

# Monroe County Mooring Field Feasibility Study



*Prepared for:*



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## 1.0 EXECUTIVE SUMMARY

Public waterfront access in Florida has been significantly reduced over the years, primarily due to increasing waterfront real estate redevelopment and conversion. Along with population growth and increasing waterfront real estate redevelopment, there has been an ever growing number of unmanaged nearshore anchorages surfacing in coastal areas, including Monroe County. With the expansion of nearshore anchorages come social and environmental impacts in the form of crowding, crime, noise, trash, decreased water quality, and damage to marine resources. The use of mooring fields is a proven strategy to address the various environmental and social impacts that typically result from haphazard anchoring. Mooring fields are recommended in the Monroe County Comprehensive Plan, Monroe County Boating Management Plan, and the Florida Keys National Marine Sanctuary Management Plan. It is Monroe County's goal to identify an effective and economical approach to provide managed mooring fields and associated shore-side access and service facilities throughout the Keys.

In 2013 Monroe County commissioned Coastal Systems International (Coastal Systems) to conduct a Feasibility Study to evaluate siting and development of a new mooring field (or fields) in the Florida Keys. The purpose of this Study is to examine the existing unmanaged anchorages at Jewfish Creek, Buttonwood Sound, and Boca Chica Basin (considered by the County to be priority sites for potential mooring fields), identify possible shoreside facilities, create conceptual mooring field designs for all three sites, and determine the optimal mooring field location. Information was obtained via (1) discussions with County staff, (2) a background/literature review, and (3) cursory field assessments of water depths, marine resources, site utilization, and potential shoreside access. The resulting information served as input to the site selection analysis. The site selection analysis evaluated the bathymetric surveys, marine resource surveys, and site visits, as well as conceptual design and siting of a mooring field at all three locations, and identification of possible shore-side providers. This information was utilized to rank the potential sites for the County to pursue design, permitting, and construction of the mooring fields. The available environmental data, pertinent regulations, existing infrastructure, and management potential were

considered in this recommendation. In addition, this Feasibility Report summarizes the permitting process including site specific challenges of the potential mooring field, identifies grant opportunities, provides recommendations for engineering/design schedule and contracting, and presents recommended next steps. Conceptual mooring field layouts of all three sites have been prepared for consideration by the County in Appendix C. After an analysis of site conditions, shore-side access, and ease of permitting Coastal Systems determined that the Buttonwood Sound area would be the optimal site to design, permit, and construct Monroe County's next managed mooring field, although all three sites would benefit from the implementation of a managed mooring field.

Permitting challenges associated with the development of a managed mooring field in the Keys include: development of a Managed Mooring Field Management Plan; securing Proprietary Authorization from the State of Florida; and demonstrating avoidance, minimization, and mitigation of ecological resource impacts. To facilitate the permitting process, a Managed Mooring Field Management Plan should be developed that will outline the rules and regulations for the managed mooring field, as well as the disaster manuals and emergency evacuation procedures. This operational plan should be prepared prior to application submittal to the regulatory agencies, in order to streamline the permitting process. Development of a managed mooring field in any of the three locations would occur over sovereign submerged lands and will therefore require a submerged lands lease in accordance with 18-21.005(1)(d)(8) F.A.C. As the proposed Project is generally in the public interest, it should qualify for issuance of a Sovereign Submerged Lands Lease from the Board of Trustees of the Internal Improvement Trust Fund (BOT) for the State of Florida. The overall permitting timeframe for a managed mooring field in Monroe County is expected to be a minimum of 1 to 1.5 years from the time of application submittal. While many issues can be resolved concurrently, negotiations regarding submerged lands use and/or avoidance and minimization discussions can lengthen the overall permitting process.

## 2.0 BACKGROUND

Public waterfront access in Florida has been reduced significantly over the years due to increasing waterfront real estate redevelopment. Many marinas have been converted to strictly private upland development or privatized facilities. Furthermore, many marinas have been redeveloped to accommodate larger vessels and managed mooring facilities often do not appeal to private operators due to the limited revenue generated, as opposed to potential revenue from wet or dry slips.

An alternative to marinas is mooring fields, which are usually established in protected bays or harbors and consist of a number of moorings, permanently affixed to the bottom, that allow boats to securely tie off to the mooring rather than using traditional ground tackle. Moorings are less expensive than dockage at a marina slip and mooring fields typically provide shore-side access with various amenities like a designated place to come ashore with your dinghy, showers, laundry, garbage drop off, pump out services, 24-Hour security, and sometimes bicycle and vehicle parking. In order for a mooring facility to be effective and meet the needs of all user groups, certain key amenities should be offered on the uplands, adjacent to the proposed mooring fields. These amenities include, but are not limited to, restrooms and showers, waste disposal, laundry facilities, telephone and mail access, sewage disposal/pump-out, emergency medical access, parking, dinghy/courtesy dock, and ice, food and convenience store within the vicinity. There are no minimum requirements for the establishment of mooring fields and while not required, providing certain amenities such as pump out service/dump stations, trash service, restrooms, and laundry facilities provides justification that the facility will not have adverse cumulative impacts to water quality.

Developing new marinas and/or mooring fields has become increasingly challenging in Florida due to strict environmental regulatory constraints. There are few permitted managed mooring fields in South Florida (Fort Myers Mooring Field in Fort Myers, Rickenbacker Marina, Pelican Harbor, Crandon Park, and Dinner Key in Miami, John Pennekamp in Key Largo, Boot Key Harbor in Marathon and Garrison Bight in Key West),

despite mooring fields providing an economical approach to providing vessel access to the waterfront and providing protection to marine resources that would otherwise be impacted by haphazard anchoring, gray and black water discharges, and dumping. In addition, there are minimal marine resource impacts associated with managed mooring fields, as opposed to a traditional wet slip marina facility as there are less over water structures such as docks and pilings in a mooring field that directly impact marine resources or shade seagrass and vessels are moored to a buoy that allows rotation of the vessel minimizing shading of any one area which allows seagrass growth beneath moored vessels.

Monroe County harbors a water-oriented lifestyle with its waters traditionally being used by both liveaboard vessels (vessels used as primary residence or business such as houseboats, sailboats, and some power boats for a period of more than 2 months) and transient vessels (vessels that are transiting through, staying in an area for a short period of time) residing in unmanaged anchoring areas (Monroe County, 2010). An increase in vessels anchoring and the number of anchorages in the County have lead to derelict and abandoned vessels, discharge of pollutants from derelict vessels, use of marine debris as unpermitted mooring devices, unattended anchored vessels breaking free, marine debris causing damage to other vessels and shore facilities, seagrass and coral damage through scouring by haphazard anchoring, sunken and derelict vessels, shading of seagrass by vessels, and propeller dredging by vessels in shallow areas (Monroe County, 2010; Terraman, 2011, WM Barry Associates, 2013). Derelict vessels are vessels that are left stored or abandoned in a wrecked, junked, or substantially dismantled condition upon any public waters of the State or docked, grounded, or beached upon the property of another without the owner's consent (Florida Statute 327.02). Other concerns with unmanaged anchoring areas include overboard dumping of sewage, shoreside dumping of trash, and impeded navigation (WM Barry Associates, 2013). The Monroe County Comprehensive Plan addresses these issues by directing the County to identify liveaboard anchorages and pursue the potential for development of mooring fields to manage vessels (Monroe County, 2010).

Management of currently unmanaged anchorages is necessary to deter further derelict and abandoned vessels, provide secure moorings, protect marine resources, promote water

quality, and ensure appropriate public access to waters of the State. The Florida Keys National Marine Sanctuary (FKNMS) established a Mooring Buoy Action Plan in 1996 to protect marine resources by promoting the use of mooring buoys over haphazard anchoring. In addition, the Monroe County Marine Resource Department provided a proposal for a Keys-Wide Mooring Field System, consisting of a system of mooring fields throughout the Keys that would provide safe, secure moorings, shore access, reduce marine resource damage, eliminate discharge of sewage, and deter derelict and abandoned vessels. The 2002 Keys-Wide Mooring Field System Study by Monroe County identified and evaluated anchorages in the County and ranked priority sites in need of management. The study also acknowledged that the development of managed mooring fields is a strategy to address environmental concerns associated with anchorages. Since then, the operation of mooring fields in Key West and Marathon have modified anchoring habits and allowed for environmental recovery in these areas, as well as addressed the growing environmental concern of derelict vessels. In 2010 the Florida Fish and Wildlife Conservation Commission (FWC) and Florida Department of Environmental Protection (DEP) established a Pilot Program in 327.4105 F.S. to regulate anchoring of non-liveaboard vessels outside of legally permitted mooring fields, which further promoted the establishment of mooring fields to address environmental concerns. The goals of the Pilot Program are to promote the public use of mooring fields, promote public access to state waters, protect the marine environment and maritime infrastructure, enhance navigation and deter improperly stored, abandoned, or derelict vessels. The Pilot Program is authorized through the Monroe County Ordinance No. 036-2012 and an extension of this program will be decided in 2014 by the Florida Legislature.

The existing mooring fields in Monroe County include Pennekamp State Park, Boot Key Harbor in Marathon, Garrison Bight Mooring Field in Key West and a smaller system of moorings in the Lignumvitae Key area (See Figure 1). Only two of these mooring fields, Boot Key Harbor and Garrison Bight, are of an appreciable size. See Table 1 for information related to the existing mooring fields in Monroe County.

**Table 1.** Existing Mooring Fields in Monroe County

Existing Mooring Field	Location	No. of Moorings	Size of Vessel	Daily Rate	Weekly Rate	Monthly Rate
Pennekamp State Park	Key Largo	11	45 foot vessels	\$21.80	NA	NA
Lignumvitae Key	Islamorada	5-6	NA	Free	NA	NA
Shell Key	Islamorada		NA	Free	NA	NA
Indian Key	Islamorada		NA	Free	NA	NA
Boot Key Harbor	Marathon	226	60 feet (15 moorings) 45 feet (211 Moorings)	\$22.00	\$110.00	\$300.00
Garrison Bight	Key West	149	50 feet	\$18.08	NA	\$318.45

To address the need for additional shoreside access, amenities for boaters, minimization of environmental impacts, and reduction in the number of derelict and abandoned vessels, new mooring fields are being planned in Monroe County in association with existing mooring fields to comprise a Keys-Wide Mooring Field System. Three unmanaged anchoring areas are being evaluated as potential mooring field locations: Jewfish Creek, Buttonwood Sound, and Boca Chica Basin.

In 2013 Monroe County commissioned Coastal Systems International (Coastal Systems) to conduct a Feasibility Study for siting and development of a new mooring field or fields in the Florida Keys. The purpose of the Study is to examine the existing unmanaged anchorages at Jewfish Creek, Buttonwood Sound, and Boca Chica Basin (considered by the County to be priority sites for potential mooring fields). The scope included site evaluations, the identification of possible shoreside facilities, rankings of the potential mooring field sites, recommendation of the optimal site, and creation of a conceptual designs for the potential mooring fields. This study is based upon background research and site visits, as well as cursory assessments of water depths, marine resources, site utilization,

and potential shoreside access in each location. In addition, this Feasibility Report summarizes the permitting process including site specific challenges of the proposed mooring field, identifies grant opportunities, provides recommendations for engineering/design schedule and contracting, and provides recommended next steps.

