information is analyzed to develop long term, comprehensive measures to protect manatees and their habitat. MPPs need to include a boat facility siting element, seagrass protection measures, springs protection and other warm-water refuge protection, law enforcement strategies, a plan for outreach efforts to the public, monitoring initiatives, and an implementation plan to assure the listed activities will be addressed.

The SJR provides habitat for the manatee along with supporting tremendous recreational and industrial vessel usage. Boat traffic in the river is diverse; it includes port facilities for large industrial and commercial shippers, commercial fishing, sport fishing and recreational activity that represent a significant economic factor for the COJ. Increasing boating activity on the SJR, and the number of manatees which have been reported using the river, make it critically necessary that a comprehensive manatee protection plan for the waters of the COJ be in place.

The purpose of this MPP is to provide a long term strategy to protect manatees based upon a comprehensive understanding of manatee populations, habitat needs, and areas of manatee/boater overlap and interaction, in addition to understanding and acknowledging human recreational and commercial uses of the COJ waterways. The basic concept is to focus future boat facility development

away from areas of high manatee use and high watercraft-related manatee mortality. In setting policies to safeguard manatees and their habitats, MPPs also have the effect of increasing boater safety, facilitating recreation planning, and protecting aquatic habitat critical to many 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; protecting manatee habitat; promoting boating safety; and increasing public awareness of the need to protect manatees and their habitat.

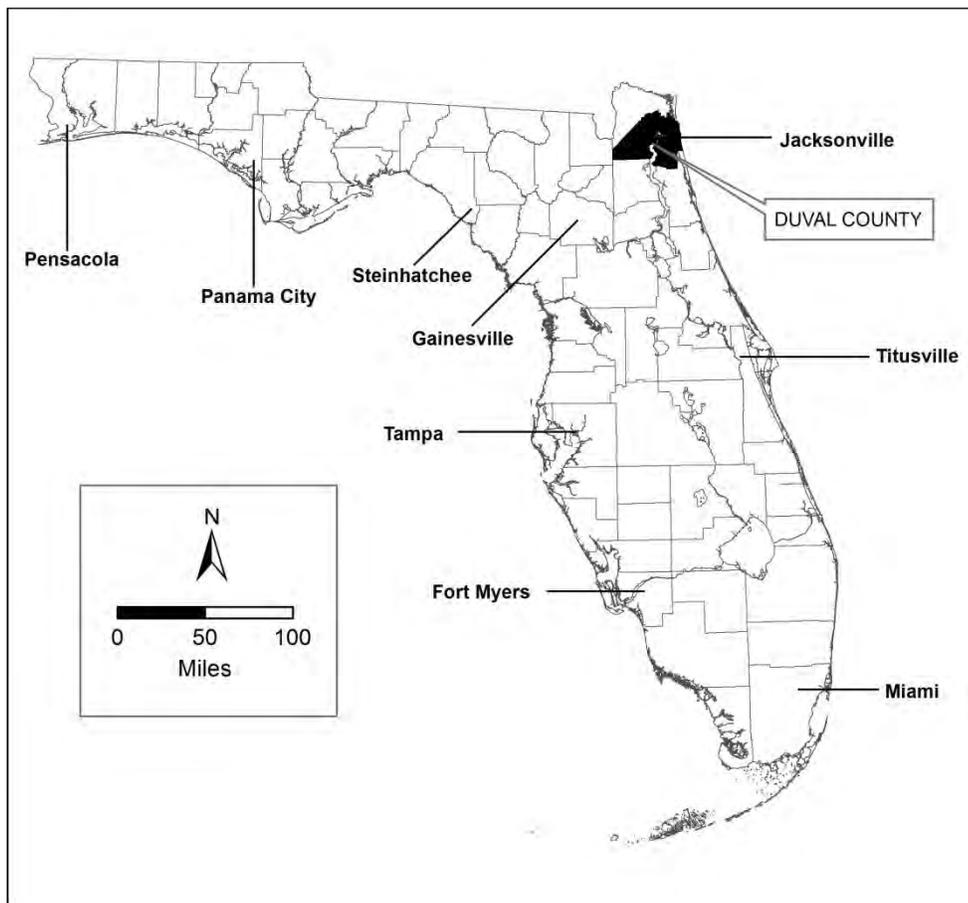


Figure 1: Location of City of Jacksonville (Duval County), Florida.

2 General Setting

2.1 City of Jacksonville Waterways

2.1.1 Waterway Characteristics and Designations

Duval County, with its coastal plain topography, is located in northeast Florida with a total area of 918 square miles (145 square miles is water). The population in 2010 was 864,263 and the City of

Jacksonville and County government were consolidated in 1968, although various separate municipalities exist - Atlantic Beach, Baldwin, Jacksonville, Jacksonville Beach, Neptune Beach, and Orange Park.

2.1.1.1 Waterway Characteristics

The SJR is a dark tannic water system that flows north from the Everglades extending for 310 miles. It drains about 10,000 square miles (one-sixth of the total surface area of Florida) prior to discharging into the Atlantic Ocean at Jacksonville. The SJR is the longest river in Florida and is one of 14 American Heritage Rivers (1998), as well as, being designated as one of the nation's most Endangered Rivers.

The COJ is dominated by the final 40 miles of the SJR and characterized by sandy barrier islands, inlets, sounds, rivers and extensive coastal marshlands. The SJR provides access to both Commercial and Naval ports, and includes significant recreational use activities. Fort George Inlet is an important network of tidal creeks, channels and waterways that receive daily tidal inundation. Nutrient exchange between ocean and river-transported detritus makes saltwater marshes a significant area of primary production and provides an invaluable nursery habitat for commercial and recreational fish species. Marshes and coastal hammocks located on the uplands are part of the Atlantic flyway that provides winter stopover areas for migratory birds.

The SJR passes through six counties that represent part of the Lower St. Johns River Basin (LSJRB) of the St. Johns River Water Management District (SJRWMD). The basin consists of an area about 2,777 square miles encompassing mainly Volusia, Flagler, Putnam, St. Johns, Clay, and Duval Counties. In the COJ, the width of the river varies greatly from less than 1 mile in the downtown area and towards the mouth, to as much as 3 miles in the main stem of the river south of downtown. There are numerous tributaries that contribute to about 1000 miles of shoreline within the County. Water depth, shoreline topography, and river channel morphology vary significantly depending on the location. In the narrower section of the SJR from downtown to the mouth, there is significant Port activity and associated commercial vessel traffic. The river provides an important economic base for the community. The channel consists of a 21 mile stretch of the river from the mouth at the Atlantic Ocean to the Jacksonville Port Authority's Talleyrand Marine terminal just north of downtown Jacksonville. The port operates 24-hours, 7 day-a-week with no bridge restrictions except for cruise ships greater than 180 feet in height. Naval Air Station Mayport is located at the mouth of the SJR and serves as the second largest Atlantic fleet operation in the nation. The confluence of the SJR and the Intracoastal Waterway (ICW) occurs a short distance to the west of Mayport.

South of downtown, in the wider main stem of the SJR is Naval Air Station Jacksonville which serves mainly aircraft type operations. This southern section of the SJR in the COJ is less industrialized and more residential than the section previously described above. In general, land-based commercial working water fronts tend to be positioned towards the mouth of tributaries. The narrowing of the SJR as it flows north into the downtown area has a funneling effect and the current can be on the order of several knots depending on the tide. This is in contrast to the rest of the SJR with its headwaters 30 feet above sea level and a gradient of about one inch per mile. Most of that drop actually occurs in the beginning 100 miles of the SJR. As a result, the river water is relatively slow moving, retention times may be several months, and reverse flows up to 160 miles upstream can occur under the right tide and weather conditions. Reverse flows are a daily phenomenon, but some net reverse flows can persist for several weeks depending on larger weather events like hurricanes and northeasters. The SJR discharges 5.4 billion gallons per day, but when combined with the effects of the tide, this can be as much as seven times more water volume. Tidal height varies from about six feet at the mouth near Mayport to less than

a foot at the Buckman Bridge. In general, the wet season is from June to October with the highest rainfall in September.

In the COJ, the SJR has the characteristics of a relatively well mixed estuary. As a result, salinity varies considerably with time and location. Salinity changes in the LSJRB are affected by seasonal rainfall, periodic droughts, and storm events. When salinity changes occur for an extended time period, this can lead to adverse impacts to the Submerged Aquatic Vegetation (SAV) and fauna, including manatees, which depend on this habitat. Excessive rainfall also affects color and sediment turbidity in the water column that can also adversely impact SAV. In the 1990's, SAV beds in the COJ occurred south of Sadler Point (west bank) and New Rose Creek (east bank). However, more recently grass beds have been severely depleted or disappeared completely in those areas likely due to droughts. South of the Buckman Bridge, the bed length on western SJR shorelines is longer because of less wave action caused by the prevailing winds and broader, shallower littoral edges compared to the east bank.

2.1.1.2 Protection Designations

Waters within the state are classified by Chapter 17-302, Florida Administrative Code (FAC), which provides "use" designations and defines the criteria for each use.

2.1.1.2.1 Class II Waters - Shellfish Propagation or Harvesting

Duval County contains four areas designated as Class II Waters. These waters lie within the boundaries of the Nassau River-St. Johns River Marshes Aquatic Preserves. The four areas are fully described in 17-302.600, Classified Waters, FAC. Management of shellfish harvesting in these waters is the responsibility of the Department of Agriculture and Consumer Services' (DOACS) Division of Aquaculture.

2.1.1.2.2 Aquatic Preserves

Nassau River-St. Johns River Marshes and Fort Clinch Aquatic Preserves (also referred to as the Timucuan Ecological Preserve), a State designation created in 1969 by the Board of Trustees of the Internal Improvement Trust Fund and subsequent acts by the Trustees and the State Legislature, is located in the northeast COJ (Figure 2). Specifically, Chapter 160-21 and 160-20 of the FAC control activities conducted in State-sovereignty submerged lands. Additionally, the intent of these acts and codes states "all sovereignty lands within the preserve shall be managed primarily for the maintenance of essentially natural conditions...the propagation of fish and wildlife and public recreation including hunting and fishing are deemed appropriate by the board and the managing agency." The FDEP is responsible for managing the Aquatic Preserve. The Nassau River-St. Johns River Marshes Aquatic Preserve is comprised of both estuarine and marine waters of exceptional biological and aesthetic value to the state. These aquatic preserves are a unique Florida representative of the "Sea Islands" usually associated with southern Georgia. A chain of sandy barrier islands, occasional inlets, and a combination of sounds, rivers, and extensive coastal marshland characterize these diverse landscapes. The preserve areas consist of vast salt marsh estuary with numerous interconnecting tidal creeks, and channels as well as minor uplands (tree islands). The Nassau River-St. Johns River Marsh Aquatic Preserve extends south from A1A and east from State Road 17 in Nassau County, to the St. Johns River in Duval County, which includes portions of the Nassau, Amelia, and Fort George Rivers. The preserve is bordered by two incorporated cities, Fernandina Beach and the COJ.

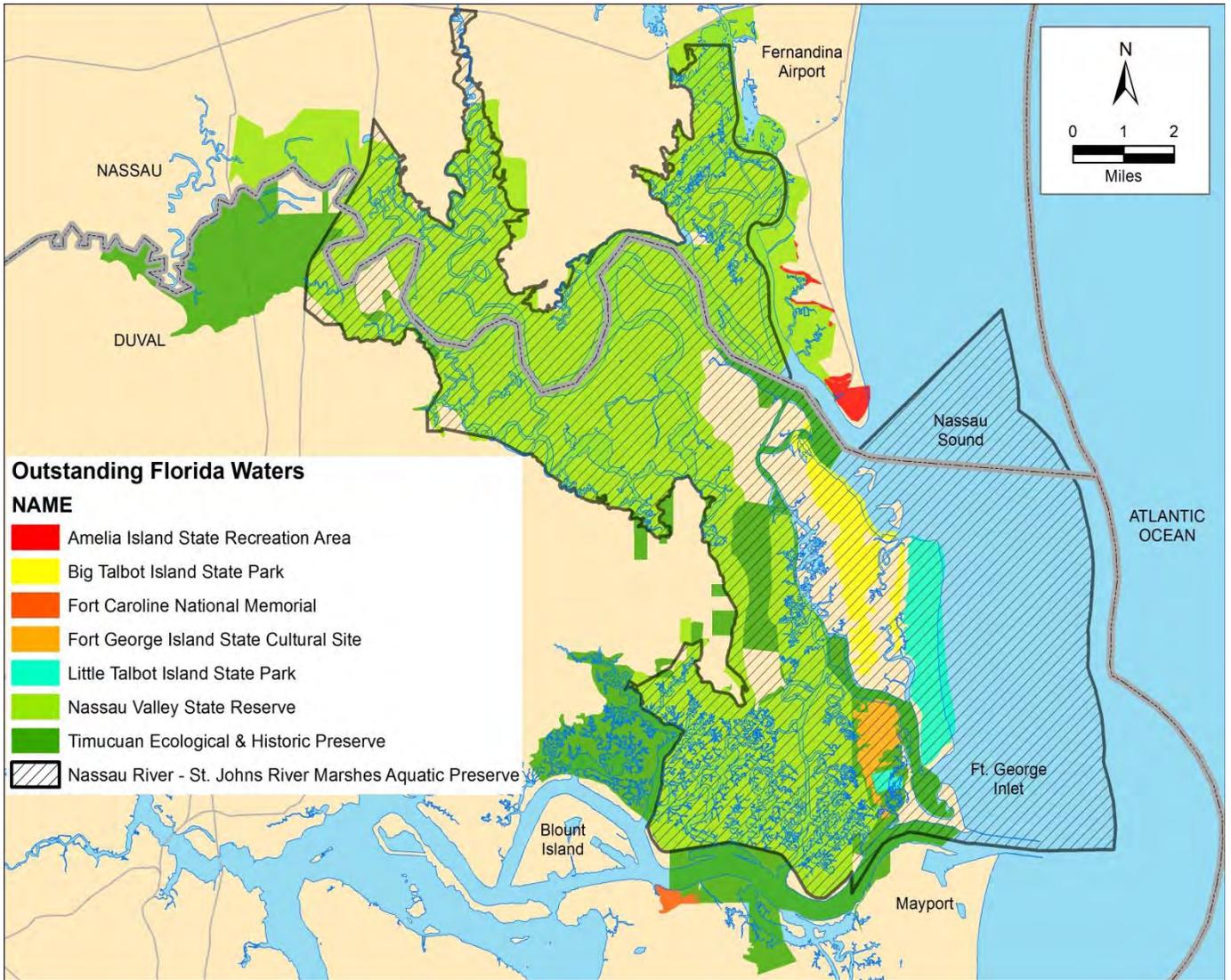


Figure 2: Location of Outstanding Florida Waters, City of Jacksonville (Duval County), Florida.

2.1.1.2.3 Manatee and Boating Safety Protection Zones

2.1.1.2.3.1 St. Johns River Safety and Security Zones

33CFR165.759: Information regarding restricted zones for safety and security for the Ports of Jacksonville, Fernandina, and Canaveral, Florida, is provided in The United States Coast Pilot 4, 43rd Edition, 2011 (Chapter 2. Navigation Regulations Vol. 4. Page 132). Those restricted areas in Duval County are illustrated in Figure 3.

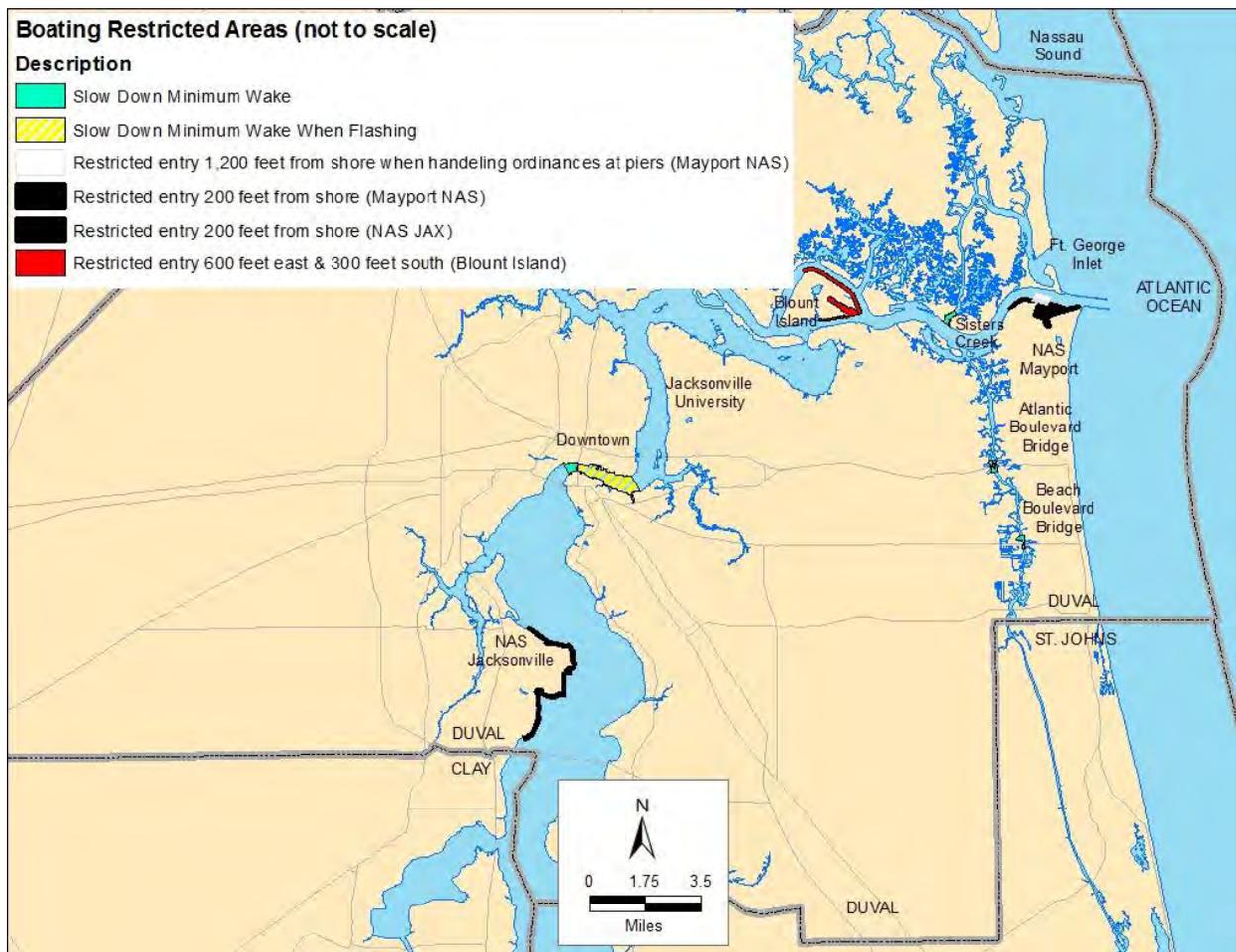


Figure 3: Location of Boating Restricted Areas, City of Jacksonville (Duval County), Florida.

2.1.1.2.3.2 Manatee Protection Zones

Manatee protection rules are rules that are established by FWC to restrict the speed and operation of vessels to protect manatees from harmful collisions with vessels and from harassment. The rationale for reducing vessel speeds to reduce risks to manatees is discussed in a peer-reviewed paper by FWC staff authored in 2007 (Calleson and Frohlich 2007). In areas that are especially important to manatees, the rules can prohibit or limit entry into an area as well as restrict what activities can be performed in the area. FWC is authorized to adopt these rules by the Manatee Sanctuary Act, 379.2431(2), Florida Statutes (FS). The rules appear in Chapter 68C-22 of the FAC. The rule process is started when the FWC evaluates all available information and determines that a new or amended rule may be warranted. The initial step of identifying an area to be evaluated can be undertaken internally by FWC or can be done by someone outside of FWC by submitting a request. The 2007 MMP describes the factors FWC considers when prioritizing areas to be reviewed. Many different factors are considered when the need for a rule is evaluated. The most important factors are typically the amount and types of manatee use and boating use in the area in light of the available habitat and waterway characteristics (depth, visibility, width of the waterway, etc.).

Local governments can also establish manatee protection zones through the adoption of a local ordinance. These zones must be approved by FWC before they can take effect, as required by 379.2431(2)(p), FS. Local manatee protection zones cannot include waters within the main marked channel of the Florida Intracoastal Waterway or waters within 100 feet thereof. In the COJ, Federal, State and local Manatee Protection Zones almost mirror the other agencies' zones so that the rules are less complicated for the boating public and manatee protection restrictions within the zone areas can be enforced by all the enforcement agencies.

Regulatory zones (Figures 4 - 8) are designated by signs along waterways. Signs provide information regarding the boundary of a zone, its regulated speed, and the area of regulation. Regulatory zones are to be enforced by the appropriate law enforcement agencies. The state Manatee Protection Zones in Duval County (68C-22.027 FAC) were last amended January 2007. The FWC Boating and Waterways section installs and maintains manatee protection zone signs. A program has been set up exclusively for receiving reports of missing or damaged signs and buoys (markers). Report of a damaged FWC sign or buoy can be submitted to FWC Boating and Waterways staff through the FWC waterway marker On-call Response Program via electronic report form submission at <http://www.myfwc.com/boating/waterway/markers/damaged-or-missing/report-form/> or calling 1-866-405-2869.

Good resources for Manatee Protection Zones in the area are: <http://myfwc.com/wildlifehabitats/managed/manatee/protection-zones/>, and <http://www.fws.gov/northflorida/Manatee/Documents/MPARules/index-federal-mpa-maps.htm> for the federal, state and local manatee protection zone details and definitions, refer to 50 CFR 17.102; 68C-22.027 FAC; and Jacksonville Ordinance Code Chapter 387.

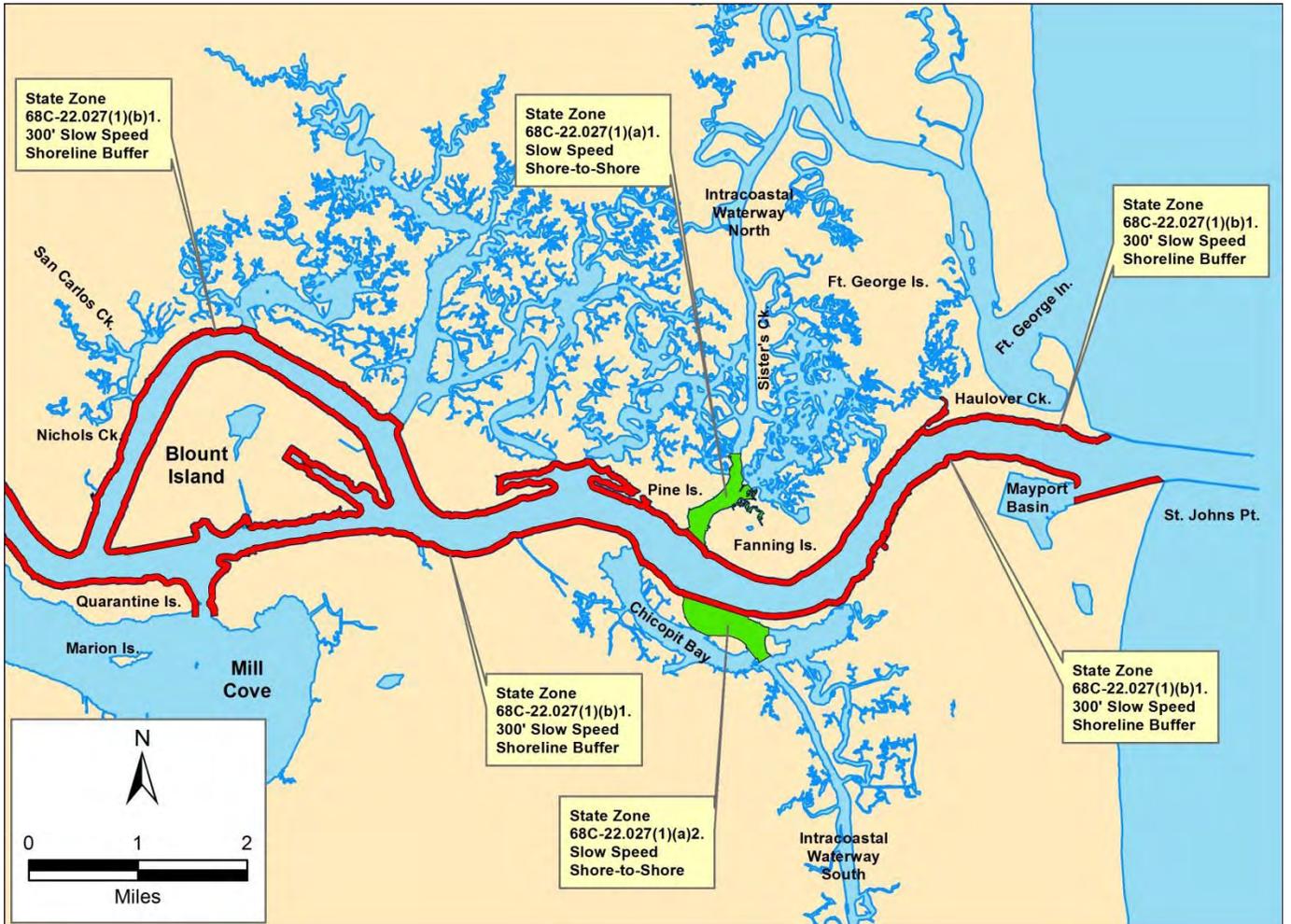


Figure 4: Federal, State and Local Manatee Protection Zones. Source: Jacksonville University.

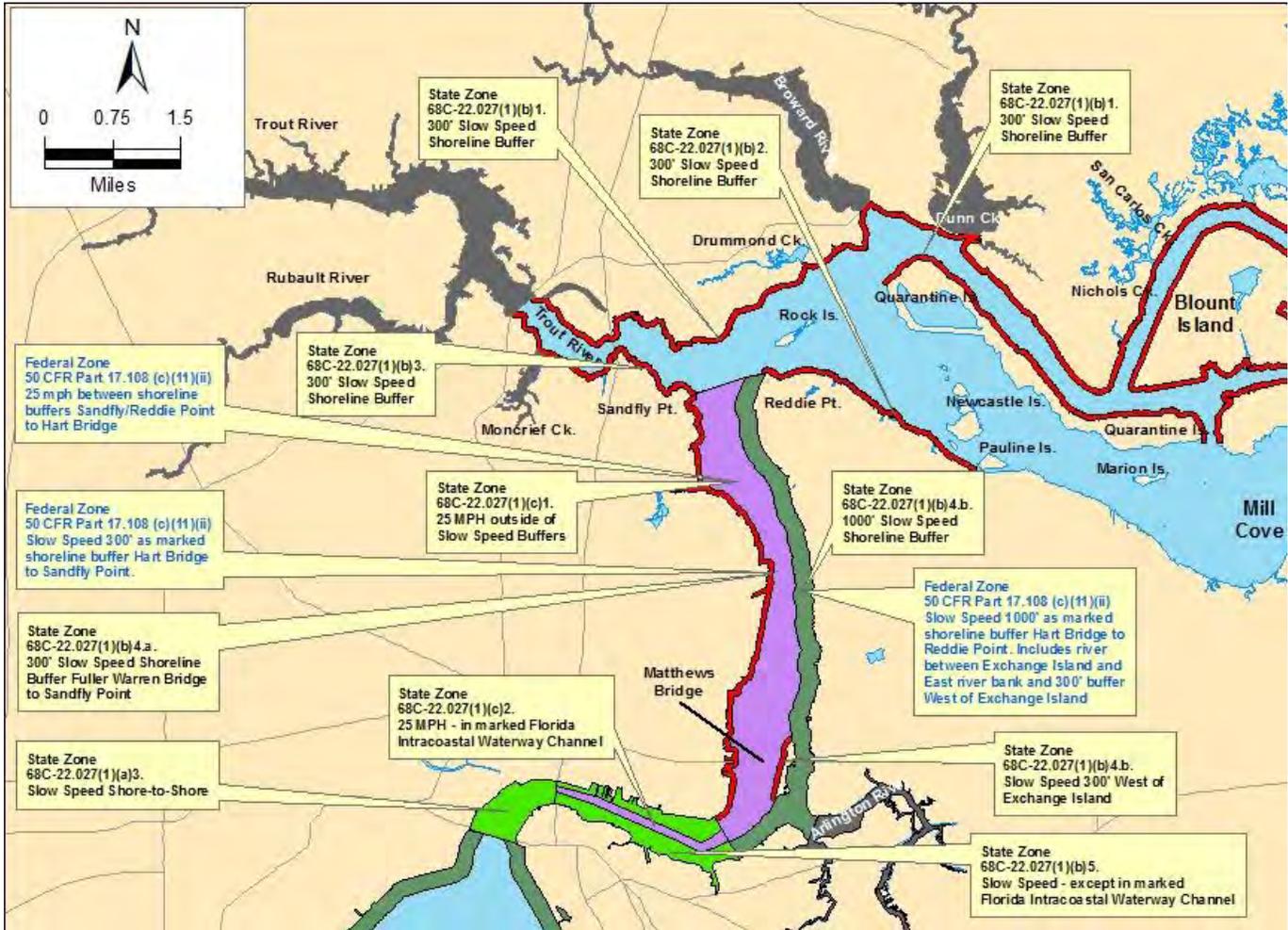


Figure 5: Federal (blue text), State and Local Protection Zones. Source: Jacksonville University.

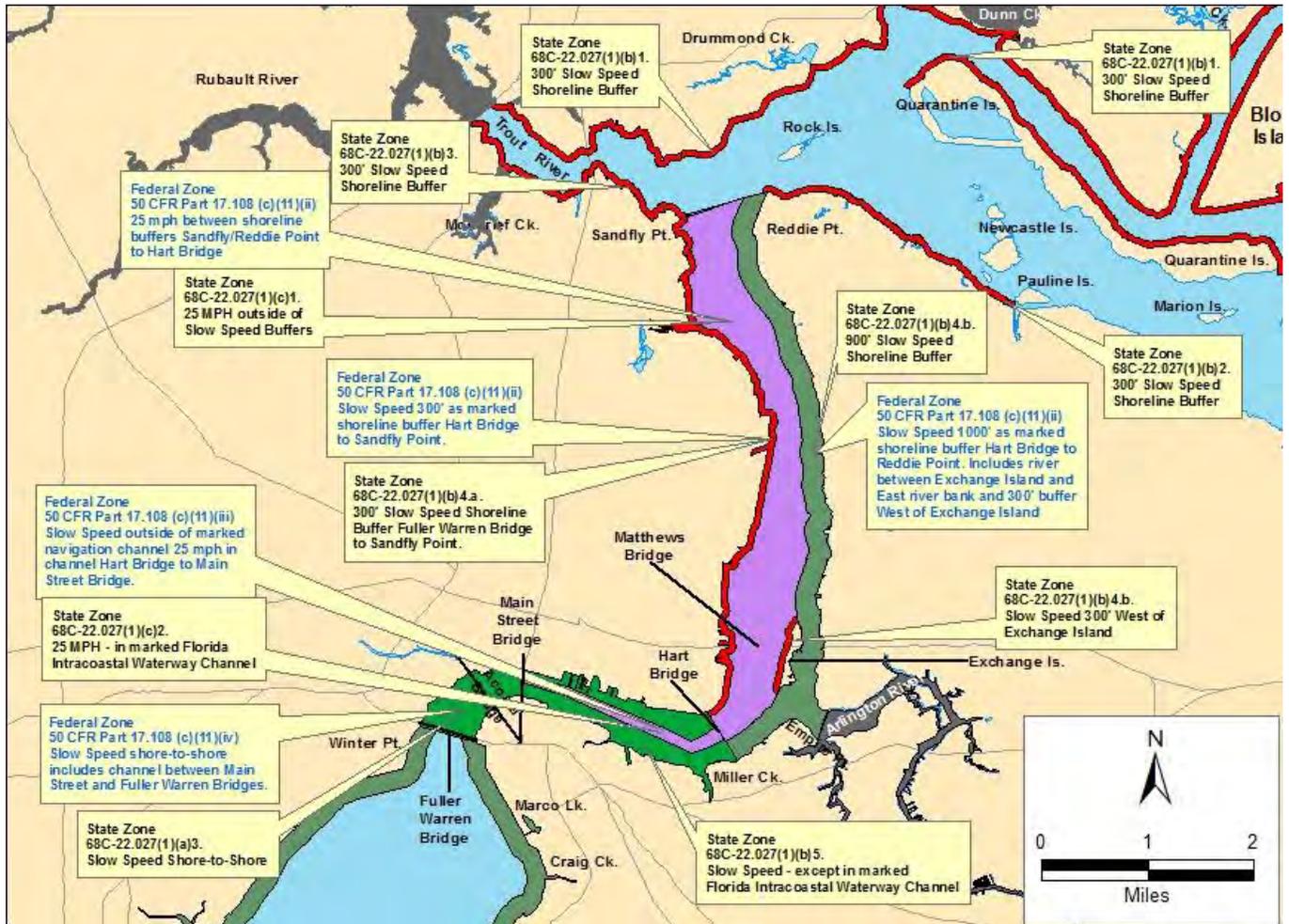


Figure 6: Federal (blue text), State and Local Manatee Protection Zones. Source: Jacksonville University.

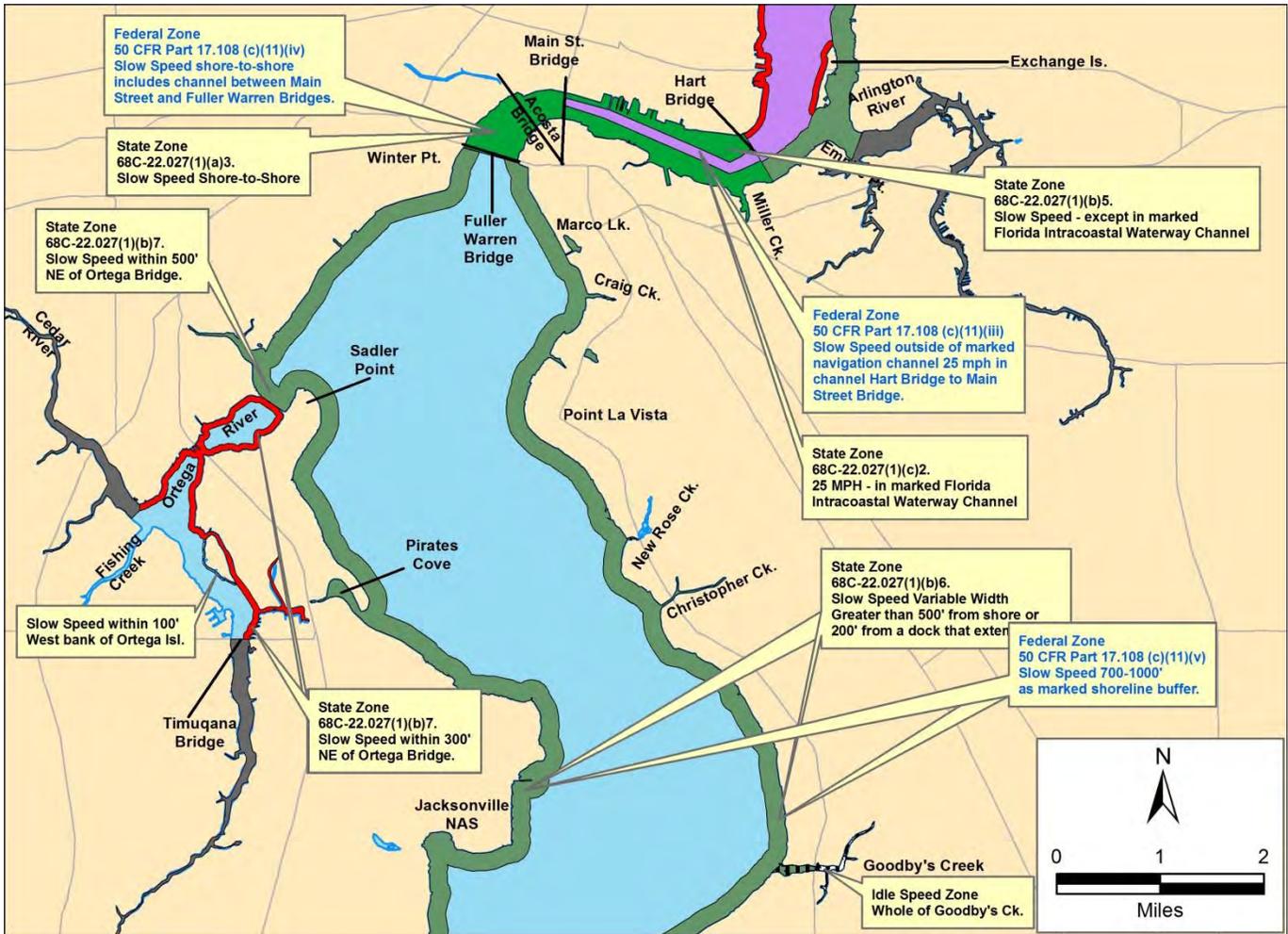


Figure 7: Federal (blue text), State and Local Manatee Protection Zones.

Solid grey shaded areas represent local Caution Manatee Awareness Zones. Source: Jacksonville University.

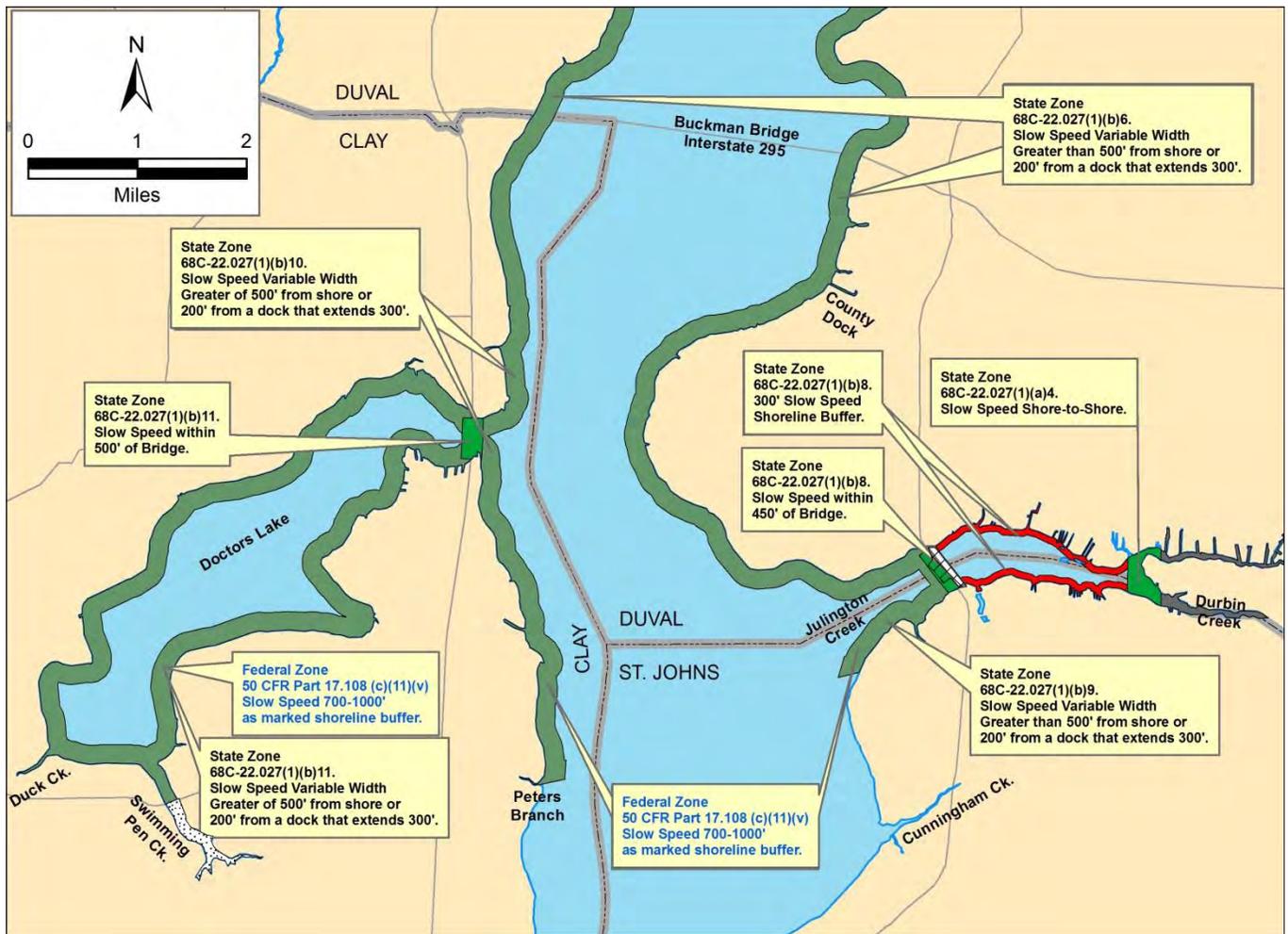


Figure 8: Federal (blue text), State and Local Manatee Protection Zones.

Solid grey shaded areas represent local Caution Manatee Awareness Zones. Grey and spotted shading represent county lines.
 Source: Jacksonville University.

2.1.1.3 Waterfront Parks

The COJ is committed to the protection of Northeast Florida’s environmentally sensitive lands. The Waterfront Management and Programming Division protects and maintains existing public lands that are environmentally sensitive and culturally significant. The division also operates nature preserves and parks, offers environmental education programs and takes the lead in restoring and managing fragile ecosystems. The Preservation Project Jacksonville, spearheaded by Former Mayor John Delaney, acquired about 40,000 acres of protected lands. In all, the addition of these lands contributes to 73,000 acres of the COJ’s park system, making the COJ the largest urban park system in the nation with 427 parks (Figures 9 and 10). From this number, 90 parks (11,475 Acres) are waterfront parks. Today the project is moving successfully into the next phase to provide public access to these beautiful areas while continuing to protect the lands. The COJ Parks and Recreation Department is responsible for the city-owned parks, preserves, entertainment facilities, pools, marinas and waterfront facilities.

No.	Name	Address	Zip	Min Acres	Type
1	Alimacani Boat Ramp	11080 Heckscher Dr.	32226	39.230	Preservation
2	Alimacani Fish Camp	11080 Heckscher Dr.	32226	0.987	Boat Ramp
3	Arlington Boat Ramp	5130 Arlington Rd.	32211	0.744	Boat Ramp
4	Arlington Lions Club Park	4322-1 Richard Denby Gatlin Rd.	32277	36.010	Community
5	Bee Street Park	720 South Shores Rd.	32207	8.335	Undeveloped
6	Bert Maxwell Boat Ramp	500 Maxwell Rd.	32218	4.352	Boat Ramp
7	Betz Tiger Point Preserve	13990 Pumpkin Hill Rd.	32226	548.000	Preservation
8	Big Pottsburg Creek Preserve	7440 Holiday Rd.	32216	48.390	Preservation
9	Blue Cypress Park	4012 University Blvd. North	32277	119.828	Regional
10	Castaway Island Preserve	2885 San Pablo Rd. South	32224	49.140	Preservation
11	Cedar Point Preserve	7116 Cedar Point Rd.	32226	93.000	Preservation
12	Charles Reese Memorial Park	1200 Ken Knight Dr.	32208	3.554	Neighborhood
13	Cherry Street Park	1865 Cherry St.	32205	0.066	Neighborhood
14	Dames Point Park	9101 Dames Point Rd.	32226	9.100	Community
15	Dutton Island Preserve	2001 Dutton Dr.	32233	8.000	Preservation
16	Elizabeth Park	1886 Elizabeth Place	32205	0.117	Neighborhood
17	Exchange Club Island	5020 Arlington Expressway	32211	33.385	Undeveloped
18	Forest St.Park	505 Alfred Dupont Place	32202	1.840	Neighborhood
19	Fort Caroline Club	4131 Ferber Rd.	32277	1.252	Community
20	Friendship Fountain	1015 Museum Circle	32207	10.920	Specialty
21	Fuller Warren Green space	750 Riverside Ave.	32202	2.800	Community
22	Fulton Road Landing	5099 Fulton Rd.	32225	0.550	Boat Ramp
23	Goodby's Lake Boat Ramp	9020 San Jose Blvd.	32257	4.045	Boat Ramp
24	Greenridge Park	3850 San Jose Blvd.	32207	2.865	Neighborhood
25	Grove Park	1500 Grove Park Blvd.	32216	11.310	Neighborhood
26	Half Moon Island Park	17850 Main St.	32218	244.510	Preservation
27	Harborview Boat Ramp	4100 Harborview Dr.	32208	1.237	Boat Ramp

No.	Name	Address	Zip	Min Acres	Type
28	Heckscher Drive Center	9364 Heckscher Dr.	32226	1.295	Community
29	Helen Cooper Floyd Park	3600 SR A1A	32233	78.180	Community
30	Hood Landing Boat Ramp	12925 Hood Landing Rd.	32223	0.392	Boat Ramp
31	Huguenot Memorial Park	10980 Heckscher Dr.	32226	363.56	Regional
32	Intracoastal Boat Ramp	2510 Second Ave.	32250	1.942	Boat Ramp
33	Jim Rink Park	801 Cedar St.	32207	0.260	Neighborhood
34	Joe Carlucci (Sisters Creek) Boat Ramp	8414 McKenna Dr.	32226	3.210	Community
35	John Stockton Elementary Park	4827 Carlisle Rd.	32210	7.500	Neighborhood
36	Julington-Durbin Creek Preserve	13130 Bartram Park Blvd.	32223	2055.000	Preservation
37	Kids Kampus	1410 Gator Bowl Blvd.	32202	9.593	Specialty
38	LaSalle St. Pocket Park	801 LaSalle St.	32207	0.270	Neighborhood
39	Lighthouse Marine Boat Ramp	5434 San Juan Ave.	32210	1.259	Boat Ramp
40	Lonnie C Miller Park	7689 Price Lane	32208	102.100	Regional
41	Lonnie Wurn Boat Ramp	4131 Ferber Rd.	32277	3.311	Boat Ramp
42	Mandarin Park	14780 Mandarin Rd.	32223	36.926	Community
43	Memorial Park	1620 Riverside Ave.	32204	5.850	Neighborhood
44	Metropolitan Park	4110 Gator Bowl Dr.	32202	19.330	Regional
45	Michael B. Scanlon Boat Ramp	4870 Ocean St.	32233	6.042	Boat Ramp
46	Nathan Krestul Park	2001 LaVaca	32217	1.888	Neighborhood
47	New Berlin Boat Ramp	9100 Frederick Rd.	32226	0.150	Boat Ramp
48	Northbank Riverwalk	201 East Coastline Dr.	32202	8.628	Specialty
49	Northshore Park	7901 Pearl St.	32208	2.617	Neighborhood
50	Norwood Park	6919 Norwood Dr.	32208	3.958	Neighborhood
51	Oak Harbor Boat Ramp	2428 Seaway St.	32233	4.041	Boat Ramp
52	Palmer Terrace	1100 Palmer Terrace	32207	0.350	Neighborhood
53	Palms Creek Fish Camp	6359 Heckscher Dr.	32226	2.000	Preservation
54	Reddie Point Preserve	4499 Yachtman Way	32277	101.800	Preservation
55	Ribault River Preserve	3250 Clyde Dr.	32208	39.000	Preservation
56	Ribault River Preserve Expansion	2617 Ribault Scenic Dr.	32208	2.560	Preservation
57	Ringhaver Park	5198 118th St.	32244	575.988	Regional

No.	Name	Address	Zip	Min Acres	Type
58	River Oaks Park	1000 River Oaks Rd.	32207	10.263	Community
59	Riverfront Park	901 Landon	32207	0.100	Neighborhood
60	Riverview Park	9555 Water St.	32208	10.151	Community
61	Rolliston Park	7505 Rolliston Rd.	32208	1.699	Neighborhood
62	Seminole Park	4170 McGrits Blvd.	32210	2.322	Neighborhood
63	Signet Park	197 West 67th St.	32208	0.194	Neighborhood
64	Sisters Creek Marina	8203 Heckscher Dr.	32226	22.656	Community
65	Southbank Riverwalk	1001 Museum Circle	32207	6.228	Specialty
66	St. Johns Marina	901 Museum Circle	32207	3.722	Boat Ramp
67	St. Johns Park	1403 Riverplace Blvd.	32207	0.100	Neighborhood
68	Stinson Park	450 San Juan Ave.	32210	1.945	Neighborhood
69	Stockton Park	4021 Ortega Blvd.	32210	3.214	Neighborhood
70	T.K. Stokes Boat Ramp	2120 Riverview St.	32208	2.520	Boat Ramp
71	Verona Park	7155 San Jose Blvd.	32217	9.689	Neighborhood
72	Walter Jones Historical Park	11964 Mandarin Rd.	32223	11.051	Specialty
73	Wayne B. Stevens Boat Ramp	4555 Ortega Farms Blvd.	32210	4.190	Boat Ramp
74	Westside Regional Park	7000 Roosevelt Blvd.	32244	356.732	Regional
75	Yacht Basin Park	2941 St. Johns Ave.	32205	1.739	Neighborhood

Figure 9: City Owned Parks, Duval County, Florida.

Number in table corresponds to a specific park or boat ramp on the following map. Source: COJ Parks, February 2014.

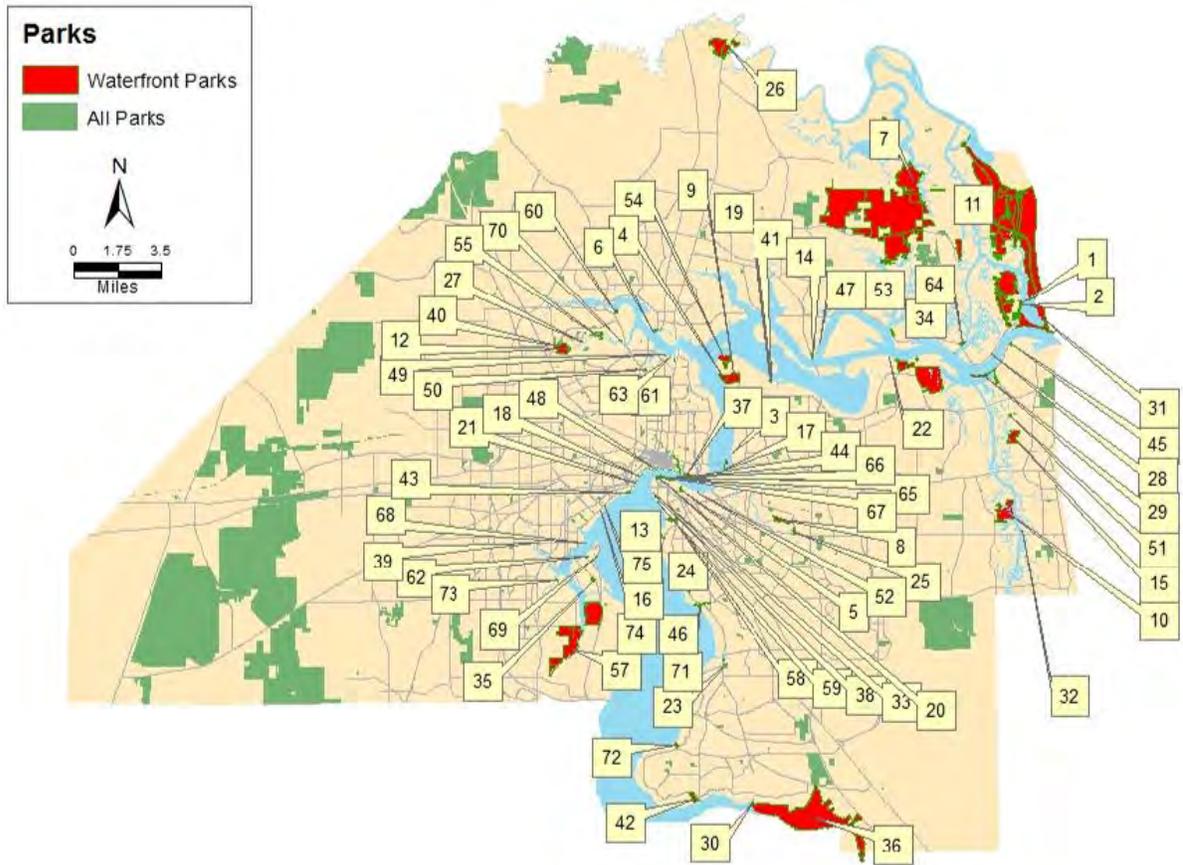


Figure 10: Duval County Parks (2009). Details see Figure 9.

Timucuan Trail State and National Parks is a unique co-op between the COJ, State of Florida and National Park Service. The group of parks includes some of the last unspoiled coastal wetlands on the Atlantic Coast and preserves the area's rich historic and prehistoric sites. Hiking, biking, and kayak trails weave through the seamless system of parks, giving visitors a rare view of pristine marshland, coastal dunes and maritime hammocks. The Timucuan Preserve encompasses 46,000 acres, 75 percent of which are waterways and wetlands forming an estuarine system where the Nassau and SJR rivers meet the Atlantic Ocean. Virtually the entire area is within the COJ, offering a large open area for recreation and the protection of natural and cultural resources within a major metropolitan center. A part of the parks Memorandum of Agreement reads: "To the extent practicable, [the partners] mutually agree to commit staff, equipment and facilities ... for the common protection of all resources contained in the Cooperative Zone, as well as for the appropriate enjoyment and appreciation of the same by the public." The following parks, preserves and facilities are located within the partnership area:

- Kingsley Plantation - National Park Service (NPS)
- Ribault Clubhouse - Florida Park Service (State)
- Ft. George State Cultural Park - State
- Ft. Caroline National Memorial - NPS
- Huguenot Memorial Park - City of Jacksonville (City)
- Rollins Bird Sanctuary - State
- Big Talbot Island State Park - State
- Little Talbot Island State Park - State

- Theodore Roosevelt Preserve - NPS
- Sisters Creek Marina - City
- Betz Tiger Point Preserve - City
- Cedar Point Preserve - NPS/City
- Thomas Creek Preserve - City
- Hanna Park - City
- Broward Islands - NPS
- Alamicani Island - City
- Bird Island - City

2.2 Land Use

Land Use is a general vision for the development of the City. Broad vision statements found in a land use plan are translated into a map, the Future Land Use Map (FLUM), to produce a visual representation of the intended development pattern for the COJ. The City's Comprehensive Plan regulates this growth and development through a series of goals, objectives, and policies. The COJ has numerous land use classifications that fall into larger categories such as Residential, Industrial, Commercial, etc. Each classification has a list of primary and secondary uses, development characteristics and allowable densities for each area, and a list of appropriate supporting uses.

2.2.1 Zoning

Zoning is the tool used to implement the vision or the FLUM. Zoning provides the details for what we see on the ground; including the type of uses, number, height and location of buildings on a parcel, and similar. Zoning provides the standards and regulations that apply to land and structures in the City of Jacksonville. These standards and regulations help implement the City's Comprehensive Plan. The COJ has numerous zoning districts. Each one has a list of permitted uses and standards for building setbacks, densities, and heights. Some have specific design guidelines. Please refer to the Zoning Code, on www.coj.net, for details on each classification.

2.2.2 Working Waterfronts

The COJ has only one area officially designated a working waterfront. In 1997, Mayport became a Waterfront Florida Partnership Community. The Mayport Village contains commercial fishing, a public boat ramp, and seafood processing and fish-house facilities. The commercial fishing facilities are not associated with JaxPort and represent a part of Florida's history and culture threatened by urban development. Loss of commercial and recreational waterfront to residential development may have long term adverse economic impacts on the local economy.

2.3 Local, Federal and State Manatee Protection Provisions and Requirements

2.3.1 COJ Manatee Protections

Aquatic life in the SJR and its tributaries is addressed in the Conservation Coastal Management Element of the 2030 Comprehensive Plan, along with endangered, threatened and species of special concern. It is the intent of the COJ to promote the responsible management of its coastal areas and the protection of wildlife and natural habitat. The COJ recognizes the need for natural resource protection. It is one of the most beneficial efforts the COJ can institute for the preservation of the manatee and its habitat. The

Environmental Quality Department is tasked with preserving, conserving, protecting and improving the quality of all waterways in the City. They also manage, preserve and enhance viable native ecological communities in order to protect and improve the functions of natural systems and the distribution, productivity and diversity of native plants, animals and fisheries, particularly those species which are endangered, threatened, of special concern, or have high ecological, recreational, scientific, educational, aesthetic, or economic value.

The COJ 2030 Comprehensive Plan provides the goals, objectives, and policies to guide future development and conservation activities in the COJ. There are several goals, objectives and policies in the Coastal Element of the Jacksonville 2030 Comprehensive plan that are relevant to manatee and manatee habitat protection. The COJ Comprehensive Plan will be amended to be consistent with this MPP. This MPP shall be adopted by reference to the Coastal Management Element of the 2030 Comprehensive Plan. The MPP is part of the Background Data and Analysis of the Comprehensive Plan and was enacted by the Jacksonville City Council pursuant to local ordinance. Pending amendment of the COJ 2030 Comprehensive Plan by adoption of this MPP as an element of the plan, the Comprehensive Plan strategies related to manatee protection can be found in the Conservation/Coastal Management Element of the 2030 plan.

In considering the construction, expansion or renovation which changes structures or adds boat slips to a boat facility, the landowner or developer must submit the proposal to the COJ Planning and Development Department for initial review to determine consistency with the Comprehensive Plan. The purpose of this is to determine if development presents unfavorable impacts in relation to such issues as the improvement, development and protection of the SJR and its tributaries. Moreover, the COJ Planning Commission will oversee and verify the findings of the Planning and Development Department. The primary responsibility for permitting boat facilities within the COJ lies at the State and Federal level. Because of the limited regulatory responsibility at the city level, manatee protection efforts in local waterways focuses on manatee protection zone enforcement, habitat restoration and environmental enhancement programs, population monitoring, and education. However, activities in COJ parks are regulated through Jacksonville Ordinance Code Chapter 28, and Ordinance Code Chapter 191 regulates special events in the city. It may be possible to include manatee protection elements and considerations on permits issued under these Chapters of the Ordinance Code.

The COJ Waterways Commission acts as a coordinating agency and specialized advisor for governmental units and for programs and activities affecting the improvement, development and protection of the SJR and all tidal waters in the city. The Commission is charged to formulate an overall plan for dealing with any problems that exist in the SJR and city tidal waters, study and make recommendations to the City Council with respect to the improvement, development and protection of the SJR and weighs in on decisions in developing future public uses of those waterways. The Commission also serves as the COJ committee to review rules proposed by the FWC governing operation of motorboats to protect manatees.

2.3.2 Federal Endangered Species Act, 1973

This Act protects endangered and threatened species and their habitat at the national level and is administered by USFWS and National Marine Fisheries Service (NMFS) in cooperation with State agencies.

2.3.3 Federal Florida Manatee Recovery Plan

Early efforts by the State of Florida to assist in manatee recovery were guided by the federal Florida Manatee Recovery Plan, first produced in 1980. The USFWS listed the manatee as a federal endangered

species and the federal recovery plan detailed the actions needed to protect and recover the manatee population. The plan also prioritized the tasks and assigned them to the most appropriate entity, such as federal or state agencies or other partner organizations. State personnel have historically assisted with the federal manatee recovery plans and continue those efforts today.

2.3.4 Federal Marine Mammal Protection Act, 1972

The Marine Mammal Protection Act (MMPA) was enacted by Congress in 1972 as a reaction to the concern that certain marine mammals may be in danger of extinction or depletion as a result of man's activities. The MMPA is primarily implemented by the USFWS and the NMFS. This Act protects manatees from harassment, injury, molestation, capture, collection, and/or killing - akin to the *Endangered Species Act, 1973*. The Marine Mammal Commission administers this Act and has the authority to establish refuges and sanctuaries.

2.3.5 Title 33 Code of Federal Regulations Part 100 (33 CFR 100) – Safety of Life on Navigable Waters

This section of the Code of Federal Regulations regulates marine events which will introduce extra or unusual hazards to safety on navigable waters in the United States. US Coast Guard Marine Event permits are issued under this section of the CFR. Examples of events that may require a 33 CFR 100 permit include fireworks displays on or near a waterway, marine parades, regattas, boat races, etc. These permits may include manatee protection event planning and procedure requirements.

2.3.6 State of Florida, Florida Manatee Sanctuary Act, 1978

This Act established Florida as a refuge and sanctuary for manatees. It protects manatees from injury, disturbance, harassment or harm in the waters of Florida and allows for enforcement of boat operations in areas where manatees are concentrated. The FWC is responsible for enforcement.

2.3.7 Article IV, Section 9, State of Florida Constitution

The FWC has State constitutional authority over Florida's wild animal life, freshwater aquatic life, and marine fish. The FWC was created in 1999 by a Florida constitutional amendment that passed in November 1998. Article IV, Section 9, states in pertinent part:

The commission shall exercise the regulatory and executive powers of the state with respect to wild animal life, fresh water aquatic life, and shall also exercise regulatory and executive powers of the state with regard to marine life, except that all license fees for taking wild animal life, fresh water aquatic life, and marine life and penalties for violating regulations of the commission shall be prescribed by general law. In 2003, the Florida Supreme Court interpreted Chapter 99-245, Laws of Florida, which implemented the FWC. The Supreme Court upheld Chapter 99-245, and concluded that the FWC has constitutional authority over the wild animal life, freshwater aquatic life and marine fish, but the FWC is subject to statutory authority when regulating endangered or threatened marine life, specifically manatees, sea turtles, and whales. *See, Caribbean Conservation Corporation v. FWC, 838 So.2d 492 (Fla. 2003).*

2.3.8 State of Florida Water Resources Act of 1972

This act defines the State of Florida's authority to permit use of the State's surface waters and wetlands. Use can be permitted if public interest standards defined in the statute are met. An element of the public interest test is whether an activity will adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats. FWC comments to state regulatory agencies about

possible adverse effects to the conservation of fish and wildlife is a required element of the surface water and wetland use permitting process.

2.3.9 Manatee Protection Plans

From past experience, it is known that coastal development and activities such as dredge and fill projects, marina and boat ramp construction, marine events and even movie production can directly, secondarily and cumulatively harm manatees or their habitat. The FWC and USFWS provide recommendations to the state and federal permitting agencies to help reduce or eliminate potential negative effects to manatees. MPPs serve as valuable tools for planning future boat facility development and as guidance for the state and federal wildlife agencies in reviewing coastal construction permits for manatee impacts and habitat protection. The MPP recommendations provide long term, comprehensive guidelines that are implemented by the FWC and USFWS through their respective permit application review processes. Usually, a proposed activity that impacts Florida's surface waters is authorized to occur if special permit conditions are followed. Possible manatee protection permit conditions that may be recommended are listed in section five (5) of this MPP.

2.3.10 2007 Florida Manatee Management Plan

The MMP is a planning document that provides the framework for conserving and managing manatees in Florida. The plan addresses the key tasks outlined in the Federal Florida Manatee Recovery Plan (2001) and is complementary with that plan. The goal of all federal recovery plans is to remove the species from the list of federally endangered and threatened species. The Florida MMP differs from the federal recovery plan in that it will be used to guide management efforts to conserve the population even after the species is de-listed. If and when the threat of extinction is removed, the manatee will be actively managed by the FWC as protection under federal and state laws continue.

3 **Manatee Habitat**

3.1 **Submerged Aquatic Vegetation (SAV)**

SAV found in the LSJRB are primarily freshwater and brackish water species. Commonly found species include: tape grass (*Vallisneria americana*), water naiad (*Najas guadalupensis*), and widgeon grass (*Ruppia maritima*). Tape grass forms extensive beds when conditions are favorable. Water naiad and widgeon grass form bands within the shallow section of the SAV bed. Tape grass is a freshwater species that tolerates brackish conditions, water naiad is exclusively freshwater and widgeon grass is a brackish water species that can live in very salty water (Sagan, 2010; White, et al. 2002). Widgeon grass does not form extensive beds. It is restricted to the shallow, near shore section of the bed and has never formed meadows as extensive as tape grass even when salinity has eliminated tape grass and any competition, or other factors change sufficiently to support widgeon grass (Sagan, 2010). Other freshwater species include: muskgrass (*Chara sp.*), spikerush (*Eleocharis sp.*), water thyme (*Hydrilla verticillata*; an invasive non-native weed), baby's-tears (*Micranthemum sp.*), sago pondweed (*Potamogeton pectinatus*), small pondweed (*Potamogeton pusillus*), awl-leaf arrowhead (*Sagittaria subulata*) and horned pondweed (*Zannichellia palustris*) (UF/IFAS Center for Aquatic and Invasive Plants, 2007; Sagan, 2006; USDA, 2007).

