

KEY WEST MOORING FIELD PILOT STUDY

Final Report

Prepared by:



Key West • Miami
Hollywood • Fort Myers
www.swcinc.net

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1.0 PURPOSE

The intent of this report is to present the results of a year of monthly surveys conducted within one mile of the Key West mooring field, Monroe County, FL (see Location Map, Attachment 1). The assessment was commissioned by Monroe County, in association with the City of Key West, to provide an evaluation of anchoring and mooring activities as part of the FWC Pilot Program as directed by Florida Statutes.

In addition to the Pilot Program minimum requirements, data captured by the study will be utilized by the County to determine vessel locations, track movement of vessels, and assist in the determination of boating infrastructure needs and/or development of regulatory regimes.

2.0 GENERAL PROJECT DESCRIPTION

As identified in Chapter 327.4105 Florida Statutes, the Florida Fish and Wildlife Conservation Commission (FWC) and the Florida Department of Environmental Protection (DEP) have been directed to establish a Pilot Program to explore potential options for regulating the anchoring or mooring of non-live-aboard vessels outside the marked boundaries of public mooring fields. Each location selected for inclusion in the Pilot Program must be associated with a properly-permitted mooring field.

Prior to FWC's final selection of five Pilot Program sites, participants must provide survey data of vessels currently on moorings within the permitted mooring fields, as well as vessels moored or anchored within a one-mile radius of the permitted mooring field. Survey data must be collected for a period of twelve (12) months, occurring on the same day each month, beginning by March 1, 2010. The vessel data will be used by FWC and DEP to determine the final selection of the Pilot Program sites. The information provided by Monroe County, and the other four sites in the State, will be included in a report by FWC that will be submitted by January 1, 2014 to the Governor, the President of the Senate, and the Speaker of the House of Representatives.

While Monroe County does not currently operate a mooring field, it is involved in issues pertaining to anchoring and mooring activities adjacent to established mooring fields, and submitted to the FWC Boating and Waterways Section a Letter of Interest to participate in the Pilot Program, partnering with the cities of Marathon and Key West. Monroe County is coordinating with Marathon and Key West on the Pilot Project, including data compilation and submittal for each of the two cities. The County was responsible for the collection of FWC-required vessel mooring/anchoring data adjacent to, and within one mile of, the Key West mooring field and contracted SWC to collect that data.

In addition to the FWC Pilot Project survey requirements, the Scope of Services provided by the County requested the collection of additional data, including vessel-specific locational and photographic information. The data acquired would allow for the

monthly mapping of moored and anchored vessels, and provide a more robust database which can be queried for a variety of informational purposes.

3.0 METHODOLOGY

For this study, SWC utilized a Magellan Mobile Mapper CX electronic data gathering system capable of sub-meter accuracy, for the purpose of collecting and downloading data on anchored vessels within one mile of the Key West mooring field. Aerial photographs and Geographic Information System (GIS) shapefiles of the existing mooring field and its one-mile buffer were loaded onto the Mobile Mapper to assist in the field survey of vessels located in the designated study area.

Field Survey of Anchored and Moored Vessels

The data collection took place over a period of 12 consecutive months, beginning March 1, 2010. Every attempt was made to conduct the surveys on the same day of each month, and when weather or logistics made this impossible, the surveys were conducted as close as possible to the scheduled date. SWC coordinated with Monroe County Marine Resources staff for the monthly surveys, as follows:

1. Survey data was collected for all moored and anchored vessels adjacent to, and within one mile of, the Key West mooring field.
2. Upon arrival at each vessel location, vessel data was captured for all data fields including date, location by latitude/longitude, vessel registration number (or other key vessel identifier), vessel name, hailing port, vessel use, and type of vessel. Clear, representative digital photos of each vessel were taken, including, if possible, one photo of the entire vessel and one photo of the vessel identifier.
3. The Vessel Use was determined, consistent with the categories described on the FWC survey form (i.e. stored, transient or liveaboard).

The survey data was collected, stored electronically, and managed in an appropriate format for downloading to ArcGIS for the development of shapefiles containing the described attribute data used for subsequent mapping, and suitable for future analysis.

