MIAMI-DADE COUNTY
MANATEE PROTECTION PLAN (MPP)

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DISCLAIMER

This version of the Dade County Manatee Protection Plan may require minor editing to clarify statements or maps or correct typographical errors before it is finalized.

The figures will be integrated into the document upon finalization.

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MIAMI-DADE COUNTY MANATEE PROTECTION PLAN
Executive Summary

A Manatee Protection Plan 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.

Miami-Dade County's original 1995 Manatee Protection Plan (MPP) was developed over a 6-year period with assistance of a citizen's advisory committee, and approved by the Miami-Dade County Board of County Commissioners (BCC) in 1995. The Florida Fish and Wildlife Conservation Commission (FWC, as predecessor agency the Florida Department of Environmental Protection) and the U.S Fish and Wildlife Service (USFWS) subsequently approved this plan with implementation commencing in 1996.

In October 2007, the Miami-Dade County Board of County Commissioners (BCC) adopted Ordinance 07-144 establishing the Miami-Dade Manatee Protection Plan Review Committee (MPPRC) "for the purpose of providing advisory recommendations to the Board of County Commissioners as to the need for amendments, revisions and additions to the Miami-Dade County Manatee Protection Plan, consistent with manatee protection regulations as may be proposed or adopted by the State of Florida".

The MPPRC concluded its review in October 2009. Its recommendations were summarized and forwarded to the Mayor and the County Commission, and also to the FWC. It should be noted that the MPPRC's recommendations focused primarily on the Marine Facility Siting portion of the 1995 MPP and provided a foundation upon which portions of this updated MPP is based.

Miami-Dade County has worked with FWC staff in an effort to develop updates to the 1995 MPP that address the concerns about the Marine Facility Siting Criteria while also updating the remainder of the MPP. This document therefore represents the first revision to Miami-Dade County's 1995 MPP and is the result of the recommendations of the MPPRC, and coordination between Miami-Dade County staff and FWC staff, and U.S. Fish and Wildlife Service (USFWS) staff. The purpose of revising the original 1995 MPP is to provide guidance targeted at reduction of human-related threats to manatees and manatee habitat based on an evaluation of updated information on manatee use and boat activity in Miami-Dade County.

As recommended by FWC staff, the format of the updated MPP has been modified to be consistent with the progressive formatting currently recommended by FWC staff. The 1995 MPP is available online on the Miami-Dade County website for the purposes of reference.

A Manatee Protection Plan attempts to balance boater waterway access with impact to manatees from boat traffic, and is intended to increase the predictability of permitting outcomes for marine facility development. The Marine Facility Siting strategy is a primary component of a Manatee Protection Plan that 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 Marine Facility Siting strategy is intended to direct new boat slips to 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. Data and information that are more current in

each of these areas has been collected and analyzed to develop this updated MPP, including a revision of the boat facility siting recommendations.

Additionally, recommendations are made in this update that address plan implementation, funding to perform MPP implementation tasks, continued and improved education and awareness, increased law enforcement and plan revision guidelines. Once approved and adopted by the Miami-Dade BCC, FWC and USFWS, portions of the MPP will be incorporated by reference in the Miami-Dade Comprehensive Development Master Plan (CDMP).

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List of Acronyms

MPP	Manatee Protection Plan
RER	Regulatory and Economic Resources
DERM	Division Environmental Resources Management
FDEP	Florida Department of Environmental Protection
SFWMD	South Florida Water Management District
USACOE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
BCC	Miami-Dade County Board of County Commissioners
CDMP	Comprehensive Development Master Plan
FWC	Fish and Wildlife Conservation Commission
MMPA	Marine Mammal Protection Act
ESA	Endangered Species Act
MMP	2007 State of Florida Manatee Management Plan
CWA	Critical Wildlife Area
CI	Bayesian credible interval
ICW	Intracoastal Waterway
WCS	Water Control Structures
FAC	Florida Administrative Code
OFW	Outstanding Florida Waters
NMFS	National marine Fisheries Service
USGS	United States Geological Survey
MDC-PROS	Miami-Dade County Parks, Recreation, and Open Spaces
MDAD	Miami-Dade Aviation Department
CFR	Code of Federal Regulations
MOP	Marine Operating Permit
GPS	Global Positioning System
GIS	Geographic Information System
MIPS	Manatee Individual Photo-Identification System
FPL	Florida Power and Light Company
PEDs	Piezoelectric Detectors
SAV	Submerged Aquatic Vegetation
N	North
S	South
W	West
E	East
NW	Northwest
SW	Southwest
NE	Northeast
SE	Southeast

List of Definitions

1:100 – ratio between powerboat slip count and shoreline length in feet. This ratio represents one slip for every one hundred feet of developable shoreline owned or controlled by an applicant.

Aggregation site - an area where manatees may be found in large numbers, either seasonally or year-round. These sites may also include areas that are not traditional warm water sites (springs and artificial warm water discharge) such as estuaries and canals that serve as thermal basins or freshwater attractants, or a source of forage.

Berth – see also "boat slip".

Berthing – see also "mooring".

Boat – see also "vessel"**.**

Boat docking facility – a place where vessels may be secured to a fixed or floating structure or to the shoreline. (Source: Section 24-5 of the Code of Miami-Dade County). Marine docking facility is synonymous with this term.

Marine Facility Siting Criteria– a component of a MPP which identifies the most appropriate locations and slip densities for boat facility development, based upon an evaluation of manatee protection needs, potential natural resource impacts, and zoning and future land use compatibility. The purpose of developing a marine facility siting strategy (or criteria) is to reduce threats to manatees and other environmental resources, such as seagrasses, mangroves, wetlands, and oysters, from boating activities and infrastructure development impacts.

Boat ramp or boat ramp facilities – an artificial or altered natural feature with one or more lanes, which facilitates the launching and landing of boats into a water body. Boat ramp facilities may include temporary courtesy docks to facilitate launching and retrieval of boats into and out of a water body.

Boat slip - a space, mooring, or parking space for a boat or vessel in the water or on land (examples include lifts, trailers, blocks, anchorage, mooring buoys, floating platforms, davits, boat lifts). When located adjacent to a dock or bulkhead, where the size of the slip is not defined by mooring pilings or appurtenant structures, a boat slip is a 20 foot wide by 40 foot long area of water in which an average-sized vessel may be moored. For the purposes of this plan and consistent with appropriate wildlife agencies, *a boat trailer parking space* is a boat slip. Structures authorized only for fishing or observation where mooring is not permitted are not considered boat slips.

Boat storage facility - a facility where recreational vessels are stored on uplands by one or more of the following methods: 1) On boat trailers on a paved or unpaved surface; 2) On individual boat racks; 3) On multi-story boat racks. (Source: Section 24-5 of the Code of Miami-Dade County).

Boat yard - a facility used solely for boat repair and/or boat building (Source: Miami-Dade County MPP, 1995)

Commercial Marina Site - a publicly or privately operated marine facility that are not associated with an adjoining residential development land use and that provides wet or dry berthing.

Commercial vessel - any vessel engaged in any activity wherein a consideration is paid by the user either directly or indirectly to the owner, operator or custodian of the vessel; or any vessel engaged in the taking of saltwater fish or saltwater products for sale either to the consumer, retail dealer or wholesale dealer. (Source: Section 24-5 of the Code of Miami-Dade County). For the purposes of this plan, a commercial vessel used occasionally for recreational purposes is still classified as a commercial vessel.

Courtesy dock - a dock or slip that is used by any particular vessel for the purposes of staging, loading, and offloading and, that does not allow for additional vessels in excess of the approved number of slips.

Comprehensive Development Master Plan – an official planning document adopted by the Miami-Dade County Board of County Commissioners (BCC) that includes goals, objectives, policy direction, and decision-making related to growth and physical development within Miami-Dade County. (Source: Miami-Dade County)

Developable shoreline - the shoreline [property line] owned by a permit applicant upon which marine structures may be constructed. Developable shoreline for the purpose of this plan do not include beaches, marsh, or mangrove shorelines (including mangroves designated as mitigation) upon which marine structures may not be permitted.

Dock - any fixed or floating structure including, but not limited to, access walkways, terminal platforms, catwalks, used for mooring or accessing vessels. (Source: 18-21.003(20) FAC)

Dry slip – an upland structure, parking lot or space designed for the storage of one vessel in an upland location that is associated with a dry storage facility.

Dry storage facility - an upland structure, parking lot, or space used specifically for storing watercraft, including, but not limited to, in/out boat storage, boat repair, boat sales, or long term dry storage lots or facilities. **Note:** A dry storage facility is considered part of a boat facility if the dry storage facility has the capability of launching vessels into adjacent waters or water access is provided adjacent to, or in close proximity to the facility.

Existing marine facility – for the purposes of this plan, the definition of an existing boat facility is one which is operating with all required authorizations and is currently producing boat traffic, or has recently produced boat traffic in the past five years that is still affecting manatees. Facilities that have all required local, state, and federal permits, authorizations and approvals that are still valid, but not yet built, may also be considered existing.

Florida manatee – (*Trichechus manatus latirostris*) a large, herbivorous marine mammal inhabiting the coastal waters, rivers, and springs throughout Florida. They are federally listed as threatened throughout their range, primarily due to human-related impacts, habitat loss, and a low reproductive rate.

Freight Terminals and Large Vessel Docking Facilities – facilities mooring vessels greater than 100 feet in length (Source: Miami-Dade County MPP, 1995).

Fuel and Transitory Docks - docks, slips or other shoreline structures used for the temporary mooring of vessels (less than one day, but may include overnight or multiple day use if camping), including docks at non-fee public facilities (e.g., public parks or ramps), facilities used for water-dependent public transportation, designated day-use slips at restaurants and hotels, and staging docks, piers, seawalls, and/or slips required for the operation of dry storage facilities or boat ramps. Courtesy docks are excluded from this definition of fuel and transitory docks.

Idle Speed/No Wake – A navigable area where a motorboat cannot proceed at any speed greater than that speed which is necessary to maintain steerageway. A motorboat that is operating on a plane is not proceeding at idle speed no wake. (Source: Section 7-25(d) of Miami-Dade County Code)

Intracoastal Waterway – all waters within the navigable channel of the Atlantic Intracoastal Waterway in Miami-Dade County, Florida.

Large Vessel Docking Facilities – facilities mooring vessels greater than 100 feet in length (Source: Miami-Dade County MPP, 1995).

Limited Special Use Dockage – dockage that includes transitory docks, water dependent public transportation dockage, and/or commercial/charter fishing boat docks with a maximum density (including existing boat slips) of 1 vessel slip per 500 feet of shoreline. (Source: Miami-Dade County MPP, 1995)

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 are defined as the county's boundaries.

Mean High Water Line – the intersection of the tidal plain at the mean high water with the shore. Mean high water is the average height of high waters over a nineteen-year period. (Source: Chapter 177.27 F.S.)

Mega-yachts- is a yacht that measures over 60 meters (about 197 feet) in length, surpassing the dimensions of a Superyacht.

Mooring - any location where a vessel in the water is secured, including, but not limited to, where a vessel is 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 (Source: Section 5(199) of Miami-Dade County Code).

Motorboat - any vessel which is propelled or powered by machinery, and which is used or capable of being used as a means of transportation on water. (Source: Section 7-25(a) of Code of Miami-Dade County). Sailboats with auxiliary engines are not considered motorboats for the purpose of this plan.

Multi-family residence - a building occupied by more than one family, in which each family shares a roof and/or outer wall(s) with at least one other family (Source: Miami-Dade County MPP, 1995)

No Coastal Construction Area- undeveloped areas of extremely frequent manatee use (Source: Miami-Dade County MPP, 2025).

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. For the purposes of this plan, a personal watercraft is considered a motorboat. (Source: Chapter 327 F.S.)

Powerboat – see also "motorboat".

Rafting - vessels that are tied together or otherwise attached to other vessels when the proximity between each tied or otherwise attached vessel is five feet or less. (Source: Section 21-287 of Miami-Dade County Code)

Recreational boat docking facility – a boat docking facility which has boat slips, moorings, vessel tie-up spaces, or davit spaces of which fifty (50) percent or more are designated for or contain recreational vessels. (Source: Chapter 24-5 Miami-Dade County Code)

Recreational vessel – For the purposes of this plan**,** any vessel used by its owner or operator solely for noncommercial purposes.

Residential Dock Marina Site – a privately operated marine facility is for an adjoining residential land use, where the docks are occupied by vessels owned by persons residing at the adjoining property.

Residential "No Entry" Areas - areas heavily used by manatees during the winter that have been designated "No Entry", Residents Only, November 15 - April 30" (Source: Miami-Dade County MPP, 1995).

Single-family residence - a detached building having a roof and outer walls entirely separated from any other structure by space, and occupied by members of a single family with not more than two outsiders, if any, accommodated in rented rooms.

Slip - see also “boat slip”.

Special Use – areas designated for mooring vessels for special uses such as commercial fishing, charter fishing boats, and oceangoing luxury yachts (including “mega-yachts”).

Submerged aquatic vegetation – Plant and algal species that must complete all or part of their life cycle in the water including, but not limited to, seagrasses, macroalgae, and freshwater grasses.

Superyacht- a yacht that measures between 24 meters (about 79 feet) and 60 meters (about 197 feet) in length.

Transitory boat slip - a slip that is used for a very brief period of time (generally less than one day) and contributes to boat traffic. Examples include but are not limited to, water dependent public transportation dockage (e.g., water taxis), temporary slips (such as at a fuel dock, hotel or restaurant) and non-fee public facilities (e.g., public parks, etc.). Transitory slips are counted when calculating slip densities.

Travel Corridor – an area through which manatees may travel, either daily or seasonally, between feeding areas and sources of fresh or warm-water, resting or feeding locations, or other habitat areas.

Vessel – a watercraft, boat, ship, yacht, barge, canoe, kayak or other vehicle, used or capable of being used as a means of transportation on water. (Source: Chapter 24-5 Miami-Dade County Code)

Water Dependent Use – Any use which cannot exist or occur without association with marine, freshwater or estuarine water masses (Chapter 24-5).

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

Wet Slip- a type of boat docking arrangement where the vessel is moored in the water rather than being lifted out or stored on land.

I. INTRODUCTION

The West Indian manatee (*Trichechus manatus*) is a marine mammal species found within the southeastern United States and throughout the Caribbean basin. The Florida manatee (*Trichechus manatus latirostris*) is a subspecies of the West Indian manatee and was designated Florida's state marine mammal in 1975. Manatees belong to the scientific order Sirenia, which also includes the Amazonian manatee, Dugong, West African manatee, and Steller's sea cow (extinct).

Florida manatees typically stay in Florida waters; however, some individuals have been documented as far north as Massachusetts, as far west as Texas, and occasionally into the Caribbean (Lefebvre et al., 2001). Florida manatees are physiologically intolerant of water temperatures below approximately 68º F (20ºC), which significantly influences their geographic range. During the winter months, manatees typically seek warmer water in southern Florida, or aggregate at a number of natural or artificial warm-water refuge sites. (USFWS 2001, Laist & Reynolds 2005a, Reynolds & Wilcox 1994). Manatees are typically found in shallow, slow-moving rivers, as well as estuaries, saltwater bays, canals, and other coastal areas. Their diet consists primarily of aquatic vegetation, particularly sea grasses, although they do feed on emergent vegetation. While some of manatees' freshwater intake is derived from the vegetation they consume, they do require freshwater for drinking.

Threats to the Florida manatee are both naturally-occurring and human-related. The low reproductive capacity increases the significance of conflicts resulting from human-related activity and limited coastal resources. It has been demonstrated that there is a correlation between the number of registered recreational and commercial vessels in Florida and the number of watercraft-related manatee mortalities (Ackerman, et al., 1995). Furthermore, between one quarter and one third of all annual manatee deaths are a result of watercraft collisions (Laist & Reynolds, 2005). Habitat protection is also critical to conserving this species. A state-wide quantitative assessment of threats demonstrates that watercraft related mortality is having the greatest impact on manatee population growth and resilience. Loss of warm water refugia essential for winter survival is also a significant threat, particularly over the long term, and other threats such as entanglement and red tide. (Runge et al, 2007).

The Florida manatee was listed as an endangered species by the USFWS in 1967 and by the FWC in 1979. The federally listed entity was changed to the species level (West Indian manatee) in 1970. Manatees are federally protected by both the Marine Mammal Protection Act of 1972, as amended (MMPA) and the Endangered Species Act of 1973, as amended (ESA). In 2017, the USFWS reclassified the West Indian manatee from endangered to threatened.

The Florida manatee is also protected by the Florida Manatee Sanctuary Act (1978) which requires that "key counties" in Florida adopt a Manatee Protection Plan and incorporate the boat facility siting provisions into their Comprehensive Plan. The components of a manatee protection plan must be compatible with local policies and ordinances while addressing manatee concerns. Manatee protection plans are designed to provide a summary of available information

on manatees, establish protection criteria, and provide strategies aimed at minimizing manatee-related threats within a specific county.

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. The cumulative goal of developing manatee protection plans in the thirteen counties is to ensure the long-range protection of the manatee species and its habitat in Florida. Miami-Dade County's MPP was the first to be approved by the State of Florida in 1996. At this time, all "key counties" have state-approved manatee protection plans in place.

This updated MPP replaces the 1995 Miami-Dade County MPP. This update to the Miami-Dade County MPP is intended to assist in county-wide protection of manatees and their habitat by including criteria for marine facilities and their siting, enforcement of manatee protection zones, shoreline and submerged land development, manatee educational programs, habitat protection, human-manatee interactions, and governmental coordination.

In addition, it is intended to provide a long-term strategy to ensure the continued survival of the Florida manatee based upon a comprehensive assessment of manatee data, manatee habitat needs, and areas of manatee/boater overlap and interaction, while also understanding and acknowledging human recreational and commercial uses of the county waterways.

The implementation of the Miami-Dade County MPP has contributed to achieving the statewide goals set for the thirteen "key" counties by Florida Statute. The following guidelines or objectives were established and remain in place for the Miami-Dade County MPP:

1. Minimize the number of manatee mortalities and injuries, including but not limited to those which are human-related, particularly flood gate and boat related causes;
2. Protect manatee habitat (the Marine Mammal Protection Act aims to maintain the health and stability of the marine ecosystem) and upgrade where possible;
3. Minimize manatee harassment;
4. Increase public awareness of the need to protect manatees and their environment;
5. Monitor the status of manatee populations and their habitats

These objectives are drawn from the USFWS Florida Manatee Recovery Plan (USFWS, 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).

General Setting

1.1 Miami-Dade County

According to the April 2020 US Census Bureau statistics, approximately 2.7 million people live in Miami-Dade County, making it the most populous county in the entire state of Florida. Miami-Dade County has a number of unique habitats within a very dense urban area. These include two national parks, two state aquatic preserves, an FWC Critical Wildlife Area, several state parks, as well as numerous designated historic and archeological sites. Managing the delicate balance between preservation and maintenance of these unique areas in concert with increasing urban growth and expansion throughout the county is challenging.

Manatees inhabit both fresh and saltwater areas including canals, rivers, estuaries, bays and the open ocean, but they need fresh water to drink periodically. They are herbivores feeding primarily on aquatic plants. Manatees are generally found in water at least 1.5 meters (5 feet) deep and cannot tolerate water temperatures below 20°C (68°F) for long periods of time. During especially cold winter weather in other parts of the state, manatees congregate in warm water areas such as the discharge zones near power generating plants, natural warm water springs, and thermal basins. In south Florida manatees often aggregate in tributaries near flood gates or dead-end residential canals where water temperatures remain higher longer than in the open bay. With the exception of mating herds, they are seldom found in large groups.

On a statewide basis, most human-related manatee deaths are caused by collisions by watercraft. Recent studies have indicated approximately 20-25% of reported manatee mortality are a result of watercraft-related injuries. The number of manatee mortalities due to vessel collisions statewide has been rising in recent years, as has the number of registered boats statewide (Figure 1).

Manatees can move at a maximum speed of 15-20 mph for short periods of time; however, often collisions by motorboats still occur due to various factors. In confined or congested waterways, and in cases where turbidity makes it difficult for boaters to see manatees, the likelihood of collisions is higher.

Propeller blades can cut through the skin and cause permanent marks and scars. FWC researchers found that one out of every four adult carcasses analyzed in a recent 10-year study bore evidence of 10 or more watercraft strikes. With only 4% of adult manatees devoid of watercraft-related scars, it appears exceedingly rare for an adult manatee to not be struck multiple times in its life. While most Florida manatees have distinctive propeller scars, the majority of manatee mortality associated with watercraft-related injuries are due to blunt-force trauma. Manatees are known to frequent areas with heavy boat traffic including the Intracoastal Waterway (ICW) in

Miami-Dade County or cross this channel while moving to and from areas that support sensitive manatee behaviors such as feeding, calving, nursing, and resting.

Historically, many manatees have been killed in operational flood gates or salinity control structures within tributaries. The installation of sensors on these structures has resulted in a significant decline of manatee mortality in Miami-Dade County since the implementation of the 1995 MPP. Manatees have also been injured and killed by entanglement in monofilament line, drowning in storm drain culverts, and a few have been killed by poaching and vandalism.

Waterway Characteristics

Biscayne Bay is the largest body of water in Miami-Dade County and one of the largest estuaries in Florida. It encompasses 448 square miles and is contiguous with the southern Florida Everglades and Florida Bay.

Tributaries that discharge into Biscayne Bay are part of a network of canals constructed in the early 1900's by the U.S. Army Corps of Engineers (USACOE), primarily for drainage to provide land for agriculture and other development. Subsequently, barriers or dams were installed on the coastal canals to prevent salinity intrusion and excessive drainage. Decades ago, most of the dams were replaced by remotely operated hydraulic or mechanical gates known as flood gates or salinity control structures (WCS). The canals and flood gates/WCS, are operated and maintained by the South Florida Water Management District (SFWMD), Miami-Dade County, and USACE for the primary purpose of flood control and water supply protection.

Water Quality and Use Protection Designations

Waters within the state are classified by Chapter 62-302, Florida Administrative Code (FAC), which provides "use" designations and defines the criteria for each use. Miami-Dade County is comprised of waters that are designated as Class II (Card Sound and Little Card Sound) as well as Class III (Biscayne Bay).

Water bodies designated as Class II allow uses including shellfish propagation and harvesting and are more stringently regulated and therefore require additional permitting consideration by the Florida Department of Environmental Protection (FDEP) and the SFWMD. Class III waters allow recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The Miami-Dade County waters of the Biscayne Bay Aquatic Preserves, as well as those in Biscayne National Park are Class III waters.

Standards for pollutants are set according to the classification of the water bodies. Effective August 5, 2010 the definition of Class III waters was amended to distinguish between those that are

"predominantly fresh" or "predominantly marine." Biscayne Bay is regarded as "predominantly marine" in that the chloride concentration in surface waters is greater than or equal to 1500 milligrams per liter. (FDEP, 2012). In 2012, numeric nutrient criteria were established by FDEP in order to propagate and maintain a healthy, well-balanced population of fish and wildlife, as well as recreational uses.

Outstanding Florida Waters (OFW)

In addition to being classified, water bodies worthy of special protection because of their natural attributes can be designated as Outstanding Florida Waters (OFW). The waters of Florida's aquatic preserves, as well as Biscayne National Park are among those designated as OFWs and FDEP provides the highest protection to these waters; providing that, other than that allowed by rule, worthy of special protection because of their natural attributes is to be permitted. State and national parks, along with aquatic preserves and select other waterbodies, were granted this protection through designation in Chapter 62-302 FAC.

The intent of OFW designation is to prevent activities from lowering existing water quality. Section 403.061(27), F.S., created additional protection for waterbodies that are classified as OFW. Biscayne Bay-Cape Florida to Monroe County Line Aquatic Preserve was designated OFW in 1979 [Rule 62-302.700(9), F.A.C.]. Biscayne Bay Aquatic Preserve became an OFW in 1982. With some exceptions, FDEP or the SFWMD is not to permit a lowering of existing or ambient water quality through pollutant discharges directly to the OFW. In addition, indirect discharges must not significantly degrade the water quality.

Aquatic Preserves

The Florida Legislature has designated certain water bodies as "Aquatic Preserves" and as such they are afforded the highest level of water quality and habitat protection in the state. These bodies of water are defined as exceptional areas of submerged lands and associated waters set aside for their aesthetic, biological, and scientific value and are to be maintained in an essentially natural or existing condition. Aquatic preserves have specific management policies, standards, and criteria for activities on sovereignty lands and include strict limitations on those activities.

There are two aquatic preserves located in Miami-Dade County: Biscayne Bay Aquatic Preserve and Biscayne Bay-Cape Florida to Monroe County Line Aquatic Preserve, collectively regarded as the Biscayne Bay Aquatic Preserves. These preserves were established in 1974 and 1975, respectively and are afforded protections specific to them via 258.397 F.S. and Chapter 18-18 FAC, unlike other aquatic preserves whose management authorities are captured collectively under Chapter 18-20 FAC and via other statutes. The Biscayne Bay Aquatic Preserves were established "for the purpose of preserving and enhancing Biscayne Bay and all natural waterways tidally

connected to the bay in an essentially natural condition so that its biological and aesthetic values may endure for the enjoyment of future generations".

The boundaries of these preserves include all publicly and privately-owned submerged lands as well as publicly owned islands, excluding Biscayne National Park. The Biscayne Bay Aquatic Preserves boundaries extend the length of Biscayne Bay, from the headwaters of Oleta River south to Little Card Sound, excluding Biscayne National Park, and includes all natural waterways tidally connected to the Biscayne Bay, as well as an area offshore adjacent to Bill Baggs Cape Florida State Park (Figure 2).

Biscayne Bay-Card Sound Lobster Sanctuary

The taking of lobster is prohibited year-round in the Biscayne Bay-Card Sound Lobster Sanctuary. The northern boundary of the state-designated sanctuary (68B-11 F.A.C.) is between the north edge of Matheson Hammock Park east to the south tip of Cape Florida, and the south boundary is the Card Sound Bridge. The sanctuary contains a portion of Biscayne Bay, and Card Sound/Little Card Sound waters within its boundaries.

FWC Critical Wildlife Area and National Water Designations

Critical Wildlife Areas (CWA) are established under a Florida Administration Code rule to protect important wildlife concentrations from human disturbance during critical periods of their life cycles and require commitments from landowners to successfully and jointly manage these sensitive habitats. The 700-acre Bill Sadowski Critical Wildlife Area, located along the west side of Virginia Key, was established through a joint effort between the state and the City of Miami in 1991. Due to the sensitive ecological habitat in the CWA, it is maintained as a “No Entry Zone” year-round for the benefit of wading and migratory birds (Appendix B). Manatees have been observed engaging in various sensitive behaviors such as mating, calving, nursing their young, feeding, and resting in this area and therefore this basin has also been designated as a state Manatee Protection No Entry Zone under chapter 68C-22.025, F.A.C.

A portion of Biscayne Bay has also been designated a National Park. Biscayne National Park includes most of south Biscayne Bay waterward of the mean high-water line and extends eastward of the barrier islands into the Atlantic Ocean. It also extends into wetland areas landward of the shoreline that include important habitat. Coral reefs and other submerged habitats are protected through park regulations, which include restrictions on habitat destruction.

Boating Safety Zones and Boating Restricted Areas

Section 7-26 of the Code of Miami-Dade County designates several waterbodies in Miami-Dade County as motorboat restricted zones. For example, Section 7-26(b) establishes an "Idle Speed No Wake" Zone in the Miami River, including its tributaries, the Tamiami Canal, Comfort Canal, and Seybold Canal from their respective salinity control structures to the Intracoastal Waterway in Biscayne Bay. Additional "Idle Speed No Wake" zones are also designated in Section 7-26, including Little Maule Lake, the Key Biscayne Hurricane Harbor and Pines Canal, Oleta River, and Upper Oleta River.

Section 7-26 also designates several motorboat and personal water craft exclusion zones including the Rickenbacker Causeway Motorboat Exclusion zone, the Haulover/Sunny Isles Beach Boat, Motorboat or personal watercraft Exclusion Zone (Atlantic Ocean), and Crandon Park Motorboat or Personal Watercraft Exclusion Zone (Atlantic Ocean).

The FWC Division of Law Enforcement designates areas of the Miami-Dade County Intercoastal Waterway Channel as Boating Restricted Areas for the regulation of vessel speed and traffic. Chapter 68D-22.013, F.A.C. establishes a year-round, shore-to-shore "Slow Down Minimum Wake Zone" in the surrounding waterways of Golden Beach. An "Idle Speed No Wake Zone" exists in Biscayne Creek, Bakers Haulover Inlet, and the waters west of the Port of Miami. Additional "Idle Speed No Wake" zones are designated in areas around the Broad Causeway Bridge, 79th Street Causeway Bridge, and the Rickenbacker Causeway Bridge.

Manatee Protection Zones

In 1979, the FWC (then the Florida Department of Natural Resources), designated the Black Creek area including Black Point Marina as an area of significance to the manatee population. The "Idle Speed No Wake" zone associated with this designated area extends from the Black Creek entrance channel in Biscayne Bay to the salinity control structure on Black Creek and Goulds Canal, and includes all tidal canals in the vicinity.

Prior to late 1991, there were no other speed zones in Miami-Dade County established for manatee protection, although several other areas were regulated for boating safety. However, in November 1991, the Florida Governor and Cabinet approved a state rule establishing vessel speed and access restrictions for the purpose of manatee protection.

These manatee protection rules were established by the FWC to restrict the speed and operation of vessels to protect manatees from harmful collisions with vessels and from harassment. Research by Calleson and Frohlich (2007) indicate that reducing vessel speeds can reduce manatee injury or fatality because it allows for greater reaction time for the boat operator, greater reaction time for the manatee, and reduced severity of injuries in the event that a manatee is hit by a boat, and concluded that reducing boat speeds in specific areas is an appropriate, reasonable, and defensible

management action. 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.

The FWC is authorized to adopt these vessel speed restriction zones for manatee protection by the Florida Manatee Sanctuary Act, 379.2431(2), FS and they are implemented through Chapter 68C-22 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 the FWC or can be done by someone outside of the FWC by submitting a request. Many factors are considered when the need for a rule is evaluated. The factors considered by the FWC when prioritizing areas to be reviewed are described in the 2007 Florida Manatee Management Plan. 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, and other factors).

Two areas in Biscayne Bay historically used for water-skiing have a 35-mph speed limit on a year-round basis. One is located on the east side of Meloy Channel (along Miami Beach) between theoretical 64th Street and West 51st Street, and the other is located on the west side of Meloy Channel surrounding Monument Island, between Rivo Alto and Star Islands. Two additional water-ski areas east of Meloy Channel have a seasonal (May 1 - November 14) speed limit of 35 mph, and are slow speed the remainder of the year. One is located between Indian Creek Village and Biscayne Point, and the other is between Julia Tuttle Causeway and the Sunset Islands.

Signs along waterways designate regulatory zones. Signs provide information regarding the boundary of a zone, its regulated speed, and the area of regulation. The state Manatee Protection Zones in Miami-Dade County (68C-22.025 FAC) were last amended in December 1991.

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 by calling 1-850-488-5600, via email at Waterway.Management@MyFWC.com, or via electronic report form submission at the following link:

http://www.myfwc.com/boating/waterway/markers/damaged-or-missing/report-form/

Additional information about Manatee Protection Zones in the area are located at the following links:

http://myfwc.com/wildlifehabitats/managed/manatee/protection-zones/
https://myfwc.com/wildlifehabitats/wildlife/manatee/data-and-maps/

1.2 Federal Manatee Protection Provisions and Requirements

Federal Endangered Species Act, 1973

Manatees were first listed as an endangered species by the Endangered Species Preservation Act of 1966 (16 U.S.C. 668aa(c)). Further protection was implemented under the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.). Manatees were reclassified from endangered to threatened under the ESA in April 2017.

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 human 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 USFWS and National Marine Fisheries Service (NMFS) are jointly responsible for administering the ESA and MMPA; however, manatees are specifically a USFWS responsibility. The MMPA gives the Marine Mammal Commission certain responsibilities, but Marine Mammal Commission does not establish manatee refuges and sanctuaries, that is done by the USFWS.

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 which was first produced in 1980. The USFWS listed the manatee as a federal threatened 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. The current federal manatee recovery plan was approved in 2001 and it continues to guide and direct recovery actions by the USFWS and other partners.

State personnel have historically assisted with the federal manatee recovery plans and continue those efforts today.

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 (CFR) regulates marine events which will introduce extra or unusual hazards to safety on navigable waters in the United States. Marine event permits are issued by the US Coast Guard 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.

The USFWS is responsible for the management of manatees under federal laws, and maintains the Florida Manatee Recovery Plan.

1.3 State of Florida Manatee Protection Provisions and Requirements

Biscayne Bay Aquatic Preserve Act

The Biscayne Bay Aquatic Preserve Act is located in Ch.258.397 of the Florida Statutes and gives authority over state owned sovereign submerged lands to the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees).

The Act contains provisions that further restrict marina construction including the following:

- sovereignty submerged lands in the preserve may not be sold, transferred, or leased except by proof of extreme hardship by the applicant and a determination by the Board of Trustees that the action is in the public interest;
- no dredging or filling submerged lands in the preserve unless minimum dredge and fill is authorized for public navigation projects, is of public necessity or for preservation of the Bay in accordance with the Act;
- other alteration of physical conditions may be authorized if necessary to enhance the quality or utility of the preserve;
- minimum dredging and filling may be authorized for marina and associated channel construction and maintenance if the Board of Trustees determines that the project will be constructed and operated so as not to adversely impact water quality and utility of the preserve - this does not authorize the connection of upland canals to preserve waters, and
- dredging, which is clearly in the public interest and is necessary to eliminate conditions hazardous to public health or stagnant waters, islands, or spoil banks which would enhance the aesthetic and environmental quality and utility of the preserve, may be authorized by the Board of Trustees.

Florida Manatee Sanctuary Act, 1978

This Act (Chapter 379.2431(2) F.S.) 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.

The Act states, in part, that "It is unlawful for any person, at any time, intentionally or negligently, to annoy, molest, harass, or disturb any manatee."

In addition, Section 68C-22.025 of the Florida Administrative Code (FAC) sets forth specific manatee protection zones throughout Miami-Dade County. These year–round and seasonal speed zones include "Slow Speed"; "Idle Speed"; "Maximum Speed" zones, as well as, the establishment of "No Entry" and "Motorboat Prohibited" Zones.

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."

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.

2007 Florida Manatee Management Plan

The Florida Manatee Management Plan 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 (USFWS, 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 Manatee Protection Plan 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.

1.4 Local Manatee Protection Provisions and Requirements

Upland and submerged land development may negatively affect manatee habitat. Harmful development activities include those that destroy wetland and aquatic vegetation such as artificial canal systems, dredging and filling, the construction of structures such as docks and bulkheads, and the installation of structures that can trap or crush manatees. The construction of facilities which could increase the number of boats in areas utilized by manatees are also considered incompatible with the goal of protecting manatees.

Chapter 24 of the Miami-Dade County Code provides for the regulation and standards related to environmental protection of the resources of the County including Biscayne Bay.

Class I Permit

Chapter 24 of the Miami-Dade County Code requires a Class I Coastal Construction permit for work in, on, over or upon all tidally connected waters of Miami-Dade County. In addition, the Code of Miami-Dade County generally requires that any work authorized by a Class I permit must be related to a water dependent activity.

During the review process of an application for a Class I permit, proposed projects are evaluated using criteria in the County Code and CDMP including impacts to environmental resources in the vicinity of the work. In addition, any long-term impacts that may result from the use of the proposed structure are evaluated including, but not limited to, impacts to both manatees and their habitat.

Marine Facilities Operating Permit (MOP)

In 1990, Miami-Dade County passed an ordinance requiring operating permits for all commercial boat docking facilities; boat storage facilities contiguous to the tidal waters of Miami-Dade County with a total of ten (10) or more dry storage spaces; and all recreational boat docking facilities with a total of ten (10) or more boat slips, moorings, davit spaces, and vessel tie up spaces.

This Pursuant to this ordinance, which was codified into as part of Chapter 24 of the Code of Miami-Dade County, and in 1991, RER-DERM began issuing marine facility operating permits (MOPs) to all commercial facilities and facilities with ten or more slips or storage spaces (Appendix A).

The MOP is designed to ensure compliance with conditions in federal, state, and local coastal construction/dredge and fill permits after permit expiration. The MOP ensures that pollution control equipment such as sewage pump out facilities, fuel spill management, and solid waste and waste oil management remain operational. In addition, the MOP encourages the implementation of Best Management Practices to safeguard against pollution and includes conditions that were previously part of a coastal construction permit for the facility as well as, adherence to standards in the Miami-Dade County Code.

These facilities or their operation may affect manatees and their essential habitat by reducing/eliminating aquatic vegetation in feeding areas, obstructing manatee movements along shorelines, providing a source of contaminants, disrupting wetland functions through dredge and fill work, disturbing or displacing manatees and increasing the probability of boat collisions with manatees.

Current Miami-Dade County Manatee Protection Plan

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. Manatee protection plans 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 County, FWC and USFWS through their respective permit application review processes.

Miami-Dade County's 1995 MPP was developed over a 6-year period with assistance of a citizen's advisory committee and approved by the Miami-Dade County Board of County Commissioners (BCC) in 1995. This plan was subsequently approved by the FDEP (predecessor agency to the FWC) and the USFWS with implementation commencing in 1996.

The MPP provides general information about manatees in Miami-Dade County such as relative abundance and habitat areas and also outlined objectives and policies to be implemented to ensure increased manatee protection.

2. Information Assessment

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).

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 (Warm-water Habitat Action Plan, 2020; Florida MMP, 2007). 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 FWC conducted the third statewide Florida manatee abundance survey on December 1–15, 2021 on Florida's west coast and November 30–December 6, 2022 on the east coast. The estimate of statewide abundance for the 2021-2022 period is 8,350–11,730 manatees, with 3,960–5,420 on the west coast and 3,940–6,980 on the east coast (Gowan et al. 2023).

2.1 Manatees in Miami-Dade County

Miami-Dade County is categorized as part of the Atlantic Coast Management Unit. Manatee travel patterns include seasonal and daily movements. Manatees migrate south to Miami-Dade in the fall and winter, primarily through the Intracoastal Waterway or along the western shoreline, and disperse by the same route in spring and summer. Manatees also travel in other major navigation channels and small channels leading to marina basins or some tributaries. Manatees are consistently observed moving upstream or downstream in tributaries (Figure 3).

2.2 Manatee Activity Data

Studying manatee movements, behavior, and habitat use is key to understanding not only the threats that face this imperiled species but also possible strategies to aid in their recovery. Various types of data specific to Miami-Dade County waters were compiled in 2010, with an emphasis on comparison of data considered for the development of the 1995 MPP, to the more recent data (up to 2023), including manatee use patterns, including, but not limited to, relative density or use, in cold-weather, aggregation areas, feeding areas, travel corridors and seasonal patterns, as well as manatee causes of death over time, and spatial patterns.

Aerial Surveys

From 1989 to 2024, Miami-Dade County RER-DERM, with assistance of the Miami-Dade Sheriff's Office and the Department of Transportation and Public Works, has conducted helicopter surveys with varying frequency of county nearshore tidal waters and tributaries in all seasons. The purpose of these surveys is to determine manatee distribution and habitat use patterns, as well as document any changes that may be occurring over time.

During the surveys, two or more observers in the survey aircraft record location of manatees, number of individual adults and calves, and behavior (e.g., resting, feeding, mating, nursing, traveling) using protocols consistent with FWC guidelines. In addition, the flight path is tracked on a Global Positioning System (GPS) for reference later. The data from the aerial survey results is maintained in a Geographic Information System (GIS) database. In addition, opportunistic sightings by Miami-Dade County staff and the public are recorded and maintained in the GIS database. Using the GIS data, maps may be produced indicating locations where manatees have been sighted using any or all of the data.

Manatee aerial survey results vary greatly by season, from year to year, and by preceding weather conditions. Counts vary widely depending on weather conditions, water clarity, time of day, flight route, and other factors, as well as on number of animals actually present.

However, composited data collected repeatedly over a long period provides information on preferred habitats (those used most frequently and by the greatest number of individuals), sites where larger numbers of animals aggregate in winter, and locations where sensitive behaviors occur repeatedly.

Manatees occur year around, but are most abundant from November through April, with highest counts occurring in January or February during the coldest winters, when as many as 391 were recorded on a single day in 2015. In summer, manatees disperse throughout their range along the Atlantic coast, with typical counts in Miami-Dade County averaging 40 (Figure 4).

Manatees feed consistently in seagrass beds in Dumfoundling Bay, north Biscayne Bay (especially in the basin north of Julia Tuttle Causeway), near the Miami River and west of Virginia Key, near the mouth of Coral Gables Waterway, and nearshore waters of Black Point (Figure 3).

Cow-calf pairs are commonly observed in the same frequently used habitats described above: tributaries, north Biscayne Bay seagrass beds, and seagrass near canal mouths (Figure 15). Sensitive behavior, such as nursing of calves or mating, has been recorded in areas less likely to be disturbed by human activity, such as protected basins, and remote canals and grass beds.

Aggregated data from 4,016 aerial surveys conducted from 1996-2023 were analyzed to determine the relative density of manatees per area of water per survey. This type of graphic analysis synthesizes both frequency of observations and number of individual manatees sighted. Results for all areas where manatees have been observed were sorted into five equivalent categories. Areas

that were surveyed, but where no manatees were ever observed are also displayed. As suggested by other more simplistic data depictions, the spatial analysis of relative density shows that manatees most heavily use all tributaries and canals, north Biscayne Bay seagrass beds, and nearshore seagrass beds adjoining canals (Figure 3).

The overall spatial distribution of the animals has not changed since the 1995 MPP was approved. Since that time, maximum (winter season) annual counts have varied widely but have not shown an increasing trend over time. Minimum (warmer seasons) counts have shown a small increase over time.

Manatee photo-identification is a non-invasive research technique that uses the unique pattern of scars and mutilations on a manatee's body and tail fluke to identify individual animals over time. The scars are usually the result of encounters with boats, but they can also be caused by entanglement in fishing gear, cold-stress lesions, and injury caused by infections. This research is conducted through a partnership between FWC, USGS, and Mote Marine Laboratory. Partners work collaboratively to photograph Florida manatees throughout their range, process images, identify manatees, and manage an integrated sightings database, known as the Manatee Individual Photo-Identification System (MIPS). MIPS provides the individual life histories currently used to estimate key population parameters for modeling manatee population dynamics for state and federal population assessments. The records in MIPS provide insights into manatee movements, site fidelity (i.e., the tendency to return to the same location year after year), adult survival and reproductive rates, and reproductive parameters such as calving intervals (time between births) and length of calf dependency. Staff from Miami-Dade County and other organizations play an important role by contributing manatee photographs for integration into MIPS.

In December of 2015 and 2016, FWC conducted its second statewide Florida manatee abundance survey. Surveys were conducted December 1–4th, the 7th and 9th, 2015 on Florida's west coast and December 5–8th and 12th, 2016 on the east coast. FWC's best estimate of statewide abundance for the 2015-2016 period is 8,810 with 95% probability (Bayesian credible interval or CI) that the real abundance is between 7,520 and 10,280 manatees. The best estimate for Florida's west coast was 4,810 (CI: 3,820–6,010) and 4,000 (CI: 3,240–4,910) for the east coast.

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, such as satellite-linked or radio tags, allow for precise individual manatee movements to be collected over a specific amount of time. This information also contributes to the understanding of distribution or preferred sites and provides insight concerning travel patterns. Manatees are also followed through ongoing year-round satellite (since 1986) and radio tracking (since 1978) of tagged animals conducted by USFWS (O'Shea et al., 1990). Telemetry data

collected in a study of 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. This telemetry data provided information about general year-round manatee usage of Miami-Dade County waterways, with subsequent research efforts serving to further inform agencies' understanding of manatee behavior, movements, and habitat requirements.

Tracking of tagged or scarred manatees has documented that manatees move into and among tributaries, for resting and freshwater, and move to nearby seagrass beds to feed. These travel patterns involve crossing or overlap with major navigation channels, including the ICW Waterway and federal channels.

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.

Photo Identification/Mark Recapture Studies

Photo identification of manatees is a non-invasive means of tracking individual animals over time. Researchers use the unique markings on each individual caused by collisions with vessels to identify individuals. Through a collaboration between the USGS, FWC, and Mote Marine Laboratory, the Manatee Individual Photo Identification System, known as "MIPS", is a catalog comprised of photographs with uniquely-scarred individuals. Upon death, unique markings can be evaluated against known animals cataloged in MIPS and some life history information can be derived.

The major winter aggregation sites are industrial warm water effluents, primarily at coastal power plants where operations can be affected by economic and regulatory changes. The primary sites on the Atlantic Coast that have been included in photo identification studies are in Brevard County, Riviera Beach, Fort Lauderdale, and Miami.

Seasonal Patterns

During the coldest periods, manatees aggregate in larger numbers in rivers and canals, where water temperatures remain a few degrees warmer due to seepage of ground water. They are recorded throughout the tributaries, traveling to and from resting areas, with the highest winter counts in

upstream reaches or basins. The highest aerial survey counts have been recorded in the Coral Gables Waterway, Miami River, and Little River, with smaller aggregations noted in Black Creek and Biscayne Canals (Figure 4). An increasing number of manatees have been documented near the southern extent of the cooling canal system at FPL's Turkey Point facility in south Biscayne Bay. Manatees continue to aggregate in shallow seagrass beds west of Virginia Key. The study of subpopulations in each region of the state indicate that individuals largely return to the same winter warm-water sites.

2.3 Aggregation Areas in Miami-Dade County

Per the USFWS Manatee Recovery Plan (USFWS-MRP), protecting winter aggregation areas has been a management priority since 1978. The USFWS-MRP identifies four major winter aggregation sites in Miami-Dade County: Little River, Coral Gables Waterway, Palmer Lake, and Black Creek Canal. Despite also being areas with relatively intense use by humans and highly altered habitat, each area has aggregations between 25 and 100 animals. Biologists have noted that the animals historically brought their young to these areas where warmer water can be found and subsequent generations tend to use the same areas. Manatees are observed in these areas most frequently and at the highest densities between November and April.

In particular, the portion of the Little River immediately downstream of the salinity control structure is a consistent manatee gathering place during the winter months. Manatees drink fresh water which leaks through the structure. A low bridge prevents most boats from entering this area; however, the site is a popular fishing spot for anglers.

Another manatee aggregation site is located in the north portion of the Black Point marina basin and the portion of Black Creek Canal (C-1 canal) adjacent to the S-21 water control structure. The Miami-Dade County Park, Recreation, and Open Spaces (MDC-PROS) constructed a marina in the south portion of the basin and originally had plans to expand the marina into the north portion. However, due to regular manatee usage of the area for sensitive behaviors, the marina expansion plans were abandoned. Historically, the Black Point Marina area was highly utilized by manatees for resting, socializing, nursing, and giving birth according to fishermen and manatee research biologists. However, these activities (particularly the latter) occurred in narrow canals which were filled in for marina construction. Manatees are still observed resting, socializing, and mating in the north portion of the basin and to a lesser extent in Black Creek on the downstream side of the SCS (located northeast of the basin). These areas are designated as "No Entry" as a result of vessel speed regulations approved in 1991 and boaters are prohibited from entering these areas.

A year-round freshwater aggregation area for manatees is the Sky Lake and Little Sky Lake system located north of NE 183 Street and east of I-95. Manatees have been observed feeding on

freshwater vegetation, which occurs in both lakes, on most aerial surveys conducted by RER-DERM.

The Bill Sadowski Critical Wildlife Area, located on the northwest side of Virginia Key and adjacent to the Port of Miami, it is one of only a handful of marine CWA designated by the FWC. Established in the 1980s to protect shore and water bird roost and rookery habitat, the protection was expanded to include protection for seagrasses and manatees. The boundaries of the CWA are comprised of approximately 700 acres of submerged lands, and is managed through an agreement between the City of Miami, owner of the submerged lands, and the FWC (Figure 16). Human activity is strictly prohibited. This area contains extensive seagrass beds and except for the county's sewage treatment plant, the adjacent upland area is undeveloped and hosts large undisturbed mangrove stands with mangrove islands located within it.

Manatee Rescue Information

FWC staff respond to calls to verify and attend to sick, injured, or dead manatees throughout the county in partnership with FDEP, Marine Animal Rescue Society, Miami-Dade County and other organizations that assist with the rescues, rehabilitation and carcass recoveries.

Summary

Based upon aerial survey, telemetry, and manatee mortality data collected, the following conclusions can be made about manatee activity in Miami-Dade County:

- Manatees undergo a seasonal migration, and are approximately 5 times more abundant in Miami-Dade in winter months than in summer.
- Manatee densities and frequency of occurrence are greatest in tributaries and north Biscayne Bay.
- Manatees aggregate in winter in canals and rivers, particularly Little River, the Miami River and its tributaries, Palmer Lake, Black Creek Canal, and the Coral Gables Waterway. They also occur in higher numbers in seagrass beds adjoining the major tributaries and near Virginia Key.
- Manatees move among tributaries and grass beds, particularly north of Rickenbacker Causeway, and may travel within or cross major navigation channels such as the Intracoastal Waterway and federal channels in the Port of Miami and Miami River.

2.4 Manatee Mortality

Manatee carcass numbers have increased Statewide over time (with added peaks during Unusual Mortality Events). It is no longer feasible nor necessary to necropsy nearly every carcass reported in Florida. In February 2021, the FWC implemented newly developed protocols for manatee carcass recovery and case selection for necropsy. A larger proportion of carcasses are not fully necropsied and therefore increases or decreases of known cause numbers over the years may not be a true change. The below carcass data is confirmed by FWC's Fish and Wildlife Research Institute (1974-2021).

The average number of deaths from all causes combined within Miami-Dade County per year over the period of record increased from 6.8 per year from 1974 to 1995 (total 150), to 12.7 per year from 1996 through 2021, an increase of approximately 86.7%. Prior to the implementation of the 1995 MPP, the leading known cause of manatee death in Miami-Dade County was crushing or entrapment in flood gates. Since 1995, the leading known cause of manatee death in Miami-Dade is vessel collision (Figure 10). It is understood that manatee carcasses may drift after death, or that in some cases injured animals may be able to move from the location of injury prior to dying. However, distribution of carcass recovery locations still provides the best available frame of reference for evaluating geographic patterns related to human impacts on manatees.

Water Control Structure Mortalities (Figure 11)

From 1974-2021 there have been 83 manatee deaths attributed to Flood Gates and Navigational Locks in Miami-Dade County. Out of these, 34 mortalities were post-implementation of the 1995 Miami-Dade Manatee Protection Plan which represents a slight decrease in yearly mortality averages from 1.5 per year (1974-1995) to 1.3 per year (1995-2021). The implementation of Manatee Protection Systems by the South Florida Water Management District including Piezoelectric Detectors (PEDs) which utilize pressure sensors to prevent crushing injuries, and manatee exclusion devices, such as grating of accessible culverts and pipes that could entrap manatees, have contributed to the safeguarding of structures for manatees.

Watercraft Mortalities

The carcasses of manatees killed by watercraft collisions have been collected most frequently in north Biscayne Bay and its tributaries, both prior to and after adoption of the 1995 MPP. Although it is not possible to determine exactly what vessel struck a manatee, FWC has developed forensic methods for identification of manatees killed by large propeller wounds, or by extensive blunt trauma from large vessel crushing. Necropsy reports and other studies by FWC pathologists indicate that carcasses exhibiting evidence of large vessel injury have been collected within north central Biscayne Bay, in the general vicinity of the Port of Miami and Miami River.

A comparison of the annual rate of vessel-related deaths from before approval of the 1995 MPP to the rate after approval indicates that the absolute number of deaths per year has increased (Figure 12). From 1974 through 1995, 29 manatees killed by vessels were recovered county-wide, an average rate of 1.3 per year. From 1974 through 2023, 95 manatees killed by vessels have been recovered, an average rate of 2.2 per year, and increase of approximately 69%. Vessel-related death is increasing at a higher rate than all causes of mortality combined.

Spatial analysis of vessel-related mortality indicates that more than 60% of all carcasses associated with this cause of death from 1995 to present were recovered within a 5-mile radius of the lower Miami River, as compared to 45% prior to 1995. The region with the second highest relative amount of manatee carcasses from vessel collisions is the area within 5 miles of Haulover Inlet; however, percentages improved from 41% prior to 1995 to approximately 18% after. Approximately 11% of manatee carcasses have been recovered within 5 miles of Coral Gables. Approximately 7% have been recovered within 5 miles of south Biscayne Bay canals. There are also some cases of vessel-related manatee death in freshwater lakes and portions of the canal network that are accessible to small boats, including the upper C-9 canal and lakes, Biscayne Canal, C-4 canal and Blue Lagoon.