**Figure 1.** Map of existing and potential mooring fields in Monroe County



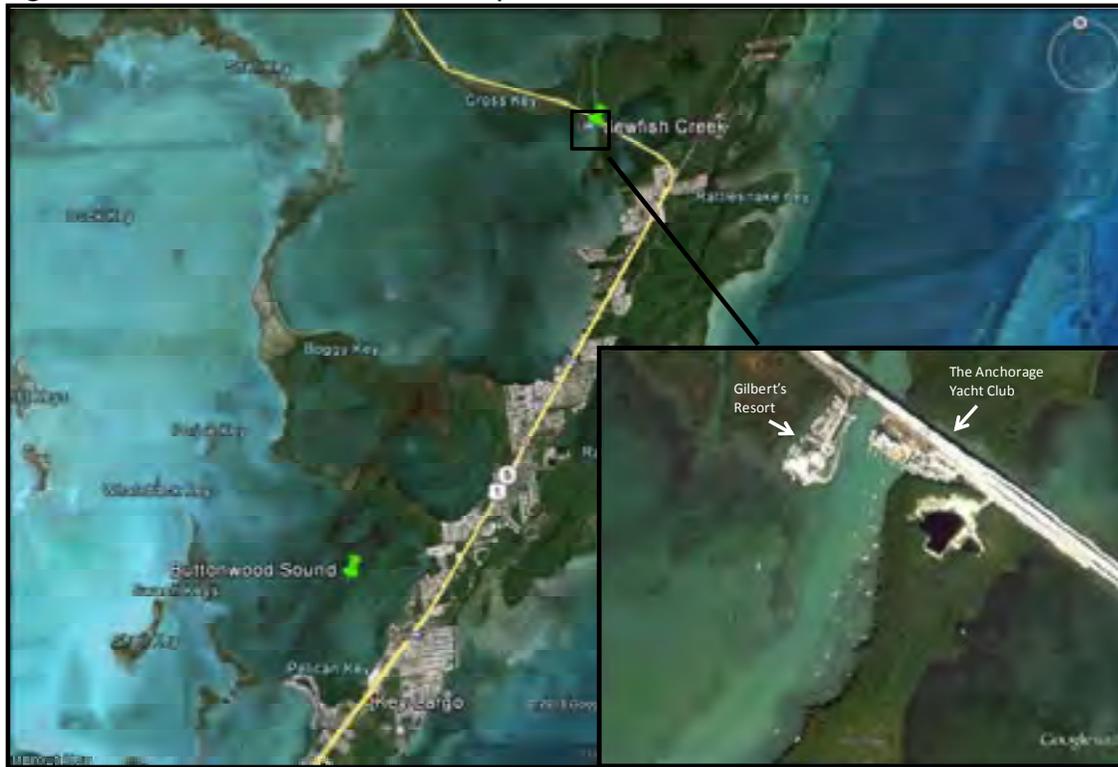
### **3.0 ANCHORAGE SITE EVALUATIONS**

Three existing unmanaged anchorages including Jewfish Creek, Buttonwood Sound, and Boca Chica Basin, considered as priority sites for potential mooring fields by Monroe County, were evaluated for potential development of a managed mooring field. A cursory marine resource survey and bathymetric survey were conducted within all three areas (See the Field Observation Report in Appendix B). In addition, Coastal Systems took an inventory of the number and types of vessels anchored during the site visit and identified possible shore-side facilities.

#### **3.1 Jewish Creek**

The Jewfish Creek anchorage site is located on the bayside of Key Largo, south of Overseas Highway (MM 108) in Blackwater Sound at the mouth of Jewfish Creek (See Figure 2). The area is protected from northeast winds by the adjacent uplands. The uplands consist of two developed areas, one on either side of the Jewfish Creek Bridge: the Anchorage Resort and Yacht Club (Photos 9-12) is located on the east side of the Jewfish Creek Bridge and Gilbert's Resort and Marina (Photos 5-8) is located on the west side of Jewfish Creek Bridge. Currently to access the uplands boaters are limited to docking at either the Anchorage or Gilbert's Resort, under the Jewfish Creek Bridge (Photo 2) or in the surrounding mangroves (Photo 4).

**Figure 2.** Jewfish Creek Location Map



Further to the south along Overseas Highway, past Lake Surprise, there are other restaurants, shopping centers, dive shops, a post office, the Mariners Hospital, the Key Largo Visitor Center, and points of interest such as John Pennekamp Coral Reef State Park, a community pool, the Wild Bird Rehabilitation Center, and dolphin encounters. In order to access this area to the south, however, boaters would need upland transportation in the form of a vehicle or public transportation. Without a vehicle on the uplands, access to the surrounding areas is difficult, making the Jewfish Creek area relatively isolated which may be an important criteria for liveaboard vessels seeking upland amenities nearby such as medical facilities, grocery stores etc.

Coastal Systems conducted a review of historical aerial photographs obtained from the Florida Department of Transportation (FDOT) dating back to 1959 and from Google Earth dating back to 1994 for each of the three proposed mooring field sites, select aerials can be found in Appendix A. The aerials show between 0 and 41 vessels anchored in the

Jewfish Creek area since 1959, with an average of 24 anchored vessels using the area since 2004 (See Table 2).

The anchorage near Jewfish Creek has been observed by Marine Resource Staff as one of the fastest growing in Monroe County. Currently boaters anchor offshore of the mangrove area along the shoreline on the east side of Jewfish Creek channel (Photos 1, 3 and 4). On May 8, 2013 Coastal Systems conducted a site visit to determine the number and types of the vessels anchoring in the area. The survey indicated that 16 vessels were anchored in the Jewfish Creek anchorage (Photos 1-4) including 10 sailboats, three powerboats, one houseboat, and two derelict vessels (Photo 4) (See Appendix B for the Field Observation Report). Between 2008 and 2013 five derelict vessels were reported in the anchorage and all five of them have since been removed.

The anchored vessels observed during the site inspection were primarily clustered in the area adjacent to the eastern edge of the channel, south of the Anchorage Resort. Vessels were also anchored under the Jewfish Creek Bridge, north of the Anchorage Resort (Photo 2). Since that time vessels under the Bridge have been required to move. During a site visit on July 30, 2013, there were 15 vessels anchored east and west of the channel (2 of which were derelict vessels). No boats were observed anchored under the Overseas Highway Bridge during the July 30, 2013 site visit.



**Photo 1:** Boats anchored in the Jewfish Creek anchorage.



**Photo 2:** Boats tied up under the Jewfish Creek Bridge on May 8, 2013.





**Photo 3:** Boats anchored in the Jewfish Creek anchorage.



**Photo 4:** Derelict Vessel observed in the mangroves at Jewfish Creek.



Preliminary reconnaissance marine resource and bathymetric surveys were conducted at Jewfish Creek on May 8, 2013. Dense turtle (*Thalassia testudinum*) and shoal seagrass (*Halodule beaudettei*) were observed east and west of the Jewfish Creek channel. The area immediately south of the Anchorage Resort, along the east side of the Jewfish Creek channel, where approximately half the boats were anchored, consisted of sand. The submerged lands south of the dense seagrass, west of the Jewfish Creek channel consisted of patchy seagrass (*T. testudinum*) and sand (Figure 2 in Appendix B and Figure 2 in Appendix D). Water depths range from 2.8 to 7.7 feet in the area surveyed, with mostly adequate water depths ( $\geq 4$  feet) for moorings. The area that appears to be most suitable for a mooring field, based upon the preliminary reconnaissance data, is the sandy area south of the Anchorage Resort, adjacent to the channel, which is devoid of marine resources and has water depths between 4.8 and 7.7 feet.

If the County decides to pursue a managed mooring field in this area, a public-private partnership should be sought with one of the two existing adjacent upland facilities, Gilbert's Resort or Anchorage Resort, to provide shore access, dinghy dockage, shore-side pump-out, and other facilities. Gilbert's Resort is a motel, marina, restaurant complex and could provide most of the shore-side amenities needed for a managed mooring field, as they have the first fuel dock entering the Florida Keys and the last leaving the Islands, existing docks with water, power, cable and Wi-Fi, boat ramp which can accommodate 40 foot vessels, vehicle parking (120 spaces at Gilberts), trash, water fountains, ice, laundry (4 washers/4 dryers), restroom facilities (8 for men and 8 for women), showers, and restaurant (See Table 3 for a list of services provided and Photos 5-8). Coastal Systems spoke with Reinhard Schautt from Gilberts Resort on October 7, 2013, about the possibility of partnering with the County to provide shore-side services for a managed mooring field and he indicated that he was very interested. Mr. Schautt stated that he currently owns Gilbert's Resort, as well as Steamers Restaurant and Grill, located adjacent to the Anchorage Resort. Mr. Schautt also owns the 12 acre property next to Steamers, which he has turned into additional parking with lights, a security camera, and 24-hour security for car parking and boat storage. This lot can accommodate 120 cars and Mr. Schautt plans to construct an additional boat ramp in this area next to Steamers. Gilbert's Resort and Marina does not

currently have a shore-side pump-out facility, but Mr. Schutt indicated he would install one if a mooring field is constructed.



**Photo 5:** Gilberts Resort.



**Photo 6:** Dock at Gilberts Resort.





**Photo 7:** Gilberts Resort Motel, Marina and Restaurant.



**Photo 8:** Boat ramp at Gilberts Resort.



The Anchorage Resort and Yacht Club is a private resort and marina offering existing docks with water, electric, cable and Wi-Fi, vehicle parking, trash, BBQ grills, and picnic tables (See Table 3 for a list of services provided and Photos 9-12). Coastal Systems has reached out to the Anchorage Resort and Yacht Club, but at the time of this report has yet to hear back regarding interest in future partnership with the County to provide shore-side services for a managed mooring field. Due to the Anchorage Resort being exclusive to members, it does not appear to have a great potential for a shoreside facility.

Adjacent to the Anchorage is boat rentals at Pontunes which also does not appear to be a potential shoreside facility as it is a business who's docks are already in use for their boat rental business and they do not have the amenities needed to support a mooring field.



**Photo 9:** The Anchorage Resort and Yacht Club.



**Photo 10:** Tennis courts and fish cleaning station at the Anchorage Resort.





**Photo 11:** Docks at the Anchorage Resort.



**Photo 12:** Picnic area and restrooms at the Anchorage Resort.



### **3.2 Buttonwood Sound**

The Buttonwood Sound anchorage site is on the bay side of Key Largo (MM 99), south of Tarpon Basin, approximately 2 miles south of the Murray Nelson Government Center (See Figure 3, Photo 13). The area is close to stores, restaurants, fast food, cafes, coffee shops, grocery store, drug store, bars, liquor store, gas stations, banks, marine service and supply store, bait and tackle shop, dive shops, hair salon, dentist, veterinarian, boat ramp, Baptist church, and public transportation; however, there is currently no appropriate location for upland public access to the commercial and recreational areas since the shoreline consists of private residential and commercial properties. In 2002 the Keys-Wide Mooring Field System Preliminary Planning Document indicated that approximately 25 vessels (power and sailboats including liveaboards as well as storage boats) were anchored in the Sunset Cove area near mm 100. Lack of shoreside facilities and upland access led boaters to access land at Bayview Drive, while leaving bikes and mopeds at the end of Bay View Drive for upland transportation. At the time the anchorage was used mostly by low-end liveaboards, and neighbors complained about noise, vandalism, and drug use. The County has since put up a fence to stop access to the uplands at this location and the negative impacts associated with it.