Monthly Data Compilation and Delivery

For each monthly vessel survey, SWC staff completed and delivered the following documents within two weeks of the survey:

1. A completed FWC survey form (see Attachment 6 for an example).
2. An Excel spreadsheet containing the required data for each and every vessel surveyed (see Attachment 6 for an example).
3. A monthly survey shapefile generated from monthly data imported into ArcGIS, and containing attributes reflective of the various data fields.
4. An 8 ½" x 11" GIS map (Monthly Vessel Distribution Map) illustrating the distribution of vessels surveyed by overlaying the mooring field boundary layer and the monthly survey layer on an aerial photo of the area (see Attachment 6 for an example).

5. A hard copy and an electronic copy of—
 - a. Completed FWC Survey form
 - b. Digital photos (*electronic copy only*)
 - c. Completed Excel spreadsheet
 - d. Monthly survey shapefile (*electronic copy only*)
 - e. Color Monthly Vessel Distribution Map

4.0 RESULTS AND DISCUSSION

Vessel Distribution by Use

Attachment 2 illustrates several points observed regarding vessel distribution by use:

1. The vast majority of transient vessels were observed west of Fleming Key.
2. Liveaboard and stored vessels were observed primarily in two areas; west of Fleming Key and in the shallower area directly north of Garrison Bight, just east of Garrison Bight Channel and the City mooring field.
3. Of the handful of vessels observed in the Garrison Bight Channel area north of and immediately adjacent to the City Mooring Field over the course of the entire year, most were transient.

Of the 318 total transient vessel observations, 97% were west of Fleming Key. The preference for transients to stay west of Fleming is likely related to ease of access from the main navigational channel and geographic protection from prevailing winds. Both the City Mooring Field and the area north of Garrison Bight are accessed only via transit under a fixed bridge (18 ft vertical clearance above MHW) or by navigating from Man O' War Harbor to the north, and around Fleming Key via Garrison Bight Channel, adding approximately three nautical miles to the travel distance (Attachment 5, Nautical Chart).

Additionally, the area north and adjacent to the City Mooring Field (Garrison Bight Channel) offers little protection from the prevailing north winds of the winter, which is the more popular transient boating season in Key West. Though the area east of the mooring field and directly north of Garrison Bight is better protected, depth is a limiting factor (1-3' MLLW), which precludes vessels of deeper draft anchoring there. Most of the transient vessels observed during the study were 30-45' sailboats which have a deeper draft than do power boats or smaller sailing vessels. Attachment 2 illustrates the exclusive use of the shallower area directly north of Garrison Bight for liveaboard or storage of vessels.

Vessel Distribution by Type

The type of vessels using the surveyed mooring area are predominantly sailboats (74%) which tend to utilize the area west of Fleming Key far more than the shallower area north of Garrison Bight. As discussed previously, water depth is more of a limiting factor for a larger sailing vessel, which generally prohibits accessibility to the shallower

anchorage directly north of Garrison Bight. The vessels in this area tend to be power boats, small sailing vessels, or floating structures stored long-term (Attachment 3).

Individual Vessel Distribution

Attachments 4A and 4B illustrate that overall, the liveaboard and stored vessels tended to remain in the same location or close to it for long periods of time over the course of the year. Most of the liveaboards and stored vessels in the area north of Garrison Bight were in the same location for the entire 12 months.

Conversely, transient vessels stayed for much shorter periods of time. Of the transient vessels observed--approximately 121 separate vessels over the course of the year--just 13% of them stayed longer than 6 months. However, those that were present for longer than six months did tend to stay close to their original anchor location (Attachment 4C).

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on 12 months of observations, it is clear that the anchorage areas near Key West and within one mile of the City Mooring Field are heavily used by transient mariners, liveaboards, and owners storing their vessels on the water. The more accessible, protected, area west of Fleming Key is a preferred anchoring area, especially for transients and sailboat liveaboards, despite available space in the City Mooring Field during all parts of the year.