Out of the total 481 manatee mortalities recorded in Miami-Dade County during the period of 1974-2021, 92 of these had the cause of death attributed to watercraft. Watercraft vessel collisions with manatees can cause both sharp and blunt force trauma, and either kind of injury can result in death. During the period 1974-1995 29 manatees were killed by watercraft (average of 1.3 per year), and between 1996 and 2021 63 manatees were killed by watercraft collisions (average of 2.3 per year). An annual increase in watercraft-related mortalities has been a trend observed Statewide since before 1995.

A greater number of manatee carcasses killed by vessel collision have been collected from the navigable tidal portions of Miami River and its tributaries, Tamiami Canal and Comfort Canal, than any other tidal canal or tributary system in Miami-Dade County. Of the 92 recorded watercraft mortalities, 51 took place within a 5-mile radius of the downtown area (55%).

Other Human Related Mortalities

While watercraft-related mortality data may provide an indication of an obvious and severe threat, numerous other factors including the future loss of warm water habitat, reductions in spring flows, and catastrophic natural events (including red tide) may also impact the long-term survival of the Florida manatee (FWC, 2007).

Summary of Manatee Mortalities in Miami Dade County

- Watercraft collisions are the leading known cause of manatee death due to human impact in Miami-Dade County, followed by water control structure deaths. The number of manatees killed in vessel collisions within Miami-Dade County has steadily increased over time (1974-2021).
- There has been a decrease in manatee deaths from water control structures in Miami-Dade and Manatee Protection Systems installed at more structures by the South Florida Water Management District.
- The relatively greatest density of carcasses killed by vessel collision is in a 5-mile radius of the downtown Miami area, including the Miami River, its tributaries, and waters near the Port of Miami. This area also includes a number of carcasses with evidence of large vessel trauma.
- Manatee mortalities within Miami-Dade County occur during all seasons and are affected by the number of manatees present as well as the level of human activities.

2.5 Boat Activity in Miami-Dade County

Boating activity in Miami-Dade County 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.

In 2016, the total number of registered vessels in the state of Florida was 931,450. Miami-Dade County had approximately 47,000 registered vessels in 1995, increasing steadily to approximately 74,622 by 2021; making it the leading county in the state based on vessel registrations. (Source: Florida Department of Motor Vehicle reports). The majority of these vessels, approximately 75 to 80%, are 26’ or less in length, are generally kept on trailers and launched at boat ramps.

The following types of data specific to Miami-Dade County waters have been compiled, with an emphasis on comparison of data considered for the development of the 1995 MPP, to the more recent or current information:

- Inventory of marine facilities with operating permits (including residential and commercial marinas, dry storage facilities, boatyards, ship terminals, and other multifamily-docking facilities), and assessment of changes that have occurred between 1995 and 2008.
- Inventory of public ramps, and data on use of county-owned ramps and dry storage facilities.

- Boating activity study, identifying seasonal variations in boat patterns, major destinations, types of boats and rates of compliance.

Boat Facility Inventory

Marinas and commercial and industrial marine facilities are concentrated along shorelines, canals, and rivers north of the Coral Gables Waterway (Appendix A). This is largely related to historic patterns of land use and development. South of Coral Gables, there are few private residential marinas, several large public marinas operated by Miami-Dade County, and two industrial facilities located in canals or basins. Most of the remaining south Biscayne Bay shoreline consists of near pristine mangrove wetlands that constitute the landward boundary of Biscayne National Park.

Residential marinas with 10 or more slips, and other facilities where more than half the vessels are commercial, must obtain an annual operating permit from Miami-Dade County RER-DERM. The operating permit primarily addresses best management practices for minimizing pollution; however, the operating permit files provide information that can be useful in creating an inventory of such facilities and the number of wet and dry slips requested for use by the applicant. In 2024, based upon available records in permit files, there were 246 facilities with 15,288 slips holding valid operating permits. Sixty-five, or 26%, of these facilities are located within the Miami River and its tributaries (Tamiami Canal, Comfort Canal, Wagner Creek).

When the 1995 MPP was approved, there were 228 facilities countywide with 12,412 slips holding valid operating permits. Although the total number of facilities decreased over time, the number of slips reported at the permitted sites increased by 735. This is a consequence of expansion or consolidation of facilities at some locations. These figures do not include facilities that are or were operating without permits, or those smaller facilities that are not required to have permits. It is important to note that some data referenced in the 1995 MPP was based on phone surveys and permitting tracking has vastly improved.

The majority of sites that had some type of facility operating in 1995 continued to have a facility operating in 2008, according to the boating survey. A few facilities are currently operating without the required permit. Due to land use changes, some large wet or dry marinas in north Miami-Dade and some commercial or industrial facilities in the Miami River are no longer in operation. However, some new facilities have also been established since 1995 (Appendix A).

In the Miami River and its tributaries some sites that had commercial or industrial marine facilities in 1995 no longer have a marine facility of any type. Facilities with operating permits decreased from 76 in 1995 to 62 in 2008. However, the number of slips reported in the operating permits for the Miami River and its tributaries increased over the time period from 1,157 in 1995 to 1,210 in 2008. This appears to be a result of consolidation or expansion of facilities at some locations, and

historically operating facilities obtaining the permit, which offset losses. A count of vessels visible on aerial photos of the Miami River and its tributaries also exhibits an increasing trend in number of vessels. New or expanded public marinas have been constructed or are undergoing development at Haulover and in the Dinner Key area, and new slips have been authorized at numerous multifamily or commercial sites in Miami-Dade County.

A list of existing marine facilities and associated boat slip information obtained from the MOP program is found in **Appendix A**. Inclusion on this list or any other list of existing marine facilities shall not be interpreted to mean that such location shall be considered an existing marine facility in the future, as any such determination would be made on a case by case basis based on the facts at the time.

Table 1. Public Boat Ramps in Tidal Waters of Miami-Dade County, Florida and Number of Marked Boat Trailer Parking Spaces at Each Ramp

Ramp Name	County or City Facilities	# of Trailer Parking Spaces	Ramp Location
1. Haulover Beach Park* (county)	County	35	10800 Collins Avenue, Sunny Isles
2. Pelican Harbor (county)	County	125	1275 NE 79 Street, Miami
3. Legion Park (City of Miami)	City of Miami	17	6447 NE 7 Avenue, Miami
4. Morningside Park (City of Miami)	City of Miami	21	750 NE 55 Terrace, Miami
5. Island View Park (City of Miami Beach)	City of Miami Beach	11	Venetian Causeway Miami Beach
6. Watson Island (City of Miami)	City of Miami	44	MacArthur Causeway, Miami Beach
7. Curtis Park (City of Miami)	City of Miami	12	1901 NW 24 Avenue, Miami River
8. Seminole (City of Miami)	City of Miami	47	Dinner Key Marina, Coconut Grove
9. Crandon Park* (County)	County	212	4000 Crandon Blvd, Key Biscayne
10. Matheson Hammock Park (County)	County	210	9610 Old Cutler Road, Coral Gables
11. Black Point Park (County)	County	180	24755 SW 87 Ave, Homestead
12. Homestead Bayfront Park (County)	County	178	9698 N. Canal Drive, Homestead
13. Miami Marine Stadium	City of Miami	75	3501 Rickenbacker Causeway, Miami

Figure 6. Locations of public boat ramps in tidal waters of Miami-Dade County.

*Public ramps are operated primarily by Miami-Dade County Parks, Recreation, and Open Spaces Department, and by the City of Miami. A small facility is operated by the City of Miami Beach. Since the 1995 MPP was approved, public ramps at Virginia Key and Dinner Key (Verrick Gym site) have been closed or restricted.

Miami-Dade Boater Traffic Study

Mote Marine Laboratory updated boating activity data by conducting a study to provide information on volumes and types of boats, seasonal patterns in boating activity, traffic routes, and speed or level of compliance with regulations. The study included 20 aerial surveys of coastal waters, including weekdays, weekends and a holiday over a one-year period. Four fixed-point ground-based sites were selected for intensive study of traffic pattern and compliance, with each site surveyed eight times. The following information is directly drawn from Mote Marine Laboratory's final report, "Recreational Boating Activity in Miami-Dade County", Jay Gorzelany, Principal Scientist, June 2009.

A total of 21,252 vessels in-use were surveyed and evaluated, including 11,809 observations from aerial surveys and 9,443 observations from fixed point surveys. The amount of boat traffic observed was highly variable among aerial survey flights, ranging from as few as 113 vessels in-use to as many as 1,648 vessels in-use during individual flights. Boat traffic also increased significantly on weekends with a weekend / weekday ratio of 4.81–1 - the highest ratio observed in any Florida county.

Vessel composition in Miami-Dade County was similar to other east coast Florida counties. While small open motorboats 16-25 feet in length were the most common vessel type, a relatively high proportion of larger vessels (i.e. vessels greater than 25 feet), more typical in east coast counties, was observed. A relatively high proportion of commercial vessels was also observed. A higher proportion of commercial vessel traffic was observed on weekdays, primarily due to large increases in recreational traffic observed on weekends. The overall spatial distribution of vessels in Miami-Dade County shows numerous areas of aggregation, including the main boating channels in northern Biscayne Bay, travel corridors to/from the Atlantic Ocean along the various tidal inlets, the coastal waters west of both Miami Beach and Key Biscayne, and the coastal waters inside Sands Key and Elliot Key, including Sands Cut (Figure 13). Common boating travel routes can also be seen near Black Point, Bayfront Park and along the ICW in south Biscayne Bay (Figure 13).

High concentrations of higher-speed traffic were observed throughout northern Miami-Dade County, particularly along portions of the ICW, the Port of Miami, Government Cut, and Miami Beach (Figure 14). Lower concentrations of vessel traffic were consistently observed throughout open water areas in lower Biscayne Bay. Though no clear seasonal pattern was observed, higher levels of recreational boat use were generally observed in the spring. The abundance and distribution of recreational boat use in coastal waters can be influenced by a variety of factors, including the time of day, weather conditions, wind speed and direction, air and water temperature, and in some cases, tide phase. Boating activity may also be influenced by weather advisories and forecasts on any given day.

Lower overall densities of boat traffic throughout much of lower Biscayne Bay (all categories) may be a function of both lower levels of boat use and the sheer size of the waterway (portions of

lower Biscayne Bay are more than 10 nautical miles wide). Boating access points such as Black Point Marina and Bayfront Park can be identified by slightly higher levels of boat density; however, boat traffic quickly becomes dispersed throughout lower Biscayne Bay. While management issues may still occur on a smaller scale at places such as Black Point and Bayfront Park, overall it does not appear that significant issues related to boat traffic abundance or areas of congestion occur in lower Biscayne Bay.

It is anticipated that the areas that require the most management and enforcement will have; 1) high numbers of powerboats in use, 2) high densities of powerboats relative to available water area, and 3) a significant number of boats traveling at higher speeds. Areas which meet these criteria are primarily located in northern Miami-Dade County, including the Downtown Miami area, the Intracoastal Waterway immediately north and south of the Miami River, the Port of Miami including Government Cut, and the Intracoastal Waterway immediately north and south of Bakers Haulover Inlet. However, this is not to say that management is not needed in other areas as well.

Compliance Studies by Mote

Mote Marine Laboratory updated boating activity data by conducting a study to provide information on volumes and types of boats, seasonal patterns in boating activity, traffic routes, and speed or level of compliance with regulations.

Aerial survey data indicated that regulatory zones in Miami-Dade County may be effective in reducing overall boat speeds in many areas, however observed speeds may still be inconsistent with posted regulatory zones (non-compliant). This was observed in particular in the Downtown Miami area near the entrance to the Miami River, along portions of Key Biscayne, and along the outer portion of the Black Point channel.

Boater compliance with boat speeds in Miami-Dade County was significantly related to vessel size and type. In general, levels of compliance increased with increasing vessel size and levels of blatant non-compliance increased with decreasing vessel size (Figure 7). Among vessel types, personal watercraft had the lowest levels of compliance and highest levels of blatant non-compliance (Figure 7). These trends were consistent with previous compliance studies conducted in other Florida counties.

Boater compliance varied significantly among both survey sites and regulatory zones. The proportion of vessels in compliance with posted speed zones was as high as 69% at Haulover Park, and as low as 14% along the Black Point channel (Figure 7). Compared with previous studies, boater compliance at several fixed-point locations in Miami-Dade County was relatively low.

Lowest levels of compliance were typically observed in idle speed zones. While determining the relative proportion of compliant vessels is important, the absolute number of high-speed vessels traveling through a regulatory zone should also be considered. For example, while percentages of

compliance at the Haulover Park survey site were considered relatively high, the high level of traffic through the area translated into more high-speed boat traffic than was observed at other lower-compliance areas with less boat traffic.

Conclusions

The following conclusions can be made from the boat activity data in the 2009 Report:

- Marine facilities with current operating permits are concentrated north of Coral Gables.
- Although there have been fluctuations in the numbers of facilities since 1995, the total number of slips at facilities with current operating permits has increased. Reductions in the number of commercial and industrial facilities are associated with land use changes and redevelopment of upland parcels in the Aventura area and some sites on the Miami River.
- Number of vessels observed on the Miami River and number of slips at facilities with current operating permits has increased since 1995.
- RER-DERM has authorized construction of more than 800 new slips at multi-slip facilities and reconstruction of more than 3,000 slips since 1995 (these figures do not include single family residential docks).
- The number of boat ramps has decreased since the 1995 MPP was approved. County boat ramp use generally peaks in spring and summer, and is much greater on weekends and holidays than on weekdays. County ramps alone generated more than 130,000 launches in 2007.
- Boat racks at two locations generated more than 7,000 launches.
- Boats travel to ocean inlets and major channels for offshore access, anchorages at Haulover, Key Biscayne and Elliott Key, and open water in south Biscayne Bay.
- In north Biscayne Bay, vessel traffic is densest within marked navigation channels.
- Vessel speed zones appear to be effective in reducing vessel speed. However, rate of compliance with posted vessel speed zones was poor compared to other counties where similar studies have occurred.
- Compliance rate generally increased with vessel size. Personal watercraft had the lowest rate of compliance and sailboats had the greatest rate of compliance. Commercial and recreational vessels compliance rates were similar.
- Poorest compliance occurred in Idle Speed Zones, where vessels traveling at Slow Speed are considered non-compliant.

- By site, poorest compliance occurred in the outer channel of Black Point Marina (14%), followed by the mouth of Miami River channel (22%). The site with the best percentage of compliance was at Haulover (69%).

Boating Accident Statistics

The FWC Division of Law Enforcement compiles an annual report on boating accident statistics in Florida. These reports include data on accident causes, human fatalities and injuries, property damage costs, vessel class, type of water body, season and time of day accidents, location and frequency by county, operator and victim demographics, and citations. Additional details are provided on the ten Florida counties with the highest number of accidents each year. These reports are available at the following FWC web site: http://myfwc.com/boating/safety-education/accidents/

In recent years, there have been more vessel accidents in Florida than in other states. The largest proportion of accident type statewide is collision between vessels or a vessel and a fixed object, and leading cause is operator inattention. The majority of accidents statewide are not within the manatee protection zones. The single largest cause of human fatalities in boating accidents is ejection or falls overboard. The frequency of accidents involving PWCs is greater than what would be expected based upon their proportion of all registered vessels. Over the period of 2002 to 2023, Miami-Dade has been among the top 10 counties with the highest number of accidents, and in 2023, ranked in second place, behind Monroe County. Accidents in 2023 involved, 95 vessels open motorboats or cabin motorboats, and 27% were PWC's. The location of accidents in Miami-Dade in 2023 is shown in Figure 17.

Accidents and fatalities have occurred in most waters, including open ocean or offshore areas. However, the highest density of accidents occurs in waters near the Intracoastal Waterway to Haulover Inlet in north Miami-Dade, and in inshore waters and channels from Venetian Causeway to the vicinity of Rickenbacker Causeway, including the downtown area. These areas coincide with areas identified in the 2009 boating activity study (Gorzelany, 2009) as those with high numbers of powerboats in use, high densities of boats related to water area, and a significant number of boats travelling at higher speeds.

3. Manatee Habitat

A major threat to Florida manatees is loss and degradation of habitat as a result of coastal development. The human population in Florida is increasing at a rate of more than 800 people per day (U.S. Census Bureau 2023). Much of the associated development has occurred along coastal waterways and rivers used by manatees. Habitat is degraded by siltation, nutrient enrichment, other forms of water pollution, and direct removal or filling of wetlands. This degradation results in a

reduction of manatee food supplies, elimination of natural secluded areas for mating, giving birth and nursing, and a general reduction in the capacity of coastal and river ecosystems to support manatees (Marine Mammal Commission, 1992). The quality of the water and aquatic vegetation is poor in some coastal areas and is unknown in many freshwater areas used by manatees.

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 utilize a variety of habitat types, including grassbeds, dredged basins, dredged channels, shoals/bars, tidal inlets, and open bays (Koelsch, 1997). 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

Habitat may also include quiet, protected areas or travel corridors. This section describes the availability of the three main habitat features, submerged aquatic vegetation, fresh water and warm water in winter months, within the County, and discusses the existing and ongoing measures that have been implemented to protect manatee habitat.

3.1 Submerged and Emergent Vegetation

Seagrass is the primary source of food for manatees and provides nurseries for a variety of aquatic life, helps to prevent erosion, and reduces turbidity by trapping sediment. Fish and insects forage and avoid predation within the cover of the grass beds (Batzer and Wissinger, 1996; Jordan, et al., 1997). Commercial and recreational fisheries are sustained by healthy submerged aquatic vegetation (SAV) habitat (Watkins, 1995).

In Biscayne Bay, where significant dredging has occurred, sunlight penetration may be reduced because of increased color, turbidity, pollution from disturbance of soils and run-off from upland development. Deteriorating water quality has been shown to cause a reduction in SAV beds which leads to erosion and further deterioration of water clarity.

However, portions of Dumfoundling Bay and portions of Biscayne Bay in Miami-Dade County contain seagrass beds regularly used by manatees. More specifically, those seagrass beds where manatees are most frequently observed feeding during the winter season, are located:

- on either side of the ICW channel in Dumfoundling Bay;

- in north Biscayne Bay between 79th Street Causeway and Julia Tuttle Causeway, and between the Port of Miami and Rickenbacker Causeway;
- in south Biscayne Bay along the mainland shoreline between Rickenbacker Causeway and Coral Gables Waterway, and south of the marked boat channel to Black Creek (which leads to Black Point Marina).

The Miami-Dade County Regulatory and Economic Resources (RER), Division of Environmental Resources Management (DERM) developed a map showing the locations and species of seagrasses and other bottom communities in tidal waters of the county (Figure 5). Mitigation for the removal of seagrass by transplanting seagrass into areas where it does not occur has generally been unsuccessful. The placement of limestone riprap boulders in the water is sometimes used to mitigate for seagrass loss. Although the boulders provide habitat for marine organisms (including algae) and fish, they do not provide a preferred food source for manatees, and therefore, to mitigate impacts to seagrass, riprap would not be preferred mitigation in areas used by manatees.

Long-term monitoring of submerged aquatic vegetation (SAV) is essential to detect changes over time. 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 Miami-Dade County waterways was collected by RER-DERM and published in the 2025 Biscayne Bay Report Card (https://experience.arcgis.com/experience/02ea7212988b4d6c856279503d991e01/page/Habitat-Monitoring).

Seagrass beds occur throughout Biscayne Bay. In north Biscayne Bay, some seagrass habitat was destroyed in the past by dredging for construction of navigation channels or as a source of fill for land development. However, even in these areas productive seagrass beds dominate most basins, particularly south of 79th Street Causeway, and nearshore areas (Figure 18). As noted above, manatees feed in many of these shallow seagrass beds, particularly in north Biscayne Bay and along the western shoreline near tributaries.

3.2 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). Man-made freshwater sources include storm water discharge points and either intentional or unintentional freshwater discharge from individual homeowners or businesses. Continuous freshwater discharges often serve as attractants to manatees.

Manatees often take advantage of the stratification of freshwater and saltwater by skimming freshwater off the surface in estuarine, rivers and coastal canals (Aragones et al., 2012). Other

sources of freshwater in Miami-Dade County include the many miles of freshwater canals which have storm water outfalls, and freshwater discharges from individual homeowners or businesses.

Manatees utilize freshwater canal systems in Miami-Dade County, particularly during warm weather. They travel through open flood gates and culverts to access these areas. Manatees are observed at flood gates year-round but aggregate at these locations in large numbers during cool weather. Those flood gates where manatees are most frequently observed are located on Snake Creek, Biscayne Canal, Little River, Miami River, Tamiami Canal and Black Creek. Another popular manatee fresh water source is a storm water outfall structure on a canal connected to Coral Gables Waterway.

3.3 Warm-Water Habitat

Manatees seek out warm water areas whenever the water temperature drops below about 20 º Celsius (68º Fahrenheit) (FWC USFWS, 2020). In south Biscayne Bay, they generally swim upstream into rivers and canals. Larger than average numbers of manatees aggregate in the Coral Gables Waterway following severe cold fronts due to warm groundwater seep. These protected deeper waters tend to stay warmer than the open shallow bay waters. In north Biscayne Bay, the manatees may do likewise (high numbers of animals have been noted in the upper Miami River and Little River during cold weather). Other sources of warm water include passive thermal basins such as in Biscayne Canal (canal structure 'S28') and in the Black Point Park Marina basin.

3.4 Travel Corridors

The primary travel corridor used by manatees in north Miami-Dade County is the ICW channel which is also a corridor for all boats travelling between Miami-Dade and Broward Counties. Manatees use the generally narrow ICW channel between the Broward County line and the Haulover Cut area of Biscayne Bay for travel. Although Dumfoundling Bay is wide, manatees frequently linger along the edges of the ICW channel in this area to feed in adjacent seagrass-covered shoals.

In the vicinity of Haulover Cut, the water depth outside of the channel is adequate for manatee travel and the animals often swim close to shore in such areas. Manatee sighting data indicate that the animals use the west (mainland) side of Biscayne Bay much more than the east (Miami Beach) side for travel. Travel in a north or south direction also occurs along the west bay shoreline in areas between the Port of Miami and Chicken Key. Although north-south travel surely occurs south of Chicken Key, it has been virtually unobserved according to available data, and routes are unknown. During the winter, east/west travel patterns occur daily in the Miami-Dade County rivers and canals. These same travel patterns have also been observed during the summer.

In addition, during spring and summer months when flood gates are opened, some manatees swim upstream into the freshwater canals and lakes and may remain in those areas throughout the summer. During warm weather, manatees may be regularly observed feeding on vegetation in the interconnected canals, lagoons and lakes, such as Sky Lake and Blue Lagoon.

Recently, more frequently reported manatee sightings in the western portions of the artificially created freshwater canal system may be indicating a shift in habitat usage. However, there is no measurable scientific data to support the possibility that this could signify a change. In fact, the more frequent reports may be related to an increased public awareness of manatees.

3.5 Manatee Habitat Protection

The Miami-Dade County RER-DERM initiated the Biscayne Bay Restoration and Enhancement Program in 1979 to maintain and improve the biological, recreational and aesthetic values of the Bay. Since its inception, projects including water and sediment quality monitoring, mangrove and other habitat restoration, pollution control enforcement, fisheries enhancement, and public awareness activities. These projects are expected to improve water clarity by reducing erosion and associated turbidity, provide habitat for marine life, and contribute to the marine food web. The program has been funded by Miami-Dade County, the Florida Department of Environmental Protection, the Florida Inland Navigation District and several other local and state agencies.

As designated by USFWS, critical manatee habitat in Miami-Dade County includes all waters of Card and Barnes Sounds, Manatee Bay, Biscayne Bay, and "all adjoining and connected lakes, rivers, canals, and waterways from the southern tip of Key Biscayne northward and including Maule Lake" (USFWS, 1991). Per USFWS, designated critical habitat are the specific areas within the geographic area, occupied by the species at the time it was listed, that contain the physical or biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection. Designation of federal critical habitat does not mean that there cannot be other undesignated areas that also are important. Manmade structures not necessary to the normal needs or survival of the manatee are excluded in these areas. Protection of existing manatee habitat is essential to the survival of the species. Many of the areas historically used by manatees in Miami-Dade County have been substantially altered by dredge and fill activities.

Essential Manatee Habitat is defined as any land or water area constituting elements necessary to the survival and recovery of the manatee population from imperiled status which may require special management considerations and protective measures. The constituent elements include, but are not limited to*:* space for individual and population growth and for normal behavior; available food sources with adequate water depth and quality; warm and fresh water sources; sites for breeding and rearing of offspring; and habitats protected from disturbances that are representative

of the geographical and seasonal distribution of the species. Essential manatee habitat in Miami-Dade County is shown in Figure 8.

Boat facilities and dredging projects can have significant adverse impacts on seagrass habitat. During 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 seagrass beds or prevent the establishment of new seagrass 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 seagrass beds if appropriate turbidity controls are not used or if water depths are not adequate. Direct and indirect impacts to seagrass should be completely avoided when possible. This can be accomplished by designing projects to avoid and minimize their potential impacts to seagrasses. Adverse impacts to habitat should be minimized to the greatest extent practicable as required by state and federal permitting regulations. All MPP allowances, including slip density recommendations, are contingent upon and only allowable to the extent that as long as impacts to habitat have been addressed as per all applicable federal, state and local regulatory requirements in place at the time of permit application are met.

There have been very few major restoration efforts for seagrasses in Miami-Dade County outside of regulatory enforcement, permitting requirements or prop-scar restoration.

3.6 Manatee and Boat Activity Overlap Discussion

Following is a summary of some of the factors assessed to identify areas within the County where boat activity interacts with high use manatee areas. Manatees are most abundant and consistently observed in areas of north Biscayne Bay including seagrass beds, and in canals and rivers, particularly the Little River, Miami River and its tributaries and the Coral Gables Waterway. These are also locations of sensitive behavior, such as winter aggregation, feeding, or nursing of calves.

The highest number of powerboats in use, the highest densities of powerboats relative to water area, and the highest number of boats traveling at high speed are located in the Downtown Miami area, the ICW north and south of the Miami River, the Port of Miami including Government Cut, and the ICW near Haulover Inlet.

Waters in the vicinity of the Port of Miami, Miami River, and downtown are also the areas with the highest occurrence of manatee carcasses killed by vessel collisions, including large vessel impacts, and these are also the areas with highest density of currently operating marine facilities.

Manatees and vessels north of Rickenbacker Causeway may be confined to narrower waterways or dredged channels, affording less opportunity to avoid an interaction.

Therefore, highest manatee and vessel use areas overlap significantly, and coincide with the general area of highest number of manatee deaths. The risk of manatee and vessel interaction,

resulting in disturbance of sensitive behavior, injury, or death is greatest in tributaries, portions of the ICW in north Biscayne Bay, and in seagrass beds from Rickenbacker Causeway to 79th Street Causeway based simply on the concentration of both manatees and higher speed vessel traffic in these regions. Furthermore, vessels departing from north Biscayne Bay tributaries or western shorelines must travel several miles or more through the most essential manatee habitat to reach ocean inlets or other popular boating destinations.

Conversely, in deeper open waters south of Rickenbacker, vessels are generally not restricted to channels, and manatees are generally associated with nearshore areas. Once vessels depart the shallow inshore waters, interaction with manatees is unlikely. Manatees may have been observed in relatively low density in locations near boating destinations, such as popular anchorages and ocean inlets However, vessels launching near these destinations would not be required to travel miles through the most densely used manatee habitats or tributaries. They are the most preferred locations for expansion generally pursuant to state manatee protection criteria provided that dredging and/or impacts to wetland or submerged aquatic vegetation would not be needed and may require fewer or no limitations on facility types and number of berths.

Several types of vessel impact to manatees may occur. Over three quarters of the manatees that die as a result of a vessel collision, do so from blunt trauma, the impact of the hull or skeg of the boat hitting the manatee. This impact often results in broken ribs which may puncture vital organs. Another form of vessel collision mortality is from the skeg and/or propeller cutting through the flesh of the manatee, damaging vital organs or exposing the animal to infection. Manatees also may be crushed by large vessels such as freighters, between the vessel and a bulkhead or between two vessels. Manatees may suffer sublethal impacts from vessel collisions; they may be weakened and therefore more vulnerable to subsequent boat hits, flood gate crushings, cold stress, disease or other cause of death. Female manatees may no longer be able to carry a fetus full term.

In addition, manatees may be harassed by moving vessels, causing the animals to move into undesirable areas in order to avoid the boats. The animals will generally dive or otherwise move out of the path of oncoming vessels and have been observed attempting to move out of the way of vessels entering manatee occupied waters.

II. MANATEE PROTECTION PLAN: IMPLEMENTATION

Unless stated otherwise, any proposals in this portion of the Miami-Dade County Manatee Protection Plan which are not already implemented, shall be implemented upon approval of the Plan by the Florida Department of Environmental Protection and/or the Governor and Cabinet.

A. Habitat Protection

Habitat protection is critical to ensure the continued survival of the manatee. The following habitat protection measures are recommended for Miami-Dade County.

1. Habitat Areas

Seagrass Beds

Seagrass beds should continue to be protected from impacts during coastal construction projects through the RER-DERM Class I permitting process. New dredge and fill projects shall generally be prohibited in seagrass areas; mitigation will be required for any adverse seagrass impacts. Protected seagrass areas include, but are not limited to, seagrass beds in Dumfoundling Bay and Biscayne Bay between the 79th Street and Julia Tuttle Causeways, between the Port of Miami and Rickenbacker Causeway, in the Chicken Key area, and in the area of the Black Creek channel.

Fresh Water Sources

Areas adjacent to flood gates should be kept as clean of pollutants and debris as possible. Members of the public who run fresh water hoses for use by manatees in areas where people or boats may congregate shall be discouraged from doing so.

Warm Water Refuges

The construction of new artificial warm water refuges (such as power generation plants discharging warm water) which may be used by manatees, shall be prohibited due to the overall adverse impacts of such facilities. Manatees rely on the warm water discharge from power plants during cold weather, and are extremely susceptible to cold stress if the facility fails to operate for a prolonged period of time.

Aggregation Areas

Any area where manatees frequently gather to rest, play, mate, nurse, or give birth shall be protected and/or enhanced. This protection shall occur through the Comprehensive Development Master Plan, zoning codes and ordinances and habitat acquisition by federal, state and local agencies where possible (see Habitat Acquisition Areas, page 52). Such areas include but are not limited to Sky Lake, Biscayne Canal near the Miami Shores Country Club golf course, Little River west of Biscayne Boulevard, northwest Virginia Key, upstream Miami River including Palmer Lake, upstream Coral Gables Waterway, and Black Point marina basin.

Travel Corridors

The recently approved vessel speed restriction rule for Miami-Dade Count was designed to provide improved protection to important manatee habitat, including travel corridors. As the manatee vessel speed zones are property enforces, modified boating patterns are anticipated in some areas.

Manatee travel patterns are not expected to change, but these patterns shall continue to be monitored. If a change in manatee travel corridors is revealed in future manatee data, or the vessel speed zones do not provide adequate manatee protection, the Miami-Dade vessel speed restriction rule shall be altered to provide further manatee protection and/or to eliminate existing vessel speed restrictions developed solely for manatee protection, in areas no longer used by manatees.

2. Water Quality and Vegetation

Water Quality Restoration

In view of the fact that manatees heavily use several tributaries identified as being contaminated enough to violate state or county water quality standards, it is important to investigate methods to enhance and restore water quality and commence with this clean-up as soon as possible. Ongoing projects undertaken as part of the Biscayne Bay Restoration & Enhancement Program and the SWIM Program are expected to contribute to manatee protection through protection or improvement of water quality and general habitat value. Some of the areas targeted by these programs, such as the Miami River, Little River, Black Creek Canal, and Oleta River/Snake Creek Canal are regularly used by manatees. Therefore, continuing SWIM and local funding of stormwater and sanitary sewer investigation and improvements in these areas is strongly recommended. Although the specific effect of the contaminants in these waterbodies upon manatees is unknown, it is recommended that appropriate tissue samples from all manatee carcasses recovered in these waterbodies be collected and analyzed (if state of decomposition permits) for trace metals, organic chemicals or other compounds. Bioassay techniques for assessing toxicity or immune system response should be used in conjunction with tracking studies to evaluate effects of degraded water quality on manatees. If adequate funding is not available through FDEP research programs, matching contributions should be provided through SWIM or local programs. RER-DERM, the City of Miami, and state and federal agencies are currently identifying illegal discharges and sources of stormwater, surface water and sediment contamination. Once identified, efforts shall be made to address contamination problems by retrofitting storm drains and dredging contaminated sediments from the Miami River.

Shoreline stabilization and mangrove, wetland and coastal hammock restoration, are expected to improve water quality and clarity by reducing turbidity caused by erosion and resuspension present in stormwater runoff Maintaining and improving water clarity or transparency is critical for protection or enhancement of seagrass communities, particularly in portions of north Biscayne Bay that have been degraded by past dredging and filling practices. It is therefore recommended that such habitat restoration projects continue to receive funding through SWIM and complementary local programs.

Pesticide Use

Pesticides used for mosquito control or other purposes (excluding herbicides as noted below under Aquatic Plant Control) shall not be used in waterways where manatees are present. If mosquito control personnel observe a manatee during pesticide application to a specific control area, all control operations shall cease, and shall not resume until all manatees have evacuated the specific control area. Pesticide for mosquitoes shall not be applied in a greater concentration than that recommended on the pesticide container.

Aquatic Plant Control

Overgrowth of aquatic vegetation occurs during the summer in freshwater canal systems, when manatees frequently use these areas. Three types of aquatic weed control are used in Dade County. These include chemical, mechanical and biological controls. Eradication of vegetation in fresh water canal-lake systems and along canal banks shall be minimized during the period from May 1 to November 15 as feasible while maintaining flood protection. Manatees may be disturbed by equipment used in mechanical removal, and herbicides used to control vegetation may cause sublethal effects in the animals. Land-locked lakes are excluded from the following recommendations specific to manatee protection. In light of seagrass die off events and Unusual Mortality Events related to starvation in counties to the north, Miami-Dade County on County property and projects has limited the use of mechanical harvesting/removal to ensure conveyance in secondary canals while allowing food sources to persist. The County has also restricted the use of glyphosate for County properties and projects and restricted the use of herbicides in County-managed secondary canals to the maximum extent possible.

Aquatic plant removal shall be permissible in manatee habitat only as necessary to maintain flood protection, canal conveyance capacity, navigation or public safety. Plants should not be removed for aesthetic reasons. Fresh water areas where this restriction is especially important include the following waterways and all contiguous tributaries (canals and lakes): Snake Creek from NW 12 Avenue downstream to Maule Lake (including Sky Lake and Little Sky Lake), Biscayne Canal from NW 17 Avenue downstream to Biscayne Bay, Little River downstream of NW 22 Avenue, Tamiami Canal from NW 57 Avenue (including the Blue Lagoon lakes) northeastward to the flood gate, Snapper Creek from SW 62 Avenue downstream, Black Creek south of SW 232 Street, and Aerojet Canal (C-111) east of US1. These areas are primarily maintained by the SFWMD and the Miami-Dade County Public Works Department. These agencies shall be required to notify RER-DERM: a minimum of 72 hours prior to planned treatment so that a review of manatee sighting data or a survey of the area for manatees may be conducted. If emergency treatment is necessary, RER-DERM staff shall be notified as soon as possible of the job. The work shall not commence or shall halt where one or more manatees are observed within 500 feet of the treatment area. Only FDEP permitted herbicides shall be used in Miami-Dade County waterways. FDEP should not

permit the use of chemicals shown to be harmful to large herbivorous mammals, in essential manatee habitats. Chemical herbicides shall only be used by licensed applicators. Independent treatments by individuals shall be eliminated. Mechanical harvesting techniques should be used in manatee areas not maintained by government agencies.

Since adequate studies have not been conducted on the effects of any herbicides on manatees, those chemicals determined to be unsafe for other animals or humans shall not be used in areas where manatees have been sighted. The use of herbicides or any chemical treatment containing copper, should be prohibited in Miami-Dade County due to toxicity to invertebrates and copper may be harmful to manatees and other wildlife (pers. comm. Kent Smith, DNR, 1993; Thomas O'Shea, USFWS, 1994; Patrick Rose, DNR, 1992). Herbicides containing endothall or fluridone are most acceptable, if biological and mechanical controls are not feasible. If herbicides are used, they shall be applied using schedules and rates which minimize dosage and maximize effectiveness. This is best achieved by using low concentrations of herbicide in a regular program to maintain aquatic plant biomass at relatively low density. Attempts to eliminate high densities of aquatic plants over large areas are less likely to provide satisfactory results, leading to multiple treatments, greater habitat and wildlife disturbance, and high costs (pers. comm. Jackie Jordan, DNR, 1993). No chemical treatment shall exceed the recommended dosage noted on the herbicide container.

The biological controls used by the SFWMD, which include fish and insects, are not expected to impact manatees. The use of these controls is encouraged. Miami-Dade County agencies shall support research on the effects of biological controls and chemical herbicides on manatees and other wildlife.

An interagency group composed of the various entities involved in aquatic plant control in Miami-Dade County (including a representative from RER-DERM) shall meet annually to address these issues.

3. Habitat Acquisition Areas

Manatee aggregation areas need to be incorporated into the state or federal systems of refuges, parks, reserves, and preserves in order to protect the manatee and other wildlife, as well as the coastal ecosystems in which they occur. Environmental restoration and compatible human activities could be permitted in these areas.

Many of the areas in Miami-Dade County most highly utilized by manatees are owned by the state of Florida or Dade County, or are developed areas under private ownership and there are areas in Dade County frequently used by manatees that are undeveloped. The Environmentally Endangered Lands (EEL) Acquisition list includes several parcels that are frequented by manatees year-round.

The purchase of parcels by the EEL program should be encouraged. Greater protection could be afforded by public acquisition and preservation.

B. Manatee-Human Interaction

Interactions between manatees and human activities have increased dramatically in recent years causing manatees to sustain physical impact, harassment and general disruption of daily activities (pers. comm. K. Curtin, USFWS, 1992). Impacts to manatees may be reduced by the following: improved operation of or structural modifications to flood gates, vessel speed restrictions, law enforcement, expansion of sanctuaries, and the designation of critical habitat.

1. Flood Gates/Locks/Manatee Barriers

Flood Gates

A full-time position should be established at the SFWMD to organize manatee protection efforts within the agency. A backup system or device should be investigated and developed simultaneously with the development of the primary project for manatee protection from flood gates, so that the backup project could be implemented immediately if the primary project fails during testing.

The SFWMD has developed the pressure sensitive device (PSD) to sense manatees and reverse the di ection of closing flood gates. However, it is unknown if the device has been perfected. Two manatee mortalities occurred (January 1993 and January 1994) at the Little River flood gate (S-27) after the installation of a single row of pressure sensitive devices (PSDs) along one edge of the flood gate. After one modification, the PSD system at Little River was responsible for one manatee mortality (November 1994). The PSD system trigger has been modified since the November 1994 mortality, and should continue to be monitored and modified as necessary.

Preliminary tests of sonar devices suggest that it may be possible to detect manatees in the vicinity of structures, and it may further be possible to integrate the sonar into the electronic operation of gates to prevent or reverse closure on large objects in the opening. The field testing and implementation of such an integrated sonar for coastal salinity control structures should resume. It is recommended that field testing of a sonar device should begin at Little River (S-27), a site where manatees aggregate on a regular and consistent basis and where structure related mortality has most often occurred. As a related strategy, further assessment of mechanical gate reversal devices similar to the PSD should be explored by the SFWMD. Such a device would act as a final safeguard that interrupts closure of a gate on a large obstruction, such as a manatee, in the opening. Possible design concepts include but are not limited to leading edge strips, deflectors, or switches that are displaced.

A parallel fence or screening device that advances prior to gate closure might also serve in concept as a component in a mechanical fail-safe. The parallel screen would block manatees from entering the opening, but only when the gate is in a closing cycle. This temporary barrier, which would be less massive than the flood control structure and therefore easier to reverse, would have to close fully before the heavy gate could come down. The temporary parallel screen would be retracted when the structure is fully open, avoiding problems with debris blockage and habitat limitation. Parallel screen concepts should be evaluated for their utility on both the upstream and downstream sides of flood structures. Conceptual designs and specifications should be provided by the SFWMD or through a "request for proposals". Promising prototypes could also be tested at Snake Creek (S-29), Miami Canal (S-26), Tamiami Canal (S-25b), or Mowry Canal (S-20f) during 1996. Field testing could be integrated with major maintenance if this occurs prior to the target date.

It is recognized that sonar and/or mechanical reversal mechanisms will result in additional cost and that extreme malfunctions could result in excess discharge or salinity intrusion. However, these risks could be addressed through routine maintenance programs and alarms or signals that trigger computer override of default mechanisms. The successful development of one or more reversal mechanisms, which act as a "fail-safe" to protect those animals that still manage to enter a gate during closing, is necessary to achieve "zero mortality" and is considered a high priority. Redundant systems or backups may also prove to be necessary for zero mortality.

The central computer algorithms implemented in 1991 represented an important improvement in minimizing gate operations. Additional evaluation of the effectiveness of the algorithm in reducing gate oscillations is necessary. Gate operation records could be randomly selected for assessment. Further refinement of the algorithm or circuitry may be achieved by revising the time delay between sequenced opening of gates in multiple-gate structures or by modifying the default mechanism during telemetry failures. All coastal structures presently operating with manatee protection algorithms should be modified with successful designs during major maintenance. The SFWMD should provide a plan for assessing these factors, and a draft report with conclusions by July 31, 1995.

Another possible approach to minimize opening/closing cycles is the use of skimmer or slot gates, structures which permit discharge of limited volumes of water over the top of the structure instead of beneath it. A structure of this sort where a gate lowers toward the bottom of the waterway, would not pose a threat of crushing a manatee. This method of discharge is expected to provide other benefits including reduced operation and maintenance of the hydraulic gates, and improved hydroperiods. Such structures were included in the original USACOE design and were at one time installed on many gates. They have been removed from most structures which are equipped with manatee circuits due to problems with trash accumulation, vandalism, and saltwater infiltration during high tides. However, modifications of the original design could be implemented to address

these concerns, but at a substantial cost (SFWMD, 1991). This type of structure should be most heavily considered as a manatee protection solution, and should replace all structures where feasible (i.e. in low to moderate flow discharge areas).

The U.S. Army Corps of Engineers and the South Florida Water Management District conducted a study of various alternative manatee protection strategies at flood gates and navigation locks, which was published in March 1997 (U.S. Army Corps of Engineers, 1997).

Preliminary conceptual evaluation suggests that during moderate to high flow, a structure that drops toward the canal bottom would not alone provide a large enough volume discharge to meet flood protection criteria and could not reduce gate operations. Additional assessment of this approach for low to moderate flow conditions should be undertaken before dismissing the skimmer gate concept, since recent structure-related manatee deaths have occurred during periods of dry weather. SFWMD performed the study and published a report in March 1997 (US Army Corps of Engineers, 1997). They implement two different types of manatee protection systems in their structures. Selected structures with lift gates have piezo-electric strips that send a signal to the control box that will stop the closure of the gate and then lift the gate to 2.5 feet (to allow the manatee or object to pass) if an object hits the piezo-electro strip with some force. The District also implemented a lock structure with an acoustic array of sensors that can detect objects that are in proximity to the closing gate. If the acoustic sensor detects an object, then the sector gates will stop closing and the gates will open enough for a manatee to move through them.

For each manatee mortality where a salinity control structure cannot be ruled out as contributing to the death, the SFWMD shall provide FDEP with a report within 30 days of notification of the cause of mortality. Each report shall include a compilation of appropriate gate operation records and assessments, conceptual designs, prototype test results and observations, and similar documentation. The reports shall be reviewed at quarterly interagency meetings attended by at least one representative of the SFWMD, FDEP, USACOE, USFWS and RER-DERM. In addition, the gate operation records should be audited on a continuing basis at these meetings to certify that coastal structures are opening to the 2-1/2 foot criteria without excessive oscillation, or to identify any other system problems. The interagency task force shall continue to meet until all agencies are satisfied that the goal of zero manatee mortality from flood gates has been achieved. The SFWMD shall record action items and future agenda topics at the meetings which shall be distributed to all meeting participants and shall be available to the public. No management strategy should be dismissed from further consideration until adequate technical information is available for full review and involved agencies reach consensus. The SFWMD shall prepare an annual report summarizing all flood gate-related manatee mortality, and the status of the SFWMD manatee protection program. This document shall also include a summary of relevant system operations. The report shall be completed by February 1 of the following year. This report shall be available to the public and distributed to Interagency Task Force members for review at least one month

prior to being placed on the SFWMD governing board agenda for discussion. RER-DERM and the SFWMD should jointly conduct an annual public workshop in Dade County, at an appropriate facility provided by RER-DERM, to inform and receive input on manatee protection from interested members of the community.

Strategies which alter established manatee movement patterns, limit access to suitable habitat, or disturb sensitive behavior should only be considered if the strategies outlined above fail to prevent mortality. Such low priority approaches include permanent barriers and acoustic or other deterrents, and are not recommended at this time.

The SFWMD shall notify FDEP and RER-DERM prior to conducting any activities involving vessels or heavy equipment, or other work in tidal waters. The SFWMD shall apply for any permits required by state or local regulations.

Locks

Although lock structures are not present in Miami-Dade County, recent permit applications to construct locks in various parts of the state have been received by FDEP. Due to the potential threat to manatees, the construction of locks in manatee habitats, including travel corridors shall be prohibited in Miami-Dade County by the SFWMD and federal, state and local permitting agencies.

Manatee Barriers

Miami International Airport shall install and maintain permanent barriers to prevent manatees from entering the airport canal/culvert system. A design for such a barrier has been conceptually approved by the USFWS, FDEP and RER-DERM. This barrier is expected to replace a temporary manatee barrier at the airport southern tributary off of Tamiami Canal. The permanent barrier at the airport north tributary shall be modified with sheet pile or other permanent base at the existing gate sections; this is necessary to prevent manatees from entering the airport system through holes which recur in the sand-cement bag riprap which is presently used. Additional barriers or other modifications may be required if additional manatee access points into the airport system are discovered.

Miami-Dade County Aviation Department (MDAD) staff shall prepare quarterly reports describing all maintenance work to manatee barriers. These reports shall include the dates of underwater or other inspections, and any work performed, including the amount of riprap replaced. These reports shall be submitted to RER-DERM and FDEP within 30 days after the end of the quarter.

MDAD staff shall immediately contact manatee protection personnel at RER-DERM, FDEP and USFWS with manatee sightings in the airport canal system, including dead or injured manatees. DCAD Environmental Engineering Division staff shall submit manatee incident reports within 30 days of the manatee sighting to those agencies noted above. These reports shall contain the date,

time, location (including a map with location indicated) and the name and telephone number of the first person to observe the manatee. MDAD, RER-DERM and FDEP staff shall discuss the state of decomposition of any dead manatee and determine the method of carcass disposal prior to meeting onsite. If extremely decomposed, DEP may authorize RER-DERM to arrange for disposal of a carcass at the South Dade landfill. MDAD Public Works staff shall assist in carcass recovery from Miami International Airport (MIA) canals. If a manatee carcass is discovered upstream of airport manatee barriers, airport personnel shall locate the point of entry within 48 hours and have divers search for additional manatees in the vicinity. Live manatees shall be relocated by Miami Seaquarium and USFWS, FDEP, or RER-DERM staff after receiving authorization from USFWS. If manatees are not discovered, the access point shall be repaired within 48 hours after the completion of the divers' inspection.

2. Site Specific Vessel Speed Recommendations

A state rule for vessel speed restrictions for manatee protection in Dade County (Appendix B) was adopted by the Florida Governor and Cabinet on November 14, 1991. The speed zones are indicated in Appendix B. Buoys shall be maintained at year-round "No Entry" areas. Vessel and manatee usage patterns shall continue to be monitored for appropriate adjustments; this monitoring shall be funded by FDEP and Miami-Dade County.

3. Recommended Areas For High Speed Water-Related Activities

High speed (greater than 30 mph) water-related activities, other than powerboat races, should occur only in designated and unregulated areas in Dade County tidal waters (see Appendix B), and in land locked lakes, borrow pits and other waterbodies not accessible-to manatees. Two areas in Biscayne Bay historically used for water-skiing have been set aside for this purpose on a year-round basis with a 35 mph speed limit. One is located on the east side of Meloy Channel (along Miami Beach) between theoretical 64th Street and West 51 Street, and the other is located on the west side of Meloy Channel surrounding Monument Island, between Rivo Alto and Star Islands. Two additional water-ski areas east of Meloy Channel have a seasonal (May 1 - November 14) speed limit of35 mph, and are slow speed the remainder of the year. One is located between Indian Creek Village and Biscayne Point, and the other is between Julia Tuttle Causeway and the Sunset Islands. Areas which are unregulated year-round may also be used. RER-DERM is working with other agencies and private industry to determine the feasibility of developing some land-locked lakes in Dade County for water-ski and personal watercraft activities.

Power boat racing shall be prohibited in Government Cut or in the unregulated areas of Biscayne Bay. Power boat races shall occur at least 1,000 feet offshore in deep water areas of the Atlantic Ocean, or in the Miami Marine Stadium; these races may occur year-round. However, during non-

event periods in Marine Stadium, a "Slow Speed, Minimum Wake" buffer shall extend waterward for 200 feet from shore around the entire edge of the basin.

During high speed marine events such as jet or water ski events and power boat races, the following manatee protection measures shall be adhered to (adapted from FDEP conditions recommended for boat race permits).

- A Manatee Watch Program shall be established.
- The manatee watch shall consist of four qualified observers, including one primary observed. Surveys shall be conducted from an aircraft and also from elevated land-based and/or boat-based positions. Each observer shall be equipped with a two-way radio and will be dedicated exclusively to the manatee watch.
- A continuous aerial survey shall be conducted beginning 1 hour prior to the event and prior to any organized practice sessions to identify any manatees in the vicinity of the event site. The survey shall continue until all official and spectator vessels have cleared the area. Aerial surveys shall extend 1 mile from the perimeter of the race course.
- An observer shall be in close communication with race sponsors/officials in order to halt the event if a manatee(s) is spotted within 500 feet of the perimeter of the event site. The event shall be halted immediately upon the request of the observer. The event shall not resume until the animal(s) move away from the area under its own volition. Manatees must not be herded away or harassed into leaving. If the manatee(s) is not sighted a second time, the event shall not resume until 30 minutes after the initial sighting.
- All participants and official boats shall adhere to speed zones adjacent to the event site.
- The primary observer shall write a report providing the names of the observers and their positions during the event, number and location of manatees sighted, and any problems encountered during the event (and possible solutions). This report shall be submitted to the Coast Guard, USFWS, FDEP and RER-DERM within 30 days of completion of the event.
- If any of the aforementioned conditions is not met prior to or during the race, the event shall be immediately terminated. The Coast Guard shall designate a monitor (possibly a Coast Guard representative or the primary manatee watch observer) who shall have the authority to terminate the event as required above.

4. Speed Zone Signage

The Florida Inland Navigation District (FIND) was directed by the state legislature to install signs to mark the designated speed zones. The manatee protection zone areas should be inspected annually to ensure that adequate marking is present, and that no hazards to navigation exist. Vessel speed restrictions in areas of high-speed water-related activity should be indicated by and/or delineated with buoys.

5. Increasing Law Enforcement Presence

New vessel speed restrictions and other manatee protection regulations will probably not be effective without adequate law enforcement. Law enforcement should be improved through the coordination of enforcement agencies and by increasing enforcement personnel. All municipal marine patrol officers are authorized to enforce vessel speed restrictions for manatee protection, in addition to the Florida Marine Patrol and Miami-Dade County Marine Patrol officers. All of these officers shall have an annual review of the vessel speed zones prior to the beginning of manatee season. All law enforcement agencies shall adhere to all vessel speed restrictions unless an emergency is in progress.

Law enforcement efficiency may be increased between the various agencies and offices by developing a task force, and by increasing personnel. Developing a manatee protection law enforcement task force composed of one officer from each marine patrol office (state, county and municipal) and the Florida Game and Freshwater Fish Commission, should aid in establishing a working relationship between enforcement agencies. The goal of the task force would be to ensure full and efficient monitoring of areas with vessel speed regulations, and proper handling of manatee-related incidents. This would include confirming manatee deaths and reporting them to the appropriate agencies, and coordinating manatee protection activities among the marine patrol agencies in Dade County. Each of these officers should be designated as the "manatee specialist" for their office, and would be notified of any manatee-related proposals with which the law enforcement agencies may be involved.