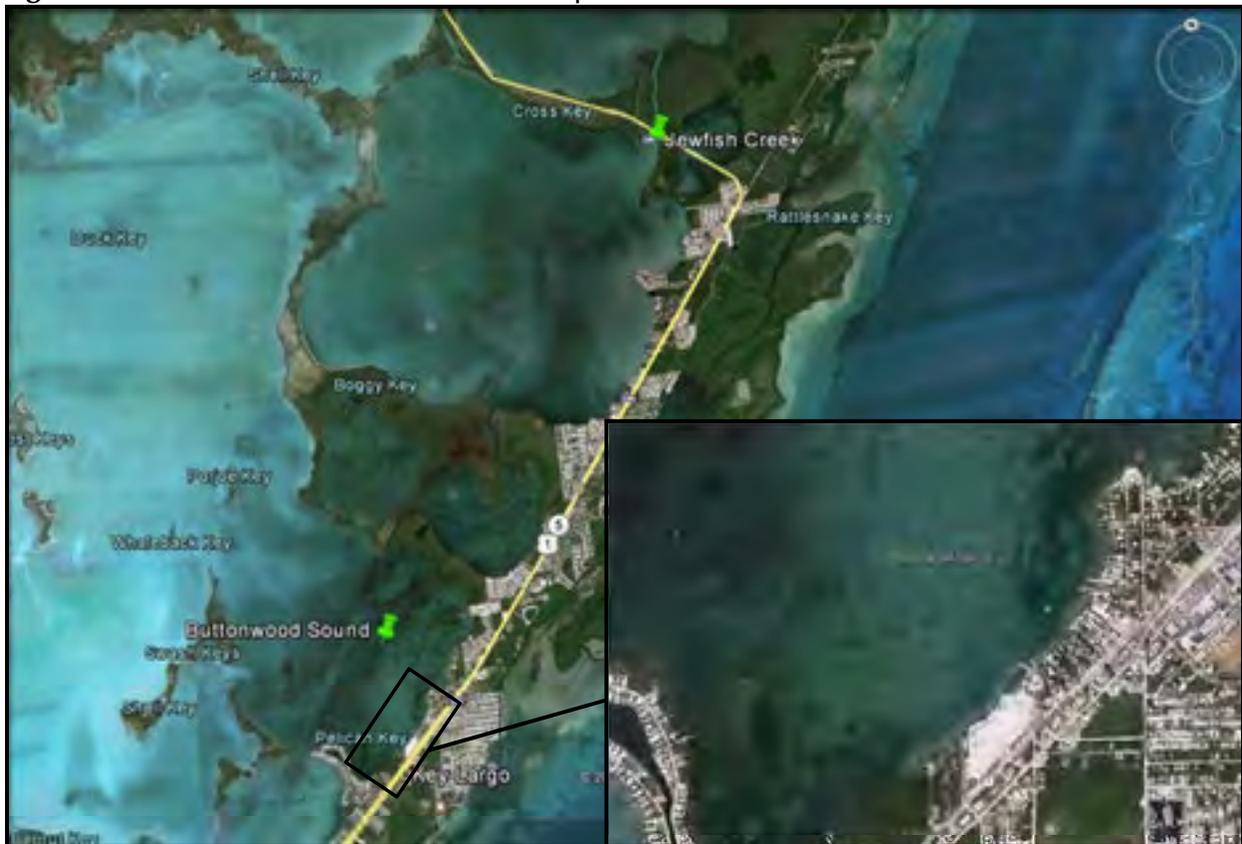


**Photo 13:** View of Buttonwood Sound Anchorage.



**Photo 14:** Anchored vessel in Buttonwood Sound.

**Figure 3.** Buttonwood Sound Location Map



Currently vessels that anchor in Buttonwood Sound are scattered throughout the area, as there is still no appropriate public upland access where dinghies can be tied up. As a result, dinghies access the uplands at various locations including the ends of roads (e.g. Bayview Drive), which is a point of contention among some of the local residents who are concerned about trash accumulation on the uplands and crime. While the commercial areas would support commerce for transient and liveaboard vessels, the current lack of access to the uplands provides an impediment to use of the Buttonwood Sound anchorage by the boating community. If a mooring field with appropriate upland access was implemented in this area, boaters would be able to access the surrounding shops on foot, by bike, or by using public transportation, in turn supporting the local economy.

Coastal Systems conducted a review of historical aerial photographs obtained from the Florida Department of Transportation (FDOT) dating back to 1959 and from Google Earth dating back to 1994 for the Buttonwood Sound site; select aerials can be found in Appendix A. The aerials show between 0 and 44 vessels anchored in the area since 1959, with an average of 24 anchored vessels using the area since 2004 (See Table 2).

On May 7, 2013, Coastal Systems conducted a survey of the number and types of vessels anchoring in the area and found that 22 vessels were anchored in Buttonwood Sound including 20 sailboats (Photo 16), one powerboat, one houseboat (Photo 14), and zero derelict vessels (see Appendix B Field Observation Report). Between 2008 and 2013, fifteen derelict vessels were reported and 11 of them have been removed. Most of the vessels were concentrated offshore of a residential area between the Point of View RV Resort and Bayview Drive, a street end where some of the boaters reportedly access the upland. Many sailboats were clustered in the area adjacent to the Upper Keys Sailing Club. During a site visit on July 30, 2013 there were 6 vessels anchored in this area, none of which were derelict vessels. The County indicated that they had recently removed numerous derelict vessels from this area. During the survey, several boats were observed using marine debris as anchors (barrels and concrete) and long chains were observed scouring the seafloor (See Photo 15).



**Photo 15:** Makeshift mooring in Buttowood Sound.



**Photo 16:** Vessel anchored in Buttonwood Sound.

Preliminary reconnaissance marine resource and bathymetric surveys were conducted on May 7, 2013 (see Appendix B: Field Observation Report and Figure 1). The nearshore area of Buttonwood Sound, within the first 500 feet of shore, consisted of dense turtle seagrass (*T. testudinum*) (See Photo 18). Water depths in the nearshore area ranged from 2.1 ft to 5.2 ft. The offshore area, 500 feet or farther offshore, consisted of patchy seagrass (*T. testudinum*), macroalgae, and sponges (See Photo 17). Water depths in the area with patchy marine resources ranged from 4.1 to 6.5 feet, with adequate water depths ( $\geq 4$  feet) for moorings (Figure 1 in Appendix B and Figure 1 in Appendix D). The area with patchy resources and adequate water depths for moorings is very large and may allow moorings to be sited so as to avoid emergent seagrass.

Buttonwood Sound appears to be an ideal location for a managed mooring field due to its proximity to restaurants, dive shops, and convenience stores which will appeal to both transient and liveaboards (many of which are assumed to work in the area), favorable water depths ( $>4$  feet) and lack of dense marine resources like seagrass and coral. If the County decides to pursue a managed mooring field in this area, a public-private partnership should be sought with one of the adjacent upland facilities to provide shore access, dinghy dockage, shore-side pump-out, and other amenities. Despite the extensive development in the area, there are only a few options for partnering with an existing upland facility for shoreside access and amenities in Buttonwood Sound, as some of the facilities are private or members only such as the Upper Keys Sailing Club, residential, or restaurants with docks (Snook's Bayside and DiGiorgio's Cafe). The two upland facilities that appear to be viable upland access locations are the Dream Bay Resort at MM 99.2 and the Point of View RV Resort at MM 99.



**Photo 17:** Patchy seagrass in Buttonwood Sound.



**Photo 18:** Dense seagrass was observed nearshore in Buttonwood Sound.





**Photo 19:** Beach and dock at the Dream Bay Resort.



**Photo 20:** Dock at the Dream Bay Resort.

The Dream Bay Resort is a small family owned resort consisting of 4 rental homes and a marina (Photos 19-20). The Resort has a dock with 11 full slips and 7 dinghy dock slips, fishing pier, Wi-Fi, 3 bathrooms and 2 showers, laundry (1 washer and 1 dryer), BBQ grills, bike rack, private beach, and limited parking (See Table 3) for a list of services provided). To provide desirable amenities, this facility could be expanded to include additional washers and dryers, a shore-side pumpout facility, and a location for a harbor master, if selected for collaboration. On October 10, 2013 Coastal Systems reached out to Tanya Cullen with Dream Bay Resort, who indicated interest in future partnership with the County to provide shore-side services for a managed mooring field.

Located just southwest of the Dream Bay Resort is the Point of View RV Resort, a luxury waterfront RV Resort. The Point of View RV Resort could provide most of the shoreside amenities needed for a managed mooring field, as they currently have available laundry facilities (10 washers and 10 dryers), bathrooms (6 men and 6 women) and showers, Wi-Fi, pool, private beach, boat ramp (can accommodate 30 foot vessels), 10 excess parking spaces, 10 slip dinghy dock, 16 slip marina, bike rack, trash, water, and convenience store (See Table 3 for a list of services provided and Photos 21-24). Coastal Systems spoke with Jim Saunders from Point of View RV Resort on June 24, 2013 about the possibility of partnering with the County to provide shore-side services for a managed mooring field and he indicated that he was very interested. Mr. Saunders Point of View RV Resort does not currently have a shore-side pump-out facility, although infrastructure is in place at the docks. Mr. Saunders indicated that he would install a pump-out facility if a mooring field is constructed.



**Photo 21:** One of the three docks at Point of View RV Resort.



**Photo 22:** Beach and docks at Point of View RV Resort.





**Photo 23:** Pool at Point of View RV Resort.



**Photo 24:** Laundry Facility at Point of View RV Resort.

### 3.3 Boca Chica Basin

Boca Chica Basin contains a large anchorage located 5 miles east of Key West, between Stock Island and Boca Chica Key, south of Overseas Highway, spanning from MM 5 to 6.5 (See Figure 4). The area is connected to the Atlantic Ocean via three navigable channels funneling into the main channel and also provides limited access to the gulf side (restricted by bridge height, precluding sailboats). The Boca Chica Basin anchorage includes two distinct anchoring areas. The northern anchorage is an open expanse of shallow water over dense seagrass and the southern anchorage, separated from the north by mangroves and shallow flats, consists of shallow dense seagrass and hardbottom habitat with two navigable channels running between. The west side of Boca Chica Key hosts the largest U.S. Naval Air Station (NAS Key West), a marina and mooring field, which is exclusively for use by active and retired military personnel. The Air Installations Compatible Use Zones (AICUZ) run through the center of the Basin, overlapping portions of both anchorage areas and the Navy Noise Zone encompasses the entire harbor.

**Figure 4.** Boca Chica Basin Location Map



The majority of the vessels anchored in Boca Chica Basin are located in the northern anchorage area. There is a public boat ramp, managed by the Florida Department of Transportation (DOT), along Overseas Highway at MM 5.2, which is utilized for upland access and provides trash receptacles (Photos 29-30). The public boat ramp is not intended to service the unmanaged anchorage as an upland access point. The number of liveaboards that utilize the public ramp for upland access, dumping of trash, bike and dinghy storage has led to issues maintaining the site. Numerous dinghies are tied up along mangroves near the boat ramp. Across the street from the boat ramp on the north side of U.S. 1 at MM 5.3 there is a Shell gas station that provides fuel, restrooms, and a convenience store. The north side of Stock Island is home to the Key West Golf Course, Florida Keys Community College, and Monroe County Detention Center. The eastern shoreline of Stock Island is home to numerous marinas, private trailer parks, and Boyd's Campground. Several restaurants, churches, a grocery store, West Marine, and a boat repair yard are also located on Stock Island. Most of the anchoring related problems (derelict and abandoned vessels, seagrass scarring, crime, etc.) have been reported in the northern anchoring area (Monroe County 2008).

Most vessels that anchor in the southern anchorage area can be found in deeper waters, located in the two westernmost channels, and consist of larger cruising vessels (Photo 28). Shoreside properties adjacent to this area include several fish houses and a large private marina complex (open to members only).

In 2012 Monroe County's Anchoring Ordinance No. 036-2012 established a "No Anchoring Buffer Zone" in the eastern portion of the Boca Chica Basin, which prohibits anchoring or mooring of any kind (except for vessels within established public mooring fields, commercial vessels engaged in marine related work, military operations, and vessels anchored for the purpose of fishing or other recreational activities (not overnight) or in the case of an emergency; Figure 5). The No Anchoring Buffer Zone was designated at the request of the U.S. Navy which operates out of these waters. The waters on the west side of the Basin, where the north and south anchorages are located, were classified through Ordinance No. 036-2012 as a managed anchoring zone, in which vessels exhibiting pre-

derelict conditions and derelict vessels are prohibited and proof of pump-out is required by Monroe County.

The U.S. Navy, during the Pilot Program Ordinance development process, expressed its opinion that the entire Boca Chica Basin should be designated as a no anchoring buffer zone and that it is not appropriate to have liveaboards in either the AICUZ or Navy Noise Zone, as they encroach on the security of the naval base (Monroe County, 2008). The Navy has indicated issues with installing moorings anywhere in the Boca Chica Basin area, especially mooring in marked channels (Monroe County, 2008; Lefere, 2012). Additionally, significant portions of the basin bottom are owned by the Navy, including the eastern and center channel. As authorization from the submerged lands owner is considered during the permitting process, this would be an impediment to development of a mooring field in the southern anchorage area, despite this area having deeper water depths that are more appropriate for larger cruising vessels (Monroe County, 2008). However, much of the northern anchorage area is outside of the AICUZ and is Sovereign Submerged Lands.