During various discussions with vessel owners and operators over the course of the survey, the most common reason cited for anchoring outside of the City Mooring Field was cost. Additional comments related to the lack of protection from north winds and distance of the mooring field from the dinghy docks and the more commercial areas of the Key West waterfront in Key West Bight. Transient boaters tended to use the southern area west of Fleming, which is a short dinghy ride to Key West Harbor with convenient access to the commercial waterfront and Key West attractions.

Many of the vessels anchored for long periods of time in the area north of Garrison Bight are in very shallow water, which has the potential to cause natural resource impacts. Areas of seagrass damage were observed during the survey where the anchor apparatus and even the vessel itself have scoured the seafloor as winds, tides, and currents change and swing the vessel. Extremely low tides allow for some of the vessels to rest on or within inches of the seagrass bed.

Stored vessels generally appeared to be in worse states of neglect or disrepair than did transient or liveaboard vessels, especially those that were in the same location for the duration of the study. The exception would be the larger, commercial passenger vessels stored west of Fleming Key like *Reef Chief* and *Black Duck*. These vessels appeared to be well-cared for and in excellent condition.



Finally, the proximity of the anchorage north of Garrison Bight to the City Mooring Field could pose a hazard should vessels stored there drag anchor during a weather event.

Recommendations for measures to alleviate anchoring issues in the surveyed area resulting from the 12-month study include:

1. Establishment of a mooring field or regulated anchorage in the area west of Fleming Key,
2. Establishment and enforcement of anchoring exclusion zones in water depths less than 3-4 feet, and
3. Establishment of a low-cost pump-out program for all vessels anchored in the vicinity of Key West to ensure enforcement of current State and federal regulations.
4. Establishment of an anchoring exclusion zone adjacent to the Garrison Bight mooring field due to the potential for vessels to drag anchor into the mooring field and the year-round availability of moorings in Key West.