The greatest distribution of SAV in the COJ is in waters south of the Fuller Warren Bridge (Kinnaird, 1983; Dobberfuhr, 2002; Dobberfuhr and Trahan, 2003; Sagan, 2004; Sagan, 2006; Sagan, 2007). SAV in the tannin-rich, black water SJR is found exclusively in four feet or less of water depth. Poor sunlight penetration prevents the growth of SAV in deeper waters. Dobberfuhr 2007, confirmed that the deeper outer edge of the grass beds occurs at about three feet in the LSJRB. Rapid regeneration of grass beds

occurs annually in late winter and spring when water temperatures become more favorable for plant growth and the growing season continues through September (Dobberfuhl, 2007; Thayer, et al., 1984). SAV beds, especially tape grass, are present year-round and are considered “evergreen” in Florida (Sagan, 2010).

Sunlight is vital for good SAV growth. Sunlight penetration may be reduced because of increased color, turbidity, pollution from upland development, and/or disturbance of soils. Deteriorating water quality has been shown to cause a reduction in SAV beds which leads to erosion and further deterioration of water quality. In addition to the amount of light, the frequency and duration of elevated salinity events in the river can adversely affect the health of SAV (Jacoby, 2010). In lab studies, Twilley and Barko 1990, showed that tape grass grows well from 0-12 parts per thousand of salinity and can tolerate water with salinities up to 15-20 parts per thousand for short periods of time. Also, SAV requires more light in a higher salinity environment because of increased metabolic demands (Dobberfuhl, 2007). Dredging to deepen the SJR channel for commercial and naval shipping in the COJ, has led to salt water intrusion upstream. The magnitude of this intrusion over time has not been well quantified. Further deepening is likely to impact salinity regimes that could be detrimental to the SAV beds. This is especially important if harbor deepening were to occur in conjunction with freshwater withdrawals from the SJR (SJRWMD, 2010).

SAV provides nurseries for a variety of aquatic life, helps to prevent erosion, and reduces turbidity by trapping sediment. Also, aquatic plants and SAV provide food for the Florida manatee (White, et al., 2002), with tape grass being a preferred food type (Bengtson, 1981; Best, 1981; Burns Jr, et al., 1997; Lomolino, 1977). Fish and insects forage and avoid predation within the cover of the grass beds (Batzer and Wissinger, 1996; Jordan, et al., 1996). Commercial and recreational fisheries, including largemouth bass, catfish, blue crabs and shrimp, are sustained by healthy SAV habitat (Watkins, 1995). Jordan 2000 and Sagan 2006, mentioned that SAV beds in LSJRB have three times greater fish abundance and 15 times greater invertebrate abundance than do adjacent sand flats.

The SJRWMD has conducted year-round sampling of SAV since 1998 at numerous stations along line transects of the SJR (1.25 miles apart) (Hart, 2011). The routine field sampling performed provides information about inter-annual relative changes in SAV by site and region. Normally, SAV bed length on western shorelines tends to be longer than on eastern shorelines; and this is likely because of less wave action caused by the prevailing winds and broader shallower littoral edges compared to the east bank. For the period 2008-2011, the data showed a declining trend in SAV bed parameters – this is in spite of some recovery in SAV beds condition in 2011. JU aerial survey observations of manatees and their habitat in the COJ continue to indicate decline in SAV bed coverage north of the Buckman Bridge (Bolles School to Buckman-east bank, and some parts from Naval Air Station – Jacksonville to Buckman-west bank, but not including Mulberry Cove). The availability of tape grass decreased significantly in the LSJRB during 2000-2001. This may be because the severe drought during this time caused higher than usual salinity values which contributed to high mortality of SAV. Factors that can adversely affect the SAV include excess turbidity, nutrients, and phytoplankton. SAV beds north of the Buckman Bridge regenerated from 2002-2006 and then declined again in 2007 due to the onset of renewed drought conditions (White and Pinto, 2006). Drought conditions ensued from 2009-2010, leading to a further decline in the SAV beds.

Continuation of long-term monitoring of SAV is essential to detect changes over time. SAV bed indices, along with water quality parameters, should be used to determine the current state of health. They can then be used to identify restoration goals of the SAV habitat, which will preserve and protect the wildlife and people who rely on the habitat for food, shelter and their livelihood. The most recent available data about SAV in the COJ waterways was collected by the SJRWMD and published in 2003.

Hyperspectral imagery was obtained and mapped for 2003 to determine SAV extents. Hyperspectral imagery was not obtained north of the Fuller Warren Bridge.

It appears that from 2009 to 2011, SAV beds have been severely depleted or disappeared completely in places north of the Buckman Bridge. Between 2009 and 2011 it was noted during observations from Jacksonville University (JU) aerial surveys of the COJ waterways that no SAV was encountered north of Sadler Point and Point La Vista. Moreover, SAV has declined from the Buckman Bridge north towards Sadler Point on the west bank and Point La Vista on the east bank. In 2011, SAV recovered to some degree on the east bank north of the Buckman Bridge, but remains well below past levels. On the following maps, areas where SAV was not detected or appeared to decline significantly during the 2009 to 2010 JU aerial surveys have been indicated by ovals with a red perimeter superimposed on the SAV maps from 2003 (Figures 11 - 16).

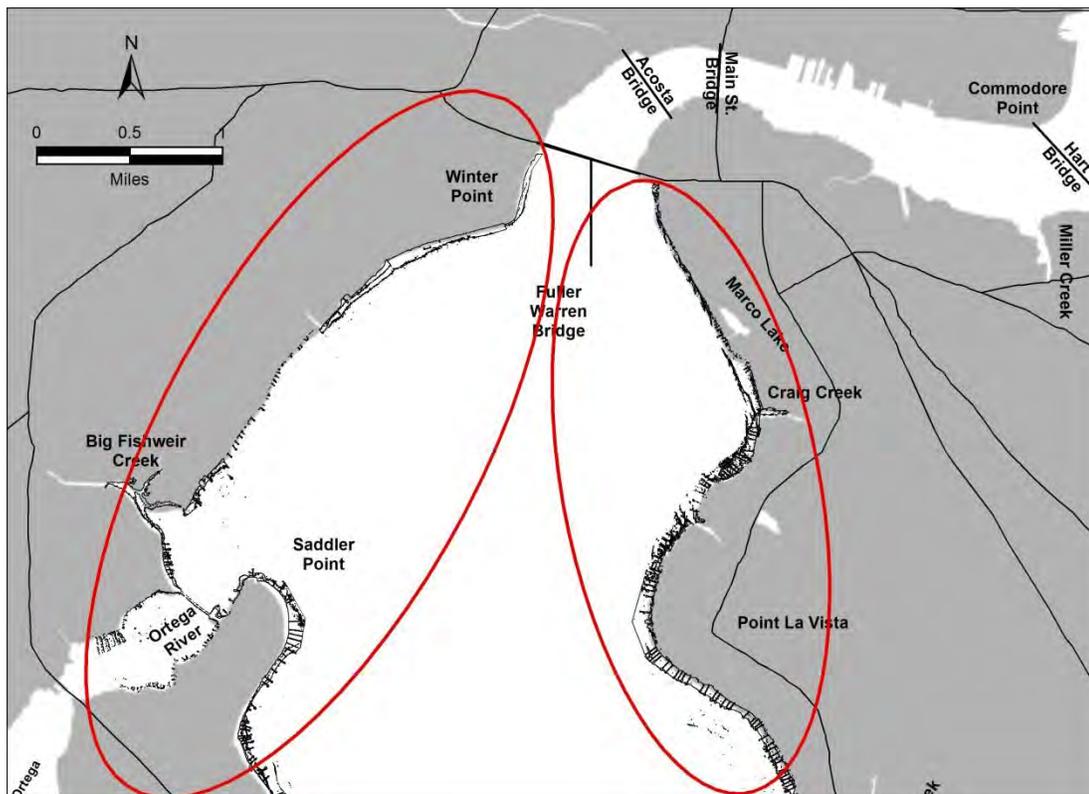


Figure 11: SJRWMD 2003 Hyperspectral mapping of emergent and submerged aquatic vegetation (black shaded areas) and no submerged aquatic vegetation (white polygons). Areas where SAV was not detected or appeared to decline significantly during the 2009 to 2010 JU aerial surveys have been indicated by ovals with a red perimeter. Map source Jacksonville University.

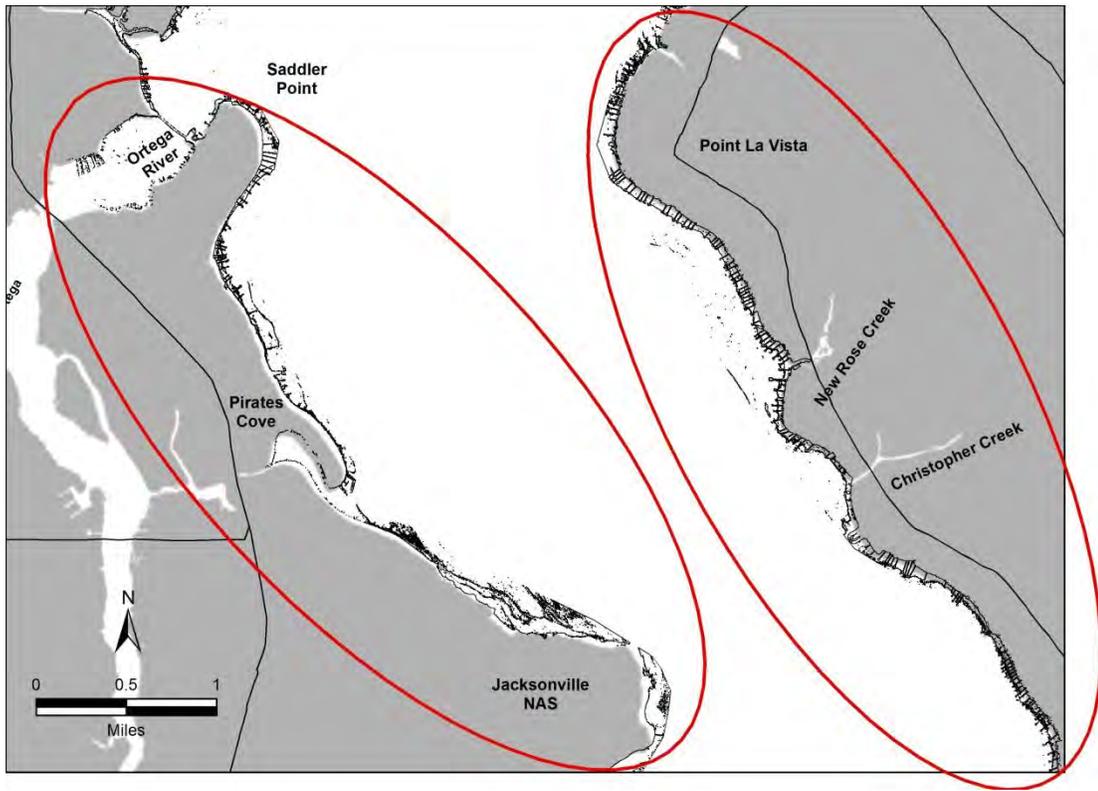


Figure 12: SJRWMD 2003 Hyperspectral mapping of emergent and submerged aquatic vegetation (black shaded areas) and no submerged aquatic vegetation (white polygons). Areas where SAV was not detected or appeared to decline significantly during the 2009 to 2010 JU aerial surveys have been indicated by ovals with a red perimeter. Map source Jacksonville University.

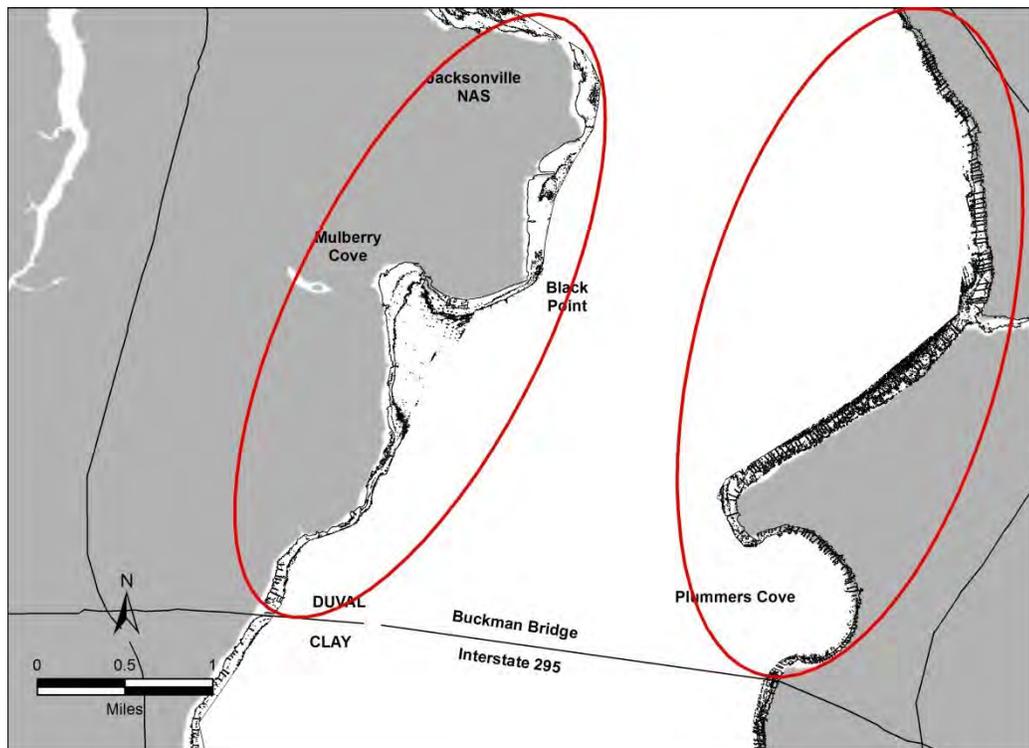


Figure 13: SJRWMD 2003 Hyperspectral mapping of emergent and submerged aquatic vegetation (black shaded areas) and no submerged aquatic vegetation (white polygons). Areas where SAV was not detected or appeared to decline significantly during the 2009 to 2010 JU aerial surveys, have been indicated by shaded ovals with a red perimeter. Map source Jacksonville University.

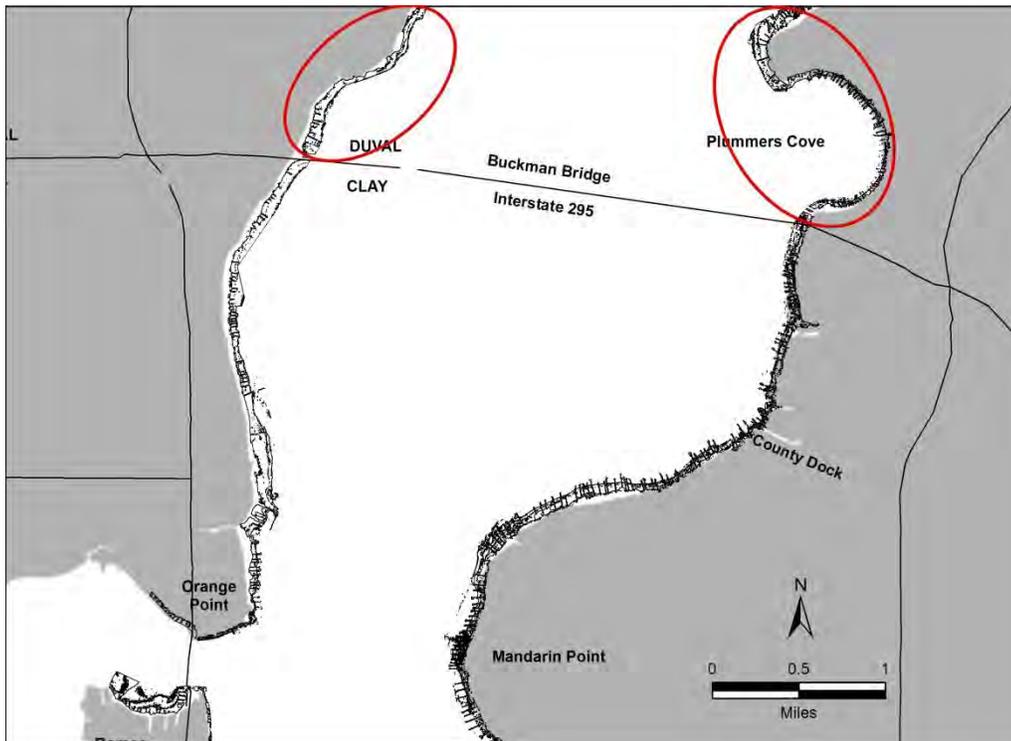


Figure 14: SJRWMD 2003 Hyperspectral mapping of emergent vegetation (black shaded areas) and no submerged aquatic vegetation (white polygons). Areas where SAV was not detected or appeared to decline significantly during the 2009 to 2010 JU aerial surveys have been indicated by shaded ovals with a red perimeter. Map source Jacksonville University.

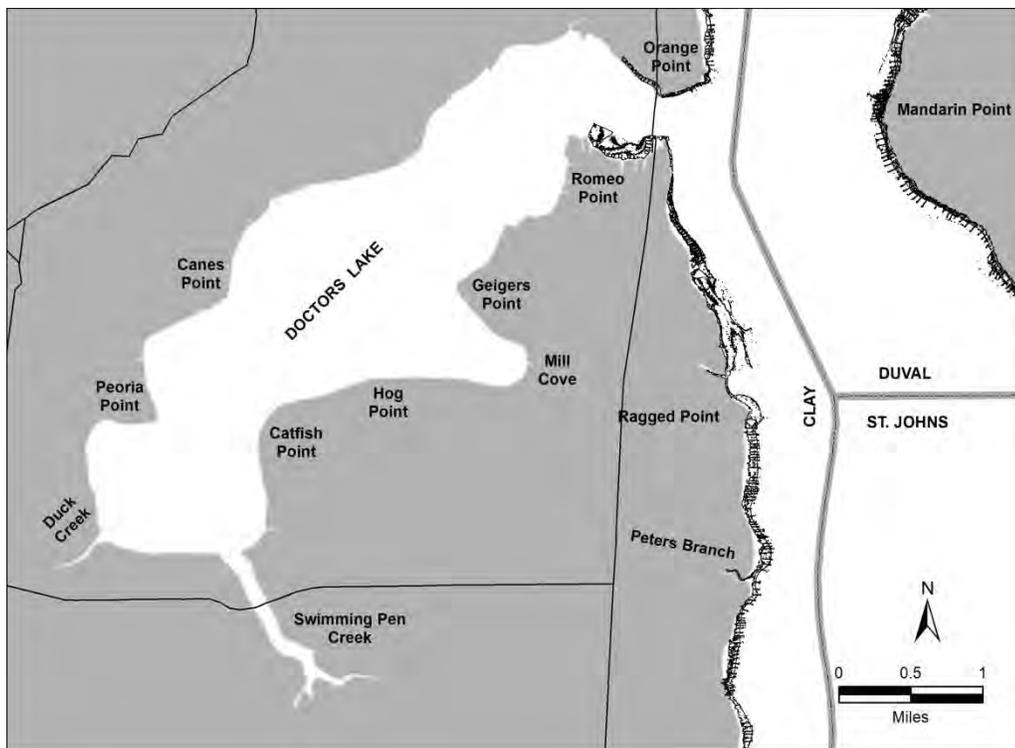


Figure 15: SJRWMD 2003 Hyperspectral mapping of emergent and submerged aquatic vegetation (black shaded areas) and no submerged aquatic vegetation (white polygons). Sampling was limited to the main stem of the St. Johns River. Map source Jacksonville University.

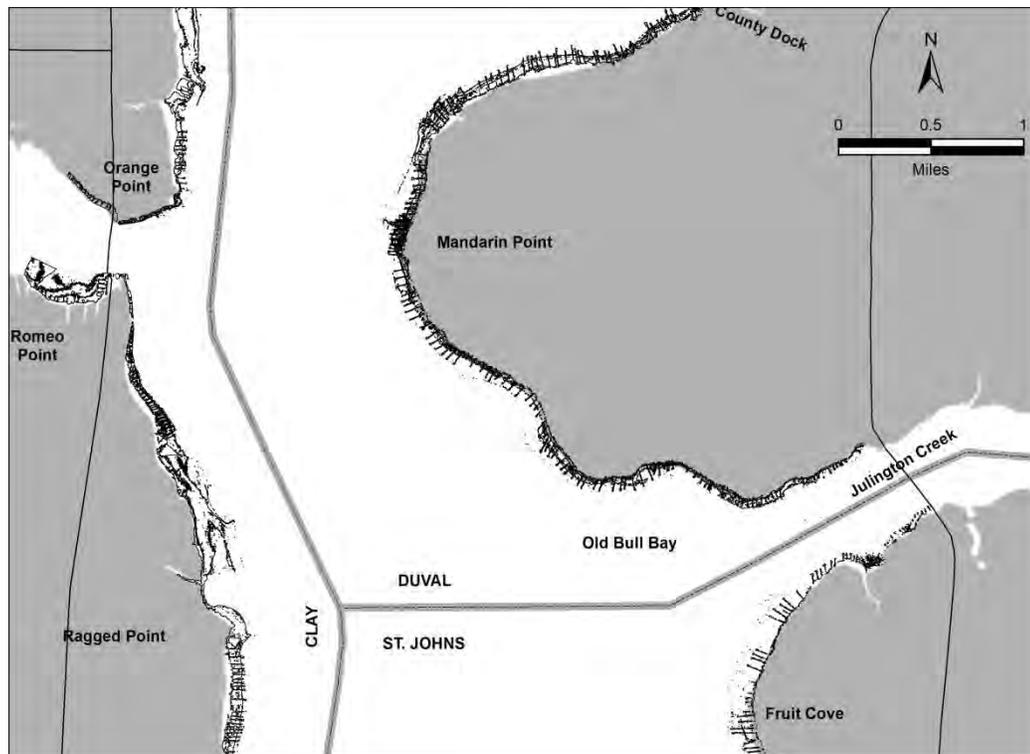


Figure 16: SJRWMD 2003 Hyperspectral mapping of emergent and submerged aquatic vegetation (black shaded areas) and no submerged aquatic vegetation (white polygons). Map source Jacksonville University.

3.2 Manatee Habitat

Florida manatees live in a variety of environments, from canal systems in densely populated urban settings to nearly pristine areas dominated by mangroves or salt-marsh habitats. They can tolerate a range of salinities, including freshwater rivers, estuarine bays, and marine coastlines. Manatees in estuarine or marine environments regularly seek freshwater sources to drink, such as creeks or industrial outfalls (Lefebvre et al., 2001). While foraging areas are typically considered to be preferred “manatee habitat,” manatees are, in fact, distributed over a variety of habitat types, including grassbeds, dredged basins, dredged channels, shoals/bars, tidal inlets, and open bays (Koelsch, 1997). A field study conducted to evaluate key habitat characteristics that may serve as either attractants or deterrents to manatees, revealed that distribution of animals at non-winter sites appears complex and involves many factors (Gorzelany and Koelsch, 1994). Manatees may be attracted to a location for a variety of reasons, and the level of importance of a specific characteristic may vary significantly from site to site. Levels of shelter, refuge, and/or retreat from human disturbance appear to be an important factor in site selection.

3.2.1 Submerged and Emergent Vegetation

Wetlands provide extremely beneficial functions including: maintaining water quality by filtering sediments and other pollutants, providing habitat for fish and wildlife, ensuring flood control, and contributing to recreational opportunities. Removal or destruction of natural vegetation disrupts natural filtration processes that protect water quality. Poor water quality damages many levels in the food web, which in turn affects fish and wildlife with commercial, recreational, or endangered species value, such as the manatee. Wetlands that are contiguous to tributaries and primary river channels are just as much a part of the river as the water itself. Emergent wetlands are dominated by saltmarsh grasses, *Juncus*

roemerianus (Black Needlerush) and *Spartina alterniflora* (Saltmarsh Cord Grass). Manatees are herbivores that feed on a variety of marine and freshwater vegetation (Smith, 1993). Manatees consume from 4-11% of their body weight daily, with tape grass being a preferred food type (Bengtson, 1981; Best, 1981; Burns Jr, et al., 1997; Lomolino, 1977). In addition to benthic foraging, manatees also feed on floating, emergent, and bank vegetation. Manatees have been observed feeding on both types of vegetation in the COJ. It has been estimated that free-ranging adult manatees spend from five (5) to eight (8) hours per day feeding (Hartman, 1979). Tape grass, the most important food source in the COJ, occurs most extensively south of the Buckman Bridge on both banks of the mainstem of the SJR; while little aquatic vegetation other than: cordgrass (*Spartina bakeri*), marsh grass, black needlerush, and floating mats of water hyacinth (*Eichhornia crassipes*), occurs in the SJR north of the Fuller Warren Bridge or in the ICW. The highest manatee aerial survey sightings are consistently recorded from the Buckman Bridge to Green Cove Springs (see Figure 20) where SAV is readily available; confirming that bottom cover by SAV is the best predictor of manatee presence. Manatee sightings are also high north of the Buckman Bridge; however, these manatees are not engaged in feeding behaviors but are mostly traveling, resting and cavorting. Salinity above about 10-12 ppt limits tape grass (Twilly and Barko, 1990). In years with lower precipitation, water salinity increases resulting in lower food availability which likely changes manatee behavior and distribution.

3.2.2 Warm-Water Habitat

Manatees cannot survive if exposed to water colder than about 17° Celsius (63° Fahrenheit) for extended periods, and prefer temperatures warmer than 22° Celsius (72° Fahrenheit) (USGS 2010). Because manatees are sensitive to cold temperature conditions, they are attracted to warm-water sources like the effluent produced from power plants and natural springs. Historically, groups of manatees were observed at COJ warm-water refugia during the early winter and late spring (Valade, 1991). Historical warm-water discharges within the COJ were associated with three power generating stations (Jacksonville Electric Authority (JEA) Northside, Southside and J.D. Kennedy Generating Stations) and two paper mills (Seminole Kraft and Jefferson Smurfit), see Figure 17. Most of these industrial sites provided warm-water refuges for manatees during periods of cold weather. Jefferson Smurfit in Fernandina, Florida also attracted manatees to Nassau County with a warm-water discharge. Researchers concluded that the COJ cold season manatee aggregation at industrial warm-water discharge sites were unstable and consisted of transient animals (Kinnaird and Valade, 1983).

The last of the facilities discharging warm-water into the SJR (JEA's Southside Generating Station) closed in October 2001. After closure of this facility, a limited number of manatees continued to migrate to the site during the cold months. There was a group of 11 adult manatees observed on an aerial survey near the JEA Southside Generating Station plant in November 2000, and one adult manatee at the same location in November 2001. Since that time, manatees were not seen near the historic COJ warm-water sites until the winter of 2011/2012. During the 2011/2012 and 2012/2013 winters manatees were observed aggregating in San Carlos Creek near the JEA Northside Generating Station cooling pond where damage to the cooling pond structure allowed warm water to leak into San Carlos Creek. Repairs to the cooling pond have been undertaken by JEA, and monitoring is ongoing. Additional information on the effect of the reduction or elimination of some of these warm-water discharges to manatees can be found in the publication *Manatee Response to Elimination of a Thermal Refuge in Northeastern Florida: A Preliminary Report of Results* (Sirenia Project, November 1998).

In 2003, the need for rescue of manatees suffering from cold stress symptoms at the Ortega Farms Basin just north of the Timuquana Road Bridge resulted in the identification of a minor warm-water source in the Ortega River. After studying the area, the Florida Department of Environmental Protection (FDEP)

determined that a significant thermocline (17-24°C) and halocline (0.3-13 parts per thousand) existed, starting at about 4-5 meters water depth. FDEP hypothesized that the most likely reason for the phenomenon could be attributed to exothermic breakdown of detritus or a seep from a spring that vented ground water (Jim Maher, FDEP, personal communication). Manatee sightings have been documented at this location in April, May, June and November. Animals suffering cold stress symptoms have also been seen by local residents and some animals were rescued from this location during the colder months. Two (2) manatees on January 11, 2002, two (2) manatees on December 5, 2003, one (1) manatee on December 7, 2003, three (3) manatees on December 18, 2008, one (1) manatee on January 3, 2008, and one (1) manatee on January 4, 2010 were observed by FWRI at this location (FWRI Manatee Rescue Database).

JEA is the largest community-owned utility in Florida. JEA generates power, and also operates water and sewer facilities within the COJ. The District II JEA waste water discharge outfall is monitored regularly during the cold season for temperature and salinity differentials and manatee presence by the JEA and the FWC Jacksonville field office. The boil from the outfall has been recorded to be at least 2 degrees Celsius warmer than the SJR temperature during these observations. This outfall acts as a warm-water attractant to a small number of animals during the cold season. A salinity differential observed at the outfall also indicates the outfall acted as a fresh water attractant. The discharge from the District II JEA waste water outfall was significantly reduced in November 2012, and in September of 2013, a District II pipeline failure occurred which attracted manatees to the outfall. Monitoring is ongoing to evaluate if manatees continue to be attracted to the District II outfall. This monitoring will continue after pipeline repairs which are expected to take up to 24 months to complete (possibly in 2015).

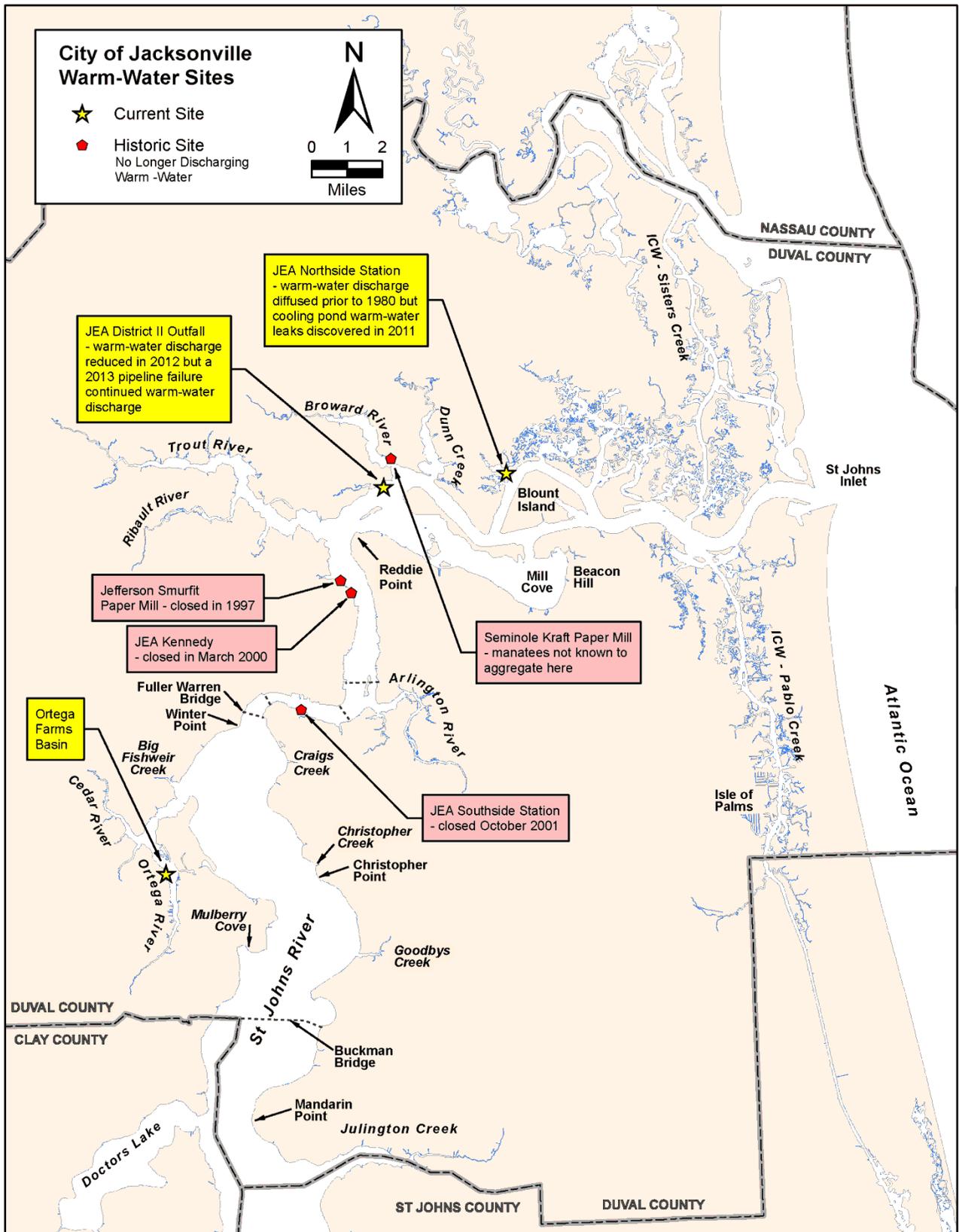


Figure 17: Warm-water site locations in the COJ.

3.2.3 Freshwater Habitat

Attraction to freshwater by manatees has been well-documented. Though manatees inhabit a wide range of salinity regimes, they tend to prefer habitats where osmotic stress is minimal and/or where freshwater is periodically available (Ortiz et al., 1998). Freshwater sources are often intentional or unintentional freshwater discharges. Freshwater sources entering the SJR in the COJ can be divided into natural and man-made sources. Natural sources other than tributaries of the river itself include springs. The United States Geological Survey (USGS) and SJRWMD keep records of natural springs in the SJR. Information on record to date indicates that no significant-sized springs have been identified in the COJ other than those that are small and superficial in nature. Man-made freshwater sources include wastewater treatment plant discharges and storm water discharge points. At present, there are roughly 200 permitted wastewater discharges in Duval County. Most of these discharge into various tributaries in the COJ and are indistinguishable from the tributaries themselves as far as "freshness". Discharges into the tributaries are generally small, less than 1 million gal/d. Larger discharges, greater than one million gal/d., discharge into the mainstream of the river. Freshwater discharges are generally continuous and often serve as attractants to manatees. Freshwater sources are often intentional or unintentional freshwater discharge from individual homeowners or businesses.

3.2.4 Manatee Habitat Protection

Boat facilities and dredging projects can have significant potential adverse impacts on SAV and SAV habitat. During in-water construction, the substrate is disturbed by installation of pilings and water clarity declines due to siltation. Once completed, boat facilities and docks create shade that has the potential to adversely affect existing SAV beds or prevent the establishment of new SAV beds. Boat facilities can also have significant indirect adverse effects. Dredging immediately adjacent to docks and the associated travel corridors to and from docks may significantly affect SAV beds if appropriate turbidity controls are not used or if water depths are not adequate. Direct and indirect impacts to manatee foraging resources, freshwater resources and warm-water habitats should be completely avoided when possible. Projects should be designed to avoid, reduce and minimize their potential impacts to SAV. Any remaining adverse impacts to manatee foraging resources, freshwater resources and warm-water habitats will be addressed during the permitting process.

4 Information Assessment

4.1 Manatees in the City of Jacksonville

4.1.1 Introduction

The Florida subspecies of the West Indian manatee occupies the northern end of the West Indian manatee range. Florida manatees are found generally in the Southeastern United States, with some individual manatees documented as far north as Cape Cod, Massachusetts, as far west as Texas, and some known to have reached the Bahamas (Lefebvre et al., 2001). The geographic distribution of manatees is greatly influenced by their physiological need for warmer water during the winter. Manatees seek shelter from the cold at a limited number of warm-water sites or areas generally in the southern two-thirds of Florida (Reynolds and Wilcox, 1994; USFWS, 2001; Laist and Reynolds, 2005 a, b).

In December 2007, the FWC developed the MMP as a framework for conserving and managing manatees in Florida. For both management and research purposes, manatees in Florida have been subdivided into four relatively distinct regional management units, originally termed subpopulations in the Florida Manatee Recovery Plan (USFWS, 2001). The four management units are: the Atlantic coast, the Southwest, the Northwest, and the upper St. Johns River (Figure 18).

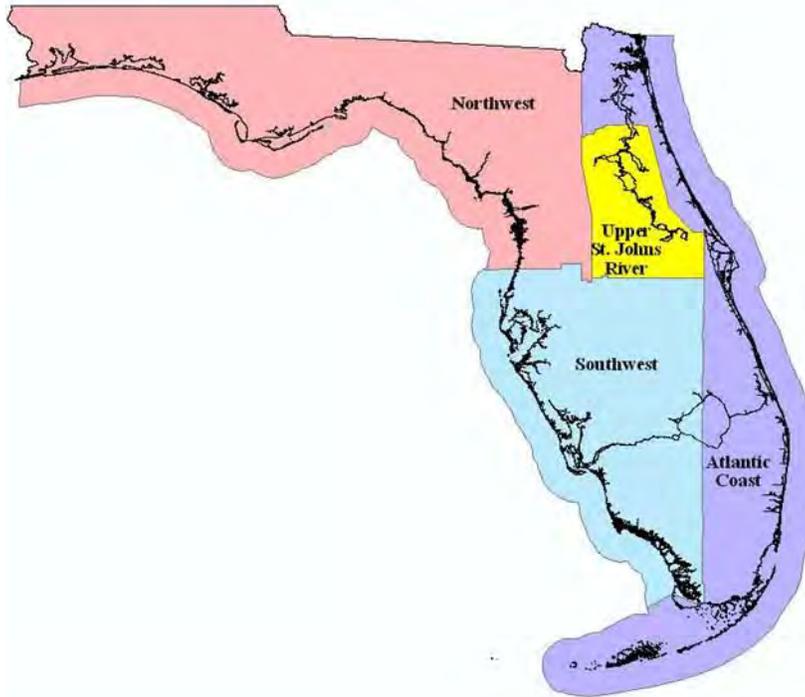


Figure 18: Regional manatee management units.

Manatees in Florida represent a group of spatially separated populations that interact at some level (metapopulation). Each region of the Florida manatee metapopulation is composed of individuals that tend to return to the same network of warm-water refuges each winter and have similar non-winter distribution patterns (Florida MMP, 2007). Information on Florida manatee distribution and abundance in the COJ is based mainly upon historical personal accounts and aerial surveys conducted intermittently since 1982. Satellite telemetry data, that includes information about manatee presence in the COJ, were also collected between 1986 and 1997. While the COJ is categorized as part of the Atlantic coast management unit, data suggest that manatees from both the Atlantic coast and upper St. Johns River management units utilize COJ waterways (Deutsch, C.J., et al., 2003; Langtimm, C.A., et al. 2004).

There are no statistical estimates of abundance for either statewide or regional Florida manatee populations, but manatee management unit population growth rates have been estimated. It has been estimated that the Atlantic unit grew at an annual rate of 3.7% per year between 1986 and 2000 (Runge et al., 2007a), and at about 4–6% per year from 1994 to 2001 (Craig and Reynolds, 2004). The management unit occupying the upper St. Johns River has shown strong growth between 1990 and 1999, increasing at an annual rate of 6.2% (Runge et al., 2004). This growth rate is supported by high survival and reproductive rates (Langtimm et al., 2004; Runge et al., 2004). However, this is the smallest of the four management units, but the upper St. Johns is the fastest growing management unit (Florida MMP, 2007). Following is a summary of available information on manatees in the COJ.

4.1.2 Aerial Surveys

Aerial surveys have been the most reliable data collection technique for the determination of relative manatee abundance and distribution (Hartman, 1979; Irvine and Campbell, 1978; Packard et al., 1986; Ackerman, 1995). A series of COJ, Clay and St. Johns County manatee aerial surveys was conducted by the USFWS in 1982 and 1983. A similar study (1988-1990) limited to COJ waters was funded by the COJ Parks and Recreation Department (Valade, 1991). The FDEP conducted aerial surveys of the SJR in 1993 and 1994. Since March 14, 1994, Jacksonville University (JU) has conducted almost bimonthly aerial surveys of the SJR, its tributaries and the ICW from Nassau Sound to Palm Valley. The two flight paths for surveying these two areas of the COJ have been adjusted slightly over time. The paths for the JU aerial surveys between 2004 and 2011, the Intracoastal Waterway (ICW Path) and the St. Johns River (SJR Path) are illustrated in Figure 19.

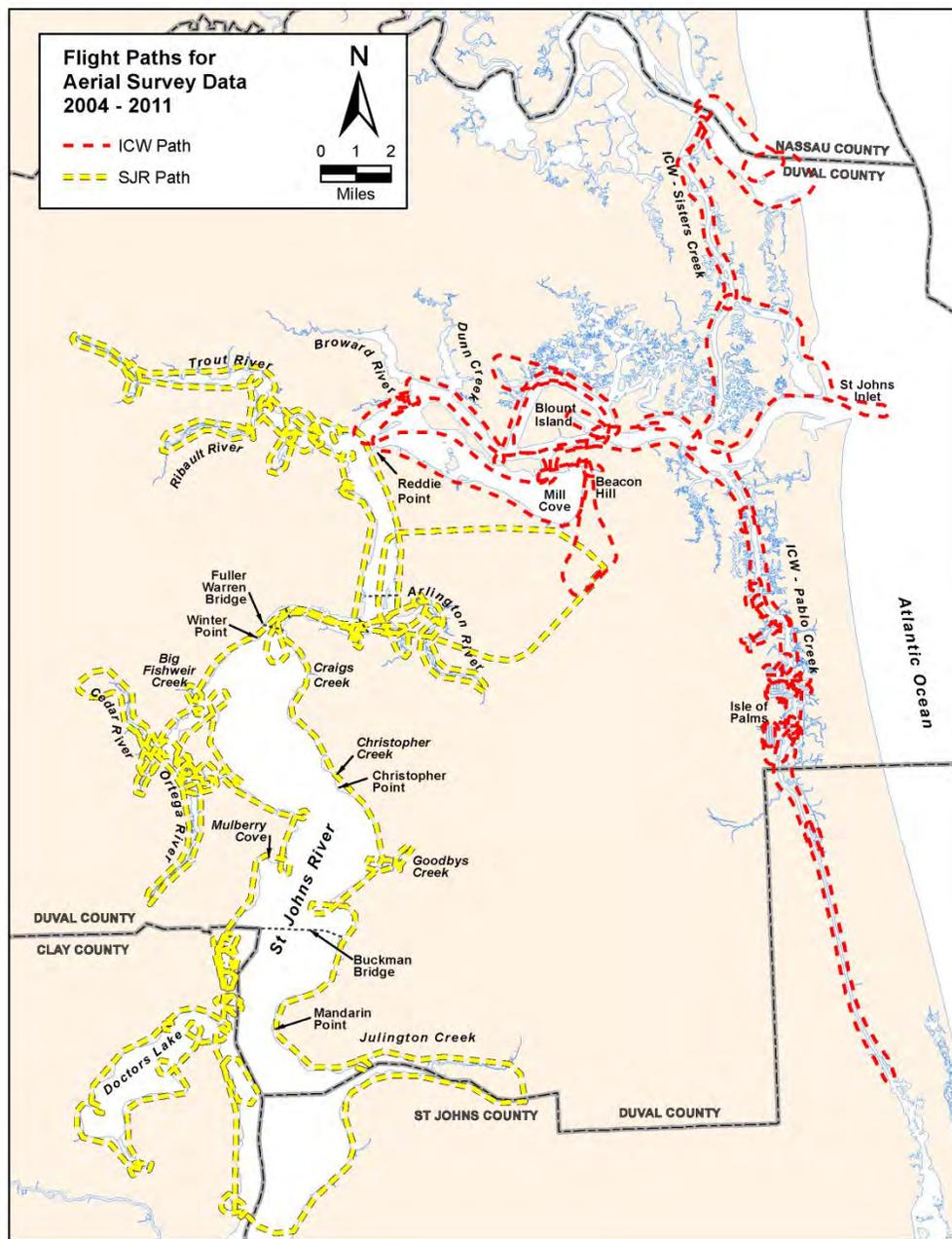


Figure 19: Jacksonville University 2004 – 2011 aerial survey flight paths.

As illustrated in Figures 20 - 28, aerial survey data indicates widespread manatee use of the COJ waterways.

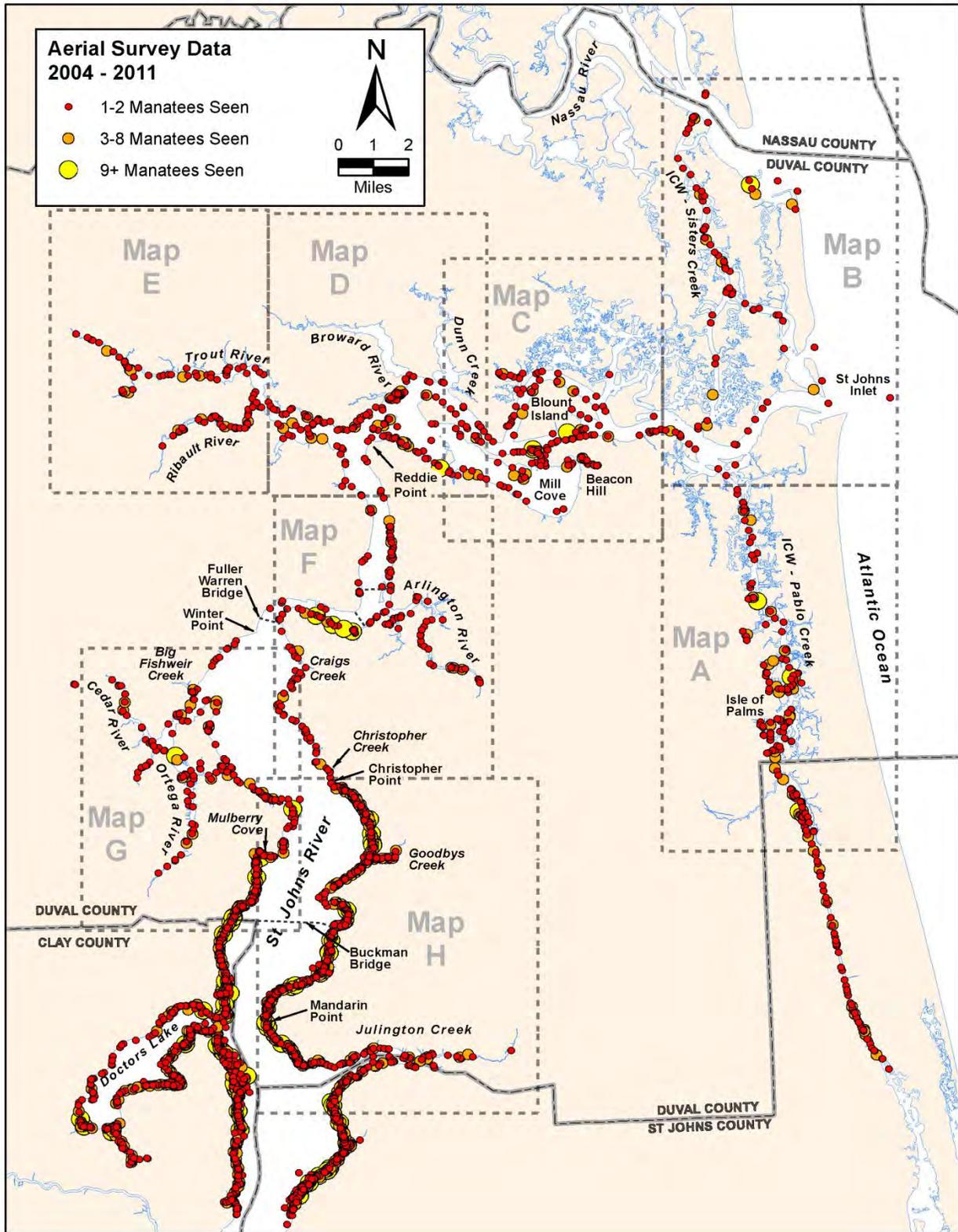


Figure 20: Jacksonville University aerial survey data (January 12, 2004 - November 22, 2011).

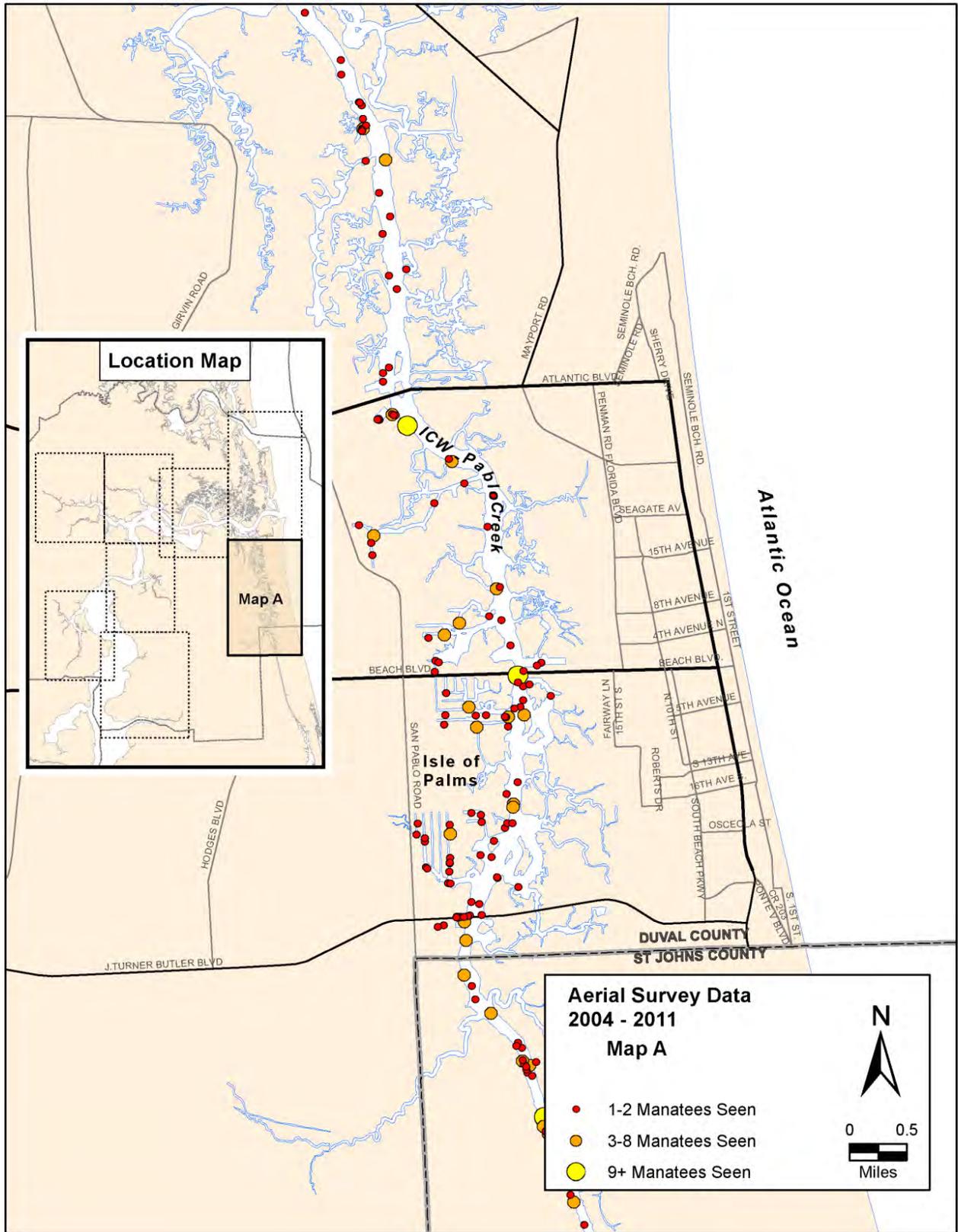


Figure 21: JU Aerial Survey Data Map A.

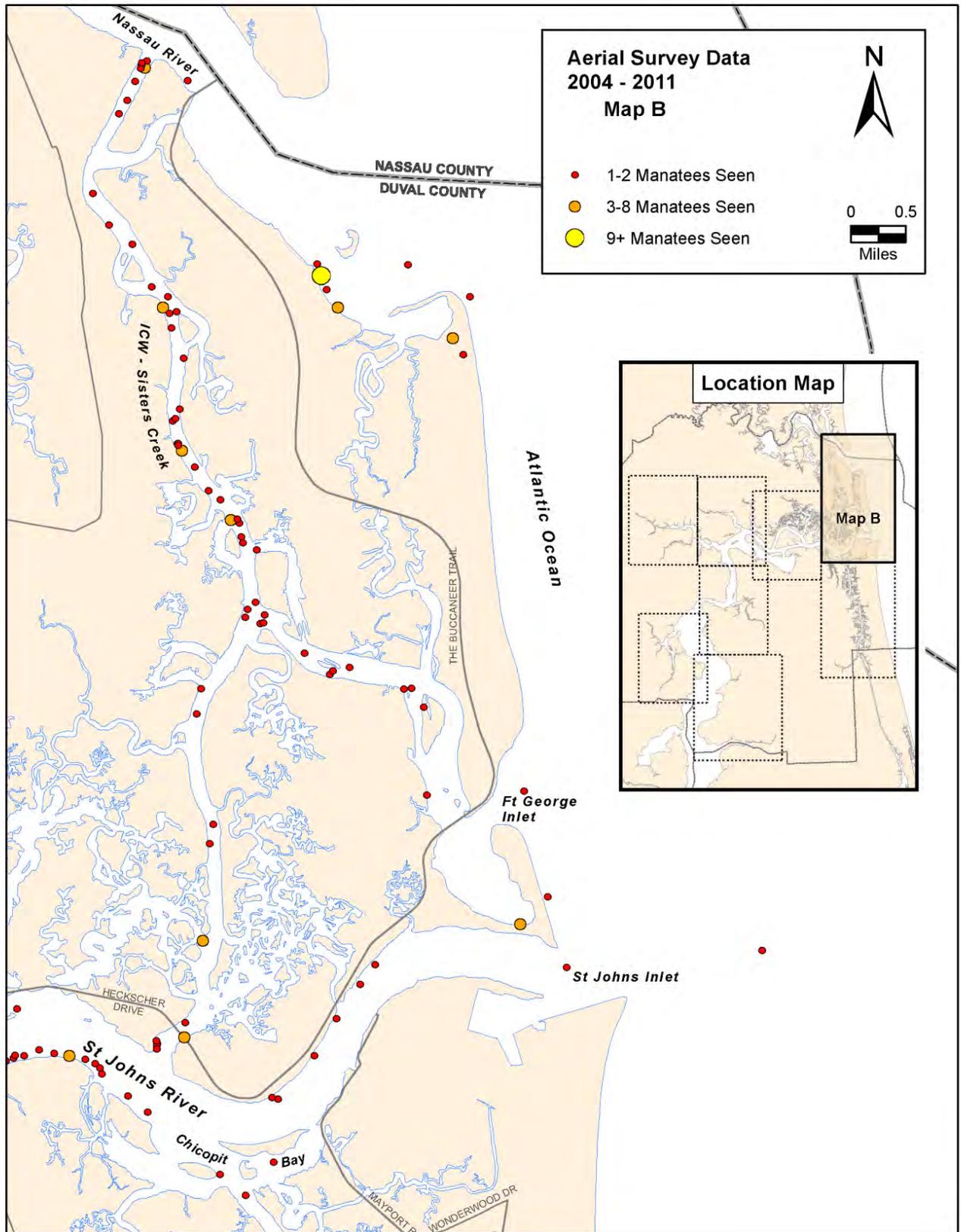


Figure 22: JU Aerial Survey Data Map B.

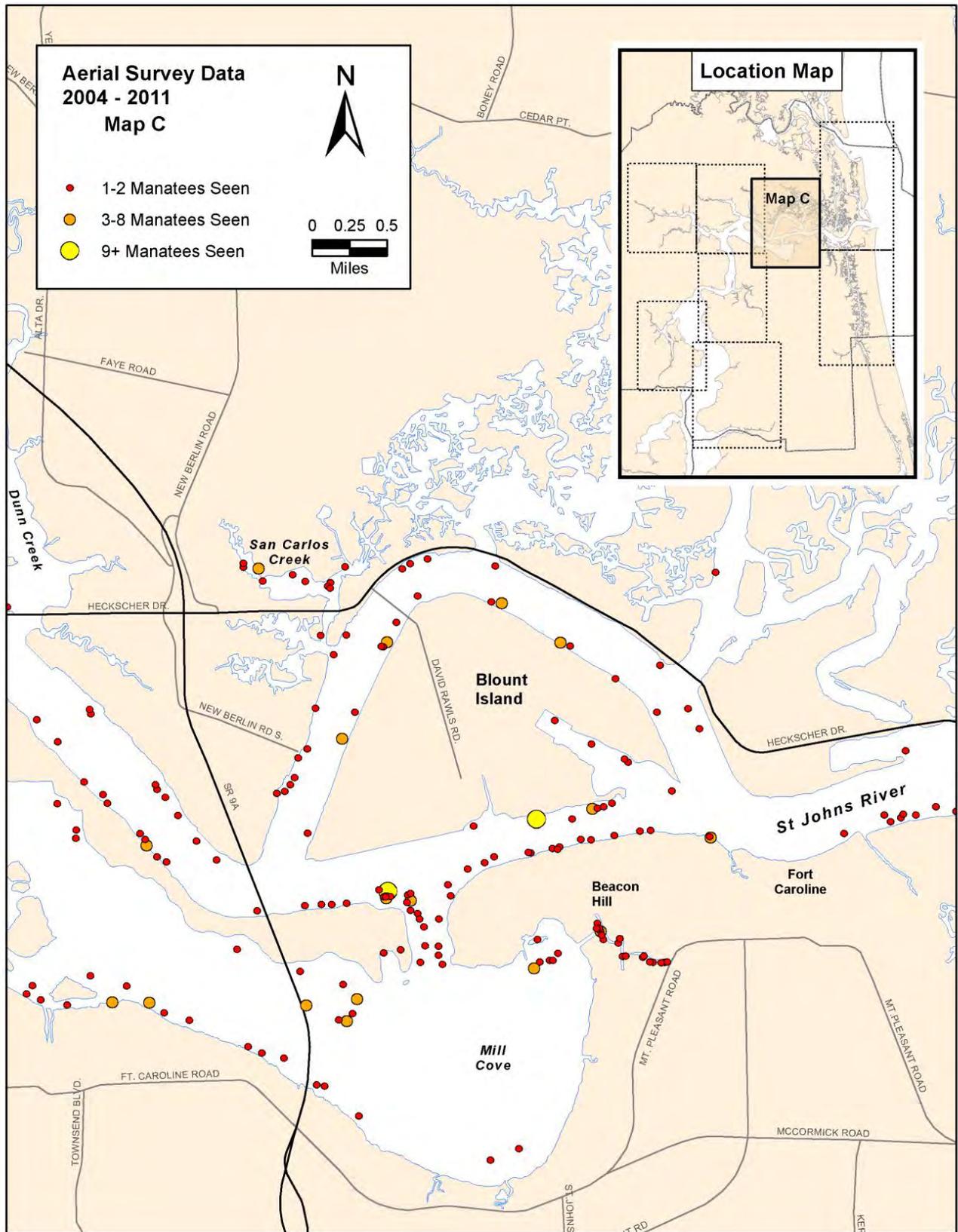


Figure 23: JU Aerial Survey Data Map C.

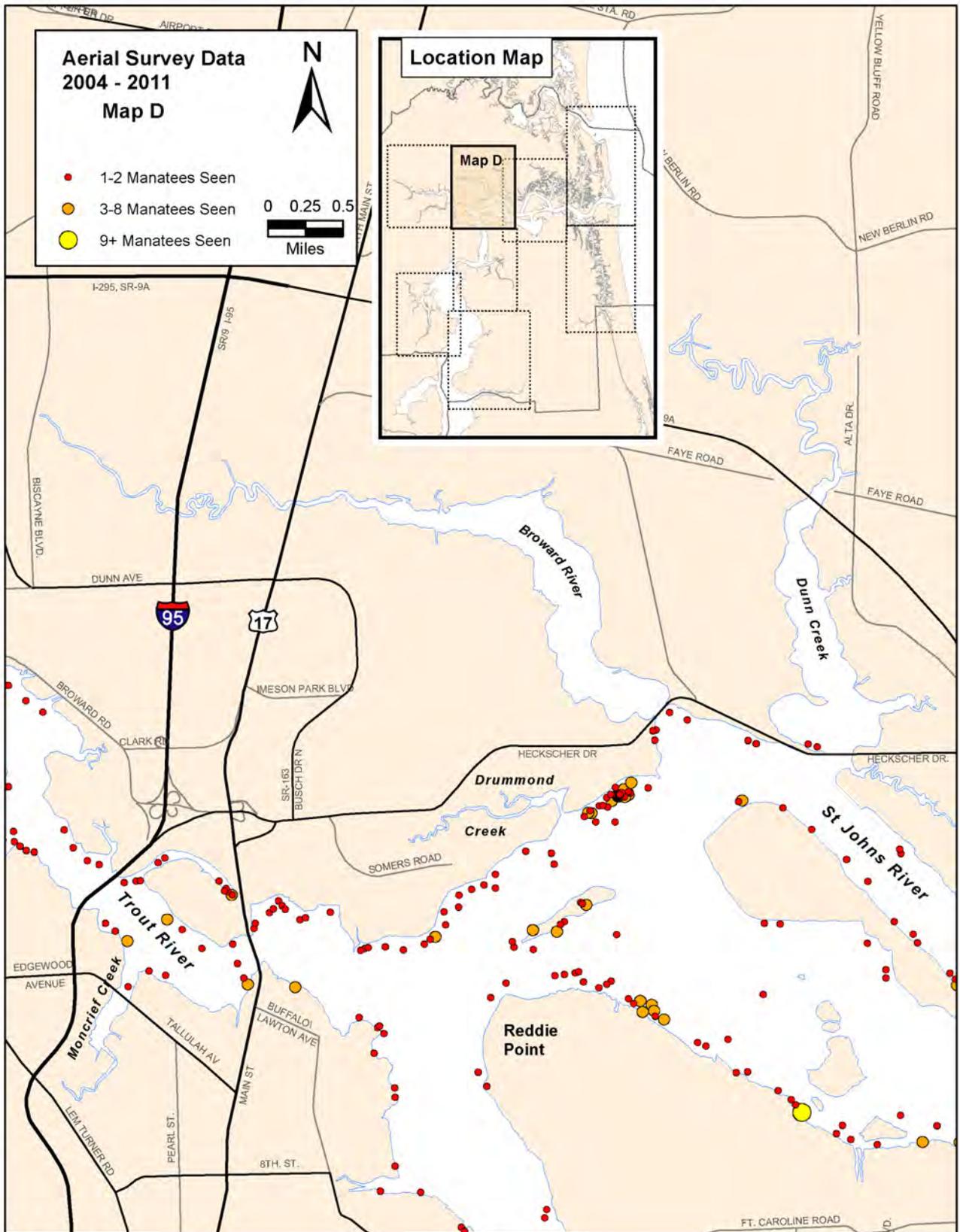


Figure 24: JU Aerial Survey Data Map D.