At least one additional marine patrol officer position should be funded. RER-DERM may be able to aid in obtaining a grant to fund an additional Miami-Dade Marine Patrol position or overtime pay necessary to cover the added workload of enforcing the new vessel speed zones. Increasing personnel would allow for additional monitoring of the regulated areas. A similar position or funds should be added to the Florida Marine Patrol with funding from an increase in the state boat registration fee. Those municipalities on the waterfront that do not have marine patrol offices should be encouraged to establish them to create additional law enforcement presence.

A proposal has been developed requiring a statewide mandatory boater education program for powerboat operators. This program shall include a manatee protection component. Licensing of powerboat operators should be encouraged statewide.

6. Sanctuary Designation

RER-DERM will continue to compile manatee sighting data to determine if manatee habitat usage patterns change in Miami-Dade County with the implementation of the Miami-Dade County

Manatee Protection Plan. New areas used for feeding, mating or congregating should be evaluated for protection and possible sanctuary designation.

C. Land Development

Land development in Miami-Dade County can adversely impact manatees. Only shoreline and submerged land development is addressed in this Plan, although other development may cause impacts, including stormwater runoff, wastewater discharge, and an increase in overall users of natural systems.

Potential impacts to endangered species and their habitats shall continue to be considered in the review of all activities requiring a Miami-Dade County Class I coastal construction permit. Projects or facilities whose construction or operation results in adverse impact to manatees or their essential habitats should not be permitted, except as necessary to protect the health and safety of the public. Essential manatee habitat includes portions of natural and man-made waterbodies used by manatees for feeding and drinking, refuge from extreme cold, shelter for resting and sensitive behavior, and travel or migratory corridors. Permitted projects or activities in any waterbody accessible to manatees shall be required to avoid (or minimize) impacts to the animals or their habitat that arise as a consequence of construction or operation of the facility.

Although some of the subsections under this "Land Development" section may recommend general areas for specific types of development, other regulations such as those for state-owned submerged land, may preclude this development.

1. Shoreline Development Standards

Natural shoreline vegetation shall be maintained. Non-water dependent structures shall be constructed on the upland above the mean high water line, landward or away from wetlands or other natural areas. All new or replacement structures accessible to manatees shall be designed to prevent entrapment of or injury to the animals.

Manatees may attempt to enter submerged storm water drainage pipes and culverts. Any culvert that is closed at one end so that a manatee cannot pass through to a natural waterway may cause an animal to drown. Those culverts which are greater than 7 and less than 60 inches in diameter, shall be covered with grates or screens with spaces less than 7 inches wide in order to prevent entrapment; these shall be maintained to prevent upland flooding. New culverts installed in areas not previously accessible to manatees shall be covered with flap gates or other devices designed so as not to cause injury to manatees, and prevent the animals from entering the culvert.

RER-DERM currently issues a Class I Coastal Construction Permit for wet slip marinas, but no Class I coastal construction permit is required for dry storage facilities where in-water work is not required in certain circumstances. Therefore, the Dade County Code shall be modified to include DERM plan review and approval for the construction, expansion, replacement or major repair of all dry storage facilities, including those in municipalities. An existing dry storage facility shall meet the definition of an "existing marine facility" indicated below under Marine Facility Siting Criteria. New dry storage facilities should be sited according to Commercial Marina Sites noted on pages 65. A state ERP may be required for stormwater runoff treatment of a dry storage facility.

2. Development Standards for Submerged Lands

Standards and policies related to the development of submerged land shall address the preservation of submerged vegetation, placement of dredge and fill material, and the size and design of structures below the mean high water line. Destruction or alteration of shallow water habitat used by manatees shall be prohibited unless necessary for the protection of the public or for restoration and enhancement of environmental resources. Blasting in or adjacent to habitat regularly used by manatees (see Essential Manatee Habitat map Figure 8) shall be prohibited.

Miami-Dade Marine Facility Strategy Development Criteria

The Plan is intended to identify and allow new marine/boat facility siting and/or expansion of existing facilities in a manner consistent with the protection of manatees and their habitat.

This section describes the criteria that contribute to boat and manatee interactions and analyzes these criteria as it relates to the relative risk to manatees if additional boat trips are generated from a given location. The plan is intended to identify and allow new marine/boat facility siting and/or expansion of existing facilities in a manner consistent with the protection of manatees and their habitat.

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 County 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 but are not limited to natural resource data, documented or anticipated boating patterns, and/or physical water body characteristics.

Marine Facility Siting Recommendations

a. Marine Facility Siting Criteria

The Marine Facility Siting Criteria in the Manatee Protection Plan generally apply to review and permitting of applications for new or expanded marine facilities for use by multiple boats, including but not limited to boat ramps, wet and dry berthing, and transient or courtesy docks of all types. The siting criteria do not apply to docks associated with detached single-family residences. The siting criteria are guidelines intended to ensure that additional vessel docking and storage to meet future needs are accommodated so as to minimize and avoid impacts to manatees or their habitat associated with construction or vessel traffic generated by use of the facility. These criteria do not replace or supplant other permitting requirements, such as those related to water quality, aquatic or wetland vegetation, navigation, or other environmental factors.

Criteria Relating to Continuing Use, Repairs and Maintenance of Existing Facilities

It is not the intention of the Plan to impose new limitations on the number of wet or dry berths or types of vessels at facilities that are lawfully in use at the time of 1995 Plan approval, even if the facility occurs within sensitive manatee habitat. It is assumed that the reconstruction, repair, or reconfiguration of a facility that has been lawfully in use does not constitute a new or increased impact on manatees, provided that the number and types of vessels using the facility and frequency of vessel activities remains substantially the same. Therefore, with respect to manatee protection guidelines, **AN EXISTING MARINE FACILITY SHOULD BE PERMITTED TO CONTINUE OPERATION OR UNDERGO REPAIRS AND RENOVATION SO LONG AS THE NUMBER AND TYPES OF VESSELS USING THE FACILITY ARE EQUIVALENT OR LESS IMPACTFUL WITH PAST VESSEL USE**. Berthing configuration or facility design may be modified, provided that the types of vessel uses and number of vessels remain consistent with past vessel uses. It is also recognized that there may be circumstances, such as natural disasters, fire, or financial matters, that temporarily render a facility inoperable, even though it has been in use in the recent past.

For the purposes of application of Marine Facility Siting Criteria for manatee protection to permitting of such facilities, an “existing marine facility” is one which is legally operating and is currently producing boat traffic or has produced boat traffic in the five years prior to the permit application. Facilities that have all required local, state, and federal permits, authorizations and approvals that are still valid, but not yet built, can also be considered existing. Reconstruction or renovation of older facilities that are legally constructed and permitted, but do not have authorizations that clearly specify the number of slips, including facilities that pre-date permitting programs and have been in continuous use, should be evaluated on a case by case basis. The case

by case review will determine the existing number of slips by taking into account the use of the slips by vessels (including motorboat and sailboat). Documentation of vessel use history and documentation showing the facility's highest single day use must be provided by historical aerial photographs. If facilities are vacated as a result of unforeseen circumstances (such as hurricanes, fires, etc.), they could be considered "existing" for a period not to exceed five years prior to the application for a permit.* Facilities that have not been in use at any time for five years prior to the application, or where vessel uses are not substantially the same as those that occurred previously, will not be considered existing and will be subject to manatee protection criteria for new or expanded facilities. Existing facilities with valid operating and construction permits that did not include specific limitations on the number of power vessels, may continue to operate without such limitations on use of the existing slips or berths.

> **The above definition of "existing marine facility" will go into effect two years after Miami-Dade County provides a courtesy notice in a newspaper having general circulation in Miami-Dade County of the Plans change to the definition of "existing facility" under the 1995 MPP. During this two year phase-in period, owners of properties with historical facilities or slips that have not been in active use, but which met the definition of an "existing facility" under the 1995 MPP, will have an opportunity to request a determination of the number of slips in historical use and apply for required approvals to reconstruct slips that were abandoned or not in operation. Slips that can be approved for reconstruction may be eligible for transfer. A more detailed description of this process is included on page 74.*

Criteria for Siting of New Facilities and Expansion of Facilities

In order to protect manatees and manatee habitat, Florida Statute 379.2431(2)(t) requires that counties identified by Governor and Cabinet policy must develop area specific manatee protection plans consistent with FWC criteria. These criteria require that boat facility siting elements are necessary components of manatee protection plans. Boat facility siting must address marinas with wet slips and dry storage, boat ramps, and port facilities. Statutes require that boating facility siting elements of the manatee protection plans must be incorporated within respective comprehensive plans.

FWC's Boat Facility Siting Guide (August, 2000) states that the main goal of boat facility siting components of manatee protection plans will be to minimize the amount of interaction between manatees and boats. In evaluation of the required types of data on manatees, their habitat, and boating facilities and patterns, the FWC directs that areas should be identified where boat use patterns show minimal overlap with manatee use patterns, and these may become preferred locations for future marina expansion. In areas where the manatee and boat patterns do converge, an assessment of overlap and the potential negative impacts of vessels on manatees and their

habitat must be undertaken. FWC offers the following general factors or criteria to consider for siting of marina and boat facilities (December 2007):

- Proximity to inlets and/or the ICW
- Existing water depths adequate for clearance beneath vessels
- Presence of seagrass beds
- Proximity to popular boating destinations
- Amount of manatee use, and
- Distances of boat/manatee use pattern overlap
- Expansion of existing facilities may be preferred over new facilities if environmentally sound
- There should be no impact to seagrass, and mitigation for seagrass destruction should not be allowed
- Areas with adequate depth and good flushing which require no new dredging are preferable
- Locations near inlets and popular destination are preferable
- Piling construction is preferred over dredge and fill techniques
- Marinas should not be sited in essential manatee habitats; and
- Marinas should not be situated in areas with high manatee mortality occurrence

These FWC recommendations are not requirements for obtaining permits, but rather serve as direction for identifying most and least preferable areas to accommodate new or expanded marine facilities.

These factors and approaches were considered in the development of guidelines in the Miami-Dade MPP identifying recommended sites for new or expanded marine facilities, and recommended sites for limited expansion or selected types of facilities. These guidelines address both commercial and residential facilities, other than single-family docks associated with detached single-family residences (for more information on single family docks, please see Residential Dock Density section).

When reviewing proposals for new or expanded marine facilities, the draft of vessels and water depth must be considered for adequate clearance over manatees. In waterbodies which may be too narrow for the animals to avoid vessels by moving aside, water depth must be at least 3 feet deeper than the average draft of vessels using the facility. A boat slip along a marginal dock or bulkhead is generally considered to be 20 feet wide by 40 feet long, in this MPP. The docking of motorized vessels (other than sailboats) along bulkheads in excess of the number of approved slips shall be restricted through a covenant associated with the Class I permit and/or through the RER-DERM Marine Facility Operating Permit.

A Class I permit is currently required for wet slip marinas and any in-water work related to dry storage facilities, but not for the upland dry storage buildings. All new marine facility sites and marina expansion sites in Miami-Dade County coastal waters should meet the following criteria:

1. cause minimal or no manatee/boat travel pattern overlap
2. cause minimal or no wetland or benthic community disturbance or similar environmental impact
3. be compatible with surrounding land use

In order to comply with criterion #1, the marine facility may not be situated so that a travel route through areas of heavy manatee use would be more likely than a route through areas used less by manatees, in order to travel to popular destinations. If only sailboats with minimal horsepower auxiliary motors (allowing the vessels to travel at a maximum speed of 8 knots) or without motors are permitted to be moored in a marina, only criteria #2 and #3 must be met. Criterion #1 is the primary consideration when determining the appropriateness of marine facility siting because criteria #2 and #3 are extremely site specific. Existing land use (zoning) was not always considered when developing this "recommended marine facility site" map (Figure 9).

Each category of vessel facility addressed below may impact manatees differently from another type of facility. For example, a large number of powerboats may be launched at boat ramps (the number launched varies with the number of ramps and parking space at the location, how quickly users get their boats into and out of the water, and other factors), while a single-family residence launches a relatively small number (generally one or two). Transitory slips, such as those at a fueling facility or waterfront restaurant where many boats may use the facility during a day, could generate more boat trips per slip than another type of facility such as a freight terminal or boat yard, where fewer vessels enter or leave the facility daily. Large full service commercial marinas with dry storage may generate more boat traffic than a small multi-family residential marina.

All vessel storage and launching facilities should be required to post manatee informational displays and manatee signs on site as noted in Chapter III. SectionD.2 "Awareness" of this document. Information regarding manatee informational signage can be found at https://myfwc.com/wildlifehabitats/wildlife/manatee/education-for-marinas/.

Commercial Marina Sites

For the purpose of this section of the MPP, "commercial marina" refers to publicly or privately operated marine facilities that are not associated with an adjoining residential development and that provide wet or dry berthing. For the purpose of this section, a trailerable boat is considered to

be a boat which can arrive at the launch site on a standard trailer with dimensions appropriate for travel on normal roadways.

Wet and dry boat storage facilities contribute to the number of boats entering Miami-Dade County waters. Preferred sites for marina development and expansion with no restriction on the number of slips from a manatee protection perspective consists of the areas as shown specifically in Figure 9.

1) Since the number and frequency of manatee sightings has been relatively lower on the east side of Biscayne Bay along Miami Beach between Haulover and Government Cuts, and most boats using a facility constructed in this area would be likely to travel along Meloy channel and exit to the Atlantic Ocean through either of these inlets, marina development should be considered in this area. Expansion of Crandon Marina on Key Biscayne could be considered due to its nearby ocean access which excludes designated manatee habitat.

2) The Keystone Point area located east of Biscayne Boulevard between NE 135 and NE 125 Streets is due west of Haulover Cut. Boats using a marina in this area would be expected to go to the ocean through this inlet, traversing through a very small portion of the Bay, which although used by manatees, is protected by vessel speed limits. Boaters whose destination is south Biscayne Bay have direct access to the Meloy Channel at Broad Causeway.

3) FIU/Oleta State Park shorelines (not including the Oleta River) are recommended as locations for public marinas, boat ramps, and transient or courtesy docks for provided all such facilities are limited to shallow draft boats of a size that can typically be stored and launched by trailer, provided that no dredging or filling of seagrass would be required to construct or operate the facility.

4) Marina expansion at Dinner Key and at Matheson Hammock Park is preferred due to less frequent manatee sightings in the immediate area, and the improbability of boats using the facility to travel through areas of heavy manatee use. Although manatees have been observed in the nearshore areas, vessels travel mainly in marked channels within speed zones until reaching open water destinations in south Biscayne Bay, where the risk of conflict with manatees is relatively low.

5) Some currently operating marinas south of Rickenbacker Causeway may be considered suitable sites for expansion of facilities available for use by the general boating public, especially for launching of smaller boats that are generally stored on trailers or in dry

berths, provided that no dredging or filling of manatee habitat would be required to operate or construct such a facility. Since boaters using these facilities generally are heading to south Biscayne Bay or offshore destinations that do not require extensive travel through essential manatee habitat, opportunities for conflict between vessels and manatees are limited. Manatees near shore should be protected from high-speed vessel impacts by the approved speed zones. Recommended locations for expansion or new facilities are:

- Chapman Field/Deering Bay is recommended for a public-access ramp or upland dry storage provided all such facilities are limited to shallow-draft trailerable boats, provided that vessels use existing basins and marked navigation channels in Deering Bay vicinity, and no dredging or filling of habitat currently being used by manatees (including seagrass habitat) would be required to construct or operate such a facility.
- Homestead Bayfront Park/Convoy Point is recommended for expansion of public marina, ramp, or transient or courtesy docks, provided all such facilities are limited to shallow draft boats that can be trailered.

The installation of new or additional boat lifts should be permitted in the suitable areas noted above.

Areas south of Rickenbacker Causeway that are NOT SUITABLE for marina expansion or development in which moderate to heavy manatee use, mortality or sensitive manatee behavior is documented, include the following:

- a portion of west Key Biscayne from Crandon Marina to the south shore of Pines Canal,
- the Coconut Grove shoreline from the south side of Dinner Key Marina to Coral Gables Waterway,
- all of Coral Gables Waterway located east of SW 57 Avenue and all other canals in Coral Gables (excluding the Matheson Hammock Marina area), and
  the Black Point Marina basin and canal "No Entry" zone

Boating activity studies have documented high levels of vessel traffic and remarkably poor compliance with existing vessel speed zones in Black Point channel and adjoining seagrass meadows used by manatees. Until this problem is addressed, expansion is not recommended. However, if compliance is improved to acceptable levels, through management actions such as but not limited to targeted enforcement, boater education, and improved signage, limited upland, ground-level public storage for trailered boats would be recommended on the south side of Black Point Marina, at the site of the former "Pirates Spa", provided that access to the Bay is through Goulds Canal. Expansion proposals could be considered in the future on a case-by-case basis, pending approval of enforcement and education plans and compliance improvement, subject to approval by FWC and USFWS.

Fuel and Transitory Docks

For the purpose of this plan, a "transitory slip" means a slip that is used for a very brief period of time (generally less than one day) and contributes to boat traffic. Examples of transitory docks include, but are not limited to docks at non-fee public facilities (e.g., public parks or ramps), facilities used for water-dependent public transportation (e.g. water taxis), and designated day-use slips at restaurants and hotels. Transitory slips cannot be used for the permanent or extended storage of vessels. Slips used for boat rentals or slips rented to patrons for extended use are not considered transitory.

Expansion of marine fuel facilities and transitory (transient) boat slips should be permitted in those identified as "Commercial Marina Sites" on Figure 9. Transitory docks are also preferred along Indian Creek in Miami Beach, Vizcaya, the north shoreline of Fisher Island, the south shoreline of Virginia Key and Marine Stadium basin along Rickenbacker Causeway, Sands Key, and Elliott Key, without limit in number solely related to manatee protection (however, other factors, such as water depth, seagrass or other sensitive habitats may affect number of slips that can be accommodated).

Fuel dispensers should be located on the upland if feasible. In order to aid in maintaining water quality, secondary containment shall be required on any fuel line extending over water along a dock or running along a seawall. Fueling facilities would be required to meet certain state criteria in the Florida Administrative Code, as may be amended and as enforced by the state. The current version of the Florida Administrative Code provisions are listed below, only for informational purposes:

1) All equipment used for transferring fuel shall be kept and maintained in good repair and excellent operating condition.
2) Hoses used for a transfer of fuel shall be in good condition with no cracks or bubbles in their outer cover material. Hoses shall be maintained so that the inner lining or core is not exposed to damage from external forces. Hose and nozzle connections must be in good condition and not leaking. The fitting, clamps and bands must be compatible to the fuel being transferred, and must be in good condition and securely attached to the hose. These fittings, clamps and bands shall be used only for the purpose for which they are designed.
3) All systems will be equipped with hard connections or delivery nozzles. The nozzles shall hang vertically while not in use and will not be lying on the ground or dock. The transfer equipment shall be equipped with an emergency shutdown device unless gravity fed. The person in charge, or his designee, must be in the proximity and have immediate access to the emergency shut-down device during all fuel transfers.
4) Any fuel remaining in a hose after a transfer shall not be drained onto the ground or into the water.

5) Dispensers located in such a manner that they are subject to being damaged or destroyed by impact, shall be equipped with safety valves. These safety valves shall stop the flow of fuel if the dispensers are damaged or destroyed by impact.

Freight Terminals and Large Vessel Docking Facilities

For purposes of this plan, this section on freight terminals and large vessel docking facilities is meant to refer to areas designated for facilities capable of mooring vessels greater than 100 feet in length, as shown in Figure 9. Due to the necessity of deep dredged channels and existing regulations restricting new dredging in Biscayne Bay, opportunity for expansion of freight terminal construction is limited. Manatee use is heavy in the Miami River and on the southwest side of the Port of Miami. Therefore, expansion of freight or large vessel terminals shall be limited to the north shore of Fisher Island, north side of the Port of Miami, existing boat basins along the City of Miami shoreline between NE 6 and NE 9 Street, and the south shoreline of MacArthur Causeway. Upon implementation of the recommendations in this section noted below, expansion of large vessel docking facilities within approximately zoned areas, such as the Miami River, may be approved. Large vessel docking facilities shall not be expanded within state designated manatee protection "No Entry" zones. All existing freight terminals and other facilities mooring vessels greater than 100 feet in length shall be retrofitted with fender systems or other design which provide at least 4 feet of standoff from the bulkhead or wharf **under maximum operational compression**. This standoff is required in order to prevent manatees from becoming crushed between a vessel and bulkhead or other structure. Fenders shall be installed entirely above the main high water line, and maintained. A minimum of 3 feet of standoff at maximum compression (fenders, cantilever docks/bulkheads, or other system) is acceptable in the Miami River. However, an exemption to this requirement in the Miami River applies to a 1,600 linear foot narrow area bordered and including 3301 NW South River Drive (folio number 30-3128-009-0080) through 3149-3163 NW South River Drive (folio number 30-3128-009-0130) on the south side and bordered by and including 3038 NW North River Drive (folio number 30-3128-000-0090) through 3032 NW North River Drive (folio number 30-3128-000-0127) on the north side. This area may be allowed to remain without fendering as a reasonable option in compromise as long as there is no development or expansion of berthing for terminals to the west of this passage beyond what are already existing facilities (as defined under Marine Facility Siting Criteria starting on page 62). This exemption means that there will be no new slips or mooring facilities for large vessels approved within or west of this 1,600 linear foot area. Any takeover of an existing facility by new or different operators will not be considered as new development provided new slips are not created. Further improvement of an existing facility will not be prohibited, provided berthing area is not expanded. Replacement or renovation of any large vessel berthing in a manatee habitat, including this portion of the Miami River will require standoff. If the 3 foot standoff is achieved

in the future, the development and expansion of large vessel docking facilities may be permitted on the River.

The study of propeller guard technology is encouraged. The Manatee Protection Plan Review Committee is unaware of a feasible prop guard in existence for tug boat or freighter use. If a propeller guard or similar device is recommended for use on tug boats in the future, the requirement of the device should receive public review and must receive county commission approval prior to implementation. Should such a recommendation come to pass, economic incentives should be considered for retrofitting tugs with the device for manatee protection.

Special Use

Areas designated for mooring vessels for special uses such as commercial fishing, charter fishing boats, and ocean-going luxury yachts, including "mega-yachts", include those noted above under "Commercial Marina Sites" on page 65 and "Freight Terminals, etc." on page 69 in addition to the entire shoreline of Watson Island (located on MacArthur Causeway).

Limited Special Use in Downtown Area

There is a recognized interest in accommodating expansion of certain water-dependent uses in the downtown Miami area, to complement traditional uses and create opportunities for boating recreation, while still providing for protection of an area with consistent manatee use and human-related manatee mortality issues. To help seek a balance, limited expansion is recommended for special types of marine facilities in a portion of the downtown area. "Limited Special Use" dockage includes courtesy docks, water dependent public transportation dockage and commercial/charter fishing boat docks with a maximum density (including existing boat slips) of 1 vessel slip per 500 feet of shoreline. This applies to the western Biscayne Bay shoreline from I-395 bridge south to SW 15th Road, including Bayside, Watson Island, and the Miami River from the mouth, upstream to the NW 5th Street bridge. Sites or additional slips may be considered if there is a demonstrated need for this type of use and such slips would be located at publicly owned and operated facilities and public access and use shall be afforded and maintained.

Boat Yards

In any Dade County coastal waters with vessel speed restrictions of "Slow Speed" year-round, renovation or expansion of an existing boat yard (including waterfront boat building facilities) is preferred to the construction of a new facility. New boat yards, including waterfront boat building

facilities, should be permitted at the Port of Miami, along the eastern (Miami Beach) shoreline of Biscayne Bay and in the two canals located in northwest Dumfoundling Bay between NE 185 and NE 190 Streets, where compatible with the surrounding land use and other permitting and zoning requirements. Elsewhere along the Biscayne Bay shoreline or in small dead end canals on Biscayne Bay, the construction of any new boat yard should generally be prohibited.

Boat Ramps

Boat launching facilities greatly contributed to the number of boats entering Dade County tidal waters. These ramps should meet the criteria noted above in the Marine Facility Siting Criteria. In addition, at all boat ramps located in essential manatee habitat, parking should be limited to the existing spaces (including existing overflow parking both on and off paved areas) only during the winter manatee season, November 15 through April 30. Excess parking should be prohibited and enforced by Dade County (through a fine, and revocation of the MOP where applicable, if not in compliance). Miami-Dade County Park and Recreation personnel should supervise parking in trailer spaces at County_owned marinas on weekends and holidays to ensure that only vehicles with trailers use the spaces.

Suitable Boat Ramp Sites

Sites suitable for boat ramp development or expansion, including the installation of new or additional boat lifts or parking spaces, are located in previously dredged portions of the following areas:

- The east side of Biscayne Bay in the vicinity of Haulover Cut, including Haulover Park, Government Cut, and Bear Cut
- Southwest Key Biscayne, the Dinner Key area, Matheson Hammock Park, and Turkey Point.
- Chapman Field/Deering Bay is recommended for a public-access ramp for trailerable shallow draft boats provided that vessels use existing basins and marked navigation channels in Deering Bay vicinity, and no substantial dredging or filling of habitat currently being used by manatees (including seagrass habitat) would be required to construct or operate such a facility.
- Homestead Bayfront Park/Convoy Point is recommended for expansion of the public ramp, for trailerable shallow draft boats.
- FIU/Oleta State Park shorelines (not including the Oleta River) are recommended as locations for boat ramps for trailerable shallow draft boats, provided that no dredging or filling of seagrass would be required to construct or operate the facility.

New boat ramps located in other areas than those listed above may be considered provided they comply with Site Specific Alternative Performance Measures for non-conforming projects noted on page 72.

b. Performance Measures and Standard Procedures for Projects Seeking a Site-Specific Alternative from Marine Facility Siting Criteria

There may be circumstances when a new or expanded marina, dry storage facility, boat ramp, or other docking or mooring facility is proposed that is not consistent with Marine Facility Siting Criteria described in the preceding sections. Examples could include a proposal for more wet or dry powerboat slips than recommended at a location, or a proposal for a type of facility or operation that is not recommended at a particular location. Furthermore, types of facilities or vessel operations that were not specifically contemplated by this plan may be developed in the future. Also, technology or procedures may be developed in the future to mitigate or offset the potential impacts to manatees or their habitat that otherwise may have been caused by increased numbers of vessel trips associated with new or expanded facilities. It is recognized that in such situations, if it can be demonstrated that the non-conforming project and its operation does not adversely affect sensitive habitats and manatees, a process for consideration of an exception should be available. This section of the MPP therefore provides performance measures and standard procedures for evaluation of requests for site-specific alternatives for non-conforming projects, with assurance that manatee protection requirements will still be met.

In order to qualify for a site-specific alternative or exception, the proposed project must be able to demonstrate that it meets a set of guidelines and measures intended to avoid or minimize potential impacts to manatees and especially sensitive habitats that could arise from the facility or the vessel trips that it may generate. As another option for seeking a site-specific alternative, a proposed increase in the number of powerboats above what is recommended, or an increase in a type of vessel use that is not recommended, may be mitigated by removal and transfer of an equivalent number and type of slips or berths that are in use at a nearby existing marine facility. Each of these procedures for seeking a site-specific alternative is described below. The measures and transfer procedure address only regulatory requirements related to manatee protection, and do not replace or obviate need for compliance with all other applicable environmental and land use regulations. In both cases, the proposed project must demonstrate that all other permitting and land use requirements can be met, before being considered for a site specific alternative or exception. Site-specific alternatives and transfer requests must be approved by Miami-Dade County, FWC, and USFWS, each under their existing independent authority and as part of the normal course of their respective regulatory reviews and consultations.

b.(1) Site Specific Alternative Performance Measures for Non-Conforming Projects

Requests for higher ratios for multi-family docking facilities subject to the 1 powerboat slip to 100 feet of developable shoreline restriction, or requests for uses proposed in a location not shown in the preceding narrative sections and maps as an acceptable site for that particular type of facility may be considered if it is demonstrated that the facility and its use would not have an adverse impact on manatees. This demonstration would be satisfied if the facility met applicable Performance Measures from the following list. However, if any Performance Measures are not met, consideration can be given for additional site specific factors or operating practices (e.g., seasonal operation) that may be proposed by either the applicant or the County, that may result in improved conditions for manatees or manatee protection. Adherence to these criteria does not automatically ensure the applicant's ability to exceed the allowable powerboat restrictions as defined above. The plan restrictions will remain in effect, if at the time of review, additional information about manatees or the proposed facility indicates threats are not addressed by these criteria. Any facility exceeding the allowable powerboat slip restrictions or type of use according to the Performance Measures defined below, must agree to obtain and comply with an annual marina operating permit (MOP) and/or Class I Coastal Construction Permit if required, and proffer a covenant in favor of Miami-Dade County which records the number and types of slips or berths. The Performance Measures are:

1. Alternative slip uses or densities at a facility may not generate increases in vessel traffic (as compared to recommended facility siting guidelines) within a cold-weather aggregation area, a state-designated no-entry or limited-entry zone, or sole travel corridor to such an area. The cold-weather aggregation state-deisgnated zones, and sole travel corrdiors are Biscayne Canal, Little River, the Miami River/Tamiami Canal, Coral gables Waterway, Virginia Key "No Entry Zone", Black Point Marina basin, and the vicinity of cooling canals at the FPL Turkey Point power plant.
2. The waters adjacent and channels leading to the facility are designated "slow speed" or "idle speed" as authorized by tate rule Ch. 68C-22.025 F.A.C., as authorized pursuant to the Florida Manatee Sanctuary Act, Ch. 379.231(2) F.S.

   The facility must provide net benefit to manatees and/or their habitat above what would otherwise be required for the project. Mitigation needed to satisfy other local, state, or federal government permitting cannot be applied to this requirement. For example, facilities may include creation or enhancement of a manatee "refuge" space as part of the design, a conservation easement, restoration of adjacent habitats or hydrology such as mangrove or seagrass to increase the net ecological value of the nearby area, reduced nutrient input to receiving waters, requiring prop guards on any high traffic vessels such as water taxis or rental boats, etc.

3. The marina facility and channel construction and subsequent uses will neither destroy nor negatively impact coastal wetlands and benthic (seagrass, hard bottom, etc.) communities and the water quality.
4. The facility must have sufficient water depth (as defined herein) in the marina basin and in any marked or unmarked channel or waterway typically used for access to or egress from the basin, and does not require any new dredging or filling that would degrade shallow water habitat (this may exclude maintenance dredging, excavation into uplands or pile installation). Sufficient water depth shall be water depth, measured at mean low tide, of 3 feet greater than the draft of vessels typically using the facility on a transient basis. Vessel drafts shall be obtained by using best available data. Entrance/exit channels near marinas shall be adequately marked if marina repairs or expansion are proposed.
5. The site shall contain appropriate site-specific informational signage (above and beyond the standard information sign requirements for all facilities) and provide educational materials advising boaters of essential manatee habitats in the vicinity.
   Multi-family residential docking facilities will require that all vessels moored at the site be registered to individuals residing at the site. Requests for more slips/berths than residential units at the site or at densities greater than 5 slips per 100 feet of shoreline shall not be approved.
6. Before expanding and exceeding the allowable powerboat slips defined above, an existing facility must demonstrate not less than 85% occupancy over the previous 2 years of operation.

b.(2) Removal of Slips or Berths in Use at a Location and Transfer to Another

Removal of dry or wet slips or berths in use at one or more locations may serve as a form of mitigation to compensate for the potential impacts to manatees from proposed new operations or expansion of marine facilities in sensitive habitats above the guidelines recommended for manatee protection. The transfer process requires a review and evaluation by Miami-Dade County, in coordination with state and federal regulatory authorities, of the proposed transfer for potential adverse impacts to manatees as well as evaluation of other requirements of Chapter 24 of the Code of Miami-Dade County. The review will include an evaluation of the type of facility and typical uses associated with both the historically existing slips at the donor property and the proposed use of the slips at the recipient property. To assure that the impacts from proposed new slips would not exceed the potential impacts from the slips that are to be removed for mitigation, this analysis must be site specific and be based on a consistent set of mitigation requirements applied to all such projects. Furthermore, to assure that the impact of new powerboat slips remains fully mitigated, a suitable restriction (i.e., restrictive covenant) on the donor property is required to record that the historical use was transferred, and assure that the original slips at the donor facility would never be reoccupied by powerboats. This is similar to other forms of environmental mitigation, or

conservation easements, intended to preserve the mitigation benefits in perpetuity. Transfer applications shall not be approved without concurrence of federal and state regulatory agencies with authority for manatee protection.

The transfer procedure has implications for the owners or future owners of donor properties. These owners have an expectation that continuing use or reconstruction of historical motor boat slips will be found consistent with manatee protection guidelines. This would no longer be the case if the historical use had been transferred to another parcel. For these reasons, both from an assessment of the biological merits of the mitigation for a proposed project, and in fairness to owners whose slips are sought for transfer, slips cannot simply be "reallocated" to another property without participation and consent of the "donor".

The following mitigation criteria will be used to evaluate requests for slip transfer. It is noted that the listed measures are evaluation factors and do not prohibit the submittal or consideration of alternative proposals for achieving a net benefit to manatees.

1. Slip transfers only have the ability to offset potential impacts if they represent a reduction in use of equivalent slips at the donor site, and the slips from the donor site are not reoccupied.

2. To assure no net increase in impact to manatees, the type and frequency of vessel use associated with the slips removed (transferred) from a donor site must be equivalent to the type and frequency of use at the receiving site. To qualify as a transferable slip, all donated slips shall be documented showing actual past use by motorboats. Documentation would include records showing the vessel use and aerial photographs, based on the highest single day slip use by motorboats during the period not greater than 5 years prior to application for transfer. Donated slips must be from a site that meets the definition of "existing marine facility."

3. Donor sites must be located in areas designated as essential habitat, as defined in the MPP. Slips located in areas recommended for expansion of commercial marinas, dry storage, transitory docks, boatyards, ramps, or large vessel (>100') berthing under the MPP do not qualify as donor slips.

4. To assure no net increase in impact to manatees, slips may only be transferred from an existing marine facility to a site that is a less sensitive or equivalent manatee habitat within the same tributary or geographic area. For example, for a project on a canal or river, both the donor and recipient sites should be located on the same waterway. Within cold weather aggregation areas and travel corridors to them, such as the Miami River, Little River, Coral Gables Waterway, slips may be transferred downstream or may be consolidated on one of several contiguous parcels. For a project in Biscayne Bay or adjoining bays and sounds, the donor and recipient sites shall be located within close proximity of each other. The goal

is to set a distance between sites that would not create a significant difference in vessel traffic impacts.

5. Recipient sites shall not be located in state manatee protection areas designated as "No Entry" or "Limited Entry", as defined in 68C-22.025 F.A.C., including portions of the Little River, Virginia Key, Coral Gables Waterway, and Black Creek canal and marina basin, except as provided in measure #4 above.
6. There shall be an overall net reduction in slips from the donor site to the recipient site.
7. Only slips in compliance with all required environmental and land use approvals are eligible for transfer. For slips located in or over the water, documentation of approval of the submerged lands owner is required. Illegal or unauthorized docking is ineligible for transfer.
8. Transfers require the consent of the property owner(s) involved (donor and receiving properties, including submerged land owners when applicable) and restrictive covenants, in perpetuity, running with the land in favor of Miami-Dade County must be recorded on the donor and recipient sites.
9. Restrictive covenants on donor sites must prohibit additional structures or launching of motorboats. Restrictive covenants on recipient sites will 1) prohibit additional structures for launching of vessels beyond the number achieved with the transfer; 2) prohibit the donation of slips to other properties; and 3) specify the type of vessel use and prohibit any change of use of the slips from the type approved during transfer. Restrictive covenants must be included as requirements or conditions in permits and submerged land leases (if required), and recorded prior to commencement of construction.
10. In order to preserve riparian property rights and to prevent net reduction of waterfront access sites, not all existing slips can be transferred away from a given donor site. At least one existing power boat slip per 100 feet of developable shoreline, or one per parcel if less than 100 feet of developable shoreline is owned, shall be retained at the donor site and shall not be eligible for transfer.
11. Slip transfers may be allowed only if all federal, state, and local approvals at the receiving site are obtained for the proposed work and operations required for transfer.

c. Residential Dock Density

For the purpose of this plan, "residential dock facilities" are those associated with an adjoining residential land use, where the docks are occupied by vessels owned by persons residing at the adjoining property. Residential dock facilities may have a significant cumulative impact on manatees and their habitat. In this MPP, a single family residence is considered to be a detached

building having a roof and outer walls entirely separated from any other structure by space, and occupied by members of a single family with not more than three outsiders, if any, accommodated in rented rooms. A multifamily residence is a building occupied by more than two families, in which each family shares a roof and/or outer wall(s) with at least one other family. The density of new coastal structures, including multifamily residential docks, should be limited in areas that are essential to the survival of the manatee. Figure 9 indicates waterbodies and shorelines that have been determined essential habitat for the manatee. In waterbodies or along shorelines that are not identified as "essential habitat" for manatees, limits on residential dock density or configuration will be determined or may be limited by other existing environmental, navigation or land use regulations.

Single family dock construction within "essential manatee habitat" areas is subject to local, state, and federal regulations and policies. Zoning, land use, building, and environmental standards, statutes, ordinances, or rules may determine or limit the size and configuration of a dock or number of slips that may be permitted at a particular location. It is not the intent to impose any additional restrictions on single family docks. Single family docks shall continue to be constructed according to all existing applicable regulations and guidelines. Unless otherwise limited to a lesser number, single family docks that request more than four slips will be reviewed under provisions of the plan for multi-family facilities with five or more slips. Slips, as well as the vessels utilizing them, should be owned by the residents of the single family home on the associated parcel and should not be rented or leased to the public.

For multifamily residential developments within essential habitat areas, multi-slip docking facilities with more than five boat slips should be permitted to construct no more than one powerboat slip per 100 feet of owned developable shoreline. Any additional slips (existing or newly constructed) may be occupied by sailboats. In no case should the number of new powerboat slips exceed the number of multifamily residential units approved and/or constructed. If a RER-DERM Marine Facilities Operating Permit is required, it should specify that all vessels docked in a multifamily facility should be registered to individuals residing at the site.

Sites on tributaries or canals which are upstream of or flow into a water body designated as an essential habitat area, should be subject to the aforementioned essential habitat standards.

Within Essential Habitat Areas:

Each single-family residence shall be limited to two power boat slips, and vessels using those slips shall be registered to the upland property owners or residents. It is not the intent to impose any additional restrictions on single family docks. Single family docks shall continue to be constructed according to the existing RER-DERM coastal construction guidelines. For multifamily residential developments within essential habitat areas, multi-slip docking facilities with more than five boat slips should be permitted to construct no more than one powerboat slip per 100 feet of owned

developable shoreline. Any additional slips (existing or newly constructed) may be occupied by sailboats. In no case should the number of new powerboat slips exceed the number of multifamily residential units approved and/or constructed. If a RER-DERM Marine Facilities Operating Permit is required, it should specify that all vessels docked in a multifamily facility should be registered to individuals residing at the site.

Site on tributaries or canals which are upstream of or flow into a water body designated as an essential habitat area, should be subject to the aforementioned essential habitat standards.

d. Residential "No Entry" Areas

Several areas heavily used by manatees during the winter have been designated "No Entry, Residents Only, November 15 - April 30". These include portions of Biscayne Canal, Little River, and Coral Gables Waterway (Figure 9). Single-family dock construction should be limited to two boat slips with only the upland residents permitted to use the dock space in these areas on a permanent basis. Temporary docking by authorized visitors should be allowed. Construction or renovation, other than emergency repairs required for the safety of the residents, shall be undertaken during the manatee summer season (May 1 - November 14). A FWC Manatee Protection Zone Exemption Permit is required for residential access to these locations pursuant to 68C-22.003(5), Florida Administrative Code. For additional information related to obtaining such a permit, property owners may contact ManateeZonePermit@MyFWC.com.

e. No Coastal Construction Areas

Undeveloped areas of extremely frequent manatee use are designated "no coastal construction or vessel access". These areas are designated "No Entry" in Figure 19, and include the northwest shorelines of Virginia Key, the north portion of the Black Point Marina basin, and the area of Black Creek from the salinity control structure (S-21) south to the north shore of the entrance to the Black Point Marina basin. No construction, other than environmental restoration or work required to protect the health and safety of the public, shall be permitted in these areas.

f. Freshwater Lakes

The Miami-Dade County Commission should pass an ordinance to give RER-DERM permitting authority in freshwater lakes and canals which have vessel speed restrictions established for manatee protection. The construction restrictions DERM should impose shall be the same as those for similar uses in tidal waters.

D. Education and Awareness

1. Educational Programs

Miami-Dade County (including RER-DERM, Parks and Recreation and Communications) staff shall work with the Florida State Department of Education, Office of Environmental Education and the Florida Advisory Council on Environmental Education (FACEE) to develop a manatee supplemental educational curriculum program targeting students in elementary, middle and high schools. A teacher guide shall also be developed to assist teachers on how best to use the curriculum and where to obtain additional education about manatees. A local resource directory, listing available materials for use in the classroom should also be compiled.

Miami-Dade County staff will work with the School Board of Miami-Dade County and local environmental educational groups to coordinate, compile and develop maps, video and educational plans on how to best protect manatees in Miami-Dade County. Local educational resources such as the Miami Seaquarium manatee display tank or "Manatee Halfway House", field trips and camps for various ages shall be incorporated into the local educational plan. A "distribution plan" will be developed for the distribution of the educational materials to both the public and private school systems. The information developed shall be printed in English and Spanish. In addition, the school system should explore the possibility of developing a boater education and operation program similar to existing driver education courses with a strong manatee awareness component.

Upon completion of the teacher guide and list of supplemental educational materials, teacher's workshops shall be held twice a year to provide basic information on manatee behavior and protection. Teachers participating in the workshops should receive continuing education credit.

Persons who operate vessels in Miami-Dade County should be required to complete a boater education class, which includes a strong manatee protection component, approved by the Florida Department of Environmental Protection, or pass an equivalency examination. The Florida Inland Navigation District (FIND) "Miami-Dade County Manatee Protection Zones" brochure should be presented and discussed in the class. Mandatory boater education is most likely to be successful if implemented statewide by statute, and if required of all vessel operators. Significant incentives for compliance, such as reduced insurance rates, or disincentives for failure to complete the educational requirements should be incorporated. Therefore, Miami-Dade County should encourage members of the Miami-Dade County delegation to the Florida legislature to support bills that make significant progress toward achieving this goal.

2. Awareness

DERM should annually promote Manatee Awareness Month in November as declared by the Florida Department of Environmental Protection (FDEP), formerly the Florida Department of Natural Resources, DNR.

- Local schools, conservation and boating groups should launch a campaign utilizing existing literature, videos, slide shows, etc. annually during November
- Pamphlets, bumper stickers and other manatee items should be distributed
- Radio and television public service announcements should be aired during manatee season
- Miami-Dade RER-DERM, Parks and Recreation and Communications staff should develop a poster contest targeting residents of all ages and backgrounds, as part of the manatee awareness campaign
- Manatee education information should be included in bills from all of the water utilities doing business in Miami-Dade County
- Manatee protection awareness should be incorporated into themes for environmental education programs, activities and events such as Baynanza, Miami Riverfest, and Earth Day celebrations, and SWIM educational programs and campaigns
- RER-DERM and FDEP should conduct an annual manatee education program for agents who enforce manatee protection laws, including state and local marine patrol officers, judges and prosecutors

In order to increase boater awareness of manatees, DERM with funding assistance from FDEP, shall print a brochure explaining vessel speed zones in county waters and "No Entry" areas designed for manatee protection. The brochures should give boaters tips on how to minimize chances of collisions with manatees. Information regarding the locations of boat ramps should be included, since boaters may decide to launch their boats at a ramp close to their destination in order to avoid vessel speed zones. The brochure should be printed on waterproof paper in English and Spanish (due to the large Hispanic population in Dade County) and distributed to boaters with their boat registration purchase or renewal, and at marina/boat ramp and boat rental facilities. The FIND "Miami-Dade County Manatee Protection Zones" brochure should also be readily available to boaters.

All marina facilities which require a RER-DERM marine facilities operating permit shall be required to post manatee awareness signs onsite. Those facilities with more than 50 slips, and all boat ramps and fuel docks, should be required to post "Manatee Basics for Boaters" and "West Indian Manatee Fact Sheet" information signs. In addition, facilities with boat ramps or more than 100 wet and/or dry slips, should develop a manatee information display with the two manatee information signs, the vessel speed brochure displayed with additional copies for boaters to take

with them, an enlarged map showing the vessel speed restrictions in the immediate area, and any other pertinent information.

Due to the extremely heavy manatee use of Little River in the vicinity of the flood gate, the SFWMD shall post a manatee information sign which includes information on how to report an injured or dead manatee, the importance of not littering manatee areas and that it is illegal to harass, harm, feed, touch or kill manatees. The sign should be trilingual (English, Spanish and Creole) and should use international symbols to the greatest extent possible. A trash receptacle shall be installed adjacent to the sign, and the SFWMD shall be responsible for maintaining it.

A similar trash collection problem exists in one area off the Coral Gables Waterway where manatees aggregate at a stormwater discharge site. Appropriate signs and a trash can should be placed onsite and maintained by the City of Coral Gables, owner of the upland property.

Funding for manatee awareness activities should be provided by Miami-Dade County, FDEP, the Florida Advisory Council on Environmental Education (FACEE) and the SFWMD. Private-public partnerships for funding should be encouraged. Upon acceptance of the Dade County Manatee Protection Plan, the above-mentioned funding agencies could dedicate that year's environmental education funding to the development of manatee educational and awareness activities. In the years to follow, the funding would decrease from year to year until it reaches a predetermined prorated share of the total available dollars. Miami-Dade County could utilize funds from several sources, such as the Biscayne Bay Environmental Enhancement Trust Fund, the Parks and Recreation Department and the Aviation Department and/or the Seaport Department to fund the Manatee Awareness Campaign. Additionally, the Miami-Dade County Board of County Commissioners could stipulate to all environmental community groups that receive funding from Dade County to earmark a portion of those funds for manatee education as part of the overall campaign.

3. Coordination of Education and Awareness

A committee composed of a representative from Miami-Dade County RER-DERM, FDEP, USFWS, FPL, SFWMD, the School Board of Miami-Dade County, the Marine Council, the Marine Industries Association of Greater Miami, Miami Seaquarium, and Save the Manatee Club should be created to coordinate suggestions and to determine funding for the various activities recommended in the Education and Awareness portion of section III. "Implementation" in this Plan. FDEP should be the lead agency on the committee.

E. Governmental Coordination

1. Land Development Code

The objectives and policies regarding land development and marine facility siting at the end of this Plan should be incorporated into the Miami-Dade County Comprehensive Development Master Plan in the Conservation Element, under Objective 9 which deals with protection of endangered species and their habitat. Appropriate portions related to coastal construction and marine facility operating permit programs should be integrated into the Miami-Dade County Code, in order to ensure compliance.

2. Boat Traffic/Manatee Area Usage Study

An annual boating survey should be conducted during the winter and summer every 5 years beginning in 1996, to determine how boat traffic patterns may change in response to vessel speed restricted zones and/or any other factors. The study should also include sampling to determine levels of compliance at several essential habitat or highly regulated locations, with and without targeted enforcement. In addition, aerial manatee surveys should be conducted monthly during the manatee winter season and every 2 months during the summer season through winter 1995-6 to determine if areas used by manatees change in response to the vessel speed zones or other factors. At the end of each 5 year boat study, alterations to the vessel speed restrictions developed for manatee protection may be considered. Possible funding sources for this study include FDEP, Save the Manatee Club, the Florida Boating Improvement Trust Fund, and/or the Biscayne Bay Environmental Enhancement Trust Fund.

3. Plan Implementation

Miami-Dade County shall prepare an annual report on the status of implementation of the Miami-Dade County Manatee Protection Plan. The FDEP shall continue to produce an annual report of the Save the Manatee Trust Fund, including statewide income and expenditure information. An annual accounting of money spent on manatee protection activities in Dade County shall be provided upon request.

IV. MANATEE PROTECTION PLAN: OBJECTIVES AND POLICIES

OBJECTIVE 1
Manatee habitat shall be protected from degradation.

POLICIES

1A. Seagrass beds used by manatees shall be protected from dredge and fill projects through the RER-DERM Class 1 permit. New dredge and fill projects shall generally be prohibited in seagrass beds; mitigation will be required for any adverse seagrass impacts.

1B. The construction of new power generation plants or other structures which discharge warm water into areas accessible to manatees, shall be prohibited.

1C. Manatee aggregation areas shall be protected from alteration or human activities that will negatively impact manatee usage.

1D. Manatee travel corridors shall be protected through the establishment and enforcement of vessel speed restrictions and/or other appropriate means.

OBJECTIVE 2
Methods to enhance and restore water quality in manatee habitats shall be investigated by RER-DERM and other agencies (e.g. City of Miami, SFWMD), and cleanup shall commence as soon as possible.

POLICIES

2A. Freshwater sources used by manatees shall be kept as free as possible of added pollutants and debris. The public shall be discouraged from running fresh water from hoses for use by manatees.

2B. Sources of sewage contamination and other illegal discharges in the Little River, Miami River, Black Creek and other waterbodies shall be identified and corrected. Tissue samples from manatee recovered in these waterbodies shall be collected and analyzed (when state of decomposition permits) for trace metals, organic chemicals or other compounds. New bioassay techniques for assessing toxicity or immune system response should be used in conjunction with tracking studies to evaluate effects of degraded water quality on manatees.

2C. Stormwater outfall improvements shall be identified and completed.

2D. Habitat restoration projects such as shoreline stabilization and mangroves, wetland and coastal hammock restoration, that improve water clarity and transparency, which protect or enhance seagrass communities, shall continue to receive funding through SWIM and complementary local programs.

2E. Pesticides for mosquito control shall not be used in areas where manatees are present.

OBJECTIVE 3
Aquatic plant removal shall be minimized in areas used by manatees.

POLICIES

3A. Eradication of freshwater aquatic vegetation in Miami-Dade County canal-lake systems shall be minimized between May 1 and November 15, exclusive of land-locked lakes, as feasible while maintaining flood protection.

3B. Aquatic plant removal in manatee areas shall be permissible only as necessary to maintain flood protection, canal conveyance capacity, navigation, or public safety.

3C. Only FDEP permitted herbicides shall be used in Miami-Dade County waterways. FDEP should not permit the use of chemicals shown to be harmful to large herbivorous mammals, in essential manatee habitats. When manatees are present, no aquatic plant treatments shall be applied within 500 feet of the animals. The use of herbicides or any chemical treatment containing copper shall be prohibited in Miami-Dade County. Herbicides shall be applied using schedules and rates which minimize dosage and maximize effectiveness. No chemical treatment shall exceed the recommended dosage noted on the herbicide container. Chemical herbicides shall only be used by licensed contractors; independent treatments by individuals shall be eliminated. Mechanical harvesting techniques shall be used in manatee areas not maintained by government agencies.

3D. The use of biological controls in encourages. Miami-Dade County shall support research on the effects of biological controls and chemical herbicides on manatees and other wildlife.

3E. An interagency group composed of representatives from the Miami-Dade County Public Works Department, the South Florida Water Management District, the Florida Department of Environmental Protection and Miami-Dade County RER-DERM shall meet annually to address aquatic plant control issues in Miami-Dade County.

OBJECTIVE 4

Manatee aggregation areas shall be incorporated into the state and federal systems of refuges, parks, reserves, and preserves.

POLICIES

4A. The Environmentally Endangered Lands (EEL) Acquisition list includes several parcels that are frequented by manatees year-round.

OBJECTIVE 5

RER-DERM shall work with the South Florida Water Management District (SFWMD) to reduce to zero the number of manatee mortalities related to flood gates/salinity control structures.

POLICIES

5A. A full-time position should be established at the SFWMD to organize manatee protection efforts within the agency.

5B. A backup system or device should be investigated and developed simultaneously with the development of the primary project for manatee protection from flood gates. The backup project could be implemented immediately if the primary project fails during testing. The following concepts should be considered:

(1) Continue monitoring and modifying the pressure sensitive device (PSD) concept

(2) Resume development of a sonar device to detect manatees in the vicinity of flood gates

(3) Consider plans for a parallel fence or screening device that advances prior to gate closure to serve as a mechanical fail-safe

(4) Refinement of the algorithm or circuitry by revising the time delay between sequenced opening of gates in multiple-gate structures or by modifying the default mechanism during major maintenance, should be performed

(5) Structures which permit discharge of limited volumes of water over the top of the structure instead of below it, should be most heavily considered as a manatee protection solution, and should replace all structures where feasible, i.e. in low to moderate flow discharge areas

(6) Strategies which alter established manatee movement patterns, limit access to suitable habitat, or disturb sensitive behavior should only be considered if the strategies outlined above fail to prevent mortality

5C. For each manatee carcass recovered in the vicinity or downstream of a flood gate, where gate crushing cannot be immediately ruled out as a contributing cause of death, the SFWMD shall provide FDEP with reports for structure-related manatee mortalities within 30 days of notification. These reports should include a compilation of appropriate gate operation records and assessments, conceptual designs, prototype test results and observations, and similar documentation. The reports shall be provided for review at quarterly Interagency Manatee Task Force meetings attended by at least one representative of the SFWMD executive office, FDEP, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service and DERM.