**Figure 5.** A Map of Boca Chica Basin showing the Managed Anchoring Zone, No Anchoring Zone and the U.S. Navy areas



A Vessel Mooring Study for Boca Chica Harbor, commissioned by Monroe County in 2010, describes the overcrowded conditions in the unmanaged anchorage and the environmental impacts associated with the anchored vessels in the northern and southern anchorages. The Vessel Mooring Study consisted of quarterly surveys in March, June, September, and December 2010 and documented 73 to 83 vessels present during any one survey. Powerboats, including commercial fishing vessels, liveaboards, and many vessels stored on unpermitted moorings (Photos 26-27), were the most abundant vessel type observed, followed by sailboats, houseboats, and floating platforms (platform equipped with no motor or sail and is towed or moved manually). Liveaboards (47%) and stored vessels (45%) were the most prevalent vessel use with transient vessels making up only 1% and the remaining 7% being derelict vessels. The report also pointed out that the majority of mooring devices used in the basin (89%) consisted of marine debris such as concrete filled barrels, engine block, iron pipes driven into the seafloor, and sunken vessels. Damage to marine resources was observed as a result of debris, moorings, and mooring lines.

Coastal Systems conducted a review of historical aerial photographs obtained from the Florida Department of Transportation (FDOT) dating back to 1959 and from Google Earth dating back to 1994 for the Boca Chica Basin site, select aerials can be found in Appendix A. The aerials show between 0 and 138 vessels anchored in the area since 1959, with an average of 82 anchored vessels using the area since 2004 (See Table 2).

The Boca Chica Basin area is currently heavily used as an ad-hoc anchoring area, with numerous vessels anchoring in the three channels leading into the Basin and in the northwest corner of the basin (Photos 25-28). The Boca Chica Basin site was the most populated anchorage of those investigated during this Study (See Appendix B) or the Field Observation Report and (Appendix A) for the Historical Aerials showing vessels anchored in the area).

On May 6, 2013, Coastal Systems conducted a survey of the number and types of vessels anchored in the Boca Chica Basin. Sixty-two vessels were anchored in the Boca Chica Area including 19 sailboats, 25 powerboats, five houseboats, and 13 derelict vessels (7 near the boat ramp and 6 observed in other areas of the Basin) (see Appendix B: Field Observation Report). Between 2008 and 2013, forty-two derelict vessels were reported and thirty-six of them have been removed. Vessels that are anchored in the Boca Chica area are scattered throughout the managed anchoring zone and the deeper channels that lead into the Basin. It appears that more liveaboards and commercial fishing vessels are anchored in the shallower managed anchoring zone to the north, while the larger, deeper draft liveaboard and transient vessels are anchored in the channels closer to the Atlantic Ocean. During the survey numerous vessels were observed anchored to concrete filled barrels, pipes, rebar, concrete blocks, and marine debris.

Preliminary reconnaissance marine resource and bathymetric surveys were conducted on May 6, 2013 (see Appendix B: Field Observation Report and Figure 3). Most of the Boca Chica Basin site consisted of dense seagrass (Figure 3 in Appendix B and Figure 3 in Appendix D). The only area with patchy seagrass doesn't have adequate waters depths (> 4 feet) to support a mooring field. Water depths in this area range between 1.4 and 2.1

feet. The area to the west of this shallow site is also not conducive to a mooring field, as it consists of mangrove islands, dense turtle seagrass (*T. testudinum*), and hardbottom. Water depths in the northwest area of the Boca Chica Basin, currently used by anchored boats, ranged from 1.2 to 6.9 feet, with shallower depths near the shoreline. The dredged approach channel leading into Murray Marine provides water depths of up to 18.6 feet. The middle of the site consisted of dense seagrass and hardbottom directly offshore, with sparse seagrass and macroalgae further offshore, intermixed among the mangroves. Turtle grass (*T. testudinum*) was the dominant seagrass species observed in these two areas and water depths ranged from 1.4 to 8.5 feet. The shallow nature of most the Basin and the presence of marine resources including dense seagrass, sponges, and corals, suggests that this area would not be the most ideal location for a mooring field from permitting perspective. Permitting agencies typically require moorings to be sited in areas devoid of marine resources. Unfortunately, the area with suitable depth for establishment of a mooring field (>4 feet) is located in dense seagrass beds. Since damage to seagrass beds and hardbottom habitat supporting hard and soft corals is occurring in the basin, establishment of moorings in more appropriate locations with less dense resources may allow for recovery of these ecological resources.



**Photo 25:** Derelict vessels anchored at Boca Chica Basin.



**Photo 26:** Vessels anchored in Boca Chica Basin.



**Photo 27:** Debris being used as a makeshift anchor in the Boca Chica Basin.



**Photo 28:** Large vessel anchored in one of the channels leading into the Boca Chica Basin.





**Photo 29:** The public DOT boat ramp as seen from the Boca Chica Basin.



**Photo 30:** Bikes are chained to the sign at the public DOT boat ramp.

During the site visit Coastal Systems spoke with an anchored boater who expressed his concern with the cluster of boats using the area and the volume of trash that the population generates and disposes of improperly. He indicated that he believes some of the trash is from the neighboring fish houses, campground, and washes in from storms. The man stated there were 70 knot winds a week ago, which caused a few boats to run aground and collide with each other. He also said that there are free dumpsters on land, but no restroom or shower facilities available to anchored boaters. The private facilities with restrooms and shower facilities available do not allow the boaters from the anchorage to use these facilities. Another issue he complained about was crime; he stated that the police have not helped recover stolen gear. The gentleman thought that charging fees to use a managed mooring field would pose a financial challenge to many of the current vessel owners and may force them to move to another unmanaged anchorage.

Properties adjacent to the north anchorage area with suitable depths ( $\geq$  4 feet) for a mooring field include several private residential trailer parks, Murray Marine marina and a campground open to the public (Boyd's Campground). The most suitable upland properties that could potentially provide shoreside amenities for the proposed mooring field are Murray Marine and Boyd's Campground.

Murray Marine is a full service marina located in the northwest portion of the Boca Chica site that offers boat slip rentals, dry dock services, a boat ramp, full mechanic shop, gas, one restroom, fish cleaning station, bait, and a convenience store (See Table 3 for a list of services provided and Photos 31-34). Murray Marine does not have a shore-side pump-out station and indicated during a site visit on September 8, 2013 that they are not interested in installing one. They also stated that they also do not have space for a dinghy dock and they have limited vehicle parking. Further discussions with Murray Marine on October 9, 2013 indicate that they are not interested in partnering with the County to provide shore-side access or services to mooring field patrons.



**Photo 31:** Murray Marine is a suitable upland support site.



**Photo 32:** The restrooms at Murray Marine.





**Photo 33:** The dock at Murray Marine.



**Photo 34:** The dock at Murray Marine.

Boyd's Campground is located south of Murray Marine and could provide most of the shoreside amenities needed for a managed mooring field including small finger piers and marginal floating dock, boat ramp, adequate water depths (1.8 - 2.9 feet) for dinghy access, fish cleaning station, 4 restroom and shower facilities, coin laundry, Wi-Fi, picnic pavilion with grill, Tiki Hut with big screen TV, 24 hour security, convenience store, ATM, bicycle rentals, and proximity to City bus service (See Table 3 for a list of services provided and Photos 35-40). Across the street from Boyd's campground is a West Marine store, fish market, and Tom Thumb convenience store. On November 26, 2013 Coastal Systems talked to Boyd's Campground who indicated they did not have an interest in a future partnership with the County to provide shore-side services for a managed mooring field.

No other facilities along the shoreline would be suitable due to lack of dockage, appropriate water depths, presence of marine resources, as well as being a residential area unsuitable for development into a public mooring field partner.



**Photo 35:** The docks at Boyd's Campground.



**Photo 36:** Additional dockage at Boyd's Campground.



**Photo 37:** The boat ramp at Boyd's Campground.



**Photo 38:** The laundry facility and bike rentals at Boyd's Campground.





**Photo 39:** The pool at Boyd's Campground.



**Photo 40:** The restrooms at Boyd's Campground.

If the County decides to pursue a managed mooring field in the northern anchorage area, a public-private partnership should be sought with one of the adjacent upland facilities to provide shore-side access, dinghy dockage, shore-side pump-out, and other amenities, or as an alternative, if no partner can be obtained, land could be purchased by the County to supply these amenities in addition to an office for a harbormaster. This option would represent a costly commitment by the County.

**Table 2.** Historical Boat Anchorage at Jewfish Creek, Buttonwood Sound, and Boca Chica Basin

Date of Aerial*	Number of Vessels		
	Jewfish Creek	Buttonwood Sound	Boca Chica Basin
1959	6	0	0
1971	5	NA	NA
1985	5	6	26
1994	3	44	95
1/14/94	0	32	NA
11/25/95	NA	NA	79
2/24/99	5	26	76
2/23/04	9	NA	NA
12/30/04	12	23	138
2006	NA	NA	44
2/27/06	13	26	98
2/8/06	14	25	NA
11/12/07	23	27	80
12/30/08	31	31	75
2009	41	2	NA
3/14/09	33	32	NA
12/30/09	33	35	74
12/23/10	30	26	NA
12/30/10	NA	28	NA
2012	27	16	NA
3/6/13	21	19	65
<b>Range</b>	0 to 41	0 to 44	0 to 138
<b>Average</b>	17	23	71
<b>Average Since Year 2004</b>	24	24	82

\*Aerials acquired from FDOT (year) & GOOGLE Earth (M/D/Y)

**Table3:** List of Services Provided by Suitable Upland facilities

SERVICE	Jewfish Creek		Buttonwood Sound		Boca Chica Basin	
	Gilberts Resort	Anchorage Resort	Point of View	Dream Bay Resort	Boyd's Campground	Murray Marine
ATM					X	
Bait Supply						X
Bar (on-site or adjacent)	X	X				
Basketball		X				
BBQ Grills		X		X	X	
Beach Volleyball						
Bicycle Rentals					X	
Bike Rack			X	X	X	
Convenience Store			X		X	X
Dishwashing Station					X	
Dive Shop (within 5 miles)	X	X	X	X	X	X
Dog Run/Walking Area			X		X	
Drug Store (within 5 miles)			X	X	X	X
Existing Dinghy Dock	X		X	X	X	
Fire Pit			X		X	
Fish Cleaning Station			X	X	X	X
Fishing Pier			X	X		
Fuel Dock	X					X
Gas Station (nearby)			X	X	X	X
Game Room			X		X	
Gift Shop		X	X			
Grocery Store (within 5 miles)	X	X	X	X	X	X
Highway Access	X	X	X	X	X	X
Hospital (within 5 Miles)					X	X
Hot Tub		X				
Ice	X		X		X	X
Kayak, Paddle Boat & Paddle Board Rentals			X	X		
Laundry Facilities	X		X	X	X	
Live Entertainment	X					
Mailbox	X			X		
Marina	X	X	X	X	X	X
Mechanic Shop						X
Motel/Room Rental	X	X		X		
Picnic Area		X		X	X	
Private Beach	X		X	X	X	
Private Boat Ramp			X			X
Public Boat Ramp	X				X	X
Public Telephone	X					
Public Transportation	X	X	X	X	X	X
Pumpout Station						
Restaurant (on-site or adjacent)	X	X		X		
Restrooms	X		X	X	X	X
Showers	X		X	X	X	
Shuffleboard		X				
Swimming Pool	X	X	X		X	
Tennis Courts		X				
Tiki Bar	X					
Tiki Huts	X			X	X	
Trash Receptacles	X	X	X	X	X	X
Vehicle Parking	X	X	X	X	X	Limited
Water	X	X	X	X	X	X
Wi-Fi	X	X	X	X	X	
24 Hour Security	X			X	X	
Facility has Interest in Partering	YES	Unkown	YES	YES	NO	NO
Facility would Allow Installation of Pumpout Station	YES	Unkown	YES	YES	NO	NO

## **4.0 MOORING FIELD CONCEPTUAL DESIGNS**

Coastal Systems prepared one mooring field conceptual layout for each of the three anchorage sites based on the preliminary reconnaissance information collected on water depths, marine resource abundance and existing anchorage patterns. The initial mooring design is a function of many design factors, including but not limited to, water depth, marine resources, vessel size, current use of the area, and proximity to an upland facility for shore-side support. The three conceptual designs were planned using a maximum vessel length of 35 feet on a mooring swing circle of 120 feet. These conceptual designs serve as initial concepts to assist with decision making and planning; however, refined designs showing exact mooring anchor locations, mooring areas, fairways, and mooring field marker buoys will need to be prepared prior to submittal of permit applications. Refined mooring field designs should be developed after a detailed qualitative marine resource survey identifies exact locations and accurate densities of submerged aquatic resources and a bathymetric survey with a density sufficient to depict one foot depth contours is conducted. The following sections describe site summaries and associated conceptual mooring field designs.