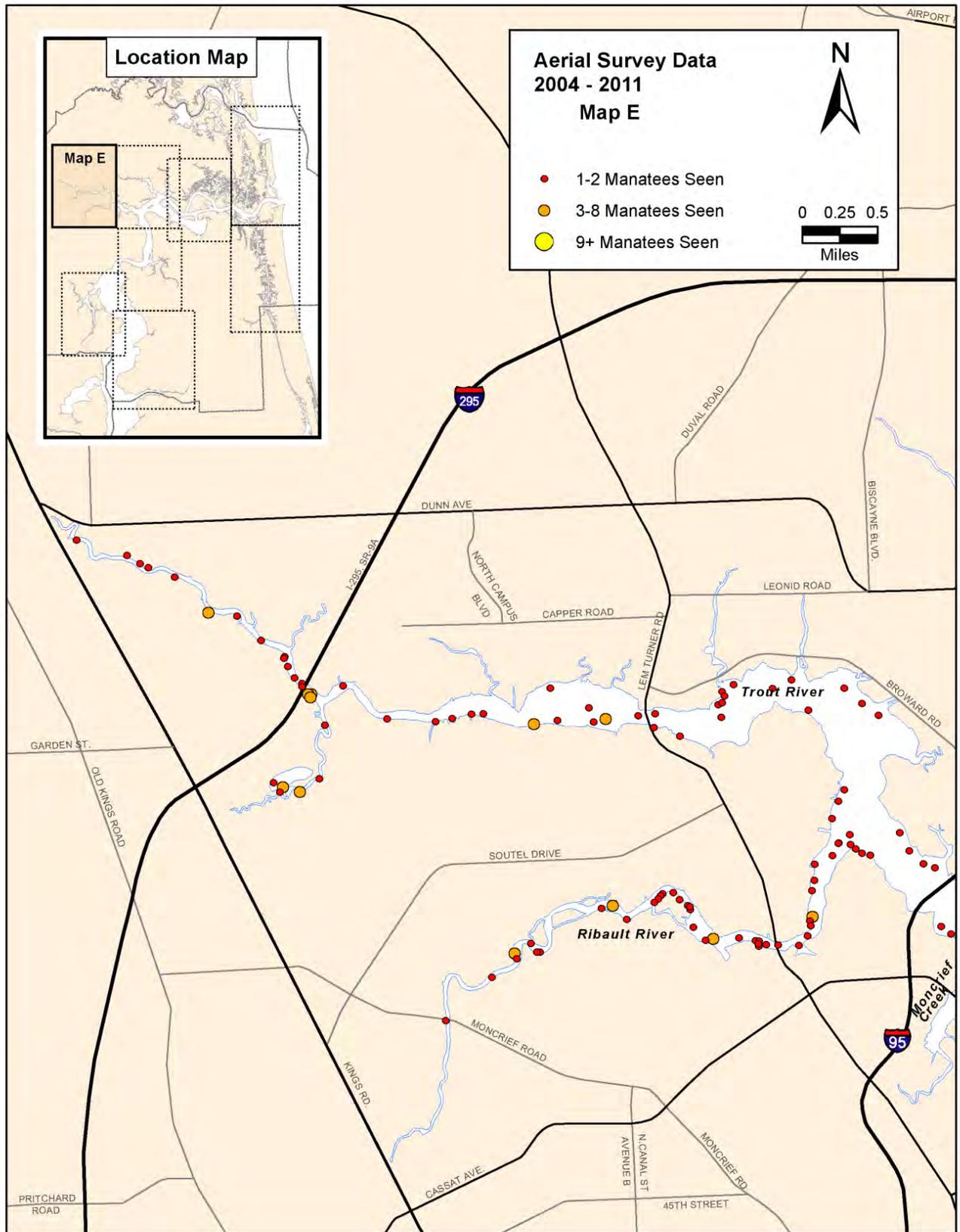


Figure 25: JU Aerial Survey Data Map E.

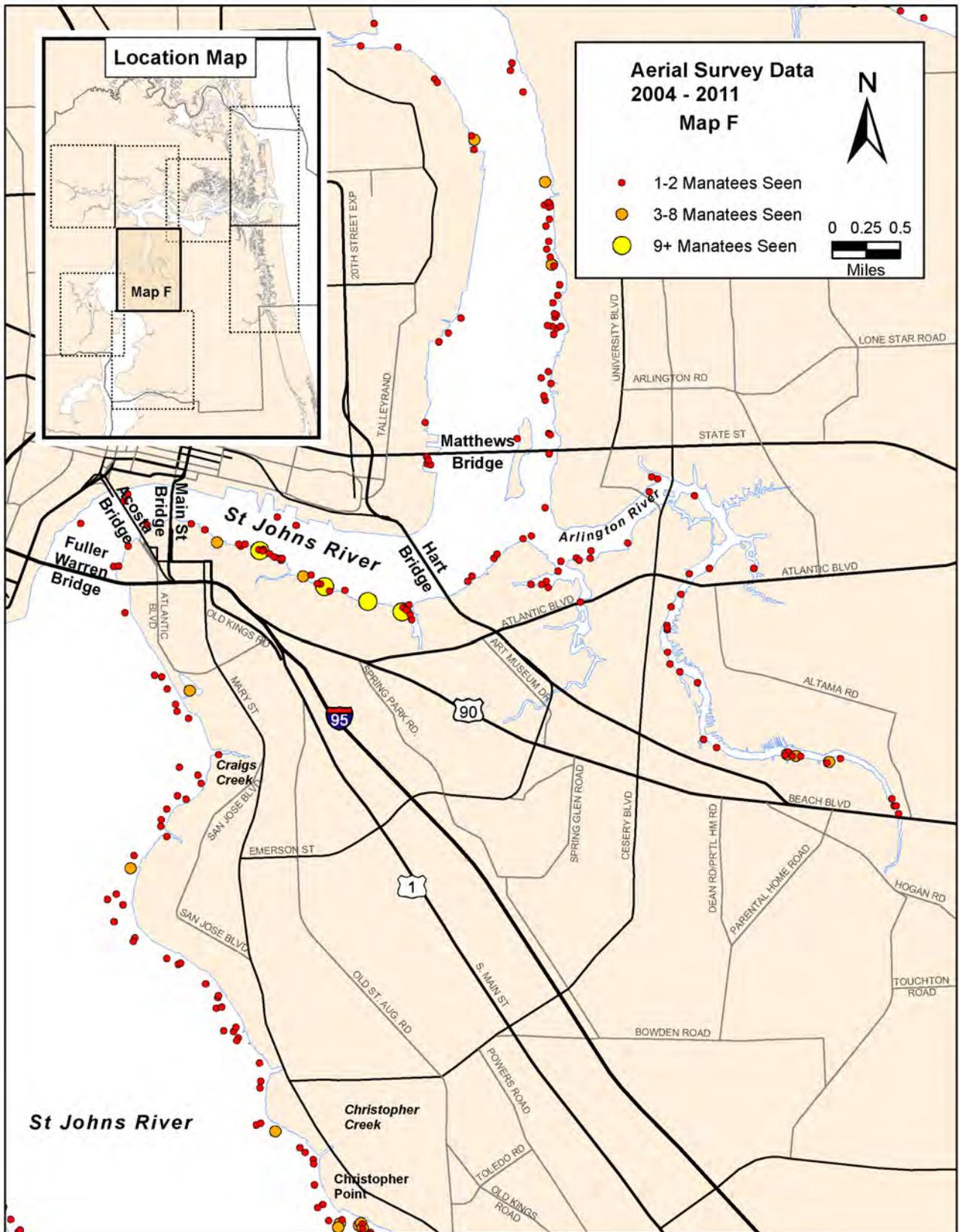


Figure 26: JU Aerial Survey Data Map F.

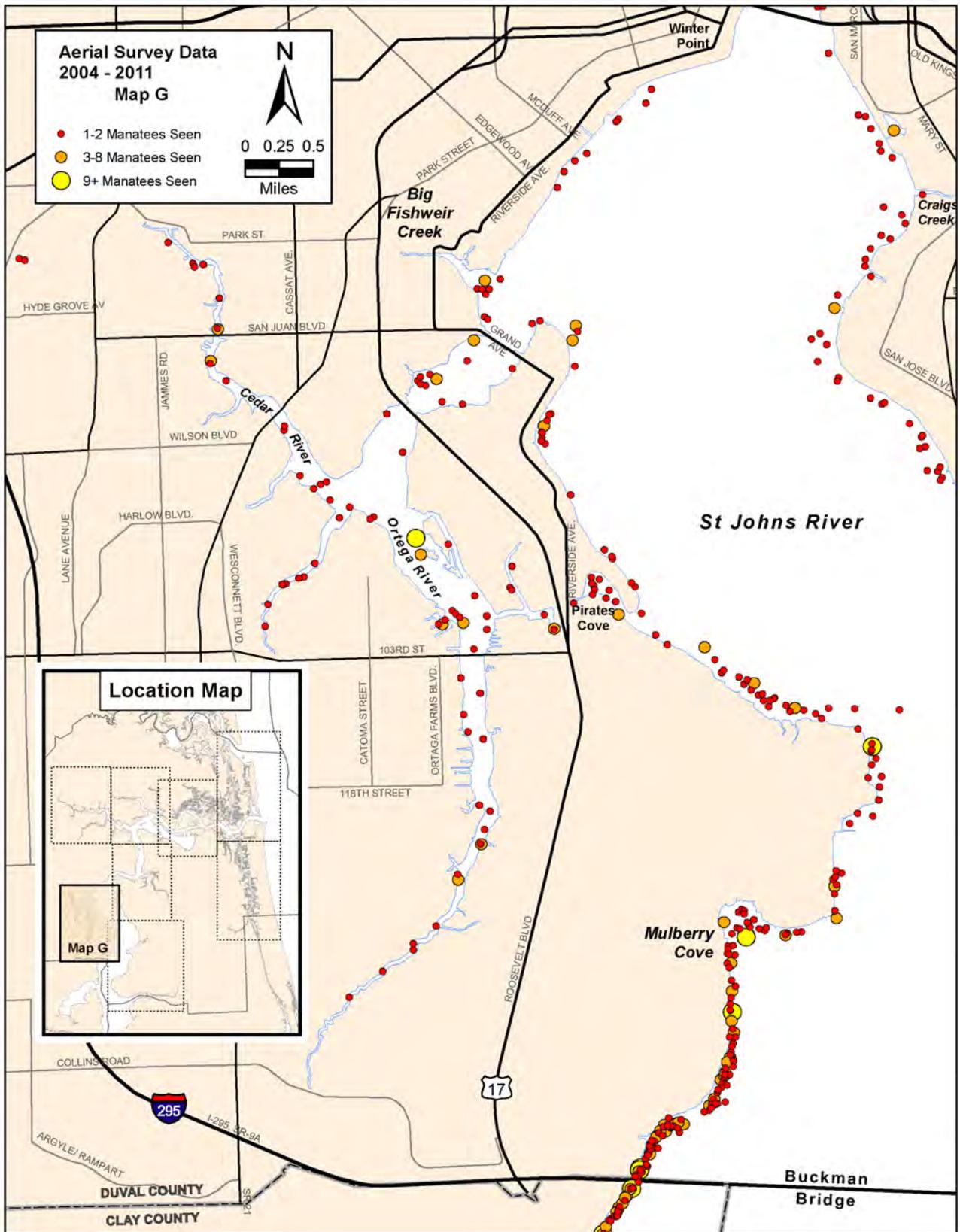


Figure 27: JU Aerial Survey Data Map G.

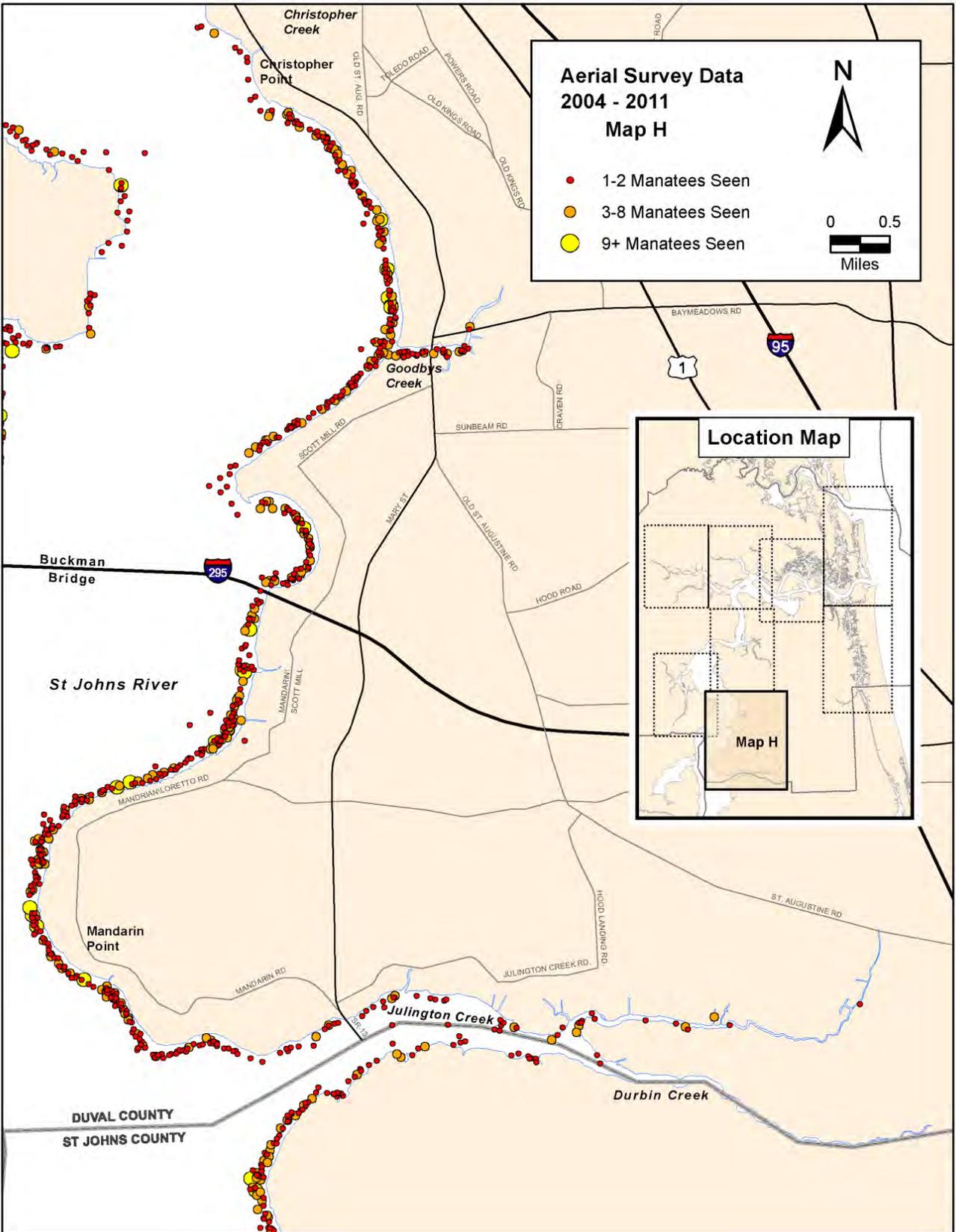


Figure 28: JU Aerial Survey Data Map H.

Aerial survey counts of manatees are indices of abundance at the time of each survey. As a result, counts must be viewed as relative only to trends in general abundance, countywide distribution, and habitat use patterns (Irvine, 1980). Sight obstructions such as tree canopy cover and water clarity may inhibit the sighting of manatees during aerial surveys in some COJ waterways. However, within COJ waterways without observation obstructions, the number of manatees sighted and the frequency of manatee sightings may reflect the value of an area to manatees for foraging, resting, calving, and traveling. Manatee counts from the JU aerial surveys are summarized below in Figure 29.

	Year	No. of Surveys	Adults	Calves	Total	Mean No./Survey	SHDC Count	SHDC Date
SJR Path	1994	19	783	67	850	45	113	9/6/1994
	1995	22	583	36	619	28	76	7/20/1995
	1996	21	706	92	798	38	124	7/15/1996
	1997	23	1113	89	1202	52	136	8/1/8/1997
	1998	26	775	82	857	33	125	9/11/1998
	1999	20	804	87	891	45	127	9/28/1999
	2000	20	294	28	322	16	67	5/3/2000
	2001	18	454	17	471	26	85	6/2/2001
	2002	23	796	28	824	36	106	5/14/2002
	2003	23	1018	68	1086	47	150	6/25/2003
	2004	18	836	88	924	51	160	5/20/2004
	2005	21	848	76	924	44	170	6/22/2005
	2006	22	996	115	1111	51	153	9/27/2006
	2007	19	584	58	642	34	151	4/23/2007
	2008	20	759	58	817	41	140	6/4/2008
	2009	14	199	23	222	16	54	6/3/2009
	2010	18	631	40	671	37	116	6/16/2010
2011	15	624	34	658	44	121	5/23/2011	
ICW Path	1994	12	74	7	81	7	21	5/12/1994
	1995	23	79	6	85	4	21	5/30/1995
	1996	23	84	11	95	4	16	5/16/1996
	1997	24	73	10	83	3	20	4/21/1997
	1998	18	46	3	49	3	19	6/12/1998
	1999	14	32	4	36	3	12	6/21/1999
	2000	21	54	3	57	3	13	5/3/2000
	2001	17	77	2	79	5	23	4/27/2001
	2002	22	109	1	110	5	28	4/30/2002
	2003	18	82	1	83	5	23	5/14/2003
	2004	18	92	11	103	6	23	5/20/2004
	2005	20	111	6	117	6	29	7/6/2005
	2006	19	77	3	80	4	19	4/21/2006
	2007	16	101	8	109	7	21	4/23/2007
	2008	19	184	11	195	10	30	5/5/2008
2009	14	118	11	129	9	44	4/15/2009	
2010	16	82	10	92	6	23	6/16/2010	
2011	15	96	4	100	7	20	5/23/2011	

Figure 29: Summary of JU aerial surveys (March 14, 1994 - November 22, 2011). SHDC is single high daily count.

Because the January 12, 2004 - November 22, 2011 (2004 - 2011) JU aerial surveys provide a comprehensive dataset, these data will be used to examine overall trends in manatee abundance and distribution. Aerial surveys act as indices of manatee abundance at the time of the survey, and describe general trends in relative abundance. Comparison of manatee data between like size areas is one way manatee data is analyzed. The COJ waterways were divided into square mile (one mile by one mile) units (155 units) to evaluate the spatial distribution of manatees throughout the city. COJ waterways vary immensely in size, ecology, and use by humans, manatees and other wildlife. The amount of potential manatee habitat within each square mile unit differs greatly because of the variation in waterway size and shape. However, analysis of the total number of manatees observed by aerial survey between per square mile is one method to compare relative manatee abundance (Figure 30). This color gradient display of relative manatee abundance was created in ArcGIS by defining and calculating the number of manatees seen within each square mile during the 2004 – 2011 aerial survey flights.

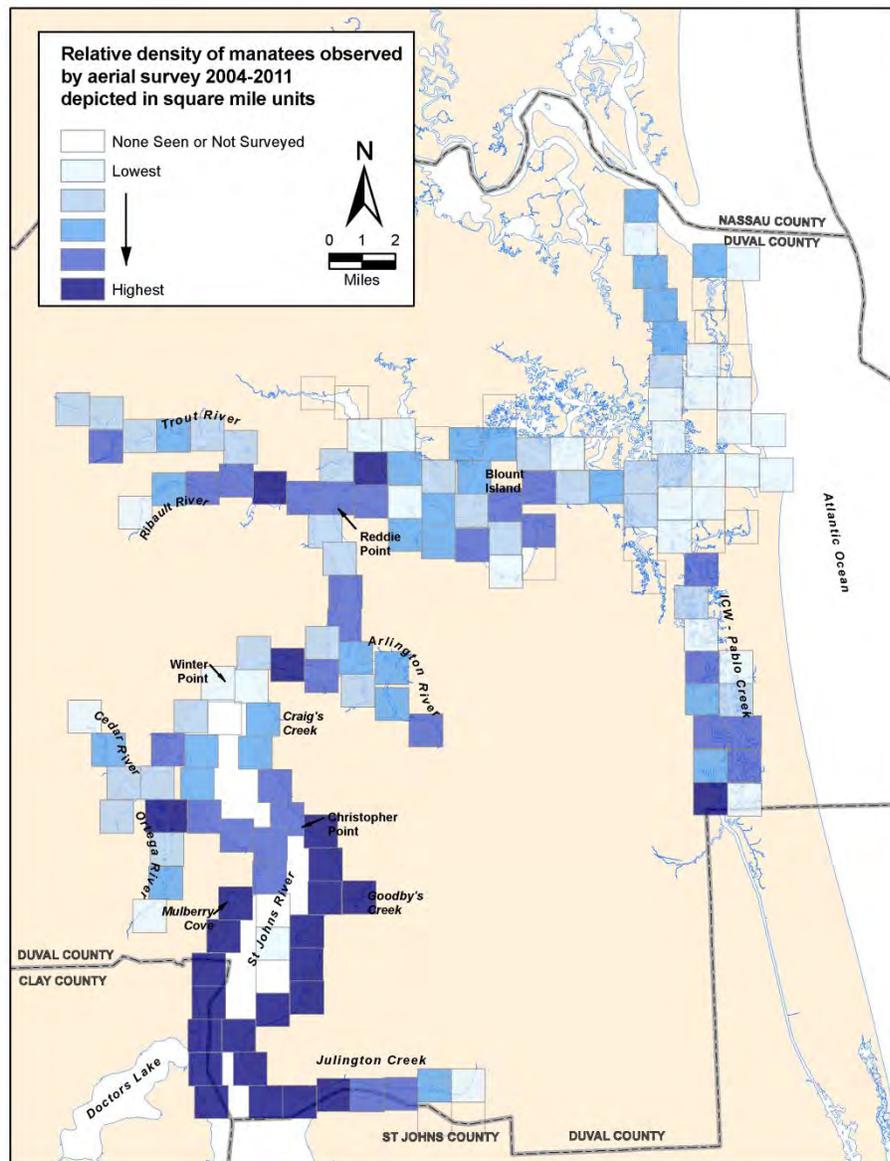


Figure 30: Spatial Distribution of Manatees displayed with quantile classifications. During the JU 2004 to 2011 aerial surveys, 18 square miles were either not surveyed or manatees were never sighted there; between 1 and 5 manatees (lowest) were sighted in 30 of the square mile units; between 6 and 10 sighted in 27 square mile units; between 11 and 18 sighted in 27 square mile units; between 19 and 40 sighted in 28 square mile units; and between 42 and 314 manatees (highest) were sighted in 25 square mile units.

Shifts in numbers of manatees sighted may be accounted for by variations in air and water temperature, photoperiod, or periods of prolonged above average salinity caused by low precipitation, which results in lower food availability (White et al., 2002). Tape grass is the most important manatee food source in the COJ, and increased salinity limits its growth.

4.1.2.1 Synoptic Surveys

Another aerial survey data collection technique is an annual statewide synoptic survey mandated by Florida Statute. Minimum manatee counts are obtained from synoptic surveys conducted nearly every winter since 1991. Synoptic surveys are conducted during periods of extreme cold weather when manatees are known to aggregate at a limited number of warm-water sites. Manatee detection probability varies greatly with environmental conditions and across sites that are surveyed. Only twelve (12) manatees have been sighted in the COJ during the 27 synoptic surveys conducted between 1991 and 2011. During these surveys, three (3) manatees were sighted in the COJ in 1991 (1 in January and 2 in February), three (3) in 1992 (1 in January and 2 in February), two (2) in 1995 (one in January and one in February), one (1) in 1999 in January, one (1) in 2000 in January, one (1) in 2001 in January and one (1) in 2006 in January.

4.1.2.2 Aerial Survey Data Seasonal Patterns

Evidence from the aerial surveys conducted by USFWS and FDEP respectively, along with earlier research on manatee abundance in northeast Florida, implies that manatee usage of COJ waters exhibits seasonal migratory fluxes (Beeler and O'Shea, 1988; Valade, 1991). The aerial survey data collected almost bimonthly since 1994 by JU continue to validate that manatee abundance and distribution in the COJ are strongly correlated with water temperature. Historical aerial survey data show that the numbers of manatees sighted increased as ambient water temperatures rose ($>70^{\circ}\text{F}$), and decreased as ambient water temperatures fell ($<70^{\circ}\text{F}$) in late winter (Kinnaird, 1983; Valade, 1991; Worthy et al., 2000; White et al., 2002). When water temperatures decrease, the majority of manatees in the COJ migrate south to warmer waters (White et al., 2002). When not constrained by low water temperature, manatees return to their spring and summer ranges, apparently attracted by habitat that is of higher quality than that in their winter range (Hartman, 1979; Lefebvre et al., 2001). Photoperiod also appears to influence manatee migration with single daily high manatee aerial survey counts typically occurring in late July or early August and the number of manatees observed decreasing before water temperatures actually decline (Figure 29). This is a common phenomenon among a variety of animals (Bradshaw and Holzapfel 2007).

Between 2004 and 2011, the lowest aerial survey counts of manatees within COJ waterways typically occurred when water temperatures were coldest. During these years, a small number of animals were seen by personal observation at the Ortega River Basin and the JEA District II outfall location in November through March. During the same years, the high single day aerial survey counts of manatees in the SJR survey path occurred in April through June, except for 2006 when the highest single day count of manatees was in September, and the high single day counts of manatees in the ICW survey path occurred in April, May, June and July.

4.1.2.3 Manatee Activity Data

Documentation of the type of activity a manatee may be engaged in is included in the JU aerial survey data collection reports. Each aerial observer records whether it looks like the manatee that is seen is traveling, resting, feeding and or cavorting (mating). Between 2004 and 2011, during aerial surveys the following manatee use of the COJ waterways was noted: in each of those eight years, between 5-11 % of the animals sighted were calves; 6-32% were feeding; 25-48% were resting; 26-48% were traveling; and 6-19% were cavorting (mating). During the same time period, in the ICW Path, manatees were

observed predominantly engaged in traveling and resting, with fewer observed cavorting than in the SJR Path. Since the ICW Path contains limited manatee food sources, fewer animals were seen feeding as compared to SJR Path. Data from JU aerial surveys indicate that manatees were observed feeding, resting and cavorting/mating most often south of Fuller Warren Bridge (east and west banks) and in Doctors Lake in Clay County in summer where substantial submerged aquatic vegetation exists. During the 2004 – 2011 aerial surveys, the most frequently seen activity south of Christopher Point in the SJR was feeding. Feeding was also seen in the Trout and Ribault rivers and the SJR near Reddie Point. Resting was recorded most frequently in the ICW south of the SJR (Pablo Creek) and around Blount Island. In the SJR east of the mouth of the Sisters Creek and between Reddie Point and the Fuller Warren Bridge, and in Sisters Creek the activity most frequently seen during this time was traveling (Figure 31).

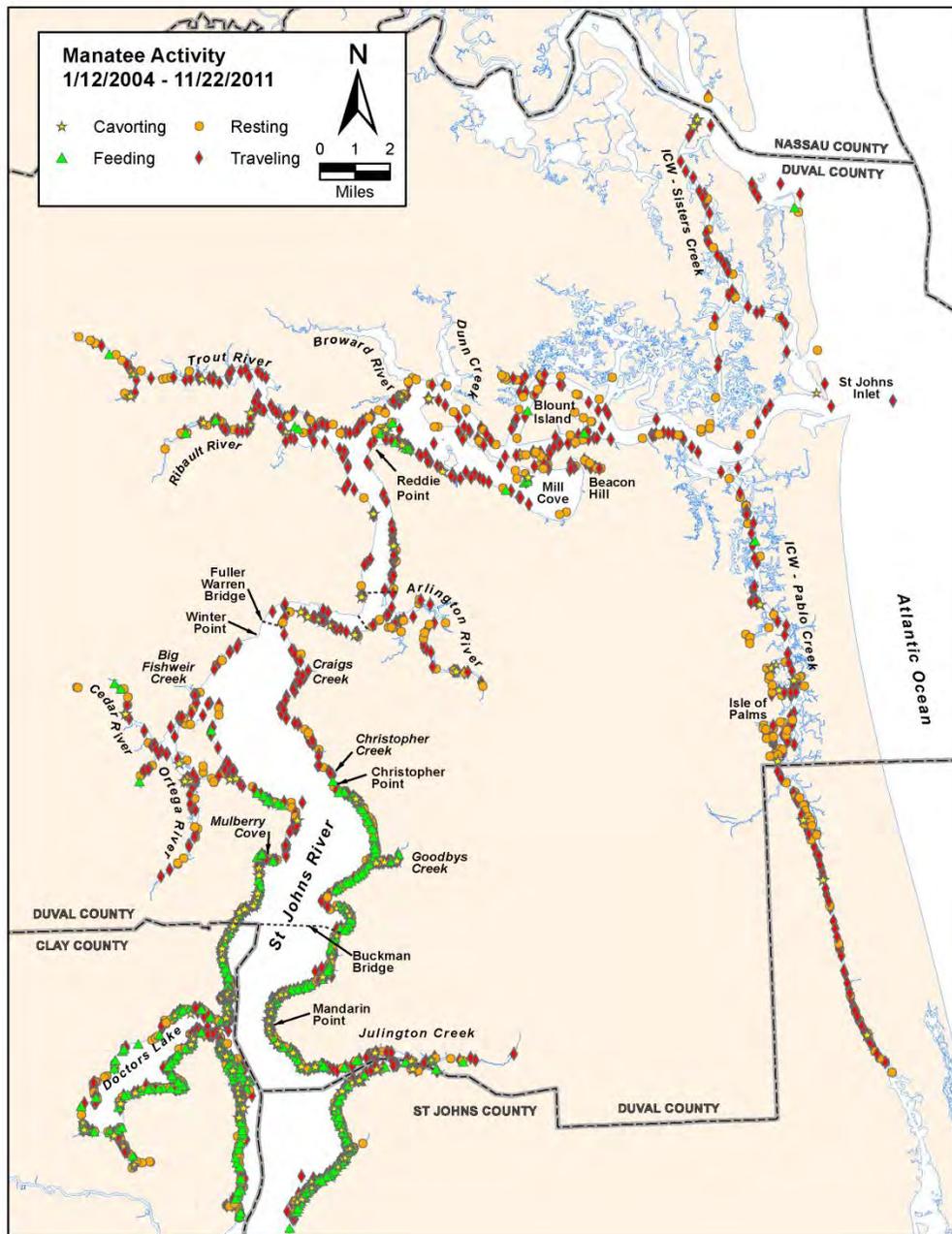


Figure 31: Manatee behaviors observed during aerial surveys flown 2004-2011.

Manatees are known to travel to quiet, protected places to give birth. Dramatic shifts in manatee range use have been documented with reproductive events, with several adult females rapidly swimming 90 – 150 km north or south of their main range to give birth in sheltered canal systems, boat basins, or back waters of narrow rivers. These animals typically returned to their normal range about one month after birth (Deutsch et al., 2003). Manatees with calves have been sighted regularly in COJ waterways during aerial surveys, often in the upstream waters of tributaries. Additionally, manatee carcass recoveries classified as perinatal (dependent calf) tend to correlate with areas that female manatees travel to with calves. Overlap of JU aerial survey manatee use data (1994-2011) and perinatal mortality data in the COJ waterways is evident in the Trout River and its tributaries, the Ortega River and its tributaries, a canal in Beacon Hills in Mill Cove, Goodbys Creek, Julington Creek, and the east shoreline of the SJR between the Fuller Warren Bridge and Christopher Point (Figure 32).

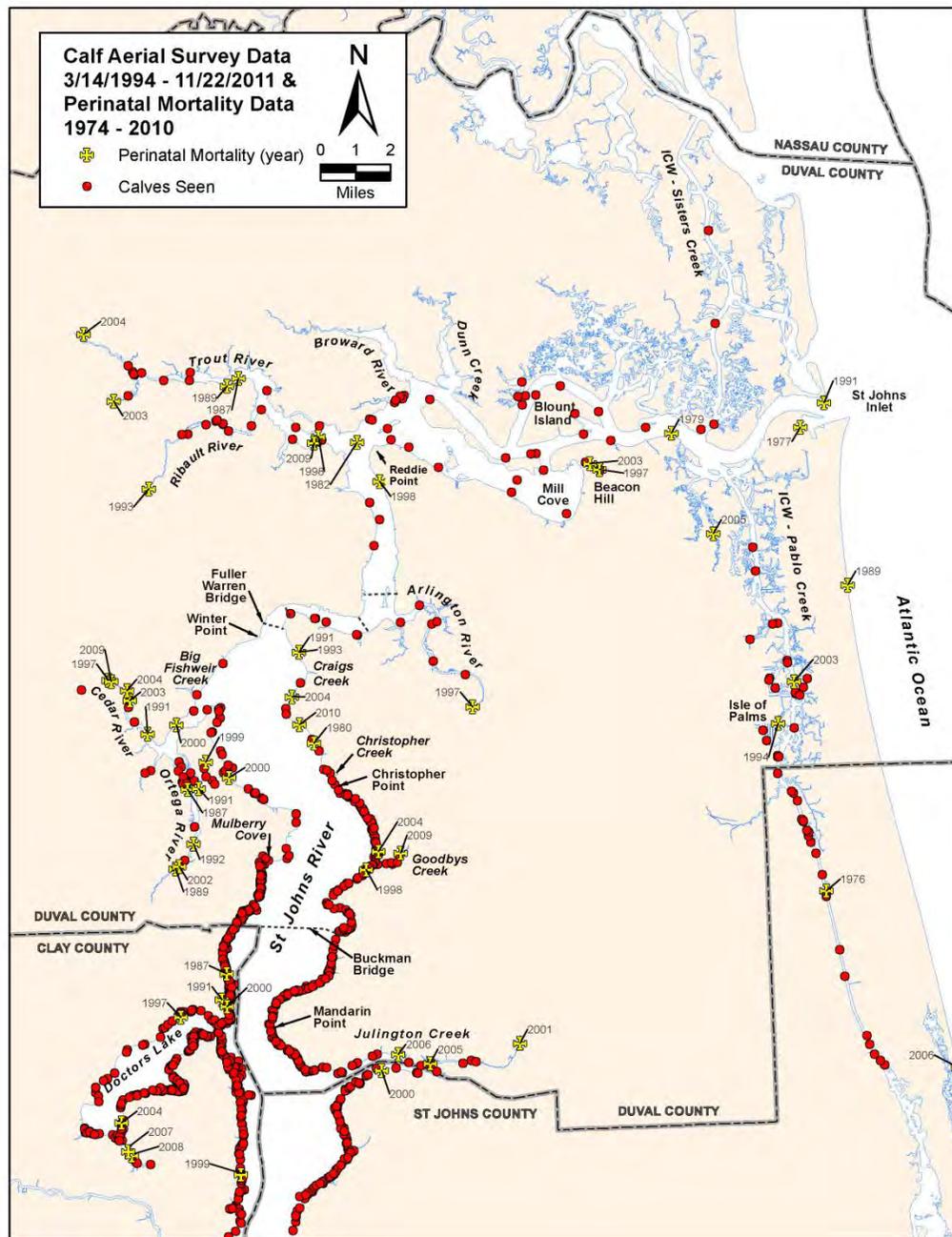


Figure 32: Calf sightings during JU 1994 – November 22, 2011 aerial surveys and perinatal deaths (1974 - 2010).

Aerial survey data can also be used to examine spatial and temporal trends in manatee use of COJ waterways, including the identification of high-use areas. In order to qualitatively depict the relative abundance of manatees throughout the county, the entire county along its shoreline was subdivided into a series of square mile units (155 units), and the number of survey flights that manatees were sighted within a unit was calculated. While some square mile units include portions of land, generally most manatee data points along the shoreline were captured for the calculations. Then for each square mile, the number of flights manatees were seen was divided by the total number of aerial survey flights. Between 2004 and 2011 there were 144 flights of the SJR Path and 138 flights of the ICW Path. While the value of the resulting percentage number is not that important, it allows for the depiction of relative recurrent manatee use of particular locations over the course of the aerial survey study (Figure 33).

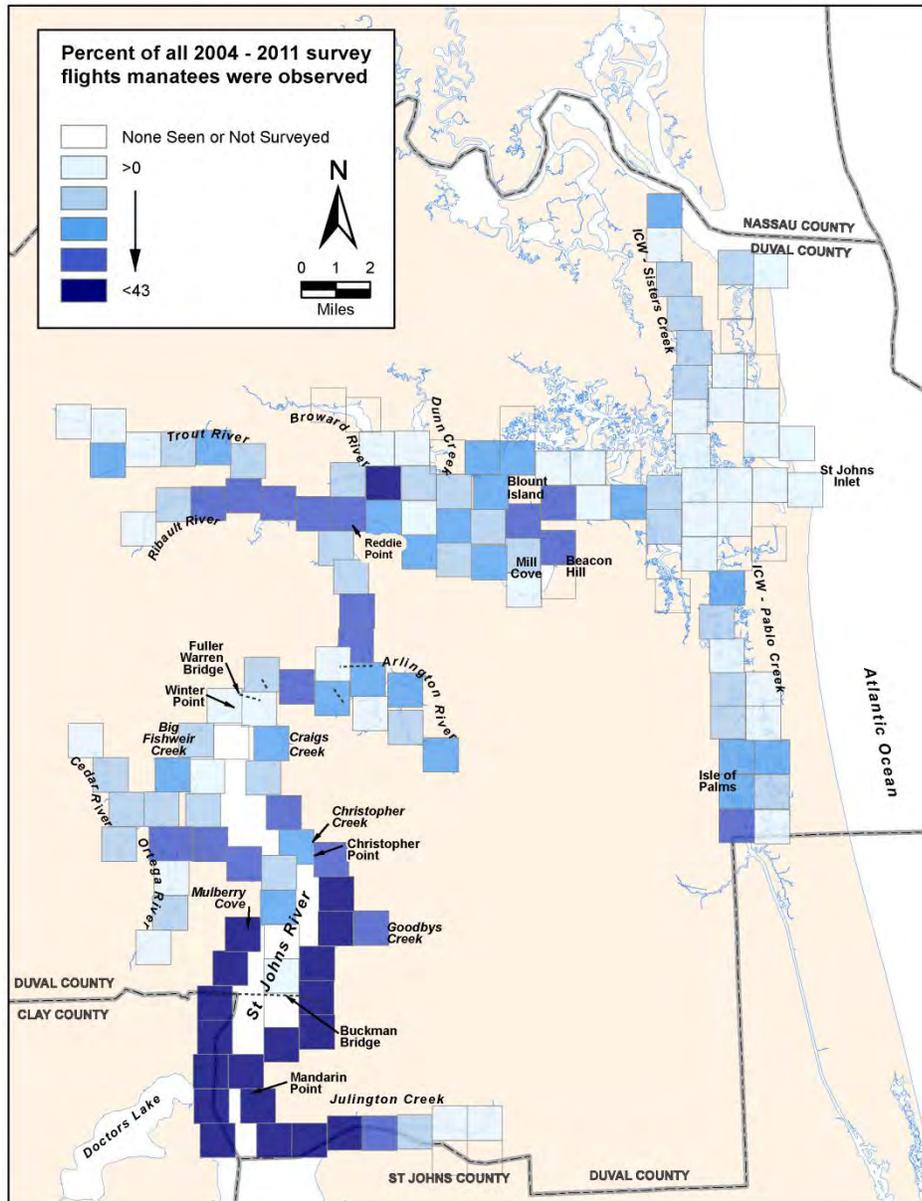


Figure 33: Number of flights manatees were seen per square mile divided by the number of aerial survey flights (2004-2011), displayed in quantile classifications. 18 square mile units were either not surveyed or manatees were never sighted there. Manatees were seen in one to three percent of all flights in 42 of the square mile units, four to six percent in 34 of the square mile units, seven to nine percent in 23 of the square mile units, 10 to 16 percent of all flights in 19 of the square mile units, and manatees were seen during 17 to 42 percent of all flights in 19 of the square mile units.

The areas of most frequent use were observed in the more southern portions of the county, south of Christopher Point down to and including portions of Julington Creek. Other isolated areas indicating relatively high recurrent manatee use were observed near downtown Jacksonville, near the confluence of the Trout and Ribault Rivers, and near Blount Island. Use was lower in the SJR Inlet area and portions of Pablo Creek.

4.1.3 Telemetry Data

While aerial survey data provide useful information about manatee abundance and distribution, the limitations of this data include the inability to identify and monitor individual manatees through time. Telemetry data about the Atlantic Coast manatee management unit movement patterns were collected when 78 manatees were tagged and monitored for varying amounts of time between 1986 and 1998. Along with details about manatee movement to warm-water discharges in South Georgia and Nassau County, Florida where animals over-wintered in the past, this telemetry data also provide information about general year-round manatee usage of COJ waterways. Because most existing industrial warm-water outfalls have been eliminated or diffused, the year-round presence of manatees in the SJR and further north is ending, through either mortality or migration (Deutsch et al., 2003).

Florida manatees are highly mobile, migrating seasonally over extensive geographic areas (Weigle et al., 2001; Deutsch et al., 2003). There may be variation in individual manatee movement, and animals may react differently to changes in water temperature. Both factors likely influence when animals leave their winter locations (Deutsch et al., 2003). The most important environmental factor influencing long-distance movements is seasonal fluctuation in water temperature, but breeding behavior and variation in forage are also significant factors. Seasonal movement patterns of manatees are varied; some are year-round residents in a local area, while others are migrants that travel over several hundred kilometers of coastline annually (Weigle et al., 2001; Deutsch et al., 2003). Manatee movement patterns are structured by the tendency to return to the same area and to the same seasonal ranges year after year; this includes winter aggregation sites and warm-season home ranges (Reid et al., 1991; Koelsch, 1997; Deutsch et al., 2003). Telemetry data indicate that an individual's fidelity to its warm-season range is usually even stronger than to its winter range, likely due to the more predictable environmental conditions in summer compared to the variations of weather and power plant operations in winter (Deutsch et al., 2003).

Areas heavily used by tagged manatees, are likely important to many manatees in the area. Telemetry data has identified the SJR inlet to Mosquito Lagoon (except for the Tomoka River) as primarily a travel corridor between the manatee northern range including the SJR system and Brevard County, and other locations farther south on the Atlantic Coast where animals over-winter mostly at industrial warm-water effluent locations. Manatees often migrated without pause between the northern Indian River and the St. Johns River over periods of two to four days (Deutsch et al., 2003). Manatees migrate during both daytime and nighttime periods. A large portion of the Atlantic Coast management unit resides in Brevard County at least seasonally (Hartman, 1974; Shane, 1983; Beeler and O'Shea, 1988; Provancha and Provancha, 1988). No animals from the Atlantic Coast unit tagged during the 1986-1998 telemetry study moved south of Palatka. But this movement is known to happen and the expansion of the Blue Spring overwintering group is partly from Atlantic Coast management unit immigration (O'Shea, 1988; Ackerman, 1995). The number of manatees using the natural Blue Springs State Park warm-water site has been documented since 1970 with the total number of manatees observed rising to 400 during the 2011-2012 winter, and a maximum single day count of 317 manatees during the 2009-2010 winter.

Twenty of the 78 manatees tagged and monitored between 1986 and 1998 during the telemetry study had locations in the COJ or used the ICW within the COJ to accomplish their seasonal travel. Eight of these 20 manatees were located within the SJR and its tributaries, and the other 12 manatees were only using the ICW as a travel corridor between the warm-water aggregation sites located north of the COJ at that time and warmer waters in Brevard County and farther south. The majority of the eight manatees using the SJR was located south of Reddie Point. The presence of these eight animals was concentrated on the east side of the SJR between Craigs Creek and Mandarin Point and into Goodbys Creek, and also on the west side of the SJR between Doctors Lake and Mulberry Cove where tape grass was readily available. A few of these eight manatees spent time on the west side of the SJR between Mulberry Cove and the Ortega River and into the Ortega River and Big Fishweir Creek. Most of these animals traveled freely from one side of the SJR to the other in this area (Figure 34).

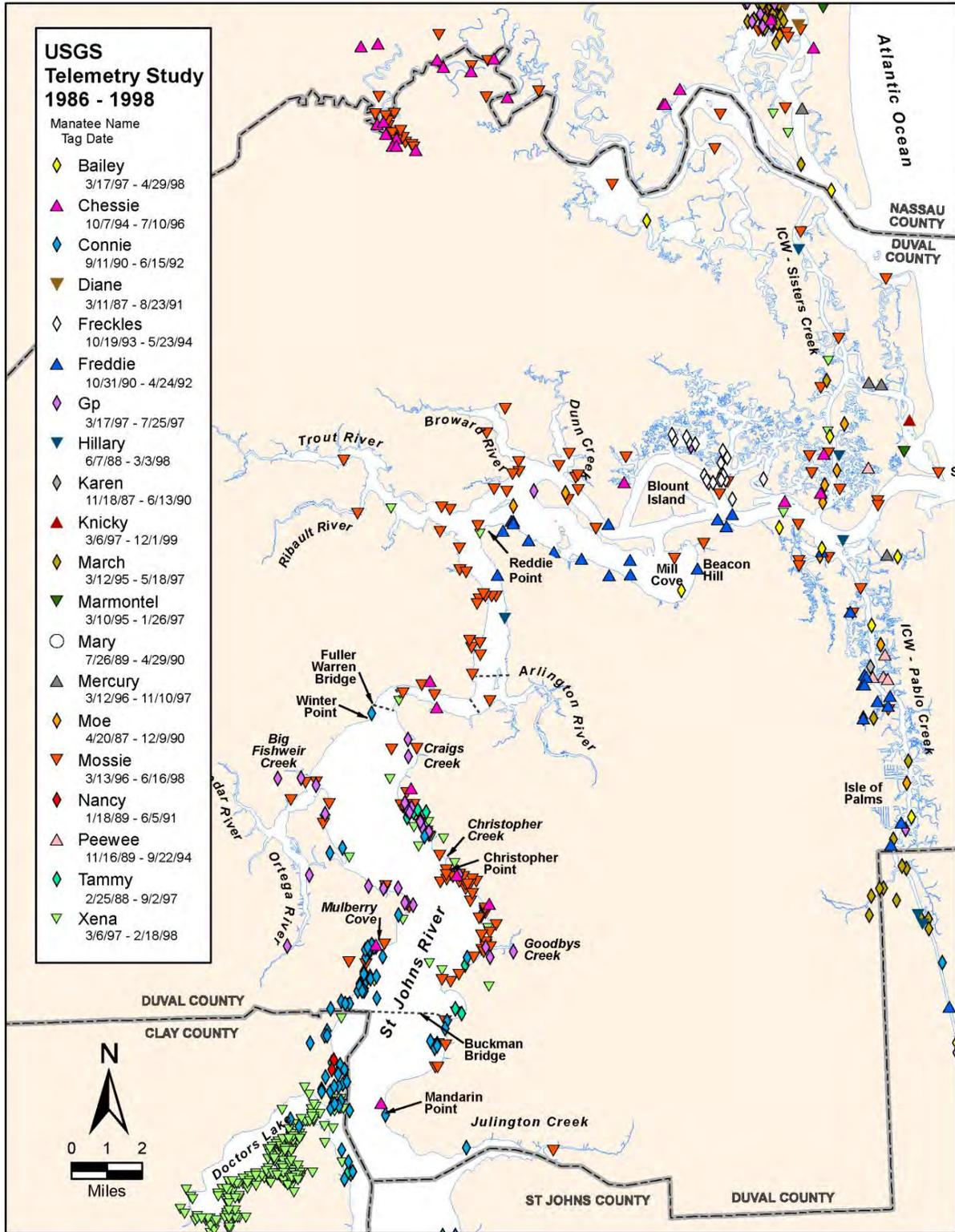


Figure 34: Telemetry study (1986-1998).

The locational data collected from individual animals tagged during this telemetry study correspond well to areas documented with high manatee use by aerial surveys.

4.1.4

4.1.5 US Geological Service (USGS) Sirenia Project

The USGS Southeast Ecological Science Center in Gainesville, Florida administers the Sirenia Project that conducts long-term, detailed studies on the life history, population dynamics, and ecological requirements of the Florida Manatee. Sirenia Project biologists work cooperatively with federal and state researchers and managers on research identified as essential for the recovery of the species.

The Sirenia Project has catalogued over 2,300 scar patterns (personal communication, Cathy Beck USGS) on manatees from photographs. JU is also involved in the project and provides local photographs of manatees. Photographs assist in identification of individual manatees. In addition, JU assists the project by doing research and collecting data to help determine travel patterns for individual manatees. According to the Sirenia Project, the manatee identities divide almost equally between the east and west coasts of Florida. The database is dynamic, with new sightings of known manatees added continuously, newly documented manatees added, and matches made to salvaged carcasses.

4.1.6 Manatee Rescue Information

FWC's Marine Mammal Section at the Florida Wildlife Research Institute in St. Petersburg has assisted in a variety of manatee rescue operations statewide. Between August 1989 and January 2010, forty-three (43) manatees have been rescued in COJ waterways. Of these 43, twelve were from the Ortega River of which nine rescues were cold stress rescues from the Ortega River Basin. Twenty-one (21) rescues were the result of cold-stress, seven (7) were the result of watercraft-related injuries, six (6) were the result of entrapment (three for crab traps and three for structures/culverts). Six (6) additional rescues were the result of orphaned calves, and three (3) rescues were from natural causes (two were stranded on mud flats from outgoing tides).

4.1.7 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.

Between 1974 and December 31, 2010, there were 7,991 reported manatee deaths in Florida, of which 1,820 were determined to be from watercraft-related injuries. Of these deaths, 377 were documented in the COJ, and 136 of these 377 (36.1%) were determined to be watercraft-related deaths. Only four counties (Brevard, Lee, Collier, and Volusia) rank higher than the COJ for manatee deaths from all causes. And only three counties (Brevard, Lee, and Collier) rank higher than the COJ for manatee deaths determined to be watercraft-related (referenced as Duval County in MMPL mortality database) (Figures 35 and 36).

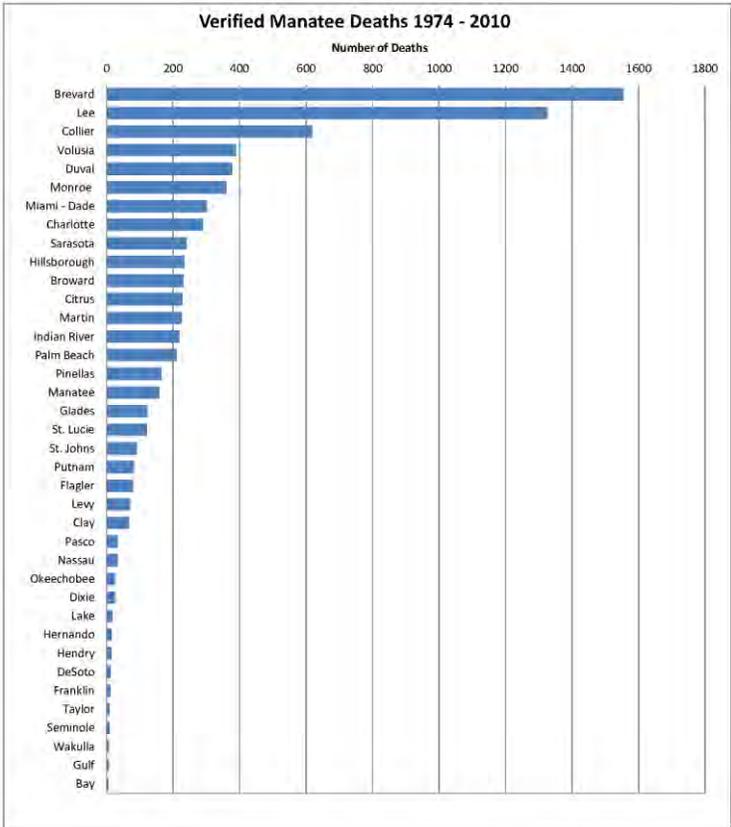


Figure 35: Florida counties ranked by total number of manatee deaths.

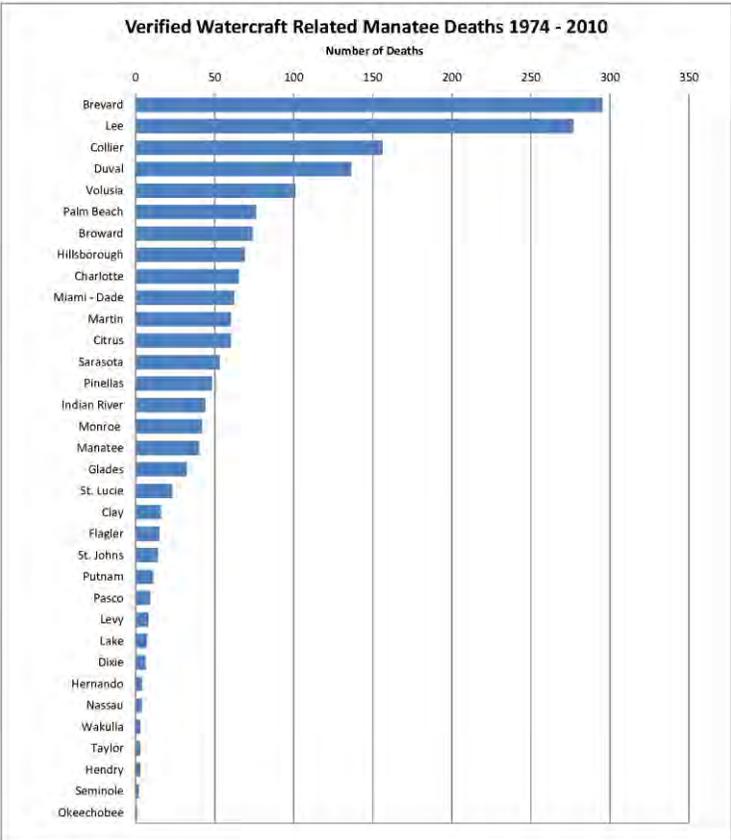


Figure 36: Florida counties ranked by total number of watercraft-related manatee deaths.

The locations of all verified manatee deaths in the COJ between 1974 and 2010 are illustrated below in Figures 37 - 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.

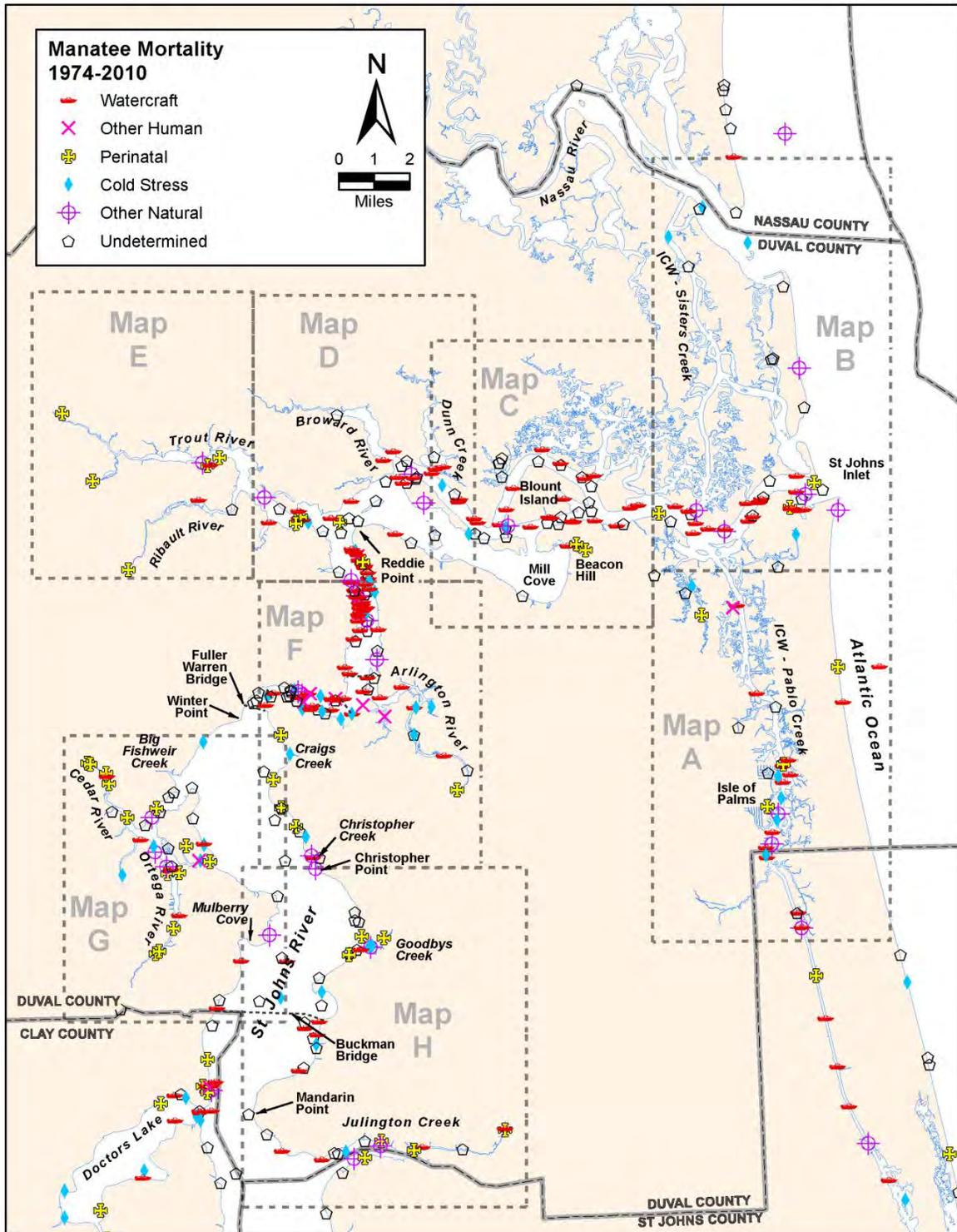


Figure 37: Manatee death carcass recovery locations (1974-2010).

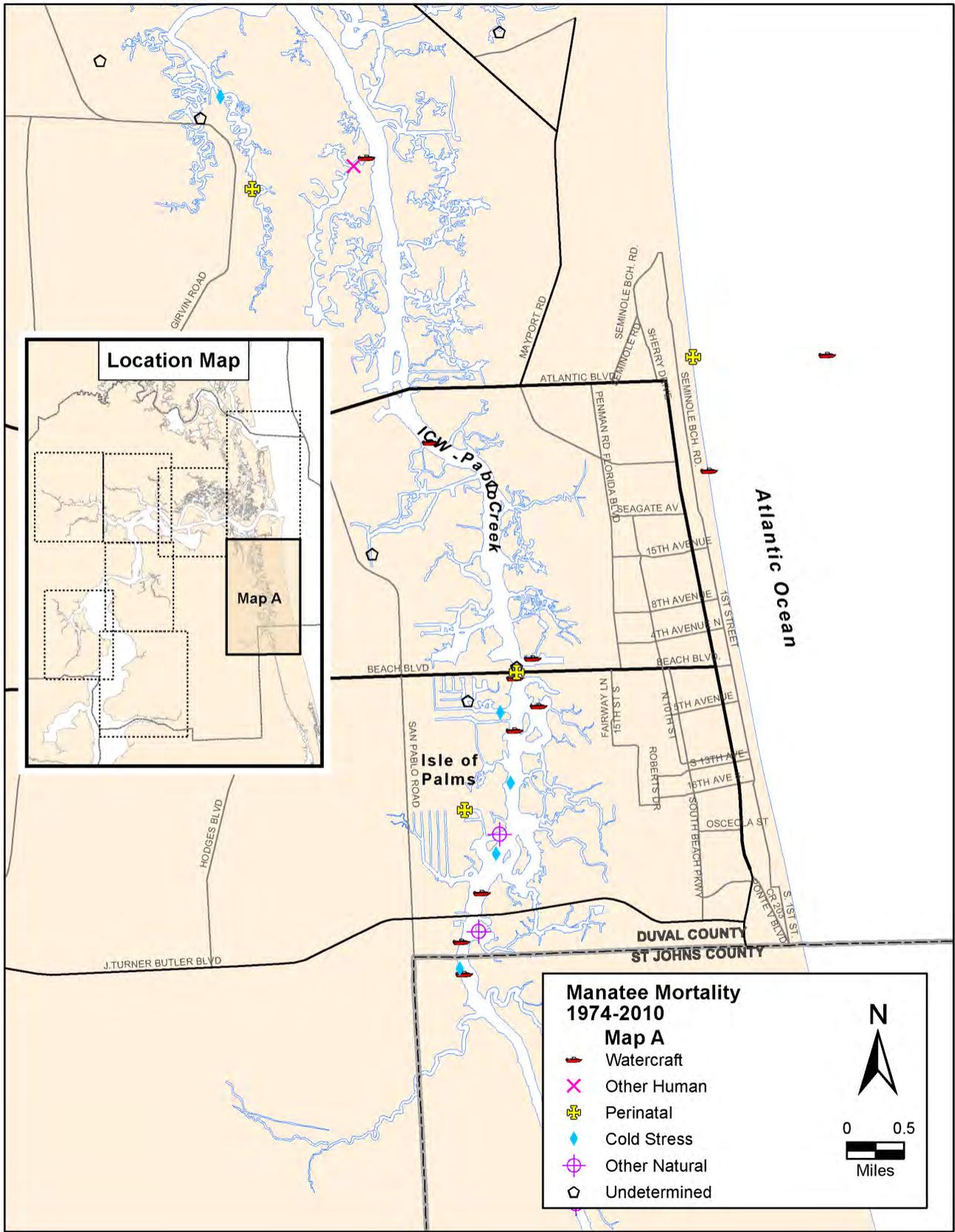


Figure 38: Manatee Mortality Map A.

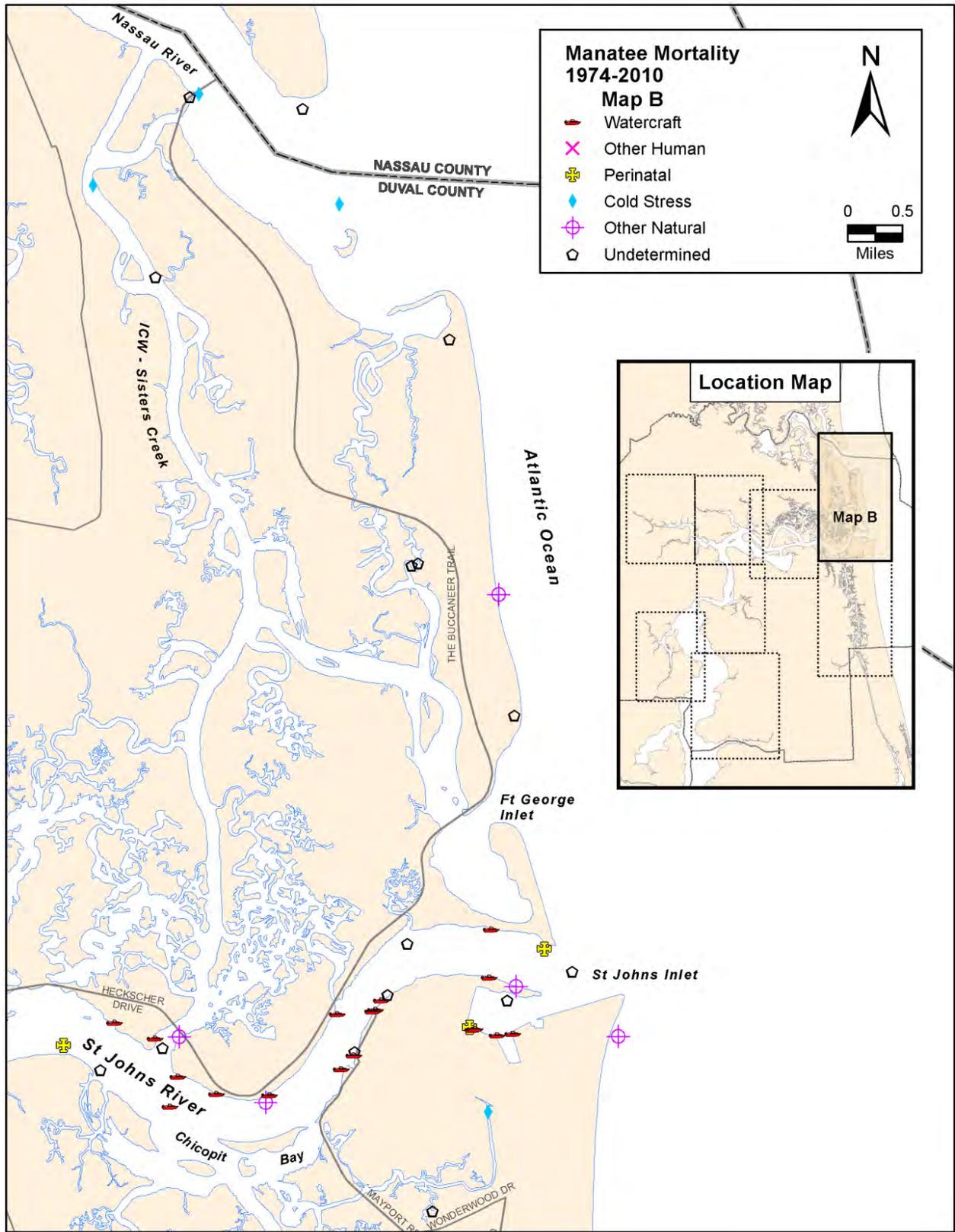


Figure 39: Manatee Mortality Map B.