5D. The SFWMD, shall prepare an annual report summarizing all flood gate-related manatee mortality, and the status of the SFWMD manatee protection program. This document shall also include a summary of relevant system operations. It shall be completed by February 1 of each year. The annual report shall be distributed for public review and Interagency Manatee Task Force review at least one month prior to being placed on the SFWMD governing board agenda for discussion.

5E. The Interagency Manatee Task Force shall continue to meet until all agencies are satisfied that the goal of zero manatee mortality from flood gates has been achieved. The SFWMD shall record action items and future agenda topics at the meetings which shall be distributed to all meeting participants and shall be available to the public.

5F. Flood gate operation records should be audited on a continuing basis at the Interagency Task Force meetings to certify that coastal structures are opening to the 2-1/2 foot criteria without excessive oscillation, or to identify any other system problems.

5G. No management strategy shall be dismissed from further consideration until adequate technical information is available for full review, and the agencies composing the task force reach a consensus.

5H. RER-DERM and the SFWMD should jointly conduct an annual public workshop in Miami-Dade County, at an appropriate facility provided by RER-DERM, to inform and receive input on manatee protection from interested members of the community.

5I. The SFWMD shall notify FDEP and RER-DERM prior to conducting any activities involving vessels or heavy equipment, or other work in tidal waters. The SFWMD shall apply for any permits required by state or local regulations.

5J. The construction of locks shall be prohibited.

OBJECTIVE 6

Miami International Airport shall install and maintain barriers to prevent manatees from entering the canal-culvert system.

POLICIES

6A. The design for a manatee barrier shall be approved by RER-DERM, FDEP and the USFWS, and appropriate permits shall be obtained prior to installation.

6B. A permanent manatee barrier shall be installed and maintained at the south tributary off of Tamiami Canal.

6C. The sand-cement bag riprap base on the manatee barrier at the north tributary off of Tamiami Canal shall be replaced with a more substantial base.

6D. Additional barriers or other modifications may be required if additional manatee access points into the airport system are discovered.

6E. Miami-Dade County Aviation Department (MDAD) staff shall submit quarterly manatee barrier maintenance reports to RER-DERM and FDEP.

6F. MDAD staff shall immediately contact manatee protection personnel at RER-DERM, FDEP and USFWS with manatee sightings in the airport canal system, including dead or injured manatees. MDAD Environmental Engineering Division staff shall submit manatee incident reports within 30 days of the manatee sighting to those agencies noted above. These reports shall contain the date, time, location (including a map with location indicated) and the name and telephone number of the first person to observe the manatee.

6G. MDAD, RER-DERM and FDEP staff shall discuss the state of decomposition of any dead manatee and determine the method of carcass disposal prior to meeting onsite whenever possible. If extremely decomposed, RER-DERM may arrange for disposal of a carcass at the South Dade landfill, after receiving authorization from the appropriate FDEP staff. MDAD Public Works staff shall assist in carcass recovery from Miami International Airport (MIA) canals.

6H. If a manatee carcass is discovered upstream of airport manatee barriers, airport personnel shall locate the point of entry within 48 hours and have divers search for additional manatees in the vicinity. Live manatees shall be relocated by USFWS, FDEP, RER-DERM and Miami Seaquarium staff after approval from USFWS. If no manatees are observed, the access point shall be repaired within 48 hours after the completion of the divers' inspection.

OBJECTIVE 7

Manatee protection shall be considered during high speed (greater than 30 mph) water-related activities.

POLICIES

7A. Water-ski activities should occur only in designated (35 mph) and unregulated areas in Dade County tidal waters, and in land-locked lakes, borrow pits and other waterbodies not accessible to manatees.

7B. Power boat racing shall be prohibited in Government Cut or in the unregulated areas of Biscayne Bay. Power boat races shall occur at least 1,000 feet offshore in deep water areas of the Atlantic Ocean, or in the Miami Marine Stadium. Races may occur year-round.

7C. During high speed marine events such as personal watercraft or water-ski events, and power boat races, the following manatee protection measures shall be adhered to:

(1) A Manatee Watch Program shall be established.
(2) The manatee watch shall consist of four qualified observers, including one primary observer. Surveys shall be conducted from an aircraft and also from elevated land-based and/or boat-based positions. Each observer shall be equipped with a two-way radio and will be dedicated exclusively to the manatee watch.
(3) A continuous aerial survey shall be conducted beginning 1 hour prior to the event and prior to any organized practice sessions to identify any manatees in the vicinity of the event site. The survey shall continue until all official and spectator vessels have cleared the area. Aerial surveys shall extend 1 mile from the perimeter of the race course.
(4) Events in the Miami Marine Stadium should require manatee observers on boats positioned across the stadium entrance.
(5) An observer shall be in close communication with race sponsors/officials in order to halt the event if a manatee(s) is spotted within 500 feet of the perimeter of the event site. The event shall be halted immediately upon the request of the observer. The event shall not resume until the animal(s) move(s) away from the area under its own volition. Manatees must not be herded away or harassed into leaving. If the

manatee(s) is (are) not sighted a second time, the event shall not resume until 30 minutes after the initial sighting.

(6) All participants and official boats shall adhere to speed zones adjacent to the event site.

(7) The primary observer shall write a report providing the names of the observers and their positions during the event, number and location of manatees sighted, and any problems encountered during the event (and possible solutions). This report shall be submitted to the Coast Guard, USFWS, FDEP and RER-DERM within 30 days of completion of the event.

(8) If any of the aforementioned conditions is not met prior to or during the race, the event shall be immediately terminated. The Coast Guard shall designate a monitor (possibly a Coast Guard representative or the primary manatee watch observer) who shall have the authority to terminate the event as required by these measures.

OBJECTIVE 8

Vessel speed restrictions for manatee protection should be adequately marked.

POLICIES

8A. FDEP and FIND shall approve of and install sufficient vessel speed signate for appropriate law enforcement. The installation and maintenance of additional signs by third parties should be considered.

8B. Manatee protection zone areas should be inspected annually to ensure that adequate marking is present, and that no hazards to navigation exist.

8C. Vessel speed restrictions in areas of high-speed water-related activities should be indicated by and/or delineated with buoys.

OBJECTIVE 9

Law enforcement should be improved through the coordination of enforcement agencies and by increasing enforcement personnel.

POLICIES

9A. All state and local marine patrol officers shall have an annual review of the vessel speed zones prior to the beginning of manatee season (November 15).

9B. All law enforcement agencies shall adhere to all vessel speed restrictions unless an emergency is in progress.

9C. A manatee protection law enforcement task force should be developed consisting of one officer from each marine patrol office (state, county and each municipality) and the Florida Game and Freshwater Fish Commission, to aid in establishing a working relationship between enforcement agencies. The goal of the task force would be to ensure full and efficient monitoring of areas with vessel speed regulations, and proper handling of manatee-related incidents. Each of these officers should be designated as the "manatee specialist" for their office, and would be notified of any manatee-related proposals with which the law enforcement agencies may be involved.

9D. RER-DERM shall work with the various marine patrol agencies to obtain necessary funding for marine patrol officers to improve enforcement capabilities.

9E. Waterfront municipalities that do not have marine patrol offices should be encouraged to establish them to create additional law enforcement presence.

9F. Any approved boater education program for powerboat operators shall include a manatee protection component. Licensing of powerboat operators should be encouraged statewide.

OBJECTIVE 10

Development of shoreline and submerged land areas shall be regulated in a manner that does not directly or indirectly impact the manatee or its habitat in an adverse manner.

POLICIES

10A. Potential impacts to endangered species and their habitats shall continue to be considered by RER-DERM for projects requiring a Miami-Dade County Class I coastal construction permit. Project or facility construction or operation which could result in adverse impact to manatees or their essential habitats (as defined in the Miami-Dade County Manatee Protection Plan) should not be permitted, except as necessary to protect the health and safety of the public.

l0B. Natural shoreline vegetation shall be maintained. Non-water dependent structures shall be constructed on the upland above the mean high water line, landward or away from wetlands or other natural areas. All new or replacement structures accessible to manatees shall be designed to prevent entrapment of or injury to the animals.

10C. Any culvert greater than 7 and less than 60 inches in diameter, shall be covered with grates or screens with spaces less than 7 inches wide in order to prevent manatee entrapment. These grates/screens shall be maintained to prevent upland flooding. New culverts installed in areas not previously accessible to manatees, shall be covered with flap

gates or other devices designed so as not to cause injury to manatees, and prevent manatee entry into the culvert.

l0D. Standards and policies related to the development of submerged land shall address the preservation of submerged vegetation, placement of dredge and fill material, and the size and design of structures below the mean high water line. Destruction or alteration of shallow water habitat used by manatees shall be prohibited unless necessary for the protection of the public or for restoration and enhancement of environmental resources. Blasting in or adjacent to habitat regularly used by manatees shall be prohibited.

10E. An existing marine facility as defined for this Manatee Protection Plan, is one which is legally operating and is currently producing boat traffic or has produced boat traffic in the past five years prior to the permit application.

10F. New or expanded marine facilities shall have adequate water depth for the draft of the vessels using the facility, plus 3 feet in order to clear manatees, in waterbodies which may be too narrow for the animals to avoid vessels by moving aside.

l0G. The number of powerboats docked at a facility, including dockage along bulkheads, shall not exceed the number of slips approved by the Class I permit or the RER-DERM marine facility operating permit. A boat slip is generally considered to be 20 feet wide by 40 feet long as defined by the Miami-Dade County Manatee Protection Plan.

10H. All new marine facility and marina expansion sites in Miami-Dade coastal waters shall cause no or minimal overlap of manatee-boat travel patterns, no or minimal wetland or benthic community disturbance or similar environmental impact, and shall be compatible with surrounding land use. If only sailboats with or without minimal horsepower auxiliary motors (allowing vessels to travel at a maximum speed of 8 knots) are permitted to be moored at a marina, overlap of manatee-boat travel patterns may not be considered.

10I. Marine facility expansion and new facility locations shall be permitted as indicated in 111.C.2.a. “Marine Facility Siting Criteria” Figure 9, and on Figures 9 of the Miami-Dade County Manatee Protection Plan.

10J. A RER-DERM Class I permit shall be required for the construction, expansion, replacement or repair of all dry storage boat facilities, including those located in municipalities.

10K. Sites recommended for marina development and expansion with no restriction on the number of powerboat slips from a manatee protection perspective include the following areas as shown in Figure 9., in the Miami-Dade County Manatee Protection Plan. The installation of new or additional boat lifts should be permitted in the suitable areas noted below.

- Since the number and frequency of manatee sightings has been relatively lower on the east side of Biscayne Bay along Miami Beach between Haulover and Government Cuts, and most boats using a facility constructed in this area would be likely to travel along Meloy channel and exit to the Atlantic Ocean through either of these inlets, marina development should be considered in this area. Expansion of Crandon Marina on Key Biscayne could be considered due to its nearby ocean access which excludes designated manatee habitat.
- The Keystone Point area located east of Biscayne Boulevard between NE 135 and NE 125 Streets is due west of Haulover Cut. Boats using a marina in this area would be expected to go to the ocean through this inlet, traversing through a very small portion of the Bay, which although used by manatees, is protected by vessel speed limits. Boaters whose destination is south Biscayne Bay have direct access to the Meloy Channel at Broad Causeway.
- FIU/Oleta State Park shorelines (not including the Oleta River) are recommended as locations for public marinas, boat ramps, and transient or courtesy docks ~~for~~ provided all such facilities are limited to shallow draft boats of a size that can typically be stored and launched by trailer, provided that no dredging or filling of seagrass would be required to construct or operate the facility.
- Marina expansion at Dinner Key and at Matheson Hammock Park is preferred due to less frequent manatee sightings in the immediate area, and the improbability of boats using the facility to travel through areas of heavy manatee use. Although manatees have been observed in the nearshore areas, vessels travel mainly in marked channels within speed zones until reaching open water destinations in south Biscayne Bay, where the risk of conflict with manatees is relatively low.
- Some currently operating marinas south of Rickenbacker Causeway may be considered suitable sites for expansion of facilities available for use by the general boating public, especially for launching of smaller boats that are generally stored on trailers and in dry berths, provided that no derdging or filling of manatee habitat would be required to operate or construct such a facilities. Since boaters using these facilities generally are heading to south Biscayne Bay or offshore destinations that do not require extensive travel through essential manatee habitat, opportunities for conflict between vessels and manatees are limited. Manatees near shore should be protected from high-speed vessel impacts by the approved speed zones. Recommended locations for expansion or new facilities are:

- Chapman Field/Deering Bay is recommended for a public-access ramp or upland dry storage provided all such facilities are limited to shallow-draft trailerable boats, provided that vessels use existing basins and marked navigation channels in Deering Bay vicinity, and no dredging or filling of habitat currently being used by manatees (including seagrass habitat) would be required to construct or operate such a facility.
- Homestead Bayfront Park/Convoy Point is recommended for expansion of public marina, ramp, or transient or courtesy docks, provided all such facilities are limited to shallow draft boats that can be trailered.

The installation of new or additional boat lifts should be permitted in the suitable areas noted above.

Areas south of Rickenbacker Causeway that are NOT SUITABLE for marina expansion or development in which moderate to heavy manatee use, mortality or sensitive manatee behavior is documented, include the following:

- a portion of west Key Biscayne from Crandon Marina to the south shore of Pines Canal,
- the Coconut Grove shoreline from the south side of Dinner Key Marina to Coral Gables Waterway,
- all of Coral Gables Waterway located east of SW 57 Avenue and all other canals in Coral Gables (excluding the Matheson Hammock Marina area), and
- the Black Point Marina basin and canal "No Entry" zone

10L. Fuel dispensers should be located on the upland if feasible. Secondary containment shall be required on any fuel line extending over water along a dock.

10M. Existing freight terminals and other facilities mooring vessels greater than 100 feet in length, shall be retrofitted with fender systems or other design which provide at least 4 feet of standoff from the bulkhead or wharf under maximum operational compression; due to the narrowness of the waterway, existing freight terminals in the Miami River shall be required to have at least 3 feet of standoff at maximum compression. However, an exemption to this requirement in the Miami River applies to a 1,600 linear foot narrow area bordered by bordered by and including 3301 NW South River Drive (folio number 30-3128-009-0080) through 3149-3163 NW South River Drive (folio number 30-3128-009-0130) on the south side and bordered by and including 3038 NW North River Drive (folio number 30-3128-000-0090) through 3032 NW North River Drive (folio number 30-3128-000-0127) on the north side. This area may be allowed to remain without fendering as a reasonable option in compromise as long as there is no development or expansion of berthing for terminals to the west of this passage beyond what are already existing facilities

(as defined starting on page 62). This exemption means that there will be no new slips or mooring facilities for large vessels approved within or west of this 1,600 linear foot area. Any takeover of an existing facility by new or different operators will not be considered as new development provided new slips are not created. Further improvement of an existing facility will not be prohibited, provided berthing area is not expanded. Replacement or major renovation of any large vessel berthing in a manatee habitat, including this portion of the Miami River will require standoff. If the 3 foot standoff is achieved in the future, the development and expansion of large vessel docking facilities may be permitted on the River.

10N. The study of prop guard technology is encouraged. If a prop guard or similar device is recommended for use on tug boats in the future, the requirement of the device should receive public review prior to implementation. Should such a recommendation come to pass, economic incentives should be considered for retrofitting tugs with the device for manatee protection.

10O. All parking at boat ramps located in essential manatee habitat shall be limited to the number of existing spaces (including existing overflow parking both on and off paved areas). Excess parking should be prohibited and enforced by Miami-Dade County through a fine, and revocation of the MOP where applicable, if not in compliance. Miami-Dade County Park and Recreation Department personnel should supervise parking in trailer spaces at County-owned marinas on weekends and holidays to ensure that only vehicles with trailers use the spaces.

10P. For docking facilities and boat ramps subject to the 1 powerboat slip to 100 feet of shoreline restriction, higher ratios may be considered if the facility can demonstrate that it will not have an adverse impact on manatees. In no case shall the maximum total buildout of S powerboat slips per 100 feet of owned contiguous shoreline be exceeded. Uses proposed in a location not shown as an acceptable site for that particular type of facility on the map in Figure 9, may be evaluated according to the following listed criteria numbered 1-8. However, adherence to these criteria does not automatically ensure the applicant's ability to exceed the allowable powerboat restrictions as defined above. The plan restrictions will remain in effect, if at the time of review, additional information about manatees or the proposed facility indicates threats not addressed by these criteria. Consideration can be given for additional site-specific factors or operating practices (e.g. seasonal operation, etc.) that may be proposed by either the applicant or the County, that may result in improved conditions for manatees or manatee protection. Any facility exceeding the allowable powerboat slip restrictions (1:100) or use according to the criteria defined below, must agree to obtain and comply with an annual marina operating permit

(MOP), even if the facility does not meet the threshold established in the MOP ordinance. The criteria are:

1. Alternative slip uses or densities at a facility may not generate increases in vessel traffic (as compared to recommended facility siting guidelines) within a cold-weather aggregation area, a state-designated no-entry or limited-entry zone, or sole travel corridor to such an area. The cold-weather aggregation, state-designated zones, and sole travel corridors are Biscayne Canal, Little River, the Miami River/Tamiami Canal, Coral Gables Waterway, Virginia Key "No Entry Zone", Black Point Marina basin, and the vicinity of cooling canals at the FPL Turkey Point power plant.
2. The waters adjacent and channels leading to the facility are designated "slow speed" or "idle speed" as defined by state rule Ch. 68C-22.025 F.A.C., as authorized pursuant to the Florida Manatee Sanctuary Act, Ch. 379.231(2) F.S.
3. The facility must provide net benefit to manatees and/or their habitat above what would otherwise be required for the project. Mitigation needed to satisfy other local, state, or federal government permitting cannot be applied to this requirement. For example, facilities may include creation or enhancement of a manatee "refuge" space as part of the design, a conservation easement, restoration of adjacent habitats or hydrology such as mangrove or seagrass to increase the net ecological value of the nearby area, reduced nutrient input to receiving waters, requiring prop guards on any high traffic vessels such as water taxis or rental boats, etc.
4. The marina facility and channel construction and subsequent uses will neither destroy nor negatively impact coastal wetlands and benthic (seagrass, hard bottom, etc.) communities and the water quality.
5. The facility must have sufficient water depth (as defined herein) in the marina basin and in any marked or unmarked channel or waterway typically used for access to or egress from the basin, and does not require any new dredging or filling that would degrade shallow water habitat (this may exclude maintenance dredging, excavation into uplands or pile installation). Sufficient water depth shall be water depth, measured at mean low tide, of 3 feet greater than the draft of vessels occupying the slips on a permanent basis, and/or 3 feet greater than the draft of vessels typically using the facility on a transient basis. Vessel drafts shall be obtained by using best available data. Entrance/exit channels near marinas shall be adequately marked, in accordance with state regulations, if marina repairs or expansion are proposed.
6. The site shall contain appropriate site-specific informational signage (above and beyond the standard information sign requirements for all facilities) and provide educational material to tenants advising boaters of essential manatee habitats in the vicinity.
7. Multifamily residential docking facilities will require that all vessels moored at the site be registered to individuals residing at the site. Requests for more slips/berths

than residential units at the site or at densities greater than 5 slips per 100 feet of shoreline shall not be approved.

8. Before expanding and exceeding the allowable powerboat slips defined above, an existing facility must demonstrate not less than 85% occupancy over the previous 2 years of operation.

A permit applicant may appeal a decision made by RER-DERM according to existing guidelines.

10Q. The following restrictions apply to boat slips within essential manatee habitat areas. These restrictions also apply to similar sites on tributaries or canals which are upstream of or flow into a water body designated as an essential habitat area.

(1) Each single family residence shall be limited to two powerboat slips, and vessels using those slips should be registered to the upland property owners or residents. Single family docks shall continue to be constructed according to the existing DERM coastal construction guidelines.

(2) For multifamily residential developments within essential habitat areas, multi-slip docking facilities with more than five boat slips should be permitted to construct no more than one powerboat slip per 100 feet of owned developable shoreline. Any additional slips (existing or newly constructed) may be occupied by sailboats. In no case should the number of approved powerboat slips exceed the number of multifamily residential units. If a RER-DERM Marine Facilities Operating Permit is required, it should specify that all vessels docked in a multifamily facility should be registered to individuals residing at the site.

10R. In "No Entry, Residents Only" zones, single-family dock construction should be limited to two boat slips. Only the upland residents shall be permitted to use the dock space for permanent dockage in these areas. Construction or renovation, other than emergency repairs required for the safety of the residents, shall be undertaken during the manatee summer season (May 1 - November 14).

10S. No construction except environmental restoration or work required to protect the health and safety of the public, shall be permitted in areas designated "No Entry" (year-round) for manatee protection.

10T. RER-DERM should have permitting authority in freshwater lakes and canals which have vessel speed restrictions established for manatee protection. The construction restrictions RER-DERM should impose shall be the same as those for similar uses in tidal waters noted above in Policies I0A through l0S.

OBJECTIVE 11

Information about manatees shall be readily available to the general public.

POLICIES

11A. Miami-Dade County (including RER-DERM. Park and Recreation and Communications) staff shall work with the Florida State Department of Education, Office of Environmental Education and the Florida Advisory Council on Environmental Education (FACEE) to develop a manatee supplemental educational curriculum program targeting students in elementary, middle and high schools. A teacher guide shall also be developed to assist teachers on how best to use the curriculum and where to obtain additional education about manatees. A local resource directory, listing available materials for use in the classroom should a1so be compiled.

11B. Miami-Dade County staff will work with the School Board of Miami-Dade County and local environmental educational groups to coordinate, compile and develop maps, video and educationa1 plans on how to best protect manatees in Miami-Dade County. Local educational resources such as the Miami Seaquarium manatee display tank, field trips and camps for various ages shall be incorporated into the local educational plan. A "distribution plan" will be developed for the distribution of the educational materials to both the public and private school systems. The information developed shall be printed in English and Spanish. In addition, the school system should explore the possibility of developing a boater education and operation program similar to existing driver education courses with a strong manatee awareness component.

11C. Upon completion of the teacher guide and list of supplemental educational materials addressed in Policies 11A-B above, teacher's workshops shall be held twice a year to provide basic information on manatee behavior and protection. Teachers participating in the workshops should receive continuing education credit.

11D. Persons who operate vessels in Miami-Dade County should be required to complete a boater education class, which includes a strong manatee protection component, approved by the Florida Department of Environmental Protection, or pass an equiva1ency examination. The Florida Inland Navigation District (FIND) "Miami-Dade County Manatee Protection Zones" brochure should be presented and discussed in the class. Mandatory boater education should be implemented statewide by statute, and if required of all vessel operators. Significant incentives for compliance, such as reduced insurance rates, or disincentives for failure to complete the educational requirements should be incorporated. Therefore, Miami-Dade County should encourage members of the Miami-Dade County delegation to the Florida legislature to support bills that make significant progress toward achieving this goal.

11E. RER-DERM should annually promote Manatee Awareness Month in November as declared by Florida DNR (now FDEP).

(1) Local schools, conservation and boating groups should launch a campaign utilizing existing literature, videos, slide shows, etc. annually during November
(2) Pamphlets, bumper stickers and other manatee items should be distributed
(3) Radio and television public service announcements should be aired during manatee season
(4) Miami-Dade DERM, Parks and Recreation and Communications staff should develop a poster contest targeting residents of all ages and backgrounds, as part of the manatee awareness campaign
(5) Manatee education information should be included in bills from all of the water utilities doing business in Miami-Dade County

11F. Manatee protection awareness should be incorporated into themes for environmental education programs, activities and events such as Baynanza, Miami Riverfest and Earth Day celebrations, and SWIM educational programs and campaigns.

11G. RER-DERM and FDEP should conduct an annual manatee education program for agents who enforce manatee protection laws, including state and local marine patrol officers, judges and prosecutors.

11H. Miami-Dade County vessel speed brochures should be available at large marinas, boat ramps and boat rental facilities.

11I. All marina facilities which require a RER-DERM marine facilities operating permit shall be required to post manatee awareness signs onsite. Those facilities with more than 50 slips, and all boat ramps and fuel docks should be required to post "Manatee Basics for Boaters" and "West Indian Manatee Fact Sheet" information signs. In addition, facilities with boat ramps or more than 100 wet and/or dry slips, should develop a manatee information display with the two manatee information signs, the vessel speed brochure displayed with additional copies for boaters to take with them, and enlarged map showing the vessel speed restrictions in the immediate area, and any other pertinent information.

11J. Appropriate manatee informational signs should be posted at locations where the general public gather to observe manatees in the wild.

(1) Due to the extremely heavy use of Little River in the vicinity of the flood gate, the SFWMD shall post a manatee information sign which includes information on how to report an injured or dead manatee, the importance of not littering manatee areas and the fact that it is illegal to harass, harm, feed, touch, or kill manatees. The sign

should be trilingual (English, Spanish and Creole) and should use international symbols to the greatest extent possible. A trash receptacle shall be installed adjacent to the sign, and the SFWMD shall be responsible for its maintenance.

(2) Appropriate signs addressing feeding and littering, and a trash can should be placed onsite and maintained by the City of Coral Gables at a dead end canal off of Coral Gables Waterway, where manatees aggregate at a stormwater discharge site.

11K. Funding for manatee awareness activities should be provided by Miami-Dade County, FDEP, the Florida Advisory Council on Environmental Education (FACEE) and the SFWMD. Private-public partnerships for funding should be encouraged. Upon acceptance of the Miami-Dade County Manatee Protection Plan, the above-mentioned funding agencies could dedicate that year's environmental education funding to the development of manatee educational and awareness activities. In the years to follow, the funding would decrease from year to year until it reaches a predetermined prorated share of the total available dollars. Miami-Dade County could utilize funds from several sources, such as the Biscayne Bay Environmental Enhancement Trust Fund, the Park and Recreation Department and the Aviation Department and/or the Seaport Department to fund the Manatee Awareness Campaign. Additionally, the Miami-Dade County Board of County Commissioners could stipulate to all environmental community groups that receive funding from Dade County to earmark a portion of those funds for manatee education as part of the overall campaign.

11L. A committee composed of a representative from Miami-Dade County RER-DERM, FDEP, USFWS, FPL, SFWMD, the School Board of Miami-Dade County, the Marine Council, the Marine Industries Association of Greater Miami, Miami Seaquarium, and Save the Manatee Club should be created to coordinate suggestions and to determine funding for the various activities recommended in the Education and Awareness portion of section III. “Implementation” in this Plan. FDEP should be the lead agency on the committee.

OBJECTIVE 12

Vessel traffic and manatee usage patterns should continue to be monitored in order to detect changes in these patterns and modify vessel speed restricted zones accordingly.

POLICIES

12A. An annual boating survey should be conducted during the winter and summer every 5 years beginning in 1996, to determine how boat traffic patterns may change in response to vessel speed restricted zones and/or any other factors. The study should also include sampling to determine levels of compliance at several essential habitat or highly regulated locations, with and without targeted enforcement. In addition, aerial manatee surveys

should be conducted monthly during the manatee winter season and every 2 months during the summer season through winter 1995-6 to determine if areas used by manatees change in response to the vessel speed zones or other factors. At the end of each 5 year boat study, alterations to the vessel speed restrictions developed for manatee protection may be considered. Possible funding sources for this study include FDEP, Save the Manatee Club, the Florida Boating Improvement Trust Fund, and/or the Biscayne Bay Environmental Enhancement Trust Fund.

OBJECTIVE 13

The general public shall be able to obtain information from county and state government regarding manatee protection in Dade County.

POLICIES

13A. Miami-Dade County shall prepare an annual report on the status of implementation of the Miami-Dade County Manatee Protection Plan.

13B. The FDEP shall produce an annual report on income received and money spent in each county on manatee protection activities.

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VI. Appendix

Appendix A- Location of Facilities with Active Marine Facilities Operating Permits- 2024

Appendix B- State rule for vessel speed restrictions for manatee protection in Miami-Dade County

Appendix A- Location of Facilities with Active Marine Facilities Operating Permits (2024)

Total Sites= 251

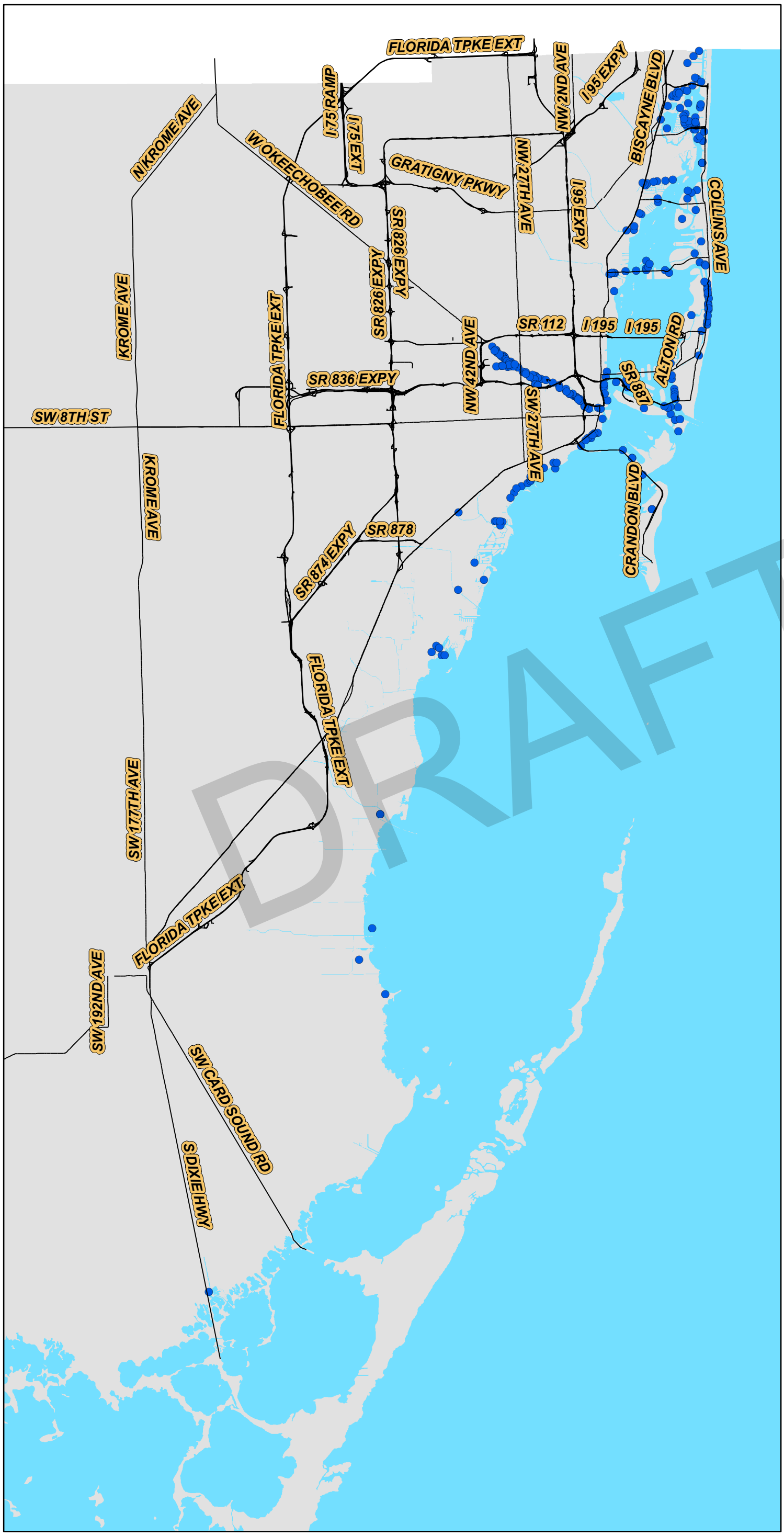
Permit #	Facility Name	Address	Folio	Miami River	Wet Slips	Dry Slips	Dry Storage
MOP-001	WATERWAYS MARINA	3601 NE 207 ST, AVENTURA	2812350720001	N	99	0	0
MOP-002	TOWERS OF QUAYSIDE	1 QUAY BLVD, MIAMI	3022320700010	N	63	0	0
MOP-004	MIAMARINA AT BAYSIDE	401 BISCAYNE BLVD, MIAMI	0101000000522	N	156	0	0
MOP-005	AVENTURA MARINA OWNER (WILLIAMS ISLAND MARINA)	4100 ISLAND BLVD, AVENTURA	2822100660023	N	106	0	0
MOP-006	KEYSTONE POINT MARINA	1950 NE 135 ST, NORTH MIAMI	0622290080069	N	60	450	0
MOP-007	TURNBERRY ISLE MARINA	19735 TURNBERRY WAY, AVENTURA	2822020120020	N	68	0	0
MOP-008	COASTAL TOWERS	400 KINGS POINT DR, SUNNY ISLES BEACH	3122140200001	N	33	0	0
MOP-010	AVENTURA MARINA	3373 N COUNTRY CLUB DR, 33180, AVENTURA	2812350230001	N	27	0	0
MOP-014	TNT MARINE CENTER, LTD.	1940 NE 135 ST, NORTH MIAMI	0622200140381	N	30	450	0
MOP-015	PLAZA DEL PRADO CONDOMINIUM	18071 BISCAYNE BLVD, MIAMI	2822100140001	N	60	0	0
MOP-019	1800 RIVER MARINA, LLC	2400 NW 18 TER, 33125, MIAMI	0131340820001	Y	70	0	0
MOP-020	POINCIANA ISLAND YACHT AND RACQUET CLUB CONDO	350 POINCIANA ISLAND DR, 33160, SUNNY ISLES BEA(	3122140210001	N	49	0	0
MOP-022	MARINER'S BAY CONDO	12000 N BAY SHORE DR, NORTH MIAMI	0622280490001	N	29	0	0
MOP-023	MARINE PLAZA APARTMENTS	660 NE 78 ST, MIAMI	0132070170520	N	22	0	0
MOP-025	BAL HARBOUR YACHT CLUB	200 BAL BAY DR, 33154, BAL HARBOUR	1222260022350	N	36	0	0
MOP-027	HARBOUR WEST YACHT CLUB	7910 WEST DR, 33141, NORTH BAY VILLAGE	2332090010110	N	33	0	0
MOP-029	MARINEMAX EAST, INC.	700 NE 79 ST, MIAMI	0132070163460	N	12	39	0
MOP-030	PALM BAY CLUB & MARINA	759 NE 69 ST, MIAMI	0132180530230	N	46	0	0
MOP-031	GRANDVIEW PALACE YACHT CLUB, INC.	7601 E TREASURE DR, NORTH BAY VILLAGE	2332090410001	N	136	0	0
MOP-032	KING COLE CONDOMINIUM	900 BAY DR, MIAMI BEACH	0232100290001	N	31	0	0
MOP-034	AQUASOL CONDOMINIUM ASSOCIATION, INC.	6770 INDIAN CREEK DR, 33141, MIAMI BEACH	0232110070930	N	16	0	0
MOP-035	SEACOAST SUITES	5101 COLLINS AVE, 33140, MIAMI BEACH	0232140010100	N	14	0	0
MOP-036	5660 COLLINS AVE CONDOMINIUM	5660 COLLINS AVE, 33140, MIAMI BEACH	0232110230001	N	17	0	0
MOP-037	JOURNEY'S END MARINA	9590 JOURNEYS END LN, 33156, CORAL GABLES	0351060220230	N	14	0	0
MOP-038	THE TOWERHOUSE CONDO	5500 COLLINS AVE, 33140, MIAMI BEACH	0232140080001	N	17	0	0
MOP-039	THE CARRIAGE HOUSE CONDOMINIUM ASSOCIATION, INC.	5401 COLLINS AVE, 33140, MIAMI BEACH	0232140200001	N	22	0	0
MOP-041	VICE CITY MARINA LLC	890 BRICKELL KEY DR, MIAMI	0102100301051	N	26	0	0
MOP-043	EDEN ROC BEACH RESORT & SPA	4520 COLLINS AVE, MIAMI BEACH	0232230020040	N	12	0	0
MOP-044	SOUTH BAY CLUB CONDOMINIUM	800 WEST AVE, 33139, MIAMI BEACH	0242031550001	N	18	0	0
MOP-045	THE CHARTER AGENCY LLC (FONTAINEBLEAU HOTEL MARINA)	4441 COLLINS AVE, 33140, MIAMI BEACH	0232230020010	N	23	0	0
MOP-047	SOUTHGATE TOWERS LLC	900 WEST AVE, MIAMI BEACH	0242030010080	N	16	0	0
MOP-048	MONDRIAN SOUTH BEACH	1100 WEST AVE, MIAMI BEACH	0232330100210	N	26	0	0
MOP-049	1600 SOUTH BAYSHORE LANE CONDO	1600 S BAY SHORE LN, MIAMI	0141140140320	N	12	0	0
MOP-050	FLAMINGO SOUTH BEACH	1500 BAY RD, 33139, MIAMI BEACH	0232330070030	N	30	0	0
MOP-051	COSTA BRAVA CONDOMINIUM	11 ISLAND AVE, MIAMI BEACH	0232330410001	N	32	0	0
MOP-052	SUNSET HARBOUR YACHT CLUB, INC.	1928 SUNSET HARBOUR DR, MIAMI BEACH	0232330220341	N	125	0	0
MOP-053	NINE ISLAND AVENUE CONDOMINIUM	9 ISLAND AVE, MIAMI BEACH	0232330530001	N	36	0	0
MOP-054	MIAMI BEACH MARINA	344 ALTON RD, MIAMI BEACH	0242030000010	N	416	0	0
MOP-055	MIAMI YACHT CLUB	1001 MAC ARTHUR CSWY, 33132, MIAMI	0132310000011	N	40	160	0
MOP-056	MIAMI OUTBOARD CLUB	1099 MAC ARTHUR CSWY, MIAMI	0132310000013	N	59	140	0
MOP-058	RICKENBACKER MARINA, INC.	3301 RICKENBACKER CSWY, MIAMI	0142170000020	N	190	378	0
MOP-059	MARINE STADIUM MARINA	3501 RICKENBACKER CSWY, VIRGINIA KEY	0142170000110	N	22	296	0
MOP-060	BETTY K AGENCIES (USA) LLC	3701 NW SOUTH RIVER DR, MIAMI	3031290200020	Y	2	0	0
MOP-061	MDCPROS - CRANDON PARK MARINA	4000 CRANDON BLVD, KEY BISCAYNE	3042320010010	N	319	130	0
MOP-062	TINEO GROUP LLC (LA COLOMA MARINA)	243 NW SOUTH RIVER DR, MIAMI	0102000401020	Y	45	0	0
MOP-063	CORAL REEF YACHT CLUB	2484 S BAY SHORE DR, MIAMI	0141220011600	N	103	66	0
MOP-064	BRICKELL BISCAYNE CONDOMINIUM ASSOCIATION, INC.	150 SE 25 RD, MIAMI	0141400130001	N	17	0	0
MOP-065	400 SUNNY ISLES MARINA CONDOMINIUM	400 SUNNY ISLES BLVD, SUNNY ISLES BEACH	3122140070240	N	36	94	0
MOP-066	SKYLINE ON BRICKELL	2101 BRICKELL AVE, MIAMI	0141390840001	N	13	0	0
MOP-067	BRICKELL PLACE MARINA	1909 BRICKELL AVE, 33129, MIAMI	0141120000020	N	74	0	0
MOP-068	VILLA REGINA CONDOMINIUM	1581 BRICKELL AVE, 33129, MIAMI	0141390410001	N	43	0	0
MOP-069	BISCAYNE BAY YACHT CLUB	2540 S BAY SHORE DR, MIAMI	0141220011620	N	76	47	0
MOP-070	GROVE ISLE MARINA	4 GROVE ISLE DR, 33133, MIAMI	0141140020010	N	112	0	0
MOP-071	COCONUT GROVE SMI LLC (BAYSHORE LANDING MARINA)	2560 SOUTH BAYSHORE DR, MIAMI	0141220011630	N	149	0	0
MOP-072	FLORIDA POWER & LIGHT CO. (TURKEY POINT)	9700 SW 344 ST, FLORIDA CITY	3070270000010	N	1	1	0
MOP-073	COCONUT GROVE SAILING CLUB	2990 S BAY SHORE DR, MIAMI	0141210400010	N	247	31	0
MOP-074	DINNER KEY MARINA	3400 PAN AMERICAN DR, MIAMI	0141220020010	N	837	0	0
MOP-076	GABLES WATERWAY TOWERS	90 EDGEWATER DR, 33133, CORAL GABLES	0341290540001	N	31	0	0
MOP-077	GABLES HARBOUR CONDOMINIUM	6901 EDGEWATER DR, CORAL GABLES	0341290520001	N	23	0	0
MOP-078	WATERS EDGE CONDOMINIUM ASSOCIATION	100 EDGEWATER DR, 33133, CORAL GABLES	0341290510001	N	18	0	0
MOP-079	COCOPLUM YACHT CLUB	6500 PRADO BLVD, CORAL GABLES	0341320280420	N	186	0	0
MOP-082	ROYAL HARBOUR YACHT CLUB MARINA	6200 SW 152 ST, PALMETTO BAY	3350250060001	N	51	0	0
MOP-083	SNAPPER CREEK MARINA	11190 SNAPPER CREEK RD, CORAL GABLES	0351070040290	N	36	31	0
MOP-085	MDCPROS - BLACK POINT MARINA	24775 SW 87 AVE, MIAMI	3060220000030	N	209	31	0
MOP-086	MDCPROS - HERBERT HOOVER MARINA	9698 SW 328 ST, MIAMI	3070210010010	N	173	60	0
MOP-089	CAY MARINE, INC. DBA CAY MARINE SERVICE	501 NW SOUTH RIVER DR, MIAMI	0141380030160	Y	4	13	0
MOP-092	FISHER ISLAND FERRY	1 FISHER ISLAND DR, FISHER ISLAND	3042090020040	N	13	0	0
MOP-095	RIVER RUN YACHT CLUB CONDOMINIUM ASSOCIATION	1700 NW NORTH RIVER DR, 33125, MIAMI	0131341040001	Y	71	0	0
MOP-097	COVE MARINA HOLDINGS LLC (RIVER COVE MARINA)	2000 NW NORTH RIVER DR, MIAMI	0131340241170	Y	72	0	0
MOP-098	SNUG HARBOR TOWNHOUSE	1000 NW NORTH RIVER DR, MIAMI	0131350460174	Y	19	0	0
MOP-099	AUSTRAL MARINA	2190 NW NORTH RIVER DR, MIAMI	0131340241140	Y	35	11	0
MOP-100	BISCAYNE TOWING & SALVAGE, INC.	151 NW SOUTH RIVER DR, MIAMI	0141380270020	Y	10	0	0
MOP-101	RIVERSIDE WHARF HOLDINGS LLC (THE WHARF)	300 SW 2 ST, 33130, MIAMI	0101140001090	Y	10	0	0
MOP-103	PELICAN REEF CONDOMINIUM ASSOCIATION, INC.	1632 S BAYSHORE CT, 33133, MIAMI	0141140200001	N	12	0	0
MOP-104	MIAMI MARINA VENTURES, LLLP (DBA VENETIAN MARINA)	1635 N BAYSHORE DR, MIAMI	0132310360021	N	222	0	0
MOP-105	BRICKELL HARBOUR CONDOMINIUM	200 SE 15 ST RD, MIAMI	0141390340001	N	12	0	0
MOP-106	MD SEAPORT-DANTE B. FASCELL PORT OF MIAMI	1015 N AMERICAN WAY, MIAMI	0142050000010	N	0	0	0
MOP-107	SOUTH DADE MARINA	54400 S DIXIE HWY, MIAMI	3099280000030	N	27	25	0
MOP-113	BETTY K AGENCIES (USA) LLC	3611 NW SOUTH RIVER DR, MIAMI	3031280280010	Y	2	0	0
MOP-114	TRANSMONTAIGNE FISHER ISLAND TERMINAL	1 FISHER ISLAND DR, MIAMI	3042090000040	N	5	0	0

MOP-115	CASABLANCA FISH MARKET, INC.	28/90 NW NORTH RIVER DR, MIAMI	0101110201090	Y	6	0	0
MOP-124	BERNUTH MARINE SHIPPING, INC.	3163 NW SOUTH RIVER DR, MIAMI	3031280090130	Y	4	0	0
MOP-125	GLASS - TECH CORP.	3103 NW 20 ST, MIAMI	3031280000070	Y	20	26	0
MOP-126	FOUR MERMAIDS SEAFOOD, LLC	3199 NW 20 ST, MIAMI	3031280000061	Y	5	0	0
MOP-127	U.S. COAST GUARD	100 MAC ARTHUR CSWY, MIAMI BEACH	0242040000020	N	22	4	0
MOP-130	FLORIDA POWER & LIGHT CO. (MIAMI BEACH PLANT)	158 MAC ARTHUR CSWY, MIAMI BEACH	0242040000070	N	4	0	0
MOP-135	UNIVERSITY OF MIAMI (RSMAS)	4600 RICKENBACKER CSWY, 33149, VIRGINIA KEY	3042200000030	N	10	0	0
MOP-138	NORTH BEACH MARINA	724 NE 79 ST, MIAMI	0132070170740	N	17	250	0
MOP-140	BAYSHORE YACHT CLUB LLC	7904 WEST DR (CU12), NORTH BAY VILLAGE	2332090261750	N	14	0	0
MOP-141	KEYSTONE HARBOR CLUB CONDOMINIUM	13155 IXORA CT, 33181, NORTH MIAMI	0622280440001	N	14	0	0
MOP-144	MAGNUM MARINE CORP.	2900 NE 188 ST, AVENTURA	2822030000292	N	4	16	0
MOP-147	MARITIME AGENCY INC.	3630 NW NORTH RIVER DR, MIAMI	3031280142570	Y	7	0	0
MOP-148	BEACH BOAT RENTAL LUXURY CHARTER TOURS	2400 COLLINS AVE, MIAMI BEACH	0232260010630	N	10	0	0
MOP-151	ARLEN HOUSE MARINA	275 BAYVIEW DR, SUNNY ISLES BEACH	3122140150010	N	25	0	0
MOP-152	LE MONTCALM CONDOMINIUM ASSOCIATION, INC.	18000 N BAY RD, SUNNY ISLES BEACH	3122110560001	N	11	0	0
MOP-153	LE LAURIER CONDO ASSOC. INC.	17800 N BAY RD, SUNNY ISLES BEACH	3122110550001	N	11	0	0
MOP-154	SHAKE-A-LEG MIAMI, INC.	2600 S BAY SHORE DR, MIAMI	0141220020020	N	24	15	0
MOP-158	C & F MARINE	2151 NW 12 ST, MIAMI	0131340510600	Y	20	0	20
MOP-159	CHAMONIX YACHT MANAGEMENT INC	3550/3660 NW 21 ST, MIAMI	3031280220010	Y	85	0	8
MOP-160	GROVE BAY INVESTMENT GROUP (REGATTA HARBOUR)	3385 PAN AMERICAN DR, MIAMI	0141220020040	N	3	325	0
MOP-161	THE CARRIAGE CLUB NORTH CONDOMINIUM	5005 COLLINS AVE, MIAMI BEACH	0232140180001	N	16	0	0
MOP-163	NORSEMAN SHIPBUILDING AND BOATYARD, LLC	437 NW SOUTH RIVER DR, MIAMI	0141380030150	Y	10	56	0
MOP-165	MARINA PALMS YACHT CLUB AND RESIDENCES	17211 BISCAYNE BLVD, NORTH MIAMI BEACH	0722090090010	N	116	0	0
MOP-166	RMK MERRILL STEVENS LLC	1270 NW 11 ST, MIAMI	0131350210180	Y	20	20	0
MOP-168	JONES BOAT YARD, INC.	3399 NW SOUTH RIVER DR, MIAMI	3031280090011	Y	14	26	0
MOP-170	MHC HI LIFT LLC (DBA HI-LIFT MARINA)	2890 NE 187 ST, AVENTURA	2822030000020	N	9	260	0
MOP-172	MIAMI RIVER PORT TERMINAL, LLC	3300 NW NORTH RIVER DR, MIAMI	3031280000110	Y	6	0	0
MOP-173	ATLANTIC AEROMARINE ASSOCIATES, INC.	3603 NW SOUTH RIVER DR, MIAMI	3031280280020	Y	8	10	0
MOP-174	1819 NBV OWNER LLC (DBA 1819 MARINA)	1819 79 ST CSWY, NORTH BAY VILLAGE	2332090000120	N	20	0	0
MOP-175	DKR MARINE LLC	961 NW 7 ST, MIAMI	0131350310020	Y	15	0	10
MOP-177	APEX MARINE, LLC	2051 NW 11 ST, MIAMI	0131341010010	Y	8	37	0
MOP-178	CHAMONIX YACHT MANAGEMENT INC	3480 NW 21 ST, MIAMI	3031280090880	Y	32	0	4
MOP-182	OCEANIKA MARINE YARD LLC	2100 NW NORTH RIVER DR, MIAMI	0131340241160	Y	5	19	0
MOP-186	KEY BISCAYNE YACHT CLUB, INC.	180 HARBOR DR, KEY BISCAYNE	2442320060021	N	100	40	0
MOP-188	ANTILLEAN MARINE SHIPPING CORP.	3038 NW NORTH RIVER DR, MIAMI	3031280000090	Y	3	0	0
MOP-191	360 MARINA CONDOMINIUM ASSOCIATION, INC.	7900 HARBOR ISLAND DR, NORTH BAY VILLAGE	2332090580001	N	14	0	0
MOP-195	ARTECH MARINA	2950 NE 188 ST, 33180, AVENTURA	2822030000291	N	43	0	0
MOP-197	MDCPROS - MATHESON HAMMOCK MARINA	9610 OLD CUTLER RD, MIAMI	0351050000010	N	259	71	0
MOP-198	GROVE HARBOUR MARINA	2640 S BAYSHORE DR, MIAMI	0141220020011	N	57	260	0
MOP-199	FISHER ISLAND CLUB, INC.	1 FISHER ISLAND DR, 33109, FISHER ISLAND	3042090020040	N	139	0	0
MOP-200	RIVER POINT MARINA	2490 NW 18 TER, MIAMI	0131340290010	Y	18	5	0
MOP-201	THE BEST YACHT REPAIR, INC.	2535 NW 18 TER, MIAMI	0131340310110	Y	6	3	0
MOP-202	EPIC MARINA LLC C/O YACHTSMYTH LLC (OPERATOR)	250 BISCAYNE BLVD WAY, MIAMI	0101140301012	Y	10	0	0
MOP-204	MIAMI RIVER LOBSTER AND STONE CRAB CORP.	510 NW 7 AVE, 33136, MIAMI	0131350271420	Y	4	0	0
MOP-206	BICENTENNIAL PARK (FEC TRACT)	1075 BISCAYNE BLVD, MIAMI	0141370730010	N	10	0	0
MOP-210	BRICKELL PLACE PHASE II MARINA	1905 BRICKELL AVE, 33129, MIAMI	0141120000010	N	24	0	0
MOP-211	STMI RIVER	1201 NW SOUTH RIVER DR, 33125, MIAMI	0131350220110	Y	4	0	0
MOP-221	BLUE DIAMOND GENERAL INVESTMENTS, CORP.	2974 NW NORTH RIVER DR, MIAMI	3031280170280	Y	4	0	0
MOP-223	GOLDEN GATE ESTATES AND MARINA	19500 COLLINS AVE, SUNNY ISLES BEACH	3122020360100	N	18	0	0
MOP-227	MARINEMAX EAST, INC	820 NE 79 ST, MIAMI	0132070163440	N	12	30	0
MOP-234	L'HERMITAGE OWNER'S ASSOCIATION, INC.	2000 S BAYSHORE DR, MIAMI	0141150640760	N	15	0	0
MOP-235	CAPOBELLA DOCKS	5025 COLLINS AVE, MIAMI BEACH	0232140230001	N	16	0	0
MOP-239	BRISAS DEL RIO MARINA	1583 NW 24 AVE, MIAMI	0131340590010	Y	45	0	100
MOP-241	CHAMONIX YACHT MANAGEMENT INC	3350 NW 21 ST, 33142, MIAMI	3031280230040	Y	17	0	4
MOP-244	CAMDEN AVENTURA APARTMENTS	3100 NE 190 ST, AVENTURA	2822030710010	N	34	0	0
MOP-246	CRICKET CLUB CONDOMINIUM	1800 NE 114 ST, MIAMI	3022320660001	N	18	0	0
MOP-247	MDPW-DERM ARTIFICIAL REEF STAGING SITE	NW 20 ST/NW NORTH RIVER DR, MIAMI	0131330070040	Y	2	0	0
MOP-249	WINSTON YACHT CLUB, INC.	270 174 ST, SUNNY ISLES BEACH	3122110040209	N	50	0	0
MOP-259	PARADISE POINT MARINA	5830 PARADISE POINT DR, PALMETTO BAY	3350250100001	N	26	0	0
MOP-261	RIVER SOLUTIONS, LLC	3600 NW NORTH RIVER DR, MIAMI	3031280142560	Y	2	0	0
MOP-264	BIMINI SHIPPING	3301 NW SOUTH RIVER DR, MIAMI	3031280090080	Y	3	0	0
MOP-273	MDCPROS - BILL BIRD MARINA AT HAULOVER PARK	10800 COLLINS AVE, MIAMI	3022140080010	N	152	0	0
MOP-275	MDCPROS - PELICAN HARBOR PARK	1275 NE 79 ST, MIAMI	0132080280010	N	139	0	0
MOP-281	P & L TOWING AND TRANSPORTATION, INC.	510 NW 1 ST, MIAMI	0102010001020	Y	1	0	0
MOP-294	MPOA BOAT BASIN	N MOORINGS WAY/S MOORINGS WAY, MIAMI	9000000000000	N	11	0	0
MOP-295	MS LEISURE COMPANY - DBA MIAMI SEAQUARIUM	4400 RICKENBACKER CSWY, 33149, MIAMI	3042200000010	N	8	0	0
MOP-296	HC INVESTORS #1, LLC (HURRICANE COVE MARINA)	1884 NW NORTH RIVER DR, MIAMI	0131340170140	Y	130	20	0
MOP-299	ELOQUENCE ON THE BAY MARINA	7928 EAST DR, NORTH BAY VILLAGE	2332090600001	N	22	0	0
MOP-300	DEERING BAY MARINA	13660 DEERING BAY DR, CORAL GABLES	0350240120001	N	94	0	0
MOP-301	EMA INVESTMENT CORP.	2115 NW 12 ST, MIAMI	0131340510610	Y	12	12	0
MOP-302	CRICKET CLUBHOUSE CONDOMINIUM	1650 NE 115 ST, MIAMI	3022320800001	N	11	0	0
MOP-303	INTERCOASTAL MARINA ASSOC. AT OCEANIA, INC.	16340 COLLINS AVE, SUNNY ISLES BEACH	3122140000101	N	48	0	0
MOP-306	ISLAND GARDENS DEEP HARBOUR	888 MAC ARTHUR CSWY, MIAMI	0132310000030	N	50	0	0
MOP-307	33032 PARTNERS LTD (DBA LOGGERHEAD MARINA SOUTH)	24777 SW 87 AVE, MIAMI	3060220000030	N	6	300	0
MOP-308	NPS-BISCAYNE NATIONAL PARK	9700 SW 328 ST, HOMESTEAD	3070160000010	N	95	0	0
MOP-311	MIAMI RIVER LOBSTER AND STONE CRAB CORP.	325 NW SOUTH RIVER DR, MIAMI	0102000102030	Y	6	0	0
MOP-315	RIVER MERCHANTS TERMINAL SERVICES INC	3030/3032 NW NORTH RIVER DR, MIAMI	3031280000127	Y	3	0	0
MOP-318	FB POWERHOUSE MARINA LLC	13255 BISCAYNE BLVD, NORTH MIAMI	0622290080280	N	12	60	0
MOP-320	OCEAN MARINE MANAGEMENT, INC.	3250 NW NORTH RIVER DR, MIAMI	3031280061850	Y	2	0	0
MOP-325	HARKHAM SHIPPING LLC	3001 NW SOUTH RIVER DR, MIAMI	3031280010040	Y	3	0	0
MOP-367	THE YACHT CLUB AT AVENTURA	19777 E COUNTRY CLUB DR, AVENTURA	2822020380001	N	18	0	0
MOP-369	HAULOVER SMI WESTREC LLC (HAULOVER MARINE CENTER)	15000 COLLINS AVE, MIAMI	3022140080010	N	10	285	0
MOP-370	RIVER TERMINAL SERVICES, INC.	2199 NW SOUTH RIVER DR, MIAMI	0131340440010	Y	3	0	0
MOP-372	555 RIVER PARTNERS, LLC (TERMINAL 555 DRY STORAGE)	517/555 NW SOUTH RIVER DR, MIAMI	0141380030180	Y	6	41	0
MOP-375	CITY OF SUNNY ISLES BEACH - BELLA VISTA BAY PARK	500 SUNNY ISLES BLVD, SUNNY ISLES BEACH	3122140070210	N	5	0	0
MOP-378	DOCK AND MARINE CONSTRUCTION CORP	752 NE 79 ST, MIAMI	0132070170630	N	10	10	0
MOP-379	EBSARY FOUNDATION COMPANY	2154 NW NORTH RIVER DR, MIAMI	0131340241150	Y	2	0	0