### **4.1 Jewfish Creek**

At the Jewfish Creek anchorage site, areas having water depths that were less than 4 feet (MWL) and areas of dense seagrass were eliminated from further consideration as potential areas to site a mooring field. Since most of the vessels currently anchored on-site are east of the Jewfish Creek Channel and a section of this area was found to be devoid of marine resources, moorings were located in areas where water depths were sufficient for mooring ( $\geq 4$  feet) and devoid of seagrass. The area devoid of marine resources can only accommodate 9 moorings for vessels that are 35 foot in length. Since the average number of vessels using this area is 17 and the maximum documented number of vessels is 41, additional moorings were included in the conceptual design in an area with sufficient water depths ( $\geq 4$  feet deep) and patchy resources, west of the Jewfish Creek Channel (See Figure 2 in Appendix C). Nineteen additional moorings were located west of the Jewfish

Creek Channel, in an area where a few vessels are currently anchored, providing a total of 28 moorings (See the Jewfish Creek Conceptual Design map located in Appendix C).

Although it may not be ideal to have the mooring field split into two separate areas divided by a channel from a management perspective, the channel does provide for a navigable fairway. From a regulatory standpoint, the Agencies typically require that moorings be sited in areas without submerged aquatic resources before they will consider permitting moorings over patchy resources. Since there is a current and likely future need for more than 9 moorings, the additional moorings located over patchy seagrasses can likely be justified. Since only a cursory qualitative marine resource survey and bathymetric survey was conducted and the survey was limited to the area shown on (Figure 2 in Appendix D), it is possible that the conceptually designed mooring field could be expanded to the west to accommodate more than the 19 moorings currently depicted.

#### **4.2 Buttonwood Sound**

At the Buttonwood Sound Anchorage, areas having water depths that were less than 4 feet (MWL) and areas of dense seagrass were eliminated from further consideration as potential areas to site a mooring field. The preliminary reconnaissance survey did not identify any large areas of sandy bottom devoid of resources; therefore, the conceptual mooring field was located in an area supporting patchy seagrass. There is a large area with sufficient water depths ( $\geq 4$  feet) and patchy resources where a mooring field could be sited (See Figure 1 in Appendix C).

The conceptual mooring field for Buttonwood Sound is depicted offshore of the two facilities, Point of View RV Resort and Dream Bay Resort and Marina, that were identified as potential and receptive shore-side providers (See the Buttonwood Sound Conceptual Design map located in Appendix C). The conceptual design shows a total of 100 moorings to accommodate 35 foot long vessels. Given that the moorings will be placed in an area that supports submerged aquatic resources, the environmental regulatory agencies will require justification of need to support the number of moorings ultimately proposed.

Typically need is justified based on documented past use and anticipated future use. Since the average number of vessels using this area is 23 and the maximum documented number of vessels is 44 (See Table 2) it may be difficult to justify the need for a mooring field with 100 moorings in this location. It may be beneficial to start with a smaller number of moorings and increase the number if demand increases since the Buttonwood Sound site includes a very large area with adequate water depths ( $\geq 4$  feet) and patchy resources.

### **4.3 Boca Chica Basin**

At the Boca Chica Basin Anchorage, areas having water depths less than 4 feet (MWL) and areas of mangroves, shoals and hardbottom habitat were eliminated from further consideration as potential areas to site a mooring field. No large areas of sandy bottom devoid of resources were observed during the survey. Additionally, the only area observed to have patchy seagrass was located in an area with insufficient water depths (approximately 2 feet) to establish a mooring field. Therefore, the only areas available for siting a mooring field were located over dense seagrass or in navigable channels. Since most of the vessels currently anchored on-site are located in the north anchorage, the conceptual design shows the mooring field sited in this area, despite it supporting dense seagrass, because it has appropriate water depths ( $\geq 4$  feet). The area can accommodate 58 moorings for 35 foot vessels (See Figure 3 located in Appendix C). This conceptual mooring field would provide moorings for only a portion of the vessels currently using the area, as the average number of vessels using this area is 71 and the maximum documented number of vessels is 138.

Given that the moorings would all be located over dense seagrass beds, securing permits from the environmental regulatory agencies would be extremely challenging. In addition to the costs associated with permit processing, the regulatory agencies would likely require compensatory mitigation for ecological impacts, and the permit applications may get denied. The Navy may voice opposition to the construction of a mooring field at Boca Chica Basin given some of their previous correspondence with the County on this topic. The Corps of Engineers in particular will seriously consider the issues raised by the Navy

and other federal commenting agencies. The Florida Keys National Marine Sanctuary and the National Marine Fisheries Service will likely oppose the issuance of a Corps permit for moorings located over dense seagrass resources, despite the obvious benefits that a managed mooring field has over haphazard unmanaged anchoring. At the State level, the Florida Fish and Wildlife Conservation Commission will have similar concerns to those raised by the National Marine Fisheries Service related to authorization of moorings over dense seagrass resources.

At the time of this report Coastal Systems could not identify an existing upland facility that was willing to partner with Monroe County to manage a mooring field. Since an existing shoreside facility willing to manage the mooring field could not be identified the County may have to purchase land and build the needed upland support for a mooring field if the Boca Chica site is selected. This option will increase the cost of building the mooring field.

Many of the vessels anchored in Boca Chica Basin are stored vessels and liveaboards of locals presumably seeking affordable housing. If a mooring field is constructed in the Boca Chica Basin, the County may want to consider subsidizing a portion or all of the moorings offered for residents who currently use the area as affordable housing, otherwise some of these current users may not take a mooring. If the moorings are not subsidized, the mooring field may not be fully occupied and the mooring field occupants may simply move to another safe harborage. Typically mooring field fees do not generate large revenues; however they do cover the costs of buoy maintenance and operation. If the County were to subsidize the mooring field then additional funds would need to be identified for maintenance and operation.

Table 4, below, provides a list of the pros and cons for each of the three anchorages evaluated herein. Coastal Systems took into account these pros and cons, the availability of shoreside providers, their willingness to partner with the County to manage the proposed mooring field, and the amenities they offered in this table. Additionally considered were environmental concerns, whether the number of moorings that could be established would suit the current and future needs of the boating public, ability to permit the mooring field

proposed in each conceptual design, and other available information. Table 4 ranks the three sites for potential mooring fields in the recommended order for proceeding towards design, permitting, and construction of a managed mooring field.

**Table 4:** Pros and Cons for the Three Anchorages

		Buttonwood Sound	Jewfish Creek	Boca Chica Basin
<b>PROS</b>	Bay Access	X	X	X (limited)
	Commercial Area within Walking Distance	X		X
	Highway Access	X	X	X
	Need for slips in the Area	X		
	Ocean Access			X
	Patchy Seagrass	X	X	
	Protected Anchorage (Wind/Waves)	X	X	X
	Public Transportation (Bus, Taxis)	X	X	X
	Sandy Areas		X	
	Sufficient Water Depths (>4')	X	X	
	Upland Facility Available to Manage Mooring Field	X	X	X
	Upland Facility Interested in Managing Mooring Field	X	X	
<b>CONS</b>	Dense Seagrass	X		X
	Isolated		X	
	Potential to Take Business from Local Marinas		X	X
	Shallow Water Depths			X
	No Existing Upland Facility Interested in Managing Mooring Field			X
<b>NOTES</b>	Derelict Vessels	0	2	13
	Vessels currently using the Area	22	14	49
	Other Issues			Shoals Present Adjacent Naval Facility
	Potential for Mooring Expansion	High	Medium	Low
	Potential for Securing Permits	Medium	Medium	Low
	<b>RANKING</b>	1	2	3

#### **4.4 Recommended Site**

Coastal Systems has determined that the Buttonwood Sound area is the optimal site for the County to pursue implementation of a managed mooring field, followed by Jewfish Creek, and then Boca Chica Basin. The mooring field would consist of 100 moorings, in an area approximately 42.3 acres. We conceptually designed this mooring field to accommodate 100 vessels because of the large area that is suitable for moorings in terms of bathymetry and ecological resources. The pending legislation reducing the regulatory burden for permitting mooring fields is limited to 100 moorings. The ultimate number of moorings will be determined based upon a review of detailed bathymetric surveys, environmental resource surveys, and anticipated usage/need. After a detailed qualitative marine resource survey and detailed bathymetric survey is conducted, the conceptual design can be refined to include refined number of moorings, proper siting of each mooring and including moorings to accommodate various sized vessels (i.e. 35 foot, 45 foot, and 60 foot vessels), as well as show mooring areas, fairways, and mooring field boundaries and marker buoys.

## **5.0 ENVIRONMENTAL REGULATORY CONSIDERATIONS**

The development and siting of a managed mooring field must be consistent with applicable regulatory criteria. The following sections discuss the applicable rules and regulations with respect to the strategy for developing a managed mooring field in Monroe County.

### **5.1 Monroe County 2010 Comprehensive Plan**

The 2010 Monroe County Comprehensive Plan (Plan) recognizes that there is a large number of people in the County who reside (or live aboard) their vessels for part of the year (Technical Document Section 2.2B, Monroe County, 2010). The Plan identified 70% of liveaboard vessels were found at shoreside sites and 30% were anchored in nearshore waters (Technical Document Section 3.20.2C, Monroe County, 2010). This community of liveaboard vessels relies on a number of dockside services and commercial services. Those services most sought out include showers, restrooms, pumpout facilities, recreation, and dinghy dockage. The Plan also discusses conflicts that arise between the liveaboard vessels and upland residents (Technical Document Section 3.20.2C, Monroe County, 2010). Liveaboard vessel owners complain about restricted access to shore and the challenges associated with disposal of sanitary and solid waste, while upland residents complain of overcrowding, noise, abandonment of vessels, degradation to the environment, and crime in the liveaboard community. The Plan acknowledges that there is a need to create facilities to accommodate the growing boating community, as well as create criteria for the future siting of additional marinas and mooring fields (Technical Document Section 3.20.2 & Policy Document 203.5.4, Monroe County, 2010). Although not a policy, the Plan suggests that future “mooring sites, including those at docks are not permitted over seagrass beds regardless of water depth” (Policy Document 3.8.2E, Monroe County, 2010). However, the Evaluation and Approval Report (EAR) based comprehensive plan amendments recently drafted by the County provide an exemption for public mooring fields.

## **5.2 Monroe County Marina Siting Plan (MSP)**

Monroe County currently does not have an approved Marina Siting Plan (MSP). The County is currently working to finalize their Draft MSP and associated marina siting criteria, and anticipates processing the documents for approval in the summer of 2014, with adoption of final Marina Siting Criteria in late 2014/ early 2015. In order for a site to be found suitable for the development of a new marina, it would be necessary for a specific proposal to be reviewed by the County. The County would make a determination as to whether the proposal is consistent with its overall Comprehensive Plan, including MSC policies, land development regulations, and the Marina Siting Criteria. In order for a proposed project to move forward towards implementation, it would have to be found consistent with the Marina Siting Criteria by the County.

## **5.3 Managed Mooring Field Management Plan (MFMP)**

The operation of a managed mooring field is typically governed by County adoption of an ordinance or resolution implementing a project specific Mooring Field Management Plan (MFMP). The Florida Department of Environmental Protection (DEP) will require that Monroe County, as manager of the proposed Project, draft and approve a MFMP. The MFMP must outline the rules and regulations for the facility, such as detailing the length of time a vessel may remain in the mooring field; identifying moorings available for transient and liveaboard vessels; establishing minimum vessel requirements; establishing mooring field fees; detailing vessel safety and insurance requirements; providing a dispute resolution process; identifying operational hours for noise and machinery; regulating the display of signs; establishing sanitation requirements; establishing policies for fishing, swimming, and other recreational activities; and appropriately restricting the feeding of wildlife, as well as providing all disaster manuals and emergency evacuation procedures governing mooring field occupants.