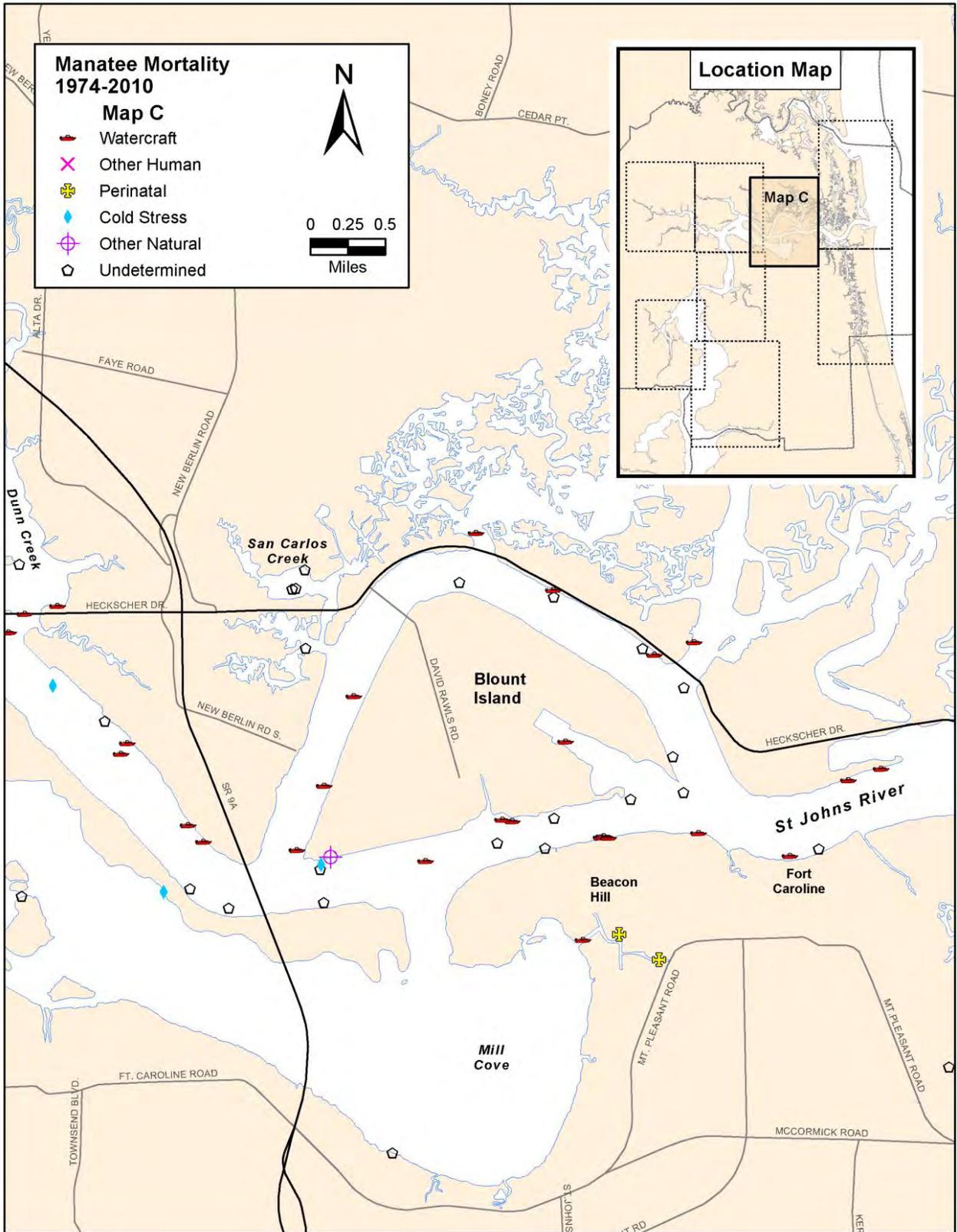


Figure 40: Manatee Mortality Map C.

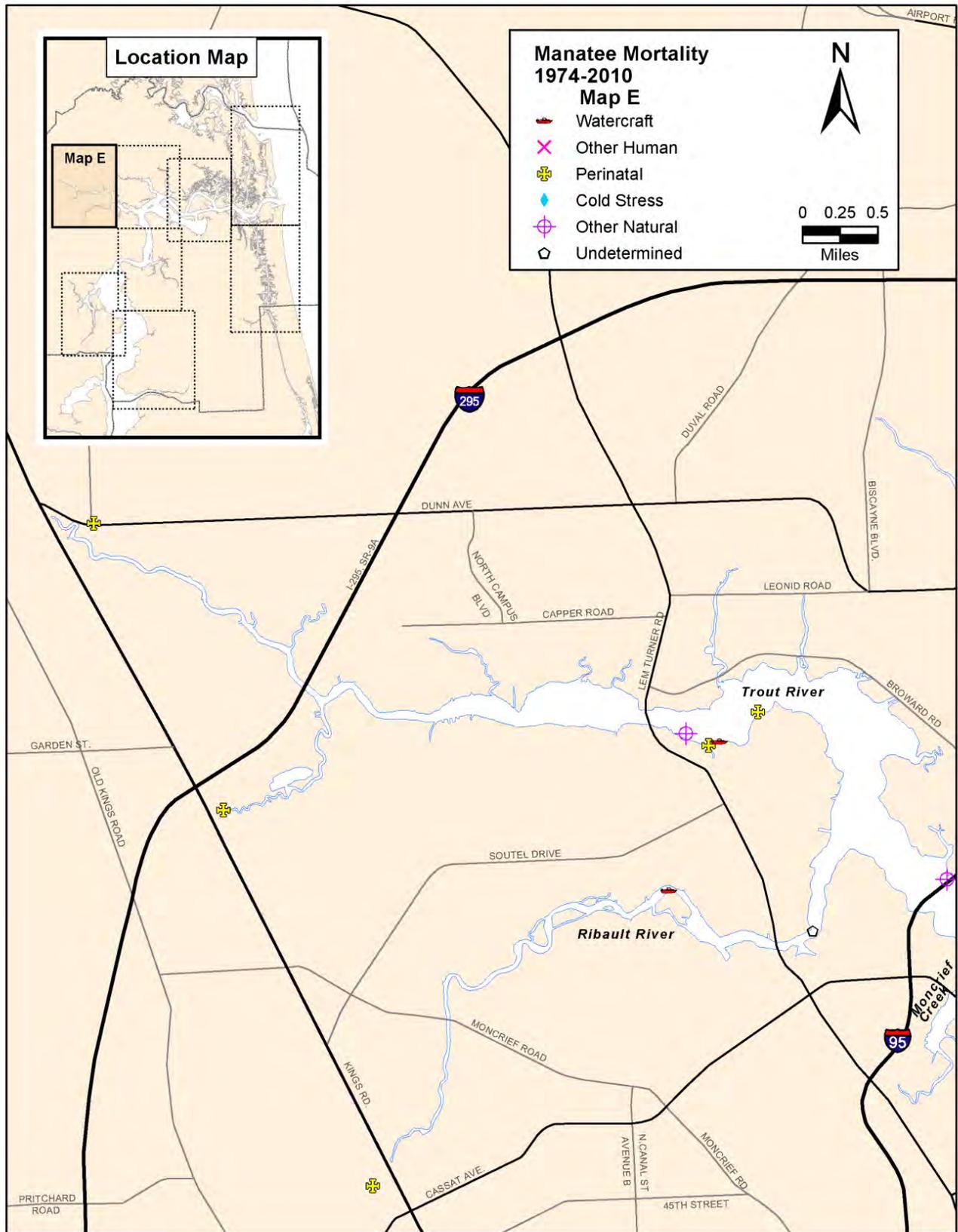


Figure 42: Manatee Mortality Map E.

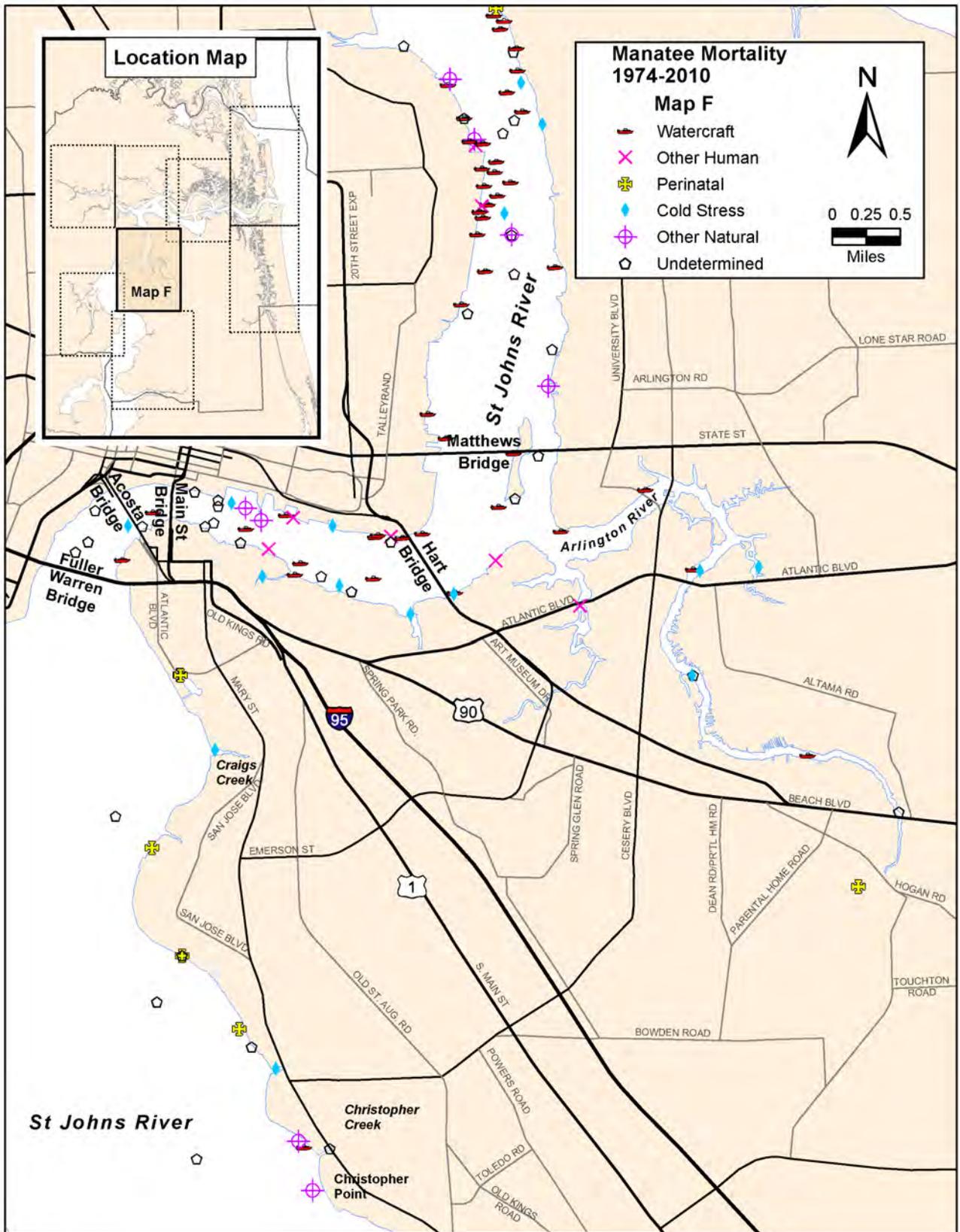


Figure 43: Manatee Mortality Map F.

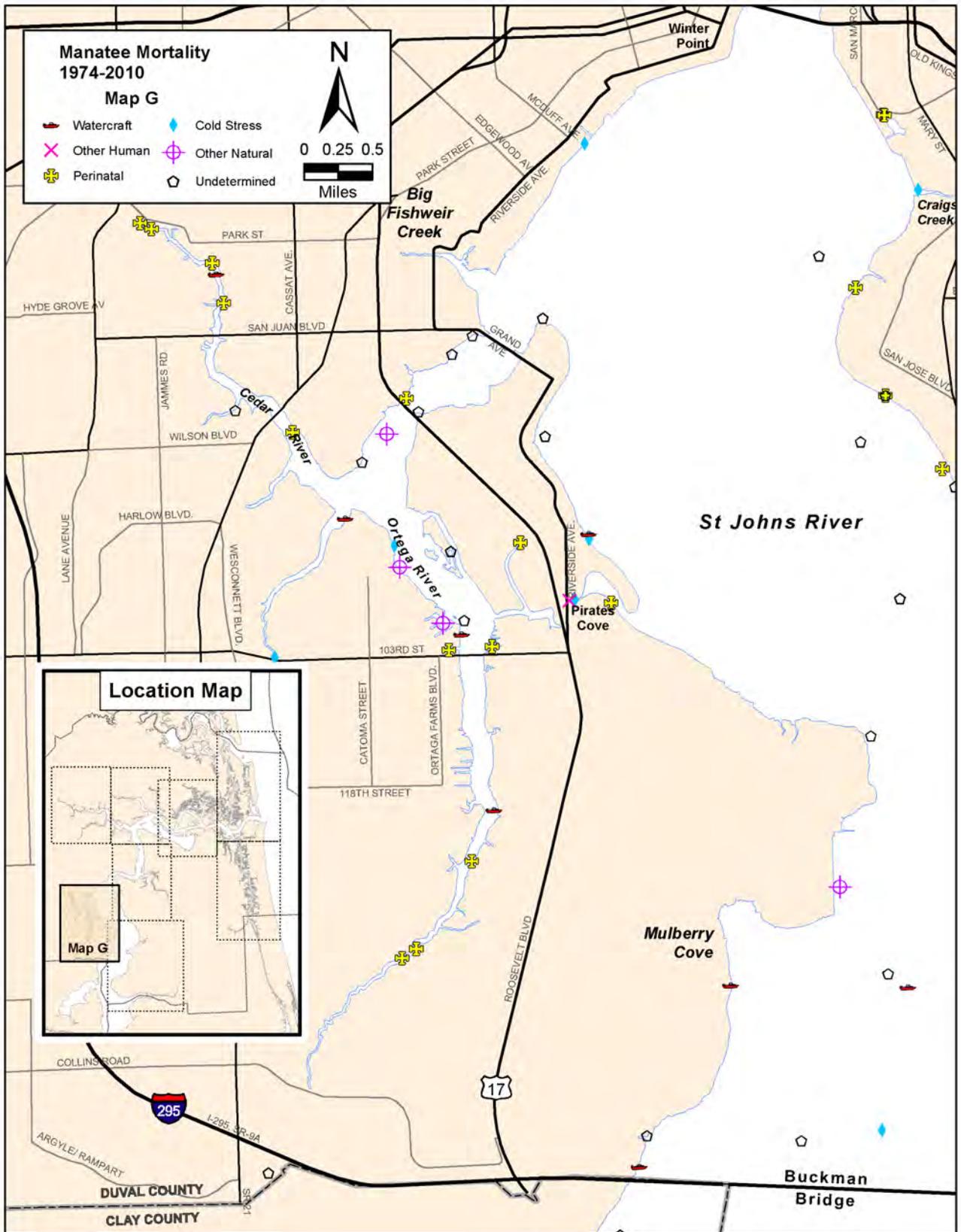


Figure 44: Manatee Mortality Map G.

“Watercraft collisions account for approximately 25% of all documented manatee deaths statewide since 1976 (and 35% of documented deaths of known cause), and are the single greatest known cause of mortality (Florida MMP, 2007, page 8).” A recent Florida manatee threat assessment indicates that watercraft-related mortality has the greatest impact on manatee population growth and resilience (Runge et al., 2007b). There has been an increase in the number of watercraft-related manatee deaths within the COJ in recent years. In the 11 years between 2000 and 2010, there were 59 watercraft-related deaths documented in the COJ which included two carcass recoveries in the Atlantic Ocean (Figure 46). In the 10-year period prior to that, 31 deaths were watercraft-related (1990 through 1999). Between 1980 and 1989, 32 manatee deaths were determined to be watercraft-related. In each of the two decades prior to the original Duval County MPP (approved 1999), an average of three (3) watercraft-related deaths occurred per year. Average annual watercraft-related manatee death has risen to five (5) per year within the eleven years after the 1999 MPP.

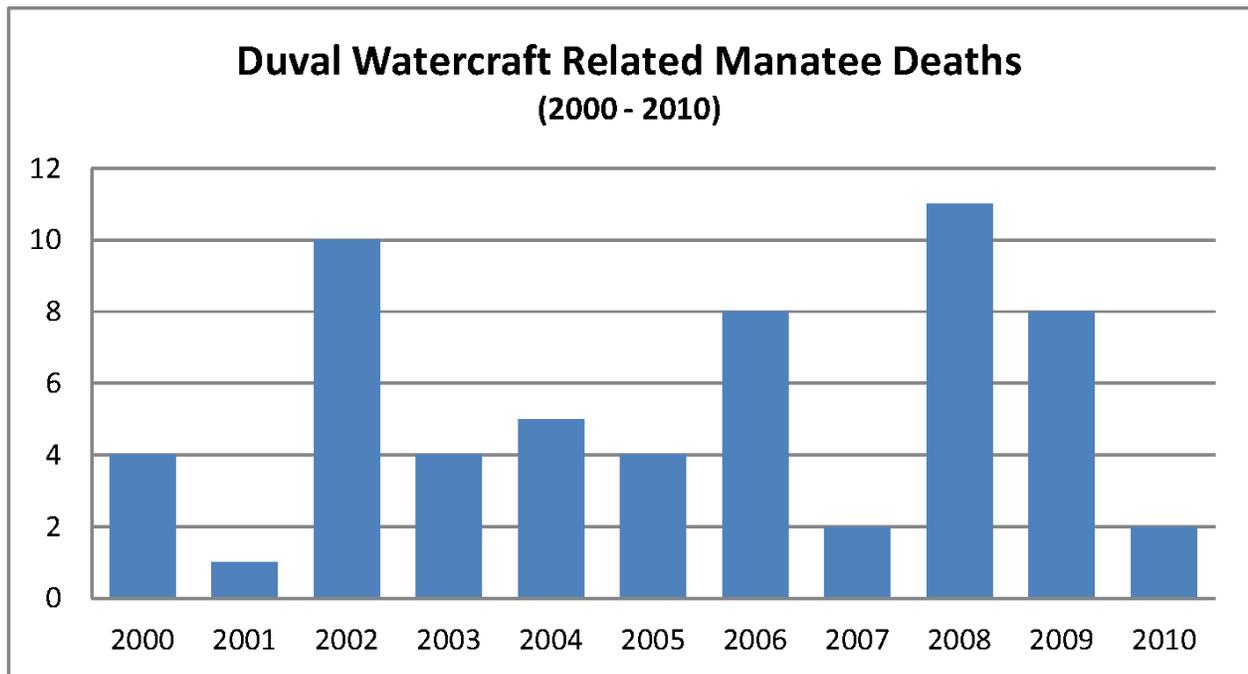


Figure 46: The number of watercraft-related manatee deaths in the COJ (2000-2010) by year.

Evaluation of carcass recovery locations is one way to analyze manatee death data. A comparison of watercraft-related manatee death locations in the COJ per decade for the 30 years between 1981 and 2010 is illustrated in Figure 47.

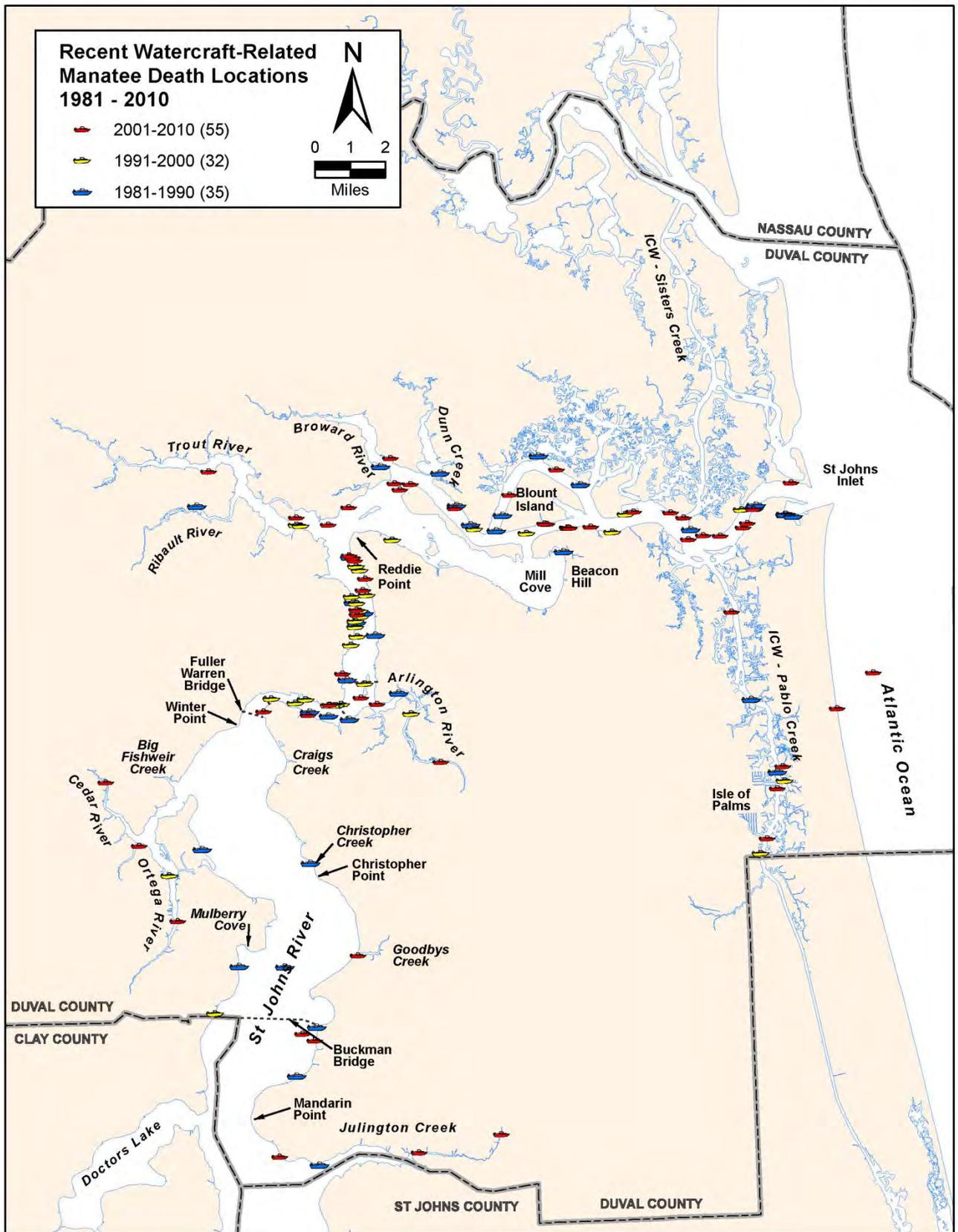


Figure 47: COJ manatee watercraft-related death carcass recovery locations (1981-2010).

The number of manatee deaths in the COJ attributable to watercraft has increased dramatically since 1999. Between 2001 and 2010, the percentage of watercraft-related manatee deaths increased to 44% of all reported manatee deaths, compared to 31% between 1991 and 2000 and 32% between 1981 and 1990. As illustrated in Figure 47, in the years following state approval of the original MPP (2001 – 2010) the highest level of verified watercraft-related manatee deaths was recorded within the SJR tributaries (Julington Creek, Cedar River, Ortega River, Arlington River), southern Pablo Creek, the SJR immediately east and west of the Pablo Creek confluence with the SJR, and the mainstem of the SJR between East 8th and East 44th Streets. During this same time period, watercraft-related deaths at a higher number than the immediate surrounding area were also recorded in Goodbys Creek and on the east shoreline of the SJR, a mile north and south of the Buckman Bridge.

The number of manatees present and variation in human activities may affect the type and amount of manatee deaths that occur throughout a year. Higher numbers of manatee deaths in warmer months may be a result of a larger number of manatees present that time of the year, as well as an increase in boating activity. There is a noticeable difference in the seasonality of type and numbers of manatee deaths between the years before and after the first MPP. In more recent years, there appears to be more watercraft-related manatee deaths earlier in the summer and spring. A factor of some of these differences may be related to the termination of most all human produced industrial warm-water discharges in 2001 which has likely altered manatee use of the COJ waterways. Variations in type, numbers and seasonality of manatee mortalities before and after the 1999 MPP are illustrated in Figures 48 and 49 below.

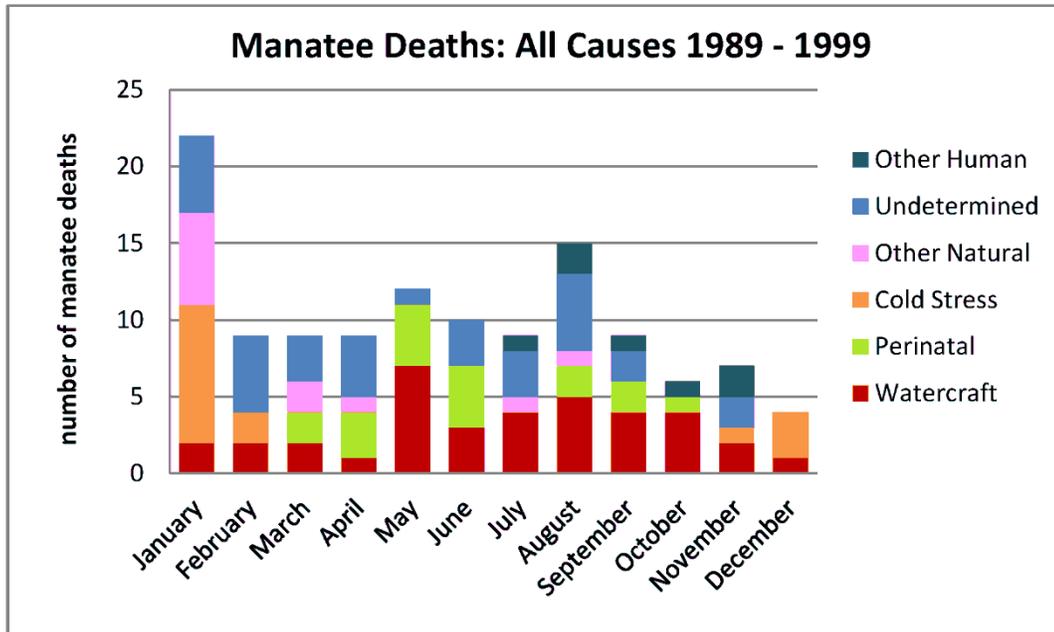


Figure 48: Chart depicting the number of manatee deaths and types of death, by month (1989-1999).

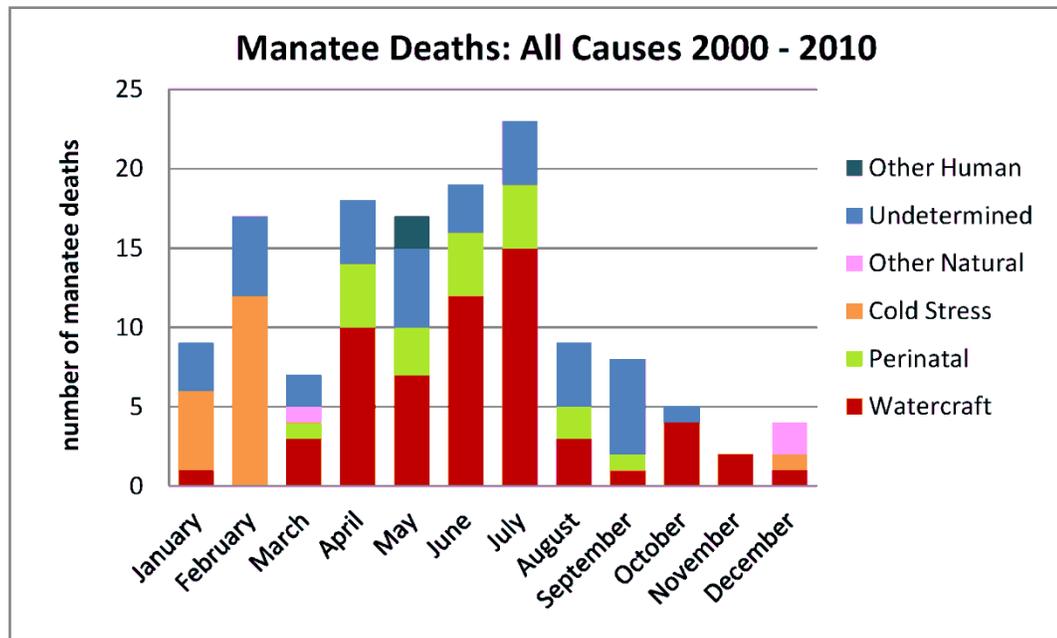


Figure 49: Chart depicting the number of manatee deaths and types of death, by month (2000-2010).

4.1.7.1 Large Vessel Mortality

Private and Jacksonville Port Authority freight shipping, as well as military ship activity in the SJR north of the Fuller Warren Bridge to the St. Johns Inlet, may account for part of the COJ watercraft-related manatee mortality. Watercraft induced wounds have been studied to characterize manatee deaths that may be attributed to very large vessels. Manatee mortality data collected between 1990 and 1999 were studied by FWC’s MMPL, and it was concluded that six of the 31 watercraft-related deaths reported in the COJ during that time exhibited evidence of death due to injuries from very large propellers (Pitchford et al., 2003). Figure 50 shows the animals identified in this study.

Field ID	Carcass Recovery Date
MNE 9108	05/01/1991
MNE 9119	08/03/1991
MNE 9133	10/19/1991
MNE 9215	07/08/1992
MNE 9509	05/04/1995
MNE 9619	11/24/1996

Figure 50: Manatee deaths identified as resulting from injuries by large vessels between 1990-1999 (Pitchford et al., 2003).

Large vessel deaths characterized in this study were those with estimated propeller diameters equal to or greater than 160 cm. After the 2003 publication, protocols to further characterize watercraft-induced wounds were developed by the MMPL. The forensic methods developed are discussed in a 2007 publication (Rommel et al., 2007). Analysis of a five year subset of mortality data (2000-2004) suggests that a disproportionate number of propeller-caused watercraft-related mortalities during this time could be attributed to propeller diameters equal to or greater than 43.2 cm, inferring that these were caused by watercraft greater than or equal to 40 feet. The paper describes very large propellers as equal to or greater than 76.2 cm. See Figure 51 for the MMPL category details.

MMPL Category I	MMPL Category II	MMPL Category III	MMPL Category IVa	MMPL Category IVb
Small outboards	Larger outboards, sterndrives, small inboards	Inboard yachts	Mega yachts, ships	Tugs
Prop. Dia. 9-10 in. (22.9-25.4 cm)	Prop. Dia. 13-16 in. (33-40.6 cm)	Prop Dia. 17-28 in. (43.2-71.1cm)	Prop Dia. > 30 in. (76.2 cm)	Prop Dia. ≥ 24 in. (61 cm)
DMV Classes A1 & A2: <16 ft	DMV Classes 1 & 2: 16-40 Ft.	DMV Class 3: 40-65 ft	DMV Classes 4 & 5: > 65 ft	DMV Classes 1-5: 25-90+ ft
Pitch: ≤ 33 cm (13 in.)	Pitch: 27.9-88.9 cm (11-35 in.)	Pitch: 43.2-96.5cm (17-38 in.)	Pitch: ≥ 76.2 (30 in.)	Pitch: ≥ 50.8 cm (20 in.)

Figure 51: MMPL propeller size categorization used in MMPL necropsy database starting 2008.

Starting in 2008, details as to whether a death was caused by a large vessel (using the 2007 publication methodology) are included in necropsy reports, when possible. Those animals conclusively described in publications or in MMPL necropsy reports as large vessel are discussed as “large vessel deaths.” It is important to note that a manatee transection does not automatically mean a very large vessel was the cause of death. It is acknowledged in the 2007 publication that due to the complexity of the forensics involved, deaths caused by larger propellers may be underestimated. As an example, an animal that died from a large vessel strike on July 19, 2009 (MNE0938) was the dependent calf of a manatee (SWFTm0916b) that was recovered on July 25, 2009. However, the death of the mother was unable to be conclusively described as a death caused by a large vessel. While MMPL Category IVa is described as mega yacht or ship and Category IVb is classified as tug, MMPL cannot distinguish between these two categories in the necropsy (FWRI MMPL, personal communication). Manatee deaths identified as a large vessel death in MMPL necropsy reports or database since 2000 are listed in Figure 52.

Field ID	Carcass Recovery Date
MNE1035	05/25/10
MNE 0938	07/19/09
MNE 0935	07/15/09
MNE 0921	04/13/09
MNE 0840	10/27/08
MNE 0839	10/25/08
MNE 0824	07/01/08
MNE 0819	06/12/08
MNE 0818	06/10/08
MNE 0738	12/06/07
MNE 0711	04/13/07
MNE 0616	06/15/06
MNE 0617	06/15/06
MNE 0610	04/17/06
MNE0311	04/01/03
MNE 0026	08/13/00

Figure 52: Large vessel manatee deaths identified in the MMPL necropsy report or database (2000-2010).

Figure 53 depicts the carcass recovery locations of 22 manatee deaths in the COJ between 1990 and 2010 that were characterized as related to large vessel. This map distinguishes the two studies, because it should be noted that these studies are not comparable. As discussed earlier, those deaths characterized as large vessel in the first study (1990-1999) estimated ‘large vessel’ propeller diameters to be equal to

or greater than 160 cm. The second study (2000-2004), as well as present day methodology, characterizes large vessel deaths as those with propeller diameters equal to or greater than 76.2 cm. Figure 54 depicts manatee deaths categorized as large vessel and all other watercraft-related manatee deaths for the two most recent 10 year periods (1991-2000 and 2001-2010). Including all of the years from both decades, twenty five percent (25%) of the watercraft-related deaths in the COJ have been categorized as large vessel. In the first decade (1991-2000), twenty-two percent (22%) of the deaths were related to large vessel, as compared to twenty-seven percent (27%) in the more recent ten year decade (2001-2010). However, the different methodologies used in characterizing large vessel deaths between these decades may contribute to what could be perceived as an increase.

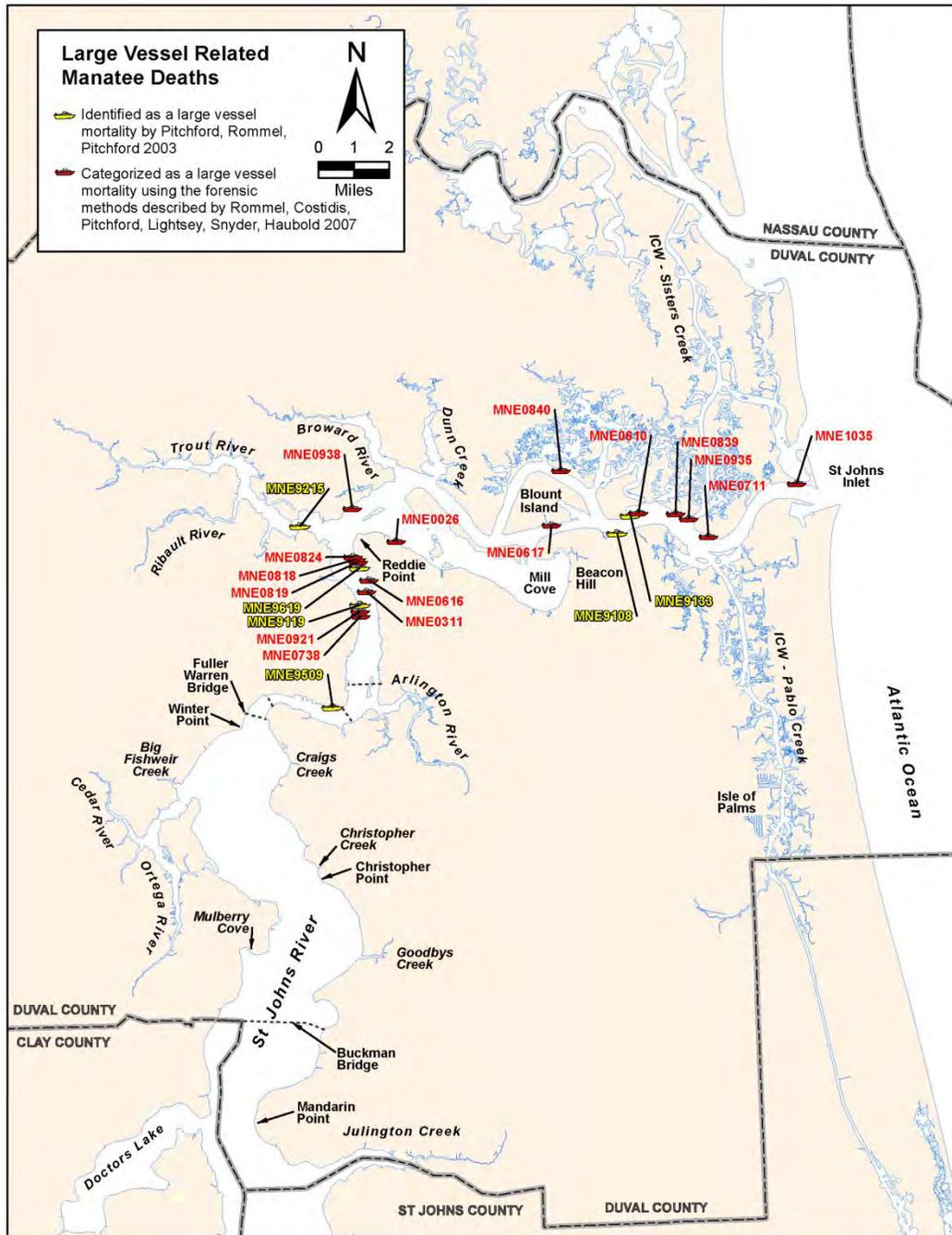


Figure 53: Watercraft mortality in the COJ categorized as large vessel related (1990-2010).

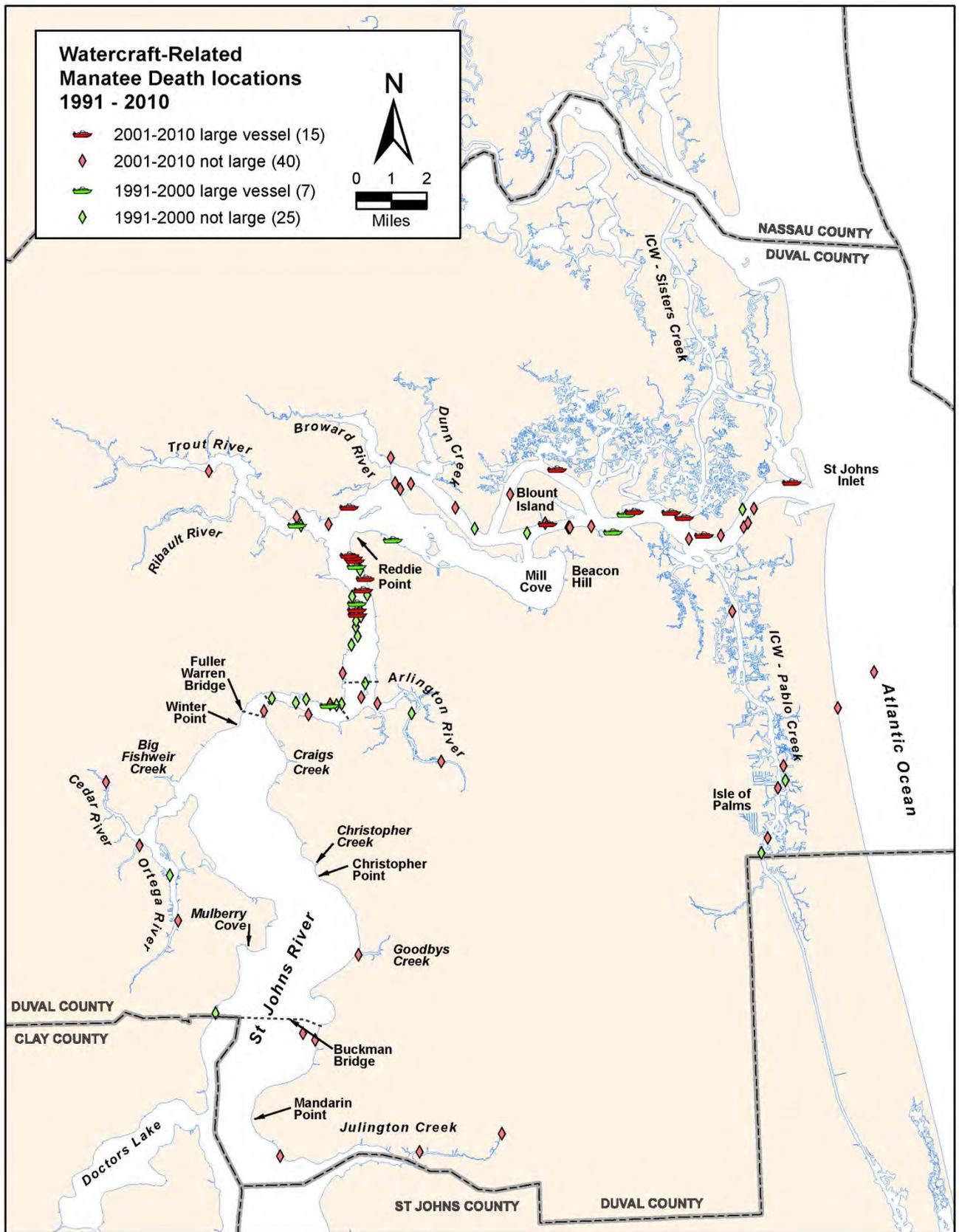


Figure 54: Comparison of COJ large vessel watercraft mortality and deaths not designated as large vessel (1991-2010).

Because of the type of injuries caused by large vessels, death likely occurs close to the manatee and boat collision site. However, it is typically not possible to correlate the location of carcass recovery with the site of death. If a manatee is not killed immediately by a boat strike, it may move on its own before succumbing to its injuries, and carcasses move with currents and tides, particularly in the SJR. Unless reported by the vessel operator, it is difficult (if not impossible) to know where a death occurred, or the circumstances surrounding it.

The 1999 version and 2006 revisions to the MPP included a provision that defined five or more watercraft-related manatee deaths in COJ waterways within a 12 month period as an unacceptable number of manatee deaths. That unacceptable level of manatee mortality occurred four times between 2000 and 2010 (May 23, 2002 and remained at the unacceptable level for almost 24 months; August 18, 2004 and remained at the unacceptable level for approximately 10 months; April 17, 2006 and remained at the unacceptable level again for approximately 10 months; and June 12, 2008 and remained at the unacceptable level for 25 months).

4.1.8 Conclusions

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

- Manatee use of the COJ waterways is widespread and the COJ waterways support a primarily seasonal manatee population with greatest abundance during non-winter months. Winter use has decreased in recent years, at least partly due to the end of industrial warm-water discharges in the COJ. Manatees have been observed at the Ortega Farms Basin and JEA District II wastewater discharge outfall in the winter seeking warm-water refuge. Due to the documentation of manatee deaths on a year-round basis, it is reasonable to conclude that at least a small number of manatees are present during the winter months.
- Site fidelity has been well documented for manatees in the COJ, with animals returning to specific locations within the COJ. These areas include locations used by manatees for foraging, resting, and calving along the SJR shorelines south of the Fuller Warren Bridge and within the SJR tributaries (Ortega River, Julington Creek, Goodbys Creek, Arlington River), and the Trout and Ribault River and tributaries.
- Manatees in the COJ are widely dispersed and move freely between sites, particularly during non-winter months. There is high manatee use in most COJ waterways; particularly in Pablo Creek, the Trout River and its tributaries, the mainstem of the SJR from the mouth of Sisters Creek upstream to the Fuller Warren Bridge, and the SJR and its tributaries south of Fuller Warren Bridge, which includes the Ortega River and tributaries.
- Some COJ waterways are used by manatees for nursing and calving. The most significant locations for these types of activities appear to be the Trout River and its tributaries and the Ortega River and its tributaries. The Isle of Palms in Pablo Creek, a

canal in Beacon Hills in Mill Cove, the Arlington River, Goodbys Creek, and Julington Creek also appear to be important calving and nursing areas.

- Some of the watercraft-related deaths have been determined to be from interactions with large vessels present in COJ waters (Port, private freight shipping, yachts, and military vessels).
- Watercraft-related manatee mortality in the COJ was at an unacceptable level as defined in the 1999 MPP for more than half of the 10 years between 2000 and 2010 (69 months). Specific areas within the county, primarily the SJR between the Fuller Warren Bridge and the St. Johns Inlet have experienced relatively high numbers of manatee deaths. Pablo Creek, the Trout River and all waterways south of the Fuller Warren Bridge have experienced lower numbers of watercraft-related deaths than the previously noted areas; however, the level of watercraft deaths in these locations has not decreased since the original MPP was approved in 1999.

4.2 Boat Activity in the City of Jacksonville

Boat traffic in the SJR is diverse and includes port facilities for large industrial and commercial shipping, commercial fishing, sport fishing and recreational activity. The following is a summary of available information about boat activity in the COJ.

4.2.1 Boat Registration

Total registered vessels in the State of Florida increased by 3.9% (+46,066 vessels) from 2001 to 2009. Commercial vessels represented an average of about 3% of total vessels per year, and experienced a steady decrease over time of 4,030 vessels from 2001 to 2009.

Florida Department of Highway Safety and Motor Vehicles (FDHSMV) 2010 records show that there were 34,483 registered boaters in the COJ (referred to as Duval County in the FDHSMV records) in 2000. This number increased to 34,494 by 2007 and decreased to 32,424 in 2009. Commercial vessels represent about 2% of total vessels and since 2000 have decreased by 14% to 600 vessels.

In addition to types of boats registered in the COJ (pleasure and commercial), information about the number of certain vessel classes (boat size) is also necessary to understand boating activity in the City. In an analysis of pleasure vessels from 2000-2009, the most abundant vessel size was Class 1 vessels from 16-25 foot (49%), followed by Class A-2 vessels from 12-15 foot (26%), Class A-1 vessels less than 12 foot (17%), and then Class 2 vessels from 26-39 foot (6%).

A similar analysis of commercial vessels over the same time period indicated that the most abundant vessel size was Class 1 vessels from 16–25 foot, followed by Class A-2 vessels from 12-15 foot, and Class 2 vessels from 26-39 foot. On average, vessels engaged in commercial operations represent about 1.8% of total vessel registrations in the COJ. It is important to understand how COJ boat registration relates to other counties in the State, and also specifically to those counties that are close neighbors.

In the State, COJ ranked ninth in terms of total vessel registrations from 2000 to 2009 (rank mean 8.80 ± 0.42 standard deviation (SD), and representing $3.5\% \pm 0.12\%$ SD). During this time, the ten counties with the highest levels of vessel registrations remained the same, and their rank positions did not change

significantly. Collectively, these counties accounted for almost 45% of vessel registrations in the State of Florida from 2000-2009 (mean 44.98% \pm 0.77 SD).

Moreover, the number of vessel registrations in surrounding counties is important because those vessels may also utilize COJ waters. South of COJ, total registered vessels in Clay County increased by 12.75% (+1,635 vessels) from 2001 to 2009, and of these, commercial vessels represented 1%. Total registered vessels in St. Johns County increased by 22.3% (+2,895 vessels); and commercial (3%). Total registered vessels in Putnam County increased 5.5% (+493 vessels); and commercial (3%). North of Duval, total registered vessels in Nassau County increased by 19.8% (+1,197 vessels); and commercial (3%).

4.2.2 Jacksonville Port Activity

Jacksonville port activity includes an independent agency of the COJ called JaxPort and other privately owned facilities. JaxPort is responsible for promoting and developing waterborne traffic and commerce. Future port expansion, public or private, must follow the 2030 Comprehensive Plan for Duval County (see 2030 Comprehensive Plan Objective 3.7).

Since 1978 Jacksonville port activity has been facilitated by a 38 foot deep channel, and roughly three (3) miles of modern wharf facilities. Access to the port is available 24-hours, seven days-a-week with no bridge restrictions (except for cruise ships greater than 180 feet in height). Its strategic location in the southeastern corner of the nation's transcontinental transportation network allows for quick and easy transfer of goods and materials between rail cars, truck chassis, and ships (JaxPort.com 2010). The port handles 8.4 million tons of cargo, cars, trucks, heavy equipment, crushed limestone and other aggregates, lumber, paper, steel, poultry, scrap materials, and general consumer goods are imported and exported through these facilities each year, and since 2003 cruise passengers. A Dames Point Terminal has been added and consists of 158 additional acres, supported by two 1,200 ft. berths and 6 Post-Panamax container cranes to handle bulk cargo (e.g. limestone and granite) (JaxPort.com 2010). Jacksonville's port also includes some private commercial docking facilities that handle large quantities of petroleum products.

The Jacksonville Marine Transportation Exchange (JMTX) is Jacksonville's maritime trade organization. JMTX was created to work for the success of its membership and coordinate the safe, secure and environmentally responsible management of the maritime transportation system within the port of Jacksonville. JMTX provides a stable coordinating structure for port-wide planning, coordination and infrastructure recommendations. JMTX serves as an information clearinghouse for port critical information, and provides a forum for the wide variety of maritime interests represented by such entities as towing companies, shipping companies, US Coast Guard (USCG), public and private commercial port pollution control companies, port security providers, freight handlers, JaxPort officials and others (stakeholder entities) and serves as a stakeholder advocate to local, regional and national agencies. The JMTX cooperative agreement "JMTX Manatee Protection Program" among commercial port stakeholders is currently in effect. All mariners are cautioned to keep a sharp look out for manatees and report any sightings to other vessels operating in the area. Details about the JMTX Manatee Protection Program and informational manatee protection placards (see Appendix A) specifically developed for commercial vessels are available by contacting JMTX. JMTX has been accepted by the USCG as the coordinating organization for the port's official Port Security Committee, and the Harbor Safety Committee. Since 9/11, JMTX has played a major role in coordinating security issues including assessments, intelligence sharing and compliance with security requirements (JMTX 2010). (<http://jmtxweb.org>).

A study characterizing commercial shipping vessel activities was conducted by JU for 30 days during August, 1994. The goal was to determine the number and type of shipping activities occurring in Duval County waters. The study was modeled after a study done by the National Marine Fisheries Service (Hain, 1993) that provided information about ship traffic and the Atlantic Right Whale. Although not an official commercial traffic study, a February 2011 Geotechnical Investigation Report prepared for the Jacksonville District US Army Corps of Engineers by Challenge Engineering & Testing, Inc., Mobile, Alabama in conjunction with proposed maintenance dredging of the SJR federal navigation channel, does conclude that during geotechnical field work that began in August of 2009 “marine traffic in the Jacksonville Harbor Entrance and St. John’s River Channel was noted to be heavy with strong tidal currents. In many instances, ships would pass side to side in the narrow channel, not allowing much additional room to maneuver in or near the channel for any other traffic or vessel” (Geotechnical Investigation Report, page 10).

Recent port statistics indicated that about 3,530 vessels use Jacksonville port facilities each year (JaxPort 2010). In 2004, there were 100 cruise ship passages to and from the Port, and by 2007, this number rose to 158. In 2008, there was a decrease to 100 cruise ship passages, and then in 2009 the number rose to 158.

4.2.3 Boating Accident Statistics

Annual boating accident statistical reports compiled by the Boating and Waterways Section of the FWC’s Division of Law Enforcement (FWC-LE) are a source of interesting information about boat use in the COJ. Most of the report data is from boating accident reports submitted by FWC-LE officers and other marine law enforcement partners working for local agencies. The FWC’s Boating and Waterways Section analyzes these statistics and uses the information to formulate proactive plans aimed at reducing the number of boating accidents and their related injuries, fatalities and property damage. This information is also reported to the USCG’s Boating Safety Division in Washington, D.C. to be included in the national database consisting of data from all U.S. states and territories. These statistics reflect data from “reportable boating accidents” that occur in Florida. An accident must involve at least one of the following incidents in order to be considered “reportable”: (1) A person dies; (2) A person disappears under circumstances that indicate possible death or injury, and (3) A person receives an injury requiring medical treatment beyond immediate first aid, or, there is at least \$2,000 aggregate property damage to the vessel(s) or other property (FWC-LE 2010). An analysis of annual boating accidents in Florida from 2005 to 2009 indicates that 61% ($\pm 3.29SD$) of the “reportable boating accidents” occurred in 10 Florida counties (Ranked highest to lowest number of reported accidents: Monroe (1), Miami-Dade (2), Palm Beach (3), Pinellas (4), Broward (5), Collier (6), Lee (6), Hillsborough (no data), Volusia (7), Bay (10), Duval (10), and Escambia (no data). COJ (referred to as Duval County in the reports) ranked from eighth to tenth between the years 2005-2008, but was not one of the top ten in 2009 (FWC-LE 2010).

FWC-LE Duval County boat accident information for the period 2000 to 2009 was also evaluated. There was a notable reduction in the number of reportable accidents between 2002 and 2004 (Figure 55). The locations of reportable boat accidents between 2005 and 2009 are indicated in Figure 56.

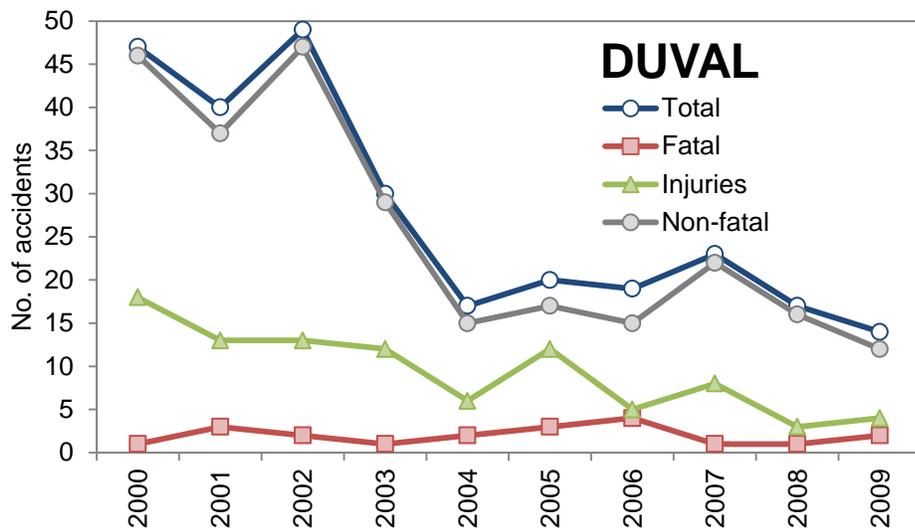


Figure 55: Boating accidents reported in Duval County 2000-2009. Source: FWC-LE 2010

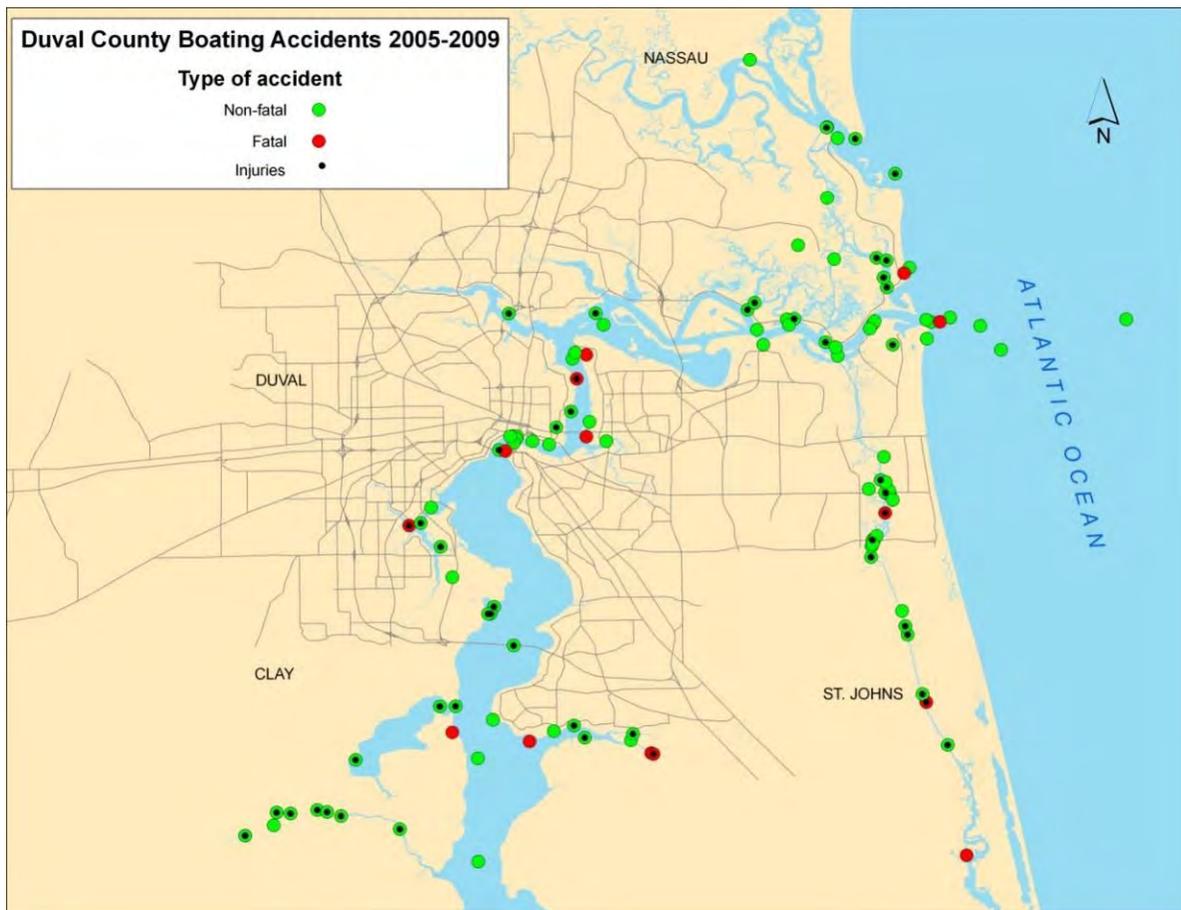


Figure 56: Location of reportable boating accidents 2005-2009.

Between 1998 and 2009, the majority of accidents occurred with open motorboats, cabin motorboats, personal watercraft (Jet Ski), and water jet boats in Duval County. Primary causes of reportable accidents in Duval County varied considerably each year, however, careless inattention was the greatest

cause of accidents, followed by no proper look-out, inattention of the boat operator, operator inexperience, mechanical failure, and then alcohol use. In Duval County between 1998 and 2009, collision with another vessel was the predominate type of reportable accident, or a collision with a fixed object in the water. Less incidents occurred due to wakes, or falls on personal watercraft, sinking, flooding (swamping), and falls overboard.

4.2.4

4.2.5 Recreational Boating Activity Studies

Only a few studies of recreational boat activity on the St. Johns River have been completed. The University of North Florida conducted a survey of recreational boat patterns on the SJR in the City of Jacksonville during 1991. Additional boat activity information was provided by a survey of boat ramps conducted by Jacksonville University (February, 1993 through August, 1994).

4.2.5.1 COJ 2009 Boater Traffic Study

Applied Technology and Management, Inc. (ATM) conducted a boater traffic study in the City of Jacksonville from December 2008 to November 2009 for the COJ. The principal objective of the study was to collect data to identify boat ramp and waterway use, boating activities and destinations, and boating traffic patterns.

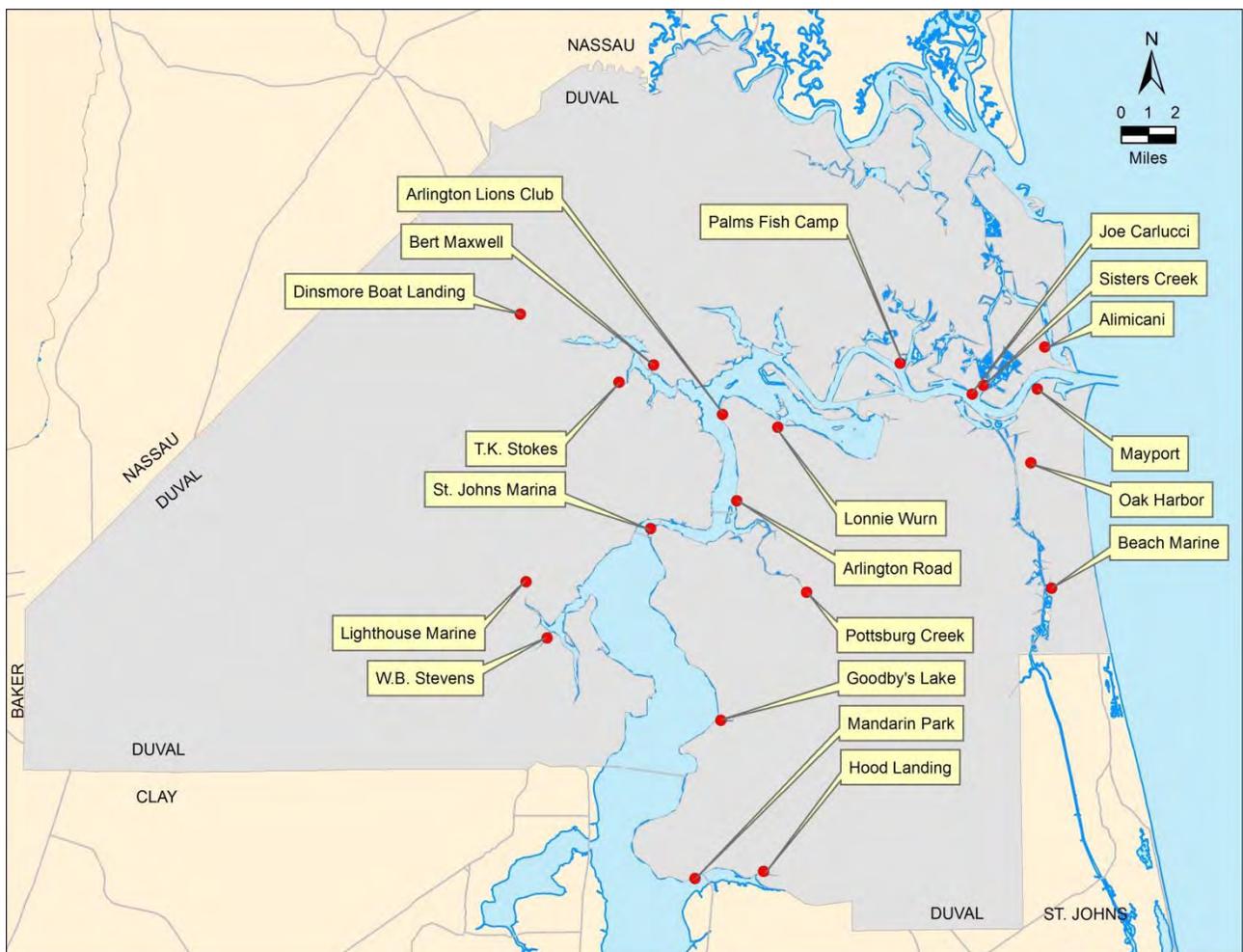


Figure 57: Boat ramp intercept survey locations, ATM, Inc. 2009.

The ATM study included a boat ramp intercept survey. In this survey, researchers visited 20 publicly owned county boat ramps multiple times and solicited boating activity responses from 1,841 boaters (Figure 57). Smaller, less used ramps were visited 2-3 times and larger more utilized facilities were visited from 4-13 times in order to optimize data collection efforts at the more crowded ramps. Not all ramps were visited on the 4th of July holiday due to inclement weather. Using the date of each boat ramp intercept survey, an illustration of the total number of survey responses by month was developed (Figure 58). The data was collected mostly on weekends once per month, including Memorial Day (May 25th), and in some cases, Independence Day (July 4th). No data was collected for the month of October. Survey effort among boat ramps differed in that the number of boat ramps surveyed each month varied, as well as, the number of ramp visits, and hours of observation at each ramp. The chart below illustrates the number of responses per hour each month and since the sampling effort was not performed in a consistent standardized manner, it does not illustrate the number of boaters by month but gives an indication of the seasonal increases and decreases in potential boat traffic based on the response rate.