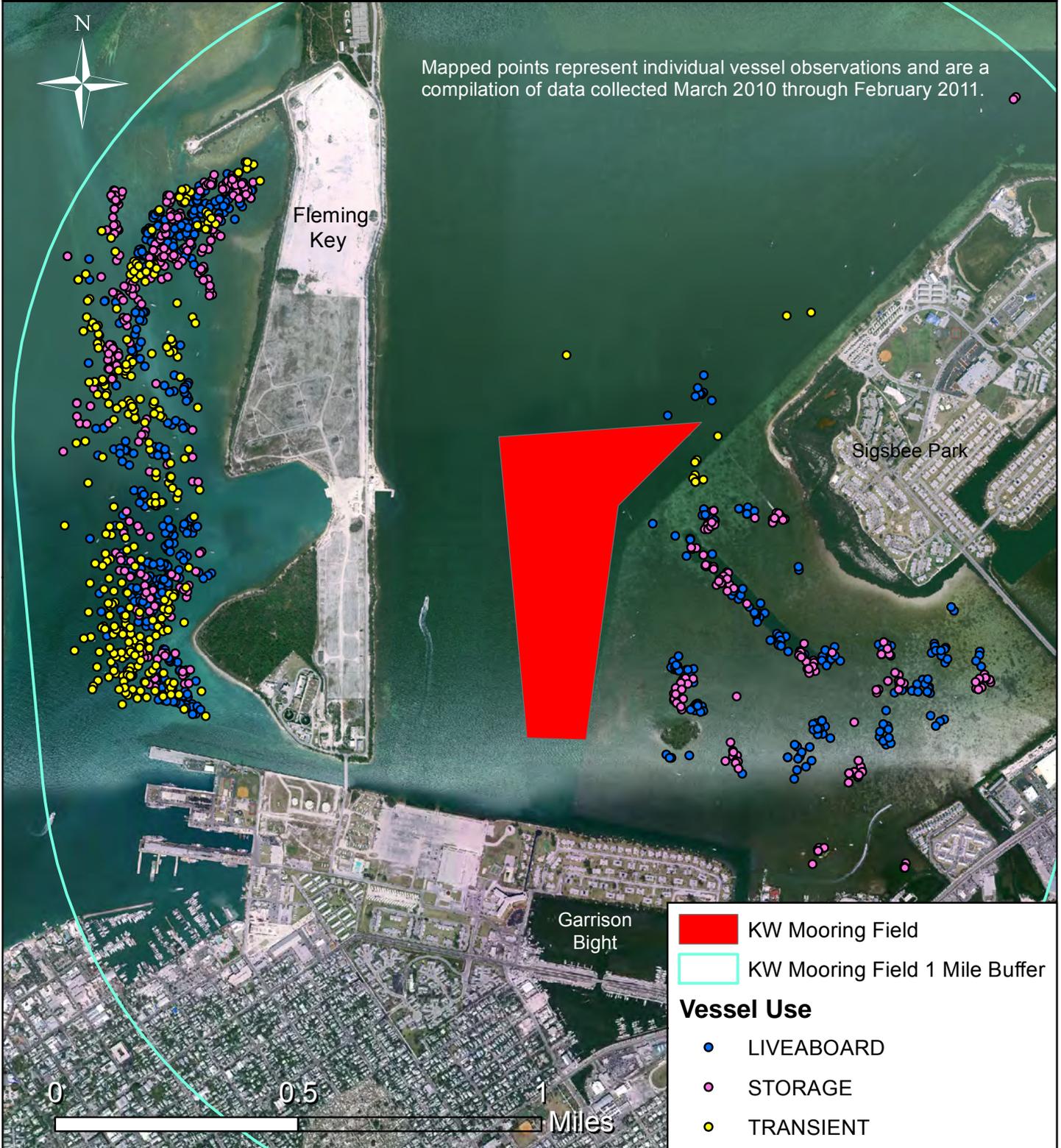


ATTACHMENT 1 Location Map





ATTACHMENT 2 Vessel Distribution by Use





ATTACHMENT 3 Vessel Distribution by Type





ATTACHMENT 4A

Individual Liveboard Vessel Distribution





ATTACHMENT 4B Individual Stored Vessel Distribution





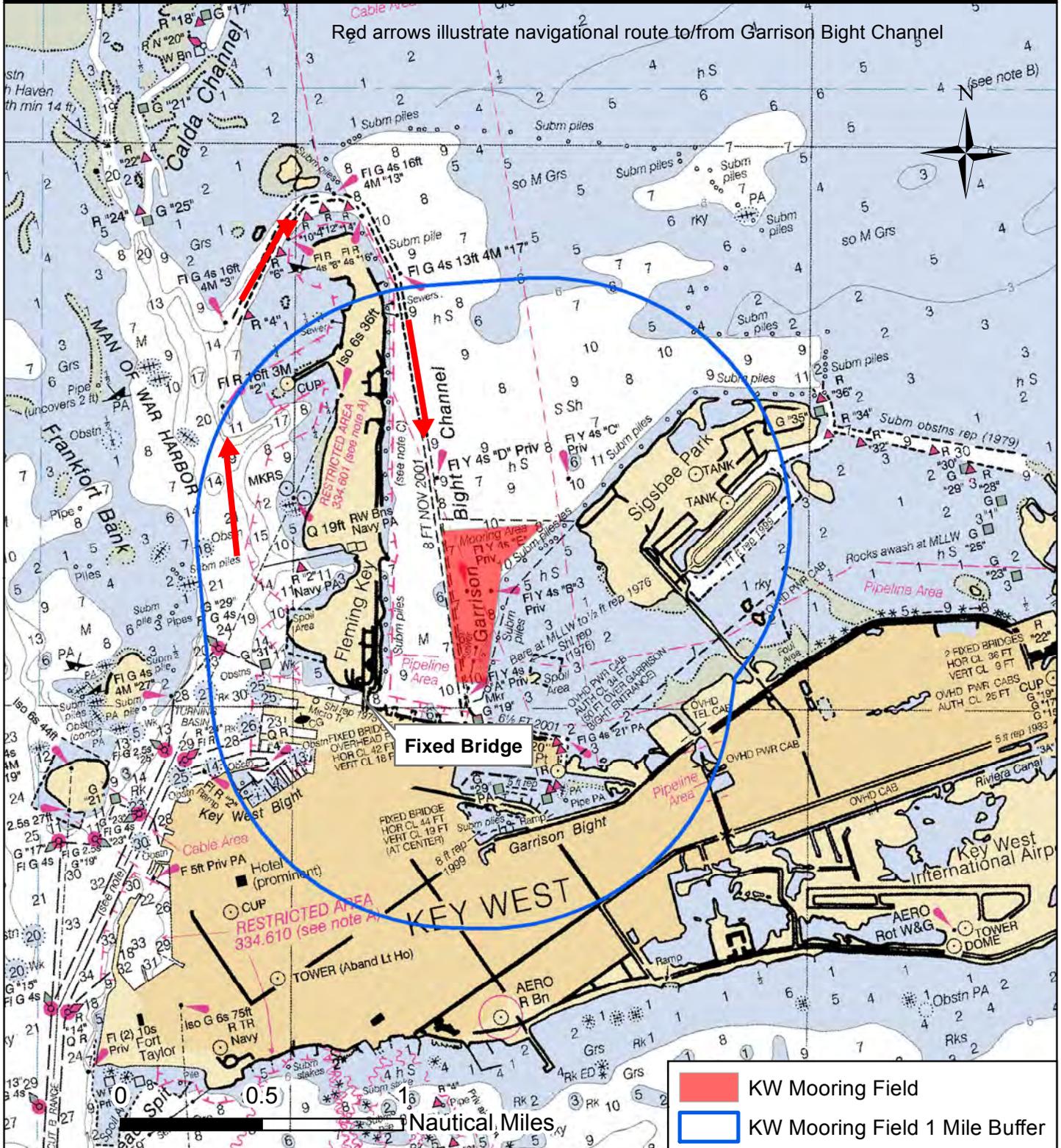
ATTACHMENT 4C

Individual Transient Vessel Distribution





ATTACHMENT 5 Nautical Chart of Pilot Study Area





ATTACHMENT 6

Sample Monthly Submittal Documents

1. February 2011 FWC survey form.
2. February 2011 data spreadsheet.
3. February 2011 Monthly Vessel Distribution Map.

G. SURVEY OF TYPE & QUANTITY OF VESSELS ANCHORED UP TO 1 MILE OUTSIDE THE BOUNDARY OF YOUR MOORING FIELD(S):

The purpose of this survey is to explore types of vessels that are using the waters within the area of up to one (1) mile outside your mooring field.

Please send this data to: Ms. Tara Alford, FWC, Boating and Waterways Section, Division of Law Enforcement, via electronic mail to anchoring.mooring@myfwc.com no later than the last business day of the month in which data is collected. (Project No. : 442021579)