In addition, the County should consider various strategies to encourage vessels to take a mooring rather than haphazardly drop anchor adjacent to the proposed mooring field. Dinner Key mooring field in the City of Miami started their mooring field with low rates to encourage anchored vessels to take a mooring. The Dinner Key Mooring Field also offers a free shuttle service to bring boaters ashore for those vessels without a dinghy. Since some boaters will still decide to anchor outside of the mooring field rather than pay to take a mooring within the mooring field, the County may want to provide a designated anchoring area outside of the mooring field at no cost, as a strategy to encourage vessels to anchor in an area with sufficient water depths and minimal marine resource coverage. This area would be defined and incorporated into the submerged lands lease. Boot Key Harbor Mooring Field in Marathon offers a designated anchoring area for those boaters unwilling to pay for an anchorage. This strategy encourages boaters to anchor in an area devoid of marine resources where they are offered a la carte shore-side services including proper waste disposal and access to the uplands using the dinghy dock. As an alternative, the County may be able to use the FWC pilot program to prohibit anchoring adjacent to the mooring field.

#### **5.4 Proprietary Authorization - Submerged Lands Lease**

The proposed mooring field will be located within the Florida Keys National Marine Sanctuary, which is a Class III, Outstanding Florida Water and therefore subject to more stringent rules and regulations than other waters of the State. Chapter 18-21 of the Florida Administrative Code requires that a Submerged Lands Lease be obtained from the BOT for any commercial or revenue generating/income related docking facility on State owned land. The County will need to demonstrate that the proposed Project has minimized potential impacts to submerged aquatic resources by avoiding, to the extent practicable, siting the proposed facility in areas with seagrass beds, hardbottom, or other submerged aquatic resources. The County will also need to demonstrate that the proposed Project will reduce current threats to submerged aquatic resources, by eliminating careless anchoring, derelict vessels, overwater discharge of black water, etc., in order to meet the strict public interest criteria required to secure a Submerged Lands Lease. Based upon the DEP initiative

to authorize additional mooring fields to help reduce anchoring pressure on important ecological resources, it is anticipated that a Sovereign Submerged Lands Lease would be granted for the Project at the recommended site. The Submerged Lands Lease issued by the BOT is anticipated to limit liveaboard vessels to 6 months stay however non-liveaboard vessels can remain at the mooring field indefinitely (Chapter 327 Florida Statute).

Chapter 18-21.0041 F.A.C., Florida Keys Marina and Dock Siting Policies and Criteria, presents specific criteria that any marine facility in Monroe County that is proposed over State owned submerged lands must adhere to in order to receive proprietary authorization. Adherence to the criteria within Chapter 18-21.0041 F.A.C. is used by the DEP in developing recommendations to approve, approve with conditions, or deny the use of State owned sovereignty submerged lands in Monroe County. In the case of a mooring field proposed over State owned submerged lands, a Sovereign Submerged Lands Lease (See Appendix E) is required. Specific Condition No. 1 states that "There shall be a moratorium on the approval of all leases of state owned submerged lands for multi-slip docking facilities from Tea Table Channel north to the Monroe County Line". The moratorium is to remain in place until the revised Monroe County Comprehensive Plan with Marina Siting Plan is adopted. Conversations with DEP personnel in association with preparation of this Feasibility Study have confirmed that a mooring field would be considered a marina for the purposes of this moratorium. Therefore, the County would be unable to secure a Sovereign Submerged Land Lease in the Jewfish Creek and Buttonwood Sound areas, which are both north of Tea Table Channel, until the County revises their Comprehensive Plan to include marina siting policies. Marina siting criteria have been developed through an Inter Local Agreement with the South Florida Regional Planning Council and these criteria are expected to be adopted in late 2014/ early 2015. The adoption of marina siting criteria will lift the County moratorium on new marinas in the Keys and allow for a mooring field to be permitted between Tea Table Channel north to the Monroe County Line.

Chapter 18-21.0041 F.A.C. also places particular consideration to potential impacts to rare, threatened or endangered species, or species of special concern and their habitat. Consideration is given to eliminating adverse impacts on submerged aquatic resources and benthic communities. Specific Condition 9 states that no application to lease State owned sovereign submerged lands for the purpose of providing multi-slip docking facilities will be approved unless there are no benthic communities present where the boat mooring area, mooring piles or other structures are to be located. Although the proposed project will clearly eliminate adverse impacts on these communities, it may not be possible to site the proposed moorings in areas devoid of submerged aquatic resources. As a result, the BOT may require proprietary mitigation, in addition to any regulatory mitigation, as a condition of approval. Specific Condition No. 6 discusses various improvements, including restoring wetland or submerged aquatic vegetation, installing sewage pump out facilities, improving circulation, or marking navigational channels. Additionally, Specific Condition No. 3 require that a minimum water depth of -4 (minus four) feet mean low water be provided and greater depths be provided for facilities designated for or capable of accommodating boats having greater than a three foot draft, so that a minimum of one foot of clearance is provided between the deepest draft of a vessel and the bottom. Refer to Appendix E for a copy of 18.21.0041 and all the Specific Conditions. The conceptual mooring field design will need to be refined after collection of detailed bathymetric and biological resource data, to demonstrate mitigation of impacts and appropriately sited moorings based upon proposed vessel sizes and bathymetric conditions.

In lieu of obtaining a submerged lands lease and avoiding any imposed restraints by the Board of Trustees the County could propose to swap County owned bay bottom for the submerged lands needed for the mooring field.

### **5.5 Avoidance/Minimization of Impacts to Marine Resources**

The presence of seagrass, sponges, corals, mangroves, hardbottom, or other resources of significance within the Project site will trigger increased scrutiny by the relevant resource agencies and will require mitigation of potential direct and indirect impacts. Mitigation

must be demonstrated sequentially and includes avoidance of siting facilities directly over resources, minimization of direct impacts to resources, and compensation for unavoidable impacts to resources. Avoidance involves locating a proposed facility over an area devoid of resources. Minimization includes field locating buoy anchors in barren areas and rotating vessels off buoys located over resources when buoys located over barren bottom become available. Compensation involves restoring, enhancing, or creating comparable marine resources to offset the lost aquatic functions and values that cannot otherwise be avoided to implement the project.

Compensatory mitigation in the marine environment is typically very expensive. An example of compensatory mitigation is restoring propeller scars by filling them to grade, planting them with seagrass plugs, and providing fertilizer through the installation of bird stakes. Compensatory mitigation projects for the restoration of seagrass impacts typically costs on the order of \$1 million per acre. Mitigation is quantified using a functional assessment, typically the State Uniform Mitigation Assessment Method (UMAM), pursuant to 62-345 Florida Administrative Code (F.A.C.). Unfortunately, the marine resource and regulatory agencies do not recognize managed mooring fields to be self mitigating, despite a common understanding that haphazard anchoring and unmanaged mooring fields have detrimental environmental effects.

On May 6-8, 2013, Coastal Systems performed preliminary reconnaissance assessments of the submerged lands within the three proposed mooring field sites. Other than a small barren area that would only accommodate a minimal number of moorings at Jewfish Creek, all three mooring field locations would likely result in some level of impacts to submerged aquatic resources. The County will need to clearly demonstrate that they have avoided/ minimized and compensated for all direct/indirect impacts to submerged aquatic resources resulting from the project.

## 6.0 SUMMARY OF PERMITTING PROCEDURE BY AGENCY

### 6.1 U.S. Army Corps of Engineers (Corps):

- a) Jurisdictional Authority: The Corps has jurisdiction over all construction in navigable waters pursuant to Section 10 of the Rivers and Harbors Act of 1899. This activity would be reviewed pursuant to the County's submittal of a Dredge and Fill Permit Application as part of the Joint Environmental Resource Permitting Process (see Florida Department of Environmental Protection Section on Application and Process).
  
- b) General Permitting Procedures: A pre-application meeting with the Corps is recommended prior to submittal of a formal application. The Corps permit would be applied for jointly with the State using the Joint Statewide Environmental Resource Permit Application form and would likely be reviewed by a project manager in the Miami Regulatory Field Office, South Permits Branch, Jacksonville District. The review would be in accordance with the procedures outlined in 33 Code of Federal Regulations (CFR) Parts 320 and 325, as well as the Standard Operating Procedures Manual.

The Corps SOP requires staff to issue permits that involve the least extensive and time consuming review process, while still providing protection for the aquatic environment. As the mooring field proposed herein does not qualify for any of the expedited permit processes available, the Corps would process it as a Standard Individual Permit (IP). This process requires issuance of a Public Notice soliciting formal comments on the proposed activity from federal commenting agencies, such as the National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (FWS), and the Florida Keys National Marine Sanctuary (FKNMS), State commenting agencies, such as the Florida Fish and Wildlife Conservation Commission (FWC), as well as the general public. This process results in input regarding impacts to the aquatic environment, navigation, and the overall public interest. The Corps

considers this input during its evaluation of the proposed project. The comment period is normally limited to 30 days; however, substantive comments received after the 30 day comment period are usually evaluated by the Corps. The most significant issues for this Project include direct and indirect impacts to seagrass and other Essential Fish Habitat (EFH) and sufficient water depths.

If a new dinghy dock is proposed, the Corps will likely require adherence to the “Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat, U.S. Army Corps of Engineers/National Marine Fisheries Service, August 2001” (Dock Construction Guidelines) (Appendix E) to avoid and minimize potential impacts to marine resources.

The Corps will also require a DEP Coastal Zone Management consistency determination and a Section 401 water quality certification prior to issuance of the IP. These State determinations are normally provided by issuance of the Environmental Resource Permit (ERP) permit by DEP.

c) Important Considerations When Applying for a Corps Permit: Although the Corps solicits comments from all applicable commenting agencies, including the FKNMS, there are formal consultation procedures for the FWS and NMFS. The following factors will be addressed during the Corps environmental permitting review of the Project:

i) Florida Keys National Marine Sanctuary (FKNMS) Permit: A FKNMS permit is required pursuant to §922.166(a)(a). Additionally the Corps cannot proceed to permit issuance until any FKNMS concerns are addressed.

ii) Fish & Wildlife Service: The FWS evaluates proposed impacts to fish and wildlife species in general and species listed as threatened or endangered under the Endangered Species Act (ESA), which are under their purview. The

American crocodile (*Crocodylus acutus*) and West Indian manatee (*Trichechus manatus*) are listed as an endangered species under the ESA. Although this Project is not located in an area of heightened scrutiny for the West Indian Manatee, minor impacts to seagrass would likely result in a *May Affect, Not Likely to Adversely Affect* determination by the Corps. The Corps would request concurrence with this determination from the USFWS. The FWS typically responds to Corps requests for concurrence (informal consultation) on MANLAA determinations within 30 days.

The Buttonwood Sound is located within designated critical habitat for the American crocodile and the Corps may make a determination that the Project *May Affect* this species but *Would Not* adversely affect designated critical habitat. A *May Affect* determination would trigger formal Section 7 consultation, requiring the FWS to prepare a Biological Opinion (BO). Upon initiation of formal consultation, the FWS would determine if they have all of the information they need to commence consultation. Once the FWS has received all requested information, they will begin a 135 day review period. The FWS BO will evaluate all of the impacts to the listed species and will result in a determination of the likelihood of jeopardy to the continued existence of the species. The determination would be that the activity is either not likely to jeopardize the species or likely to jeopardize the species and will also evaluate the potential effect on critical habitat.

If the BO is not finalized within 135 days, the Corps must still wait for issuance of the BO before completing their evaluation of the pending permit application. All impacts to species under their purview will be considered and addressed during the FWS review; the Corps will impose the FWS recommendations in most instances. Reduction of project impacts or mitigation may be required to offset any potential impacts to the American crocodile and/or manatee from the proposed Project. In either case, the FWS will require that the Standard Manatee Construction Conditions be

incorporated into any permit issued for the Project and that permanent manatee signs and an informational display be installed.