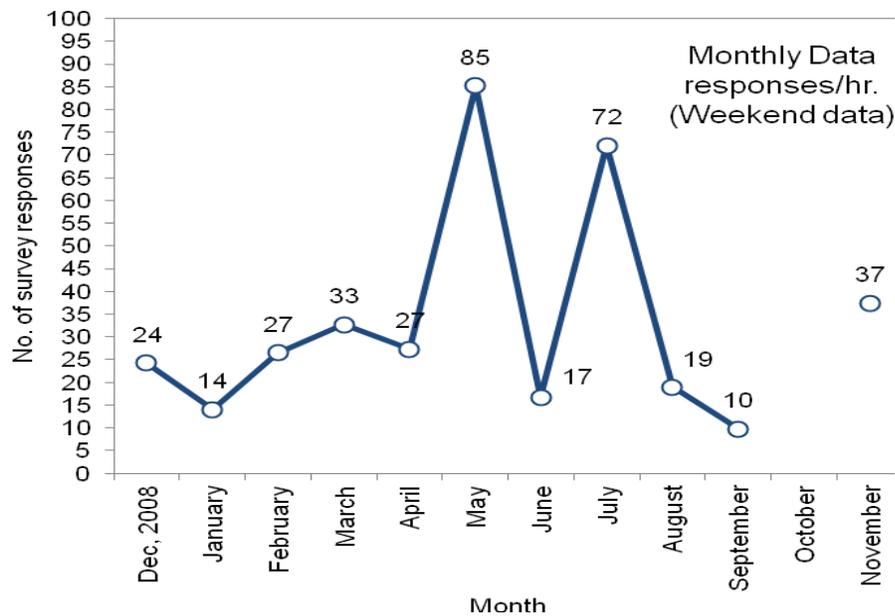


Figure 58: Total number of survey responses per hour by month (Source data: ATM, Inc. 2009).

As a result, boating traffic peaked during the months of May and July based on the highest volume of survey responses per hour each month across all ramps. In an effort to standardize observations and effort across all the ramps, the total number of responses from boaters was divided by the total hours of effort at each ramp to provide an indication of the amount of traffic in terms of survey responses per hour (Figure 59). As a result, the most traffic occurred at Beach Marine, Mayport, Sisters Creek, Joe Carlucci, Mandarin Park, and Oak Harbor (4-7 responses/hr). Intermediate levels of traffic occurred at W.B. Stevens, Pottsburg Creek, Palms Fish Camp, Goodbys Lake, Lions Club, Hood Landing , and Lighthouse (2-3 responses/hr). Lowest levels of traffic occurred from Arlington Road, St. Johns, Bert Maxwell, Alimacani, Dinsmore, Lonnie Wurn, and T.K. Stokes boat ramps (0.5-1 response/hr).

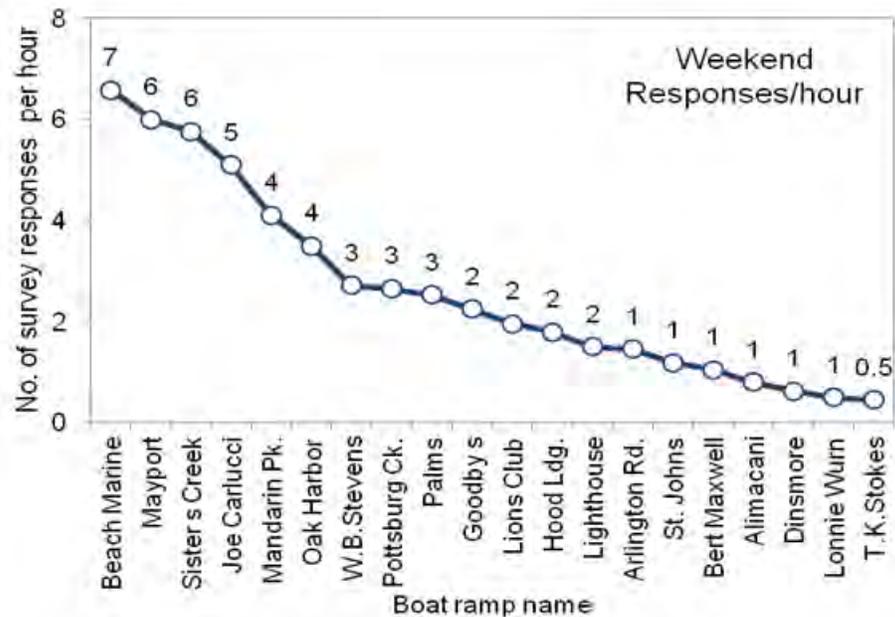


Figure 59: Number of boater survey responses per hour (Source data: ATM, Inc. 2009).

4.2.5.1.1 Travel Destination and Distance

Travel destination information was collected from ramp intercept survey respondents. Travel distance from each ramp was calculated from this information. Ramps were grouped into three categories according to the number of survey responses, and their distance from the mouth of the river. In summary, Beach Marine, Mayport, Sisters Creek, Joe Carlucci, and Oak Harbor had a mean travel distance of 6.79 miles (sd ± 1.41 miles). W.B. Stevens, Pottsburg Creek, Palms Fish Camp, Goodbys Lake, Arlington Lions Club, Hood Landing ramps had a mean travel distance of 9.31 miles (sd ± 2.32 miles) and the remaining ramps had a mean distance travelled of 11.92 miles (sd ± 6.11 miles). Mandarin Park, Lighthouse and Lonnie Wurn were considered outliers and excluded from the analysis. The mean distance traveled calculation based on the ATM ramp intercept destination survey responses seems greater than that determined in the Jacksonville University 1993-1994 study, which was 5-6 miles for the main stem of the SJR. It seems that a greater distance is traveled by vessels departing from ramps farther away from the St. Johns Inlet, or from the main stem of the SJR.

Destinations varied depending on the location of the departure ramp in the intercept survey. The most common destinations from Beach Marine, Mayport, Sisters Creek, Joe Carlucci, and Oak Harbor were the Atlantic/Offshore, the Little Jetties, and the Fort George area. From a total of 1,269 responses, 272 (21%) did not specify a destination.

Data for the other ramps indicated that there were some patterns surrounding the use of a particular ramp to visit certain destinations. The most frequent destinations from W. B. Stevens included Ortega River and Downtown; from Pottsburg Creek it was Downtown; from Palms Fish Camp, it was Fort George; from Goodbys it was Goodbys Creek and Downtown. From Arlington Lions Club, the destinations were mainly to the east of this location (Atlantic/Offshore, Little Jetties and Mill Cove) but also included south to Downtown. From Hood Landing, the destinations were primarily Julington Creek, then Clay County and Downtown.

The most common destination from Arlington road was the Atlantic/Offshore; from St. Johns it was Downtown; from Bert Maxwell, it was Broward River and Fort George. From Alimacani, it was Little Jetties and Atlantic/Offshore, however, this site had few observations. From Dinsmore, it was Downtown and Broward River. From Lonnie Wurn, it was Fort George and Atlantic/Offshore, and from T.K. Stokes it was mainly to the east of this location but did include the Trout River to the west. Alimacani, Lonnie Wurn, and T.K. Stokes had much fewer observations compared to the other ramps.

4.2.5.1.2 Purpose of Travel

This was not different among the ramp intercept survey groupings in spite of the variations in survey effort per unit of time among the ramps. Altogether, eighty five percent (85%) of the boat ramp intercept responses of 1,841 boaters included a primary travel purpose. The primary activity of most boaters (1,310, or 71%) was recreational fishing, followed by cruising (204, or 11%), commercial fishing, skiing and other activities (46, or <1%). About 281 boaters (15%) did not provide information regarding purpose of trip (ATM, Inc. 2009).

4.2.5.1.3 Seasonality of Activities

Seasonal survey coverage varied among the 20 boat ramps in the ATM study (Figure 60). Ramp intercept survey data indicated that the spring and summer months were the most popular periods for fishing, traveling (cruising) and skiing, etc. Activities were generally curtailed over the winter time; however, fishing remained significant. There were no surveys conducted in October 2009 (Figure 61).



Figure 60: Variation in survey effort among ramps visited each month (ATM, Inc. 2009)
 *= No surveys conducted in October.

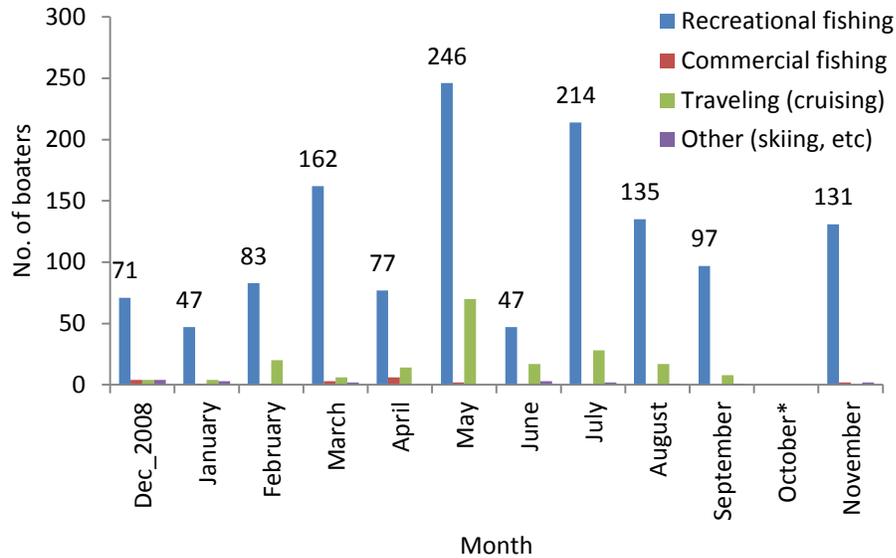


Figure 61: Monthly purpose of trip for boaters in Duval County.

Note: Time period was from December 2008 through November 2009. *=No data collected in October. (Source data: ATM, Inc. 2009).

4.2.5.1.4 Daily Boat Traffic Variation

Boat traffic information collected in the ATM study indicated that most boaters departed in the morning. Data from boat ramp intercept surveys provided information about weekend peak traffic time (1,337 responses of a total 1,841 surveys), printed surveys (1,309 responses of a total 1,342 surveys) and online surveys (254 responses of total 257 surveys) provided weekday information. The peak traffic times occurred in the late morning from 10:00 to 11:00 (17% of total traffic) and in the afternoon from 12:00 to 3:00 (50% of total traffic).

4.2.5.1.5 Boater Origination Zip Codes

In the ramp intercept study, 1,575 boaters responded with their zip code (85% of 1,841 boaters). Most of the respondents were residents of Duval County (90%), followed by Nassau, Clay, Baker and St. Johns Counties (8%), and other Florida counties including out of state (3%). About one third of ramp users came from four (4) zip codes as follows: 32218 (8.4%) from Trout River, Broward River, and Dunn Creek; 32225 (7.5%) from Mill Cove, Blount Island, Fort Caroline, and the ICW south; 32210 (6.8%) from the Ortega and Cedar River system; and 32250 (6.7%) from further south in the ICW near St. Johns County (ATM, Inc. 2009).

4.2.5.1.6 Service Area Zips by Ramp

In many cases, ramp users tend to originate from the zip code closest to the ramp they wish to use. From a total of 1,841 boaters in the ATM study, 817 (44.4%) responded that their choice of boat ramp depended on the ramps proximity to their intended destination; and 650 boaters (35.3%) preferred to use a ramp because it was close to their residence.

4.2.5.1.7 Vessel Size and Type

In the ATM ramp intercept survey responses, power boats were the most common vessel type, accounting for 1,756 (95%) of 1,841 responses. The most frequently encountered vessel size was 16-25 feet (68%), followed by <16 feet (21%) and 26-39 feet (7%). Vessel size and type information was not specified in 4% of these survey responses. Other vessel types included 53 jet skis (2.9%), 11 sail boats (0.6%) and three (3) canoe/kayak (0.2%) of the total survey responses, respectively.

4.2.5.2 Past Compliance Studies by Jacksonville University

A vessel compliance study was conducted by Jacksonville University in 1999 with additional studies in 2002 and 2003. Although all three studies were conducted in Duval County and similar techniques were used for observations, there were several differences in the methods and the conditions under which the studies were conducted. The manatee protection speed zones changed after the 1999 study. In 1999, the zones were 300 feet from shore at all the locations except the Landing, where it was shore to shore. In April 2000, the FWC adopted a State rule implementing new boat speed zones. Thus, the sites that were surveyed after 1999 where the zones changed were Bolles (zone extended from 300 to 500 feet) and Lions Club (zone extended from 300 to 900 feet). Slow speed zones were extended to 500 feet at Mandarin Park. At Lambs Yacht Center (Ortega River) the zone was extended to include from shore to shore. Mandarin Park and Lambs Yacht Center (Ortega River) have not been sampled for compliance since 1999. The number and location of observation sites varied between studies (Figure 62). The range and frequency of days sampled varied as follows: In 1999, observations were made 4 days per week for a total of 34 days between June 4th 1999 to August 1st 1999. Observations were made one day during the week and on all Fridays, Saturdays and Sundays including Independence Day. In 2002, observations were made for 26 days throughout July including Independence Day. In 2003, observations were made for 34 days from May 12th to July 17th including Memorial and Independence Days.

In 1999, vessels operating outside the 300 foot zone at Mandarin Park, Ortega River, Lions Club and Bolles School were recorded as being in compliance, because to avoid the zone would also be maintaining compliance. In order to be consistent with subsequent studies, the data was recalculated to include only boats operating within the 300 foot zones. Results pooled over all sites indicated that 85% of vessels were in compliance with the existing manatee zone regulations. Compliance was 43% (62/143 vessels) for Lions Club, and 96% (1125/1175 vessels) for Downtown.

In 2002, three locations surveyed for vessels that occurred within a manatee protection zone included Jacksonville Landing (downtown), Lions Club Boat Ramp and Sisters Creek Park Boat Ramp. Results pooled for all locations in 2002 indicated that 46% of vessels were in compliance with the existing manatee protection zones. Lower compliance values at that time could be attributed to a learning curve for vessel operators in light of the new regulations and an absence of law enforcement since September 11th 2001. For two locations, percent compliance was 36% (79/218 vessels) for Lions Club, and 54% (455/835 vessels) for Downtown.

Four locations surveyed during the summer of 2003 included: 1) The Jacksonville Landing, 2) Bolles School, 3) Sisters Creek Boat Ramp and 4) Lions Club Boat Ramp. On sampling days, all sites were observed for compliance. Each site was observed for one hour per day for vessels that were operating within the established zone at the site. Observations were made from May 12th through July 17th. Surveys were conducted every other day and the order in which sites were surveyed was rotated to allow

for variation in the sampling times during the day. Generally, two locations were observed in the morning and the other two in the afternoon. There were a total of 34 sampling days including Memorial Day and Independence Day, typically very busy boating holidays. Watercraft speeds were recorded as slow or planing. Data recorded included observation time, vessel type, directions of travel, distances from shore, and general weather conditions. Weather was recorded as percent cloud cover and the distance from shore was estimated in feet. Initially observers were trained to tell the difference between planing and slow and to ensure that boats counted were in the zone. Planing was defined as the vessel hull being at or near the water's surface as a result of increased speed, thus rendering a vessel's hull to be raised up, or if not raised up, to be plowing which caused excessive wake. Slow was defined as a vessel's hull being settled and low in the water, not plowing, and causing a minimum wake. In the 2003 study, results pooled over all the sites indicated that 78% of vessels were found to be in compliance, which may have been related to education efforts aimed at boaters due to the changing regulatory environment. For two locations, the percent compliance was 39% (161/416 vessels) for Lions Club, and 92% (785/854 vessels) for Downtown.

Year	Site	# Days	Number Compliant	Number Non-compliant	Total	Percent Compliant	Percent Non-compliant
1999	Bolles	34	3	26	29	10	90
1999	Landing	34	1125	50	1175	96	4
1999	Lions Club	34	62	81	143	43	57
1999	Mandarin	34	54	27	81	67	33
1999	Ortega	34	106	55	161	66	34
1999	Total		1350	239	1589	85	15
2002	Landing	26	455	380	835	54	46
2002	Lions Club	26	79	139	218	36	64
2002	Sisters Ck.	26	225	356	581	39	61
2002	Total		759	875	1634	46	54
2003	Bolles	34	17	39	56	30	70
2003	Landing	34	785	69	854	92	8
2003	Lions Club	34	161	255	416	39	61
2003	Sisters Ck.	34	795	125	920	86	14
2003	Total		1758	488	2246	78	22
Source: Jacksonville University, 2003.							
1999 studies conducted June/July							
2002 studies conducted July							
2003 studies conducted May/June/July							

Figure 62: Results from compliance studies by Jacksonville University in Duval Co., FL., (1999, 2002, and 2003).

4.2.6 Boat Facility Inventory

Boating activity in the COJ waterways is facilitated in numerous ways. Residential waterway access exists as single family residential docking and boat ramps; and multi-slip docking and boat ramp facilities as amenities for upland multi-family developments directly from the residential property. Public access is also present at commercial facilities that charge a fee to store, moor or launch boats; private clubs that require membership to store, moor or launch boats; and governmentally owned and operated boat facilities and boat ramps. Other boating access and activity exists within the city that is related to businesses associated with the manufacture, sale and repair of boats; fishing and water-related recreation and tourism; governmental and academic boat facilities for that institutional use only; port activity; and other private freight transport facilities.

Data from a number of sources was collected by the COJ and the FWC to create an inventory of marine facilities with five or more slips in Duval County. Marine facilities in Duval County for 2010 are summarized in (Figure 63). The inventory is not presented as an exact inventory of all boat slips within the County, but rather a general overview of boat access based on sources such as site visits to various facilities, interviews with facility management at several sites, facility website slip number representations, permit authorization records, and aerial photo examination. The information presented here does not necessarily indicate the legally-authorized slip number for a facility. Any questions pertaining to a facility's legal slip number should be directed to the appropriate state and/or federal regulatory agencies. Each facility was assigned a corresponding map number for easy map location.

Facility type designations in Figure 63 are Marinas (M), Marina & Commercial (M&C), Multifamily (MF), and Other (OT), Ramp only (R), Ramp only Multifamily (R MF), and Transitory Docks (T), Commercial (C), Ship/Barge/Tug (SBT), and Commercial & Ship/Barge/Tug (C&SBT).

Facilities are grouped according to the following designations:

Marinas (M), Marina & Commercial (M&C), Multifamily (MF), and Other (OT).
Maps A-F (Figures 64 - 69)

Ramp Only (R), Ramp only Multifamily (R MF), and Transitory Docks (T).
Maps G-I (Figures 70 - 72)

Commercial (C), Ship/Barge/Tug (SBT), and Commercial & Ship/Barge/Tug (C&SBT).
Maps J-L (Figures 73 - 75)

In an analysis of all facility types combined, there was a total of 4,317 wet slips, 2,570 dry slips, and 812 boat ramp boat trailer parking spaces for a grand total of 7,699 inventoried slips.

4.2.6.1 **Marinas**

Forty-three marinas were identified, along with 29 multi-family, and 13 other facilities. Total slip capacity for each boat facility type was indicated by the sum of all wet slips plus dry slips, and available boat trailer parking spaces where applicable. A total of 6,422 slips (3,853 wet, 2,542 dry, and 27 parking spaces) was identified for this grouping of boat facilities. A further breakdown of the group indicated that marinas accounted for 5,726 total slips (3,200 wet, 2,499 dry, and 27 parking spaces);

multifamily accounted for 484 total slips (477 wet, 7 dry, and no parking); and other facilities accounted for 212 total slips (176 wet, 36 dry, and no boat trailer parking). Slip occupancy was found to vary widely and frequently.

4.2.6.2 Ramps and Transitory Facilities

Thirty-two boat ramps, not including two multi-family ramps, were identified along with fourteen other transitory marine facilities (Map numbers 87-134). Total slip capacity for each ramp was indicated by the sum of available boat trailer parking spaces. For the other transitory facilities, total wet slips were used to indicate capacity. There was a total of 861 slips (76 wet, no dry, and 785 boat trailer parking spaces) that were identified for this grouping of boat facilities. A further breakdown of the group indicated that 32 boat ramps accounted for 779 total slips (parking spaces); 2 multifamily ramps accounted for 6 total slips as trailer parking spaces; and 14 transitory facilities accounted for a total of 76 wet slips.

4.2.6.3 Commercial and Ship/Barge/Tug Facilities

Fifteen commercial facilities not including one commercial and Ship/Barge/Tug facility were identified, along with 38 Ship/Barge/Tug facilities (Map numbers 135-188). Total slip capacity for commercial and commercial/ship/barge/tug facilities was 116 slips (96 wet and 20 dry). For the remaining Ship/Barge/Tug facilities, total slip capacity was 161 wet slips and no dry slips. There was a total of 277 slips (257 wet, 20 dry) that were identified for this grouping of boat facilities.

Map No.	Type	Facility Name	Address	Wet Slips	Dry Slips	Ramp Lanes	Ramp Paved	Ramp Parking	Total Slips
1	M	Clark's Fish Camp	12903 Hood Landing Rd	10	0	0		0	10
2	M	The Marina at Julington Creek	12807 San Jose Blvd	91	226	0		0	317
3	M	Mandarin Holiday Marina and Fish Camp	12796 San Jose Blvd	160	0	1	YES	0	160
4	M	Beatrice A. Gamble Julington Pier #3	12752 San Jose Blvd	84	8	0		0	92
5	M	Bull Bay Pier/Wiley E. Andreu	12752 San Jose Blvd	78	25	0		0	103
6	MF	Old Bull Bay		6	0	0		0	6
7	MF	Tala Cay HOA	2800 Casa Del Rio Terrace	2	0	0		0	2
8	MF	Plummers Cove HOA	9900 Scott Mill Rd	12	0	0		0	12
9	M	Florida Tackle & Gun Club	9010 San Jose Blvd	32	12	2	YES	5	49
10	MF	The Cove at St Johns	3958 Baymeadows Rd	13	0	0		0	13
11	MF	La Terraza	Laterraza Place	4	0	0		0	4
12	M & C	NFL Yacht Sales/Mandarin Marina/GC YC	8940 San Jose Blvd	5	208	1	YES	0	213
13	M	Epping Forest Yacht Club	1830 Epping Forest Dr	73	0	0		0	73
14	OT	6006 of Jacksonville Inc	0 University Blvd W	7	0	0		0	7
15	MF	Club Condominiums	5200 San Jose Blvd	8	0	0		0	8
16	M	The Rudder Club of Jacksonville	8533 Malaga Av	35	89	1	YES	0	124
17	M	NAS/Jax Marina	1072 Ranger Rd	152	248	2	YES	0	400
18	M	Florida Yacht Club	5210 & 5136 Yacht Club Rd	94	61	1	YES	0	155
19	MF	Venitian on the Ortega	5375 Ortega Farms Blvd	43	0	0		0	43
20	MF	Confederate Point Apts	4455 Confederate Pt Rd	18	0	0		0	18
21	MF	Preserve at Cedar Rvr/Cedar Cove Apts	4207/4301 Confederate Pt Rd	24	0	1	YES	0	24
22	OT	2509 Blanding Blvd LLC (retail)	2509 Blanding Blvd	4	0	0		0	4
23	MF	Coastal Creek Condo fka Cedar Shores	3434 Blanding Blvd	24	0	0		0	24

Map No.	Type	Facility Name	Address	Wet Slips	Dry Slips	Ramp Lanes	Ramp Paved	Ramp Parking	Total Slips
24	M	Lighthouse Marine/Florcal Marina	5434 San Juan Ave	23	10	0		0	33
25	M	Cedar River Moorings/Club(HarborLts)	5700 San Juan Av	15	0	1	YES	12	27
26	MF	Cedar Creek Landing Condos	5615 San Juan Av	8	0	1	YES	0	8
27	MF	Londontowne Apartments	1591 S Lane Av	10	0	0		0	10
28	OT	Klehm Estate (Chuck's Boat Yard)	6214 Park St	30	0	0		0	30
29	M	Lakeshore Dry Storage	3326 Lake Shore Blvd	0	208	0		0	208
30	M	Lambs Yacht Center	3376 Lake Shore Blvd	240	0	0		0	240
31	M	Cedar Point Marina	3436 Lake Shore Blvd	23	0	0		0	23
32	M	Huckins Yacht	3482 Lake Shore Blvd	31	0	0		0	31
33	M	Sadler Point Marina	4669 Roosevelt Blvd	65	45	0		0	110
34	M	Ortega Yacht Club Marina	4585 Lakeside Dr	112	0	0		0	112
35	M	Lakeside Ortega Prtnshp/JOWens Marina	4252 Lakeside Dr	24	0	0		0	24
36	M	Ortega Landing Marina	4240 Lakeside Dr	192	0	0		0	192
37	MF	Commander Apt	3946 St Johns Av	6	0	0		0	6
38	OT	Jerry Strozier Ferguson Estate	2263 River Blvd	12	0	0		0	12
39	M	River City Brewing Co	835 Museum Cir	62	0	0		0	62
40	M	Berkman Plaza and Marina	400 E Bay St	54	0	0		0	54
41	M	Shipyards	750 E Bay St	240	0	0		0	240
42	M	Metropolitan Park & Marina	1410 Gator Bowl Blvd	78	0	0		0	78
43	MF	Colonial Point Condos	5201 Atlantic Blvd	14	0	0		0	14
44	MF	Carlton At Oak Landing	5811 Atlantic Blvd	11	0	0		0	11
45	MF	Magnolia Shores Homeowners	220 University Blvd N	7	0	0		0	7
46	MF	River Hills Condo	1307 River Hills Cir E	21	0	0		0	21
47	OT	Jones College	5353 Arlington Expy	9	0	0		0	9
48	M	Arlington Marina/MoBro Marine Inc	5137 Arlington Rd	28	178	0		0	206
49	MF	St Johns Riverview Homes Condo Assoc	2240 Shepard St	6	0	0		0	6
50	MF	Arlington by the River Condo	2280 Shepard St	17	0	0		0	17
51	OT	JU Row Cntr and Marine Sci Dock	2800 University Blvd N	8	0	2		0	8
52	M	Pirates Point Yacht Club & Marina	531 Trout River Dr	14	0	0		0	14
53	M	William Dye Marina (DyenicYachts)	491 Trout River Dr	44	0	0		0	44
54	OT	Fire Station #38 (COJ)	469 Trout River Dr	12	0	0		0	12
55	M	Seafarers Marina	455 Trout River Dr	75	0	0		0	75
56	M	Edwards Marina (Fisherman's Marina)	451 Trout River Dr	23	0	0		0	23
57	MF	Eleanor Garrison	331 Trout River Dr	8	0	0		0	8
58	MF	Loretta Courson	243 Trout River Dr	5	0	1	YES	0	5
59	MF	Trout River Drive Apts (Strong)	103-107 Trout River Dr	0	7	1	YES	0	7
60	MF	Sibbald Road Trust	Sibbald Rd	5	0	0		0	5
61	M	Dames Pt Marina (Shafnacker)	4542 Irving Rd	11	20	2	NO	0	31
62	M	Dames Pt Yacht Club (Nicholas Crk Dev)	New Berlin Ct	6	0	0		0	6
63	OT	Safe Harbor Haven (Boys Home)	4822/4836/4804 Heckscher Dr	59	36	1	YES	0	95
64	M	Brown's Creek Fish Camp	5186/5212 Heckscher Dr	0	25	1	YES	0	25
65	M	Clapboard Creek Marina	6220 Heckscher Dr	30	20	0		0	50
66	M	Clapboard Creek Fish Camp	6233 Heckscher Dr	0	30	2		10	40
67	M	Mariner Point Yacht Club	5015 Mariners Point Dr	50	0	0		0	50
68	MF	Harbour North Park Assoc	4639 Harbour North Ct	6	0	1	YES	0	6
69	OT	Riverfront RV Park	8364 Heckscher Dr	6	0	1	YES	0	6
70	M	Sandollar Marina	9716 Heckscher Dr	14	3	0		0	17
71	M	Fort George Harbor Yacht Club	9954 Heckscher Dr	35	150	0		0	185
72	OT	Mayport Harbor OPS		16	0	1	YES	0	16
73	OT	JPA/St Johns Bar Pilot Assoc	4910 Ocean St	2	0	0		0	2

Map No.	Type	Facility Name	Address	Wet Slips	Dry Slips	Ramp Lanes	Ramp Paved	Ramp Parking	Total Slips
74	M	Morningstar Marinas	4852 Ocean St	14	145	0		0	159
75	OT	JPA/Mayport Tarvern	4636/4638 Ocean St	7	0	0		0	7
76	OT	JPA/Mayport Yacht Basin	4280 Ocean St	4	0	0		0	4
77	MF	Spanish Point Civic Assoc	1907 Tomas Dr	0	0	1	YES	0	0
78	M	Queens Harbour Yacht & Country Club	1131 Queens Harbor Blvd	56	0	0		0	56
79	MF	Harbortown f/k/a Pablo Creek Marina	13846 Atlantic Blvd	150	0	0		0	150
80	MF	Seven Pines Island Marina Assoc	Pine Island Dr	20	0	0		0	20
81	MF	Sunset Point Homeowners Assoc	Tara Ct (Neptune Beach)	5	0	0		0	5
82	M	Palm Cove Marina	14603 Beach Blvd	375	438	1	YES	0	813
83	M	Beach Marine	2315 Beach Blvd	325	350	0		0	675
84	M	Moorings Condo Assoc	14750 Beach Blvd	81	0	0		0	81
85	MF	Waterside fka Lighthouse Grille/Cove	2600 Beach Blvd	24	0	0		0	24
86	M	Marina San Pablo	Marina San Pablo Pl	46	0	0		0	46
87	R	Hood Landing Boat Ramp	12925 Hood Landing Rd	0	0	1	YES	12	12
88	R	Mandarin Park Boat Ramp	14780 Mandarin Pd	0	0	2	YES	45	45
89	R	Duval County Dock Park	2400 County Dock Rd	0	0	1	YES	5	5
90	R	Goodby's Lake Boat Ramp	9021 San Jose Blvd	0	0	3	YES	43	43
91	T	Hooters(Jax has additional name)	8938 San Jose Blvd	8	0	0		0	8
92	T	Timuquana Country Club	4028 Timuquana Rd	12	0	0		0	12
93	R	Wayne B Stevens Boat Ramp	4566 Ortega Farms Blvd	0	0	5	YES	49	49
94	R	Lighthouse Marine Boat Ramp COJ	5434 San Juan Av	0	0	2	YES	16	16
95	R	St Johns Marina at Riverwalk Park	901 Museum Cir	0	0	2	YES	15	15
96	T	S.S. Marine Taxi @ Friendship Fountn	1025 Museum Cir	1	0	0		0	1
97	T	S.S. Marine Taxi @ Jax Landing	2 Independent Dr	1	0	0		0	1
98	T	S.S. Marine Taxi @ Crowne Plaza	1301 Riverplace Blvd	1	0	0		0	1
99	T	S.S. Marine Taxi @ Liberty St	Liberty St @ Coast Line Dr E	1	0	0		0	1
100	T	S.S. Marine Taxi @ Wyndham	Prudential Dr	1	0	0		0	1
101	T	S.S. Marine Taxi @ Metropolitan Park	1410 Gator Bowl Blvd	1	0	0		0	1
102	R	Beach Blvd Boat Ramp(Pottsburg Crk)	8540 Beach Blvd	0	0	1	YES	12	12
103	R	Arlington Road Boat Ramp	5130 Arlington Rd	0	0	2	YES	13	13
104	R	Arlington Lions Club Park Boat Ramp	4322-1 Richard Denby Gatlin Rd	0	0	1	YES	61	61
105	T	Reddie Pointe Preserve	Yachtsman Way	6	0	0		0	6
106	R	Lonnie Wurn Boat Ramp	4131 Ferber Rd	0	0	1	YES	9	9
107	R	Dunn Creek Bridge	Heckscher Dr/Zoo Prkwy	0	0	1	NO	5	5
108	R	Drummond Point		0	0	1	NO	5	5
109	T	Jackies Restaurant (Seafood)	8132 Trout River Dr	35	0	0		0	35
110	R	Bert Maxwell Boat Ramp	500 Maxwell Rd	0	0	4	YES	45	45
111	R	T K Stokes Boatramp	2120 Riverview Av	0	0	1	YES	30	30
112	R	Harborview Boatramp	4100 Harborview Dr	0	0	2	YES	7	7
113	R	Charles Reese Boatramp	7260 Ken Knight Dr W	0	0	1	YES	6	6
114	R	Dinsmore Boat Ramp	6800 Dunn Ave	0	0	2	YES	16	16
115	R	Brown's Creek Bridge	Heckscher Dr at Brown's Ck	0	0	1		10	10
116	R MF	St Johns Landing Estates	Reed Island Dr	0	0	1	YES	0	0
117	R MF	St Johns Landing Homeowners Assco	11431 Kingsley Manor Way	0	0	1	YES	6	6
118	R	Palms Fish Camp/COJ	6359 Heckscher Dr	0	0	1	YES	20	20
119	R	Fulton Boat Ramp	5099 Fulton Rd	0	0	1	YES	7	7
120	T	Ft Caroline National Memorial Dock	12713 Ft Caroline Rd	3	0	0		0	3
121	R	Gate Petroleum Co	Herkscher Dr	0	0	1	NO	2	2
122	R	Pirates Cove Fish Camp	8076 McKenna Dr	0	0	1	NO	10	10
123	R	Joe Carlucci-Sisters Creek Park	8414 Heritage River Rd	0	0	2	YES	47	47
124	R	Sisters Creek Marina	8203 Heckscher Dr	0	0	4	YES	94	94

Map No.	Type	Facility Name	Address	Wet Slips	Dry Slips	Ramp Lanes	Ramp Paved	Ramp Parking	Total Slips
125	T	Fort George Island Ferry (North port)	Heckscher Dr	1	0	0		0	1
126	T	Singleton's Seafood Shack	4728 Ocean St	2	0	0		0	2
127	R	Michael B Scanlan Boat Ramp	4870 Ocean St	0	0	8		75	75
128	R	Alimacani Boat Ramp	11080 Heckscher Dr	0	0	1	NO	10	10
129	R	Ribault Club @ Ft George	Ft George Rd	0	0	1		6	6
130	T	Kingsley Plantation	11676 Palmetto Ave	3	0	0		0	3
131	R	Simpson Creek Park	A-1-A S. Big Talbot Is	0	0	1	NO	2	2
132	R	Big Talbot Island SP	12157 Heckscher Dr	0	0	1	YES	37	37
133	R	Oak Harbor Boat Ramp	2428 Seaway St	0	0	1	YES	28	28
134	R	Intracoastal Waterways Boat Ramp	2510 Second Av	0	0	4	YES	37	37
135	C	Weeks Marine	2652 Blanding Blvd	3	0	1	YES	0	3
136	C	All Wet Sports/Suzanne Paul	8550 Beach Blvd	0	8	0		0	8
137	SBT	River Cruises	Prudential Dr	2	0	0		0	2
138	SBT	JEA Park (old JEAS site)	801 Broadcast Pl	2	0	0		0	2
139	SBT	Riverfront Dev Group	1721 E Adams St	4	0	0		0	4
140	SBT	Commodore Point Prp/N FL Shipyard	2060 E Adams St	6	0	0		0	6
141	SBT	Hill Street LLC	1900-1901 Hill St	5	0	0		0	5
142	SBT	Hal Jones Contractor Inc	779 Talleyrand Av	3	0	0		0	3
143	SBT	Cross State Towing Co	5140 Arlington Rd	5	0	1	YES	0	5
144	SBT	1163 Talleyrand Inc/Crowley Liner Serv	1163 Talleyrand Av	6	0	0		0	6
145	SBT	JPA Talleyrand Marine Terminal	2085 Talleyrand Av	6	0	0		0	6
146	SBT	Standard Oil Co (Chevron)	3117 Talleyrand Av	1	0	0		0	1
147	SBT	Coastal Fuels Termianal	3425 Talleyrand Av	1	0	0		0	1
148	SBT	JEA/Kennedy Generating Station	4215 Talleyrand Av	6	0	0		0	6
149	SBT	Keystone Terminal	1915 Wigmore Street	1	0	0		0	1
150	SBT	White Sprngs AgChem(GA Sthn/FL Rlway)	1301 Wigmore St	2	0	0		0	2
151	SBT	Support Terminal	Evergreen Av	1	0	0		0	1
152	SBT	NuStar Energy	6531 Evergreen Av	5	0	0		0	5
153	SBT	US Gypsum Company	6825 Evergreen Av	1	0	0		0	1
154	SBT	Southern Belle Frozen Foods	Virginia St	1	0	0		0	1
155	C	Trout Rlver Pier 68 Marina	8137 N Main St	6	0	0		0	6
156	SBT	Gate Concrete Co	402 Zoo Prkwy	2	0	0		0	2
157	SBT	US Navy Fuel Depot	5th St	1	0	1	YES	0	1
158	SBT	BP Oil	2101 Zoo Prkwy	1	0	0		0	1
159	SBT	Amerada Hess Fuel Oil Inc	2617 Zoo Prkwy	1	0	0		0	1
160	C	One Dock Builders	3515 Heckscher Dr	8	0	0		0	8
161	SBT	JaxPort-Ed Austin Marine Terminal	Dames Point Rd	1	0	0		0	1
162	SBT	TraPac Terminal	9834 New Berlin Road	2	0	0		0	2
163	SBT	JaxPort Bulk Terminal	Dames Point Rd	7	0	0		0	7
164	SBT	Jax Port Authority	9051 Dames Pt Rd	4	0	0		0	4
165	SBT	JPA/Blount Island	9620 Dave Rawls Blvd	8	0	0		0	8
166	SBT	B P B Acquistions (Formerly Celotex)	9225 Dames Pt Rd	1	0	0		0	1
167	SBT	ESI of Florida LLC	4335 & 4336	11	0	0		0	11
168	SBT	Terminal Services	4358 Apollo Av	4	0	0		0	4
169	C	Kenneth Vogel song	4438 & 4446 Apollo Av	2	0	0		0	2
170	SBT	JEA North Generating Station Dock	No # Heckscher Dr	1	0	0		0	1
171	SBT	Jax Port Authority – 4916	4916 Heckscher Dr	2	0	0		0	2
172	C	Florida East Coast Shrimp Producers	5006 Heckscher Dr	9	6	0	YES	0	15
173	C	M & M Shrimp Dock Inc	5084 Heckscher Dr	2	0	0		0	2
174	SBT	U.S. Marine Corp	5880 Channel View Blvd	3	0	0		0	3
175	C & SBT	Atlantic Dry Dock Corp	8500 Heckscher Dr	10	6	0		0	16
176	C	St Johns Boat Co	9852 Heckscher Dr	6	0	0		0	6

Map No.	Type	Facility Name	Address	Wet Slips	Dry Slips	Ramp Lanes	Ramp Paved	Ramp Parking	Total Slips
177	SBT	Mayport Naval Station		34	0	0		0	34
178	SBT	JPA/Mayport Ferry Slip	4800 Ocean St	1	0	0		0	1
179	SBT	JPA/Formerly LA Cruise	4738 Ocean St	1	0	0		0	1
180	C	JPA/Roland Ice Co	4700/4718 Ocean St	8	0	0		0	8
181	C	JPA/Gilmer Pier	4652 Ocean St	7	0	0		0	7
182	C	JPA/Hornblower Marine/Ferry Maint Yrd	4610 Ocean St	1	0	0		0	1
183	C	JPA/Formerly Atlantic Seafood Co	4542 Ocean St	3	0	0		0	3
184	C	JPA/Mat Roland Seafood	4510 Ocean St	7	0	0		0	7
185	C	Miss Becky Seafood/Safe Harbor Mrkt	4432/4371 Ocean St	20	0	0		0	20
186	C	Rebecca Pack	(4340) Ocean St	4	0	0		0	4
187	SBT	U.S. Coast Guard – Mayport	4200 Ocean St	6	0	0		0	6
188	SBT	Moody Land Co/Bellinger Shipyard	13911 Atlantic Blvd	12	0	0		0	12

Figure 63: Table of Marine Facilities in Jacksonville (Duval County) Florida 2010.

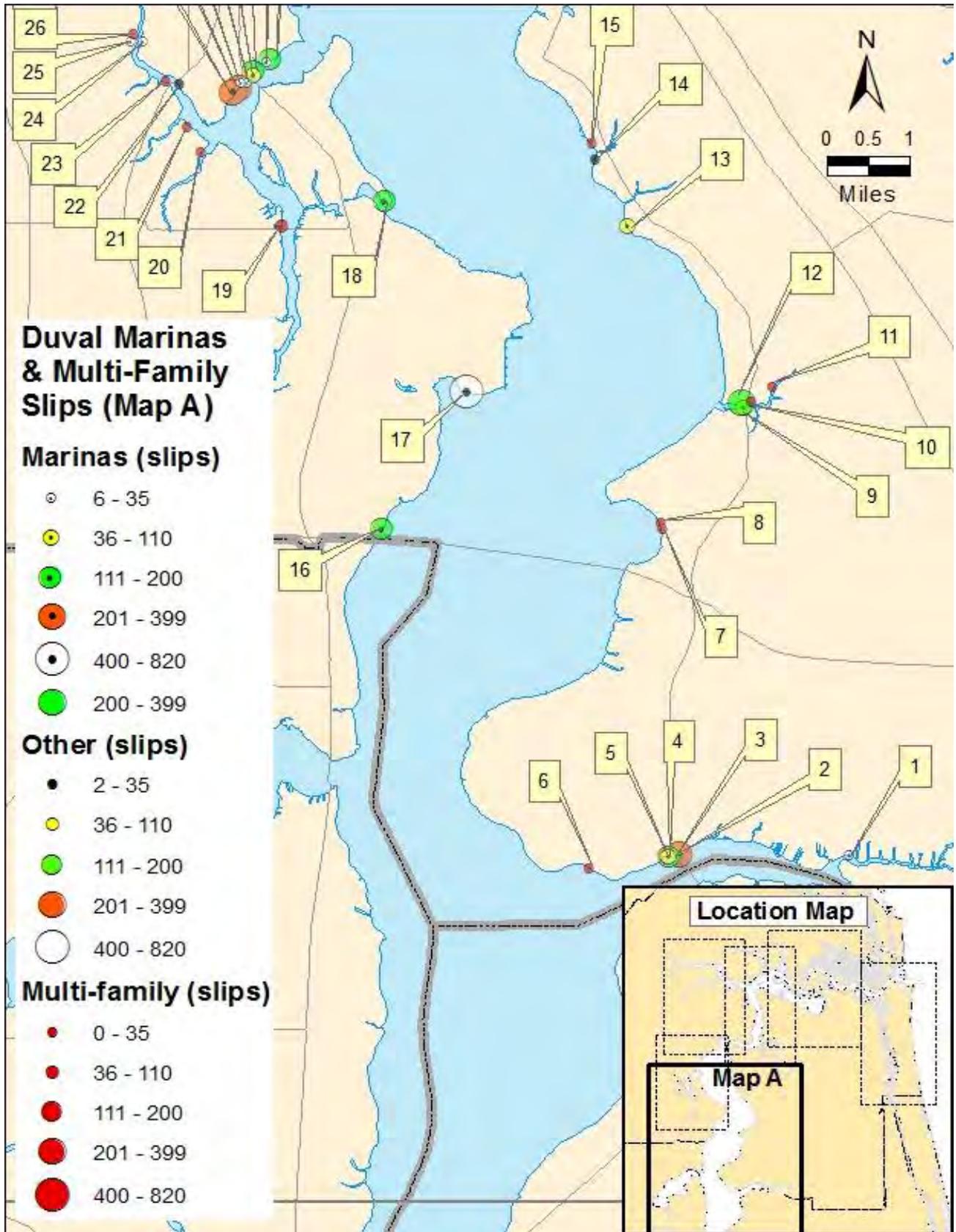


Figure 64: Boat Facility Inventory Map A – Marinas, Multifamily, and Other facilities.

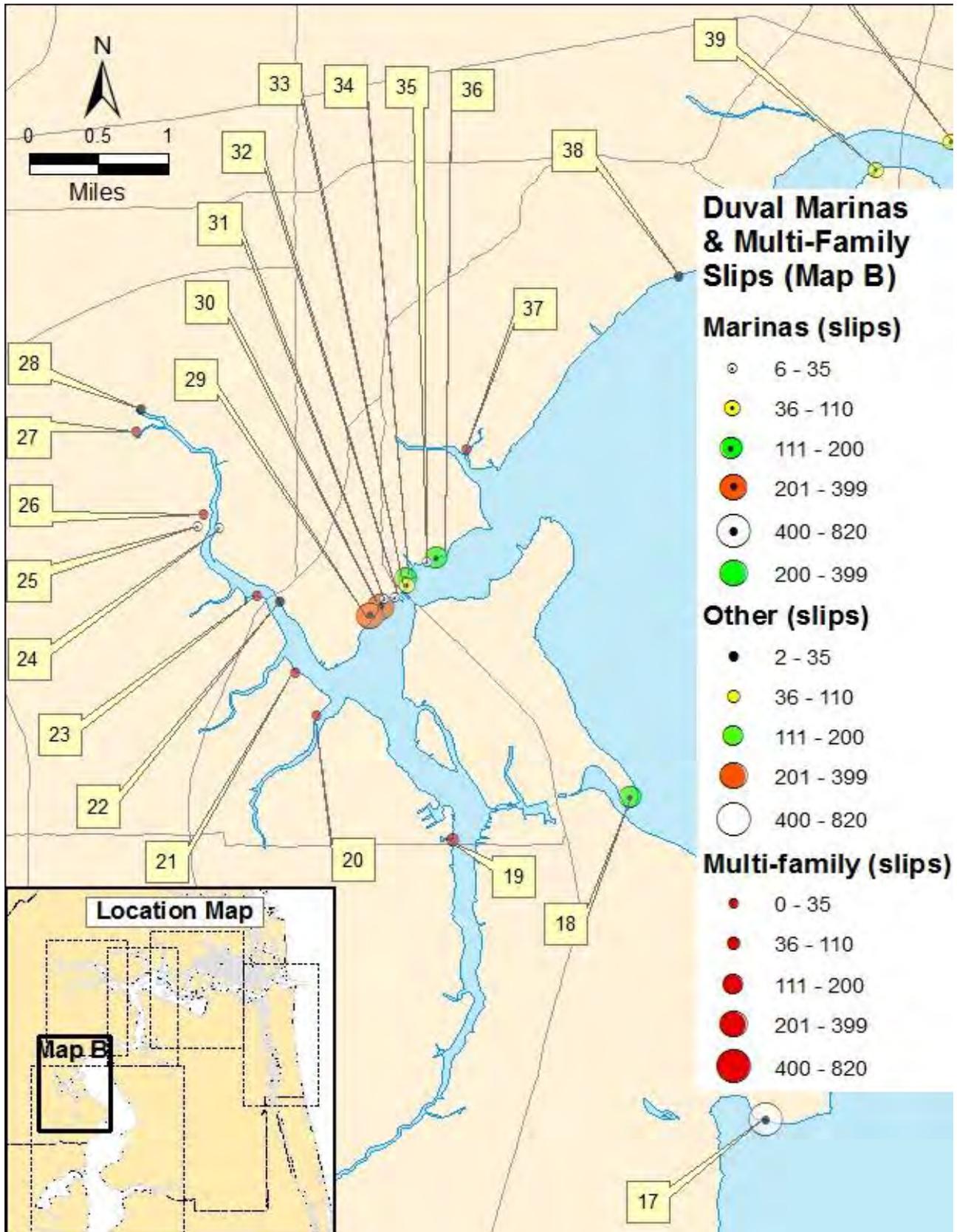


Figure 65: Boat Facility Inventory Map B – Marinas, Multifamily, and Other facilities (2).

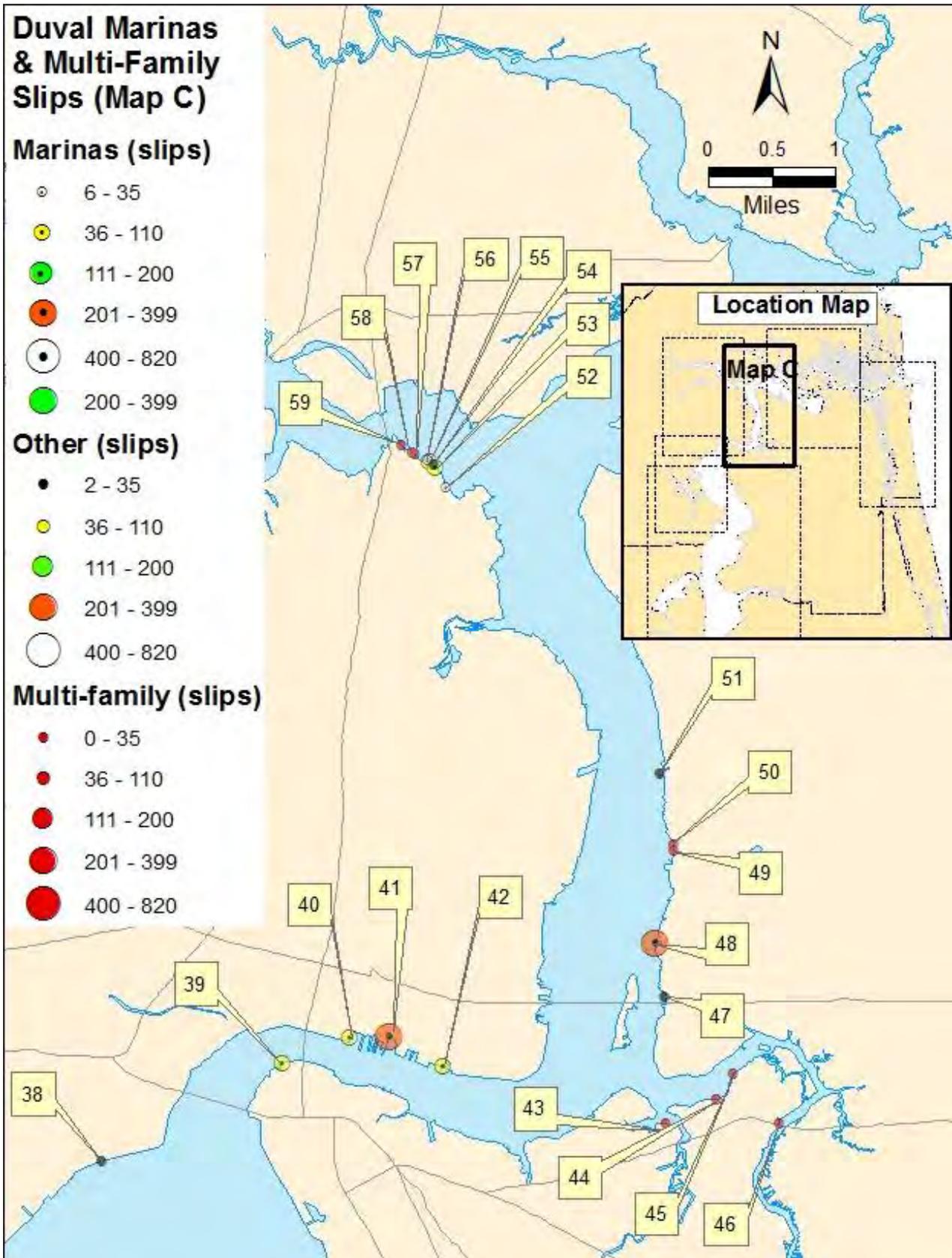


Figure 66: Boat Facility Inventory Map C – Marinas, Multifamily, and Other facilities (3).

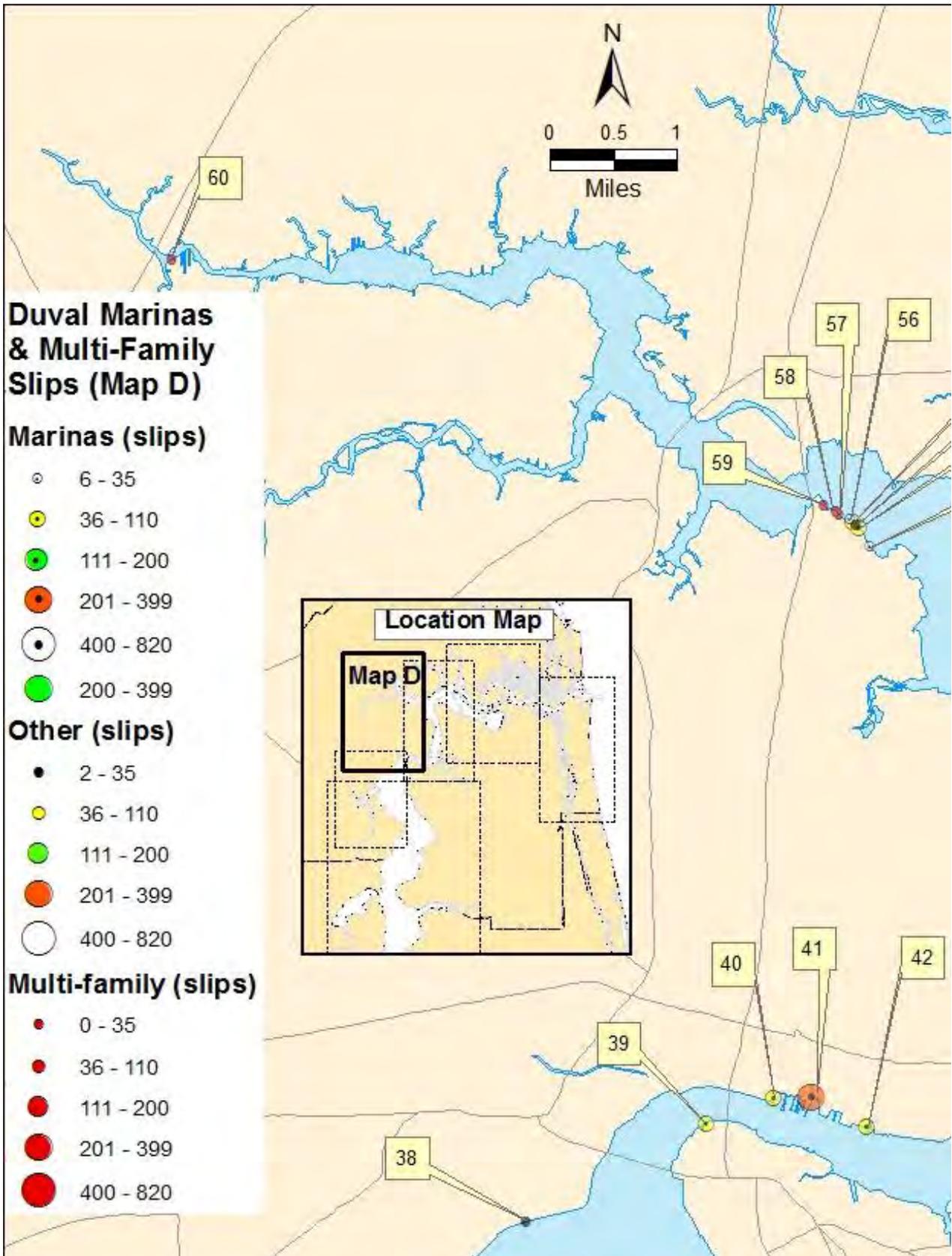


Figure 67: Boat Facility Inventory Map D – Marinas, Multifamily, and Other facilities (4).

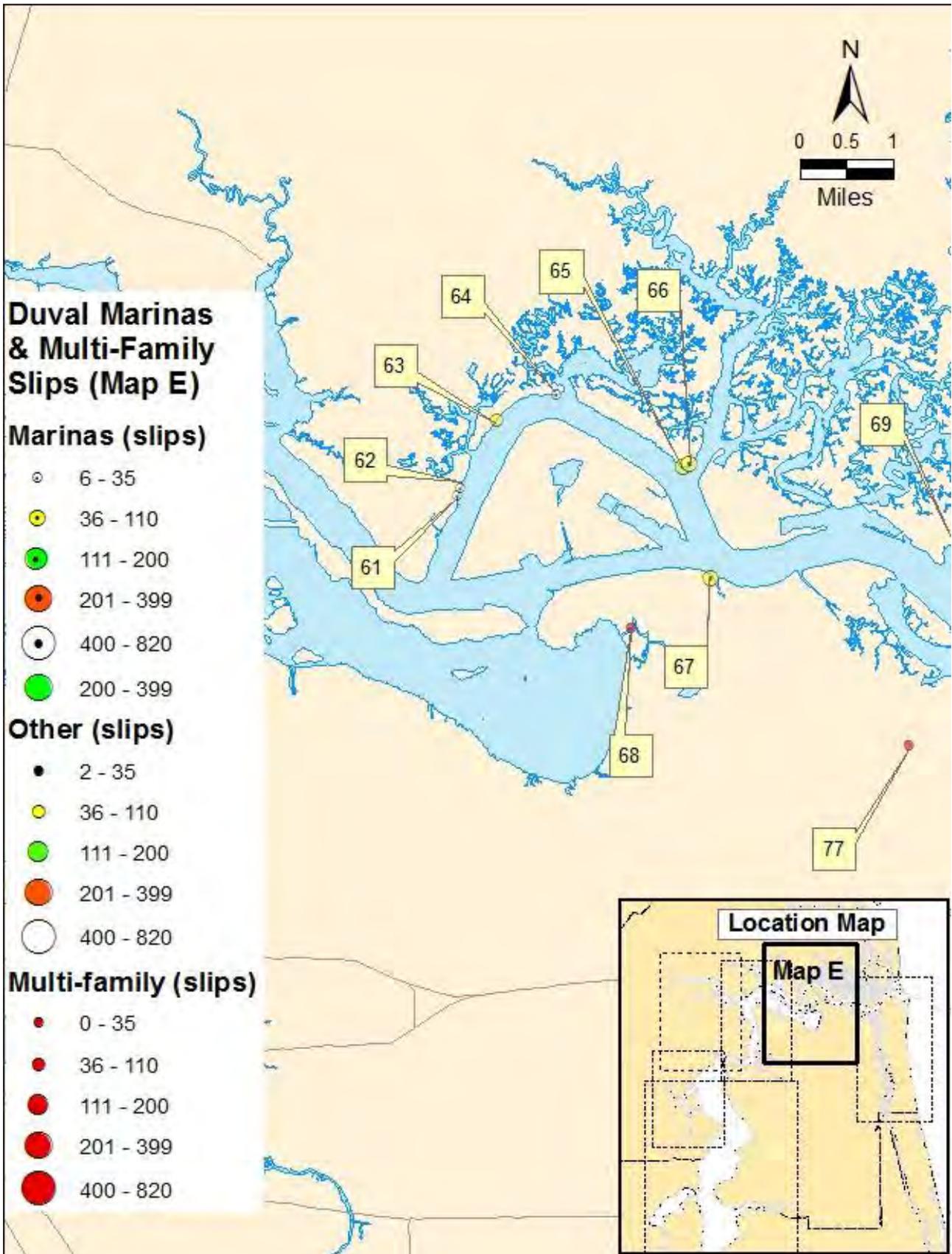


Figure 68: Boat Facility Inventory Map E – Marinas, Multifamily, and Other facilities (5).

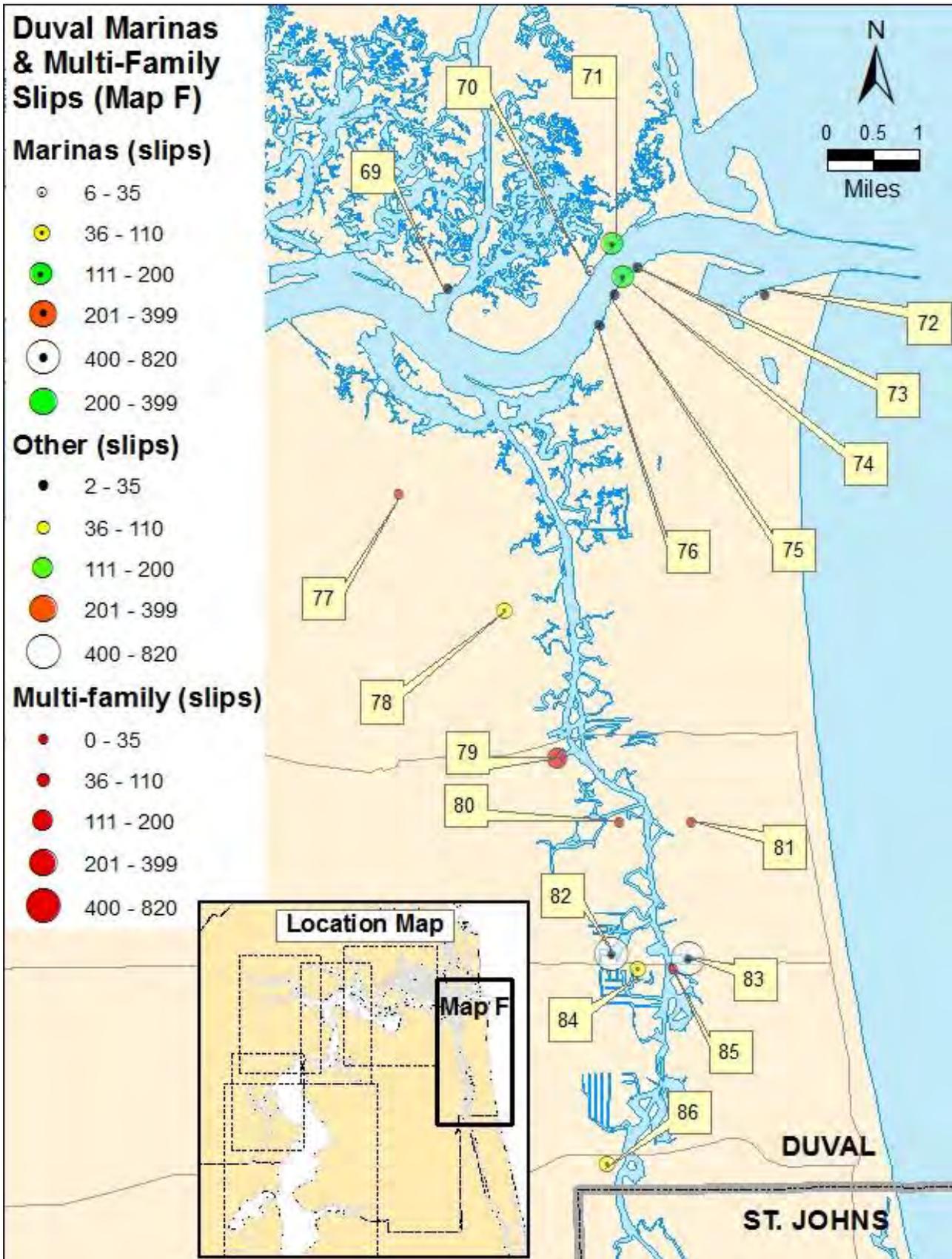


Figure 69: Boat Facility Inventory Map F – Marinas, Multifamily, and Other facilities (6).