MOP-380	TIDES TOWNHOMES	3824 NE 166 ST, NORTH MIAMI BEACH	0722100022311	N	17	0	0
MOP-381	MYSTIC POINTE MARINA	3575 MYSTIC POINTE DR, AVENTURA	2812350580001	N	122	0	0
MOP-382	MIAMI RIVER MARINA	1995 NW 11 ST, 33125, MIAMI	0131341010010	Y	37	10	0
MOP-387	BYRD COMMERCIAL DIVING	3345 NW SOUTH RIVER DR, MIAMI	3031280090050	Y	1	0	0
MOP-390	BYRD DIVING AND SALVAGE	3369 NW SOUTH RIVER DR, MIAMI	3031280090030	Y	6	6	0
MOP-396	ABITARE CONDO ASSOCIATION	3495 MAIN HWY, MIAMI	0141210880001	N	14	0	0
MOP-397	FPT FLORIDA LLC	3700 NW NORTH RIVER DR, MIAMI	3031280142420	Y	1	0	0
MOP-398	U.S. SAILING CENTER, INC.	2476 S BAYSHORE DR, MIAMI	0141220011591	N	11	44	0
MOP-400	5TH STREET MARINA LLC	341 NW SOUTH RIVER DR, 33128, MIAMI	0102000101071	Y	6	0	0
MOP-405	PUNTALLANA LLC	311 NW SOUTH RIVER DR, 33128, MIAMI	0102000102040	Y	4	0	0
MOP-409	GABLES CLUB MARINA, LLC	10 EDGEWATER DR, 33134, CORAL GABLES	0341290660001	N	30	0	0
MOP-410	GOLDEN BAY CLUB MARINA	17050 N BAY RD, SUNNY ISLES BEACH	3122110630001	N	18	0	0
MOP-411	BAYFRONT PARK	315 S BISCAYNE BLVD, 33131, MIAMI	0101000000521	N	3	0	0
MOP-412	FLORIDA POWER & LIGHT CO. (CENTRAL SERVICE CTR)	122 SW 3 ST, MIAMI	0101140801010	Y	3	0	0
MOP-415	ISLAND ESTATES MARINA ASSOCIATION, INC.	4041 ISLAND ESTATES DR, 33160, AVENTURA	2822100850230	N	54	0	0
MOP-416	GRANDVIEW CONDOMINIUMS	5900 COLLINS AVE, 33140, MIAMI BEACH	0232140260001	N	19	0	0
MOP-417	FAIRMONT HOUSE, INC.	2700 NE 135 ST, NORTH MIAMI	0622290690001	N	15	0	0
MOP-418	SANTA MARIA ON BRICKELL CONDOMINIUM ASSOCIATION, IN	1643 BRICKELL AVE, MIAMI	0141390620001	N	14	0	0
MOP-419	100 HIDDEN BAY CONDOMINIUM ASSOCIATION	3370 NE 190 ST (1001-1), AVENTURA	2822030570090	N	36	0	0
MOP-420	SEAGULL TOWNHOMES	3555 NE 168 ST, NORTH MIAMI BEACH	0722100650001	N	28	0	0
MOP-421	5600 CONDOMINIUM ASSOCIATION, INC.	5600 COLLINS AVE, MIAMI BEACH	0232140270380	N	20	0	0
MOP-422	THE MIAMI SANDPIPER CONDOMINIUM ASSOCIATION, INC.	3745 NE 171 ST, 33160, NORTH MIAMI BEACH	0722100300001	N	20	0	0
MOP-424	TOWER FORTY ONE ASSOCIATION, INC.	4101 PINE TREE DR, 33140, MIAMI BEACH	0232230160001	N	18	0	0
MOP-425	INTERCOASTAL YACHT CLUB LLC	17000 N BAY RD, 33160, SUNNY ISLES BEACH	3122110400010	N	17	0	0
MOP-427	KEYSTONE TOWERS CONDOMINIUM	2000/2020 NE 135 ST, NORTH MIAMI	0622280570001	N	20	0	0
MOP-429	DORSET HOUSE ASSOCIATION, INC.	2500 NE 135 ST, 33181, MIAMI	0622290800190	N	18	0	0
MOP-430	THE GRAND MARINA AT DEERING BAY	13660 DEERING BAY DR, CORAL GABLES	0350240150001	N	27	0	0
MOP-433	HARBOUR CLUB VILLAS	1530 NE 105 ST, MIAMI SHORES	1122300530001	N	25	0	0
MOP-434	GABLES WATERWAY MARINA	1390 S DIXIE HWY, 33146, MIAMI	0341300060290	N	22	0	0
MOP-435	ALAQUA CONDOMINIUM	3001 NE 185 ST, AVENTURA	2822030640010	N	9	0	0
MOP-436	AVENTURA MARINA OWNERS' ASSOCIATION, INC.	3350 NE 190 ST, AVENTURA	2822030520070	N	31	0	0
MOP-437	COURTYARDS AT THE POINT	3735 NE 214 ST (32), AVENTURA	2812350670180	N	27	0	0
MOP-439	ISLAND POINTE CONDOMINIUM	10350 W BAY HARBOR DR, BAY HARBOR ISLANDS	1322270016740	N	11	0	0
MOP-440	SEACOAST 5700 CONDOMINIUM	5700 COLLINS AVE, MIAMI BEACH	0232110650001	N	10	0	0
MOP-441	VILLAGE DEL MAR MARINA	1200 NE 105 ST, MIAMI SHORES	1122320270110	N	9	0	0
MOP-442	UPTOWN MARINA LOFTS CONDOMINIUM	3029 NE 188 ST, AVENTURA	2822030700010	N	29	0	0
MOP-443	AQUA ISLAND HOMES ASSOCIATION	201 AQUA AVE, MIAMI BEACH	0232110740510	N	21	0	0
MOP-444	HIDDEN WATERS CONDOMINIUM	1860 VENICE PARK DR, NORTH MIAMI	0622280580001	N	28	0	0
MOP-446	MIAMI RIVER LOBSTER AND STONE CRAB CORP.	300 SW NORTH RIVER DR, MIAMI	0141370310020	Y	5	0	0
MOP-447	BEACH CLUB VILLAS	3670 NE 167 ST, NORTH MIAMI BEACH	0722100250001	N	49	0	0
MOP-448	THE REGENCY TOWER	5838 COLLINS AVE, MIAMI BEACH	0232110240001	N	10	0	0
MOP-449	SEACOAST 5151 CONDOMINIUM	5151 COLLINS AVE, MIAMI BEACH	0232140240001	N	19	0	0
MOP-451	CAPRI SOUTH BEACH CONDOMINIUM	1445 16 ST, MIAMI BEACH	0232330230050	N	14	0	0
MOP-452	THE ALEXANDER HOTEL & MARINA	5225 COLLINS AVE, MIAMI BEACH	0232140190001	N	12	0	0
MOP-453	WATERWAY UNITS LLC (WATERWAY MARINA)	7930/7950/8000 TATUM WATERWAY DR, MIAMI	0232020020071	N	14	0	0
MOP-454	BEACH CLUB VILLAS II	3925 NE 167 ST, NORTH MIAMI BEACH	0722100410001	N	20	0	0
MOP-455	RIVER RUN SOUTH MARINA CONDOMINIUM ASSOC. INC.	2415 NW 16 ST RD, 33125, MIAMI	0131341220001	Y	14	0	0
MOP-456	KEYSTONE MANOR CONDOMINIUM ASSOCIATION	2225 NE 123 ST, NORTH MIAMI	0622280510001	N	11	0	0
MOP-457	DEZER INTRACOASTAL MALL LLC	3501 SUNNY ISLES BLVD, NORTH MIAMI BEACH	0722100022640	N	14	0	0
MOP-459	BLUE AND GREEN DIAMOND	4777 COLLINS AVE, MIAMI BEACH	0232230020091	N	10	0	0
MOP-461	THE FLORIDIAN OF MIAMI BEACH CONDOMINIUM	650 WEST AVE, MIAMI BEACH	0242030010035	N	14	0	0
MOP-462	BAYVIEW POINT SOUTH CONDOMINIUM	3601 NE 170 ST (OFFICE), NORTH MIAMI BEACH	0722100340001	N	10	0	0
MOP-463	EASTERN SHORES PALO ALTO ASSOCIATION, INC.	3922-3923 NE 166 ST, NORTH MIAMI BEACH	0722100030001	N	12	0	0
MOP-464	EDEN ROC CONDOMINIUM	17900 N BAY RD, SUNNY ISLES BEACH	3122110290001	N	12	0	0
MOP-465	MIAMI INTERNATIONAL MARINA	3175 NW 20 ST, MIAMI	3031280000050	Y	9	0	20
MOP-467	REEF CLUB CONDOMINIUM	16558 NE 26 AVE, NORTH MIAMI BEACH	0722150100001	N	47	0	0
MOP-468	VECINO DEL MAR OWNERS' ASSOCIATION, INC.	2350 NE 135 ST, NORTH MIAMI	0622290930001	N	21	0	0
MOP-470	EASTERN SHORES WHITE HOUSE	3660 NE 166 ST, NORTH MIAMI BEACH	0722100150001	N	23	0	0
MOP-471	THE ATRIUM AT AVENTURA MARINA	3131 NE 188 ST, AVENTURA	2822030790001	N	22	0	0
MOP-472	RATIA MIAMI RIVER, LLC (MIAMI RIVER APARTMENTS)	2216 NW NORTH RIVER DR, MIAMI	0131340270010	Y	15	0	0
MOP-474	RANSOM EVERGLADES SCHOOL	3575 MAIN HWY, 33133, MIAMI	0141210450180	N	22	0	0
MOP-476	CITY OF MIAMI - JAMES L. KNIGHT CENTER	400 SE 2 AVE, MIAMI	0131370220020	Y	2	0	0
MOP-477	HAULOVER SMI WESTREC LLC (HAULOVER MARINE CENTER)	15600 COLLINS AVE, MIAMI	3022140080010	N	8	502	0
MOP-478	MODA APARTMENTS	8000 WEST DR, 33141, NORTH BAY VILLAGE	2332090010040	N	13	0	0
MOP-479	CARROLLTON SCHOOL OF THE SACRED HEART	3747 MAIN HWY, MIAMI	0141280040050	N	7	14	0
MOP-480	CITY OF MIAMI - LUMMUS LANDING PUBLIC DOCKS	250 NW NORTH RIVER DR, 33128, MIAMI	0101090302020	Y	15	0	0
MOP-481	SERENO RESIDENCES CONDOMINIUM DOCKING FACILITY	10201 E BAY HARBOR DR, BAY HARBOR ISLANDS	1322270010840	N	13	0	0
MOP-482	BENTLEY BAY MARINA	520 WEST AVE, MIAMI BEACH	0242040060150	N	20	0	0
MOP-483	BISCAYNE BAY PILOTS, INC.	2911 PORT BLVD, MIAMI	0142090000011	N	5	0	0
MOP-484	RITZ CARLTON RESIDENCES MIAMI BEACH	4701 N MERIDIAN AVE, MIAMI BEACH	0232220330001	N	36	0	0
MOP-485	KAI AT BAY HARBOR CONDOMINIUM	9940 W BAY HARBOR DR, BAY HARBOR ISLANDS	1322271160001	N	14	0	0
MOP-488	MIAMI BOAT LOCKER	3250 NW NORTH RIVER DR, MIAMI	3031280061810	Y	0	0	30
MOP-489	IRIS HOMEOWNER ASSOCIATION, INC.	25 N SHORE DR, 33141, MIAMI BEACH	0232030080010	N	12	0	0
MOP-492	SPUS9 BAYSHORE, LP - DBA NAVETTE ON THE BAY	7965 NE BAYSHORE CT, MIAMI	0132080340010	N	12	0	0
MOP-495	A 626 CORPORATION DBA SOMEONE TO DO IT MARINA &	3183 NW SOUTH RIVER DR, 33142, MIAMI	3031280090120	Y	2	0	90
MOP-496	THE IVORY BAY HARBOUR, LLC	9261 E BAY HARBOR DR, BAY HARBOR ISLANDS	1322271180001	N	10	0	0
MOP-497	RL MIAMI L.P. (RIVER LANDING MARINA)	1400 NW NORTH RIVER DR, MIAMI	0131350880010	Y	15	0	0
MOP-498	MONACO YACHT CLUB & RESIDENCES CONDO ASSOC. INC	6800 INDIAN CREEK DR, 33141, MIAMI BEACH	0232110070970	N	12	0	0
MOP-500	YACHT CLUB BY LUXCOM, LLC (CUTLER PLANTATION)	6527 SW 152 ST, MIAMI	3350240000025	N	0	180	0
MOP-503	INDIAN CREEK COUNTRY CLUB, INC.	55 INDIAN CREEK IS RD, INDIAN CREEK VILLAGE	2122340020430	N	10	0	0
MOP-504	NILI CORPORATION / MARINE DIESEL, INC.	2147 NW 32 AVE, 33142, MIAMI	3031280090510	Y	17	0	135
MOP-505	CITY OF MIAMI - WATSON ISLAND MOORING FIELD	1099 MACARTHUR CSWY, MIAMI	0132310000021	N	112	0	0
MOP-507	UNTWINE MARINA LLC	300 BISCAYNE BLVD WAY, MIAMI	0101140301010	Y	10	0	0
MOP-508	BH INVESTMENT LLC (ONDA DOCKING FACILITY)	1135 103 ST, BAY HARBOR ISLANDS	1322270016770	N	15	0	0

Total:	**9631**	**5410**	**421**

Appendix A-MOP Active Facilities - 2024



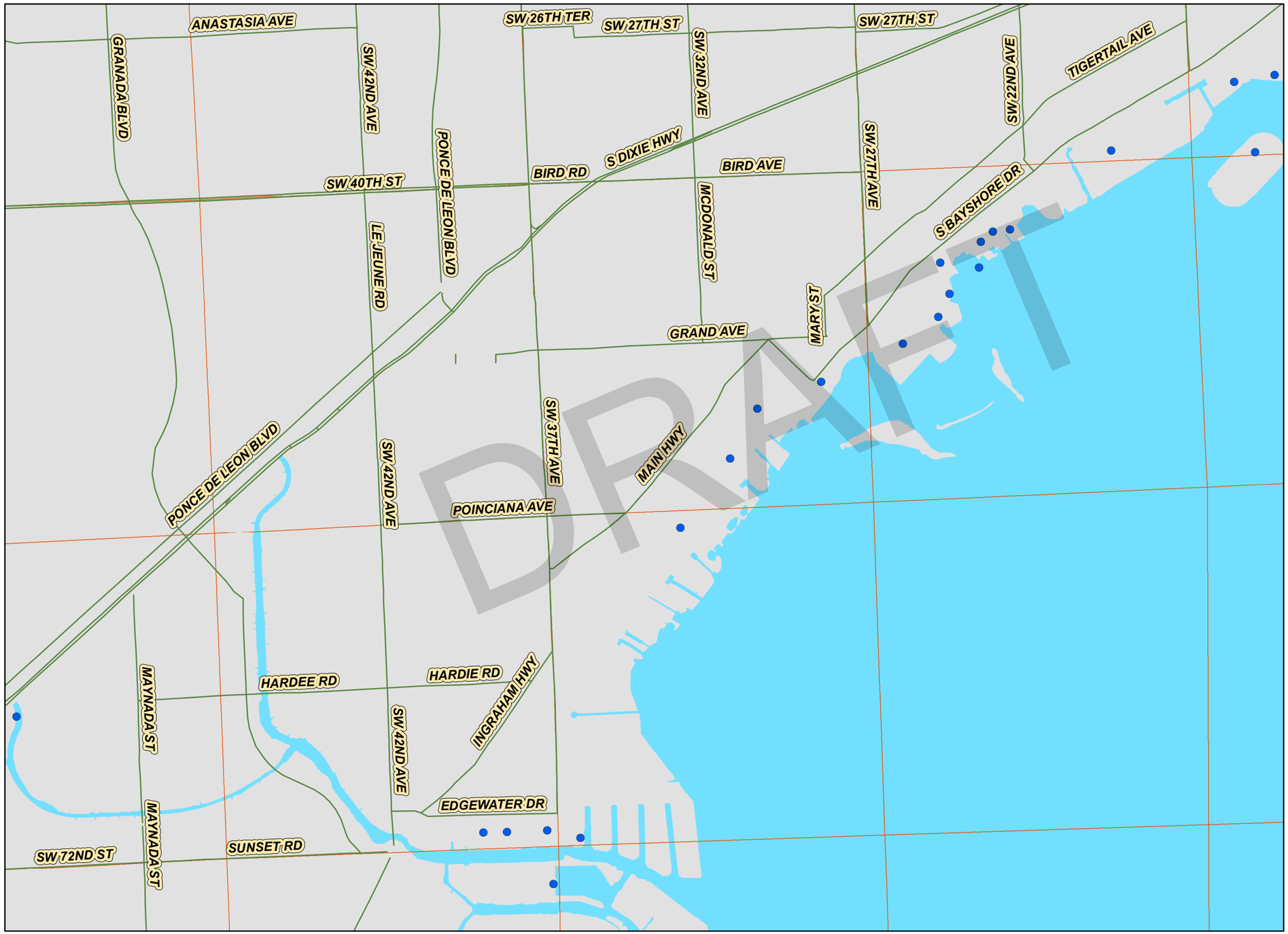
Legend

- Highways
- Marine Facilities (mop) Active

N
W E
S

SCALE: 1 inch = 20,833 feet

Appendix A-MOP Active Facilities - 2024 (Coconut Grove/Coral Gables)



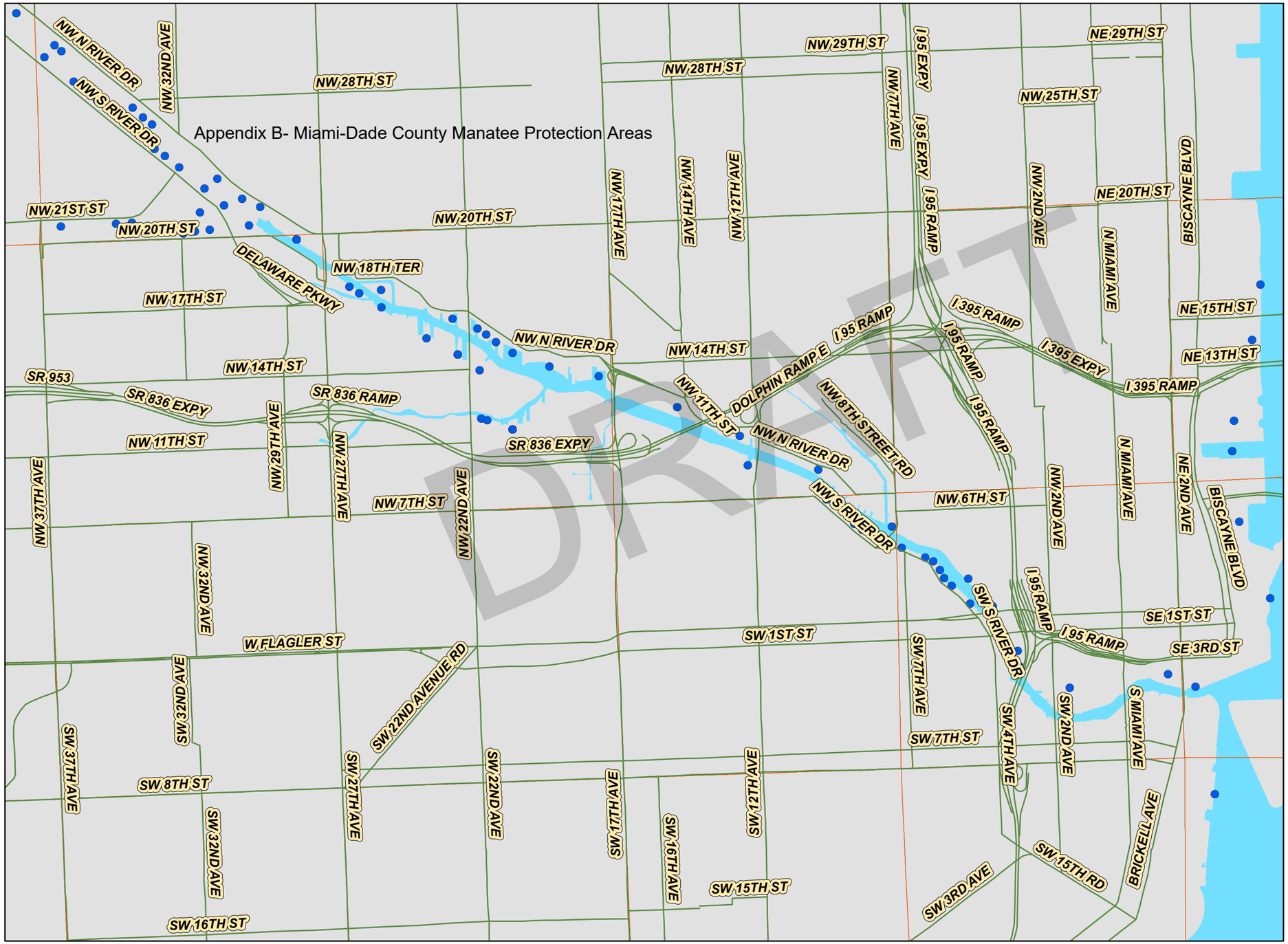
Legend

- Major Roads
- Marine Facilities (mop) Active

N
W E
S

SCALE:1 inch = 1,667 feet

Appendix A-MOP Active Facilities - 2024 (Miami River Area)



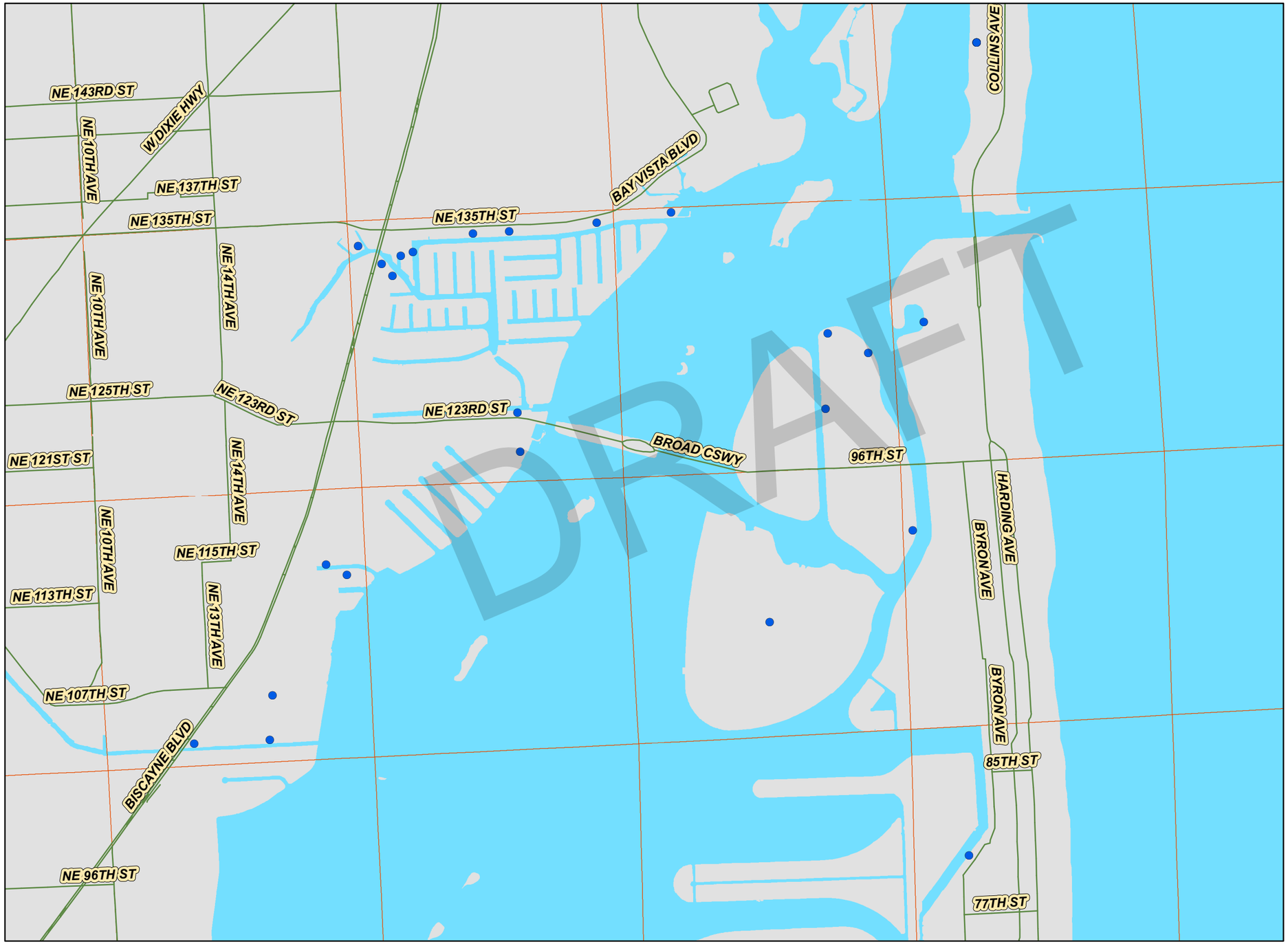
Legend

- Major Roads
- Marine Facilities (mop) Active

N
W E
S

SCALE:1 inch = 1,989 feet

Appendix A-MOP Active Facilities - 2024 (North Central Area)



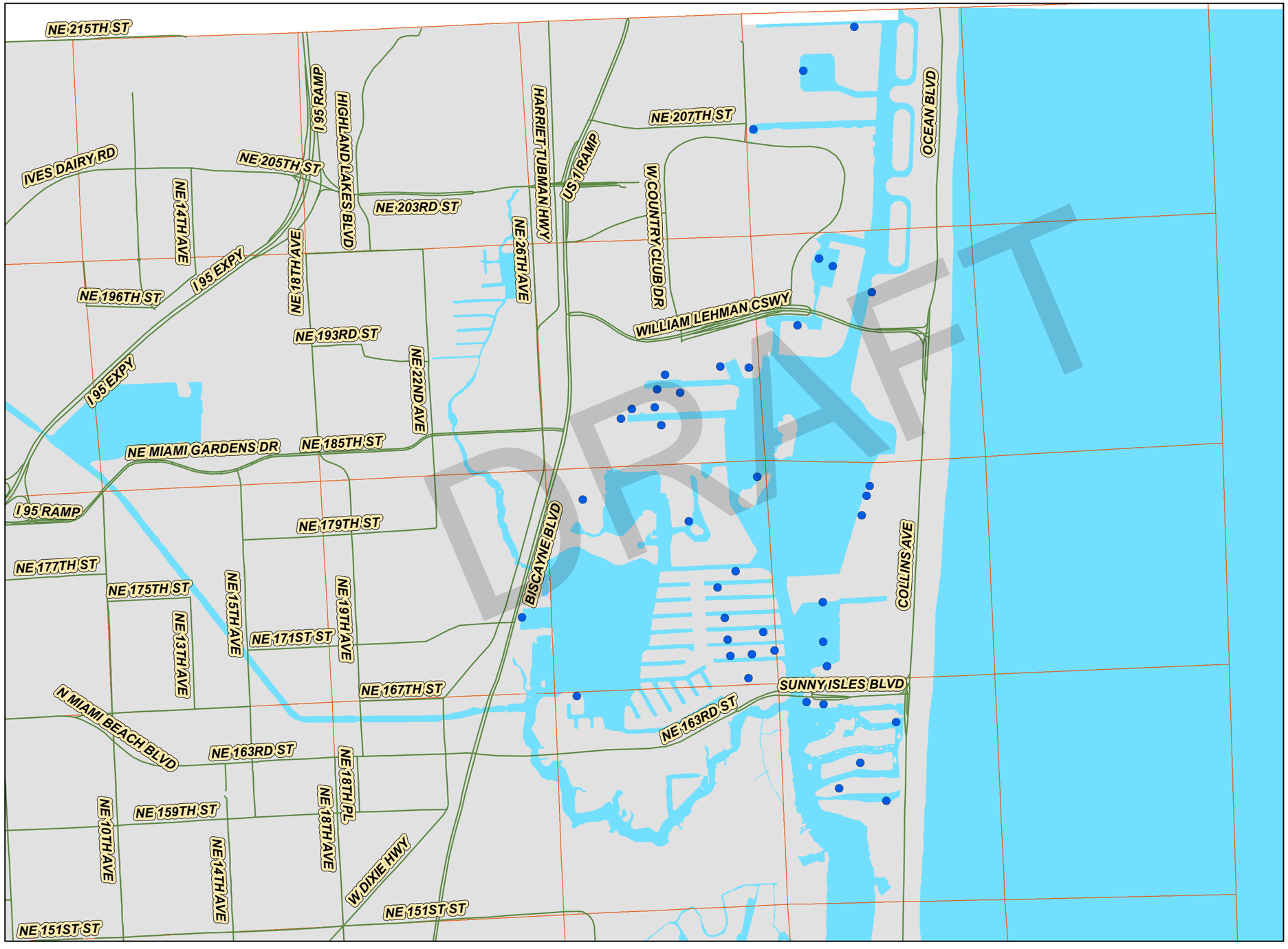
Legend

- Major Roads
- Marine Facilities (mop) Active

N
W E
S

SCALE:1 inch = 2,083 feet

Appendix A-MOP Active Facilities - 2024 (Northeast Area)



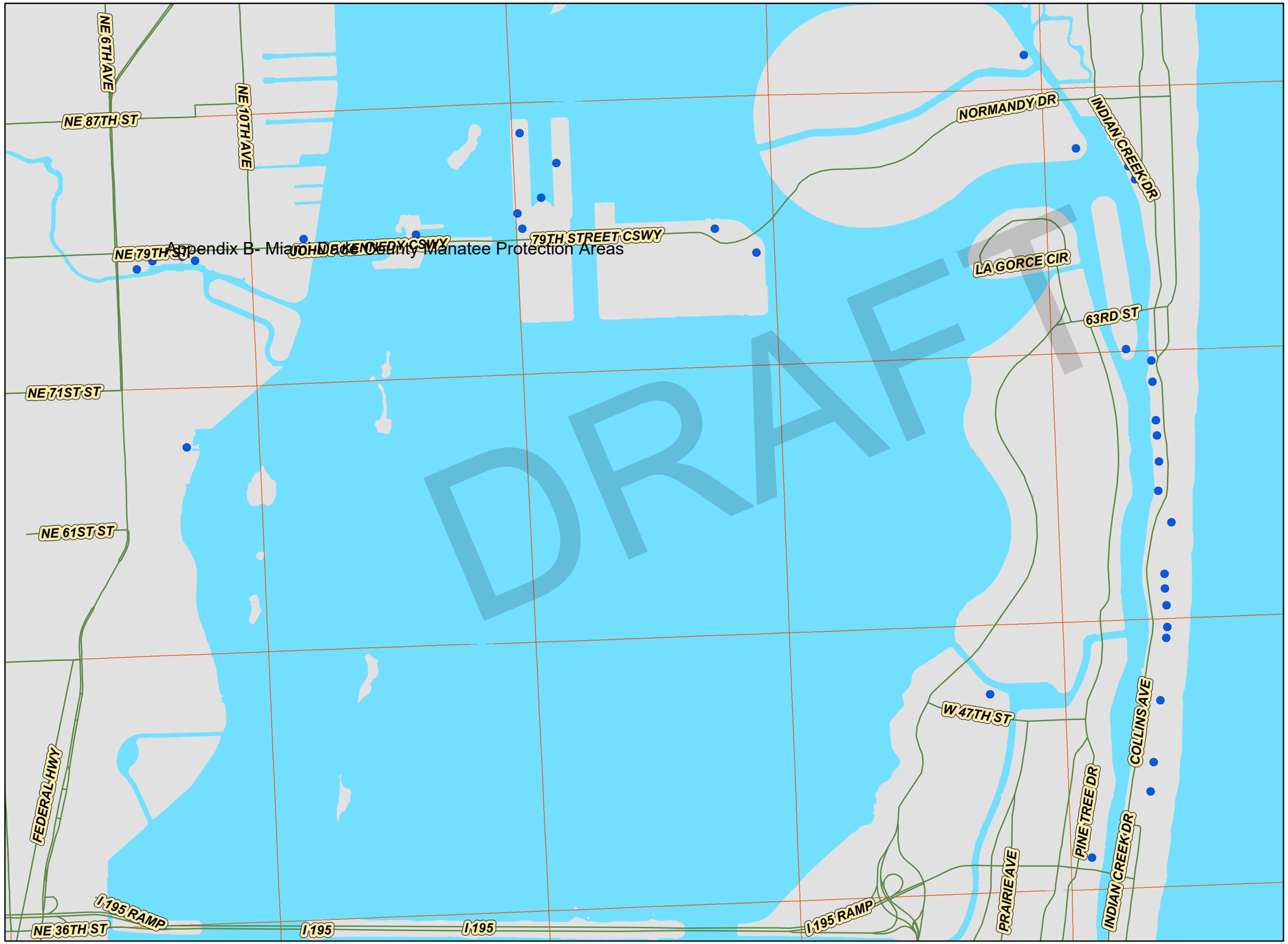
Legend

- Major Roads
- Marine Facilities (mop) Active

N
W E
S

SCALE:1 inch = 2,500 feet

Appendix A-MOP Active Facilities - 2024 (South Central Area)



Appendix B- Miami-Dade County Manatee Protection Areas

Legend

- Major Roads
- Marine Facilities (mop) Active

N
W E
S

SCALE:1 inch = 2,083 feet

Appendix A-MOP Active Facilities - 2024 (Southeast Area)

Legend

- Major Roads
- Marine Facilities (mop) Active

N
W E
S

SCALE:1 inch = 2,000 feet

MIAMI-DADE COUNTY MANATEE PROTECTION AREAS

For description of zone boundaries see:
68C-22.025 F.A.C for State Manatee Protection Zones last amended 12/25/1991

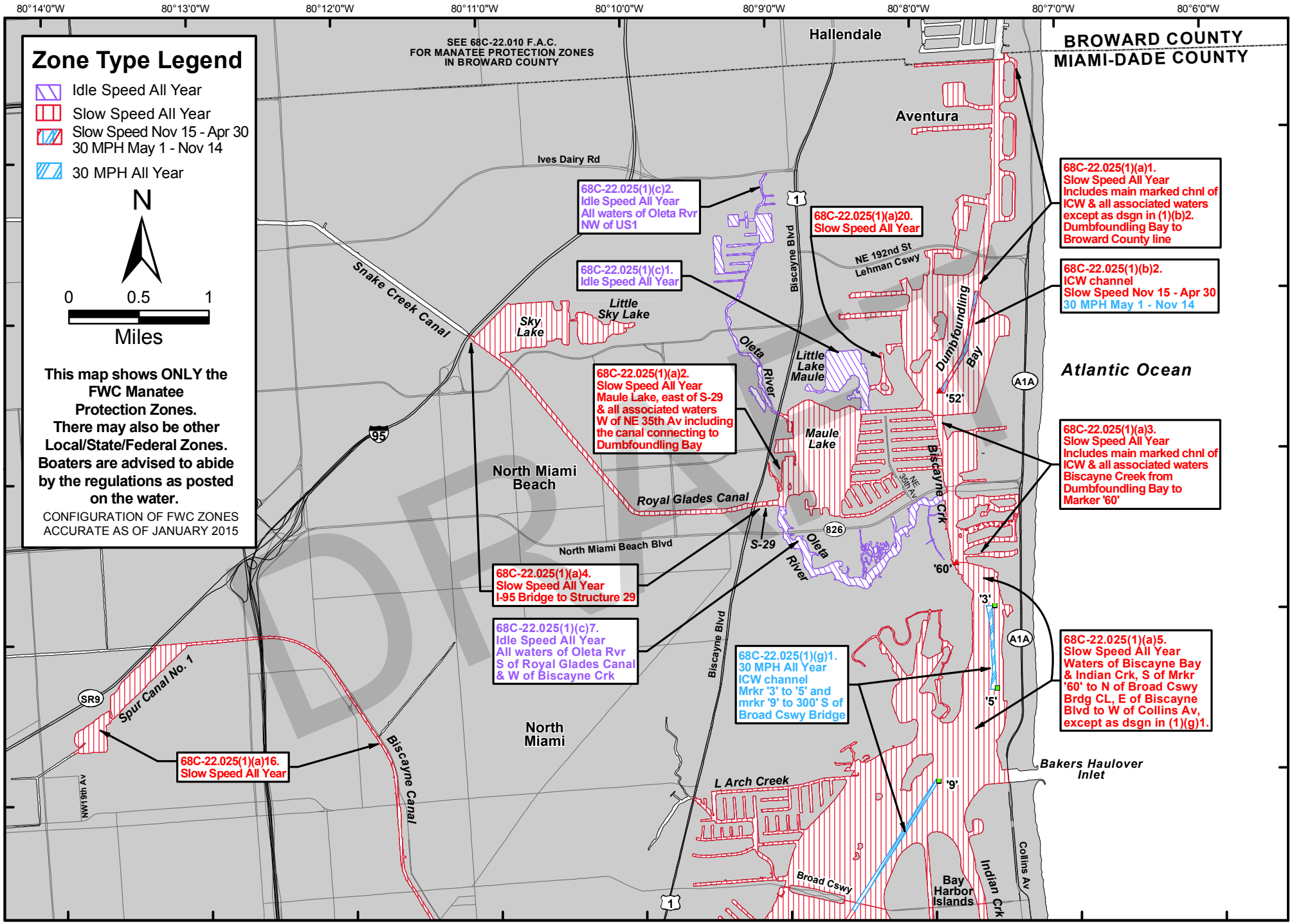
For infomation please call or write to:
Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Imperiled Species Management Section
620 South Meridian Street - Mail Station 6A
Tallahassee, FL 32399-1600
PHONE (850) 922-4330 FAX (850) 922-4338

These maps show ONLY the FWC Manatee Protection Zones.
There may also be other Local/State/Federal Zones.
Boaters are advised to abide by the regulations as posted on the water.

ZONE TYPE LEGEND

- No Entry All Year
- No Entry Nov 15 - Apr 30
  Idle Speed May 1 - Nov 14
- No Entry Nov 15 - Apr 30
  Slow Speed May 1 - Nov 14
- Motorboats Prohibited All Year
- Idle Speed All Year
- Slow Speed All Year
- Slow Speed Nov 15 - Apr 30
  30mph May 1 - Nov 14
- Slow Speed Nov 15 - Apr 30
  35mph May 1 - Nov 14
- 30mph All Year
- 35mph All Year

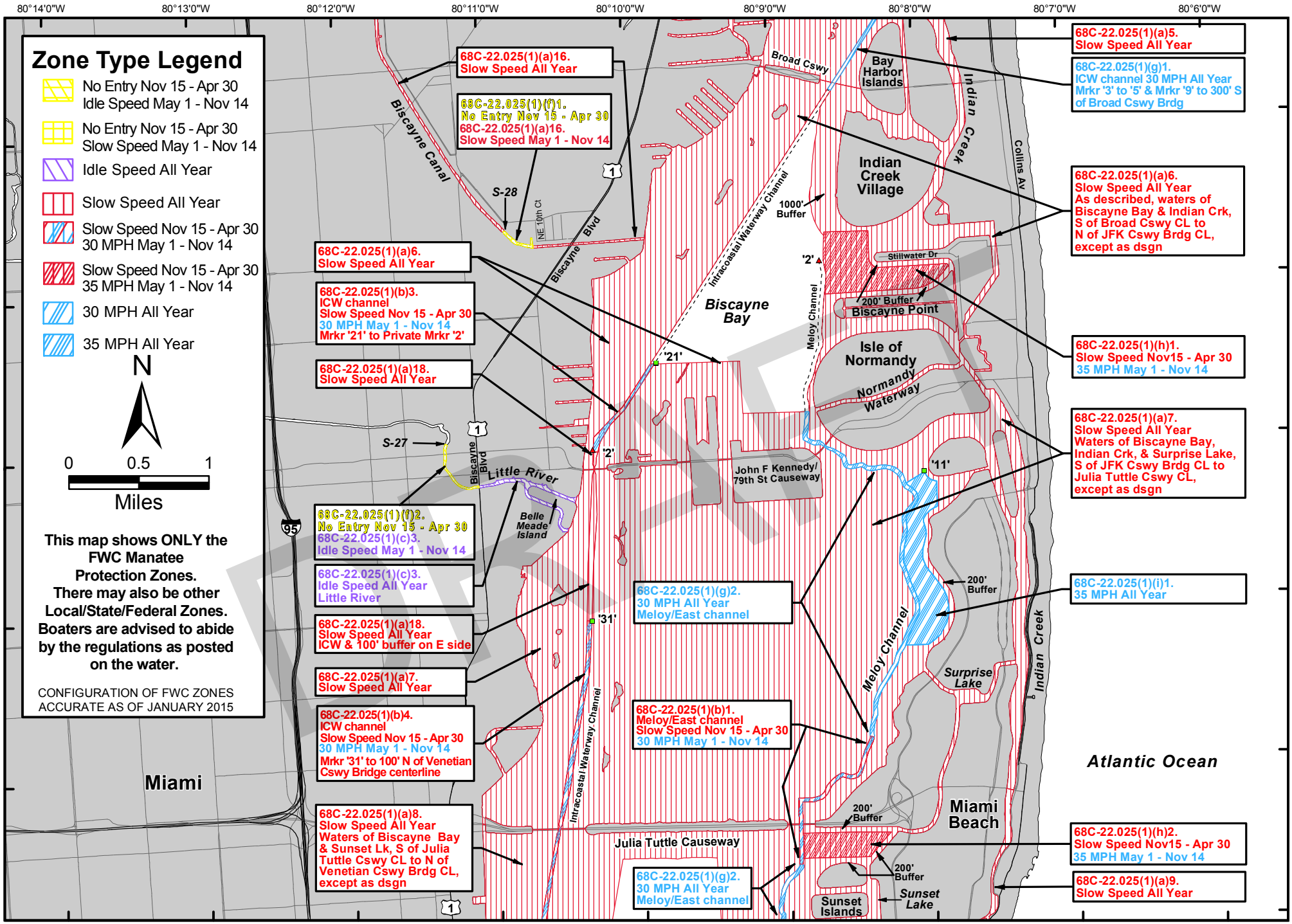
CONFIGURATION OF STATE ZONES ACCURATE AS OF JANUARY 2015



MIAMI-DADE COUNTY
FWC MANATEE PROTECTION AREAS

Appendix B

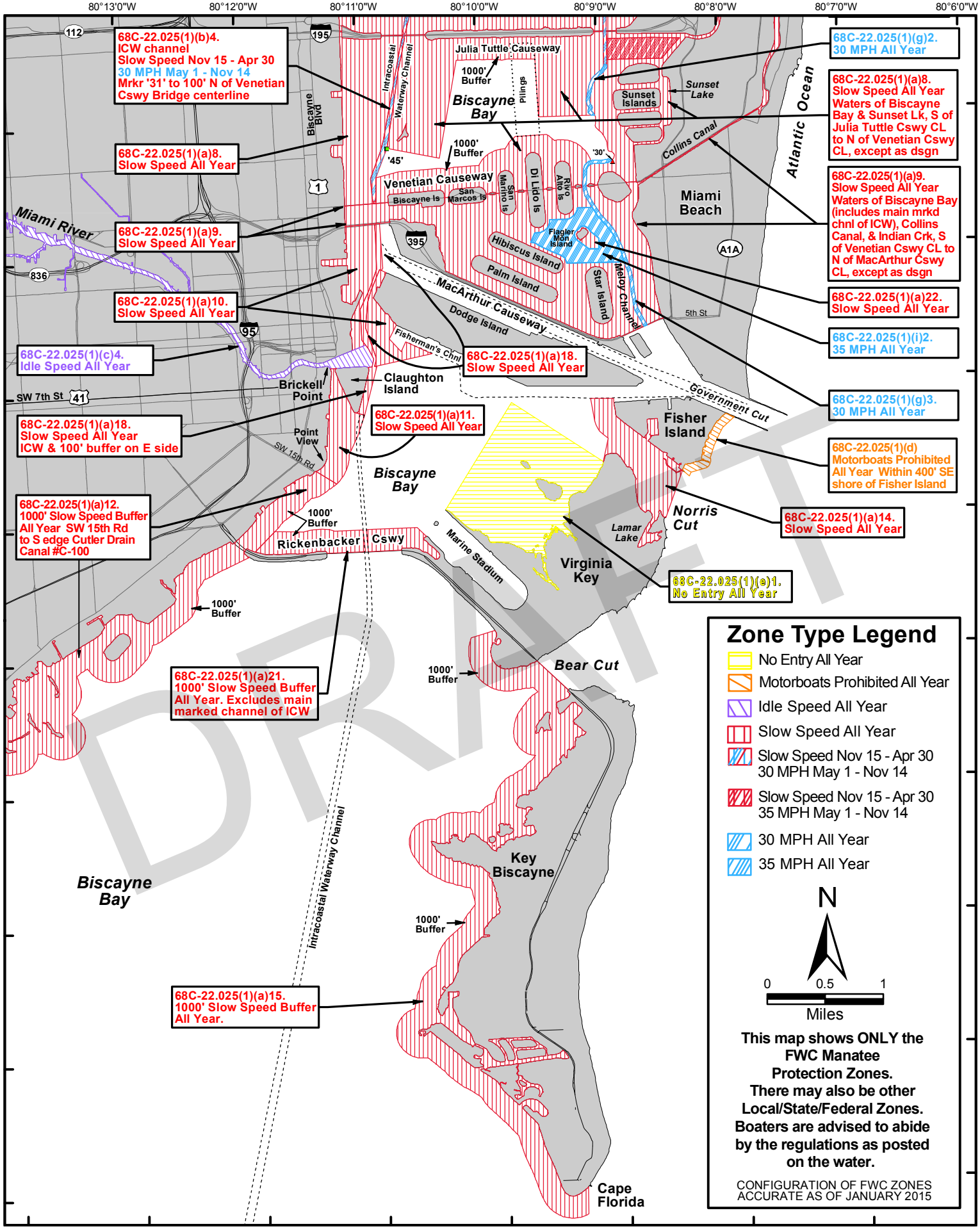
For description of zone boundaries:
See 68C-22.025 F.A.C for State Manatee Protection Zones