- iii) National Marine Fisheries Service (NMFS) Protected Resources Division (PRD): The NMFS PRD evaluates proposed impacts to species listed under the ESA, which are under their purview. The species that could potentially be affected by the Project include *Acropora* species, swimming marine turtles, and the smalltooth sawfish. Although the Project does not appear to propose any impacts to staghorn and elkhorn corals (*Acropora* spp.), swimming turtles, or the smalltooth sawfish, due to the size of the proposed project, the Corps will likely initiate informal consultation with PRD on these species. At a minimum, NMFS PRD will recommend that any permit issued by the Corps require adherence to the Sea Turtle and Smalltooth Sawfish Construction Conditions to ensure protection of these species.

As with the FWS, if informal consultation is required, the NMFS PRD should concur with the Corps MANLAA determination within 30 days. If the Corps determines that the proposed project “may affect” any listed species under NMFS PRD purview, the Corps must initiate formal consultation with NMFS PRD. If formal consultation is required, the NMFS PRD should produce a BO within 135 days of receiving all requested information. However, the NMFS PRD has normally taken longer than the prescribed 135 day period to provide a BO. If the Corps determines that the proposed Project “May Affect” a threatened or endangered species, the Corps cannot issue a permit until receipt of a BO from NMFS PRD. At the time of issuance of this Report, it is taking four months for a file to be assigned to a NMFS PRD reviewer.

- iv) NMFS Habitat Conservation Division (HCD): The Corps will process an application for a mooring field as an IP and will issue a Public Notice soliciting comments on the proposed activity from NMFS HCD, FKNMS, other federal and State agencies, as well as the general public. Comments

from NMFS HCD, as well as the US Environmental Protection Agency (EPA), normally focus on whether the environmental impacts have been avoided, minimized, and compensated to the greatest extent practicable. In response to the Public Notice, the NMFS HCD will provide comments on potential impacts to Essential Fish Habitat (EFH), as required by the Magnuson-Stevens Fishery Conservation and Management Act. The response from the NMFS HCD should be commensurate with the proposed impacts to EFH and will range from EFH Conservation Recommendations to a Section 404(q) Memorandum of Agreement (MOA) letter, which reserves NMFS right to review additional information and precludes Corps issuance of a federal permit without NMFS concurrence.

- v) Navigation: The Corps requires that projects proposed adjacent to federally maintained channels (e.g., Intracoastal Waterway (ICW)), shall be located outside of the federal right-of-way, unless substantial justification for the proposed encroachment can be demonstrated. The proposed location of the mooring field is not near any federally maintained channels and therefore should not pose a federal navigational concern.
  
- vi) Public Interest Review: The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest. This is known as the “Public Interest Review”. The Corps considers the following 21 public interest factors during their federal review: “conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people” (33 CFR Part 320.4(a)). After the Corps evaluation, the agency will make a determination whether the proposed activity will be contrary to the public interest. The Corps must determine that

the activity is not contrary to the public interest in order to issue a permit. Mooring fields are typically found to be 'not contrary to the public interest', as they provide environmentally friendly and safe locations for transient and permanent boats to moor in designated locations.

- vii) Alternatives Analysis: Pursuant to the National Environmental Policy Act (NEPA), in order to avoid the need to prepare an Environmental Impact Statement (EIS) for a proposed project, it must be demonstrated through preparation of an environmental assessment that the project will not result in any significant impacts, after consideration of any proposed mitigation. The alternatives analysis is the heart of a NEPA evaluation. The Corps must determine that adverse environmental impacts have been avoided or otherwise mitigated to non-significance. Mitigation includes avoidance, minimization, and ecological functional compensation for any unavoidable impacts.

Since this Feasibility Study includes an analysis of three potential areas and the proposed Project will attempt to avoid direct impacts to high quality resources and minimize impacts to lower quality resources, we believe that this Feasibility Study should satisfy NEPA evaluation criteria. The installation of permanent mooring buoys in an area where boaters haphazardly place traditional ground tackle in areas supporting submerged aquatic resources clearly reduces impacts to those resources. Mooring buoys will be located so as to avoid direct impacts to resources to the extent possible, vessel shading will be limited to the times vessels are using the moorings, and vessel orientation will vary based upon predominant wind direction.

- viii) Coastal Zone Management Act and Section 401 Water Quality Certification: Coastal Zone Management Act (CZMA) consistency and Water Quality Certification (WQC) are issued by the DEP under the ERP evaluation process, normally as part of the ERP. The Corps would require at least a CZMA

concurrence and potentially a WQC from the State prior to federal permit issuance. The proposed Project appears to be consistent with the Florida Coastal Zone Management Act and appears to meet State water quality requirements, provided conditions for turbidity control are adhered to during buoy anchor installation.

- d) Processing Time: The time required for Corps processing of a submitted application greatly depends on the time required to demonstrate adequate avoidance and minimization of impacts to surrounding resources. Other factors influencing Corps review time include objections and comments received during the Public Notice period, lengthy endangered species consultation (American crocodile, swimming turtles, smalltooth sawfish), and the heavy workload of Corps staff. Corps response time is not limited by regulatory time clocks and is therefore difficult to predict. The potential for impacts to federally listed species may result in a lengthy permitting process of 1.5 to 2 years. The Corps permit processing time for an Individual Permit can in some cases be more than 2 years.

## **6.2 Florida Department of Environmental Protection (DEP):**

- a) Jurisdictional Authority: Any activity proposed over sovereign submerged lands requires authorization from the BOT. The proposed Project is located in a Class III, Outstanding Florida Water (OFW) and is governed by State rules established in Chapter 18-21 F.A.C. Since no submerged lands lease is currently in place for the Project, such a lease will be required pursuant to Chapter 18-21.005(1)(d)(8). An Environmental Resource Permit (ERP) will be required for the project from the DEP.

Projects that are proposed within a OFW must not lower existing ambient water quality and must be 'clearly in the public interest', as opposed to 'not contrary to the public interest'. Coastal Systems believes that the proposed Project is clearly in the public interest and would qualify for issuance of a Sovereign Submerged Lands Lease from the BOT. Project specific annual lease fees must be negotiated with the BOT once a decision is made to issue such a lease; these fees are based upon the

area of submerged lands to be leased and anticipated revenues associated with the project. Please see Appendix F for lease fee calculations.

As stated earlier in the Monroe County Marina Siting Plan Chapter 18-21.0041 F.A.C., Florida Keys Marina and Dock Siting Policies and Criteria, Specific Condition No. 1 states that “There shall be a moratorium on the approval of all leases of state owned submerged lands for multi-slip docking facilities from Tea Table Channel north to the Monroe County Line”. The moratorium is to remain in place until the revised Monroe County Comprehensive Plan with Marina Siting Criteria is adopted. Thus a mooring field will not be permitted by the State at the Buttonwood Sound or Jewfish Creek sites until marina siting criteria have been adopted, which is anticipated to occur in late 2014 or early 2015.

- b) General Permitting Procedures: The permitting process with the State will involve pre-application meetings with the DEP staff in Marathon and joint submittal of the Statewide ERP application to both the DEP and the Corps. DEP permitting will likely entail a series of “Request for Additional Information” (RAI) letters between the County and agency staff in order to provide all information required for the DEP to approve or deny the Project application. Upon submittal of an application to the DEP, agency staff must issue a letter within 30 days, advising the applicant that either additional information is required or the Project file is complete. As part of the application process, the DEP will consult with the FWC, Bureau of Protected Species Management, to evaluate direct and indirect impacts to manatees, as well as other managed species. The DEP will also consult with the Division of State Lands, as the Project is located over sovereign submerged lands. Once the DEP receives all of the information necessary to make the application “complete” they must make a decision within 60 days.
  
- c) Important Considerations When Applying for an ERP: The following issues are critical in fulfilling the State’s environmental permitting requirements:

- i) Coastal Zone Management Act Consistency: The Project must be deemed consistent with the Florida Coastal Zone Management Act by the DEP prior to State and federal permit issuance, as mandated by the Coastal Zone Management Act (1972). The review is designed to determine if the proposed Project is consistent with the goals and standards established by the State of Florida for its coastal zones, including protection and use of the environment, habitat, water quality, and marine resources.
  
- ii) Proprietary Authorization for Sovereignty Submerged Lands: As previously stated, the DEP will require a submerged lands lease for the proposed mooring field. Additionally, evidence of ownership or legal entitlement of the submerged lands must be demonstrated prior to permit issuance, for any proposed work on or over State owned submerged lands. Chapter 18-21.004(3)(b) states that "Satisfactory evidence of sufficient upland interest is required for activities on sovereignty submerged lands riparian to uplands, unless otherwise specified in this chapter." In order for Monroe County to meet the criteria necessary to secure a submerged lands lease, an agreement must be made between the selected upland facility and Monroe County for use of the shoreline. Once this is accomplished, Monroe County will be able to demonstrate that they have sufficient upland interest to secure a Lease for the Project. If an agreement cannot be made between Monroe County and an adjacent upland facility, other avenues may be pursued with DEP in order for Monroe County to meet this criterion.
  
- iii) Florida Department of Economic Opportunity: (formerly Florida Department of Community Affairs) oversees Community Planning and Development. Their Areas of Critical State Concern Program protects resources and public facilities of major statewide significance. The City of Key West and the Florida Keys (Monroe County) is listed as one of the four designated areas of critical State concern. The Department reviews all local development

projects within the designated areas and may appeal to the Administration Commission any local development orders that are inconsistent with State guidelines.

- d) Processing Time: Standard processing time for issuance of a DEP ERP with State lands approval typically takes a minimum of 12 months. The timeframe for permit issuance is greatly affected by the completeness of the file upon application submittal, as well as the time required to respond to DEP RAIs. Efforts to obtain a submerged lands lease on sovereign lands will also significantly extend the permitting timeframe.
  
- e) General Permit: Florida House Bill 999, effective July 1, 2013, states that the DEP shall adopt a general permit for local governments to construct, operate, and maintain public marina facilities and public mooring fields. Mooring fields authorized under a general permit may not exceed 100 vessels and all facilities permitted under this rule must be constructed, maintained, and operated in perpetuity for the exclusive use of the general public. The Bill states that a general permit shall be adopted that includes criteria necessary to include the general permit in a state programmatic general permit issued by the Corps under 404 of the Clean Water Act. A facility authorized under such general permit is exempt from review as a development of regional impact if the facility complies with the comprehensive plan of the applicable local government and obtains Clean Marina Program status prior to opening for operation, and maintains that status for the life of the facility. The DEP has yet to adopt by rule a general permit covering mooring fields. The Bill was effective July 1, 2013 and the DEP was given 60 days from that date (September 1, 2013) to initiate the rule making process. Qualifying for a general permit from the DEP, and potentially the Corps, would simplify the permitting process and could minimize the amount of effort involved with obtaining a State permit. As of this time, however, there is no further information regarding the proposed rule or criteria a project must meet to qualify for a DEP general permit.

### **6.3 Monroe County Permits**

Monroe County typically defers environmental permitting to the DEP, as there is not a County process for the issuance of such permits. County zoning approval will likely be required for the proposed Project location and County structural approval will likely be required for the proposed mooring anchors. The Monroe County Planning & Environmental Resource Department is responsible for the administration of the adopted Monroe County Comprehensive Plan and Land Development Regulations and will need to provide confirmation that the proposed Project is consistent with the County Comprehensive Plan in order to secure the State ERP.

The proposed mooring field must be designed to adhere to the ordinances of Monroe County, Chapter 26-Waterways, Article II Mooring Fields, which provides for the installation of mooring fields and the authorization to manage those mooring fields as a method of addressing boating impacts associated with the many overcrowded anchorages in the Florida Keys.