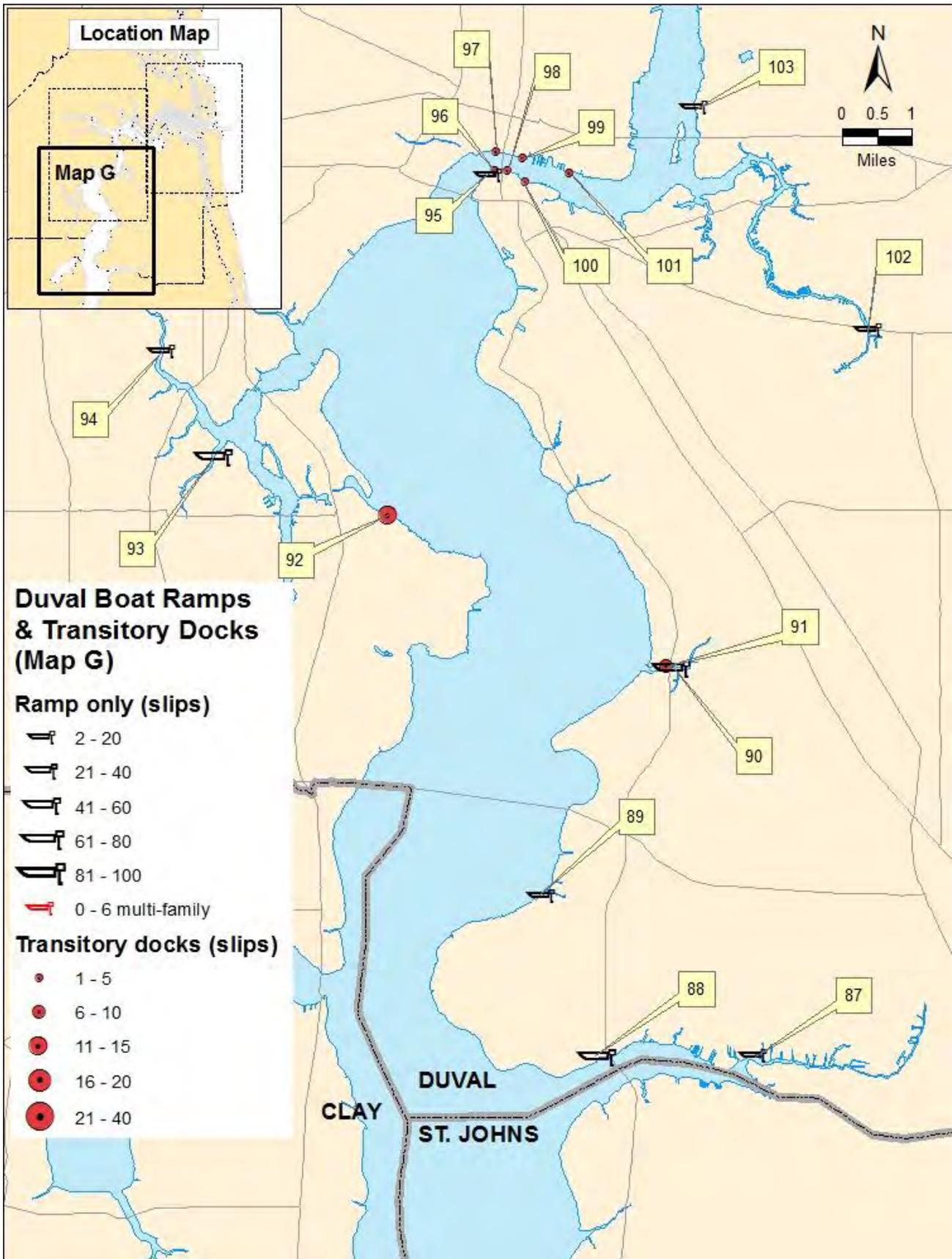


Figure 70: Boat Facility Inventory Map G – Boat ramps and transitory marine facilities.

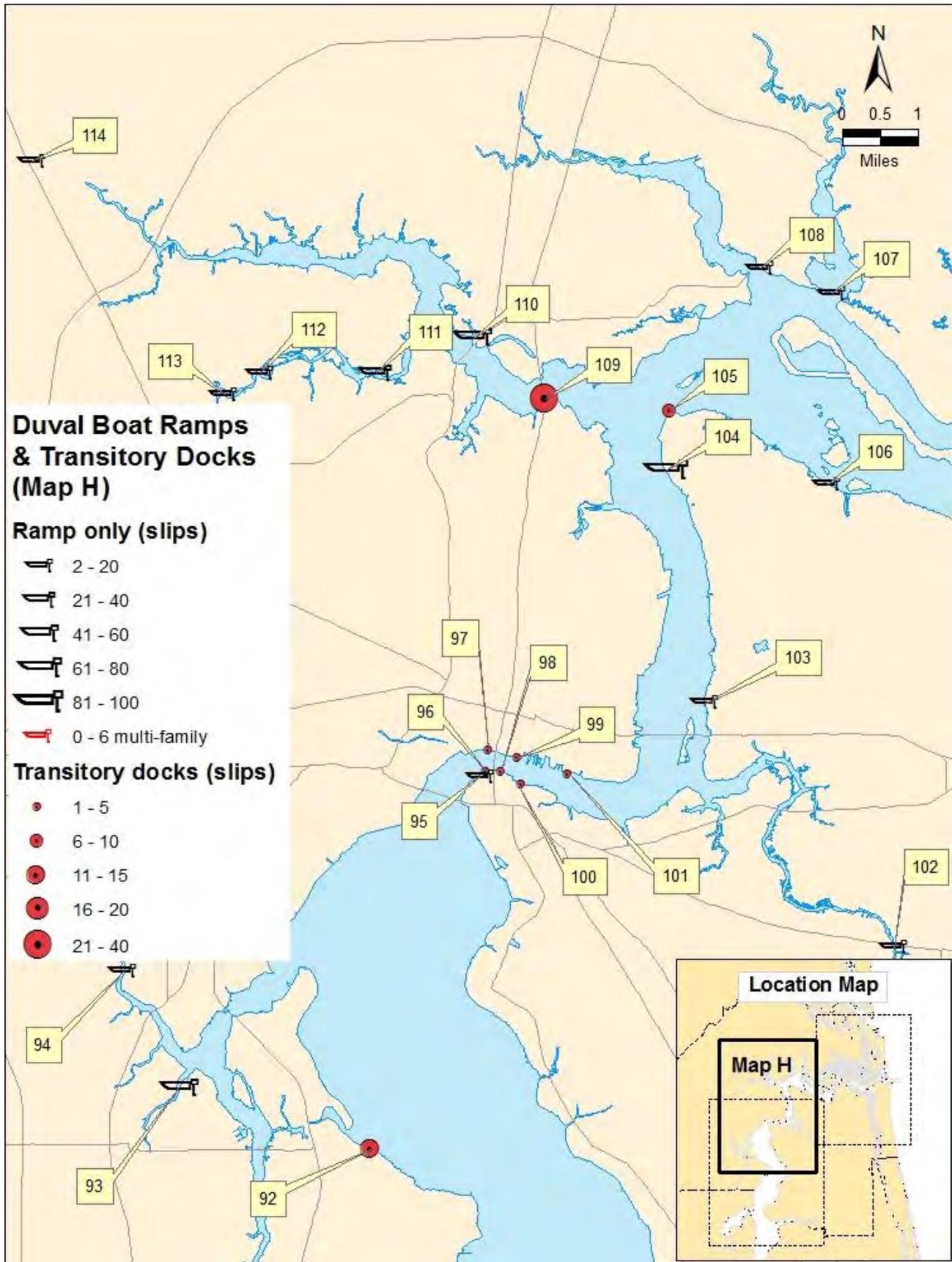


Figure 71: Boat Facility Inventory Map H – Boat ramps and transitory marine facilities (2).

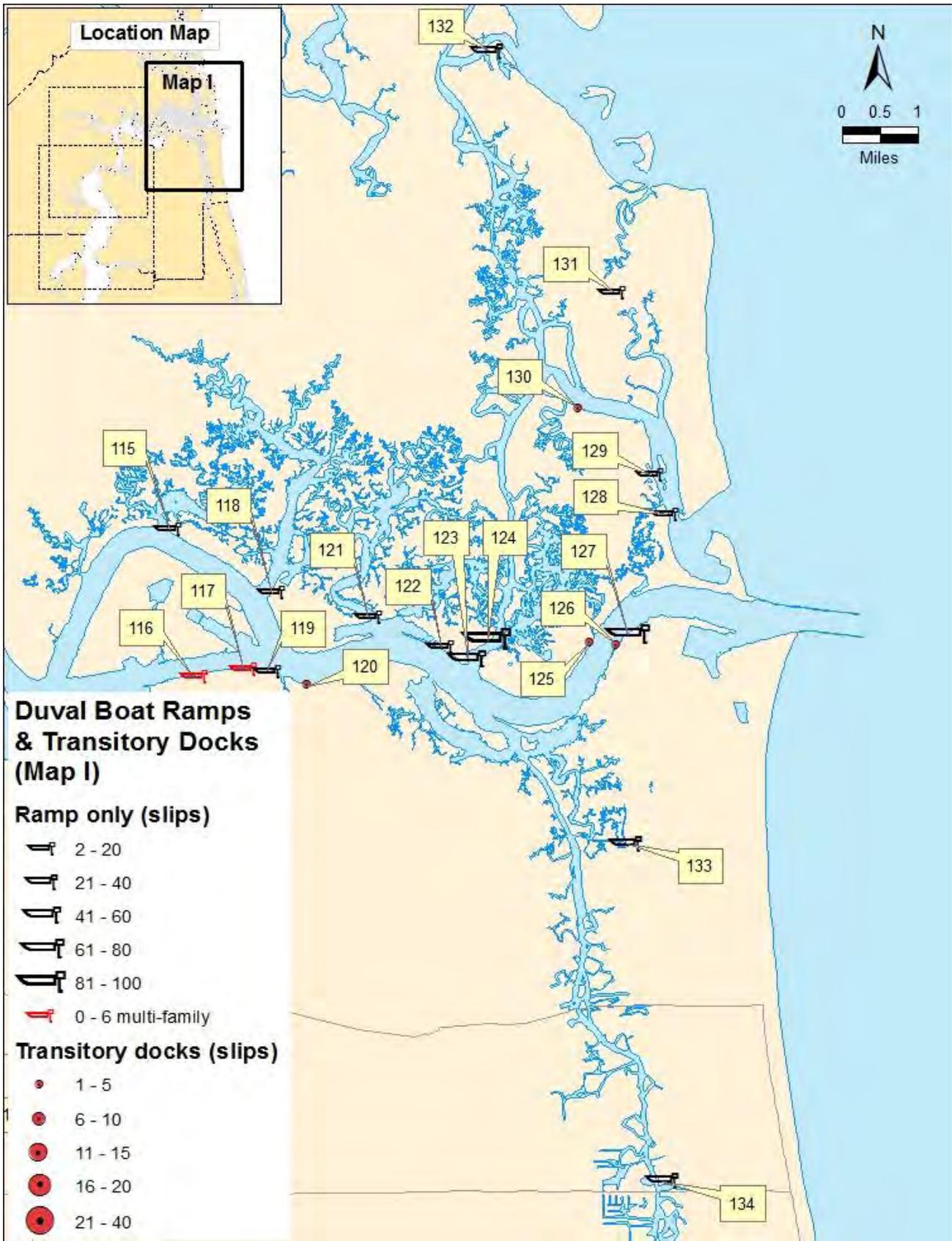


Figure 72: Boat Facility Inventory Map I – Boat ramps and transitory marine facilities (3).

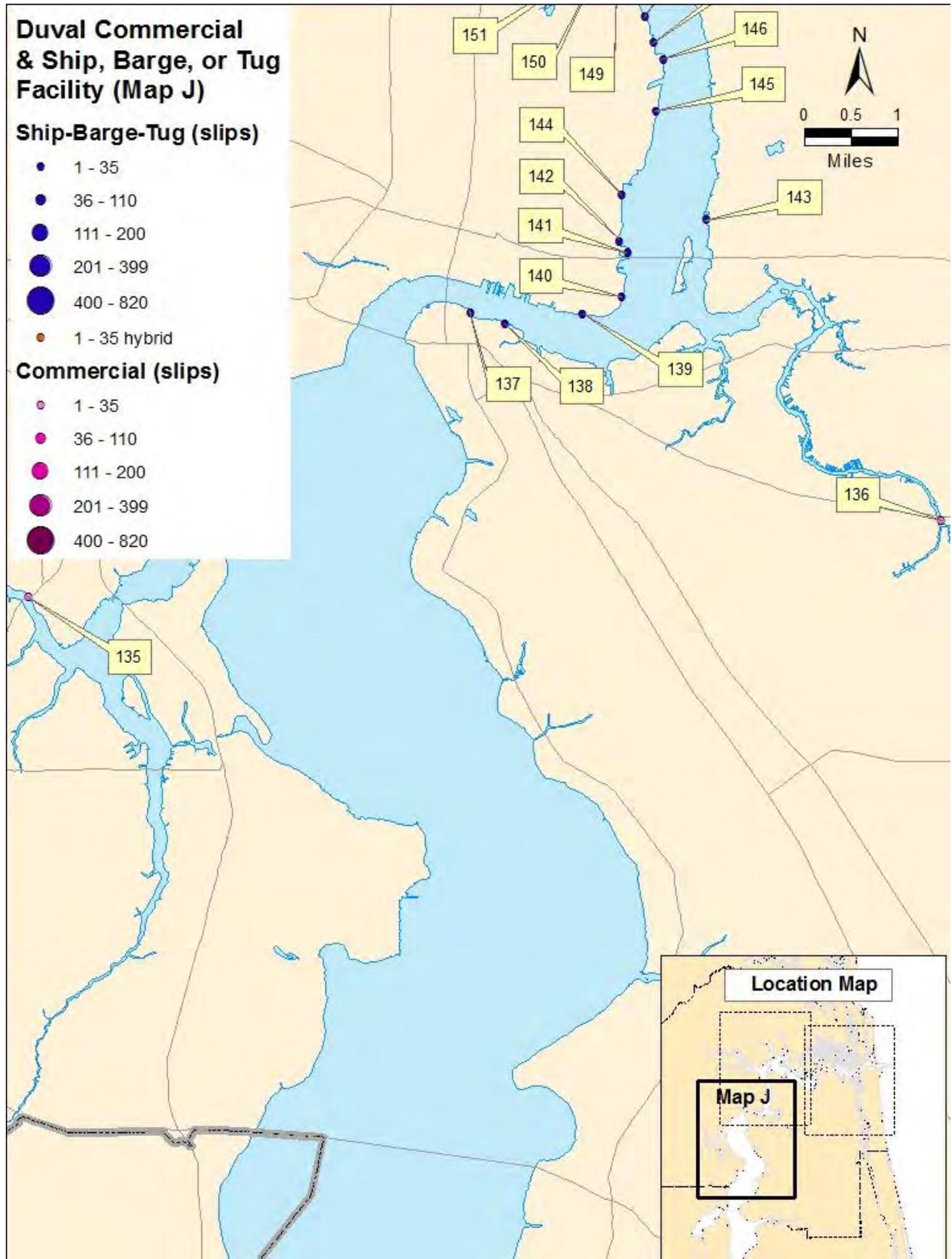


Figure 73: Boat Facility Inventory Map J – Commercial and ship/Barge/Tug marine facilities.

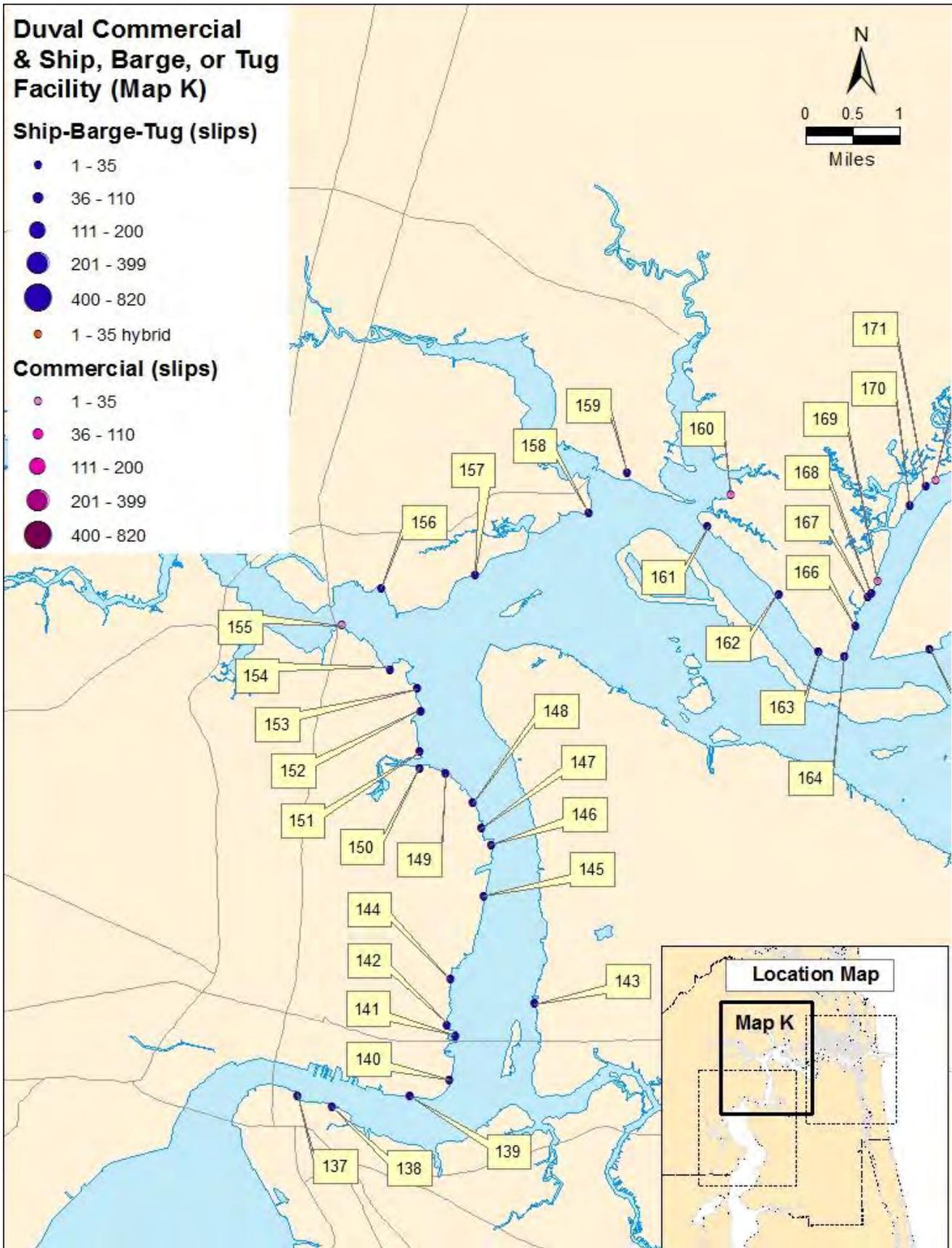


Figure 74: Boat Facility Inventory Map K – Commercial and Ship/Barge/Tug marine facilities (2).

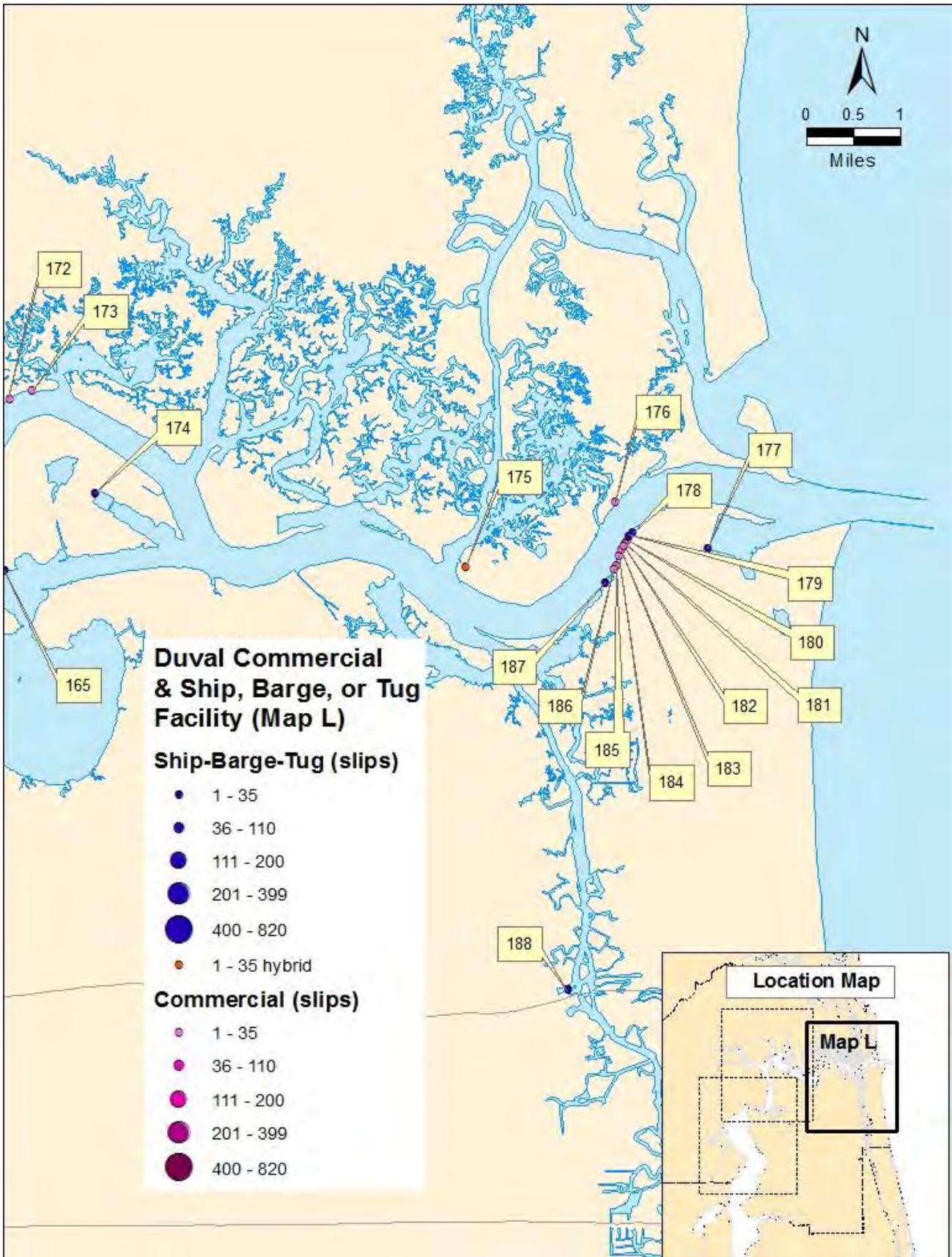


Figure 75: Boat Facility Inventory Map L – Commercial and ship/Barge/Tug marine facilities (3).

4.2.7 Future Waterway Access

The Atlantic Ocean, the SJR, many creeks, estuaries and marshes provide a vast array of recreational opportunities for COJ residents and visitors. The SJR is one of our country's most historic and significant waterways and was recognized in 1998 as one of only 14 American Heritage Rivers in the United States. In the COJ, the river supports more than 19,000 jobs with an annual economic business impact of \$2.2 billion. Property along the river accounts for more than \$1.3 billion of the county's tax rolls (Mayor's Office website on the St. Johns River Accord). Duval County waterways are a rich ecological treasure, a strong economic engine, and a delight for boaters and fisherman.

It continues to be a challenge for the COJ to balance the demand for the development, use, access, and protection of its waterways. While the capacity of boat facilities is relatively stable, occupancy seems to vary widely. While the SJR and the Atlantic Ocean provide enormous resources for recreational boating, limited access confines the population's enjoyment of these beautiful community assets. As Duval County's population continues to grow the competing demands for access to natural resources will increase. The combination of limited waterfront real estate and the need for multiple uses of that land guarantees some level of competition for use. Decreasing availability and increasing cost of waterfront land limits the City in expanding access to its waterways.

Providing public water access is important to the City, the community values the myriad of recreational opportunities available. This has been formulated through policies and plans in several planning documents. The following list of documents obligates the City to continue its vision of providing access to waterways in the COJ as well as protect the health of the SJR and its wildlife habitat.

- Master Recreation Improvement Plan (MRIP) (2002)
- 2030 Comprehensive Plan, Recreation and Open Space Element
- Future Opportunities, Continuous Upgrade Strategy (FOCUS) Plan (updated 2008)
- Boat Ramp Management Plan (updated 2009)
- Grant requirements (FIND, FBIP, BIGP, FRDAP, and FCT)
- Preservation Parks Master Plan
- Downtown Action Plan

Within the COJ community, there are a wide variety of public and private organizations focused on preserving, protecting, developing and using the waterways. Still, it is uncommon for groups charged with oversight of the river to work in tandem to protect, restore, gain access, and use the SJR. Former Mayor Peyton's River Accord, the St. Johns Riverkeeper's River Summits, and the Jacksonville Economic Development Commission's Downtown Master Plan are the examples of coordinated efforts to determine how the Jacksonville community can interact with the SJR and its tributaries for the maximum benefit of both people and nature. Mayor Alvin Brown has initiated a River Access program to create more active recreational opportunities along the St. Johns River and in parks. By responding to the need for more river access, Mayor Brown is providing more economical ways for people to experience Jacksonville and encouraging river advocacy. Future public access is a large component of all of these initiatives.

4.2.7.1 Public Boat Ramps

Based on the COJ's evaluation of distribution and total number of ramps, additional ramps and parking is needed. The Florida Statewide Comprehensive Outdoor Recreation Plan (SCORP) suggests that a single boat ramp can accommodate 36 launches per day. This figure is based on an average of 20

minutes per boat for total put-in and pull-out time during a 12-hour period (3 boats per hour X 12 hours = 36 launches per day). Duval County has 26 boat ramps with 59 launching lanes, and 34,483 registered vessels in 2010. At 20 launches per vessel per year, the boat ramp facilities should be able to accommodate a total of 689,660 launches annually, with the lanes each averaging 11,689 or 32 launches daily. Although the daily launch estimate is within SCORP guidelines, lack of parking decreases boat ramp usage. In addition, the 32 launches per day average does not provide for peak use times such as weekends and holidays. If the SCORP recommended standard of 35 parking spaces per lane is used, the City's boat ramps would require a total of 2,065 boat trailer parking spaces. The total number of existing spaces is 676, one-third of the suggested number.

The growth of boating is another factor that will affect the level of service boaters may experience. The ratio of registered boats to the total population is 26:1. Using this ratio and the COJ Planning Department's projected population increases; the COJ can expect approximately 2,198 new boaters by 2015, for a total of 36,681 boaters. According to SCORP, a boat ramp lane serves a maximum 12,500 people. This suggests that the COJ will require 19 new boat ramp-launching lanes by 2015. It is clear that new and expanded boat ramp facilities will be needed in the future. The Boat Ramp Management Plan states that the COJ should move forward to acquire new properties for ramps, adjacent property for expansion, as well as re-design existing ramps to allow for more capacity. Figure 76 identifies the public boat ramp expansion plans and property identified for acquisition for public boat ramps is identified in Figure 77.

Existing Facilities						Possible Expansion			
Waterway	Park/Boat ramp	Boat Launch lanes	Boat Docks	Pedestrian Docks	No. of Trailer spaces	Boat Launch lanes	Boat Docks	Pedestrian Docks	No. of Trailer spaces
Pottsburg Ck.	Beach Blvd.	1	1	0	12				8
ICW	Intracoastal	4	3	0	37				35
Cedar River	Lighthouse Marine	2	1	0	16	1			4
ICW	Oak Harbor	1	1	0	28				4
Fishing Ck.	Wayne B. Stevens	5	3	0	49				10
ICW	Joe Carlucci	2	2	0	47	1		1	
Mill Cove	Lonnie Wurn	1	1	1	9				5
Sisters Ck.	Sisters Ck. Marina	4	2	1	94		1		
St Johns River	New Berlin	1	0	0	0				5
Trout River	Bert Maxwell	2	3	1	45				15

Figure 76: Public boat ramps identified by the COJ for future expansion.

Proposed Facilities						
Waterway	Park/Boat ramp	Boat Launch lanes	Boat Docks	Pedestrian Docks	No. of Trailer spaces	
Palm Cove	Beach Boulevard	2	1		25	Has an existing Boat Ramp
Julington Ck.	Old Field Landing Rd.	1			20	Has an existing Boat Ramp
Nassau River	Half Moon Island	2	1	1	35	

Figure 77: Property Identified by the COJ for Acquisition for Public Boat Ramps.

4.2.7.2 Water Taxis

The Timucuan Trail State and National Parks partnership has an access plan for national, state and local parks located within the Timucuan Ecological and Historic Preserve. One plan for access for the non-boater is to provide a river taxi that will run to Kingsley Plantation and to Sisters Creek Marina and will give residents and tourists a unique perspective of the history and culture of the area. It is aimed to be more of an interpretive service, a visitor experience rather than just a shuttle service, with the goal being to involve the visitor.

4.2.7.3 Public Non-Motorized Access

An element of former Mayor John Peyton's Preservation Parks Access Plan encompasses development of fishing areas, canoe launches, parking areas, restrooms, trail systems, education centers, picnic pavilions and overlooks. Figure 78 lists many of the non-motorized access projects proposed under the plan.

Waterway	Park Name	Activity
Ribault River	Ribault River Preserve	canoe launch, fishing pier
Ortega River	Westside Regional Park	canoe launch
Julington Creek	Julington Durban Creek Preserve	canoe tie-up
Ft George River	Alimacani Park	ramp improvements
Pumpkin Hill Creek	Betz- Tiger Point Preserve	water taxi dock
Ft George River	Huguenot Memorial Park	fishing dock
ICW	Dutton Island Preserve	canoe launch
St Johns River	Reddie Point Preserve	canoe launch

Figure 78: Future COJ Non-motorized access plans.

4.2.7.4 Mooring Fields

COJ is in the process of developing a regulated mooring field at the mouth of the Ortega River, between the Grand Avenue Bridge and the Roosevelt Boulevard Bridge, as of the writing of this plan. The main reason for the development of a mooring field in this location is for boating safety. Many boaters have expressed uneasiness to the Jacksonville Waterways Commission concerning the unmarked channel and the issue of boaters mooring in or very close to the channel, making safe navigation an issue. Currently, there are anywhere from 30-50 boats anchored in the Ortega River. Present regulations enable boaters to anchor in almost any location. In zip code 32210, which covers the Cedar River and the Ortega River, there are 2,648 registered boaters. The boaters must pass through this section of the river to reach the SJR. In addition, the mooring field would be managed so as to eliminate abandoned and derelict vessels, ensure compliance with the Clean Vessel Act, minimize benthic damage, and provide safe navigation for recreational vessels.

4.2.8 Conclusions

The following conclusions can be made from the boat activity data:

- Between 2008 and 2009, boat registrations in Duval County decreased while the registered vessels in surrounding counties (St. Johns, Clay and Putnam) increased. The most abundant pleasure vessels registered are 16 – 25 foot boats.

- Jacksonville Port Facilities are used by about 3,530 vessels annually, including 158 cruise ship passages in 2009. There have been no new studies of commercial vessel traffic in the area since 1994; however, in 2009 it was documented for the USACOE that marine traffic in the Jacksonville Harbor Entrance and St. John's River Channel was heavy with strong tidal currents and in many instances, ships pass side to side in the narrow channel, not allowing much additional room for other boat traffic to maneuver. A cooperative agreement among commercial port stakeholders is currently in effect as an effort to reduce the number of manatees killed or injured by the ship activity in the COJ waterways (JMTX Manatee Protection Program).
- Duval County ranks in the top ten for boating accidents in the State (2005-2008) and the primary causes of accidents were no proper look-out and inattention of the boat operator. The primary type of accident was predominantly collision with another vessel, or a fixed object in the water.
- It is only possible to draw general conclusions from the 2009 ATM Inc. boating study because survey effort among boat ramps differed significantly.
- Boat ramp traffic was reported highest at Beach Marine, Mayport, Sisters Creek, Joe Carlucci, Mandarin Park, and Oak Harbor, with less traffic at W.B. Stevens, Pottsburg Creek, Palms Fish Camp, Goodbys Lake, Lions Club, Hood Landing, and Lighthouse and the lowest levels of traffic occurred at Arlington Road, St. Johns, Bert Maxwell, Alimacani, Dinsmore, Lonnie Wurn, and T.K. Stokes. Popular destinations from Beach Marine, Mayport, Sisters Creek, Joe Carlucci, Palms Fish Camp and Oak Harbor were Atlantic/Offshore, the Little Jetties, and the Fort George area. Destinations from Mandarin Park were Atlantic/Offshore (also the Little Jetties and Fort George), Goodbys Creek, Ortega River, Julington Creek, and Clay County.
- While it continues to be a challenge for the COJ to balance the demand for the development, use, access, and protection of its waterways, this plan attempts to address some of these issues. Future public access to the SJR is a continuing concern and focus of the COJ. Responding to the need for more river access, Mayor Brown is providing more economical ways for people to experience Jacksonville and encouraging river advocacy through the COJ's River Access Program.

4.3 Manatee and Boat Activity Overlap Discussion

Following is a geographic summary of some of the factors considered and analyzed to identify areas within the COJ where boat activity interacts with high use manatee areas. The COJ waterways are discussed geographically from the north/east to south/west.

Waterways North of Heckscher Drive and east of Alta Road, and the Ft. George Inlet

Manatee Protection Zones: Protection zones in this area are limited to a small state slow speed zone in the ICW near Sisters Creek Marina and Joe Carlucci Park areas.

Existing Watercraft Access: There are a total of approximately 181 motorboat access points in this area. This access consists of 55 boat trailer parking spaces among four boat ramps (Ribault Club at Ft. George, Alimacani, Big Talbot Island State Park, Simpson Creek Park), three transitory slips at the Kingsley Plantation and approximately 123 single family or vacant residential parcels with watercraft access. About 2/3 of all boat access here is single family residential and most of the other access is from small boat ramps.

Boating Traffic: Ramp intercept surveys were conducted in 2009 from only one of the four ramps in this area. The 2009 ATM boat ramp intercept survey reported that the majority of boats launched from the Alimacini Ramp went offshore through the Fort George Inlet, with a smaller amount of traffic from offshore back to the Little Jetties area through the St. Johns Inlet. ATM also reported some level of boat traffic to this area from ramps throughout the City.

Manatee Data: Manatee use in this area seems primarily limited to traveling in the ICW. No watercraft-related or perinatal/dependant calf manatee deaths were recovered in the area between 2000 and 2010. Manatees have been regularly sighted in this area, but the number sighted was not high between 2004 - 2011. There was an average of one manatee seen per aerial survey of the area between 2004 - 2011, with no aerial sightings November through February.

Summary: Shoreline land use in this area is predominately conservation and agricultural. This is primarily a conservation area with regular manatee use and low residential and recreational boat activity.

The Chicopit Bay, and the SJR south of Heckscher Drive from the St. Johns Inlet west to Fort Caroline

Manatee Protection Zones: State slow speed buffer zones.

Existing Watercraft Access: There are a total of approximately 817 motorboat access points in this area. This access consists of three marinas (361 slips), five port facilities (58 shipping berths), 226 boat trailer parking spaces among four boat ramps (Pirates Cove Fish Camp, Michael B. Scanlan, Sisters Creek-Joe Carlucci, Sisters Creek Marina), two facilities with transitory slips (3 slips), 91 slips among 13 other facilities (commercial businesses, educational or public institutions, etc.) and approximately 78 single family or vacant residential parcels with watercraft access.

Boating Traffic: The 2009 ATM boat ramp intercept survey reported most of the traffic from the four public ramps is to offshore destinations with less traffic north to Nassau River, and a small amount of traffic west and also south almost to the Clay County line. ATM also reported a lot of traffic through this area from all other ramps surveyed during the 2009 boat activity study mostly to offshore and also to north and south ICW destinations. There is regular ship traffic to and from five port facilities in this area and the Atlantic Dry dock ship repair business located on the SJR at the mouth of Sisters Creek. There is also regular ship traffic through this area as ships travel between offshore and port facilities in the downtown area. Most of the boat traffic generated in this area not related to ship activity is from the three marinas and eight commercial businesses concentrated near Batten Island and Mayport. The amount of residential boat activity generated in this area is limited.

Manatee Data: Since 2000, manatees have been most frequently sighted at the mouth of Sisters Creek and the south shore of the SJR southwest of Sisters Creek. There have also been sightings on the north shore of the SJR across from Mayport near Batten Island where the marinas, commercial and freight/cargo facilities are located. However, the number of manatees sighted at this location is not high with an average of 0.2 manatees seen per aerial survey of the area between 2004 and 2011. Manatee use of the area appears to be primarily for traveling. Nine (9) of 59 watercraft-related manatee deaths reported in COJ between 2000 and 2010 (Figure 46 in Section 4) were recovered in this area. Of these nine deaths, four (4) were attributed to large vessel impact. Three perinatal/dependant calf deaths occurred in the area, all prior to 2000.

Summary: The most predominant land use in this area is related to ship activity and other commercial waterfront uses. This use is in close proximity to conservation areas near the St. Johns Inlet and the mouth of Pablo Creek (Chicopit Bay) and rural and low density residential parcels scattered throughout the area. This area is a cross roads between the ICW and the St. Johns River, with steady east/west and north/south boat activity. While a relatively low average number of manatees were sighted during aerial surveys, there is a relatively high number of watercraft-related manatee deaths. There is regular east/west shipping activity and east/west and north/south recreational boating traffic in this area.

Pablo Creek south of Chicopit Bay to the St. Johns County Boundary

Manatee Protection Zones: No state speed zones.

Existing Watercraft Access: There are a total of approximately 3,093 motorboat access points in this area. This access consists of five marinas (1,671 slips), one shipyard (12 slips), 65 boat trailer parking spaces among two boat ramps (Oak Harbor, ICW-Beach Marine), four multi-family facilities (199 slips) and approximately 1,146 single family or vacant residential parcels with watercraft access.

Boating Traffic: The 2009 ATM boat ramp intercept survey reported most of the boat traffic from the two public ramps in this area is to Ft. George, some traffic offshore through the St. Johns Inlet, with limited boat trips to the Nassau River area, downtown Jacksonville, the Ortega River and south to Julington Creek. Boat traffic into this area from other COJ ramps was reported predominately from the downtown and St. Johns Inlet and Mayport areas with some traffic from the Mandarin Park ramp near the Clay County line. A third of the recreational boat traffic into the system in this area is from private residential lots. Most other boat traffic is from marinas and 94% of the marina slips are located at the Beach Boulevard Bridge area.

Manatee Data: Manatees have been regularly sighted in this area. There was an average of two manatees seen per aerial survey of the area between 2004 - 2011. Manatees travel through Pablo Creek as they move to and from the SJR and Nassau County and their southeast Florida winter habitat. Manatees have also been observed feeding and resting in the area, with most, sighted near the Atlantic and Beach Boulevard bridges and near the St. Johns County boundary. Four (4) of 59 watercraft-related manatee deaths reported in COJ between 2000 and 2010 (Figure 46 in Section 4) were recovered in the area. Between 1974 and 2010, three perinatal/dependent calf manatee deaths occurred, two of which were after 2000.

Summary: The shoreline land use in this area is predominately low density residential. There are also some medium density residential, agricultural and a few small commercial and conservation parcels. There are numerous water access points in the area and a number of the marinas and multi-family facilities are located where manatees are sighted. The boat traffic into the waterways from the access points overlaps with regular manatee travel, resting and feeding patterns.

West of Fort Caroline to the Reddie Pointe Preserve (SJR, Blount Island Channel, Mill Cove, Broward River, Dunn Creek)

Manatee Protection Zones: State slow speed buffer zones in the center of the area, no state zones in Broward River or Dunn Creek.

Existing Watercraft Access: There are a total of approximately 1,014 motorboat access points in this area. This access consists of six marinas (202 slips), 15 port facilities (47 shipping berths), 58 boat

trailer parking spaces among seven boat ramps (Brown's Creek Bridge, Dunn Creek Bridge, Drummond Point, Gate Petroleum Co, Lonnie Wurn, Palm's Fish Camp and Fulton), one facility with three (3) transitory slips, three multi-family facilities (12 slips), 122 slips among five other facilities (commercial businesses, educational or public institutions, etc.) and approximately 570 single family or vacant residential parcels with watercraft access. There are also 133 wet slips permitted, but not yet constructed or in/near construction phase.

Boating Traffic: Boat activity in this area is diverse. The 2009 ATM boat ramp intercept survey reported city wide destinations from the ramps in this area and also regular traffic through this area from other boat ramps to offshore and less traffic to north and south ICW destinations. There is regular ship traffic to and from 15 port facilities in the area along with ship traffic through the area between offshore and port facilities downtown. In conjunction with regular shipping activity, just over half of the locations that generate boat traffic into the system are residential parcels.

Manatee Data: Since 2000, manatees have been most frequently sighted in this area near the inlet to Mill Cove, the JEA District II outfall and Reddie Point, with an average of four (4) manatees seen per aerial survey between 2004 - 2011. Fifteen (15) of 59 watercraft manatee deaths reported in COJ between 2000 and 2010 (Figure 46 in Section 4) were recovered in this area. Of these 15 deaths, five were attributed to large vessels. Between 1974 and 2010, two perinatal/dependent calf manatee deaths occurred, one of which was after 2000.

Summary: Land use in this area is diverse. The predominant use is related to cargo transport that is intermixed mostly with rural and low and medium density residential parcels. About half of the area's shipping facilities are in close proximity to the locations manatees are most often observed in this area (Mill Cove inlet, the JEA District II outfall and Reddie Point). Manatee behavior observed in this area is feeding, resting and traveling. There is regular recreational vessel and ship traffic generated in, and through the area.

Trout River, Ribault River, Moncrief Creek

Manatee Protection Zones: State slow speed buffer zones in downstream sections, no state zones west of Interstate 95.

Existing Watercraft Access: There are a total of approximately 743 motorboat access points in this area. This access consists of four marinas (156 slips), one port facility (2 shipping berths), four multifamily facilities (25 slips), 104 boat trailer parking spaces among five ramps (Charles Reese, Dinsmore Landing, T.K. Stokes, Bert Maxwell, Harborview), one facility with transitory slips (35 slips), 18 slips among two other facilities (commercial businesses, educational or public institutions, etc.) and approximately 403 single family or vacant residential parcels with watercraft access.

Boating Traffic: The 2009 ATM boat ramp intercept survey reported the Broward River, Ft. George and downtown as the primary destinations from the five area boats ramps with some travel to Goodbys Creek, Mill Cove and offshore at the St. Johns Inlet. The study also reported some traffic into this area from downtown, the St. Johns Inlet and Mayport area, Pablo Creek and the south part of the city. Just over half of the locations that generate boat traffic into the system in this area are residential parcels. There are four multi-family facilities and numerous marinas and other commercial facilities located at the mouth of the Trout River.

Manatee Data: Manatees have been regularly sighted in this area traveling, resting, foraging and cavorting, with the highest number of animals sighted in the Ribault River and the headwaters of the Trout River. There was an average of two manatees seen per aerial survey of the area between 2004 - 2011, with no aerial sightings in November or February. Two (2) of the 59 watercraft manatee deaths reported in COJ between 2000 and 2010 (Figure 46 in Section 4) were recovered in this area. Between 1974 and 2010, seven perinatal/dependent calf manatee deaths occurred, three of which were after 2000.

Summary: Land use in this area is predominately low density residential. There is also some medium density residential and commercial use near the mouth of the Trout River. Manatees have been regularly sighted in this area traveling, resting, foraging and cavorting. Recreational boat traffic is generated from residential parcels in the area, boat ramps in and outside the area, and a concentration of commercial and marina activity at the mouth of the Trout River.

SJR between US Navy Property on South Somers Road and Winter Point, and the Arlington River

Manatee Protection Zones: Slow speed state and federal buffer zones and 25 mile per hour speed zone in channel.

Existing Watercraft Access: There are a total of approximately 1,468 motorboat access points in this area. This access consists of five marinas (440 slips), seven multi-family facilities (276), 101 boat trailer parking spaces among four boat ramps (St. Johns Marina, Arlington Road, Pottsburg Creek/Beach Blvd., Arlington Lions Club), 18 port facilities (58 shipping berths) seven facilities with transitory slips (12 slips), 25 slips among three other facilities (commercial businesses, educational or public institutions, etc.) and approximately 556 single family or vacant residential parcels with watercraft access.

Boating Traffic: This area has the highest level of diverse vessel traffic in the city. Over one third of the boat traffic generated into the system in this area is from residential parcels and one half is generated from multi-family facilities and commercial marinas. The 2009 ATM boat ramp intercept survey reported most recreational boat traffic from the four (4) public ramps in this area destined to offshore through the St. Johns Inlet, and some traffic to downtown locations. Traffic through this area from southern and eastern location boat ramps, and the Trout River ramps was also reported. In addition to the recreational boat traffic from and through the area, there is regular ship traffic to and from 18 port facilities and traffic between numerous water taxi stops as a taxi service crisscrosses the SJR on a two mile loop.

Manatee Data: There was an average of two manatees seen per aerial survey of the area between 2004 and 2011. Since 2000, manatees have been most frequently sighted in this area in the Arlington River, on the SJR east shoreline between the Arlington River and Jacksonville University and on the SJR south shoreline west of the mouth of the Arlington River to the Acosta Bridge. Eighteen (18) of the 59 (30.5%) watercraft-related manatee deaths reported in COJ between 2000 and 2010 (Figure 46 in Section 4) were recovered in this area. Of these 18 deaths, seven (7) were attributed to large vessels. Between 1974 and 2010, three perinatal/dependent calf manatee deaths occurred in this area, all prior to 2000.

Summary: The close geographic proximity of the COJ central business district, Tallyrand area and the Arlington River results in wide variation of land use and boat activity. The Arlington River and east side of the SJR north of the Arlington River include many low density residential parcels. There is also some recreational and open space land use in addition to a conservation area at and just south of Reddie

Point. There is boat traffic generated in, and through, the area in addition to the regular shipping activity and water taxi service. Regular manatee use of the area is evident.

SJR between Winter Point and the Buckman Bridge, and the Ortega and Cedar Rivers

Manatee Protection Zones: State slow speed buffer zones in downstream sections, no state zones in headwater areas of Ortega and Cedar Rivers. Slow speed state and federal buffer zones in SJR.

Existing Watercraft Access: There are a total of approximately 3,590 motorboat access points in this area. This access consists of 16 marinas (2,014 slips), 12 multi-family facilities (172 slips), 108 boat trailer parking spaces at three boat ramps (Goodby's Lake, W.B. Stevens, Lighthouse), two facilities with transitory slips (20 slips), 56 slips among five other facilities (commercial businesses, educational or public institutions, etc.) and approximately 1,220 single family or vacant residential parcels with watercraft access.

Boating Traffic: The 2009 ATM boat ramp intercept survey reported traffic from two public ramps in the Ortega River and the ramp in Goodbys Creek mainly to downtown, south to Julington Creek and Doctors Lake, and north to Mill Cove, the Little Jetties and Ft. George. Regular boat traffic into this area from the more southern ramps, and some traffic from most of the ramps farther north in the city was also reported. About one third of all boat access points in this area are from residential parcels. Most of the other watercraft access is from the 16 marinas in the area, the majority of which are concentrated at the mouth of the Ortega River, with a few multi-family facilities widely distributed throughout the area.

Manatee Data: There was an average of 10 manatees seen per aerial survey of the area between 2004 and November 22, 2011. Manatees have been regularly sighted in this area traveling, resting, foraging and cavorting, with the highest number of animals sighted on both shores of the SJR south of Piney and Christopher Points, in Goodbys Creek and in the Ortega and Cedar Rivers. Abundant submerged aquatic vegetation in the SJR, and the Ortega Farms warm-water basin in the Ortega River likely attract manatees to the area. An elevated level of manatee and calf use of the area has been observed. Four (4) of the 59 watercraft-related manatee deaths reported in COJ between 2000 and 2010 (Figure 46 in Section 4) were recovered in this area. Between 1974 and 2010, twenty-one (21) perinatal/dependent calf manatee deaths occurred, 10 of which were after 2000.

Summary: The dominant land use in this area is residential, with a large portion of the western shoreline of the SJR occupied by the Jacksonville Naval Air Station. There is recreational boat traffic generated from numerous residential parcels in the area, from boat ramps in and outside the area, and there is a concentration of marina activity at the mouth of the Ortega River. Manatees have been regularly sighted in this area traveling, resting, foraging and cavorting.

SJR between the Buckman Bridge and the Clay County boundary, and Julington Creek

Manatee Protection Zones: Slow speed state and federal buffer zones in SJR and up to San Jose Blvd. bridge in Julington Creek. State slow speed within 450 feet of San Jose Blvd., state slow speed buffer zone in Julington Creek up to Durbin Creek where state zone changes to slow speed shore to shore.

Existing Watercraft Access: There are a total of approximately 1,160 COJ motorboat access points in this area. This access consists of five marinas (682 slips), 62 boat trailer parking spaces among three boat ramps (Hood Landing, County Park, Mandarin Park), one multi-family facility with six (6) slips and approximately 410 COJ single family or vacant residential parcels with watercraft access.

Boating Traffic: The 2009 ATM boat ramp intercept survey reported boat traffic dispersed from the three public boat ramps in this area to city wide destinations. Some traffic through this area generated from northern ramps in the Ortega, Mayport and Pablo Creek areas was also reported. Over one third of all boat access points are at residential parcels with most of the other water craft access at five marinas near the mouth of Julington Creek.

Manatee Data: There was an average of 15 manatees seen per aerial survey of the area between 2004 and November 22, 2011. The largest number of manatees sighted in the COJ, have been sighted in this area. High numbers of manatees have been sighted on both shores of the SJR and in Julington Creek. The high manatee use of this area is likely associated with abundant SAV and elevated manatee and calf use of the area has also been observed. Five (5) of the 59 watercraft-related manatee deaths reported in COJ between 2000 and 2010 (Figure 46 in Section 4) were recovered in this area. Between 1974 and 2010, four perinatal/dependent calf manatee deaths occurred.

Summary: Most of this area is rural and low density single family use with a small commercial area where marinas are located near the mouth of Julington Creek. There is also an existing conservation area in the Julington Creek headwaters. A high level of manatee use is evident in this area. Recreational boat traffic is generated from residential parcels in the area, boat ramps in and outside the area, and a concentration of marina activity at the mouth of the Julington Creek.

COJ Manatee and Boat Overlap Conclusions

Manatees are widely dispersed over a variety of locations and move freely between locations, particularly during non-winter months. As discussed in the manatee data section of this plan, manatee use is regular, occurring in the same locations for foraging, resting and calving from year to year. Areas most highly used for these behaviors are along the SJR shorelines south of the Fuller Warren Bridge and within the SJR tributaries (Ortega River, Julington Creek, Goodbys Creek, Arlington River), and the Trout and Ribault River and tributaries. The most significant locations for nursing and calving appear to be the Trout River and its tributaries, and the Ortega River and its tributaries. The Isle of Palms in Pablo Creek, a canal in Beacon Hills in Mill Cove, the Arlington River, Goodbys Creek, and Julington Creek also appear to be important calving and nursing areas. Regular manatee traveling, resting and some foraging behaviors in Pablo Creek and the downtown and Blount Island segments of the SJR also occur. Specific areas within the COJ, primarily the SJR between the Fuller Warren Bridge and the SJR inlet have experienced relatively high numbers of manatee deaths by watercraft-related injuries despite lower numbers of aerial survey sightings than areas south of the Fuller Warren Bridge.

As discussed in the boat activity section of this plan, there are various types and intensity of boating activities within the COJ waterways. Large vessels in COJ waters (Port, private freight shipping, yachts, and military vessels), and some of the watercraft-related deaths in the SJR between the Fuller Warren Bridge and the St. Johns Inlet have been determined to be from interactions with large vessels. The “JMTX Manatee Protection Program” discussed in the Boat Activity and Manatee Education sections of this plan, specifically developed for and targeted to commercial vessels has been implemented in an effort to decrease the manatee and large vessel overlap related to existing port facilities. Because of the complexity with port facility planning and development, the siting of port facilities cannot be addressed in this plan. Port facility development will be addressed on a case by case basis. Examples of port facility protection measures are attached as Appendix B.

There are a number of areas within the COJ waterways where boat and manatee overlap is problematic because of the levels of both manatee and boat activity, as well as the importance of some of the areas to manatees. In these areas, the current level of development cannot be decreased, and the development of additional speed zones is unlikely. New or expanding boat facilities should be discouraged, with boat facility development allowed at relatively low or moderate levels. These areas include:

The SJR south of the Yacht Basin and Christopher Point to the Clay County boundary, including Christopher, Julington and Goodbys Creeks: Due to available foraging resources, the largest number of manatees seen during aerial surveys in the COJ is in this area. The relatively high manatee use in this area is also documented by telemetry data. This high level of manatee use occurs in an area where there are already a relatively high number of boat facilities existing. Goodbys and Julington Creeks are used regularly for calving. Three (3) COJ watercraft-related manatee deaths were recovered in this area between 1989 and 1999, and between 2000 and 2010, six (6) watercraft-related deaths have been reported in this area. The upper portion of Julington Creek is unregulated for boat speed. Regular recreational boat traffic is generated from residential parcels on the SJR shoreline, there are numerous public boat ramps in the area as well as marinas, commercial facilities, and multi-family facilities on the SJR. Large boat facilities exist at the mouth of Julington Creek in addition to residential boat activity. Goodbys Creek has residential, boat ramp and commercial boat activity. This area warrants increased manatee protection due to the high manatee use, the importance of this area to manatees for foraging, and the existing amount of boat traffic. In this area, except for the eastern SJR shoreline south of Christopher Creek to Goodbys Creek, increased boat facility development should occur at a low level. Increased boat facility development could occur at a more moderate level south of Christopher Creek to Goodbys Creek since manatee use here appears lower.

The Ortega and Cedar Rivers: Manatees regularly give birth, rest, and feed in the rivers and tributaries. The presence of a thermocline creates a natural, minor warm-water refuge for manatees in a portion of the SJR near the Timuquana Bridge. No watercraft-related manatee deaths were recovered in this area between 1974 and 1997. In 1998, one watercraft-related manatee death was recovered in this area, and between 2000 and 2010, three (3) watercraft-related deaths have been reported in this area. Between 1974 and 2010, 12 perinatal (dependent calf) deaths have occurred. The upper portion of the rivers and tributaries are unregulated for boat speed. There is a concentration of marina activity at the mouth of the Ortega River, and recreational boat traffic is generated from numerous residential parcels adjacent to the Ortega and Cedar Rivers. Two public boat ramps exist in the rivers, and these rivers are also a destination for boaters launching from other ramps outside these rivers. Except for specified development at the public boat ramps, and the parcels where marina activity is concentrated at the mouth of the Ortega River, increased boat facility development should occur at a low level.

The Arlington River: Manatees regularly give birth and rest in the river and its tributaries. No watercraft-related manatee deaths were recovered in this area between 1974 and 1988. Two (2) watercraft-related manatee deaths were recovered in this area between 1989 and 1999, and between 2000 and 2010, another two (2) watercraft-related deaths have been reported in this area. The upper portion of the river is unregulated for boat speed. There are residential parcels, multi-family facilities, and a public boat ramp on the river. Increased boat facility development should occur at a low level.

Trout River, Ribault River and Moncrief Creek: Manatees regularly give birth, rest, and feed in the river and its tributaries. Perinatal deaths have occurred in the upper portions and calves have regularly been seen during aerial surveys. Two (2) watercraft-related manatee deaths were recovered in this area between 1989 and 1999, and between 2000 and 2010, two (2) watercraft-related deaths have been reported in this area. Between 1974 and 2010, seven (7) perinatal (dependent calf) deaths have

occurred. The upper portions of the rivers are unregulated for boat speed. There is a concentration of marina activity at the mouth of the Trout River, and recreational boat traffic is generated from numerous residential parcels adjacent to the rivers and four boat ramps existing in the rivers. Increased boat facility development should occur at a low level.

The SJR North of The Yacht Basin and Christopher Creek to Reddie Point: Used by manatees mostly for traveling and resting, and the greatest number of watercraft-related manatee deaths have been documented in this area. Eighteen (18) watercraft-related manatee deaths were recovered in this area between 1989 and 1999, and between 2000 and 2010, sixteen (16) watercraft-related deaths have been reported in this area. The area between Winter Point and Reddie Point is likely the area of highest manatee and boat activity overlap in the COJ. The waterway is relatively narrow, and there is regular boat and shipping traffic congestion. With the exception of a shore-to-shore slow speed zone between the Fuller Warren and Main Street bridges, there are mainly buffer zones in this area (with 25 mph outside the buffers between Main Street Bridge and Reddie Point). This area includes downtown Jacksonville with numerous boat facilities, as well as port facilities such as Talleyrand. There is regular shipping activity as well as water taxi service. This area is in close proximity to the JEA District II outfall, where manatees are often observed. While there is a concern for risks to manatees in this area, because it has more speed zones than other locations in the COJ, increased boat facility development should occur at a moderate level.

Pablo Creek: Manatees travel Pablo Creek to use COJ waterways and to use important manatee habitat further south, such as Blue Springs. This is an important manatee travel corridor, and manatees have also been observed frequently resting just off the ICW, often in the same location as several large boat facilities. Two (2) watercraft-related manatee deaths were recovered in this area between 1989 and 1999, and between 2000 and 2010, four (4) watercraft-related deaths have been reported in this area. This waterway is relatively narrow, and is not speed regulated for manatee protection. While there is a concern for risks to manatees in this area, increased boat facility development should occur at a moderate level.

5 Boat Facility Siting Strategy

The boat facility siting strategy objective is to minimize the overlap between boat traffic and important manatee habitat, to reduce the potential for adverse manatee/watercraft interaction. The intention is to address secondary and cumulative impacts to manatees and manatee habitat as a result of boat facilities, in a long term, comprehensive manner. A Boat Facility Siting Strategy is based upon the following goal: Minimizing adverse impacts to manatees by strategically locating new or expanding boat facilities. This can be achieved by limiting the overlap of existing and potential boat traffic with known areas of high manatee use. The following are factors to consider when developing recommendations for construction of a new facility or expansion of an existing facility:

- High 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; and
- Travel time to high use boater destinations.

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.

5.1 COJ Boat Facility Strategy Development Criteria

The first step in the development of this boat facility siting strategy was to identify the factors or criteria that contribute to boat and manatee interaction within the COJ waterways. These factors are considered to characterize the probable 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 feeding habitat;
- Watercraft-related manatee mortality;
- Perinatal (dependent calf) manatee mortality;
- Proximity to boating destinations;
- Existing slip numbers and locations;
- Presence of speed zones; and
- Facility type 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 four (4) of this MPP.

The following are also considerations in the development and use of this Boat Facility Siting Strategy:

- A.** New facility construction or existing facility expansion should have no or minimal impact to SAV. Adverse impacts to habitat should be avoided, reduced and minimized as required by state, federal and local regulations.
- B.** New facility or existing facility expansion construction should have no or minimal dredging and thereby avoid adverse impact to benthic communities and native submerged vegetation.
- C.** The Boat Facility Siting Strategy complements other existing resource protection, waterway management initiatives and programs including, but not necessarily limited to:
 - i. Florida Department of Agriculture and Consumer Services designation of areas approved or conditionally approved for shellfish harvesting.
 - ii. Florida Department of Environmental Protection surface water quality classification and Outstanding Florida Waters designations.
 - iii. Aquatic Preserve and other conservation area management plans.
- D.** The following practices for the design and operation of facilities are encouraged:
 - i. Preserve or establish shoreline stabilization using appropriate native wetland vegetation.
 - ii. Utilize rip rap materials, pervious interlocking brick systems and other similar stabilization methods in lieu of vertical sea walls where feasible.

- iii. Piling construction and other non-dredge/non-fill techniques rather than bulkheading or dredging where possible.
- iv. Open wet slips rather than covered wet slips to reduce shading of water bodies which results in lower biological productivity.

5.2 Boat Facility Siting Recommendations

To reduce the potential for adverse manatee/watercraft interaction, the following recommendations apply to 1) the construction of a new Boat Facility as defined in this MPP; 2) expansion of an existing Boat Facility; 3) proposed change in the use of an existing Boat Facility that generates more frequent trips or increases boat traffic; or 4) proposed change in an existing Boat Facility footprint that impacts SAV:

- A.** The boat facility siting strategy and recommendations do not apply to port facilities. Because of the complexity with port facility planning and development decisions, any port facility proposal will be reviewed and addressed on a case by case basis by federal and state wildlife agencies.
- B.** 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.
- C.** 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.
- D.** When determining the allowable slip densities per parcel the number of existing slips are included in the total allowable. For example, if there is an existing 50 slip facility, and the boat facility siting recommendation allows for 60 slips, the facility can expand by 10 slips. Temporary slips, as defined in this MPP, are not counted when calculating the slip densities. All MPP provisions, including slip density recommendations are allowable as long as impacts to habitat have been addressed as specified in section 3.2.4 of this plan.
- E.** The boat facility siting recommendations do not apply to Boat Facilities with a total of four (4) or less slips, unless the slips are transitory slips or are slips that are expected to generate intensive boat traffic. Proposals with four (4) or less of these types of slips will be reviewed and addressed on a case by case basis by federal and state wildlife agencies. Note that this provision allows for the possibility of up to four (4) slips per site that are not transitory or do not generate intensive boat traffic if the proposal conforms with all applicable federal, state and local regulations in place at the time of permit application.
- F.** Unless specified otherwise above, the boat facility siting recommendations defined below, and in figures 79-87, apply to any new Boat Facility, as defined in the MPP, with five (5) or more slips, or expansion of a Boat Facility.
 - i. Preferred - Development in a Preferred area can have an unrestricted number of slips from a manatee management perspective. Other local, state, or federal restrictions may limit slip numbers for other reasons.

- ii. Acceptable With Conditions - Development in an Acceptable With Conditions 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.
- iii. Unacceptable – Development may occur in an Unacceptable area if the development is proposed at a level of one slip for every 100 feet of shoreline owned or controlled by the applicant. For example: A site has 442 feet of shoreline. In order to calculate the allowable number of slips, 442 is rounded up to the next one hundred foot increment (500), then divided by 100 which equals five (5). That number is multiplied by the slip to shoreline ratio one (1). In this example, five (5) would be the allowable number of slips.

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

- i. Downtown Development of Regional Impact (DRI) Area - Slips within this area will be limited to the 964 slips authorized by the Consolidated Downtown (DRI) Consolidated Order 2015-777 (see attached Appendix C, DRI location map). These 964 slips to be distributed to locations within the Special Development area as specified in the DRI consolidated order, some of which may already be permitted and existing.
- ii. Ortega River Working Waterfront Zone – Development on the parcels with riparian rights at the six (6) marina sites in that zone (Huckins Yacht, Cedar Point Marina, Lambs Yacht Center, Lakeshore Dry Storage and Sadler Point Marina) is unrestricted from a manatee management perspective.
- iii. Property Parcel North of Atlantic Boulevard on Pablo Creek – A maximum of 650 slips (wet and dry) as authorized by City of Jacksonville Ordinance 2009 – 621-E are allowable within this area.
- iv. City of Jacksonville Public Boat Ramps - The following planned expansions and one new public boat ramp are allowable as detailed below:
 - a) Wayne B. Stevens Park Boat Ramp at 4555 Ortega Farms Boulevard – 10 additional boat trailer parking spaces at this location. For a total of 59 trailer parking spaces (49 existing + 10 additional).
 - b) Lighthouse Marine Boat Ramp at 5434 San Juan Avenue – Four (4) additional boat trailer parking spaces at this location. For a total of 20 trailer parking spaces (16 existing + 4 additional).
 - c) Bert Maxwell Park Boat Ramp at 500 Maxwell Road - 15 additional boat trailer parking spaces at this location. For a total of 60 trailer parking spaces (45 existing + 15 additional).
 - d) Lonnie Wurn Boat Ramp at 4131 Ferber Road – Five (5) additional boat trailer parking spaces at this location. For a total of 14 trailer parking spaces (9 existing + 5 additional).
 - e) Oak Harbor Boat Ramp at 2428 Seaway Street – Four (4) additional boat trailer parking spaces at this location. For a total of 32 trailer parking spaces (28 existing + 4 additional).

- f) Beach Boulevard Boat Ramp at 8540 Beach Boulevard – Eight (8) additional boat trailer parking spaces at this location. For a total of 20 trailer parking spaces (12 existing + 8 additional).
- g) Half Moon Island Boat Ramp at Half Moon Island Park on the Nassau River – Up to a total of 35 trailer parking spaces at this location.