DATA COLLECTION MUST BEGIN NO LATER THAN MARCH 1, 2010 AND CONTINUE FOR 12 CONSECUTIVE MONTHS, WITH DATA GATHERED ON THE SAME DAY OF EACH CONSECUTIVE MONTH

SUMMARIZE AND SHOW TYPES & QUANTITY OF EACH TYPE VESSEL ANCHORED UP TO 1 MILE OUTSIDE THE BOUNDARY OF YOUR MOORING FIELD(S) GATHER THIS DATA ON THE SAME DAY OF EACH MONTH									
12 Month Summary	Date Data Collected	Florida Registration	Foreign Registration	Other State Registration	Port of Call	Documented Vessel	Unknown		
Stored Boats - Power	02-01-11	1	0	0	0	0	0		
Stored Boats - Sail	02-01-11	14	0	3	5	2	6		
Stored – Domicile	02-01-11	0	0	0	0	0	3		
Transient Cruiser - Power	02-01-11	0	0	0	3	3	0		
Transient Cruiser - Sail	02-01-11	2	0	4	23	8	3		
Liveaboard – Power	02-01-11	11	0	2	2	2	0		
Liveaboard - Sail	02-01-11	28	0	0	17	8	6		
Liveaboard – Domicile	02-01-11	0	0	0	0	0	1		

Vessel Distribution Within 1 Mile of Mooring Field February 1-2, 2011