MIAMI-DADE COUNTY
FWC MANATEE PROTECTION AREAS

Appendix B

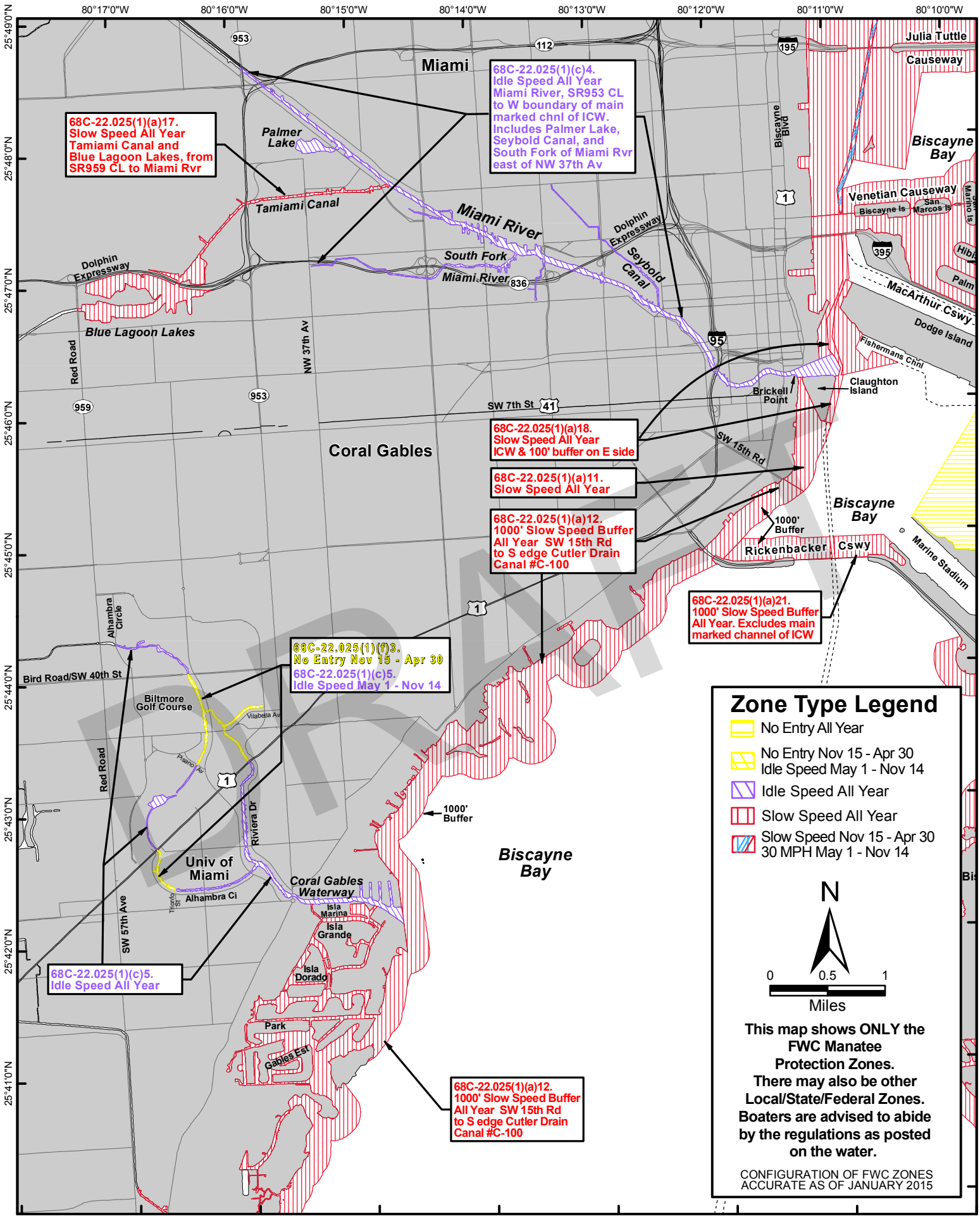
For description of zone boundaries:
See 68C-22.025 F.A.C for State Manatee Protection Zones



Appendix B

MIAMI-DADE COUNTY
FWC MANATEE PROTECTION AREAS

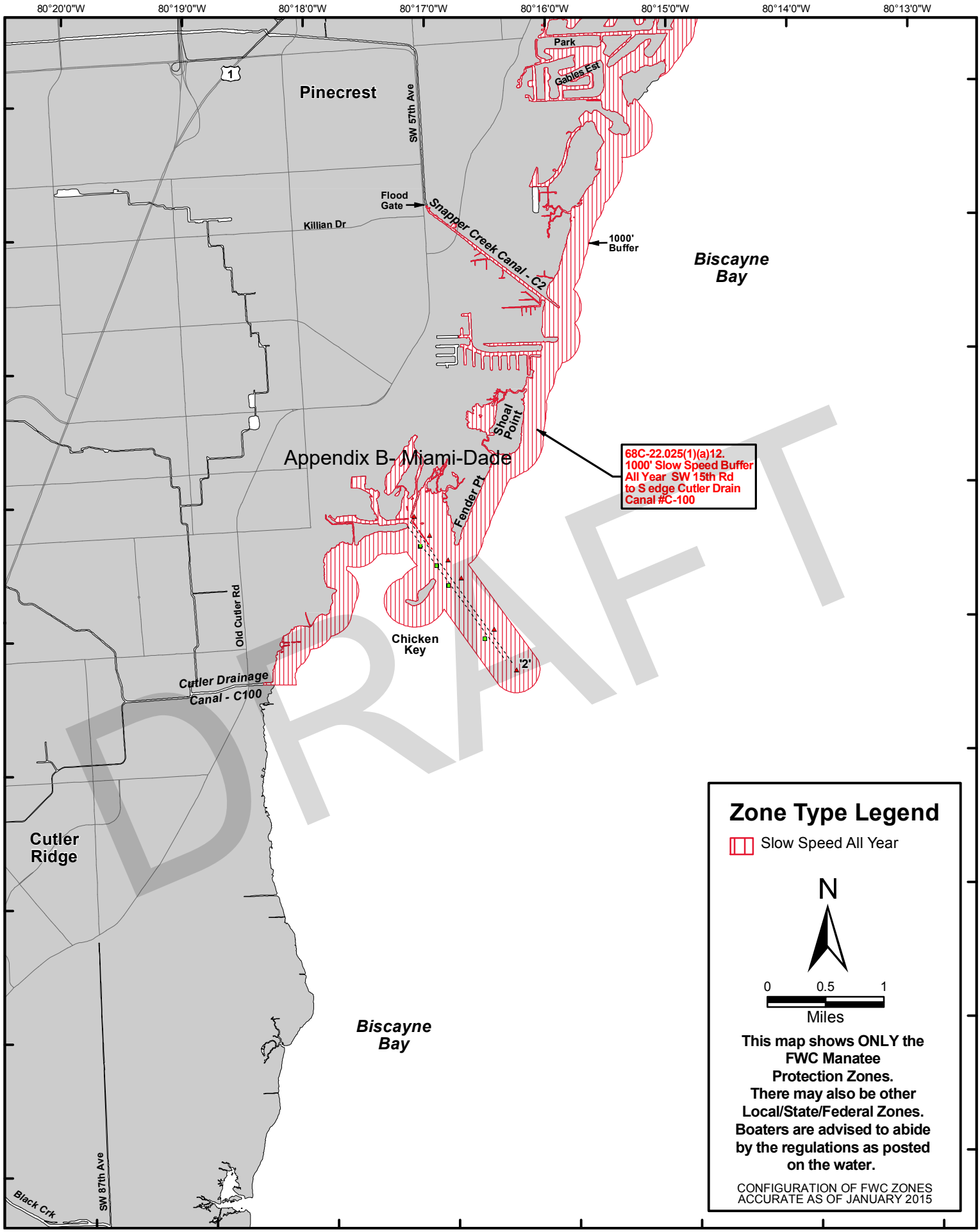
For description of zone boundaries:
See 68C-22.025 F.A.C for State Manatee Protection Zones



MIAMI-DADE COUNTY FWC MANATEE PROTECTION AREAS

Appendix B

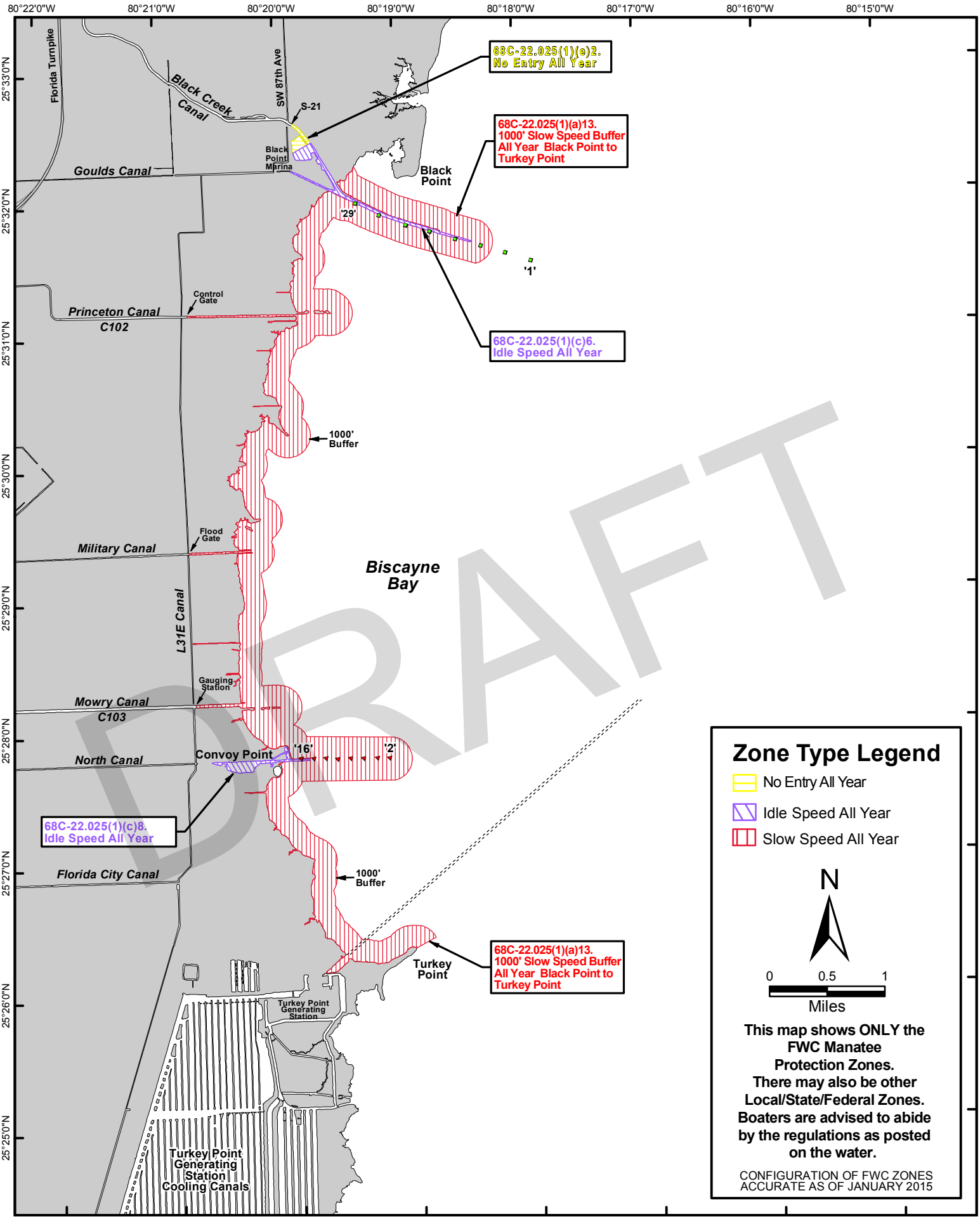
For description of zone boundaries:
See 68C-22.025 F.A.C for State Manatee Protection Zones



MIAMI-DADE COUNTY FWC MANATEE PROTECTION AREAS

Appendix B

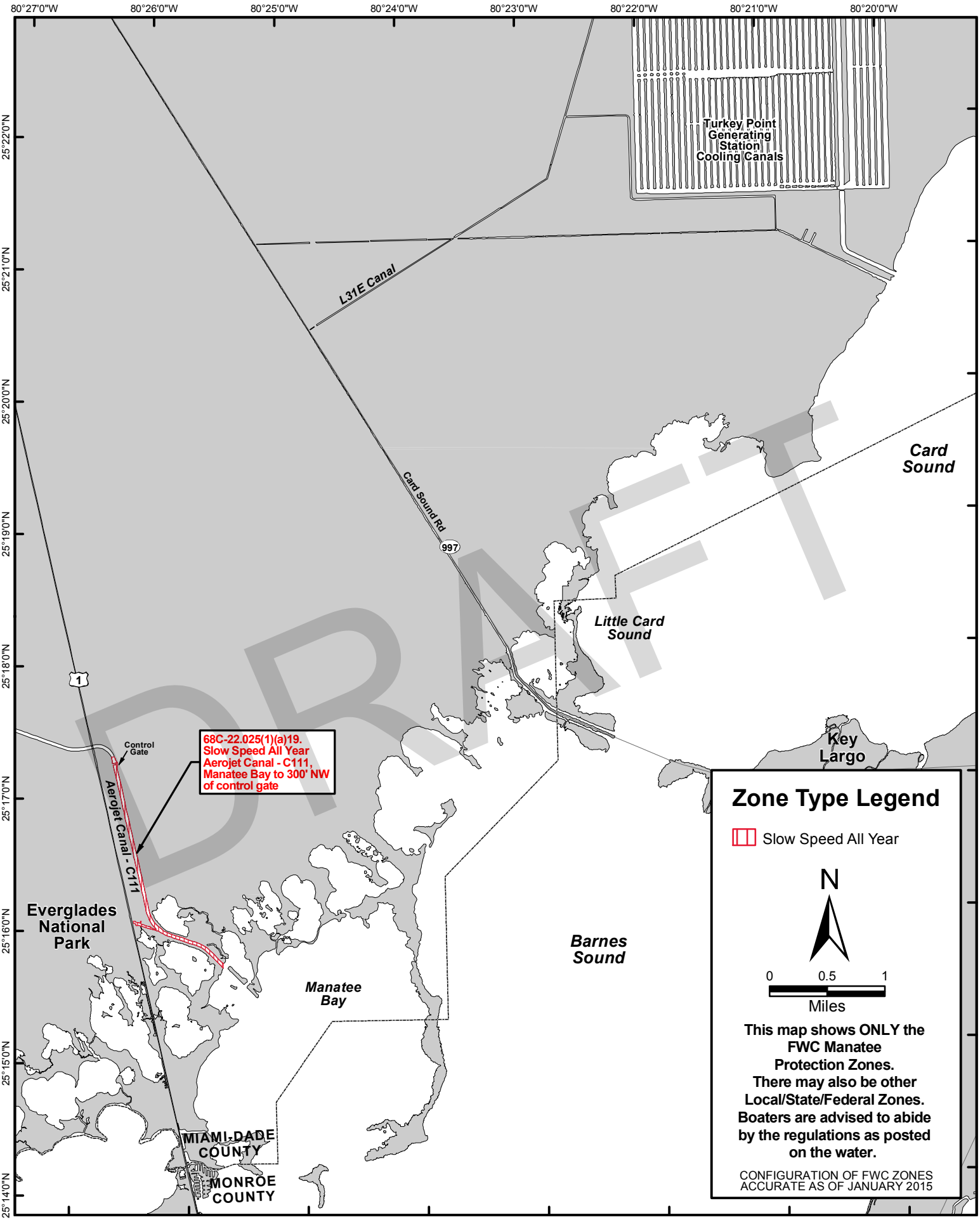
For description of zone boundaries:
See 68C-22.025 F.A.C for State Manatee Protection Zones



MIAMI-DADE COUNTY FWC MANATEE PROTECTION AREAS

Appendix B

For description of zone boundaries:
See 68C-22.025 F.A.C for State Manatee Protection Zones



MIAMI-DADE COUNTY
FWC MANATEE PROTECTION AREAS

Appendix B

For description of zone boundaries:
See 68C-22.025 F.A.C for State Manatee Protection Zones

Figure 1

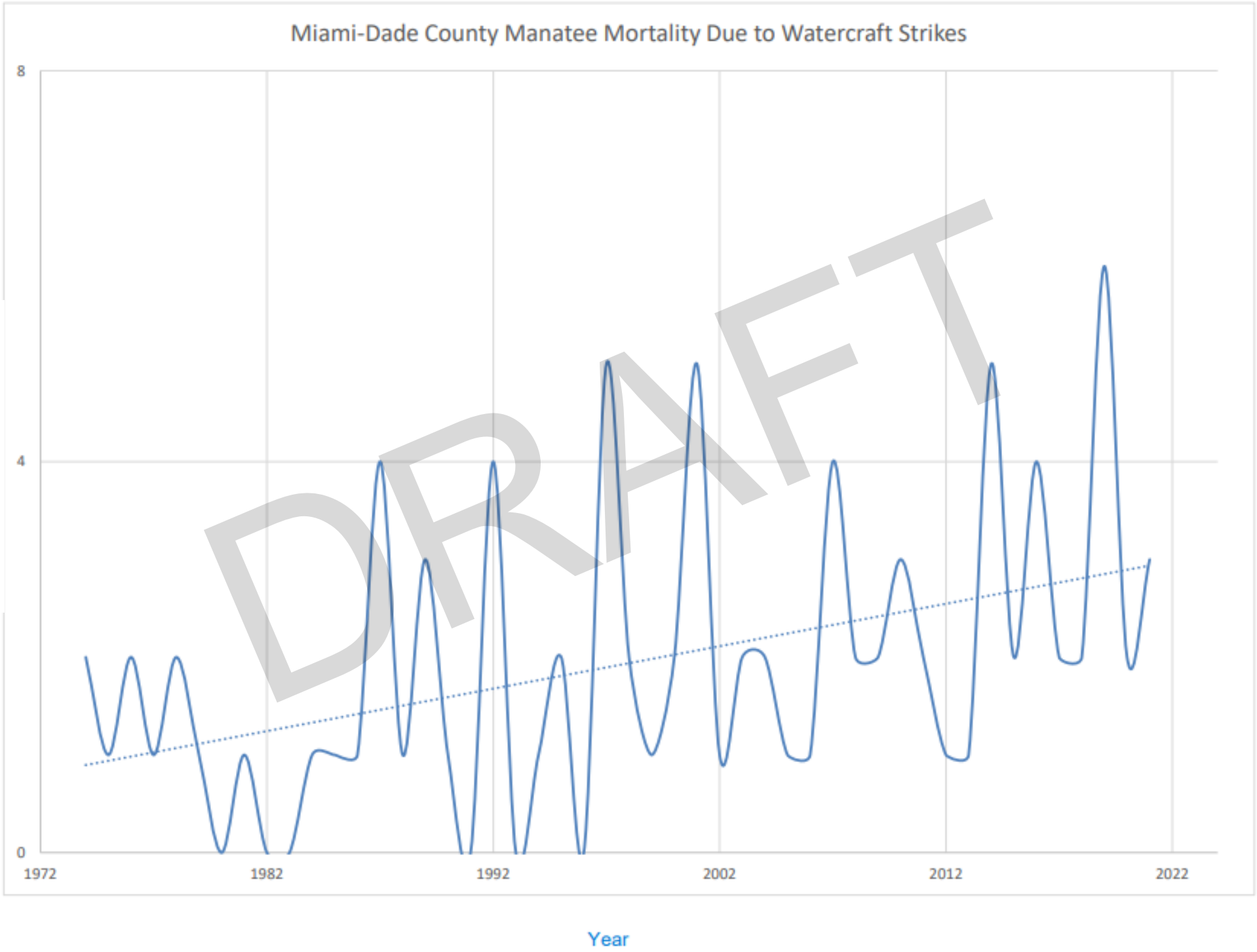

Miami-Dade County Manatee Mortality Due to Watercraft Strikes
8
4
0
1972
1982
1992
2002
2012
2022
Number of Manatees
Year
DRAFT

Figure 2a

State Aquatic Preserves within Miami-Dade County (North Area)

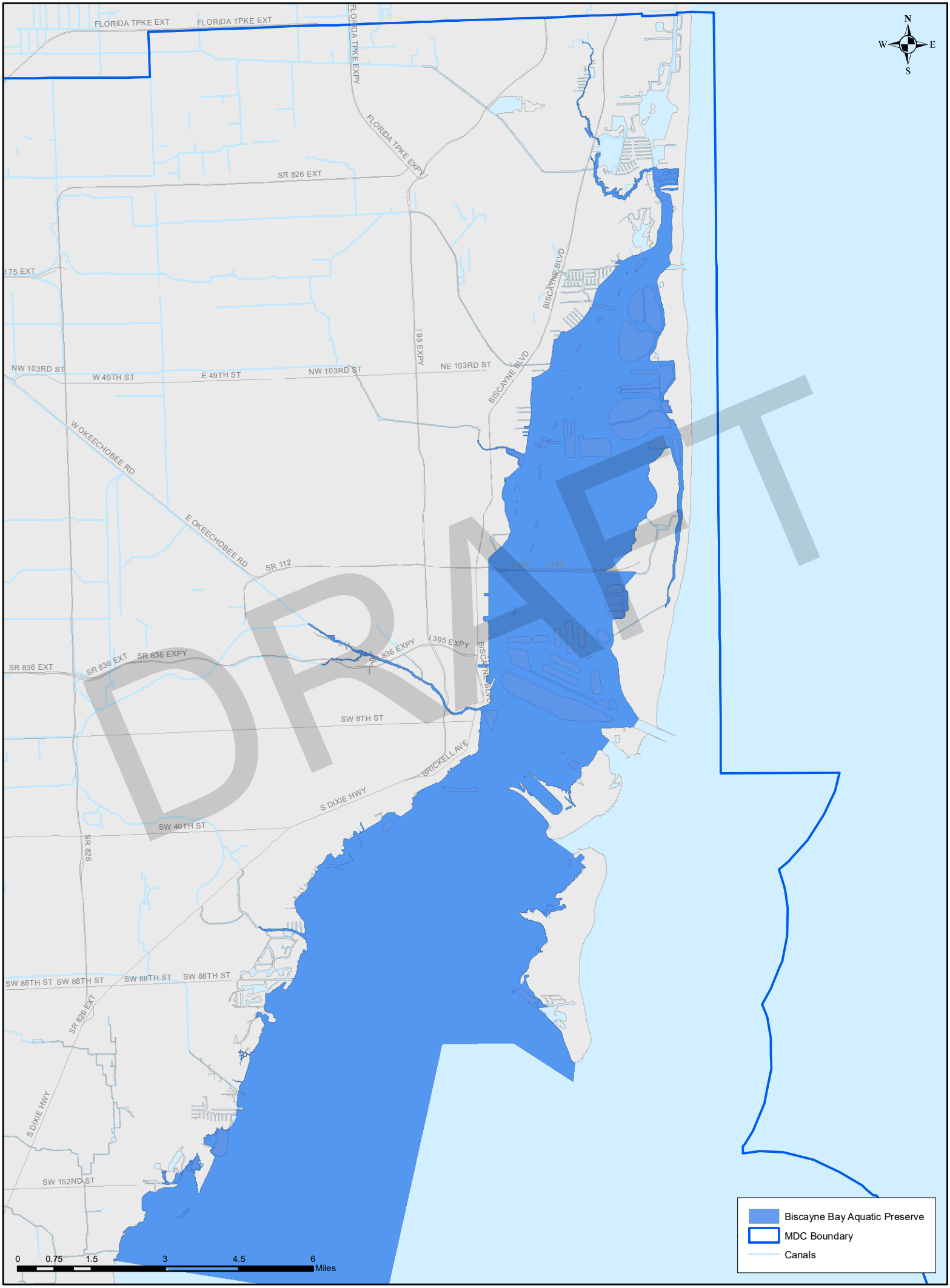


Figure 2b

State Aquatic Preserves within Miami-Dade County (South Area)

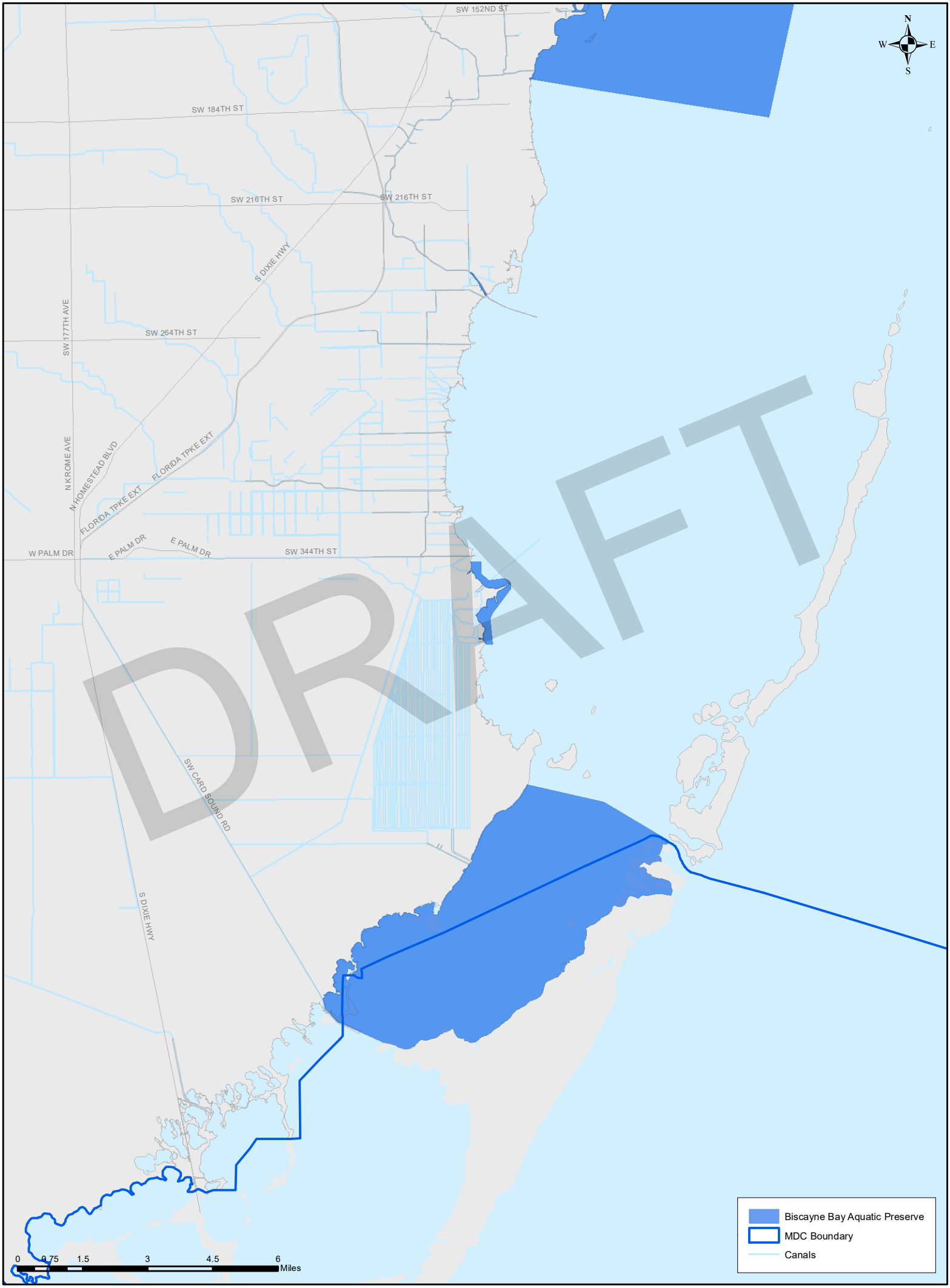
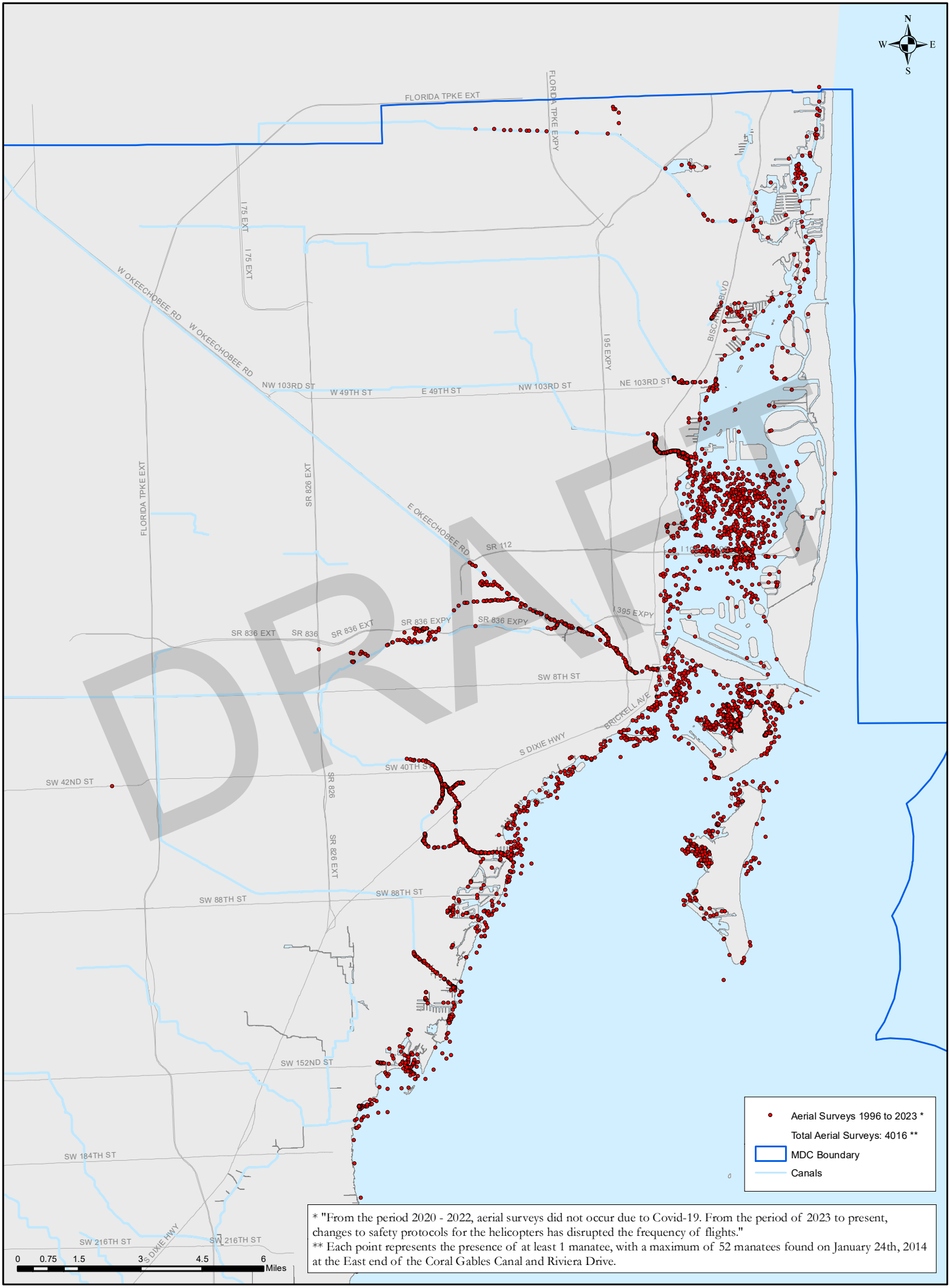


Figure 3a

Miami-Dade County Aerial Manatee Sightings 1996 - 2023 (North Area)

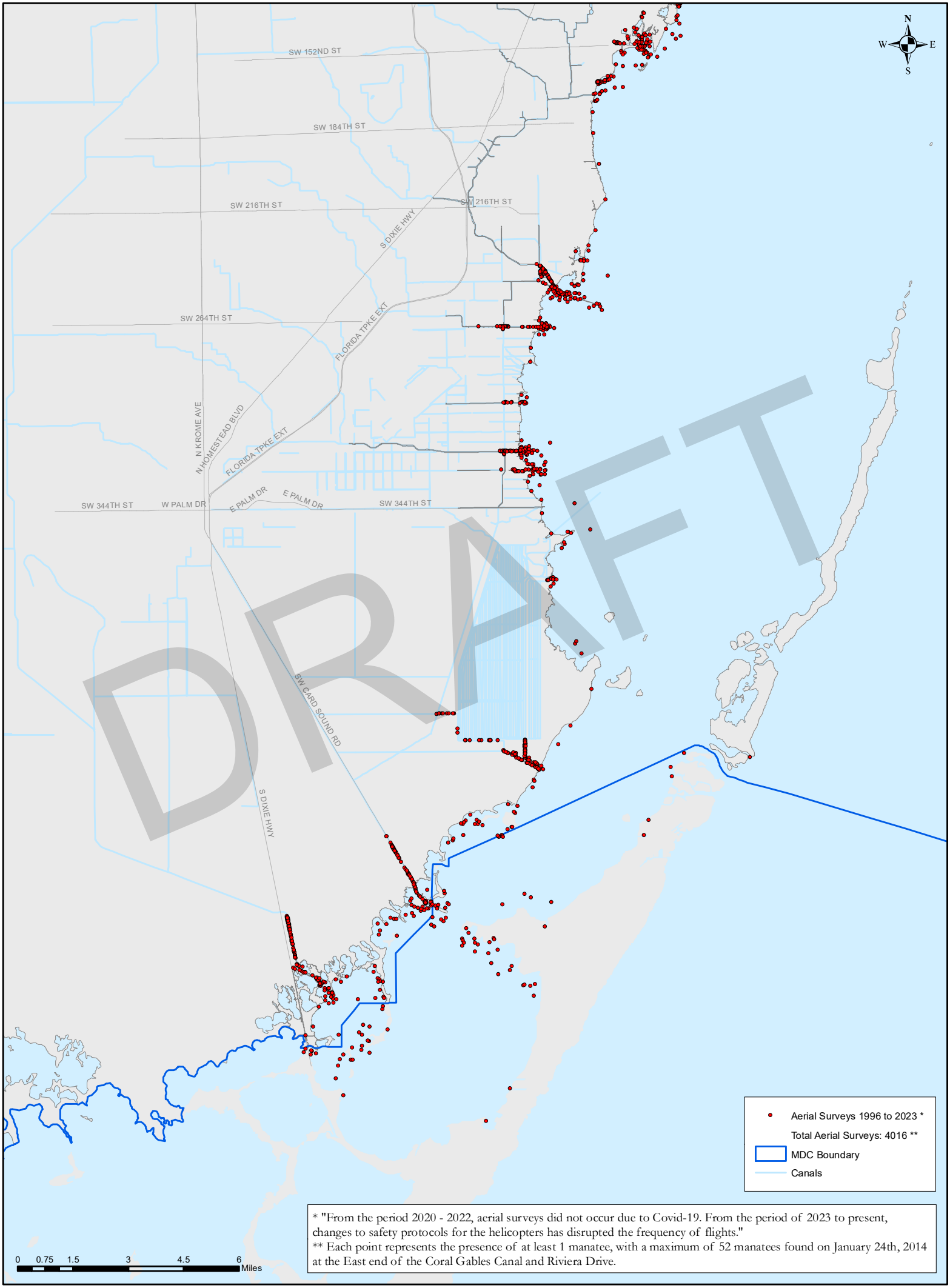


* "From the period 2020 - 2022, aerial surveys did not occur due to Covid-19. From the period of 2023 to present, changes to safety protocols for the helicopters has disrupted the frequency of flights."

** Each point represents the presence of at least 1 manatee, with a maximum of 52 manatees found on January 24th, 2014 at the East end of the Coral Gables Canal and Riviera Drive.

Figure 3b

Miami-Dade County Aerial Manatee Sightings 1996 - 2023 (South Area)



* "From the period 2020 - 2022, aerial surveys did not occur due to Covid-19. From the period of 2023 to present, changes to safety protocols for the helicopters has disrupted the frequency of flights."

** Each point represents the presence of at least 1 manatee, with a maximum of 52 manatees found on January 24th, 2014 at the East end of the Coral Gables Canal and Riviera Drive.

Miami-Dade County Aerial Manatee Sightings 1996 - 2023
Seasonality report (cold vs warm season)

Figure 4

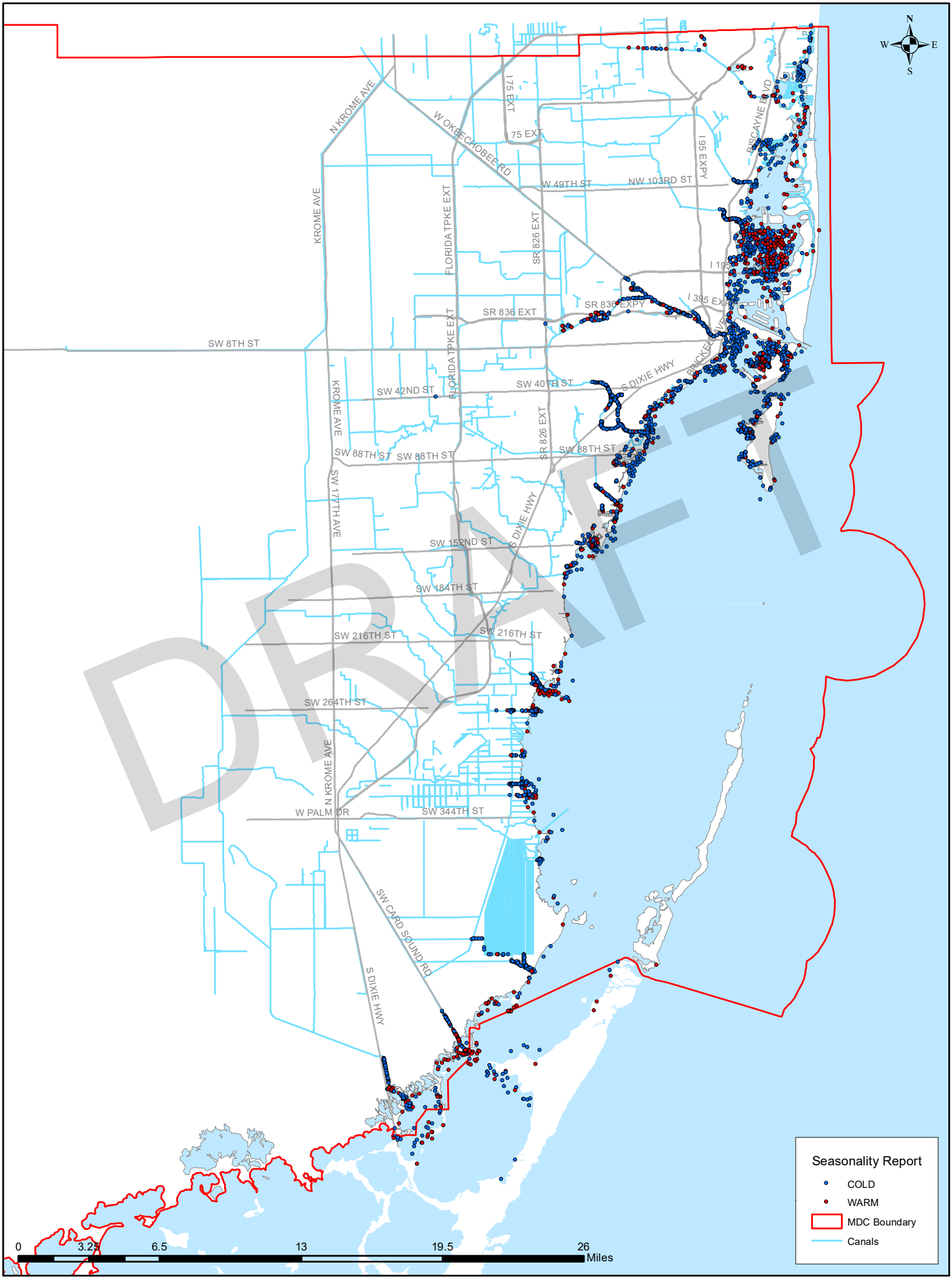


Figure 5a

Miami-Dade County Seagrass Habitat (North Area)

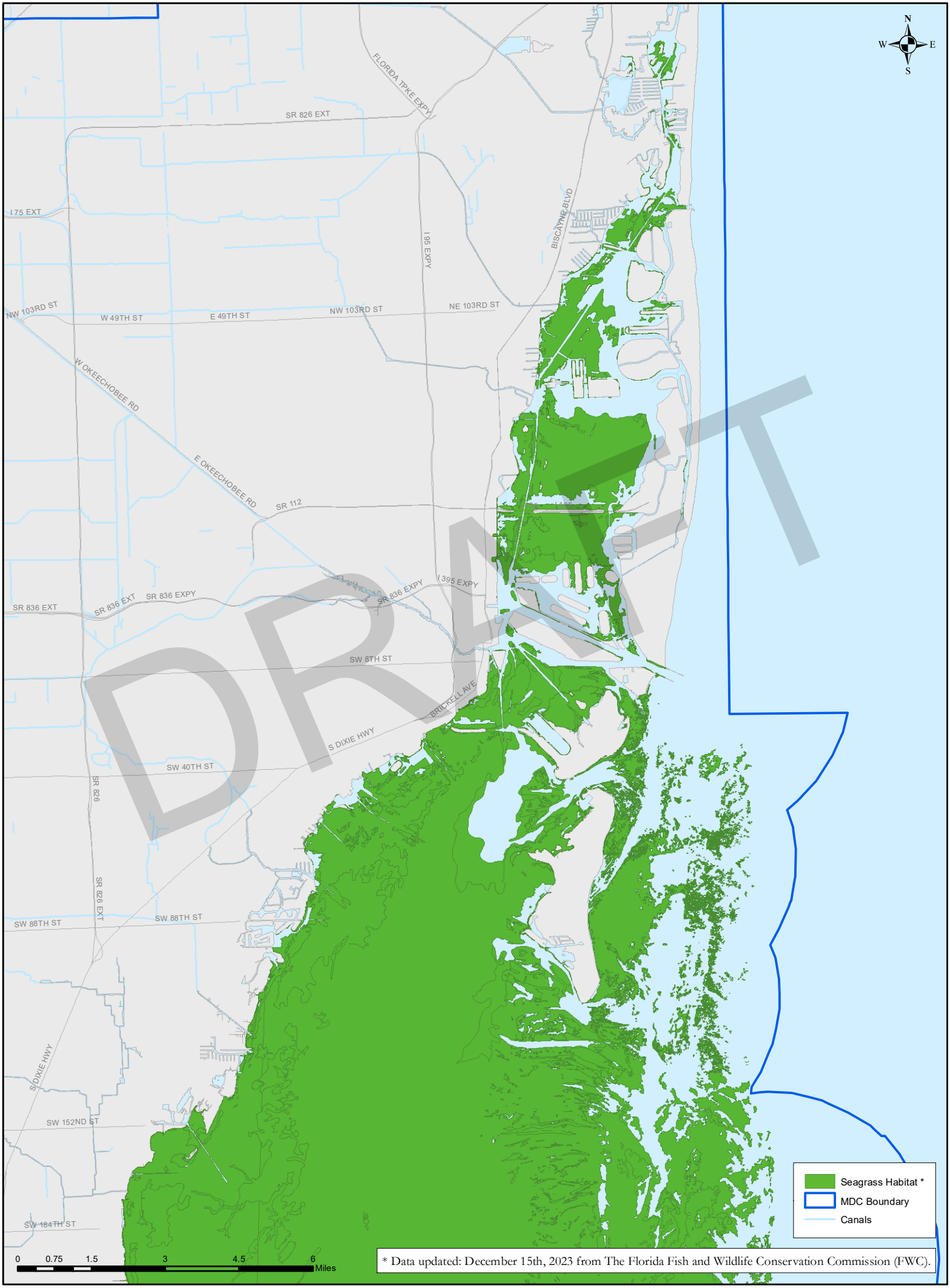


Figure 5b

Miami-Dade County Seagrass Habitat (South Area)

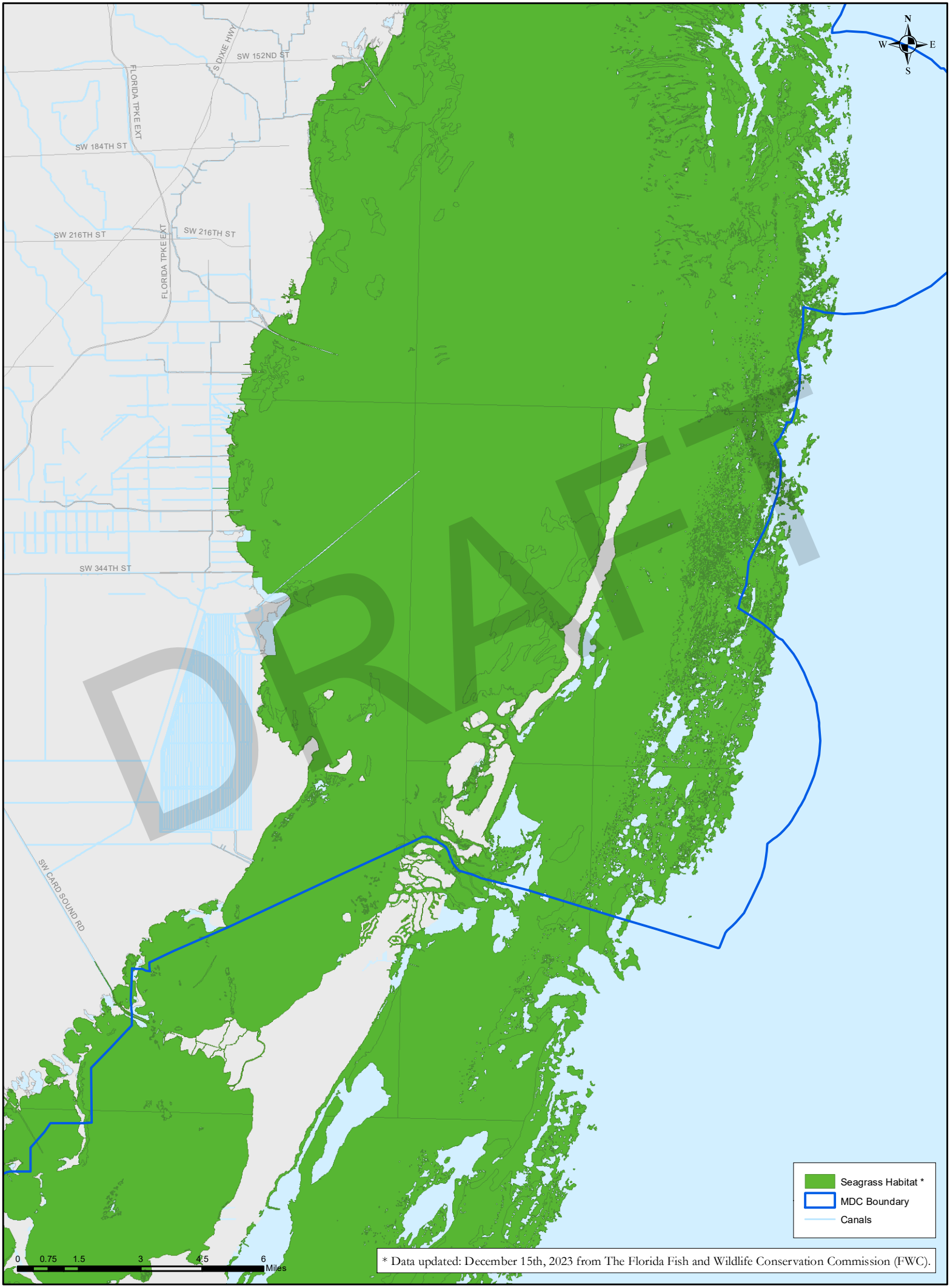


Figure 6

Public Boat Ramps in Tidal Waters of Miami-Dade County

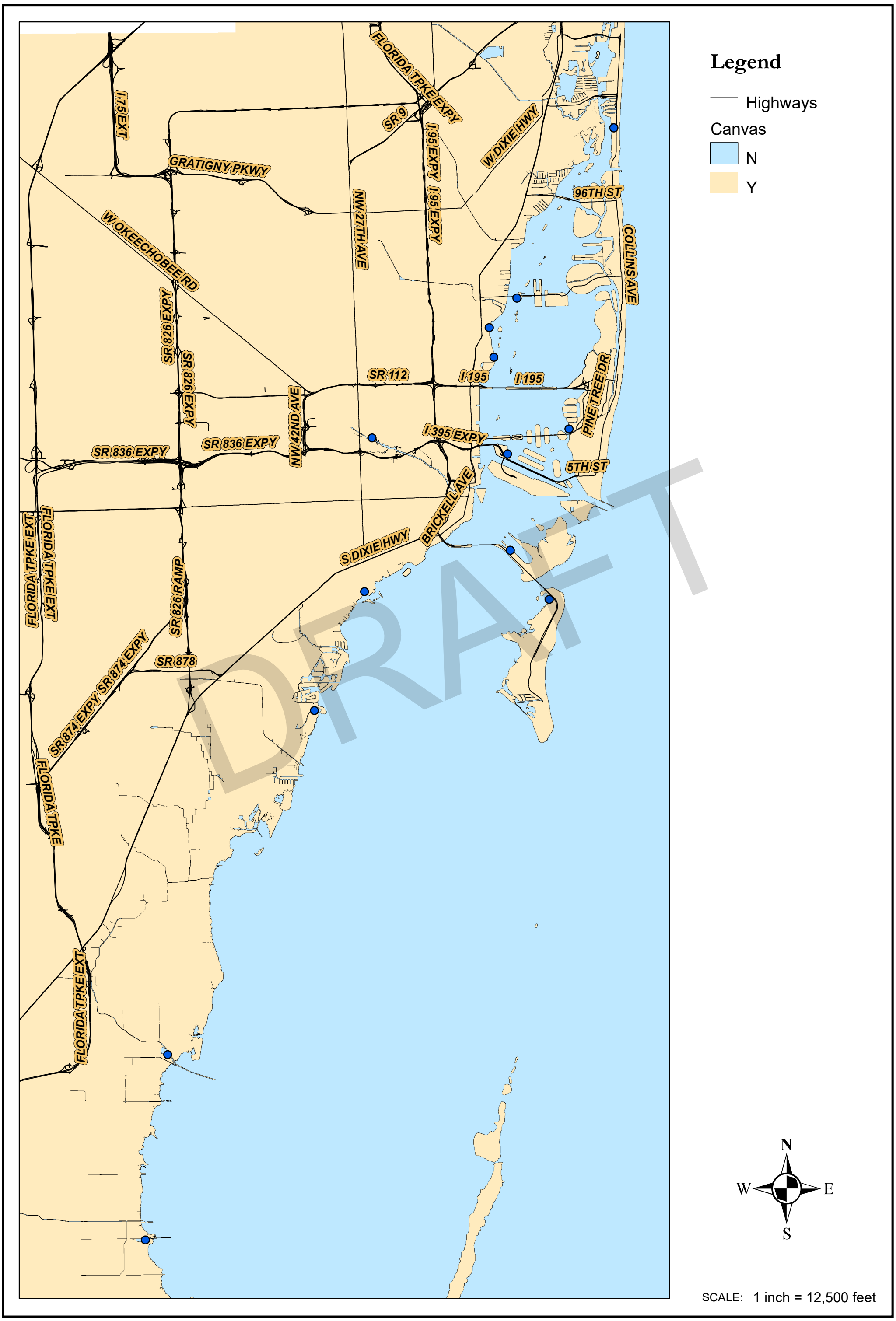


Figure 6

Public Boat Ramps in Tidal Waters of Miami-Dade County

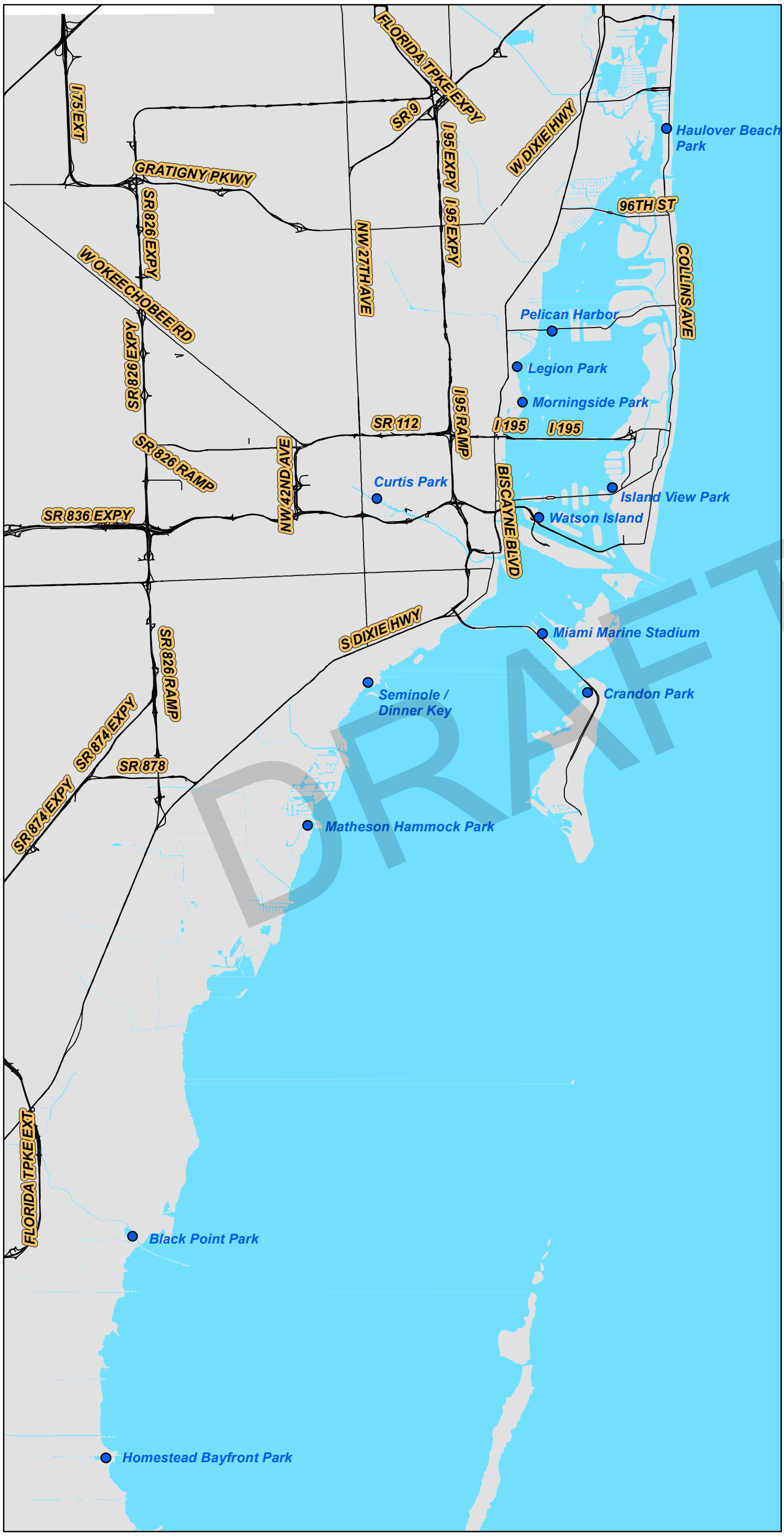


Figure 7a. Comparison of Levels of Boater Compliance from Boating Study

Survey Site	County	Compliance	Technical Non-Compliance	Blatant Non - Compliance	Speed Zone
Haulover Park (2008-09)	Miami-Dade	69%	25%	7%	Slow
Pelican Harbor (2008-09)	Miami-Dade	54%	25%	21%	Slow
Miami River (2008-09)	Miami-Dade	61%	30%	9%	Slow
Miami River (2008-09)	Miami-Dade	22%	44%	34%	Idle
Black Point (2008-09)	Miami-Dade	14%	39%	47%	Idle
Black Point (2008-09)	Miami-Dade	34%	6%	60%	Slow
John Lloyd State Park (2004-05)	Broward	59%	39%	2%	Slow
Colee Hammock Site (2004-05)	Broward	78%	22%	1%	Slow
Hugh Taylor Birch State Park (2004-05)	Broward	50%	46%	4%	Slow
Orange River (1997-98)	Lee	68%	24%	8%	Idle
Shell Island (1997-98)	Lee	58%	33%	8%	Slow
Beautiful Island (1997-98)	Lee	39%	50%	11%	Idle
New Pass (2005-06)	Sarasota	47%	37%	16%	Idle
Venice Inlet (2005-06)	Sarasota	71%	20%	8%	Slow
Terra Ceia Bay (2006-07)	Manatee	66%	26%	8%	Slow