Other Potential Permit Conditions

Additional conditions may be recommended by reviewing agencies. These conditions may include, but are not limited to the following:

- Standard manatee construction conditions for in-water construction.
- Manatee Educational displays and/or educational programs that provide information on the characteristics of manatees and the potential threat to this endangered species from boat operation.
- Dedicated or FWC approved manatee observers and/or watch plans for construction and/or demolition.
- Seasonal restriction on in-water work.
- Restrictions on types of dredges (equipment) used for dredging, or dredging operational restrictions.
- Grates for culverts or pipes to prevent access that can result in entrapment.
- Fenders or stand-off space between wharfs and vessels.
- Methods to avoid and/or minimize impacts to SAV.
- Restrictions on vessel drafts.
- Restrictions on facility for types of vessel moored (powerboat: sailboat ratio).
- Potential modification to the size, type, or design of the proposed facility.
- Execution of a conservation easement, designed to prohibit future construction or expansion of docking facilities or other watercraft access along the shoreline.

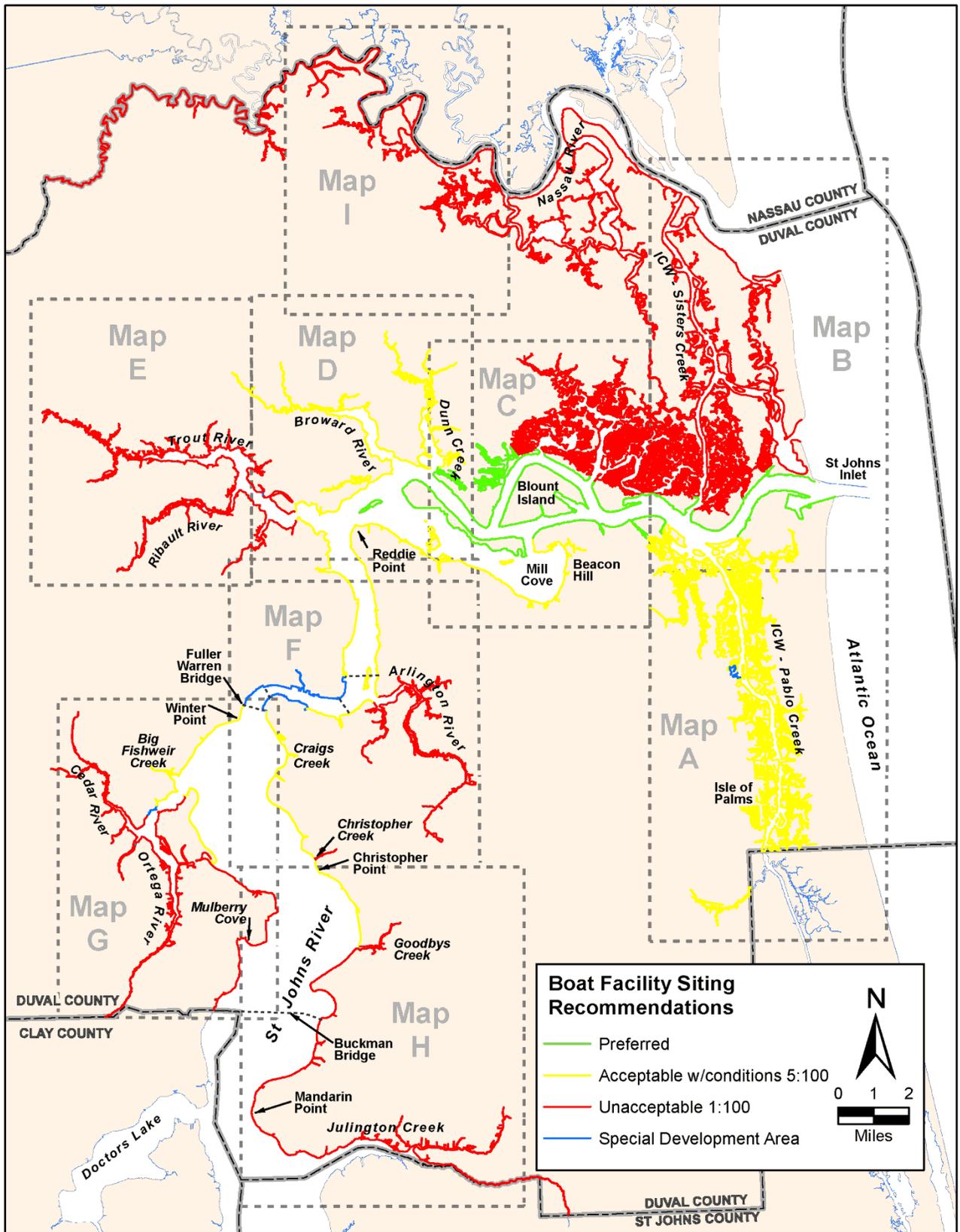


Figure 79: Boat Facility Siting Recommendations.

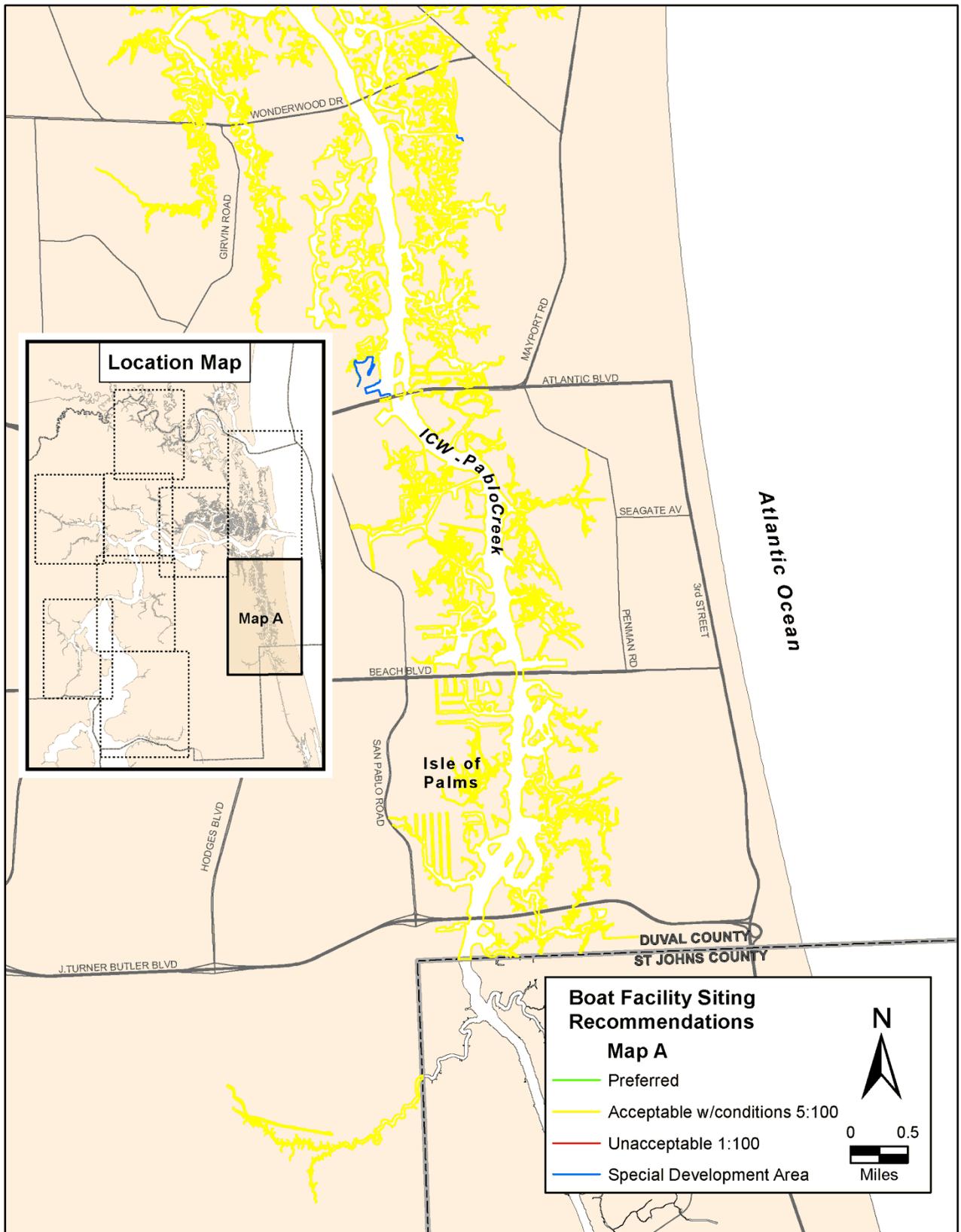


Figure 80: Boat Facility Siting Recommendations Map A.

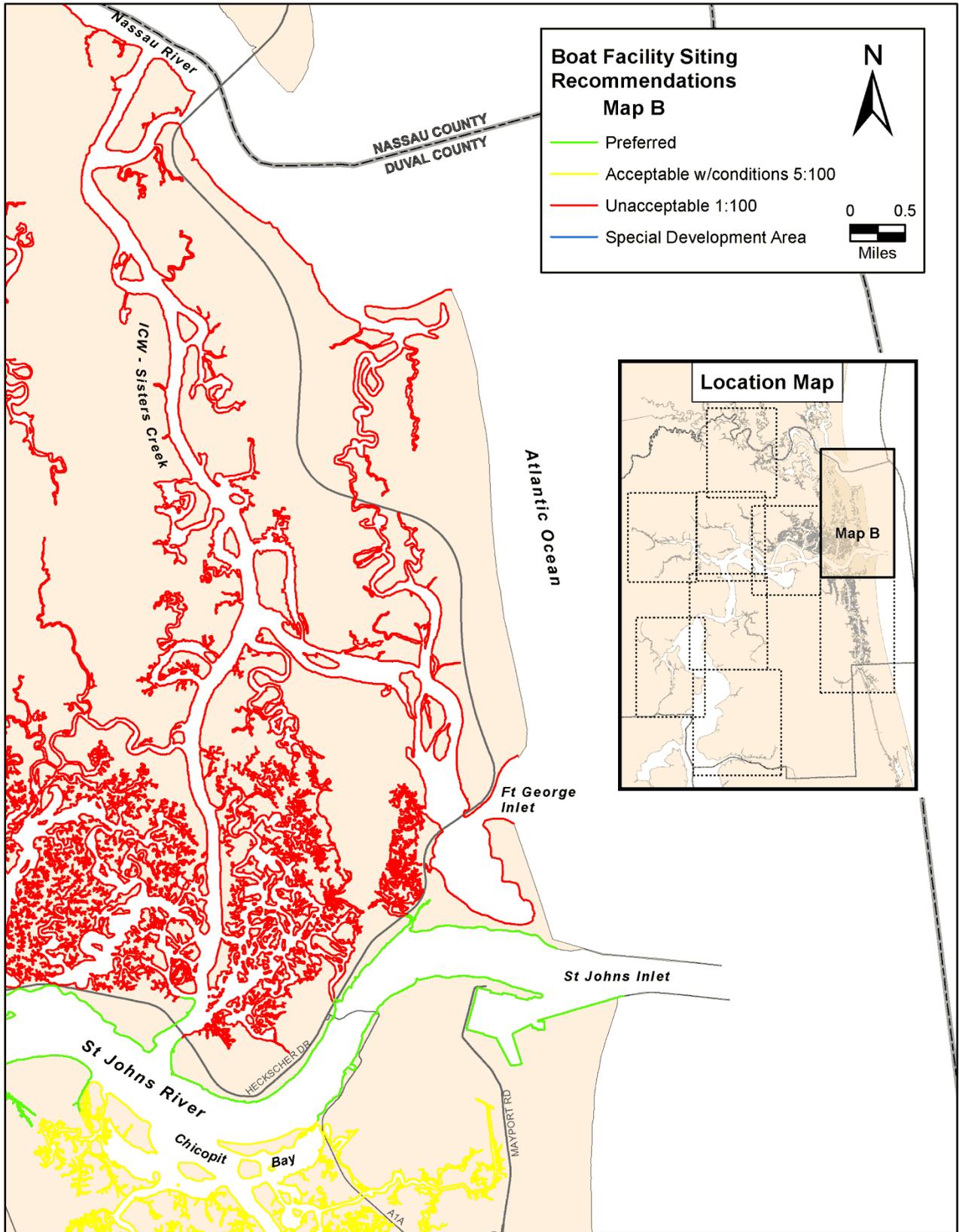


Figure 81: Boat Facility Siting Recommendations Map B.

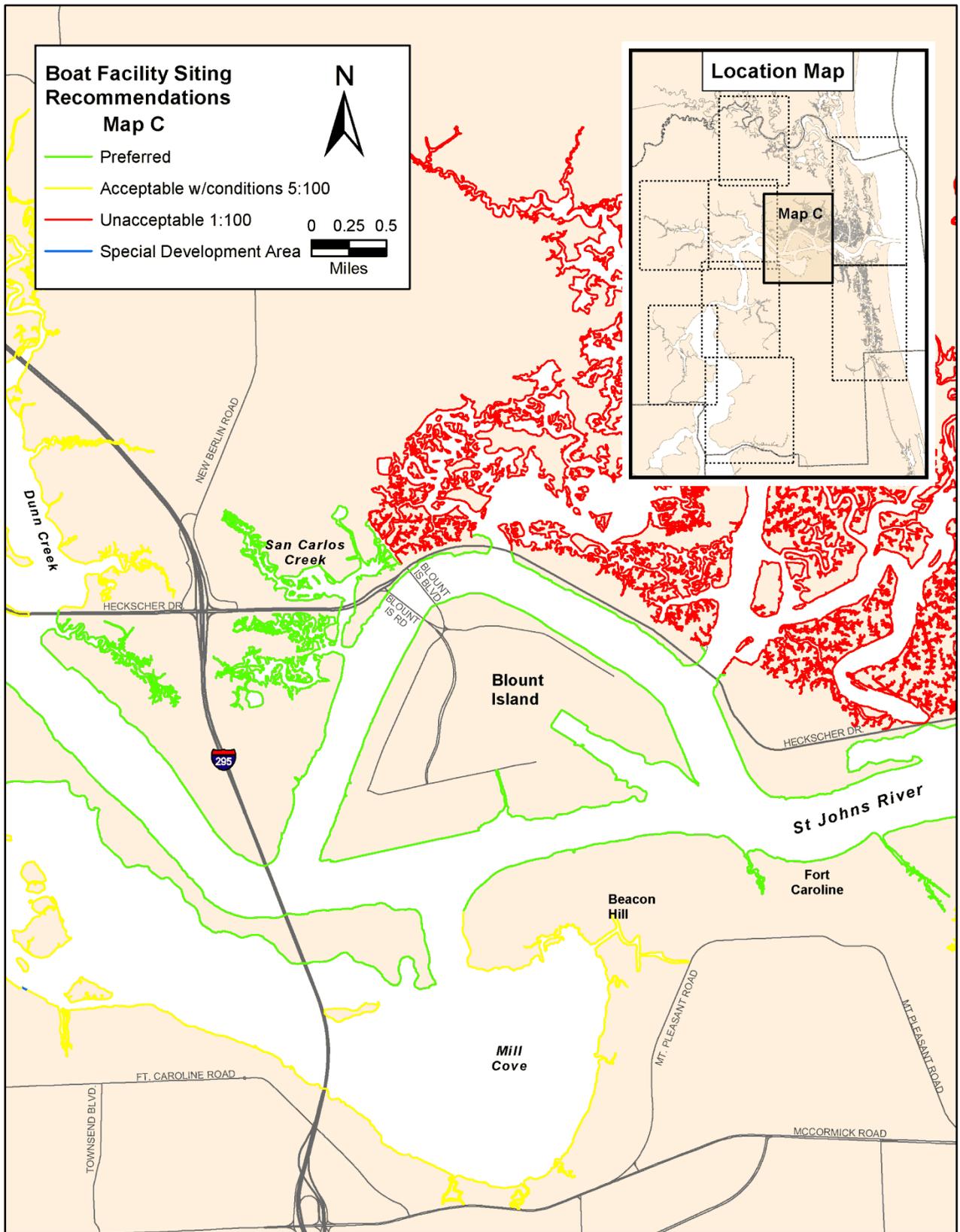


Figure 82: Boat Facility Siting Recommendations Map C.

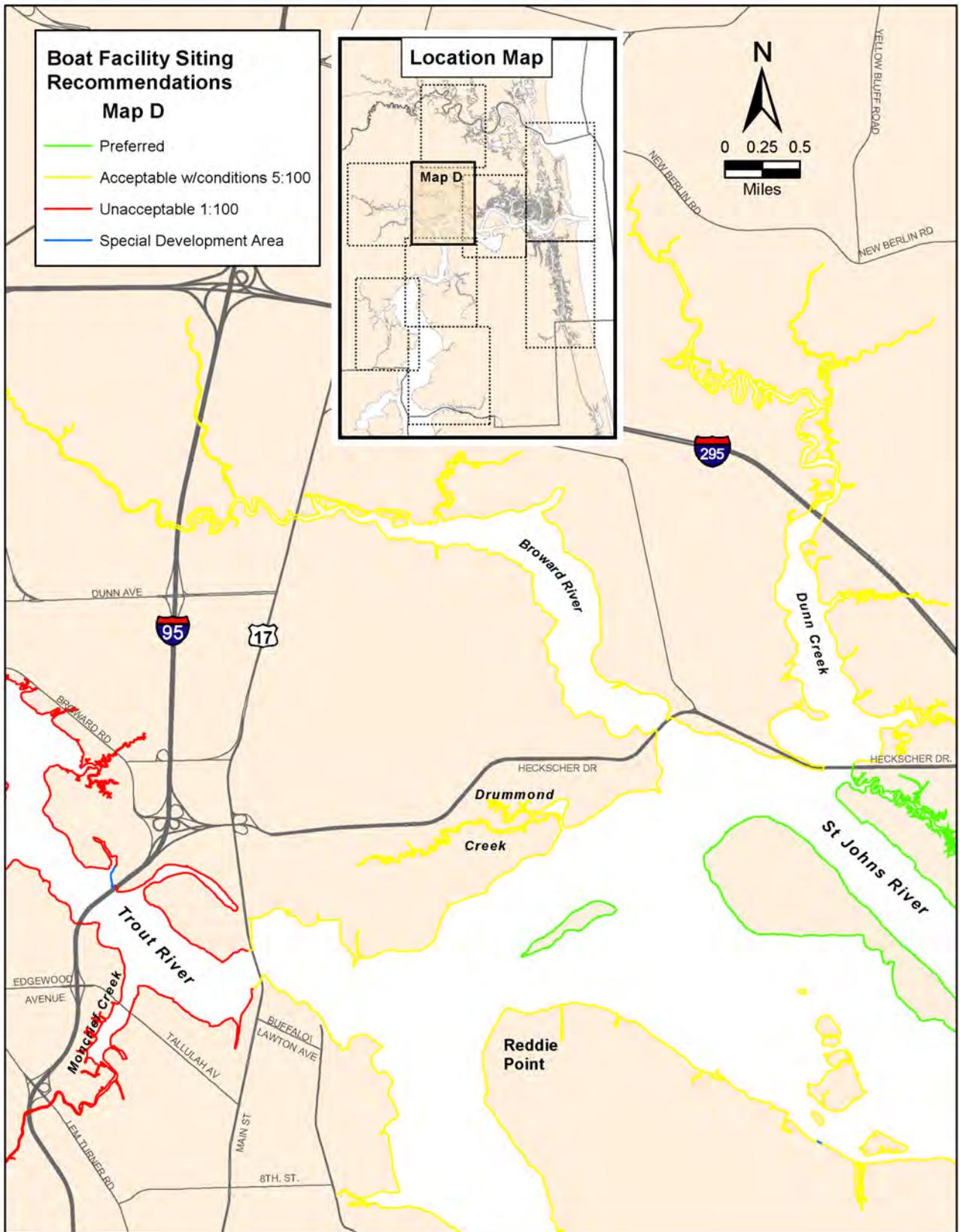


Figure 83: Boat Facility Siting Recommendations Map D.

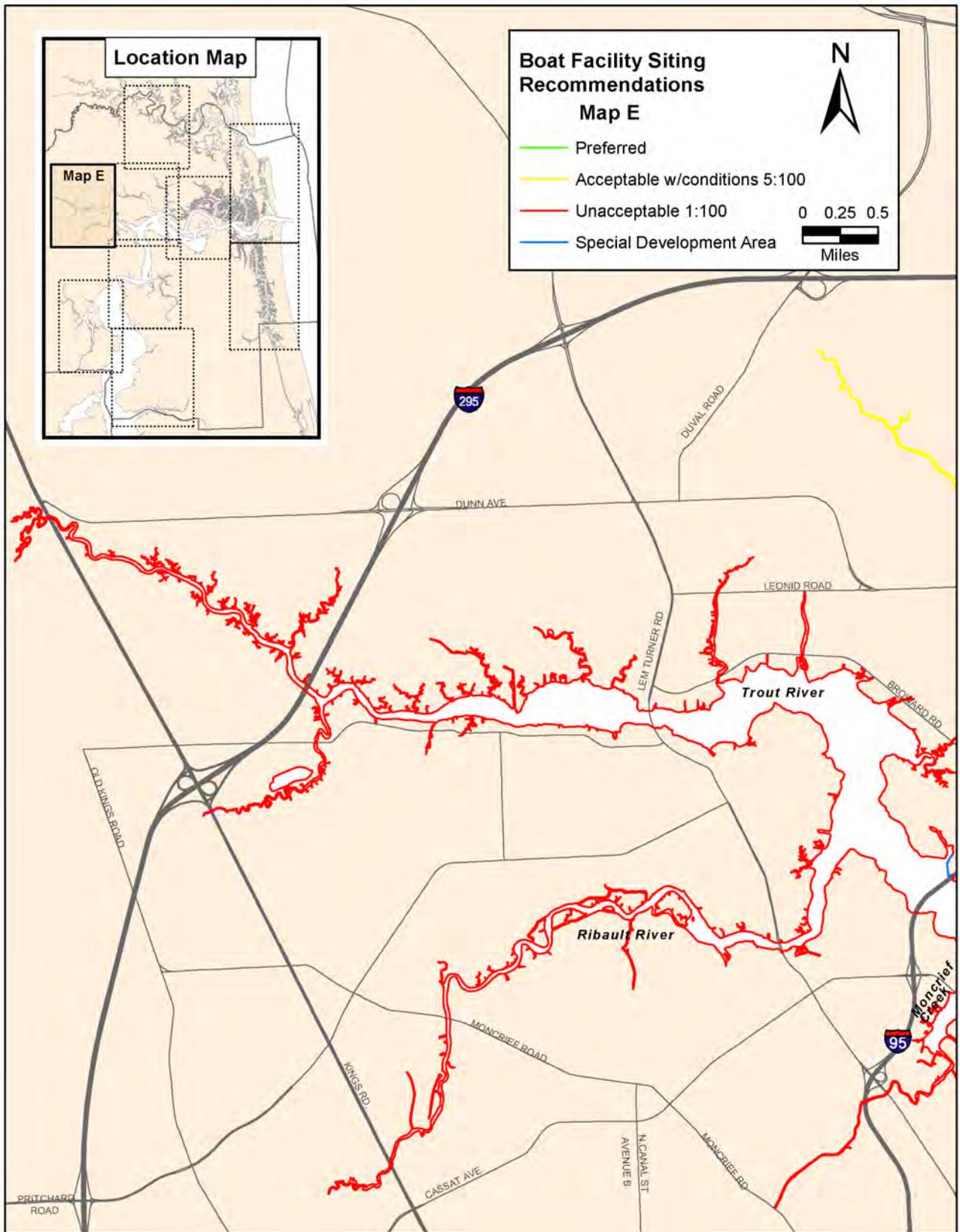


Figure 84: Boat Facility Siting Recommendations Map E.

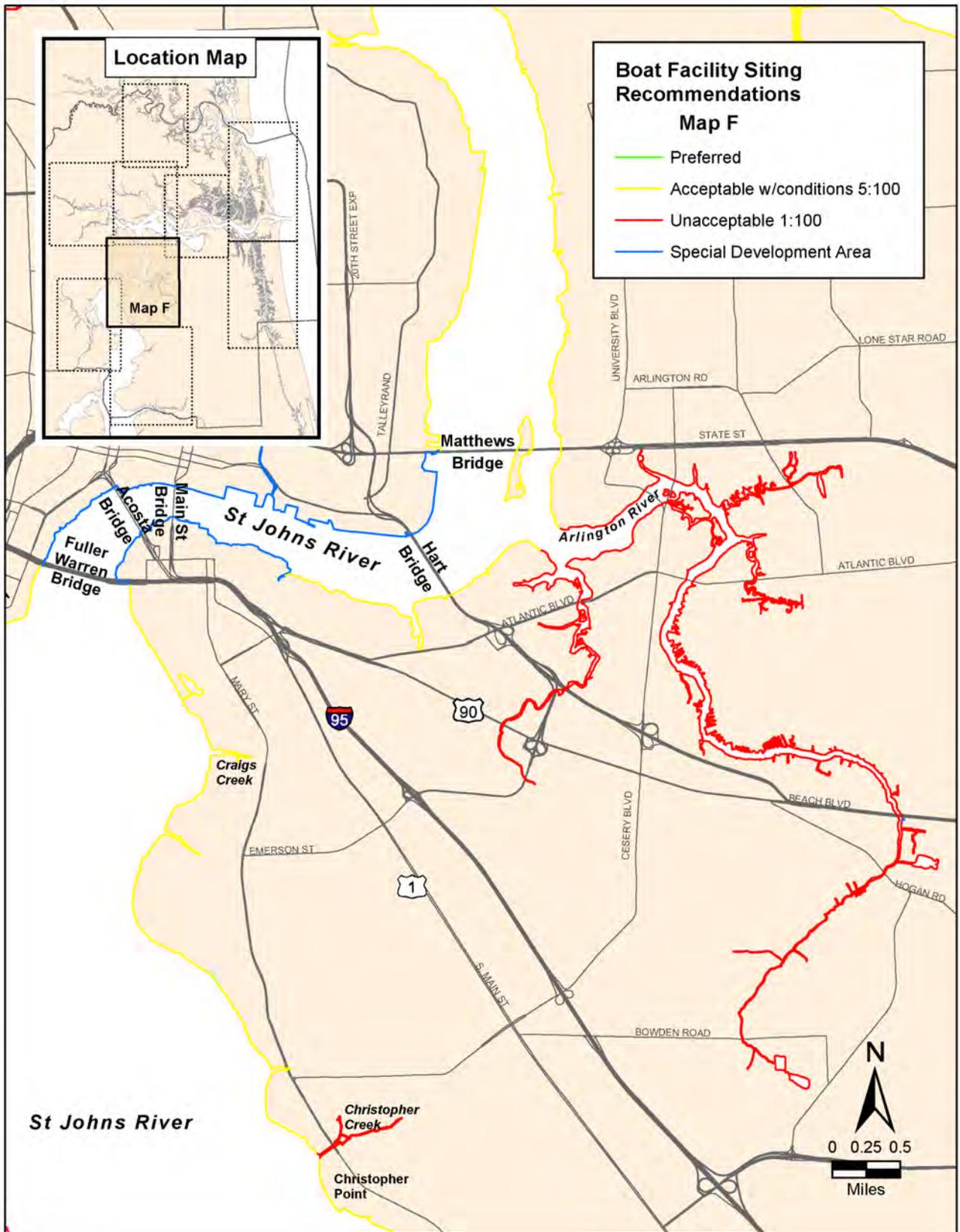


Figure 85: Boat Facility Siting Recommendations Map F.

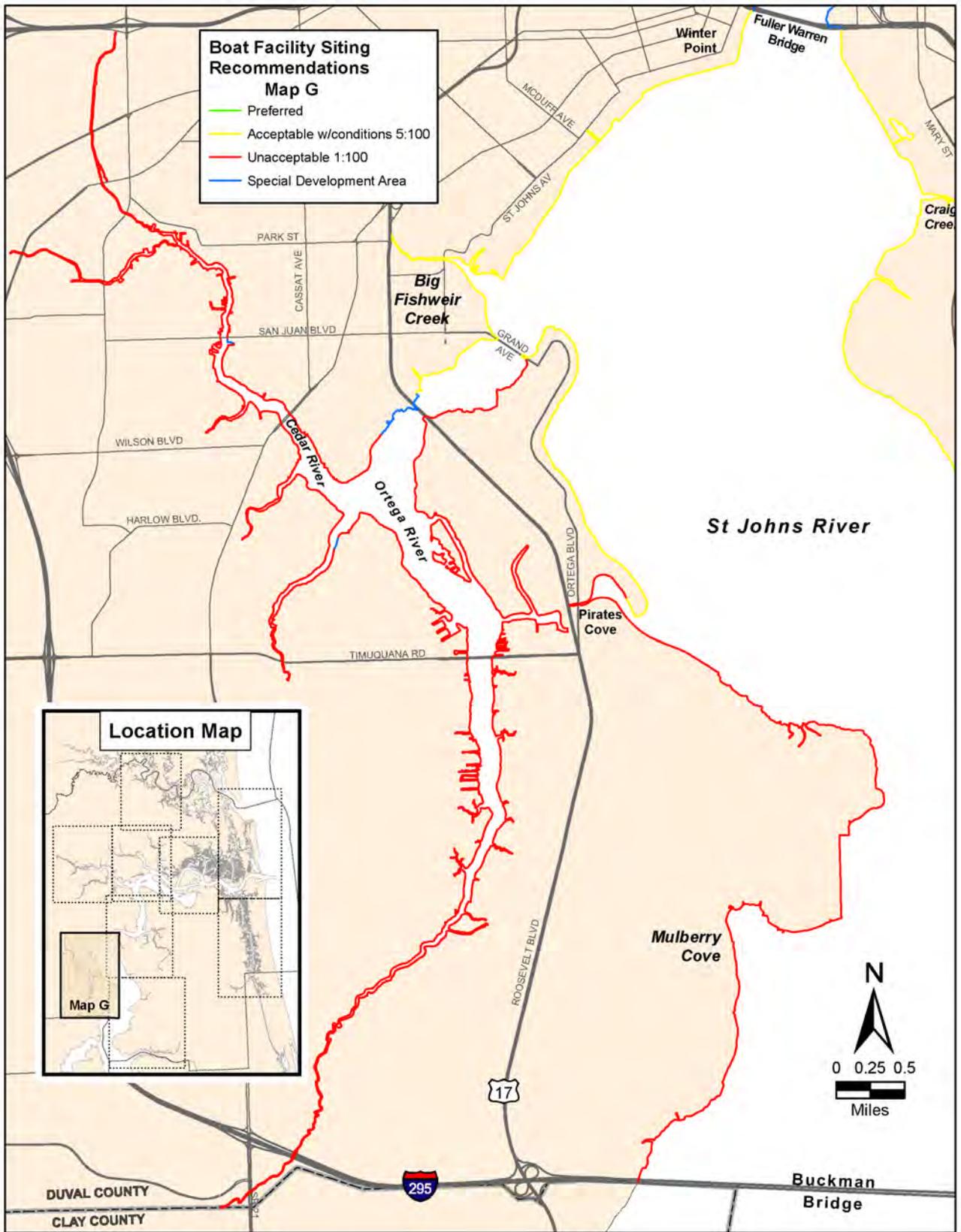


Figure 86: Boat Facility Siting Recommendations Map G.

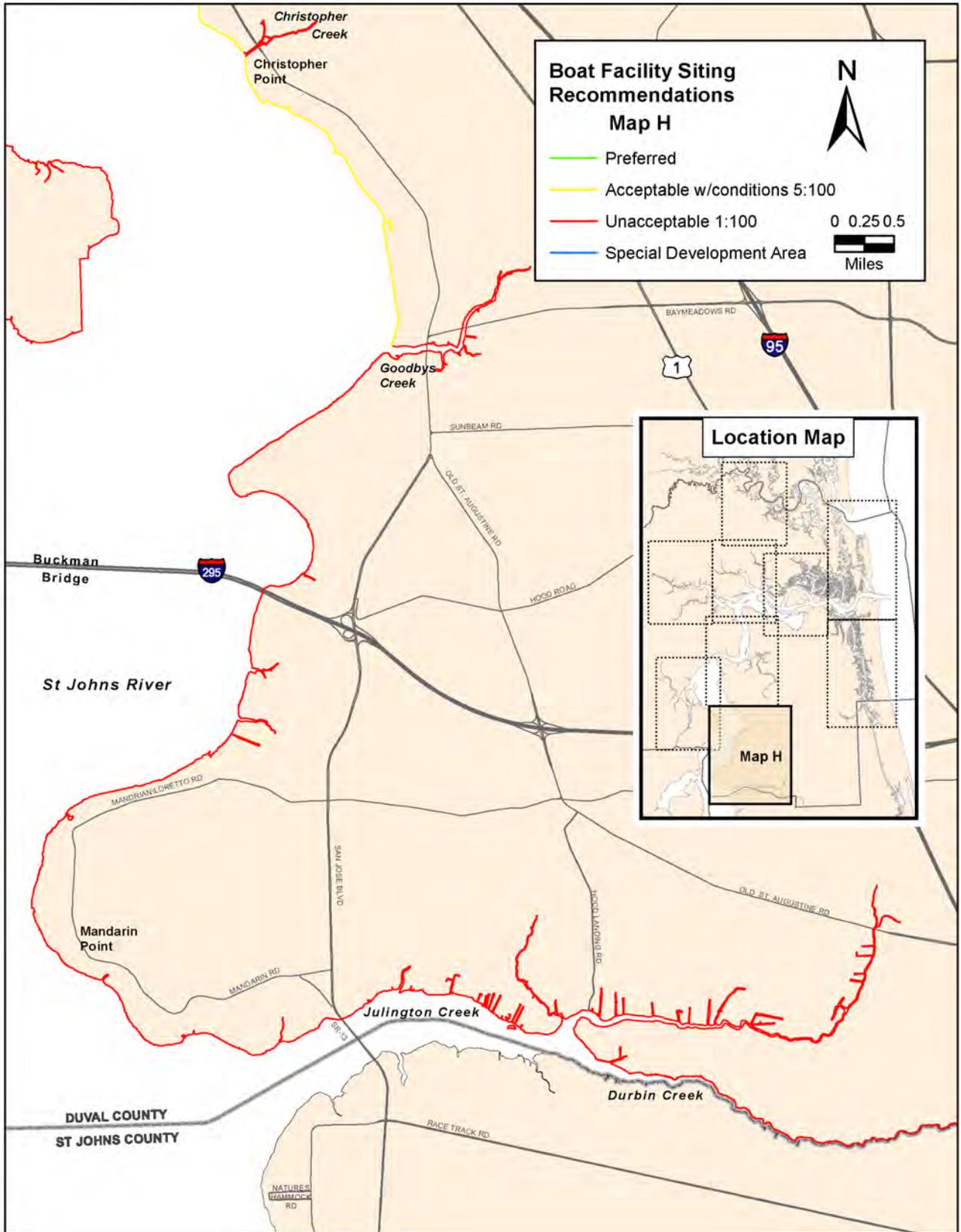


Figure 87: Boat Facility Siting Recommendations Map H.

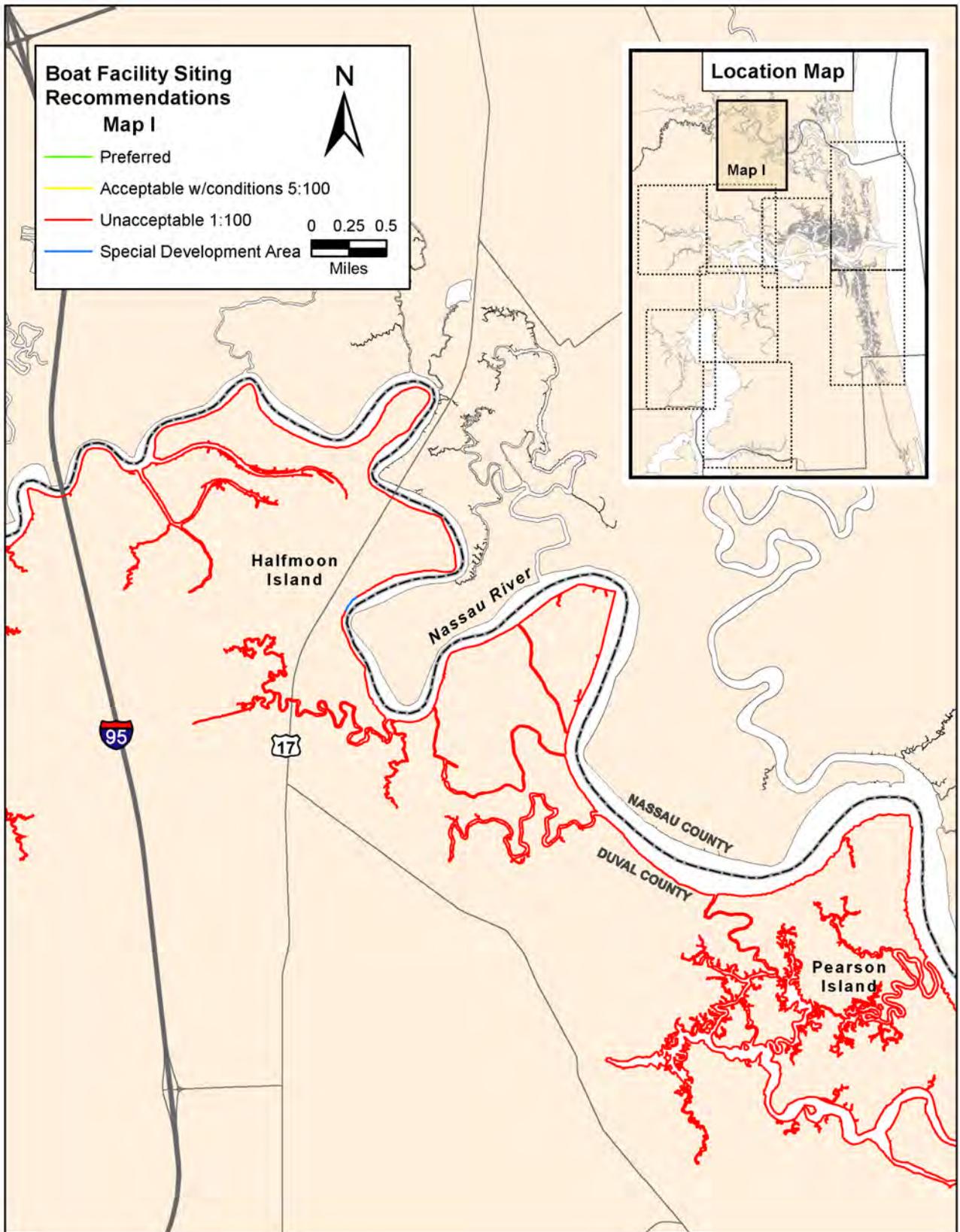


Figure 88: Boat Facility Siting Recommendations Map I.

6 Manatee Educational Efforts

A critical element of the Manatee Protection Plan is educating the public about manatee behavior and habitat. Successful public awareness and education are integral aspects of manatee protection. It is critical that COJ residents, visitors and people doing business in the city understand the need for manatee protection and be aware of manatee presence. Education specific to various civic groups, industries, and boaters is essential. The COJ, along with Federal and State agencies, and in conjunction with various other groups, sponsors several programs to increase manatee awareness in Duval County and surrounding waterways.

6.1 The City of Jacksonville

Significant effort has been expended by the COJ to promote manatee awareness in northeast Florida, including an on-going association with JU to provide aerial flight data, educational programs, manatee awareness displays and MPP manatee data updates and MPP revisions. The COJ Regulatory and Environmental Services Department was awarded funds from the Florida Coastal Management Program to implement the Duval County Manatee Awareness Program. Because of COJ governance structure reorganization, responsibility for the MPP and its associated educational and awareness program is currently administered by the COJ Planning and Development Department.

COJ Educational Kiosks and Signage

A primary focus of the Manatee Awareness Program is boater education through educational kiosks located at 14 of the COJ's highest-use boat ramps (Figure 89, Kiosks). These Kiosks present three themes: 1) basic and interesting facts about manatees in the St. Johns River and the Intracoastal Waterway; 2) actions boaters can take to help protect manatees; and 3) actions which residents can take to help improve water quality in the SJR. Plans are to maintain and update the kiosks as renovations occur at the ramps. The recently opened Riverside Arts Market (2009) has a boat dock to accommodate river access to the site that includes manatee awareness, Florida Friendly Boating signage. The educational signage was designed by COJ in coordination with FWC with a site specific format which includes educational manatee protection zone information that can be adapted to provide manatee information at other locations throughout the City. Manatee educational signage is also required at some public and private boat facilities on a case-by-case basis, as a condition of their state or federal permit.

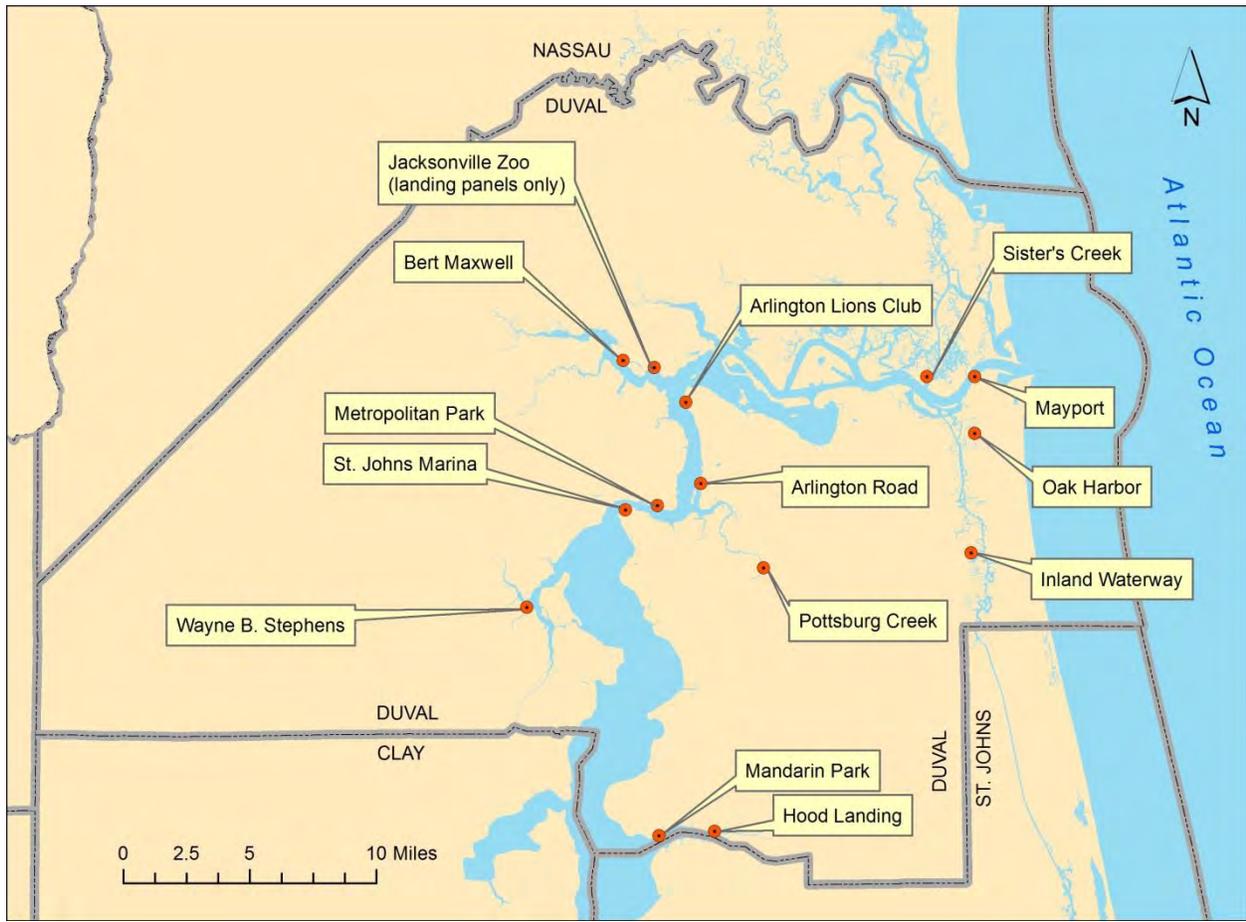


Figure 89: Locations of manatee awareness kiosks, Duval Co., Florida.

COJ Portable Information Displays

Manatee information is also provided to the public through the COJ manatee awareness program's portable information displays. Indoor displays are used, and will continue to be available for use in a variety of settings such as: Learning Resources Centers (LRC's); boating safety classes; boat shows; and The Home and Patio Show. Portable displays have been made available to environmental education centers such as the Marine Resource Center and Tree Hill Nature Center, in an effort to reach students in the COJ. Displays are also available for use at annual in-service training for teachers in the COJ. Portable displays designed for use outdoors, are used and will continue to be available for use in venues such as the Jacksonville Jazz Festival, the Jacksonville Seafood Festival, the Greater Jacksonville Kingfish Tournament, and other events that take place at the Jacksonville Landing and Metropolitan Park. The COJ Parks and Recreation Department makes use of traveling education displays at fishing tournaments, conferences and other special events. While not in use, these displays are available for display in libraries where they can provide a more long term and beneficial exhibit.

COJ Informational Pamphlets

Manatee awareness pamphlets are periodically mailed by the COJ to all waterfront property owners and registered boaters. These pamphlets include basic information about manatees, a Manatee Protection Zone Map, and other pertinent manatee related information. Boating safety brochures have also been produced by the Jacksonville Sheriff's Office (JSO) that contain manatee protection information.

COJ Manatee Hotline

A 24-hour Jacksonville "Manatee Hotline," was established to collect information on manatee sightings, and is staffed during business hours (904-256-7575). During non-business hours, callers are able to leave recorded messages. If calls are received during business hours, an attempt is made to verify the sighting. This information is subsequently transferred to a GIS database at JU Marine Science Research Institute to facilitate data handling and analysis. Thus far, sightings reported on the telephone are consistent with the location of aerial survey sightings. Feedback from the general public, as a result of the hotline, prompted the subsequent creation of a public service announcement (PSA).

COJ Manatee Research Website

As part of the COJ's manatee awareness program, JU has developed a manatee research website (<http://www.ju.edu/MARCO>) that is maintained as an interactive educational tool for manatee awareness.

Information Reports

As part of the COJ's manatee awareness program, the COJ Waterways Commission members and the general public are educated about recent manatee information at monthly Waterways Commission Meetings. JU and the University of North Florida have been funded by the COJ Environmental Protection Board to complete an annual review of the state of the SJR. The River Report reviews and summarizes the ecological and water quality conditions in the SJRLRB, and also contains information about manatees and other endangered species in the SJR.

School Curriculum

As part of the COJ's manatee awareness program, a power point presentation developed by JU, entitled "Manatee Protection in Duval County" is available to elementary, middle, and secondary school students, among other civic organizations. The availability of this program is promoted on brochures, and announced at various teacher conferences. For educational assistance, teachers may contact the "Manatee Hotline" (904-256-7575), or the Marine Science Research Institute (904-256-7766). This presentation is also available to County staff for educational purposes. Also, teacher resource kits are available from the FWC Jacksonville Field Office for loan to schools. These kits have proved to be useful educational tools.

Commercial and Port Awareness/Education Program

The JMTX is an association of commercial and governmental organizations that are active in the Port of Jacksonville. JaxPort, the COJ's port authority, is a landlord operator of port facilities and is only part of the port facilities within the COJ. JMTX is a vehicle to promote cooperation and coordination among cargo/freight and other shipping berth users. The COJ assists the JMTX in the development and implementation of a manatee education program made available to commercial vessel operators that includes manatee protection procedures to be followed by port stakeholders. The COJ assistance with the JMTX manatee education program includes:

- JMTX and JaxPort Board meeting attendance to communicate the importance of implementing the manatee protection program on each ship and at each facility as freight transport operational

standards; learn about problems or concerns the shipping community may have with implementing the program; and assist with resolving any program implementation problems that do arise.

- Working with port entities to develop and fund a manatee awareness video for distribution to commercial vessel operators.
- Coordinated efforts with JMTX to create a manatee information notebook modeled after a National Oceanic and Atmospheric Administration (NOAA) Right Whale Protection program for distribution to commercial vessel operators and crews.
- Distribution of a manatee awareness placard (Appendix A) to commercial vessel operators and crews. 11,000 copies were distributed in 2010 by Jacksonville Bar Pilots to incoming ships and by JMTX to local tug operators.
- Coordinated efforts with JMTX and JU to document shipping activity so the manatee information distributed to commercial vessel operators and crews can be targeted to actual ongoing shipping activity and modified as necessary.

Other COJ Manatee Education Efforts

- Coordinated efforts with JMTX, NOAA and USFWS to develop Federal Manatee Zone awareness documentation.
- Manatee educational presentations by the COJ Waterways Coordinator to community groups such as the Captains' Club, River Watch groups, Civic clubs, neighborhood organizations, and environmental groups.
- When notified about activities in the COJ parks and special events on, or that affect COJ waterways, the COJ Waterways Coordinator provides manatee awareness information for these events.
- Manatee educational presentations by the City of Jacksonville's Park Naturalist to a variety of groups which include the general public and school classes.
- Provide manatee education materials and lectures on manatee protection and local boating safety procedures for local elementary, middle and high schools, colleges and other interested public and private groups.
- Production by COJ Public Information Office of a Public Service Announcement (PSA) to improve manatee awareness for airing on TV, radio, the COJ website, and other media outlets.
- JSO manatee education presentations at 10 safety fairs conducted yearly by JSO, and at boat shows in Duval County.
- JSO distribution of a Marine Unit Safety pamphlet map during JSO manatee protection zone patrols.

6.2 Organizations

The COJ manatee awareness program is complemented by the manatee protection education efforts of a number of organizations and other governmental entities. These entities have a variety of information concerning manatees that may include interactive and static exhibits and/or educational programs that could be incorporated into school curricula and other manatee education presentations.

Save the Manatee Club

The Save the Manatee Club is a non-profit organization that increases public awareness and education relating to manatees. The Club's activities encompass: producing and distributing awareness signs; publishing various educational materials; decals; and promoting an "Adopt A Manatee" program. In addition, the Club is involved on both a "grass roots" level and a professional level through lobbying for protection of manatees and their habitat and securing funds for research. Educational materials are available through the web site, <http://www.savethemanatee.org/>. The Club also offers community and organization presentations and display booths for community events.

The U.S. Coast Guard Auxiliary and the U.S. Power Squadron

These organizations offer Boating Safety Courses for the general public and these include information about manatee behavior and suggest ways for boaters to spot and avoid manatees while boating. To register for a class, or to take the course on-line you can use the following web address (<http://boat-ed.com/fl/>). On occasion, a portion of the program includes a segment concerning manatees that is presented by Wildlife Officers from the FWC.

St. Johns Riverkeeper

The St. Johns Riverkeeper, is an advocacy group whose mission is the protection of the SJR and its water quality. The organization has programs that include manatee awareness and are presented to various school groups, civic clubs and on their eco-cruises on the SJR. Contact information: St. Johns Riverkeeper, Jacksonville University, 2800 University Boulevard North, Jacksonville, Florida 32211 (904) 256-7591.

Jacksonville Marine Transportation Exchange (JMTX)

JMTX maintains a commercial and port awareness program for manatees and right whales. Information about this program is available at <http://jmtxweb.org/http://jmtxweb.org/http://jmtxweb.org/>

6.3 State-sponsored Manatee Information

Florida Department of Environmental Protection (FDEP)

The FDEP is one of two state agencies primarily responsible for the dissemination of environmental information. Within FDEP, the State Park System provides a variety of materials describing the State's flora and fauna.

Florida Fish and Wildlife Conservation Commission (FWC)

The primary sections of the FWC involved with manatees are the Florida Wildlife Research Institute (FWRI) and the Imperiled Species Management Section (ISM) of the Division of Habitat and Species Conservation within FWC. Manatee research (e.g. mortality statistics) is compiled by FWRI, and manatee management, such as manatee educational materials are handled through ISM. These educational materials include a variety of posters, brochures, booklets and videos (Figure 90).

Video	A Closer Look at Manatees
	The State of Manatees
	Manatee Messages: What can you do?
	Roll on Manatees
	Silent Sirens
	The Best of Manatees
	What in the World is a Manatee?
	Endangered Mermaids—The Manatees of Florida
	Audubon’s Animal Adventures – Manatee Adventures
	Protecting Florida’s Springs
	Manatees—Florida’s Gentle Giants
	18 minutes of B:roll footage, no sound, BetaCam SP or VHS—manatee behavior (on loan for productions – Diane Wilkins Productions)
	Posters
Mini-poster: The Florida manatee	
Brochures/Fact Sheets/Booklets	The Florida Manatee—A Florida Treasure
	A Boater’s Guide to Living With Florida Manatees
	Where are Florida’s Manatees?
	El Manati de la Florida – Un Tesoro del la Florida (Spanish)
	Multilingual Waterway Signs
	Florida’s Seagrass Meadows
	Fishing Line Recycling (Which Would You Rather Catch)
	Help Prevent Entanglement
	The West Indian Manatee in Florida
Educational Materials for Teachers and Students	Way of the Manatee Treasure Box Report
	Manatees - Florida’s Gentle Giants (3 rd – 7 th Grade)
	Book list
Web sites	www.myfwc.com (Manatee Section)
	www.efieldtrips.org/manatees (Internet field trip)
	http://research.myfwc.com (Manatees)
Manatee Artwork	Black and white graphics (Artist – Brian Bryson)
Photographs	Photo gallery located on web site www.myfwc.com

Figure 90: Manatee Educational Information Available from FWC, Imperiled Species Management Section, Outreach, Education and Information Program. Updated 07/2013.

FWC Manatee Educational material is also available at <http://www.myfwc.com/wildlifehabitats/managed/manatee/signs/>. The ISM staff also includes a full-time manatee educator's position. Current funding sources for the State manatee program include manatee license plates, boat registration fees and voluntary contributions associated with vehicle registrations.

St. Johns River Water Management District (SJRWMD)

SJRWMD is one of five water management districts in Florida. Together with the FDEP, the water management districts share in the responsibility for issuing state permits for projects in waters and

wetlands of the state. They are also responsible for implementing the state's Surface Water Improvement and Management Program (SWIM) and for mapping submerged aquatic vegetation in some areas of the state. The SJRWMD publishes and distributes a variety of brochures and environmental education information from their District headquarters located at the Palatka Office (386) 329-4500.

Florida Inland Navigation District (FIND)

FIND is responsible for maintaining the Intracoastal Waterway (ICW) for navigation. FIND, which is based in Jupiter, Florida, also prints and distributes the pamphlets that identify speed zones in many counties on the east coast of Florida. These brochures are available by contacting FIND at 1314 Marcinski Rd., Jupiter, Florida 33477, (561) 627-3386.

Homosassa Springs State Wildlife Park

This FDEP facility located north of Tampa near Florida's west coast now houses several long-term captive manatees and a research facility. The public may view manatees from an underwater viewing area and obtain a variety of information about manatees. Further information can be obtained from Homosassa Springs State Wildlife Park, 9925 W. Fishbowl Dr., Homosassa Springs, Florida 33408, (352) 628-5343.

6.4 Federally-sponsored Information

US Fish and Wildlife Service (USFWS)

The USFWS is the primary federal agency involved in the conservation of the nation's wildlife. The USFWS operates the National Wildlife Refuge System. Additionally, the USFWS is responsible for enforcing the Endangered Species Act and the Marine Mammal Protection Act. USFWS manatee protection issues such as the Recovery Plan are administered at the USFWS North Florida Ecological Services Office in Jacksonville, Florida. The USFWS also consults with the US Army Corps of Engineers (ACOE) about issuance of federal Clean Water Act Section 404 Dredge and Fill permits that may adversely impact manatees. Information about manatees is provided by the USFWS online at <http://www.fws.gov>. For additional manatee information, USFWS staff may be contacted at (904) 731-3336.

US Geological Service (USGS)

The USGS Southeast Ecological Science Center in Gainesville, Florida administers the Sirenia Project that conducts long-term, detailed studies on the life history, population dynamics, and ecological requirements of the Florida Manatee. Information about manatees and the USGS Southeast Ecological Science Center's Sirenia Project is provided by the USGS online at <http://fl.biology.usgs.gov/Manatees/manatees.html>.

US Army Corps of Engineers (ACOE)

The ACOE is the federal agency responsible for issuing permits for projects in the nation's rivers, lakes, harbors, navigation channels and wetlands. Although their primary responsibility is permitting, information about manatees is available through the ACOE's Public Affairs Office, P.O. Box 4970, Jacksonville, Florida 32232, (904) 232-1650.

7 Law Enforcement

7.1 Law Enforcement Activities

Local on-water law enforcement activities in Duval County are represented by federal, state and local agencies; the local Jacksonville Sheriff's Office (JSO), the state FWC-LE, the federal USFWS-LE and the U.S. Coast Guard (USCG). The law enforcement activity in Duval County is summarized in Figure 91 below from information supplied by these federal, state and local agencies.

	JSO (2012)	FWC-LE (2012)	USFWS-LE (2012)	USCG (2010)
Number of on-water officers	2	19	3	Station Mayport – 14 SDM = 18
Number of officers on the water per day	6	Varies widely	1 to 3	<i>information not provided</i>
Number of boats available for manatee zone patrol	6	<i>information not provided</i>	3	10 -25' boats
Equipment used during on-water patrols	GPS, radios, computers	GPS, VHF, LE radio, computers	radar and video cameras	GPS, radios, computers, Blue lights
Patrol Area	Duval County	St. Johns River, ICW 145.5 sq. miles	All state and federal manatee zones in Florida	From Kings Bay to Ft Matanza west to Buffet Blvd Bridge
Patrolled Manatee Zones (sq. miles)	<i>information not provided</i>	76 sq miles	All state and federal manatee zones in Florida	<i>information not provided</i>
Field Facilities	Marine Patrol building, 8 covered slips	Use public boat ramp to launch Field office NAS/Jax	None	Station Mayport
total on-water hours	<i>information not provided</i>	9570	unknown	<i>information not provided</i>
Avg # of on-water hours per week	60	180	16-24 / officer	96 of which 5 were in manatee zones
% of on-water hours in manatee zones	80%	25% in or insight of a manatee zone	100%	<i>information not provided</i>
# of citations issued	<i>information not provided</i>	189	N/A	<i>information not provided</i>
# of manatee zone citations issued	11	44	unconfirmed	1
# of warnings issued	<i>information not provided</i>	2245	N/A	<i>information not provided</i>
# of manatee zone warnings issued	32	81	110	<i>information not provided</i>

Figure 91: Law Enforcement Summary

7.2 Law Enforcement Task Force

The COJ has developed a Manatee Law Enforcement Task Force (Task Force). This Task Force includes all the law enforcement agencies that patrol Duval County waterways (JSO, FWC-LE, USFWS-LE, and USCG), as well as other members such as COJ, USFWS North Florida Ecological

Services Office (USFWS-ES), FWC, FWC-FWRI, JEA, JMTX and JaxPort. Meetings have been held twice a year, with one meeting in the Spring - before boating season to discuss upcoming holidays and events and coordination activities, and a meeting in the Fall - to discuss law enforcement activities that occurred in the peak of boating season. In addition, the Task Force organizes multi-agency coordinated, weekend operations from April to October each year to address manatee protection zone (zone) enforcement. These Task Force enforcement operations occur during some holiday weekends such as Memorial Day, Independence Day (4th of July) and Labor Day, plus other additional weekends as determined by the Task Force. The Task Force also assists the JMTX and COJ with development and implementation of the commercial and recreational vessel educational program outlined in the Manatee Educational Effort section of this MPP.

Effective zone enforcement is an essential element of manatee protection. Due to reduced law enforcement positions, it is essential for manatee protection to improve the effectiveness of zone enforcement with existing available resources. Adequate enforcement may be accomplished by improving efficiency and effectiveness of on-water zone enforcement. A core group of the Task Force (JSO, FWC-LE, USFWS-LE, USCG and COJ) will continue to improve efficiency to provide the most effective multi-agency zone enforcement. Specific law enforcement operation and reporting items will be implemented by the Task Force as specified in Chapter 8 to provide the most effective multi-agency zone enforcement possible.

7.3 JSO Manatee Protection Commitments

In addition to Task Force membership, the JSO 2013 business plan includes the following manatee protection commitments:

- Six (6) coordinated, weekend deployments from April to October each year to address manatee protection.
- A minimum of 25 JSO deployments for only manatee protection zone enforcement per year.
- Public education by speaking to the public about manatee protection zones and distribution of the JSO Marine Unit Safety pamphlets with a Manatee Zones map (Appendix D) inside.
- 12 manatee awareness and educational initiatives per year.
- Coordination with the Jacksonville Waterways Commission (JWC) on manatee related issues.

8 MPP Implementation Plan

Manatee Protection in the COJ involves coordinating many different efforts and strategies throughout the City. A MPP is intended to provide guidance in developing comprehensive manatee protection measures in local waterways. Manatee protection is accomplished by implementation of governmental policies and private partnerships and efforts in the community. This section describes activities, programs, initiatives, and schedules for effective MPP implementation and ensuring relevancy of the plan into the future.

8.1 City Adoption of COJ Manatee Protection Plan

Upon adoption of the State approved City of Jacksonville MPP by the COJ City Council, the MPP will be incorporated by reference into the Jacksonville Comprehensive Plan. The City will also encourage local municipalities within Duval County that are not a part of the Consolidated COJ to adopt the MPP into their respective Comprehensive Plans (by reference including version date). The projected date for

incorporation of the MPP into the COJ comprehensive plan by reference is one year from the date of State approval of this plan. Comprehensive Plan revisions will be submitted to the Department of Economic Development and FWC in the submittal cycle following State plan approval.

The MPP will be made available in both hardcopy and electronic formats and will be posted on the COJ website. GIS maps and shape files that include boat facility siting area boundaries will be provided to enable interested parties to utilize detailed information for planning, development and permitting. This information can be obtained by contacting the COJ Planning Department.

8.2 MPP Implementation Report

The 1999 and 2006 revised versions of the Duval MPP recommended that the Jacksonville Waterways Commission review the manatee protection plan on an annual basis, update information and determine any needed changes to the plan to ensure the plan's implementation. This recommendation has resulted in what has been referred to as an annual Manatee Protection Plan Update. The name "Manatee Protection Plan Update" has been changed to "MPP Implementation Report. This report will be submitted to the COJ Waterways Commission, FWC Imperiled Species Management Section and USFWS-ES, Jacksonville on an annual basis, and will report on the progress of each implementation task described in this section of the MPP.

8.3 Funding for MPP Tasks

Adequate funding is critical to successful accomplishment of the MPP objectives, since there are various costs associated with many of the implementation tasks. All funding and budgeting details will be reported in the annual MPP Implementation Report. To successfully implement these objectives, the COJ will:

- A. Continue the current annual budget allocation of \$90,000 per year (minimum) towards MPP implementation.
- B. COJ staff will identify additional funding sources that might be required in order to implement specific MPP tasks. These other possible funding sources include governmental grant programs, corporate sponsors, private sponsors, public interest groups, etc.

8.4 Law Enforcement Implementation Plan

The existing Task Force between the local, state and federal law enforcement agencies, created to help address watercraft related manatee mortality issues, will continue to improve efficiency and provide the most effective multi-agency zone enforcement possible as specified in the MPP Law Enforcement Plan attached as Appendix E. A COJ Task Force Coordinator will be designated to assist the Task Force.

8.5 COJ Manatee Education and Awareness Implementation Tasks

As described in the Manatee Education section of this plan significant effort has been expended by the COJ to promote manatee awareness in northeast Florida. This effort will continue and at least include the following manatee education and awareness information dissemination elements:

- A. Presentations to local community groups and boating groups/clubs by the COJ Waterways Coordinator and Park Naturalist.