Figure 7b. Comparison of Levels of Boater Compliance from Boating Study

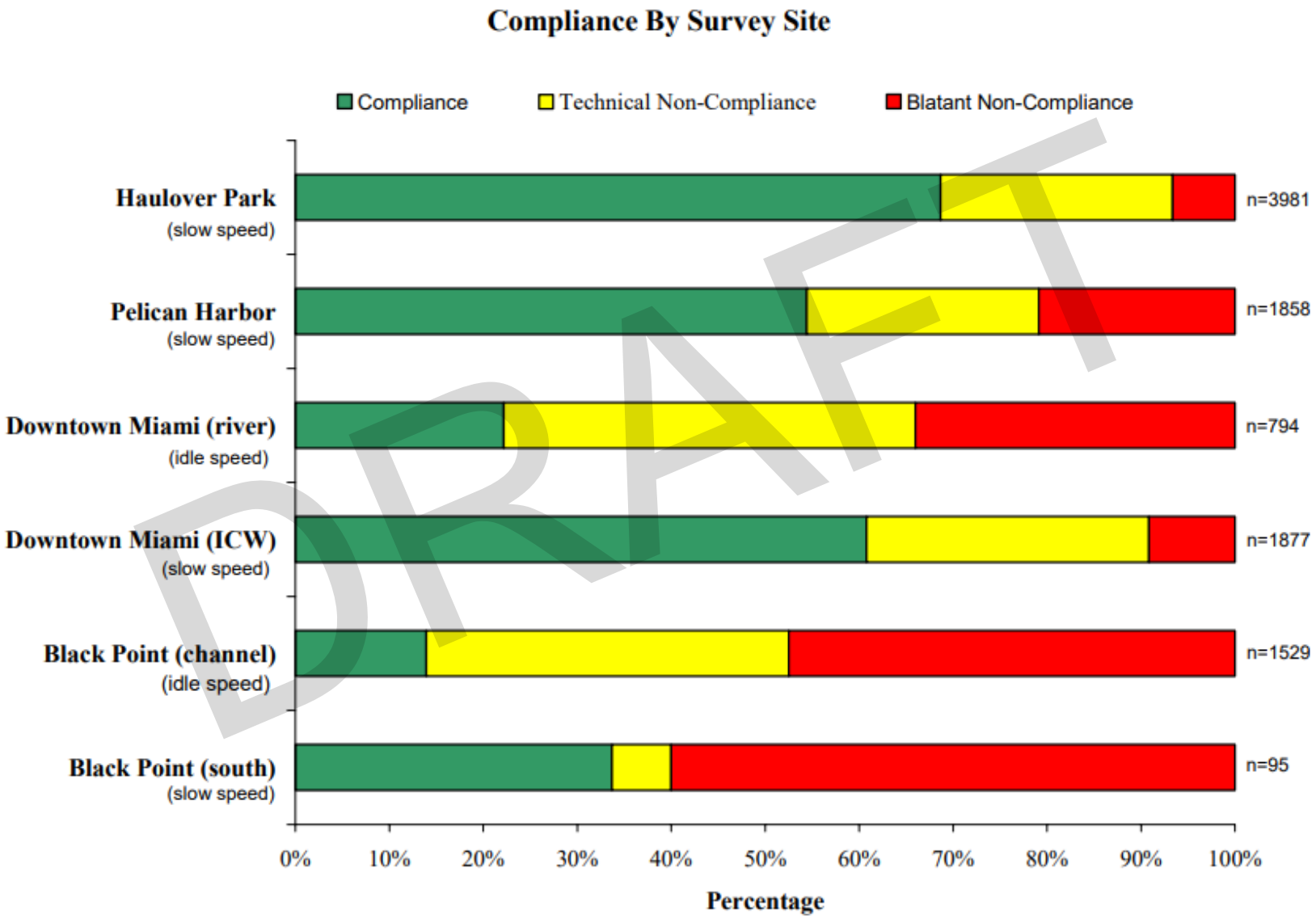


Figure 7c. Comparison of Levels of Boater Compliance from Boating Study

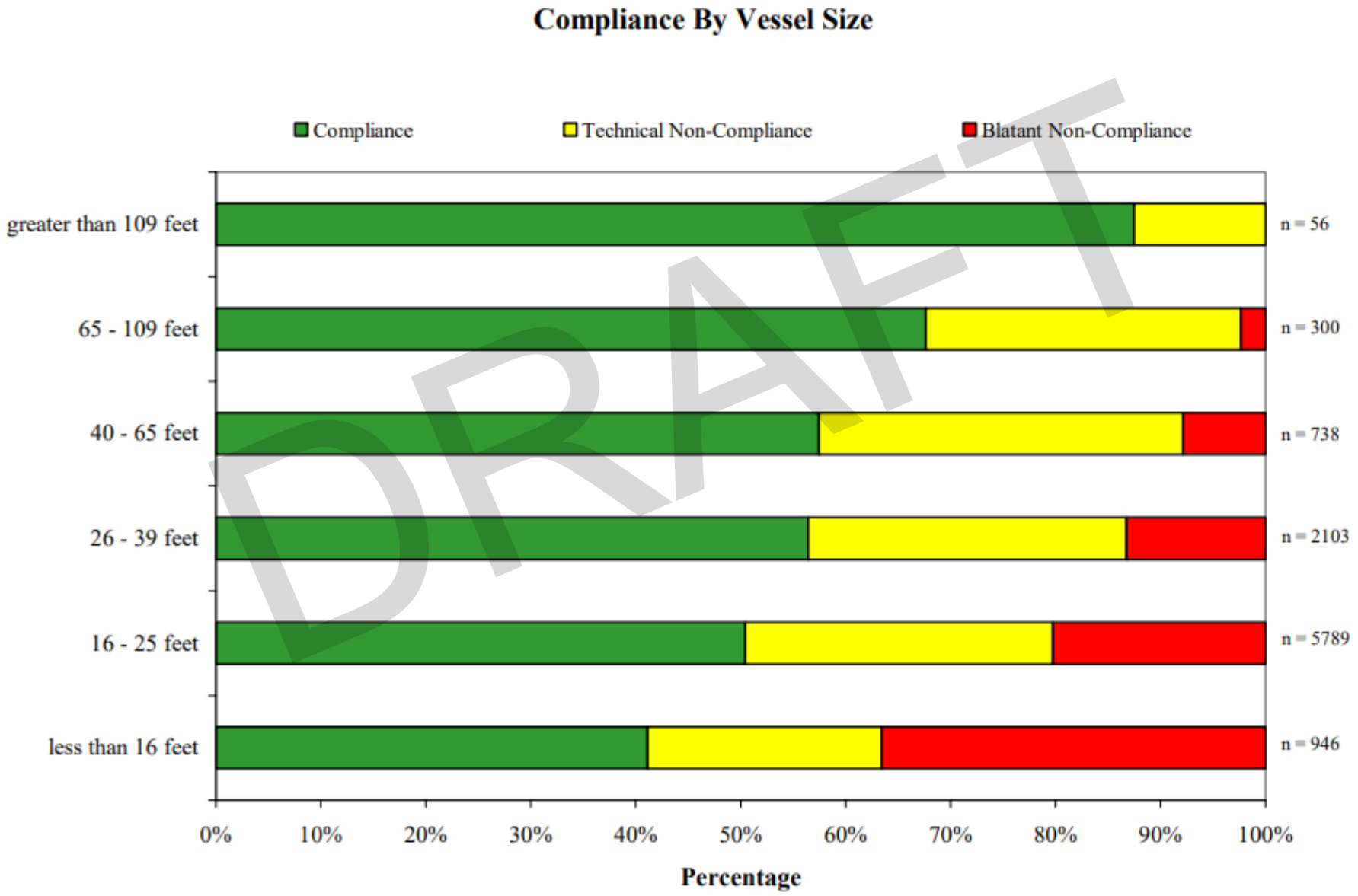


Figure 7d. Comparison of Levels of Boater Compliance from Boating Study

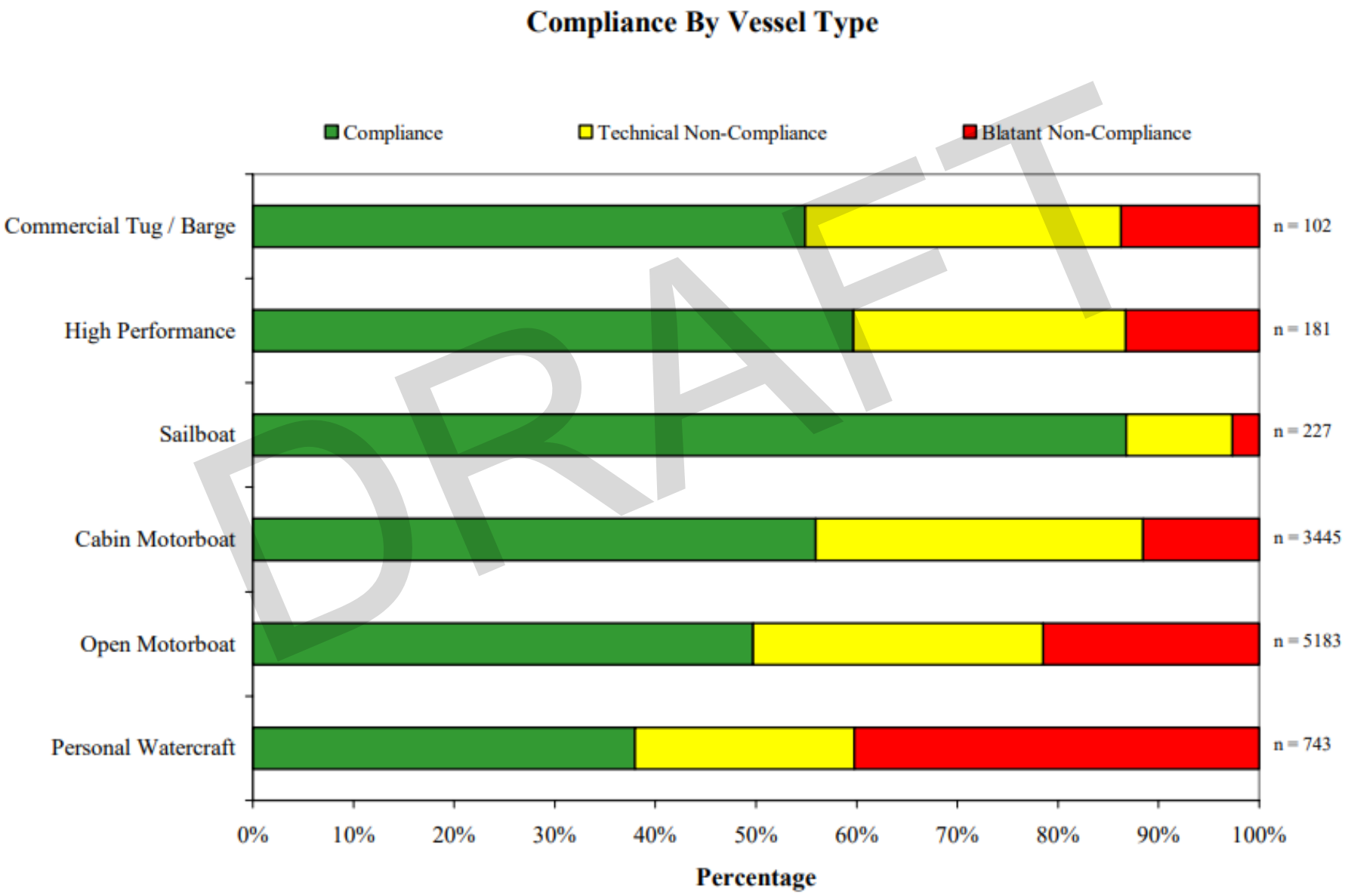


Figure 8a. Essential Manatee Habitat

Figure 8b. Essential Manatee Habitat

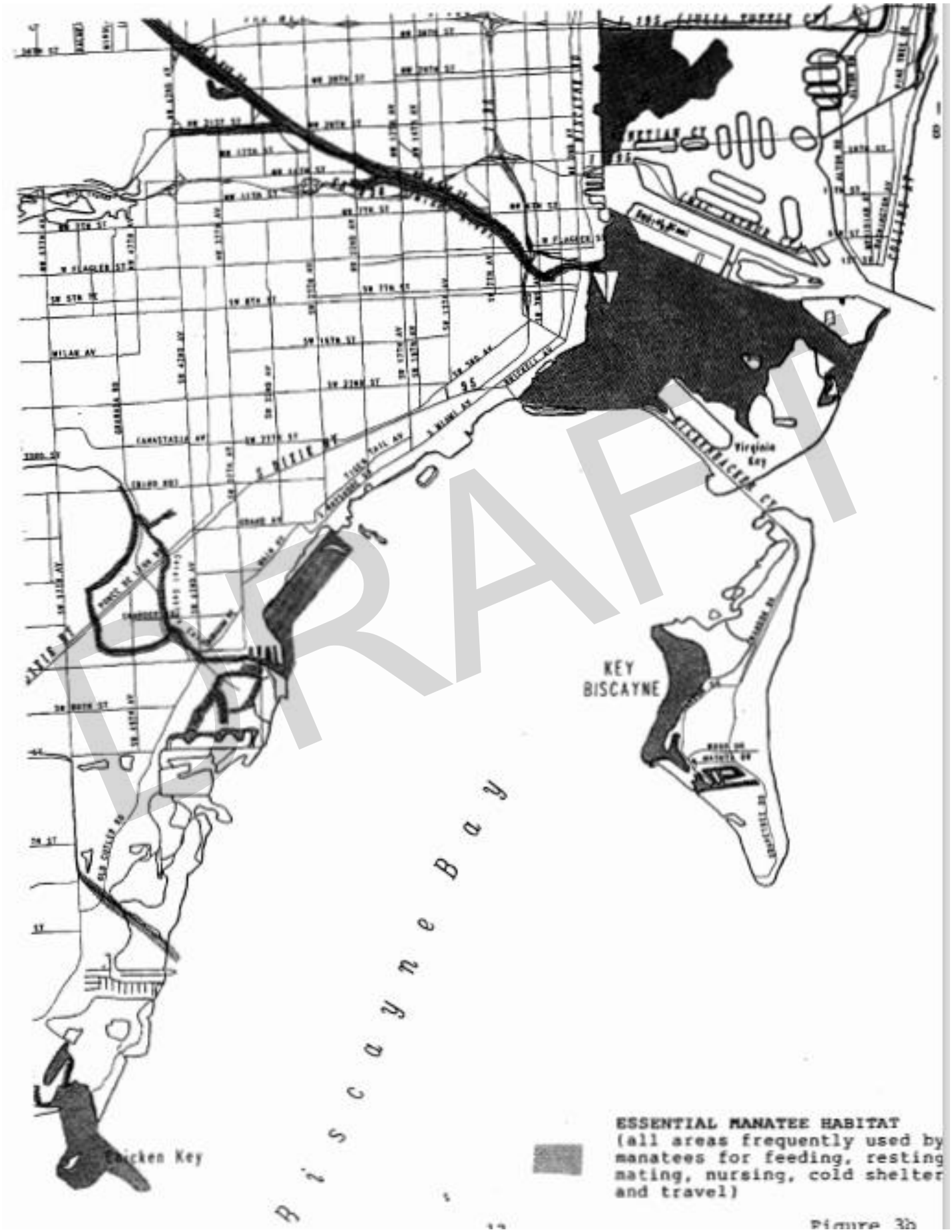


Figure 8c. Essential Manatee Habitat

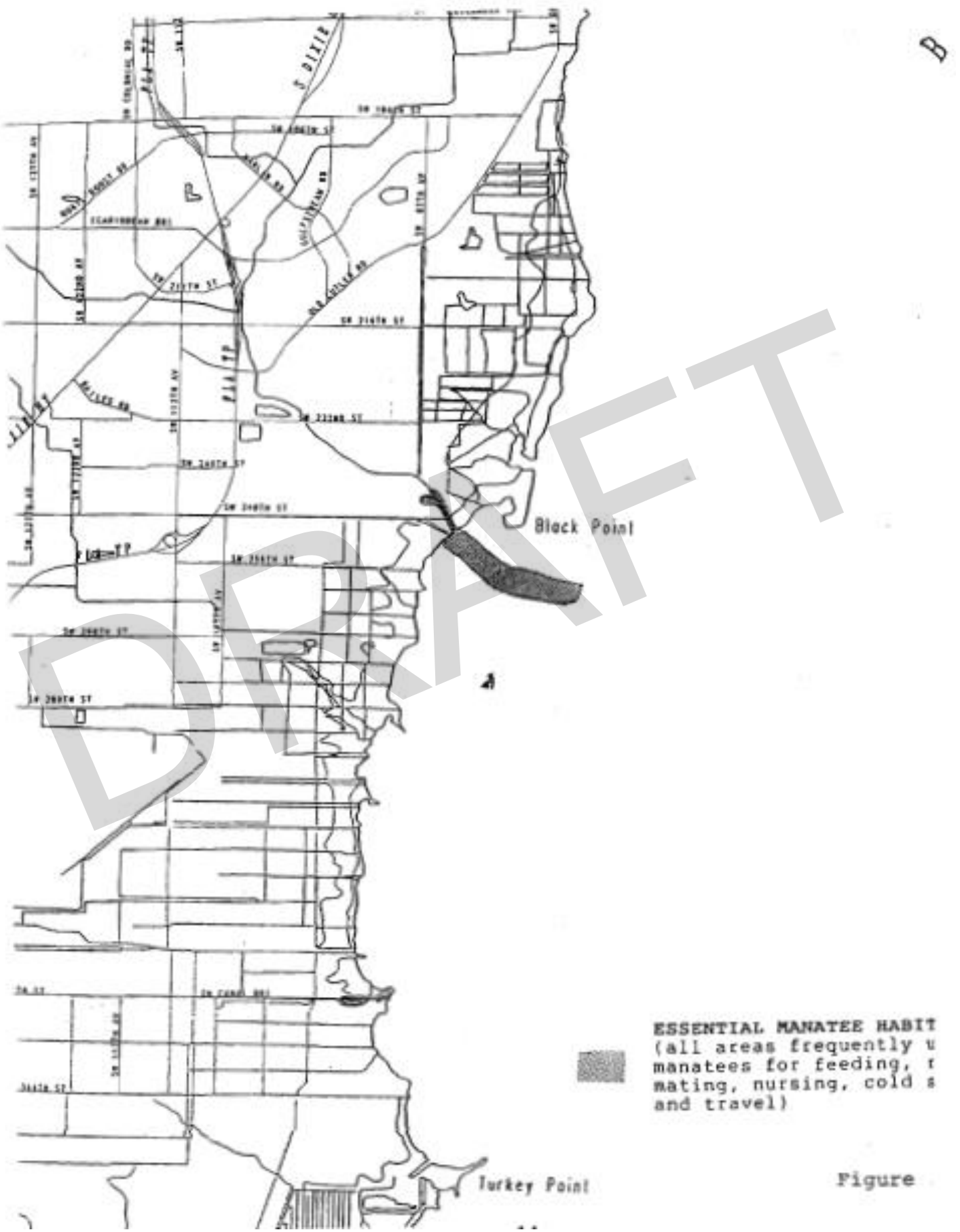


Figure 8d. Essential Manatee Habitat

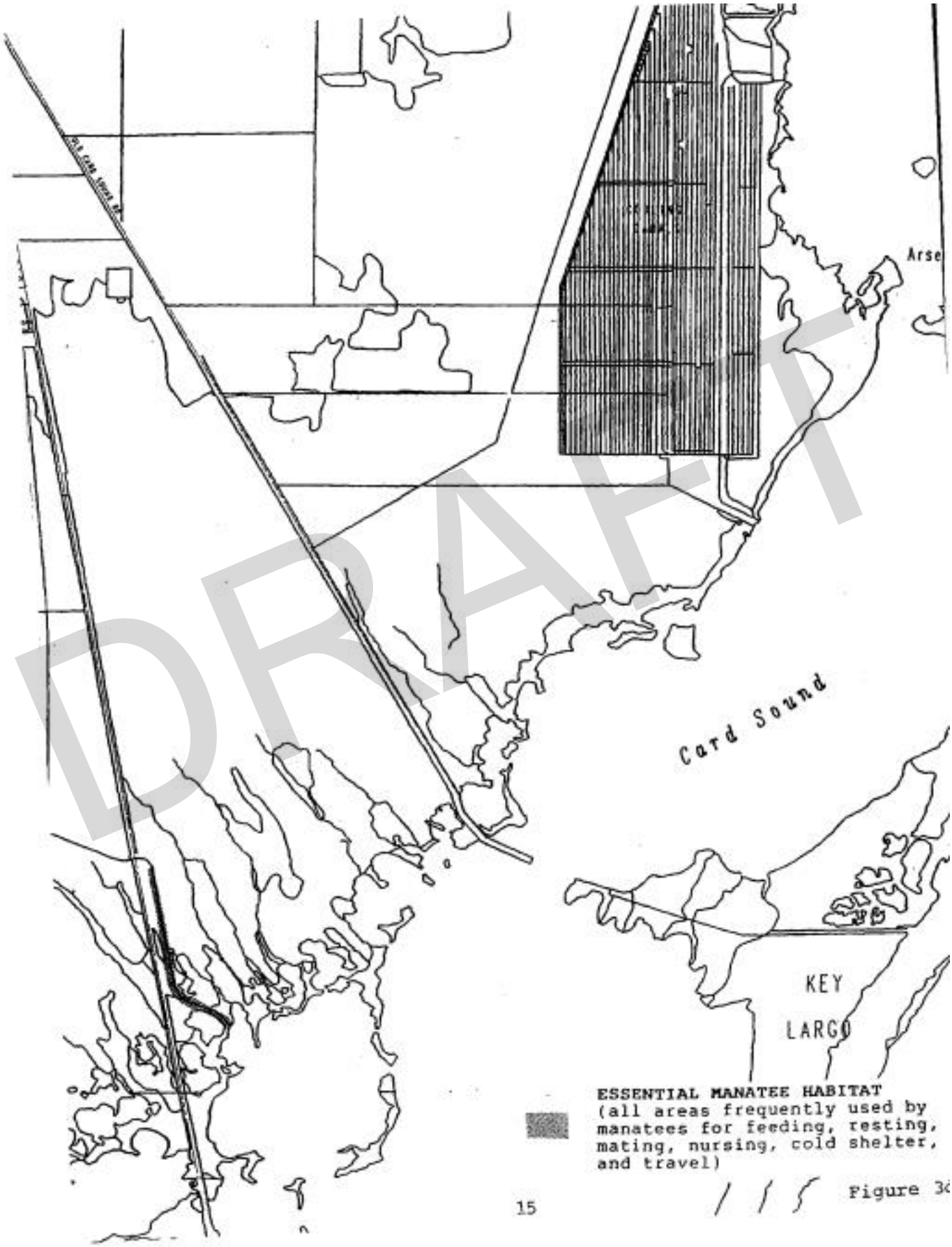


FIGURE 9a-PROTECTION GUIDELINES FOR ESSENTIAL MANATEE HABITAT

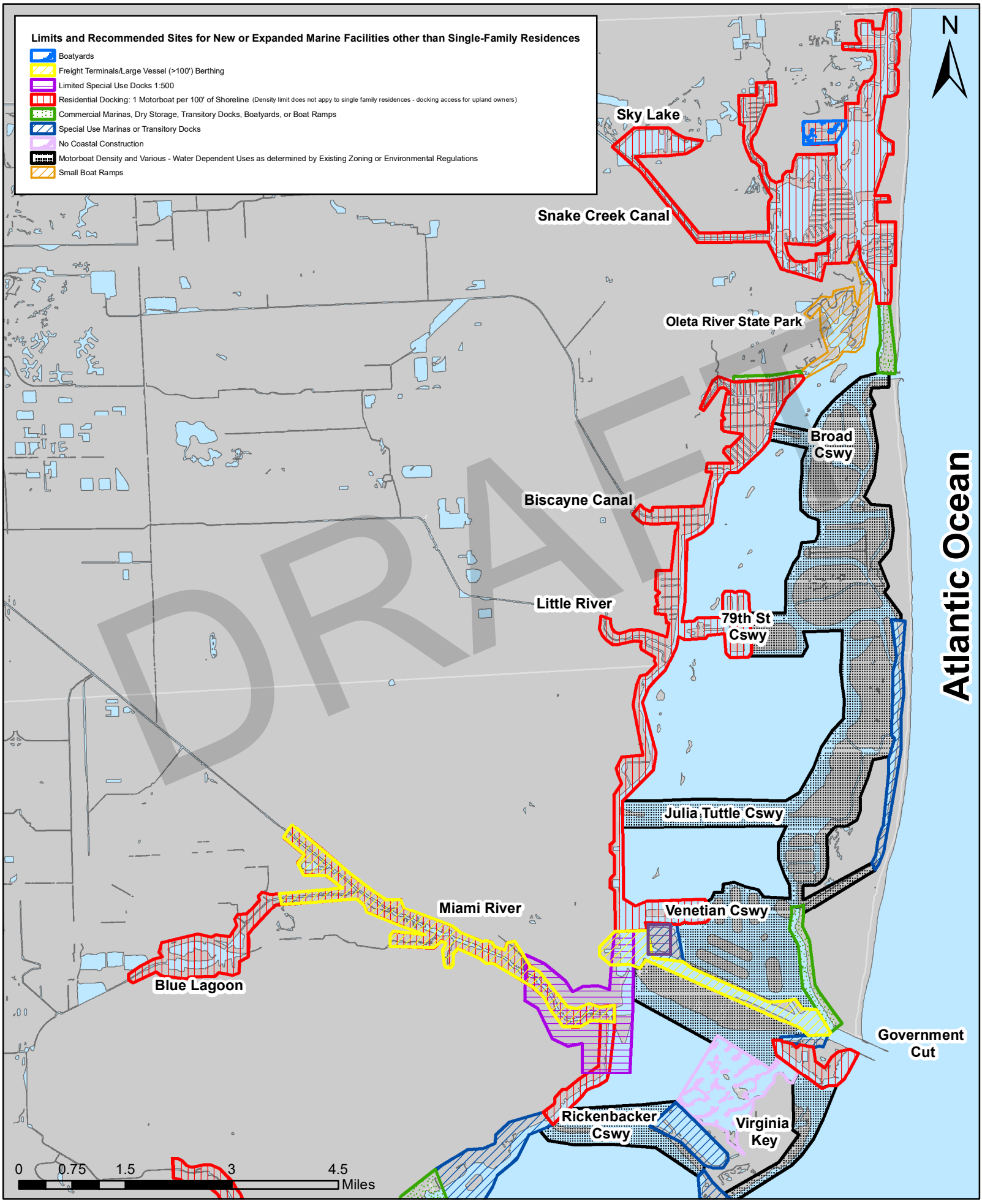


FIGURE 9b-PROPOSED 2024 PROTECTION GUIDELINES FOR ESSENTIAL MANATEE HABITAT

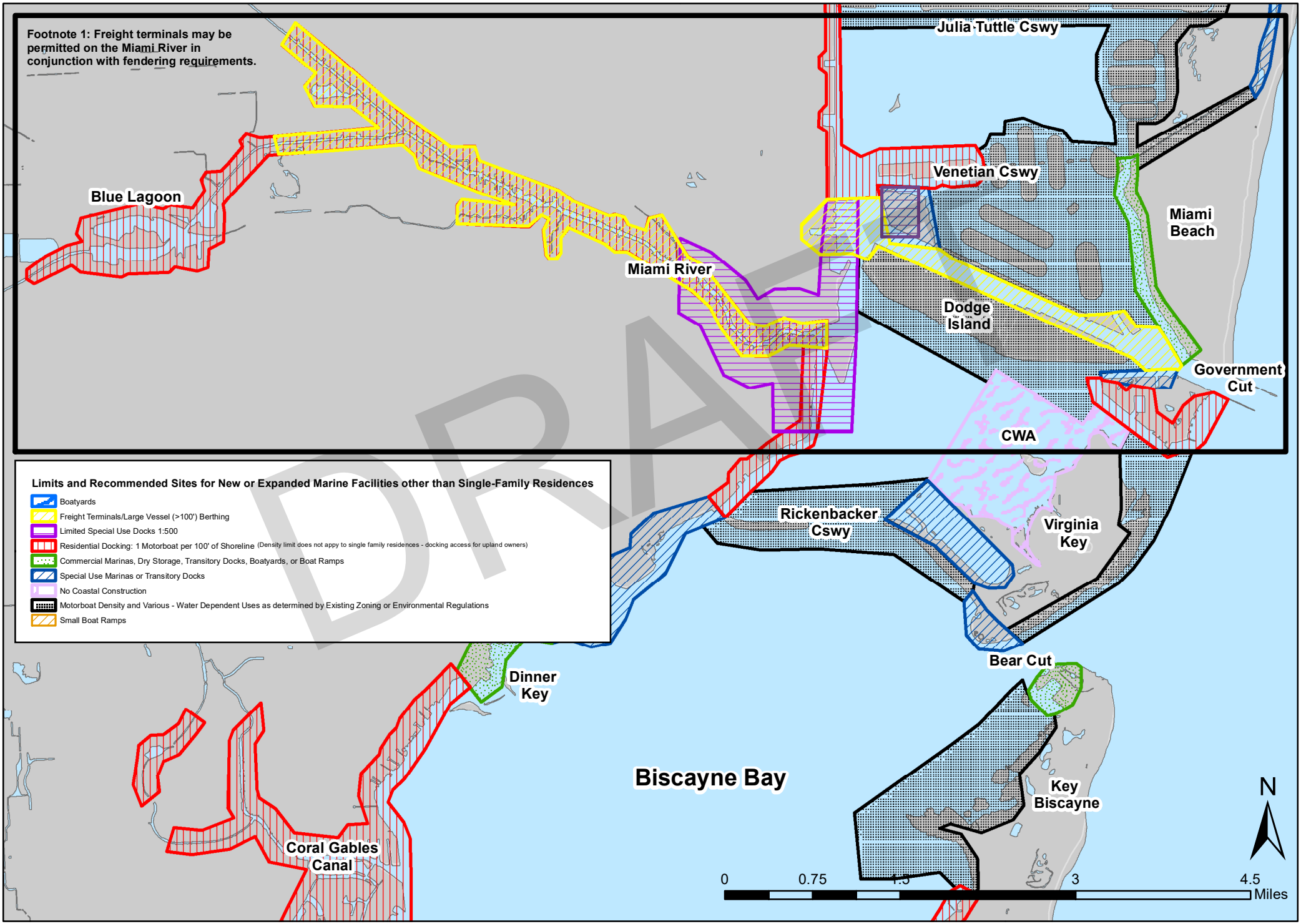


FIGURE 9c-PROPOSED 2024 PROTECTION GUIDELINES FOR ESSENTIAL MANATEE HABITAT

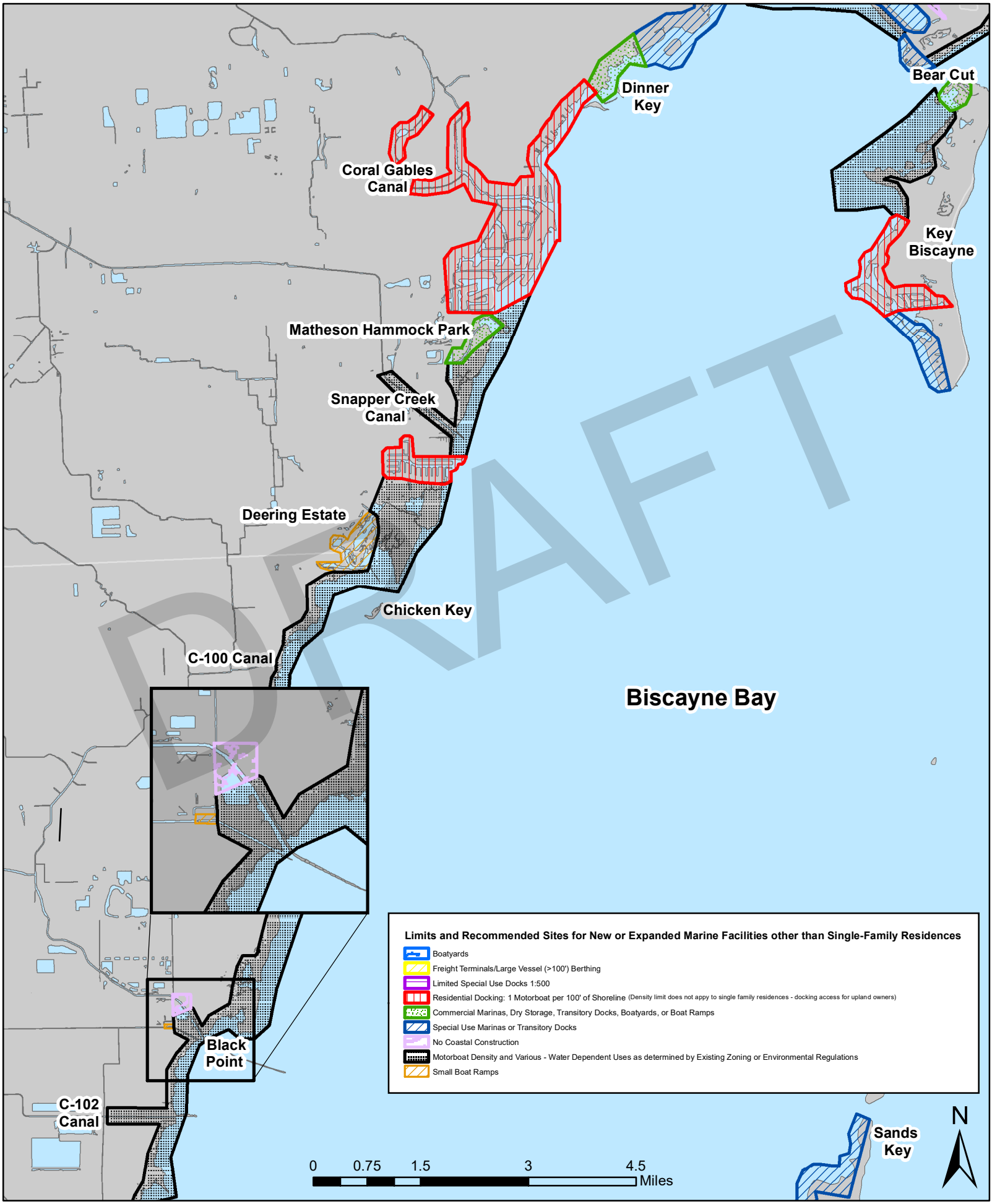


FIGURE 9d-PROPOSED 2024 PROTECTION GUIDELINES FOR ESSENTIAL MANATEE HABITAT

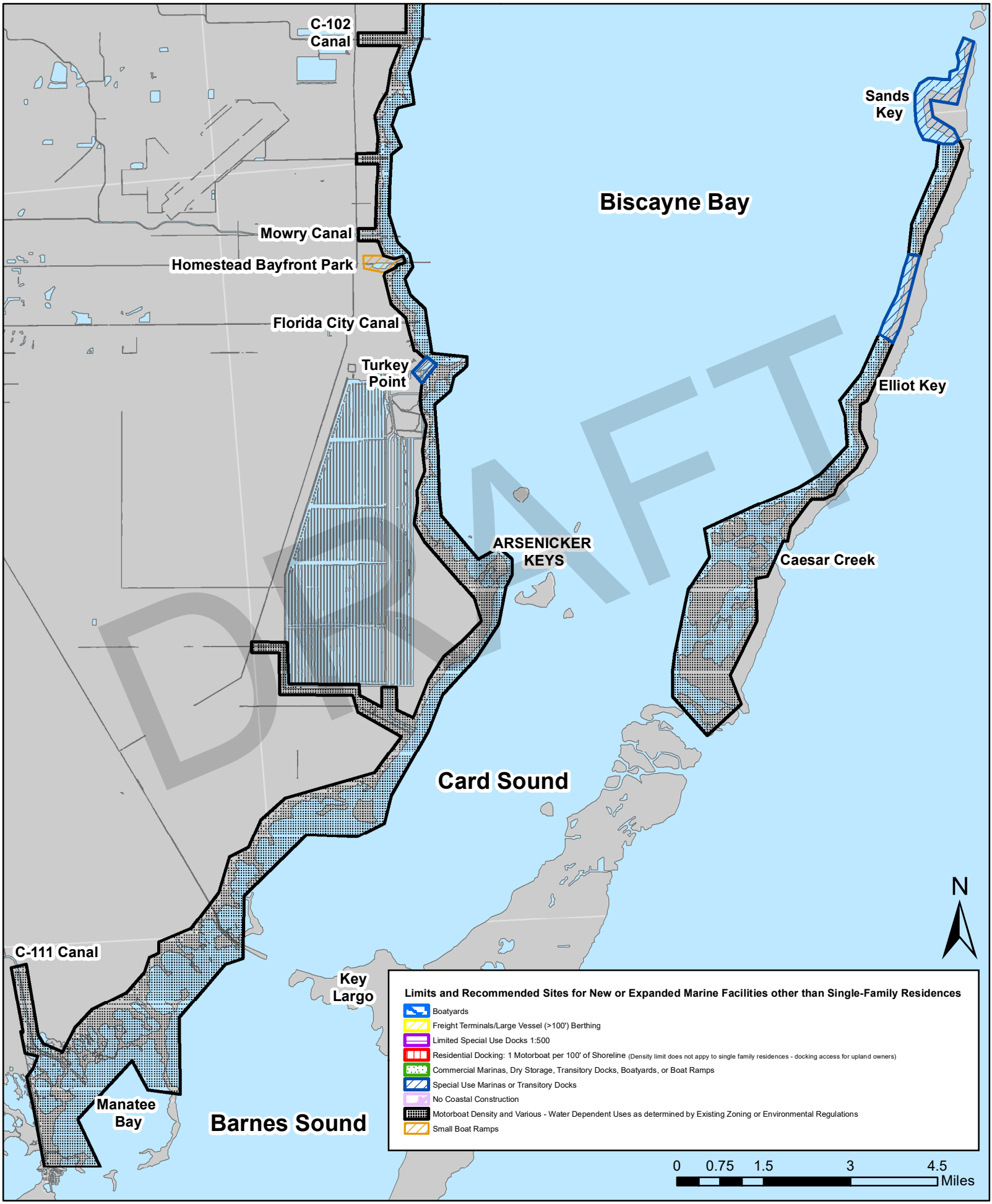


Figure 10a-Miami-Dade Manatee Mortality Causes of Death (1971-2021)

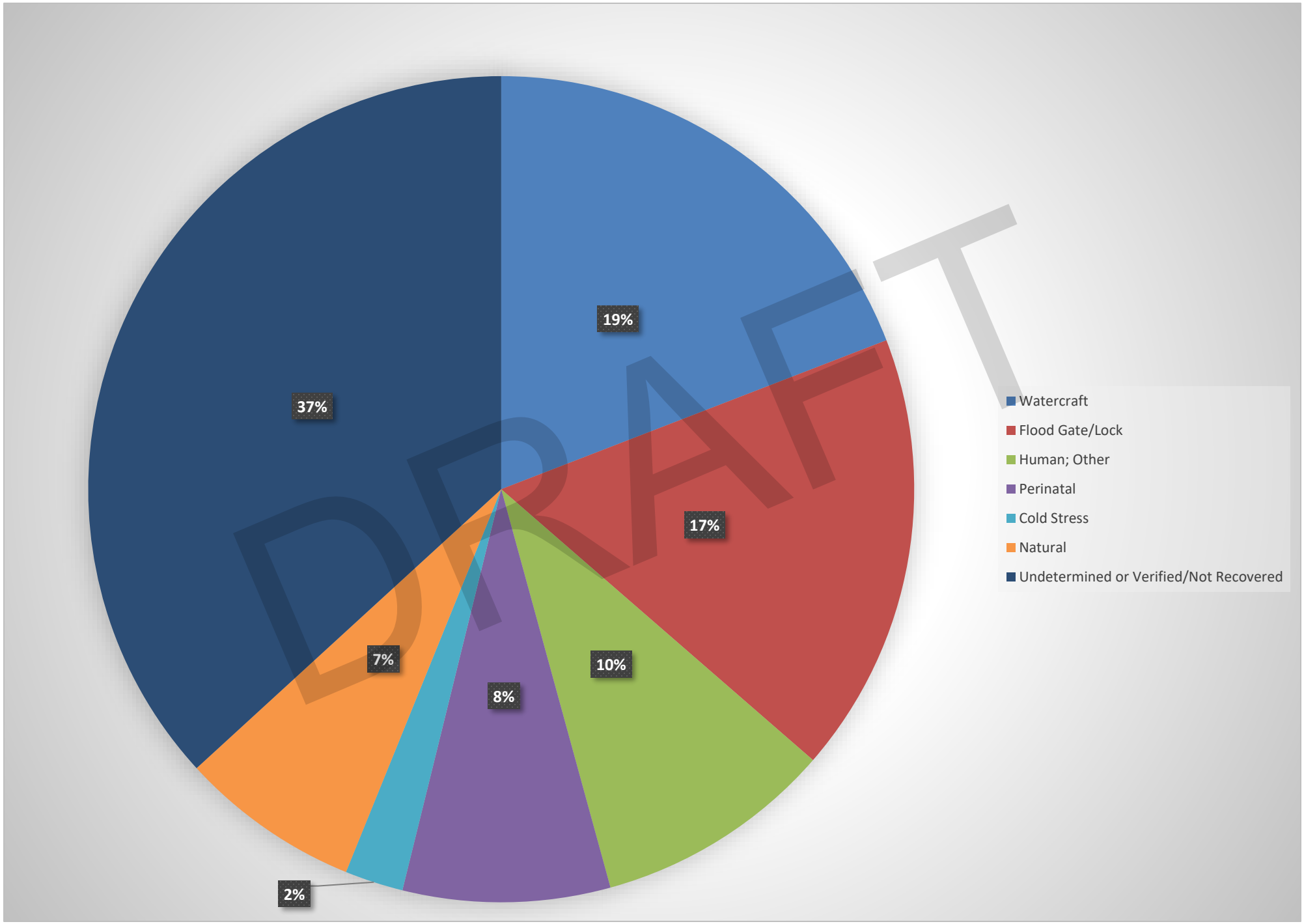


Figure 10b-Miami-Dade County Manatee Mortality by Year and Cause of Death (1974 - 2021)

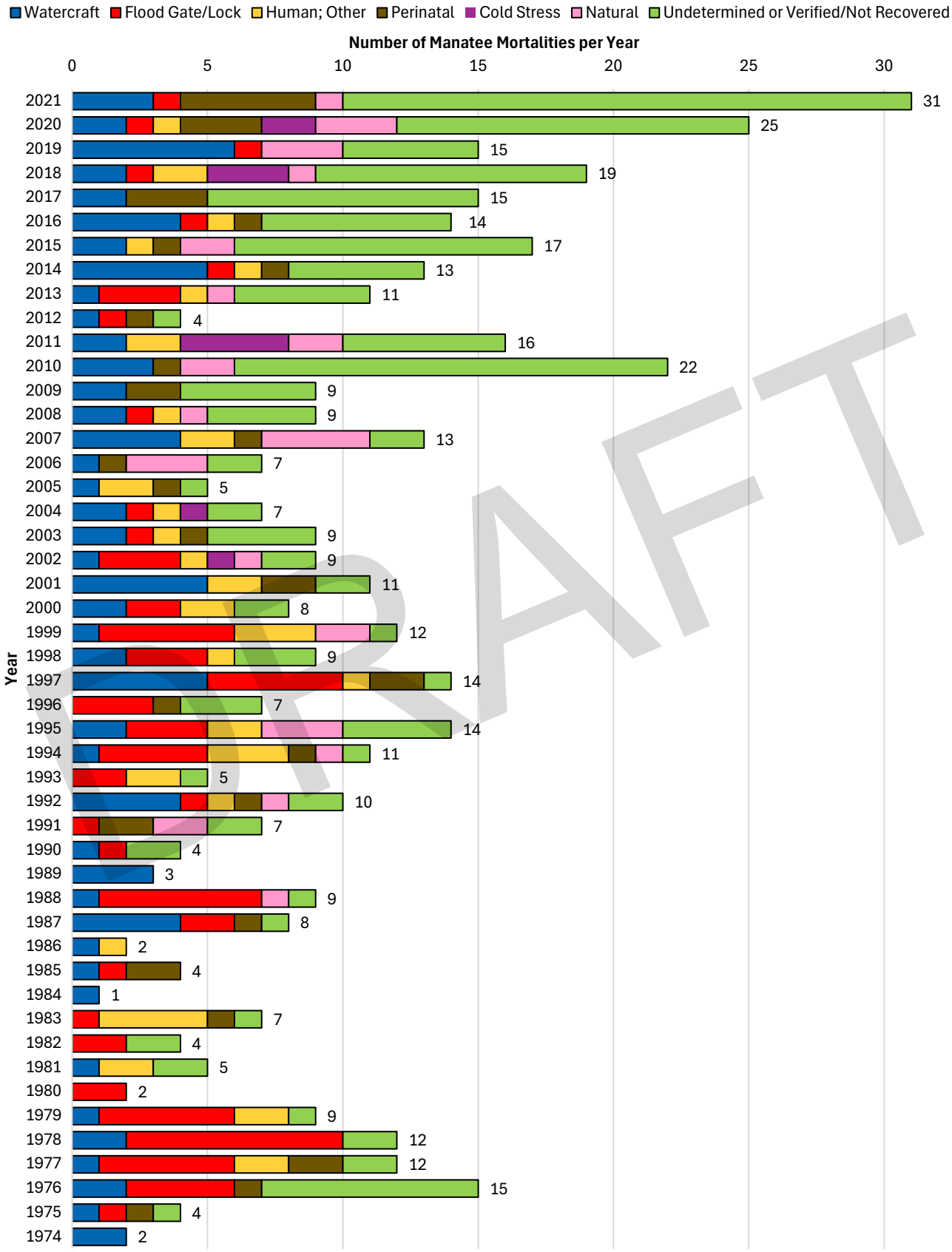


Figure 10c-Miami-Dade County Manatee Mortality by Year and Cause of Death (1974 - 2021)

Year	Watercraft	Flood Gate/Lock	Human; Other	Perinatal	Cold Stress	Natural	Undetermined or Verified/Not Recovered	Total
2021	3	1	0	5	0	1	21	**31**
2020	2	1	1	3	2	3	13	**25**
2019	6	1	0	0	0	3	5	**15**
2018	2	1	2	0	3	1	10	**19**
2017	2	0	0	3	0	0	10	**15**
2016	4	1	1	1	0	0	7	**14**
2015	2	0	1	1	0	2	11	**17**
2014	5	1	1	1	0	0	5	**13**
2013	1	3	1	0	0	1	5	**11**
2012	1	1	0	1	0	0	1	**4**
2011	2	0	2	0	4	2	6	**16**
2010	3	0	0	1	0	2	16	**22**
2009	2	0	0	2	0	0	5	**9**
2008	2	1	1	0	0	1	4	**9**
2007	4	0	2	1	0	4	2	**13**
2006	1	0	0	1	0	3	2	**7**
2005	1	0	2	1	0	0	1	**5**
2004	2	1	1	0	1	0	2	**7**
2003	2	1	1	1	0	0	4	**9**
2002	1	3	1	0	1	1	2	**9**
2001	5	0	2	2	0	0	2	**11**
2000	2	2	2	0	0	0	2	**8**
1999	1	5	3	0	0	2	1	**12**
1998	2	3	1	0	0	0	3	**9**
1997	5	5	1	2	0	0	1	**14**
1996	0	3	0	1	0	0	3	**7**
1995	2	3	2	0	0	3	4	**14**
1994	1	4	3	1	0	1	1	**11**
1993	0	2	2	0	0	0	1	**5**
1992	4	1	1	1	0	1	2	**10**
1991	0	1	0	2	0	2	2	**7**
1990	1	1	0	0	0	0	2	**4**
1989	3	0	0	0	0	0	0	**3**
1988	1	6	0	0	0	1	1	**9**
1987	4	2	0	1	0	0	1	**8**
1986	1	0	1	0	0	0	0	**2**
1985	1	1	0	2	0	0	0	**4**
1984	1	0	0	0	0	0	0	**1**
1983	0	1	4	1	0	0	1	**7**
1982	0	2	0	0	0	0	2	**4**
1981	1	0	2	0	0	0	2	**5**
1980	0	2	0	0	0	0	0	**2**
1979	1	5	2	0	0	0	1	**9**
1978	2	8	0	0	0	0	2	**12**
1977	1	5	2	2	0	0	2	**12**
1976	2	4	0	1	0	0	8	**15**
1975	1	1	0	1	0	0	1	**4**
1974	2	0	0	0	0	0	0	**2**
Totals:	**92**	**83**	**45**	**39**	**11**	**34**	**177**	**481**