- B.** Presentations to schools, and other interested public and private group gatherings by other COJ staff.
- C.** Presentations at 10 annual JSO safety fairs and all Duval County boat shows by the JSO.
- D.** The COJ Public Information office will:
 - i. Produce and air on TV, radio, COJ website, and other media outlets a manatee awareness public service announcement (PSA). The PSA will be broadcast during periods of higher manatee activity in the COJ. The PSA will also be made available for broadcast at events that may impact manatees (such as Jacksonville Tall Ships, water ski shows, boat races, or Boat Light Parade). The PSA should be updated at least annually in coordination with the FWC and USFWS-ES; and
 - ii. Work to maintain existing relationships with local media for annual electronic manatee awareness billboard displays during periods of higher manatee activity in the COJ. The billboards should be updated at least annually in coordination with the FWC and USFWS-ES.
- E.** The COJ will maintain a manatee awareness website, to include educational facts and information, and information about the type and availability of COJ manatee awareness resources.
- F.** The COJ will increase manatee awareness by coordinating with the USCG about periodically including special messages related to manatee protection and manatee awareness in the USCG “Notice to Mariners” that is issued to Jacksonville mariners.
- G.** The COJ will track, evaluate and update as needed, all COJ manatee awareness materials. Material updates will be done in coordination with the FWC and the USFWS-ES. The COJ will track all COJ (JSO, park naturalists, waterway coordinator, other COJ staff/subcontractor, Public Information office, COJ Task Force, etc.) manatee education and awareness implementation tasks. Tracking of these tasks should include documentation of items such as the number and type of outreach efforts, the type and intensity of use of various educational materials, some gauge of public reception, and any other details that may allow for an evaluation of the effectiveness of the education and awareness efforts.
- H.** COJ will produce and distribute manatee awareness pamphlets to waterfront property owners or registered boaters at least every two to three years as funding is available. The up to date pamphlet will also be added to the COJ webpage. Pamphlet modifications will be coordinated with FWC and the USFWS-ES. The COJ will also make their indoor and outdoor portable manatee awareness program educational displays and a power point presentation available for public use.
- I.** The COJ will publicize (mail, email, social networking, websites, etc.) to local community groups (Captains’ Club, River Watch groups, civic clubs, neighborhood organizations, environmental groups, public and private schools, teacher conferences, etc.) that manatee awareness resources (presentations and materials) are available to the public.

- J. Manatee education and awareness signage which the COJ is responsible for will be inspected annually and replaced when necessary. The annual MPP implementation budget allocation will fund this activity. To accomplish this task the COJ will:
 - i. Develop a maintenance plan for the COJ’s manatee awareness signage.
 - ii. Develop a database of all COJ manatee information signs and kiosks. Information in the database will include: 1) Location (decimal degree lat/long); 2) Condition; and 3) Type.
- K. The COJ will work to develop Comprehensive Plan policies and/or incentives to increase manatee educational signage at private marinas and multi-family docks where signage may not be required by permit.
- L. The COJ and the Northeast Florida Regional Council (NEFRC) will explore potential partnerships to enhance manatee awareness education.
- M. The COJ will continue to work with the FWRI to maintain an up to date Boating and Angling Guide for Duval County.

8.6 Other Specific COJ Manatee Protection MPP Implementation Tasks

Jacksonville Waterways Commission Support

The COJ will provide monthly updates to the Waterways Commission on manatee related issues in Duval County.

Shipping Industry Related Manatee Protection

To help reduce shipping industry impacts on manatees the COJ will, at a minimum:

- A. Designate the COJ Recreation and Community Services Department’s Waterways Coordinator to represent the COJ as an active member of JMTX, as well as to sit on the Port Safety Committee. The Coordinator will attend JMTX, JaxPort Board, and other Port Facility meetings as needed.
- B. Assist with development and implementation of the JMTX manatee awareness program so it provides the most effective manatee protection as possible. This activity to include, but not be limited to:
 - i. Manatee awareness outreach to Port Facilities about the importance of implementation of the JMTX manatee protection and awareness program on each ship and at each facility;
 - ii. collect information about shipping activity trends or changes that may require modification of the JMTX program so it remains relevant to ongoing activities;
 - iii. collect information about problems or concerns the shipping community may have with implementing the JMTX program, and how it might be modified to be more easily adopted as freight transport operational standards;
 - iv. discuss with port stakeholders the importance of avoiding ship/barge/tug destruction of manatee protection markers, and the idea of incorporating the issue of zone marker damage avoidance as part of the JMTX program.

- v. Assist with development of a boater's manatee awareness video and a manatee awareness notebook modeled after a NOAA Right Whale Protection program to be included as part of the JMTX Manatee Protection Program for distribution to commercial vessel operators and crews.
- vi. Produce and distribute the JMTX manatee awareness placard (Appendix A) to commercial vessel operators on an as needed basis as funds become available.

Special Event Related Manatee Protection

Boat activity associated with waterway events (Jacksonville Tall Ships event, water ski shows, boat races, and the Boat Light Parade, etc.) or events that generate event attendance boat traffic, may impact manatees. To help minimize impact to manatees from these types of events, the COJ will, at a minimum, take the following steps in regards to these events:

- A. Some events that are on, or may affect the COJ waterways, require a federal 33 CFR 100 permit or a permit required by Chapters 191 and 28 of the Jacksonville Ordinance Code. The COJ Waterways Coordinator will coordinate with the USCG, The COJ Parks and Recreation Department and the COJ Special Events Office regarding notice of any of these permit applications. Upon notice of any such event application the COJ Waterways Coordinator will coordinate with the JSO, the FWC-LE, USFWS-LE and event coordinators regarding event planning considerations for manatee protection, compliance with all manatee protection zones, and possible manatee protection law enforcement actions related to any such event prior to permit issuance. The COJ Waterways Coordinator will also provide manatee awareness information to the event coordinator.
- B. The COJ will also take steps to be informed about events that include or affect the waterways of Duval County but may not require a federal or local permit. The COJ will monitor local media, local boating group/organization trade publications and/or web pages, and electronic social networks for waterway event announcements. If an event is identified that may impact manatees, the Waterways Coordinator will coordinate with the JSO, the FWC-LE, USFWS-LE and event coordinators regarding event planning considerations for manatee protection, compliance with all manatee protection zones, and possible manatee protection law enforcement actions related to any such event prior to the event. The COJ Waterways Coordinator will also provide manatee awareness information to the event coordinator.

8.7 Future Data Collection Needs

For an MPP to remain effective, its strategies, programs and policies must be periodically reviewed and amended as necessary. To ensure that the MPP remains relevant to existing conditions, an evaluation and any subsequent update of the plan must be based on current information. In addition to other data collection and reporting tasks described earlier in this plan, provided that funding is available, the following will be collected in order to assess and update the MPP in the future.

- A. Manatee Speed Zone Boating Compliance Study: Within five years from the date of the MPP revision approval, COJ will conduct a boating compliance study of current levels of compliance with the existing state and federal manatee protection speed zones. The compliance study will begin within one year from the date of State MPP approval, be for a minimum of one year, and the study protocol will be developed in coordination with FWC and USFWS-ES prior to commencement.

- B. Boat Activity Study:** Within five years from the date of the MPP revision approval, the COJ will conduct a boat interaction activity study, provided funding is available. The boat activity study should provide a thorough understanding of how recreational boat traffic and shipping traffic might interact to affect overall boat traffic patterns. The boat interaction activity study will be for a minimum of one year, and the study protocol will be developed in coordination with FWC, USFWS-ES, JaxPort, and JMTX prior to commencement, and will begin within two years from the date of State MPP approval.
- C. Marine Facility Inventory:** The COJ will annually monitor the increases and decreases in boat facility slip numbers and report the boat facility inventory changes accordingly. The COJ will also track the docking facility proposals submitted for review as required by the COJ Comprehensive Plan. The marina inventory will be updated and available for the five year review of the MPP.

8.8 MPP Monitoring and Review

A. MPP Annual Review: Implementation Report Schedule and Use

The COJ will prepare an annual MPP Implementation Report. Each annual Implementation Report will include a summary of the progress for each task outlined in the MPP. These reports will be reviewed and considered by the COJ, FWC-ISM and USFWS-ES to monitor the progress of the MPP.

The first MPP Implementation Report will be submitted to FWC-ISM and USFWS-ES at the end of the first calendar year following the date of state approval of the MPP. The COJ will submit the Implementation Report to the same agencies annually on the same date each following year.

The Implementation Report's submittal and annual review is an opportunity for the COJ, the FWC, and the USFWS to identify and discuss any emerging issues with the MPP implementation. Significant emerging issues may require meetings to determine corrective measures. The FWC and USFWS will respond to the COJ within two months of each annual Implementation Report submission if they believe any clarifications, concerns or issues need to be documented or addressed.

B. MPP Five Year Review: Assessment Report Schedule and Use

The MPP will be reassessed by the COJ in coordination with the FWC and USFWS-ES every five (5) years. To aid in this reassessment, the COJ will submit a five year Assessment Report, and a written summary of the COJ's assessment of what MPP related action may be required, based on all available information (see below). These Assessment Reports should be forwarded within three months of the end of the 5th year from the last approval date. The FWC and USFWS will respond in writing within three months of receiving the COJ's initial assessment regarding whether they think any revisions to the MPP are needed. The five year assessment could result in one of the following determinations:

- No MPP related action is currently required. If it is determined by the COJ that no MPP action is required, the MPP will be considered renewed for another five years. The FWC and USFWS will provide letters agreeing that the MPP does not need to be revised.
- Minor clarifications for consistent interpretation may be needed, but do not necessitate a plan revision. These clarifications can be documented in the five year assessment report.
- Major clarifications of plan language for consistent interpretation or corrections are needed and warrant a minor plan revision. The MPP will continue to be implemented during minor plan revisions. If at least one of the agencies has determined that a minor MPP revision is required,

the COJ, the FWC and the USFWS will work closely together to make any needed minor modification(s) as soon as practical.

- Major changes to the plan are needed and warrant a major revision of the MPP. If at least one of the agencies has determined that a major MPP revision is required, the agency that deemed it necessary will take the lead alongside the COJ to help make the necessary revisions. Efforts will be made by all agencies to revise and approve revisions within one (1) year of the date it is determined that major revisions are needed. If the major MPP revision is not accomplished within this time period, a temporary boat facility siting provision will be followed until the revisions are complete and the plan is approved (see details below).

Temporary Boat Facility Siting Provision:

The requirement of a major revision indicates that the FWC and the USFWS have determined that the existing MPP provisions are not providing the manatee protection needed for their respective State and Federal regulatory review processes. To address this issue, if major revisions of the MPP take longer than one year, the boat facility siting recommendations for the “Preferred”, “Acceptable with Conditions”, and “Special Development Area” categories will temporarily change to the Unacceptable category. This temporary provision will be in effect until the major revisions to the MPP are completed and approved by all agencies.

Project consistency with MPPs approved by the FWC and USFWS provides reasonable assurance that adverse impacts to manatees have been adequately minimized and incidental take will not occur. This protection is provided by long term planning and implementation of comprehensive conservation measures, which are typically not measures that an individual applicant can accomplish. 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.

Examples of Information Reviewed for the Five Year Assessment:

The COJ, FWC-ISM and the USFWS will review all available information during the five year review. At a minimum, this information will include, but will not be limited to:

- Annual MPP Implementation Reports and the five year report;
- Whether or not the information necessary to reassess the MPP has been collected;
- Whether or not the tasks and reporting with enforcement of manatee speed zones have been implemented;
- Whether or not the tasks in manatee education have been implemented;
- A 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 any 12 month period during the past five year MPP period; and
- Changes in legal requirements.

8.9 MPP Implementation Summary

The MPP implementation elements outlined in this chapter of the plan are summarized in Figure 92 below.

MPP Policies and Tasks	Action Items	Anticipated Schedule
The comprehensive plan will be amended to incorporate the revised MPP	Submit Comprehensive Plan amendment to Department of Economic Development and FWC	Within 1 year of the date of FWC approval of the revised MPP
COJ will incorporate the use of the revised MPP in their Planning and Development Department reviews for development	Distribution of revised MPP within COJ once approved	Distribution within a few months of approval; Using as a tool for reviewing projects is active and ongoing
Keep the Jacksonville Waterways Commission up to date on manatee related issues	COJ will attend monthly meetings and provide updates on manatee related issues	Monthly
Report updated information, manatee mortality, and status of implementing the recommendations in the MPP	Draft and submit an annual MPP Implementation Report	Annually
COJ will actively engage with the shipping/Port industry	Representatives of COJ will be members of JMTX and the Port Safety Committee, attend meetings and assist with implementing manatee awareness initiatives	To begin immediately after the date of State MPP approval
COJ will actively engage USCG and Special Events Office	Representatives of COJ will monitor and track special events in the waterways and assist with implementing manatee awareness initiatives	To begin immediately after the date of State MPP approval
COJ will create awareness within the County regarding manatee protection issues	COJ will inspect and replace manatee educational signs that are their responsibility, develop a maintenance plan and a database of locations	Annually
	COJ will develop policies or incentives to increase educational signs at private marinas and multi-family docks where signs are not required by permit	To be completed prior to the 5 year review

MPP Policies and Tasks	Action Items	Anticipated Schedule
	COJ will work with FWC, and FWRI to update the Boating and Angling Guide	To be completed prior to the 5 year review
	COJ will maintain and document manatee sightings reported through the COJ hotline	Active and ongoing
	COJ will produce multimedia information such as PSAs, billboards, social media and on a website to promote information and awareness	Updated annually when needed
	COJ or representatives will present manatee awareness programs to local schools, community groups, boating groups and clubs	As frequently as possible, given other tasks
	JSO will present manatee awareness programs at JSO safety fairs and all County boat shows; at least 12 education initiatives a year	Annually
	COJ will coordinate with USCG when special manatee messages are needed in the “Notice to Mariners”	As needed
COJ will facilitate improved law enforcement participation in manatee protection, including improved coordination between multiple agencies	Implementation of the MPP Law Enforcement Plan and the action items within it	Active and Ongoing; Various reports needed as per LE Plan schedule
	JSO commits to a minimum of 25 deployments for only manatee speed zone enforcement	Annually
	A minimum of 6 coordinated, multi-agency weekend deployments from April to October specifically for manatee speed zone enforcement	Annually

MPP Policies and Tasks	Action Items	Anticipated Schedule
COJ will keep the MPP current, with the best available data and wildlife protection practices	Review the MPP periodically in conjunction with FWC and USFWS to determine whether revisions are needed; Requires COJ analysis and compilation of information from the annual reports	Every 5 years
	Complete a Manatee Speed Zone Compliance Study	To begin within one year from the date of State MPP approval; to be completed prior to the 5 year review
	Develop a Boat Activity Study Protocol between Recreational and Shipping traffic, and complete the Study	To begin within two years from the date of State MPP approval; to be completed prior to the 5 year review
	Marine Facility Inventory Update	To be completed prior to the 5 year review
	Maintain an up-to-date record of the location and status of foraging habitat, warm water discharges and freshwater sources	Active and ongoing; Summaries prepared for annual reports

Figure 92: MPP Implementation Summary

Literature Cited

- Bartram W (1928) *Travels of William Bartram*. New York (NY): Dover Publications. ISBN: 978-0486200132. <http://store.doverpublications.com/0486200132.html> Accessed July 15, 2011
- Ackerman BB (1995) Aerial surveys of manatees: A summary and progress report. In: O'Shea TJ, Ackerman BB, Percival HF (eds) *Population biology of the Florida manatee*. National Biological Service Information and Technology Report 1. Washington, DC
- Adimey N (2011) *Personal email communication* to FWC and USFWS staff
- Applied Technology and Management, Inc. (ATM). (2009) *City of Jacksonville 2009 Boater Traffic Study, Final Summary Report*. Certification No. 00004669
- Batzer DP, Wissinger SA (1996) Ecology of insect communities in nontidal wetlands. *Ann. Rev. Entomol.*; 41(1):75-100. <http://dx.doi.org/10.1146/annurev.en.41.010196.000451> Accessed July 15, 2011
- 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. Contract No. #14-16-0009-86-1815
- Bengtson JL (1981) *Ecology of manatees (Trichechus manatus) in the St. Johns river, Florida*. St. Paul, Minnesota, University of Minnesota
- Best RC (1981) Food and feeding habits of wild and captive Sirenia. *Mammal Rev.* 11(1):3-29 <http://dx.doi.org/10.1111/j.1365-2907.1981.tb00243.x> Accessed July 15, 2011
- Bradshaw WE, Holzapfel CM (2007) Evolution of Animal Photoperiodism, *Annual Review of Ecology, Evolution and Systematics* 38:1-25
- Burns JW Jr, Chapman AD, Messer E, Konwinski J (1997) Submerged aquatic vegetation of the lower St. Johns river. Palatka, Florida, St. Johns River Water Management District. 225 pp. DeMort CL. 1991 In: Livingston RJ (ed) *The rivers of Florida*. Volume 83. New York (NY): Springer-Verlag. ISBN: 978-0387973630 Chapter 7. The St. Johns river system. p 97-120. <http://www.springer.com/life+sciences/ecology/book/978-0-387-97363-0> Accessed July 15, 2011
- 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
- Dennison WC, Orth RJ, Moore KA, Stevenson JC, Carter V, Kollar S, Bergstrom PW, Batiuk RA (1993) Assessing water quality with submersed aquatic vegetation: habitat requirements as barometers of Chesapeake Bay health. *BioScience* 43(2):86-94. <http://dx.doi.org/10.2307/1311969> Accessed July 15, 2011
- 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

- Dobberfuhr DR (2002) Distribution of submerged aquatic vegetation in the lower St. Johns River. 1998 Atlas. St. Johns River Water Management District, Palatka, Florida SJ2002-PP1
<http://www.sjrwmd.com/technicalreports/pdfs/PP/SJ2002-PP1.pdf> Accessed July 15, 2011
- Dobberfuhr DR (2007) Light limiting thresholds for submerged aquatic vegetation in a blackwater river. J. Aquat. Bot. 86(4):346-352. <http://dx.doi.org/10.1016/j.aquabot.2007.01.003> Accessed July 15, 2011
- Dobberfuhr DR, Trahan N (2003) Distribution of submerged aquatic vegetation in the lower St. Johns River. 1998 Atlas. St. Johns River Water Management District, Palatka, Florida SJ2003-PP1
<http://www.sjrwmd.com/technicalreports/pdfs/PP/SJ2003-PP1.pdf> Accessed July 15, 2011
- Dunn AE, Dobberfuhr DR, Casamatta DA (2008) A survey of algal epiphytes from *Vallisneria americana* Michx. (Hydrocharitaceae) from the lower St. Johns River, Florida. Southeast. Nat. 7(2):229-244
[http://dx.doi.org/10.1656/1528-7092\(2008\)7%5B229:ASOAEF%5D2.0.CO;2](http://dx.doi.org/10.1656/1528-7092(2008)7%5B229:ASOAEF%5D2.0.CO;2) Accessed July 15, 2011
- Florida Fish and Wildlife Conservation Commission (2007) Florida Manatee Management Plan *Trichechus Trichechus manatus latirostris*
- 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
- Hart C (2012) *Personal communication* to Pinto G
- 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. 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
- Jacoby CA (2011) *Personal communication* to Pinto G
- Jordan F (2000) An evaluation of relationships between submerged aquatic vegetation and fish community structure in the St. Johns River. Final Report. Loyola University of New Orleans, Department of Biological Sciences, New Orleans, Louisiana
- Jordan F, Bartolini M, Nelson C, Patterson PE, Soulen HL (1996) Risk of predation affects habitat selection by the pinfish *Logodon rhomboids* (Linnaeus). J. Exp. Mar. Biol. Ecol. 208(1-2):45-56.
[http://dx.doi.org/10.1016/S0022-0981\(96\)02656-1](http://dx.doi.org/10.1016/S0022-0981(96)02656-1) Accessed July 15, 2011
- 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
- Kinnaird MF, Valade J (1983) Manatee use of two power plant effluent on the St. Johns River in Jacksonville, Florida. Site-specific Reduction of Manatee Boat/Barge Mortality Rep. No. 1. Prepared for US Fish and Wildlife Service. Coop. Agreement 14-16-0004-81-923. Florida Coop. Fish and Wildlife Res. Unit, Gainesville, Florida

- 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, Rathbun GB, Domning DP (2001) Status and biogeography of the West Indian manatee 425-474 In: Woods CA, Serigile FE (eds) *Biogeography of the West Indies: new patterns and perspectives*. CRC Press LLC. Boca Raton, Florida
- Lomolino MV (1977) The ecological role of the Florida manatee (*Trichechus manatus latirostris*) in water hyacinth-dominated ecosystems. MS Thesis, University of Florida, Gainesville, Florida
- National Research Council (2009) Review of the St. Johns River Water Supply Impact Study: Report 1. Summary page 7-Littoral Zone. http://www.nap.edu/openbook.php?record_id=12733&page=R1 Accessed May18, 2012
- NOAA (2012a) FAQ: How do El Niño and La Nina influence the Atlantic and Pacific hurricane seasons? National Oceanic and Atmospheric Administration, Climate Prediction Center, Camp Springs, Maryland http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ensofaq.shtml - HURRICANES Accessed July 15, 2011
- NOAA (2012b) 2009 Atlantic Hurricane Season. National Oceanic and Atmospheric Administration, National Hurricane Center, Miami, Florida < <http://www.nhc.noaa.gov/2009atlan.shtml> > Accessed July 15, 2011
- Ortiz RM, Worthy GAJ, MacKenzie DS (1998) Osmoregulation in wild and captive West Indian manatees (*Trichechus manatus*). *Physiological Zoology* 71(4):449-457
- 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*. Final Report Submitted to the US Fish and Wildlife Service. FWC/FMRI file code: F2280-00-F. USFWS Order Number 401810M446. Project Identification Number 9322-160-2280
- 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

- Rao DV, Jenab SA, Clapp DA (1989) Rainfall analysis of northeast Florida. Part III: Seasonal rainfall data. St. Johns River Water Management District, Palatka, Florida, Technical Publication SJ 89-1 <http://www.sjrwmd.com/technicalreports/pdfs/TP/SJ89-1.pdf> Accessed July 15, 2011
- Reid JP, Rathbun GB, Wilcox JR (1991) Distribution patterns of individually identifiable West Indian Indian manatees (*Trichechus manatus*) in Florida. *Marine Mammal Science* 7:180-190
- Reynolds, JE III, Wilcox JR (1994) Observations of Florida manatees (*Trichechus manatus latirostris*) around selected power plants in winter. *Marine Mammal Science* 10(2): 163-177
- 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, Fonnesebeck 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, Fonnesebeck CJ (2007b) A quantitative threats analysis for the Florida manatee (*Trichechus manatus latirostris*). USGS Open-File report 2007-1086
- Sagan JJ (2004) SAV bed architecture: Water depth distribution and cover of *Najas guadalupensis*, *Ruppia maritime*, and *Vallisneria americana*. St. Johns River Water Management District, Palatka, Florida. Final Report SG425RA
- Sagan JJ (2006) A reanalysis of data related to submerged aquatic vegetation within the lower St. Johns River: 1996-2005. St. Johns River Water Management District, Palatka, Florida, Contract No. SG425RA
- Sagan JJ (2007) SAV Monitoring Project: Interim Reports I-IV and Draft Annual Status Reports. Interim reports associated with quarterly sampling and ground truth surveys for the St. Johns River Water Management District. Palatka, Florida
- Sagan JJ (2010) *Personal communication* to Pinto G
- Shane SH (1983) Abundance, distribution, and movements of manatees (*Trichechus manatus*) in Brevard County, Florida. *Bulletin of Marine Science* 33:19
- SJRWMD (2010) St. Johns river water supply impact study interim report (Draft 2) January 27, 2009. St. Johns River Water Management District, Palatka, Florida http://www.sjrwmd.com/surfacewaterwithdrawals/pdfs/AWS_Complete_No_Exec_Summary.pdf Accessed July 15, 2011
- SJRWMD (2012) Radar rainfall data. St. Johns River Water Management District, Palatka, Florida <http://webpub.sjrwmd.com/agws93/sjrwmdradarrain/> Accessed July 15, 2011
- St. Johns Riverkeeper (2009) Central Florida's thirst threatens river. St. Johns Riverkeeper, Jacksonville, Florida <http://www.stjohnsriverkeeper.org/thirstthreatens.asp> Accessed July 15, 2011

- Thayer GW, Kenworthy WJ, Fonseca MS (1984) The ecology of eelgrass meadows of the Atlantic coast: a community profile. US Fish and Wildlife Service, Division of Biological Services, Beaufort, North Carolina FWS/OBS-84/02 <http://www.nwrc.usgs.gov/techrpt/84-02.pdf> Accessed July 15, 2011
- Twilley RR, Barko JW (1990) The growth of submersed macrophytes under experimental salinity and light conditions. *Estuar. Coasts*; 13(3):311-321 <http://dx.doi.org/10.2307/1351922> Accessed July 15, 2011
- UF/IFAS Center for aquatic and invasive plants (2007) University of Florida Institute of Food and Agricultural Sciences, Gainesville, Florida <http://plants.ifas.ufl.edu/> Accessed July 15, 2011
- USDA (2007) Plants database. US Department of Agriculture. Natural Resources Conservation Service <http://plants.usda.gov/> Accessed July 15, 2011
- USFWS (2001) Florida Manatee Recovery Plan *Trichechus manatus latirostri*, Third Revision. US Fish and Wildlife Service, Atlanta, Georgia
- Valade JA (1991) The scientific study of the distribution of manatees in the waters of Duval County, Florida by aerial survey. City of Jacksonville, Department of Recreation and Public Affairs Administrative Services, Jacksonville, Florida
- Watkins B (1995) Florida governor's nomination of the lower St. Johns river estuary to the National Estuary Program. US Environmental Protection Agency, Washington, DC
- White AQ, Pinto GF (2006) The Duval county manatee protection plan (2nd edition). City of Jacksonville, Jacksonville Waterways Commission <http://www.coj.net/City-Council/Jacksonville-Waterways-Commission/JWC-MPP.aspx> Accessed July 15, 2011
- White AQ, Pinto GF, Robison AP (2002) Seasonal distribution of manatees, *Trichechus manatus latirostris*, in Duval County and adjacent waters, northeast Florida. *Florida Sci.* 65(3):208-221
- Weigle BL, Wright IE, Ross M, Flamm R (2001) Movements of radio-tagged manatees in Tampa Bay and along Florida's west coast, 1991-1996. Florida Marine Research Institute, St. Petersburg, Florida, Technical Report TR-7
- Worthy, Graham AJ (November 2000) When is it too cold for a manatee? Save the Manatee Club, The Manatee Zone p.4

Appendices

Appendix A

8.9.1 JMTX Manatee Protection Program and Informational Manatee Protection Placard

PORT OF JACKSONVILLE MANATEE AWARENESS AND PROTECTION

The Port of Jacksonville is a deepwater port located on the St. Johns River that extends 22 miles between Jacksonville and the Atlantic Ocean. Vessel traffic in the river includes commercial shipping through large port facilities, commercial and sport fishing and recreational usage. Major marine terminals are located at Blount Island, Dames Point and Talleyrand. *Florida manatees inhabit the waters of Jacksonville primarily between March and November, with a few animals each year wintering in the area at warm water sources instead of migrating south. They typically feed and travel close to shorelines in waters ranging from a few feet to over forty feet. They are active both during the day as well as at night.* Manatee deaths attributable to large vessels have been occurring in Duval County for some time. The increase in such mortalities in 2008 and 2009 may reflect the steady increase in commercial ship traffic. While planned navigational improvements and channel deepening are expected to reduce the level of traffic, there remain ongoing risks of adverse impacts to manatees from routine port and ship operations.

THE LAW

Manatees are protected under Federal and State laws. There are two federal laws which make it illegal to harass, hunt, capture, or kill any marine mammal: (1) The Marine Mammal Protection Act of 1972 and (2) The Endangered Species Act of 1973. Convictions under federal law are punishable by fines of up to \$100,000 and/or one year in prison. Manatees are also protected by State law under the Florida Manatee Sanctuary Act of 1978, which states: "It is unlawful for any person, at anytime, intentionally or negligently, to annoy, molest, harass or disturb any manatee." Convictions for violating Florida State law include a maximum fine of up to \$500 and/or imprisonment for up to 60 days.

MANATEE PROTECTION ZONES

There are both Federal and State manatee protection speed zones within the St. Johns River and some of its tributaries. Most slow speed, minimum wake zones encompass shorelines and extend from 300 to 1000 feet into the river. A 25 mph limit zone is located within the shipping channel between the Hart Bridge and Reddie Point. The type of zone and its boundary are identified by white and red signage attached to posts and other structures. A map of those zones within and around marine terminals is provided below.

PURPOSE

This placard is to inform commercial shipping interests about manatee awareness and provide guidance to help the industry reduce the likelihood of manatee injury or death by commercial vessels, and to encourage mariners to adopt Manatee Watch protocols as part of routine voyage planning.

ADDITIONAL INFORMATION

Federal Protection Areas Map:
www.fws.gov/northflorida/Manatee/federal-manatee-protection-areas.htm
Duval County Manatee Protection Speed Zones Map:
http://myfwc.com/WILDLIFEHABITATS/Manatee_protectionzones.htm

Key

- 25 MPH (All Year)
- Slow Speed (All Year)
- Slow Speed (All Year) Within 300' from shore
- Slow Speed (All Year) Within 1,000' from shore
- Slow Speed (All Year) outside of Channel. Channel 25 mph.
- Manatee watercraft deaths 2000-2009

Map labels include: Broward River, Drummond Creek, Dunn Creek, Trout River, Reddie Point, Talleyrand, Mathews Bridge, Arlington River, Hart Bridge, Mill Cove, Blount Island, Dames Point, Intracoastal Waterway North, Fort George Inlet, Mayport Basin, Intracoastal Waterway South, Nassau Sound, Atlantic Ocean.

Scale: 0 0.5 1 2 Miles

PROTECTIVE ACTIONS

BEFORE DEPARTURE AND PRIOR TO DOCKING:

- 1 Check the following web sites for a map of recent manatee sightings. Such sightings can alert mariners to general manatee presence, but are no substitute for area-specific inspections and watches:
JU: <http://www.ju.edu/marco/sightings.aspx>
JMTX: <http://jmtxweb.org/environmental.htm>
- 2 For vessels preparing to get underway, inspect areas around the dock and vessel (including areas around propellers) to see if any manatees are present for 15-30 minutes *immediately* before moving the vessel or conducting any equipment checks (engine, telegraph, throttle, etc.).
- 3 For docking vessels, including tugs and tow boats, inspect areas off the bow and alongside the ship, including areas between the hull and dock, should be inspected for manatees (all vessels engaged in a docking maneuvers, including the docking vessel, assist vessels, tugs and tow boats, should be on the lookout and all should be informed of the presence and location of manatees when sighted). If observed, inform the vessel operator(s) of their number and specific location.
- 4 Polarized sunglasses provide the best visibility into the water and should be used when looking for manatees during daylight hours. High intensity spotlights may be used between dawn and dusk. Binoculars also are recommended for areas not accessible for close inspection. Some signs that manatees may be in the area include swirls at the water's surface, the presence of mud trails, noses, tails, backs and other body parts on the water's surface, etc.
- 5 If a manatee is observed within 50 feet of the vessel, DO NOT move your vessel or conduct any equipment checks until the manatee has left the area. DO NOT attempt to herd animals away; this is considered harassment under both Federal and State laws.
- 6 Vessel and dock operators should include manatee watch protocols in operational plans and practices for departing and docking vessels. At a minimum, protocols should include the steps described above. It is recommended that mariners attend a training program to familiarize themselves with manatees and steps that can be taken to protect them.
- 7 If manatees are observed during your manatee watch, please report your sightings to:
JU Manatee Hotline: (904) 256-7575
- 8 To report manatee deaths, injuries, orphaned calves, tag sightings or harassment please contact the FWC (Florida Wildlife Commission):
Phone: (888) 404-FWCC(3922) • Cell: *FWC or #FWC • Radio: VHF Channel 16
Indicate the following information when reporting sightings:
 1. Your name, vessel name and your contact number/e-mail.
 2. Number of animals observed, location (Lat/Long), time of sighting.
 3. Manatee activity (traveling direction, resting, feeding, or mating).

WHILE UNDER WAY:

- 1 Observe and obey speed zone signs posted in manatee habitat or manatee travel corridors.
- 2 Always remain in the deepest part of the channel.
- 3 Maintain maximum possible distance from sighted manatees, consistent with safe navigation. Sightings should also be reported to JU Manatee Hotline, and manatee deaths, injuries, orphaned calves, tag sightings or harassment should be reported to FWC, as described above.

SIGNS TO LOOK FOR...



JAXPORT
JACKSONVILLE PORT AUTHORITY

JMTX
Jacksonville Marine
Transportation Exchange

Jacksonville
Where Florida Begins.

Appendix B

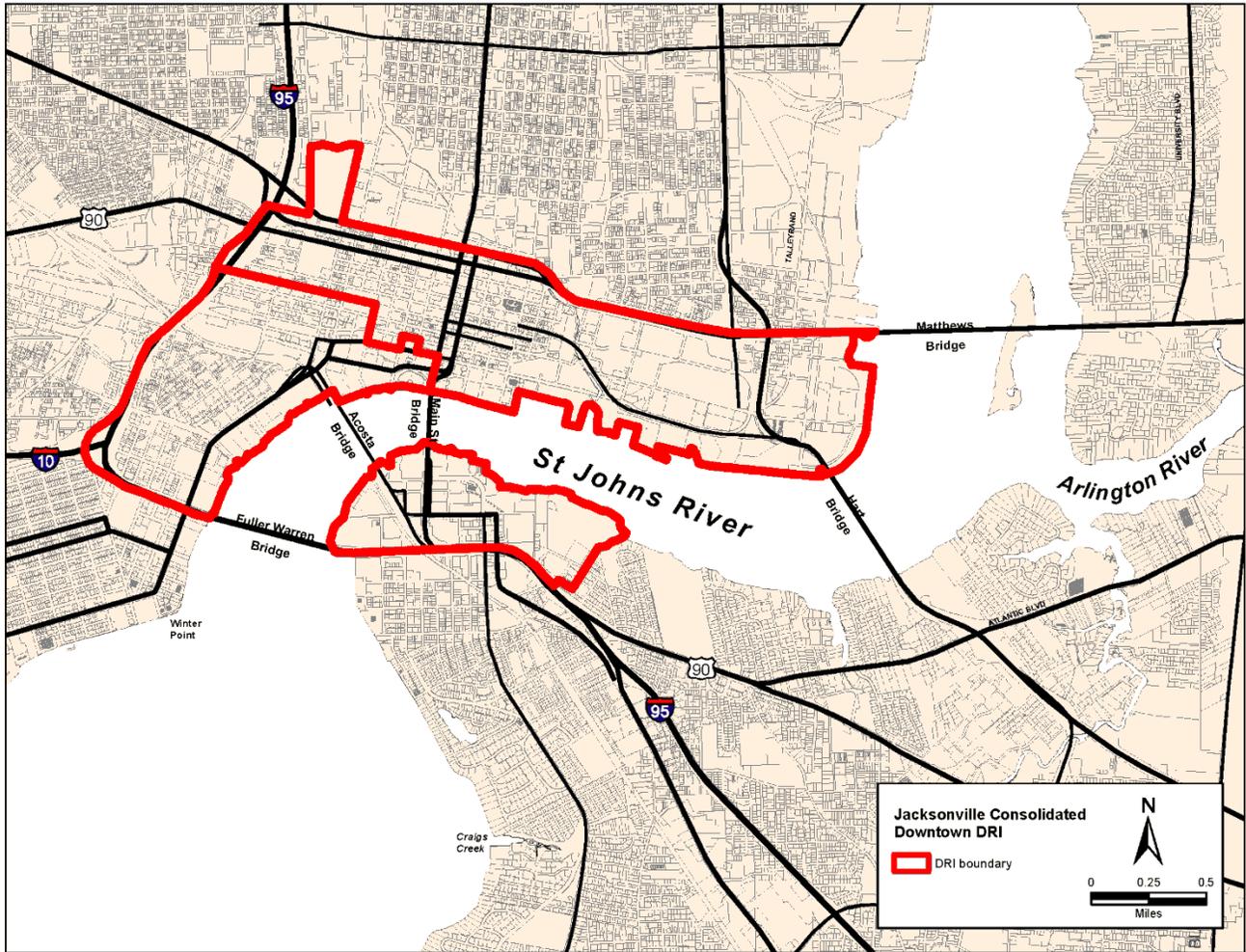
8.9.2 Port Facility Manatee Protection Measures

The following are examples of Port Facility operational practices and measures to reduce potential adverse impacts to manatees:

- The JMTX Manatee Awareness Program incorporated into port facility operational plans and training for new personnel.
- Yearly manatee awareness training provided for line handlers.
- All existing and future bulkheads that dock vessels 100 feet in length or more have a minimum of four foot standoffs under maximum operational compression, and use of fenders to provide four foot standoff under maximum operational compression between all vessels when moored at a bulkhead, between two rafted vessels, or between a fueling vessel and a receiving vessel.
- When feasible, place fenders above mean high water.
- Fenders be inspected at least every two years and repairs performed as necessary.
- Fenders on bulkhead wall structures positioned a maximum of every 50 feet.
- Port facilities should avoid fresh water flows into surrounding waterways.

Appendix C

8.9.3 Downtown DRI Special Development Area Boundary

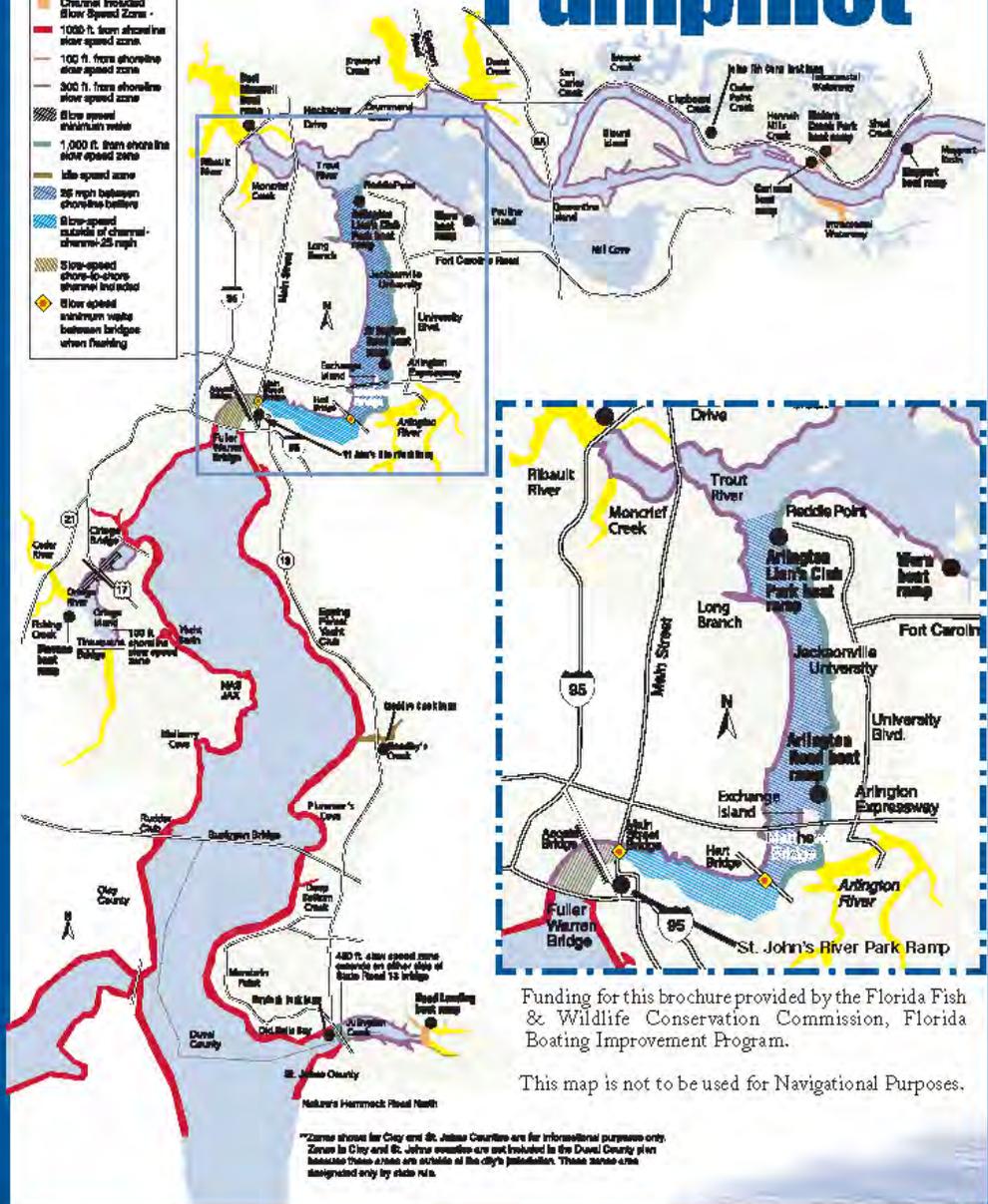


Appendix D

8.9.4 Jacksonville Sheriff's Office Boaters Brochure

DUVAL COUNTY Boating & Personal Watercraft Safety Pamphlet

- Boating & Personal Watercraft Safety Pamphlet**
- Boat ramps
 - Caution Marine Awareness Zone
 - Channel Inland Slow Speed Zone
 - 1000 ft. from shoreline slow speed zone
 - 100 ft. from shoreline slow speed zone
 - 300 ft. from shoreline slow speed zone
 - Slow speed minimum water
 - 1,000 ft. from shoreline slow speed zone
 - Slow speed zone
 - 50 ft. right between shoreline boating
 - Slow speed outside of channel - 25 ft. right
 - Slow speed shore-to-shore channel included
 - Slow speed minimum water between bridges when boating



This map is not to be used for Navigational Purposes.

*Zones shown for Clay and St. Johns Counties are for informational purposes only. Zones in Clay and St. Johns counties are not included in the Duval County plan because these areas are outside of the city's jurisdiction. These zones are designated only by state rule.

Fire Extinguisher Requirements	
Length of vessel Less than 26 ft 26 ft to less than 40 ft 40 ft to less than 65 ft	Without fixed system one B-1 two B-1 or one B-2 three B-1 or one B-2 & one B-1
	With Fixed System none one B-1 two B-1 or one B-2
Type of Extinguisher	Dry-Chemical
type and size	minimum pounds
B-1	2
B-2	10
	15
	4
	min. pounds
	1.25
	2.25
	2.25

Fire Extinguisher Requirements

Speed Zones



IDLE SPEED ZONE: A zone in which motorized vessels* are not permitted to go any faster than necessary to make headway and to be steered.



SLOW SPEED ZONE: A minimum wake zone where motorized vessels* must not be on a plane and must be completely settled in the water.
(Visible as you enter a protected area)



CAUTION AREA: An area frequently inhabited by manatees requiring caution on the part of operators of motorized vessels* to avoid disturbing or injuring the animals.



RESUME NORMAL SAFE OPERATION: A sign indicating that you may resume normal safe vessel operating speed.
(Visible as you leave a protected area)
* Motorized vessels include personal watercraft.

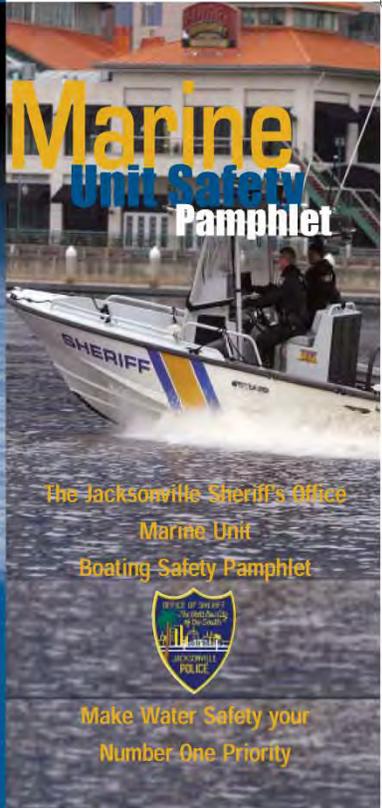
REQUIRED SAFETY EQUIPMENT (VDS)

All vessels must have one Personal Flotation Device (PFD) per person on board.
All PFDs must be in good condition and be the correct size for the intended wearer.
Vessels 16 feet in length or longer must have at least one USCG approved throwable PFD on board and immediately available.
Children under 6 must wear a USCG approved PFD at all times while underway on any vessel less than 26 feet in length on Florida waters.
Each person on board a Personal Watercraft (PWC) must wear a PFD and ignition safety switch (interlock). Inflation PFDs may not be worn on PWCs.
The original certificate of registration must be on board when the vessel is operated. Each vessel must carry a sound producing device that is audible for at least one-half mile.
PWC operation at night is prohibited.
PWC must adhere to all boating laws.
Vessels less than 16 feet, operated between sunset and sunrise, must carry a minimum of three visual distress signals approved for nighttime use.
Recreational vessels 16 ft or longer, and non-motorized open sailboats 26 ft or longer, must carry a day signal and a night signal.
If smoke and/or fumes are used, at least three USCG approved, in good condition, unexpired, and readily accessible.

PUBLIC BOAT RAMPS

- | | |
|-------------------------------|--|
| 1) Big Talbot Ramp | A1A & Nassau Sound |
| 2) Mayport Ramp | 4870 Ocean St |
| 3) Oak Harbor Ramp | 2428 Seaway St |
| 4) ICW Boat Landing | 2501 2nd Ave N. |
| 5) Sister's Creek Ramp | 8634 Hecksher Dr |
| 6) Joe Carlucci Sister's | 8410 McKenna Dr Creek Park |
| 7) Lonnie Wum Ramp | 4131 Ferber Rd |
| 8) Arlington Lion's | 4322 Richard Club Ramp
Gatlin Memorial Rd |
| 9) Bert Maxwell Ramp | 680 Broward Rd |
| 10) Dinsmore City Ramp | 11101 US1 |
| 11) T.K. Stokes Ramp | 2120 Riverview Ave |
| 12) Harborview Ramp | 4100 Harborview Dr |
| 13) Arlington Road Ramp | 5130 Arlington Rd |
| 14) Pottsburg Creek Ramp | 8508 Beach Blvd |
| 15) St. Johns River Park Ramp | 901 Museum Cir |
| 16) Lighthouse Ramp | 5434 San Juan Ave |
| 17) Wayne B. Stevens Ramp | 4555 Ortega Farms Blvd |
| 18) Goodly's Creek Ramp | 9145 San Jose Blvd |
| 19) Mandarin Park Ramp | 14780 Mandarin Rd |
| 20) Hood Landing Rd Ramp | 12925 Hood Landing
Rd Ramp |
| 21) Palms Fish Camp | 6359 Hecksher Dr. |

Marine Unit Safety Pamphlet



The Jacksonville Sheriff's Office
Marine Unit
Boating Safety Pamphlet



Make Water Safety your
Number One Priority

- ~ Florida Fish & Wildlife Conservation Commission 904-359-3883
- ~ Report B.U.I. and wildlife violations 888-404-3922. Callers are eligible for a reward and may remain anonymous
- ~ Report Boating Accidents 904-359-3883
- ~ U.S. Coast Guard 904-247-7318
- ~ Clay County Sheriff's Office 904-264-6512
- ~ Nassau County Sheriff's Office 904-225-5174
- ~ St. Johns County Sheriff's Office 904-824-8304
- ~ Jacksonville City Dockmaster 904-630-0837 or VHF channel 72 during special events
- ~ State Warning Point DEP 24 hours a day. Call 1-800-320-0519 to report environmental crimes or emergencies
- ~ For manatee sighting call 904-256-7575 and for manatee injuries/deaths call 888-404-3922.

~ Jacksonville Sheriff's Office non-emergency 904-630-0500
EMERGENCY-DIAL 911

Helpful contact numbers

Appendix E

8.9.5 Law Enforcement Implementation Plan

Law Enforcement Implementation Plan for the COJ Manatee Protection Plan
February 2014

Effective zone enforcement is an essential element of manatee protection. Due to reduced law enforcement positions, it is essential for manatee protection to improve the effectiveness of zone enforcement with existing available resources. Adequate enforcement may be accomplished by improving efficiency and effectiveness of on-water zone enforcement. It has been documented that frequent presence of law enforcement encourages compliance with speed zones.

There is an existing Law Enforcement Task Force that includes representatives from JSO, FWC-LE, USFWS-LE, and USCG, as well as other members such as COJ, USFWS North Florida Ecological Services Office (USFWS-ES), FWC-ISM, FWC-FWRI, JEA, JMTX and JaxPort. A core group of this Task Force (JSO, FWC-LE, USFWS-LE, USCG and COJ) will continue to improve efficiency to provide the most effective multi-agency zone enforcement by following law enforcement action items identified in this plan. The Task Force core group may initiate meetings or comments from additional Task Force members if needed for specific issues.

The items in this plan require administrative support to document manatee zone enforcement efforts. A COJ coordinator will be designated and will be responsible for taking notes at meetings, compiling reports, summarizing and distributing information regarding efforts towards effectiveness, efficiencies and improvement assessments, and management and retention of records as provided for in this plan.

This plan will be assessed periodically by the Task Force, and by the COJ, FWC-ISM and USFWS-ES to determine whether or not enforcement efficiency and effectiveness has increased. If changes are needed, this plan may be revised if agreed upon by the agencies that use the Manatee Protection Plan (COJ, FWC-ISM, and USFWS-ES). These agencies can also initiate the need for revisions. Below are the actions the Task Force core group will take to improve coordinated zone enforcement.

1. **Patrols will be coordinated between agencies in order to assure coverage of all zones.** Task Force meetings for the core group will be held with representatives from the local, state and federal law enforcement agencies in attendance (teleconference is acceptable when needed) on a quarterly basis. Representatives will have sufficient authority to make decisions and assign work to other staff as needed. At each quarterly meeting, discussion items will include the following:
 - A. Task Force members will plan for future multi-agency deployments, and discuss agency-specific deployments.
 - B. Task Force members will review the past quarter's patrols for each agency, to determine whether or not all existing manatee protection speed zones are patrolled periodically and to determine whether or not any seasonal or other specific reasons warrant modifying plans for future patrols for the next quarter. The Task Force will consider the following information in order to plan for future patrols and any modifications that may be needed:

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- i. Known law enforcement needs, including previous zone violation problem areas;
 - ii. Areas of recent manatee deaths from watercraft-related injuries or recent manatee rescues from watercraft collisions (information to be provided by the COJ coordinator);
 - iii. Areas that are known to be high manatee use (information to be provided by the COJ coordinator based on the aerial survey maps in this MPP and observations of manatee aggregations at locations like JEA's District II outfall and Northside Generating Station); and
 - iv. Special Events that may be taking place in the waterways, or other more typical events such as dredging activities or construction of in-water structures, etc.
2. **There will be a minimum number of deployments targeting manatee zone enforcement.** These types of patrols are scheduled and planned in advance with the intention of focused enforcement of manatee speed zones.
- A. Multi-agency Deployments: A minimum of six (6) multi-agency operations annually with manatee zones as a main focus of enforcement. Most deployments will occur between March and October on weekends, possibly during holiday weekends such as Memorial Day, Fourth of July and Labor Day weekends.
 - B. JSO Deployments: A minimum of 25 manatee only deployments annually (includes the six multi-agency joint deployments).
3. **Additional efforts to increase effectiveness.**
- A. Enforceability of zones. Effectiveness can be increased with continual discussions regarding the enforceability of the manatee protection speed zones. All LE agencies will also assist in reporting sign posting issues that may interfere with the ability to enforce zones. Any LE Officer with questions or concerns about enforceability of the state zones will discuss these issues with FWC's Office of FWC Boating and Waterways at 1-866-405-2869. If sign posting is an issue, it will be resolved either by calling the FWC Boating and Waterways or through their website by submitting an electronic report online at: <http://www.myfwc.com/boating/waterway/markers/damaged-or-missing/report-form/>. Any disagreements between LE agencies about the enforceability of zones will be included in the quarterly task force summaries and the annual implementation reports.
 - B. A multi-agency strategy for addressing violators. Effectiveness can be increased by ensuring that repeat speed zone violators are identified and adequately penalized, and that violations are addressed consistently between the zone enforcement agencies. Each LE agency and their officers will participate in an effort to identify repeat violators, share this information with the Task Force member agencies, and follow these recommended actions to address violators:

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- i. While a warning can be issued for the first zone violation, a citation should be issued for a repeat offense.
- ii. Individuals with multiple citations (from any LE agency) will be given a federal citation when possible (higher penalty fees).
- iii. LE agencies will work towards implementation of a uniform policy of when to issue written warnings/citations vs. oral warnings.

4. Additional efforts to increase efficiency.

The members of the Task Force will continue to work together to improve sharing of citation/warning data between JSO, FWC-LE and the USFWS-LE so repeat offenders can be identified by all agencies during zone violation stops. This effort should specifically include, but not be limited to:

A. Improve data sharing through the Florida Department of Law Enforcement (FDLE) Criminal Justice (CJ) net and the FWC Arrest Net database.

- i. The JSO will work with the FWC and the JSO information technology (IT) staff to most efficiently include JSO manatee zone warning data into the FWC Arrest Net database.
 - This may consist of JSO issuing both State Uniform Citations and Warnings that are mailed for manual data entry by FWC into the Arrest Net database; or
 - Identification and use of computer technology (equipment and software) by all agencies to capture FWS and JSO state manatee zone citations and warnings in the Arrest Net database.

B. Improve data sharing process for sharing FWS and USCG federal zone citations and warnings.

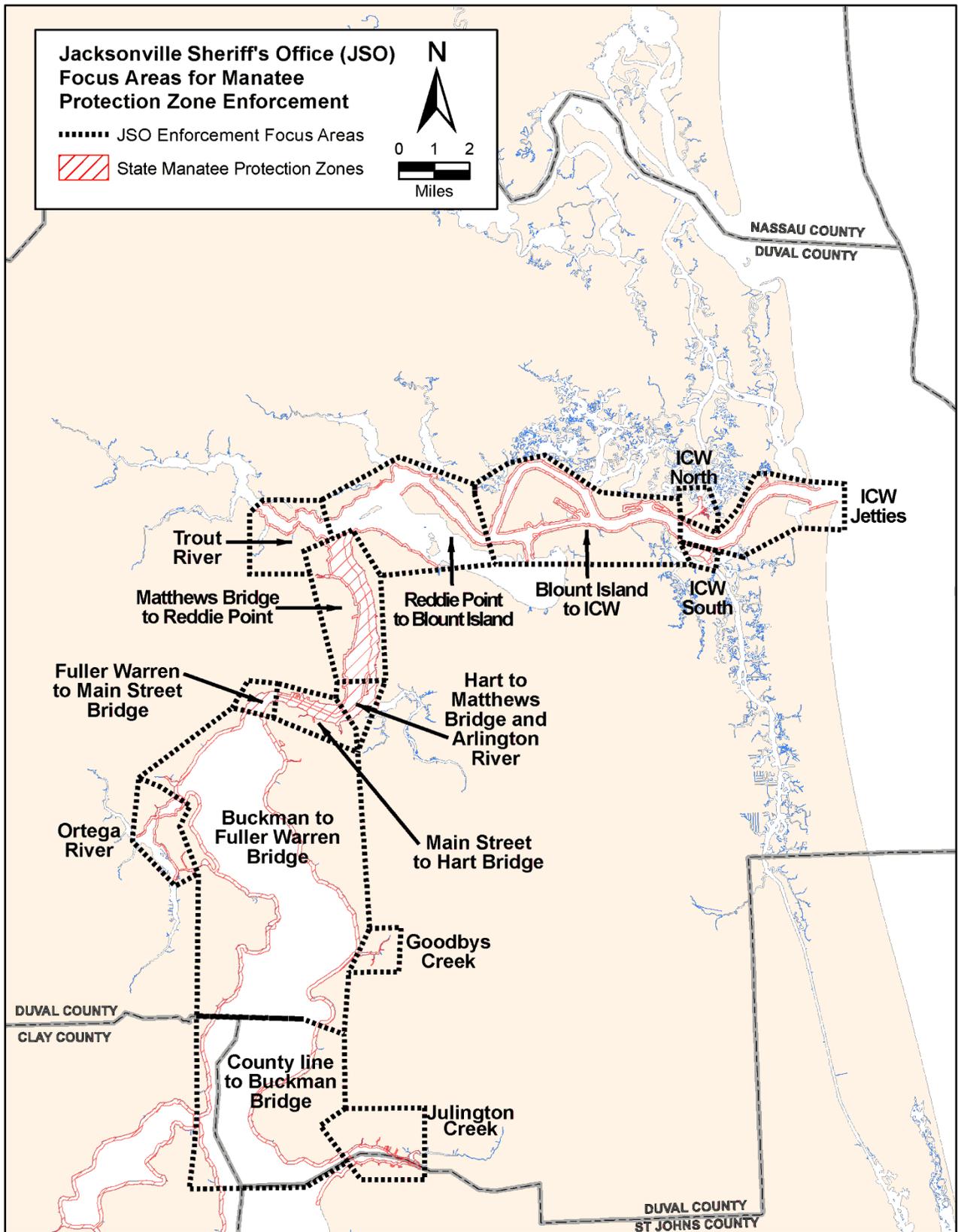
C. Investigate and implement where feasible cost sharing or resource sharing between agencies.

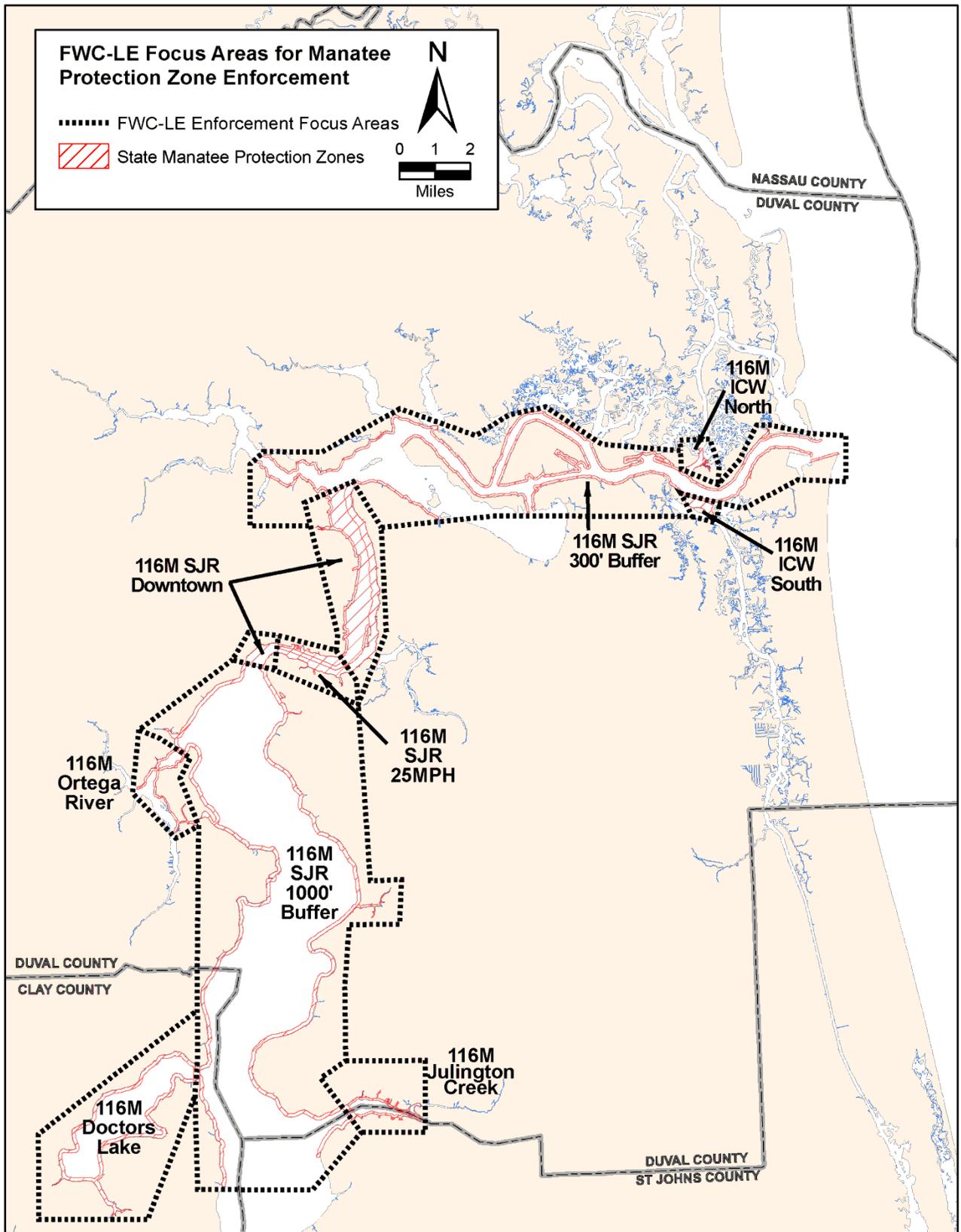
D. Periodically investigate and implement where feasible additional, future paid positions or deputizing volunteers for special, temporary details (such as Power Squadron members).

5. **Reporting.** In order to assess enforcement improvements, there is a need for increased reporting and documentation of past enforcement actions by all agencies. The waterways have been divided into focus areas for enforcement of manatee zones by the JSO (Attachment 1) and the FWC-LE (Attachment 2). Documentation of all past patrols, warnings and citations will include information that is adequate to provide locations for these activities, so that the data can be analyzed within these focus areas. Reporting and assessment of past enforcement efforts will be as follows:

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- A. **Quarterly Data Sheets.** In order to plan and assess LE efforts, all members will keep track of and report their zone enforcement activities with either a data sheet or through computer generated enforcement activity reports. Zone enforcement activity will be recorded on a data sheet if a member agency does not use computer technology that records enforcement activities and locations and/or if not all of the agency's zone citations and warnings are part of the FWC arrest net database. The focus areas for enforcement of manatee zones as depicted on Attachments 1 and 2 should also be listed on data sheets, which will record the number of citations and warnings by location, notation of manatee related incidents encountered by patrol officers and the time spent patrolling the enforcement focus areas (see example report, Attachment 3). These quarterly data sheets will be retained for a period of at least seven years, and made available to the other Task Force members upon request.
- B. **Quarterly Computer Assisted Dispatch and Arrest Net reports.** Quarterly reports from these databases will be generated by each agency that uses technology that records enforcement activities and locations. Each member agency will generate a quarterly report from their systems. The COJ coordinator will request an FWC arrest net report of Duval manatee zone enforcement data for the FWC, and another report for other agencies, two weeks prior to each quarterly task force meeting.
- C. **Quarterly Enforcement Data Summary Reports.** The quarterly data sheets, or computer generated reports, from each agency and the FWC Arrest Net technician, will be compiled into quarterly reports of each agency's activity by the COJ Coordinator. Trends concerning violations or other issues that need to be discussed will be included in the reports. Each agency will submit their enforcement activity data sheets or reports to the COJ Coordinator at least one week prior to the next quarterly meeting. These quarterly summaries will be discussed at the quarterly meetings and forwarded to the USFWS-ES, FWC-ISM and COJ staff. These quarterly summaries will be retained for a period of at least seven years, and will also be included in the annual MPP implementation report.
- D. **Deployments Targeting Manatee Zones.** Enforcement deployments that target manatee zones will also be documented. This information will be forwarded to the COJ coordinator for compilation into a report and distributed to the USFWS-ES, FWC-ISM and COJ staff. These reports will be retained for a period of at least seven years, and will also be included in the annual MPP implementation report.
- E. **Enforcement Improvement Adaptive Management.** At the quarterly meetings, each Task Force member representative will discuss the status of their efforts for the different portions of this plan. Any issues, problems or suggestions for improvement will be noted by the COJ Coordinator and forwarded to the COJ, USFWS-ES, and FWC-ISM to initiate coordination.





Example

Quarterly Manatee Zone Enforcement Report

_____ (Agency Name)
 _____ (Month) - _____ (Month) Year _____

FOCUS AREA	# of times in area	Citations	Warnings	Manatee Related Incidents ¹
Julington Creek				
County Line - Buckman Brg				
Buckman Brg - Fuller Warren Brg				
Goodbys Creek				
Ortega River				
Fuller Warren Brg - Main Street Brg				
Main Street Brg - Hart Brg				
Hart Brg - Matthews Brg and Arlington River				
Matthews Brg - Reddie Pt				
Trout River				
Reddie Pt - Blount Island				
Blount Island - ICW				
ICW North				
ICW South				
ICW - Jetties				
TOTAL				

¹ Note rescues, carcass recoveries, harassment, etc.