Data provided by FWC's Fish and Wildlife Research Institute

Figure 11

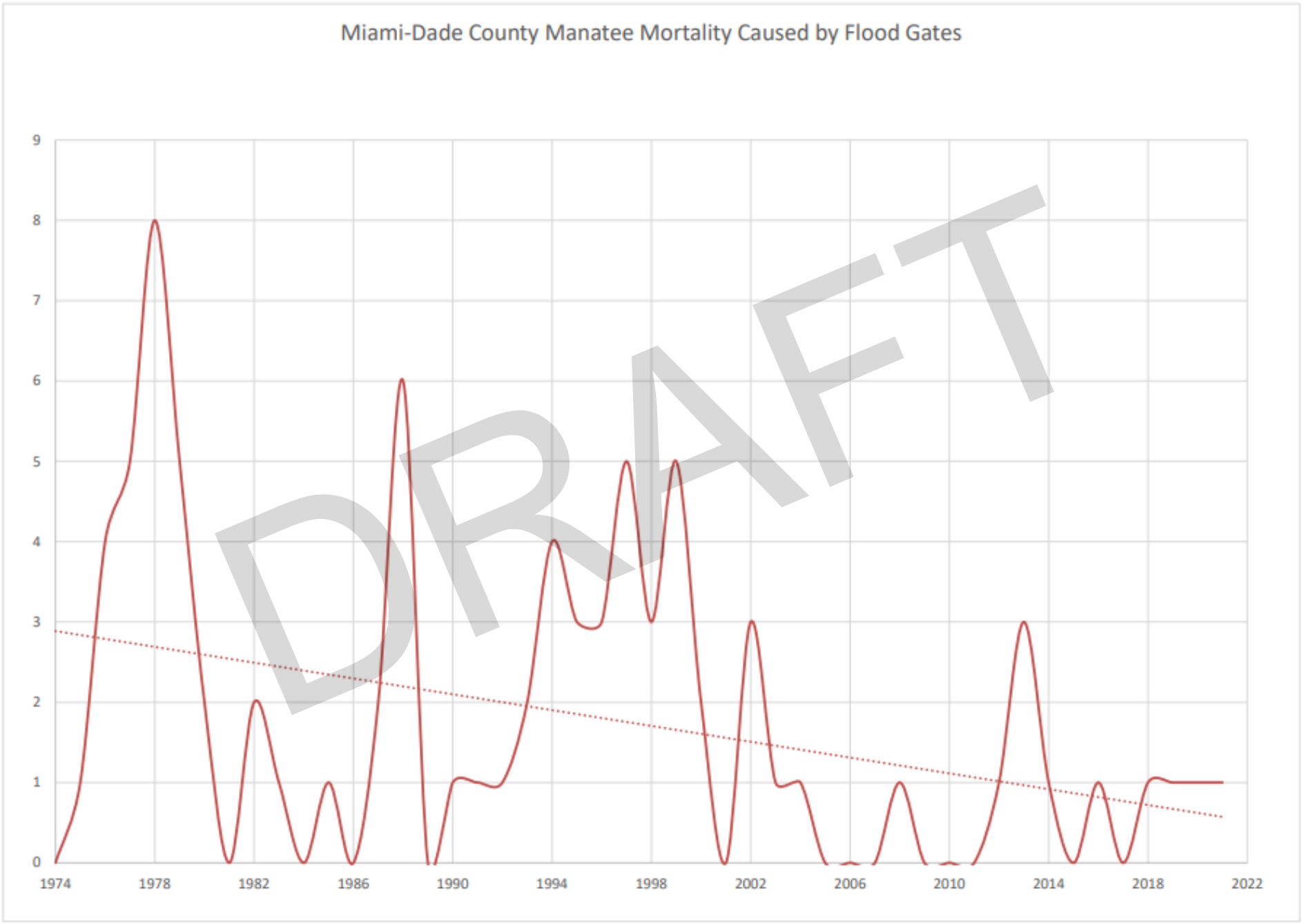

Miami-Dade County Manatee Mortality Caused by Flood Gates
Number of Manatees
Year
0
1
2
3
4
5
6
7
8
9
1974
1978
1982
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
DRAFT

Figure 12

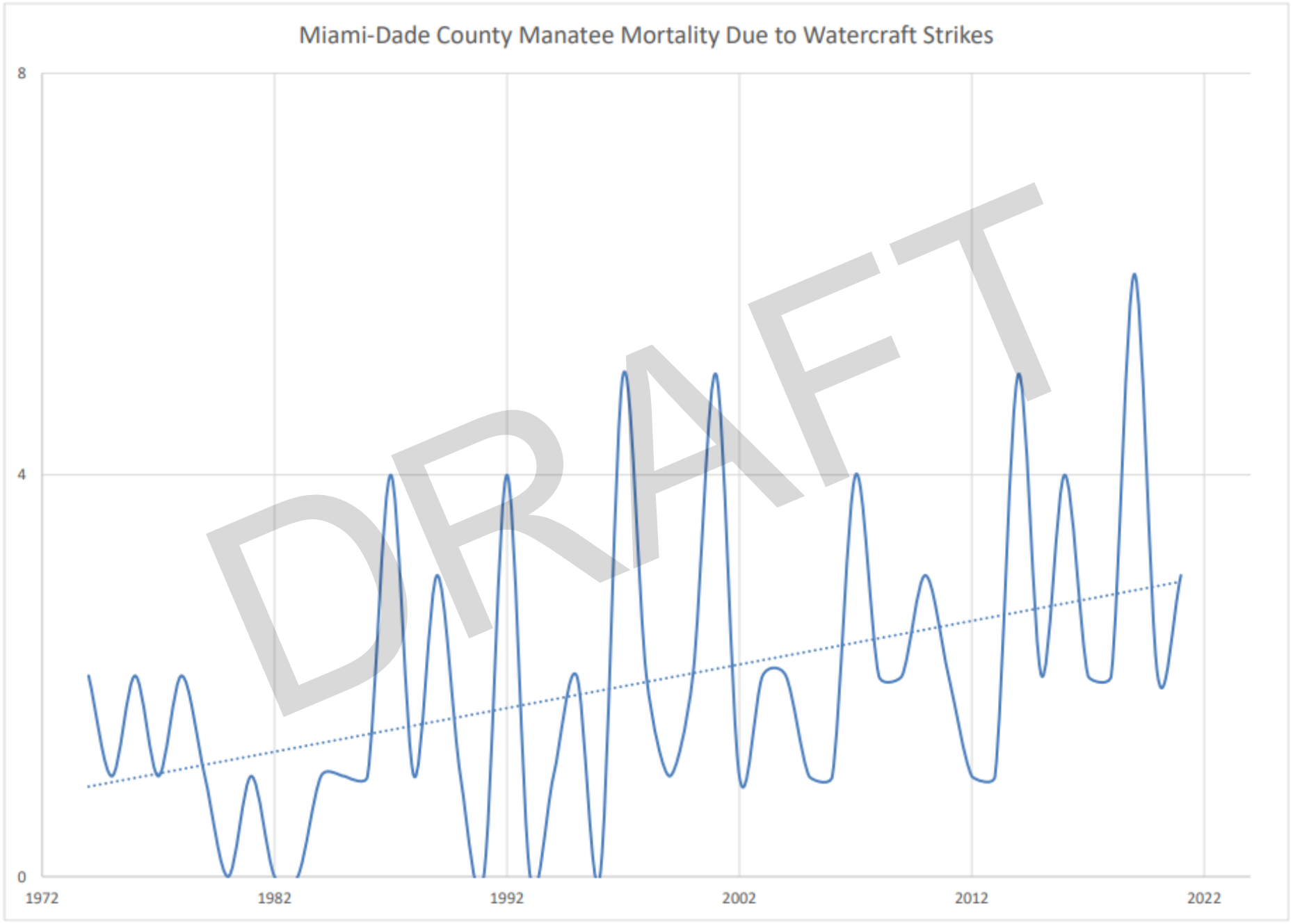

Miami-Dade County Manatee Mortality Due to Watercraft Strikes
8
4
0
1972
1982
1992
2002
2012
2022
Number of Manatees
Year
DRAFT

Figure 13a. Composite View of Vessel Traffic

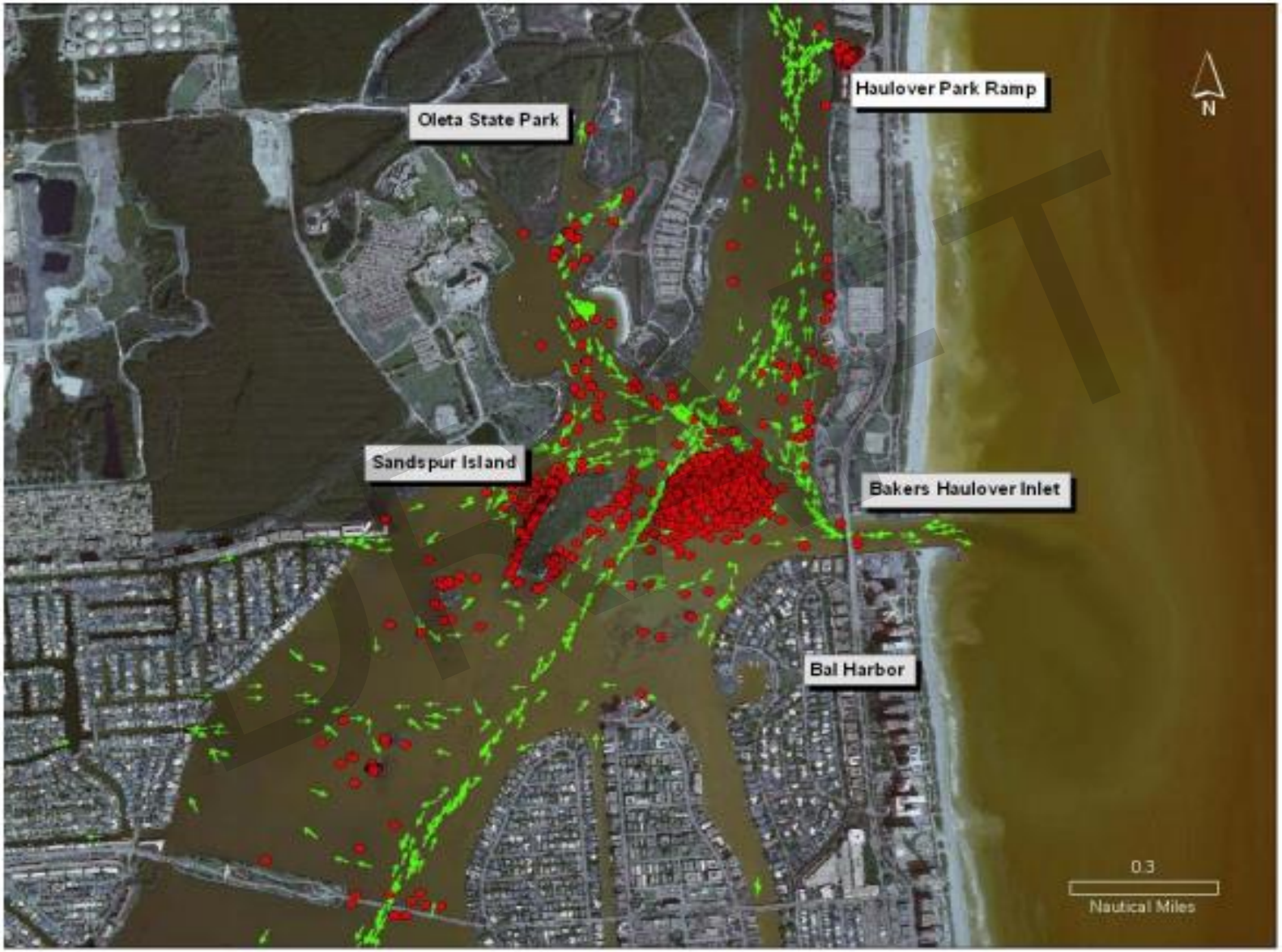


Figure 13b. Composite View of Vessel Traffic

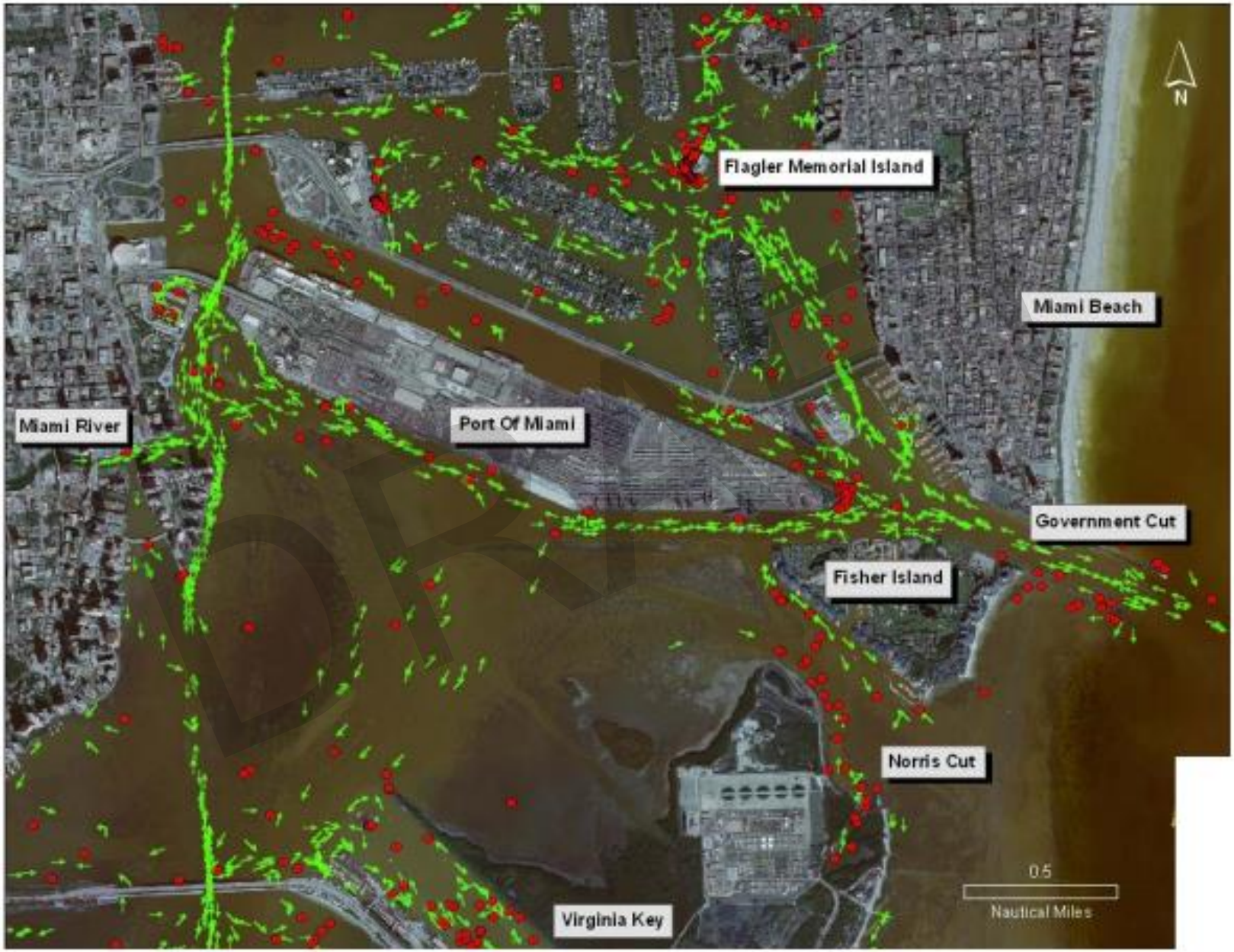


Figure 13c. Composite View of Vessel Traffic

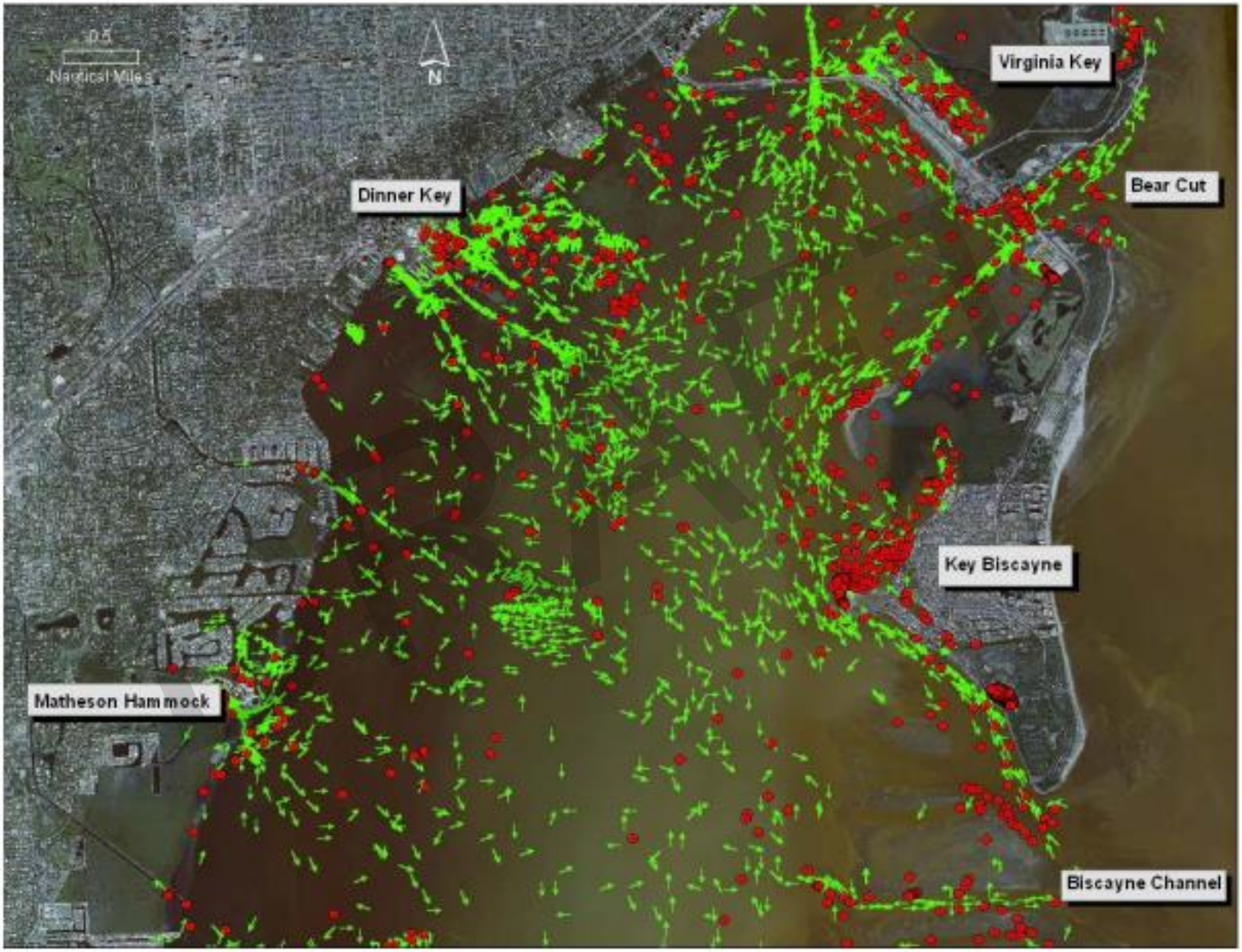


Figure 13d. Composite View of Vessel Traffic

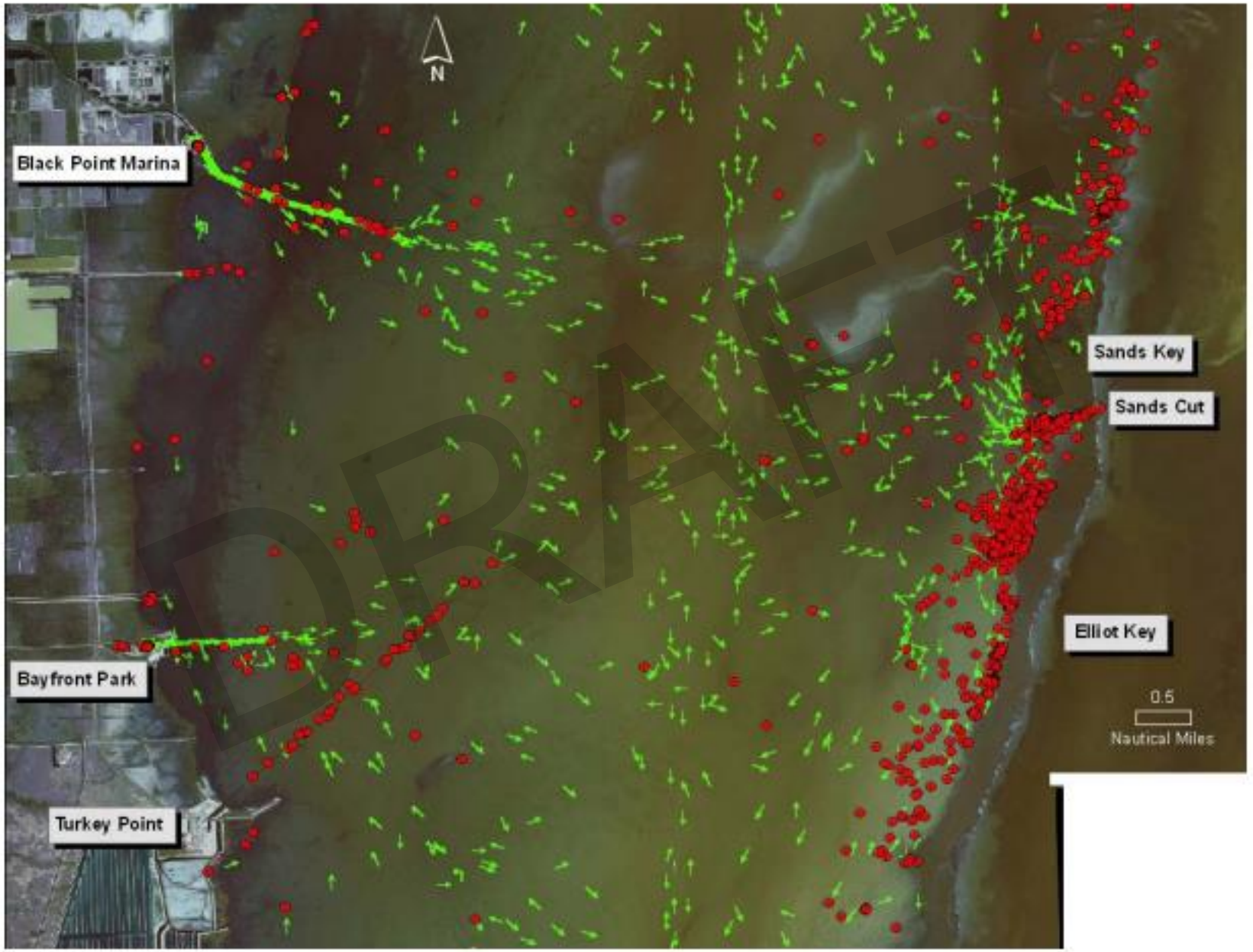


Figure 14a. Spatial Analysis of Higher-Speed Traffic

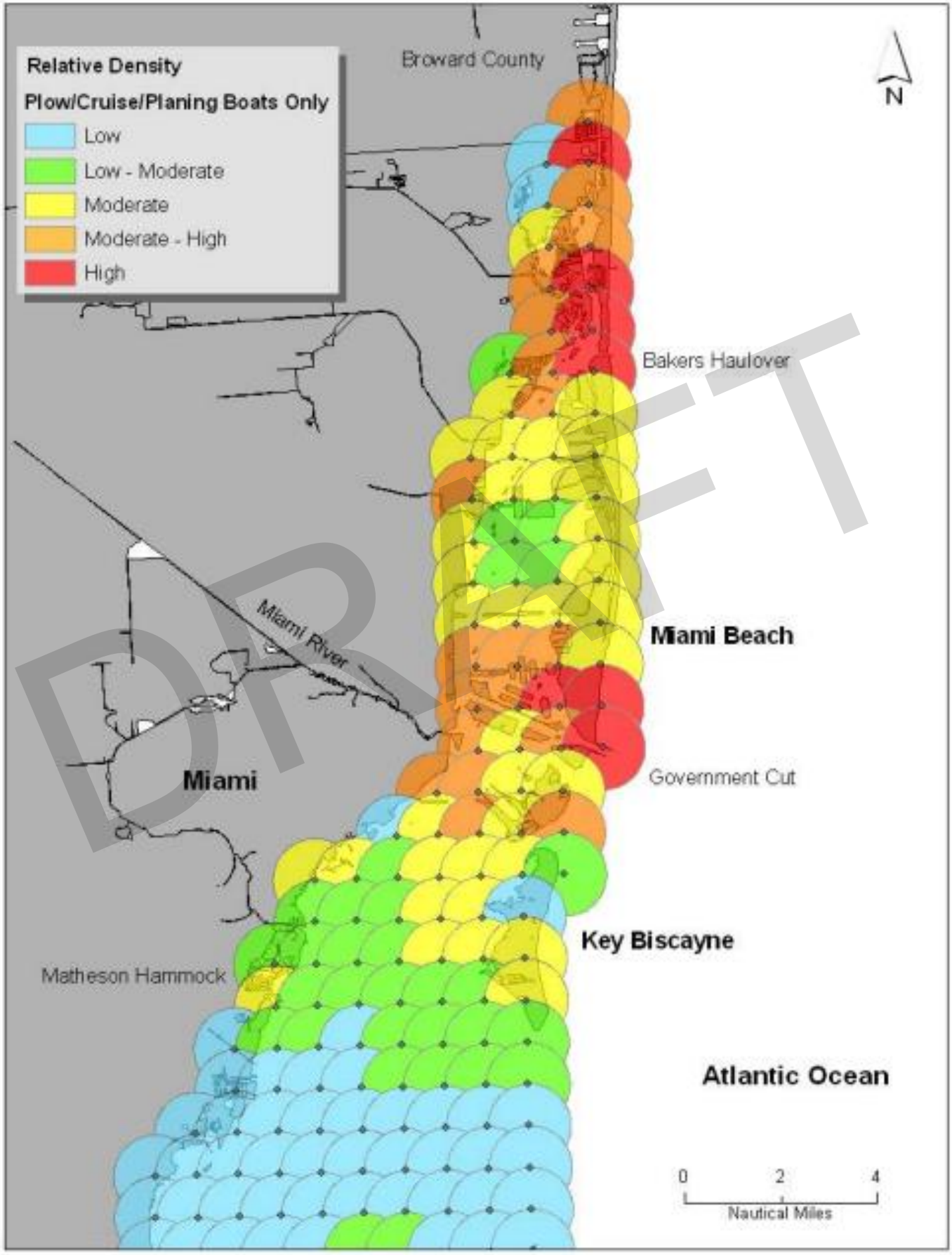


Figure 14b. Spatial Analysis of Higher-Speed Traffic

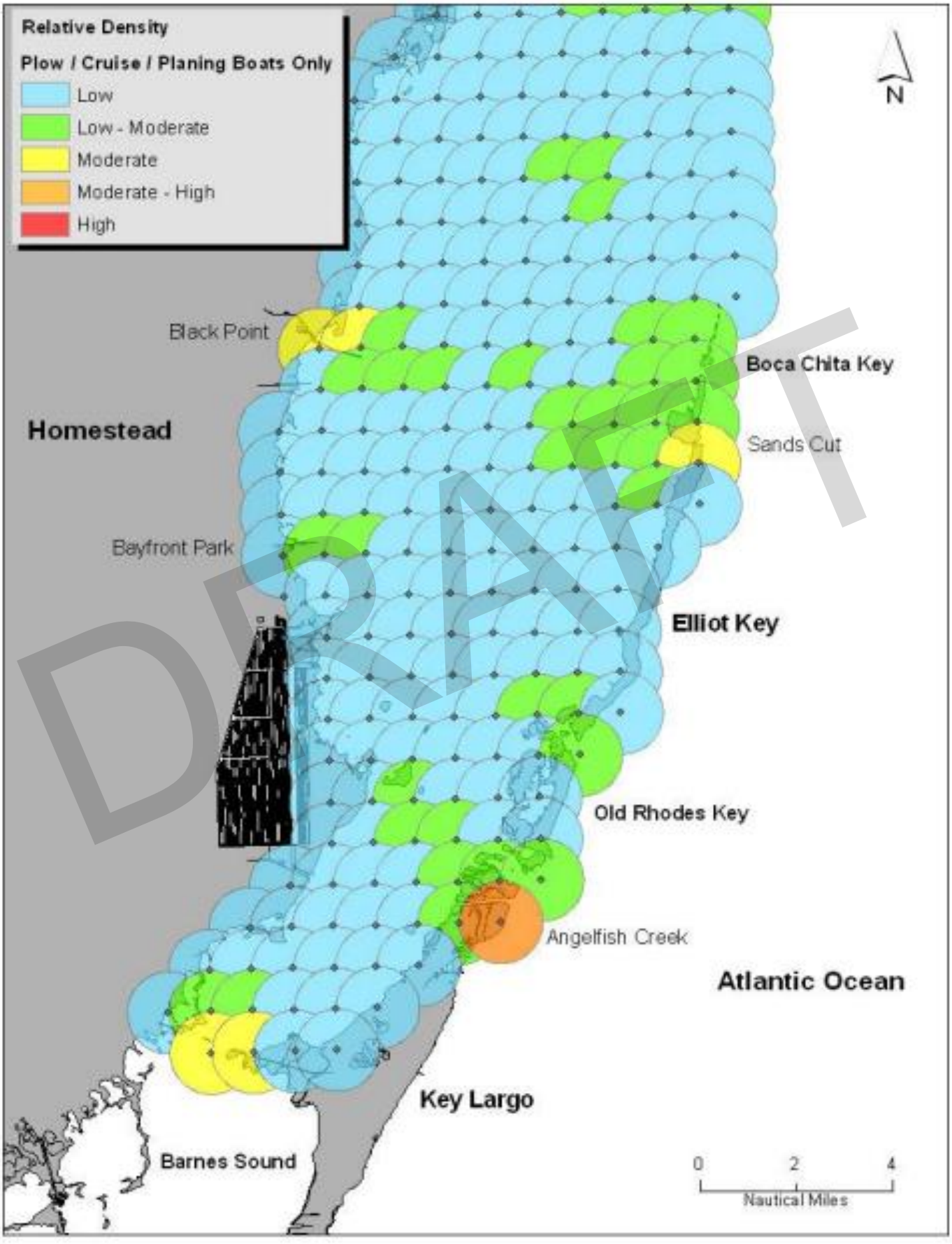


Figure 14c. Spatial Analysis of Higher-Speed Traffic

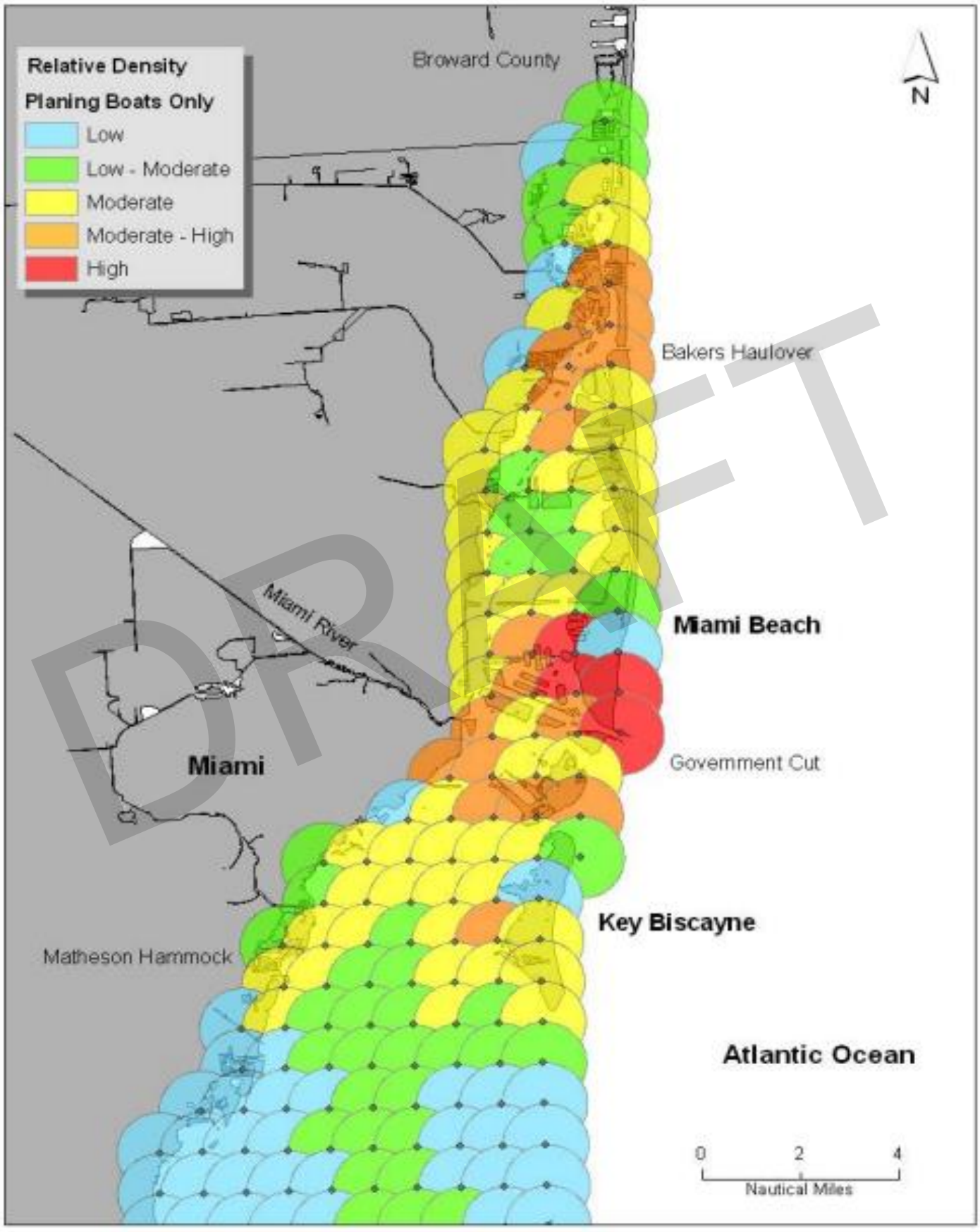


Figure 14d. Spatial Analysis of Higher-Speed Traffic

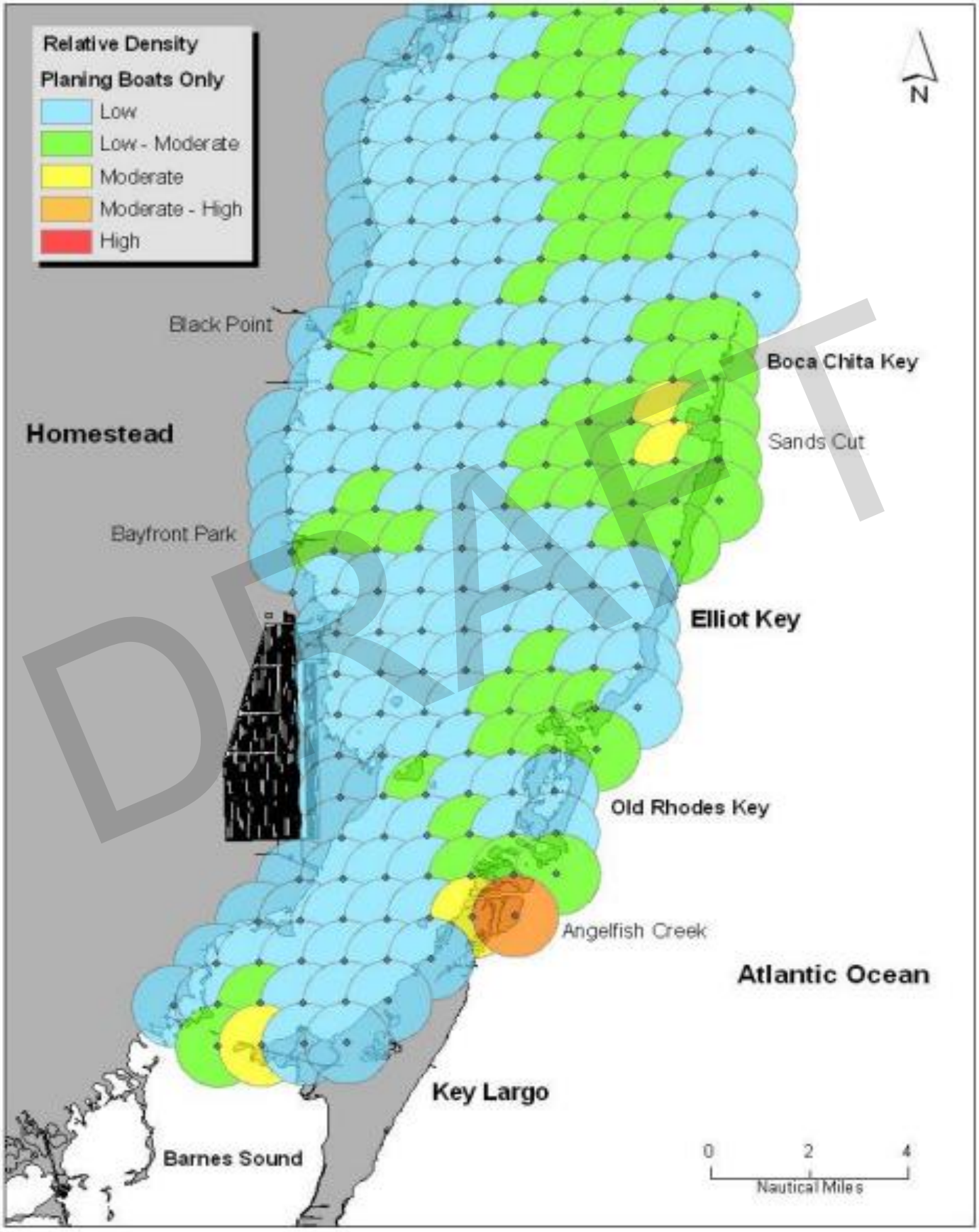


Figure 15-Miami-Dade County Aerial Manatee Cow/Calf Sightings 1996-2024

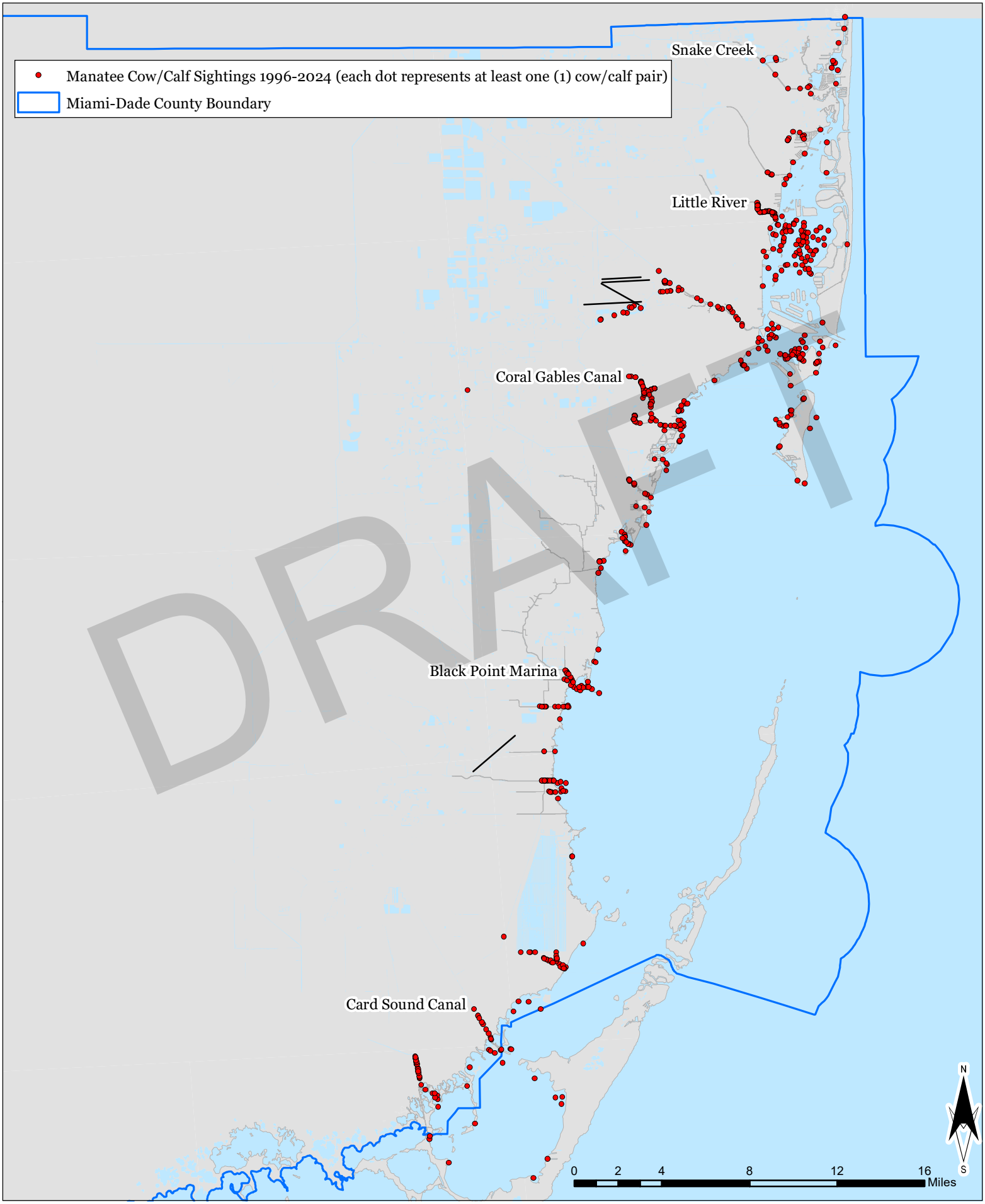
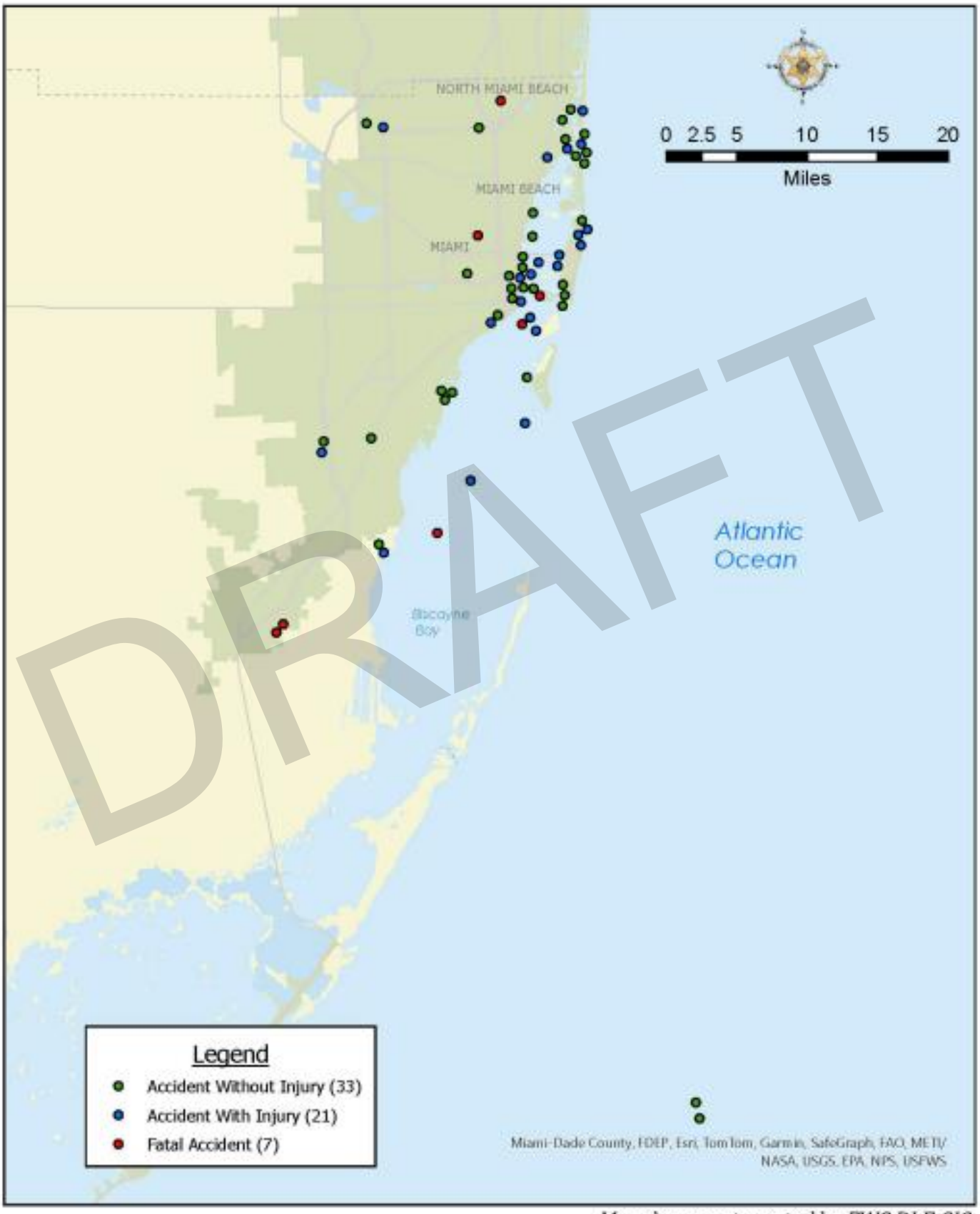


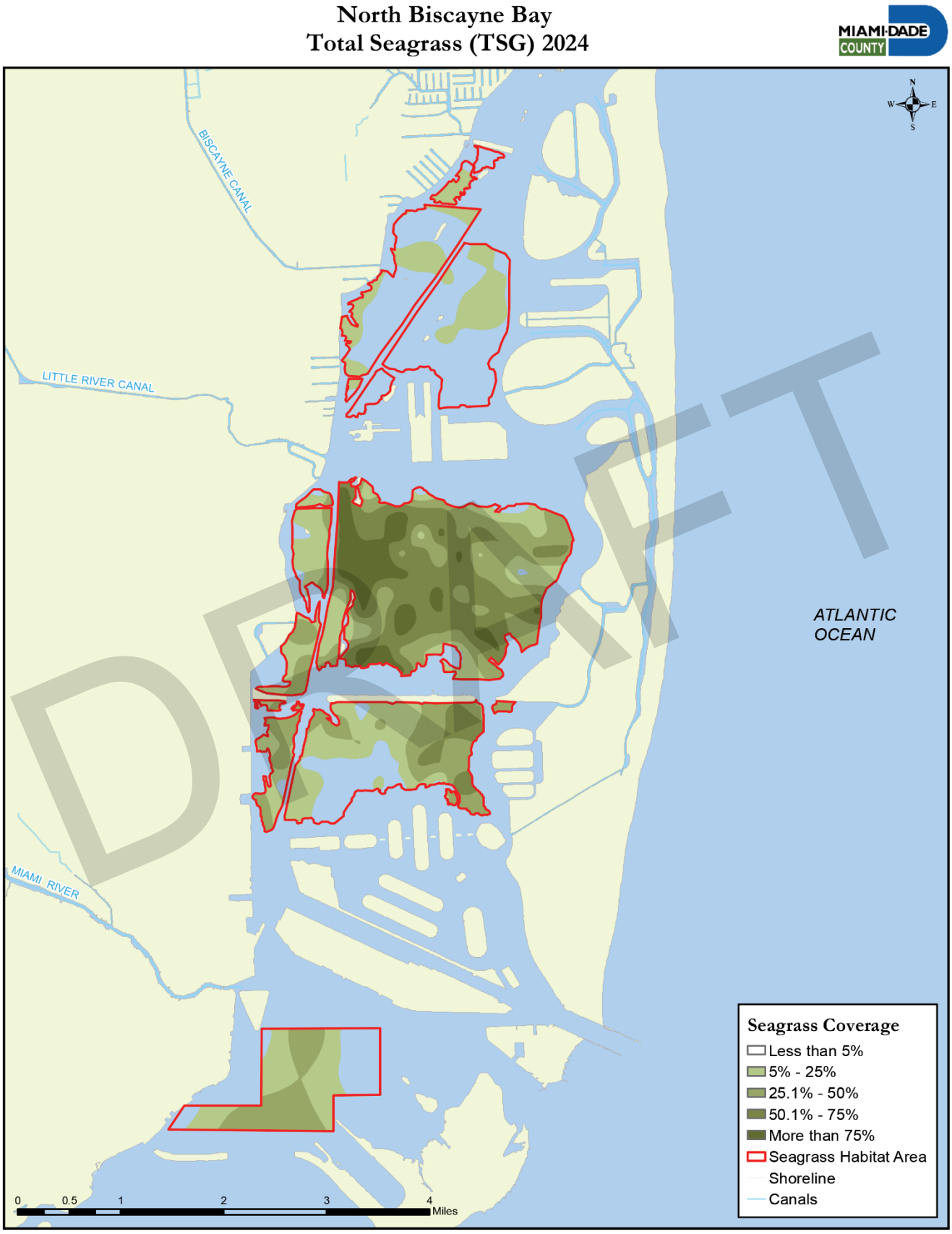
Figure 16-Bill Sadowski Critical Wildlife Area

Figure 17- Known Locations of Accidents in Miami-Dade County during 2023



Map document created by FWC DLE GIS

Figure 18



https://experience.arcgis.com/experience/02ea7212988b4d6c856279503d991e01/page/Habitat-Monitoring

Figure 19a

Miami-Dade County - North

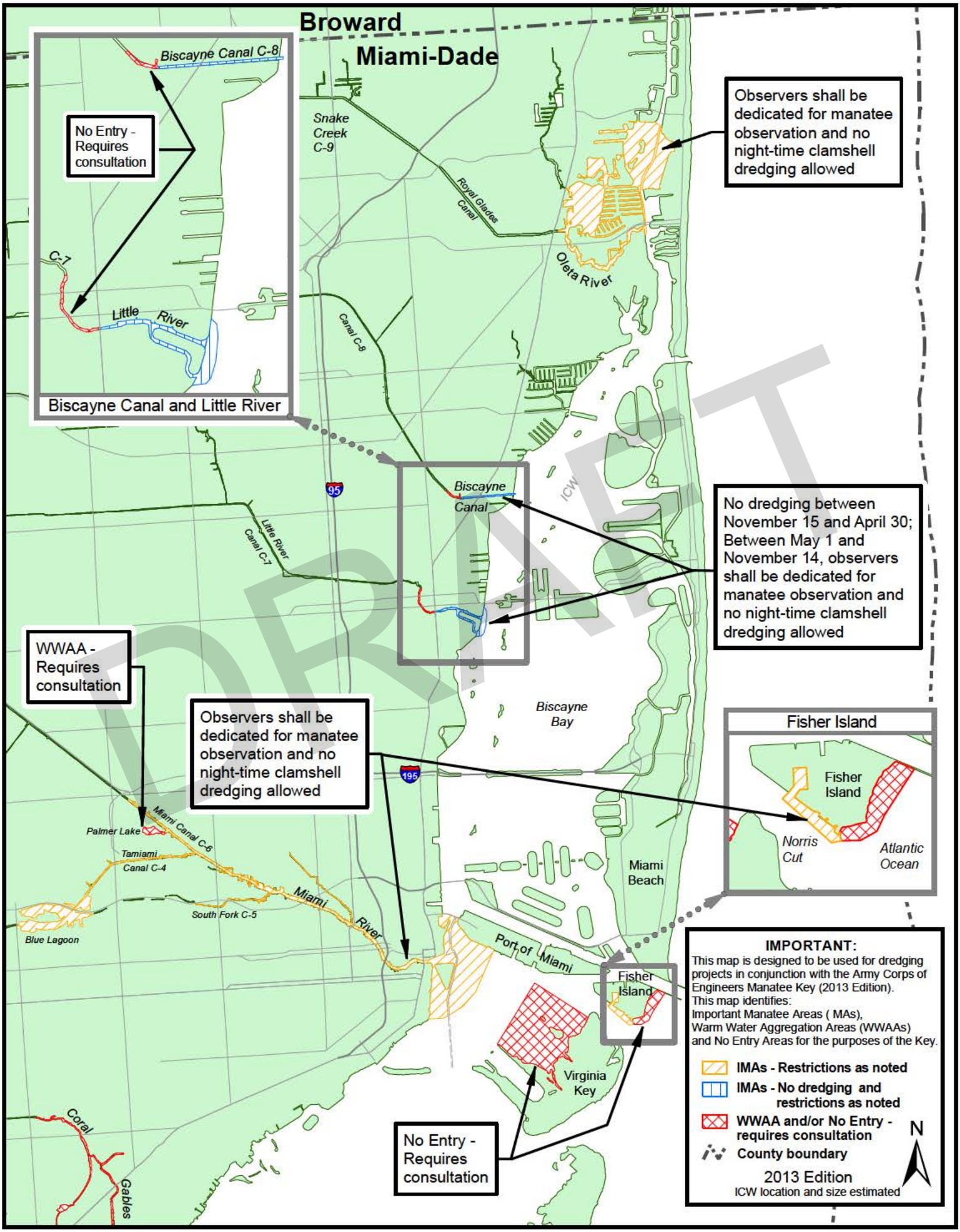


Figure 19b

Miami-Dade County - South