### **6.4 U.S. Coast Guard (USCG):**

Written approval from the U.S. Coast Guard (USCG) to designate the mooring area as a special anchorage area (approved mooring field) provides navigational and regulatory benefits such as the mooring field being marked on nautical charts and eliminates the need for vessels 65 feet or less to display anchor lights at night. Special anchorage area designation may be sought for areas of Monroe County that are not in international waters (above the COL REG demarcation line which runs through Long Key) therefore designation could be applied for in Jewfish Creek and Buttonwood Sound but not in Boca Chica. In addition to acquiring a special anchorage designation, a USCG Private Aids to Navigation Permit (PATON) will be required for the markers delineating the mooring field and for any markers within or surrounding the mooring field that are lighted. The U.S. Coast Guard (USCG) will require the applicant complete a PATON application; provide a map and the coordinates of all buoys to be placed; provide a

detailed sketch of all buoys to be installed; provide copies of all local, state, and federal permits required; and provide a copy of the MFMP.

**6.5 Florida Fish and Wildlife Conservation Commission (FWC):**

The FWC Uniform Waterway Marker (UWM) Permit is required for any buoys that are placed in accordance with Chapter 68D-23 F.A.C. The FWC will require the applicant complete a UWM application; provide a map and the coordinates of all buoys to be placed; provide copies of all local, state and federal permits required; and provide a copy of the MFMP.

## 7.0 MITIGATION

Seagrass, sponges, coral, hardbottom, and/or macroalgae are likely present in the Buttonwood Sound area. The Project is located within American Crocodile Critical Habitat and *Acropora* sp. Critical Habitat, which provides an additional level of regulatory scrutiny. The presence of ecologically valuable resources triggers Federal consultations with the NMFS, which can involve extensive review periods. To reduce the extent of the federal review, if a new dinghy dock is proposed to facilitate upland access, the dock should be designed in strict accordance with the "Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat, U.S. Army Corps of Engineers/National Marine Fisheries Service, August 2001" (Dock Construction Guidelines) (Appendix E). Designing overwater structures to be consistent with this guidance is considered minimization of impacts. However, as any overwater structure to accommodate dinghies needs to be accessible by small vessels, strict adherence to these guidelines may not be ideal for Project design. It may be possible, however, to adhere to portions of these guidelines to demonstrate resource impact minimization.

Both the Corps and the DEP will require that the Applicant clearly demonstrate that ecological impacts have been avoided and minimized to the greatest extent practicable before considering compensatory mitigation to offset unavoidable ecological impacts. The Corps can accept design accommodations to minimize impacts to submerged aquatic resources, such as elevating, limiting width, and incorporating grated decking materials to docking structures; and rotating vessels onto moorings that are not located over seagrass when such moorings are vacated, as sufficient mitigation without the need to also require compensatory mitigation. The DEP can also accept demonstrated avoidance and minimization to offset direct and indirect ecological impacts. Each agency will independently evaluate the need quantity and type of compensatory mitigation required to offset impacts pursuant to their guiding regulations. Typically all environmental agencies will accept the same proposed mitigation, although each agency will likely require different quantities. Occasionally mitigation required by one agency cannot be accepted

by another and additional mitigation must be proffered. As seagrass mitigation for direct impacts is typically risky and expensive, it is strongly recommended that impacts are avoided and minimized as much as possible to minimize the need, if any, for compensatory mitigation.

## **8.0 FUNDING OPPORTUNITIES**

### **8.1 Current Funding**

The Monroe County Board of County Commissioners has committed County funds to provide for design/engineering/build of a mooring field in FY 2014/2015 based on the scope of this Feasibility Study. The County has appropriated approximately \$750,000 for the planning, design, permitting, and construction of one proposed mooring field. In addition, the County has applied for two grants: a State grant for 4.5 million dollars for the implementation of three mooring fields through the State Resource and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act of 2012 (RESTORE Act) and a local grant for 1 million dollars in Monroe County RESTORE Act funds. RESTORE Act Funds are made available to meaningful efforts to revitalize Gulf of Mexico waters and resources from the harmful effects of the Deepwater Horizon Oil Spill.

### **8.2 Grants**

Several other grants are potentially available to fund various aspects of permitting and construction of a mooring field. The FWC Florida Boating Improvement Plan (FBIP) provides grant funding for projects designed to serve the needs of boaters and boating related activities on coastal and/or inland waters within the State, including the construction of public mooring fields. Applicants must agree to provide a share of the total project cost, which can take the form of in-kind services or cash expenditures. More points are awarded to applicants who agree to cost share 50% or more of the total project cost whether through cash, in-kind services, or other grant funding.

FWC announces the application period in the "Florida Administrative Weekly" before February 1 of each year. Applications must be submitted within 60 days after the announcement date or by the deadline in the announcement, whichever is later. Please see the following website for further details: <http://MyFWC.com/boating/boating-grant-programs/fbip/>

The FWC Boating Infrastructure Grant Program (BIGP) provides grant funding for tie-up facility projects for transient recreational boats 26 feet or longer (non-trailerable). The Program is funded through the U.S. Fish and Wildlife Service and is used for projects such as mooring buoys, day docks, and support facilities designated for transient recreational boats such as restrooms, pump-out stations, dockside utilities, water supplies, recycling and trash receptacles, and initial one-time only dredging, only to provide transient vessels with safe channel depths to the transient facility. FWC announces the application period in the "Florida Administrative Weekly". Please see the following website for further details:

<http://myfwc.com/boating/grant-programs/bigp/>

## 9.0 POST CONSTRUCTION REQUIREMENTS

Permits issued for the proposed Project will likely include conditions requiring water quality testing and marine resource surveys. Water quality testing is typically required to demonstrate that operation of the proposed facility is not degrading existing ambient water quality. It is likely that implementation of the Project will improve water quality in the area. However, there is an argument to be made that concentrating vessels in a relatively small area could adversely affect the water quality in that area. Therefore, permits issued for mooring fields typically require demonstration that water quality is not being degraded through implementation of a water quality monitoring program. Periodic sampling is typically required for specified parameters with testing conducted at a State certified laboratory and results submitted to agency compliance sections for review.

Additionally, ecological resource surveys are often required to demonstrate that moorings located over submerged aquatic vegetation are not causing adverse impacts to the density of these resources. It is recognized that moorings eliminate anchor drag from haphazard anchoring and that vessels on a mooring rotate on the mooring due to prevailing wind direction. However, the agencies typically require demonstration that issuance of their permit is not having an adverse impact on the resources in the area. Therefore, post implementation submerged aquatic resource surveys are typically required to demonstrate that the resources are not being adversely affected by facility occupation. The results of these surveys must be submitted to agency compliance sections for review.

Additionally once moorings are installed, regular monitoring and maintenance of the moorings will be required by the permitting agencies. All buoys must be maintained in good condition at all times. Visual inspections of the mooring and regulatory buoys will need to be performed by a qualified diving contractor, annually, as well as after major storm events. All buoy and down line components must be inspected, including but not limited to: shackles, hardware, ropes, underwater floats, and surface buoys. Any component that is worn or at risk becoming dislodged, as determined by the contractor, will need to be replaced within a certain timeframe, typically specified in the Buoy

Monitoring and Maintenance Plan as 30 days. Inspection reports should be prepared by the contractor and submitted to the County to document maintenance and repairs. Upon documentation of damaged or missing buoy system components, the County must notify the FWC Boating and Waterways Section by telephone and/or e-mail of the damaged structures, pursuant to 68D-23.106(1)(d), FAC and the County must provide FWC with documentation of repairs upon completion.

## **10.0 IMPLEMENTATION - MINIMUM QUALIFICATIONS FOR CONSULTANT AND CONTRACTOR**

The implementation of a managed mooring field requires a consultant with specialized environmental permitting and engineering expertise, along with a contractor that has appropriate construction capabilities. Two methods for procurement are available in accordance with Florida Statutes: a) traditional Design-Bid-Build (DBB) and b) Design-Build (DB). For DBB, the County would retain a consultant to design and permit the mooring field. As the permitting phase was being finalized, the consultant would assist the County in compiling contract documents for an advertisement for competitive bidding. The consultant would then assist the County in evaluating the bids and recommend the lowest, most responsive bidder. The consultant would then assist the County to provide construction administration to ensure the mooring field was constructed in accordance with the plans, specifications, and permits. For DB, the County would retain a contractor to provide a “turn-key” approach to the project. This contractor would retain a consultant and manage not only the construction, but also the design and permitting process. There are less than 15 managed mooring fields in Florida with more than 20 moorings and the majority of these projects have been procured through the conventional DBB method.

### **10.1 Consultant**

For either the DBB or DB procurement method, the consultant should have a demonstrated track record of planning, designing, and permitting managed mooring fields of similar scope and size in Florida. The consultant would have relevant experience in conducting field investigations, such as marine resource mapping with qualified biologists, as well as hydrographic (bathymetric) surveys. These field investigations will require operations in shallow water, with water depths being recorded relative to the “top” of seagrass beds, as opposed to the actual seabed elevation. Biologists would need relevant experience with marine resource mapping to identify resources in the Florida Keys, including seagrass, in accordance with industry-accepted protocols from federal and State regulatory agencies. The consultant should also have experience in the field of geotechnical evaluation of sub-surface conditions for the design and specification of

appropriate mooring anchor foundations, which may consist of helical anchors. Field investigations may include geophysical surveys, sampling, jet probes, and/or SPT borings with rock coring.

The consultant would need demonstrated experience over a minimum of five (5) years for the processing of environmental permits for managed mooring fields. This experience would include the compilation of comprehensive Statewide ERP applications to be processed through the Corps and DEP to include securing submerged lands leases. In addition, the consultant would need experience with the processing of Uniform Waterway Marker permits for any proposed regulatory/boundary buoys through the FWC with approval of the U.S. Coast Guard for PATONs.

The consultant would also need to be a competent engineering firm, appropriately licensed in the State of Florida to practice engineering, with Professional Engineers that have experience planning, designing, and managing construction of managed mooring fields. The engineering firm would be in business for a minimum of five (5) years and the Engineer-of-Record would need to have designed a minimum of three (3) managed mooring fields. The engineer would need to have experience in the design and specification of underwater foundations consisting of helical anchors, deadweight anchors, and/or stake piles for mooring applications. The engineer should have experience in evaluating coastal processes including winds, waves, currents, water levels, and storm surge (hurricane conditions) for site-specific loads from vessels anchored in a managed mooring field. The engineer would need demonstrated experience in the layout of swing circles, anchoring, and regulatory buoy/signage for the design of a managed mooring field in accordance with marina design standards. The engineer would need to compile construction documents and specifications that would incorporate environmental permit conditions.

## **10.2 Contractor**

For either the DBB or DB procurement, the contractor would be an appropriate general contractor, licensed and insured in accordance with County requirements, with demonstrated marine construction experience in Southeast Florida, including the Florida Keys. The contractor would need to have demonstrated construction project experience with mooring fields and have been in business in Florida for a minimum of five (5) years. The contractor would require experience in the specification and fabrication of mooring system components including helical anchors, down lines, buoys, and pendants to provide a complete mooring assembly. The specified systems shall have been in service at other managed mooring fields for a minimum of five (5) years and shall have required normal annual maintenance with no major repairs or replacement required.

The contractor would be a certified helical anchor installer with underwater construction experience installing anchors of similar size in scope within sensitive marine environments through precise positioning utilizing DGPS methods. The contractor shall conduct commercial diving operations with divers certified by ADCI and in accordance with OSHA regulations for this type of underwater construction. The contractor may be required to install rock embedment anchors to a minimum depth of 10 feet, depending on the geotechnical conditions, and the contractor will be capable of testing the installed anchors to the design pull-out loads that may approach 20 kips. After construction, the contractor will provide appropriate as-built documentation, operations manuals, and will warranty the installed mooring field for a minimum of two (2) years.

## **10.3 Procurement**

Procuring the mooring field through the DBB process is preferred, as the environmental permitting process can be challenging and will likely require 1-2 years of processing time, which can be unreasonable for a DB approach. There are many variables that can impact the schedule for environmental permitting that can further delay the project. Estimating the schedule impacts and costs for a DB approach can be variable; therefore, a DB team will either not pursue the project due to risks with the schedule, or will provide a very high

budget for the soft cost portion of the project to account for uncertainty with the environmental permitting process. The DBB process facilitates more control over project implementation by the County.

The turn-key approach with DB is popular with both private and public sector entities, as this approach minimizes risk to the owner. With a DB approach there is a single entity that is responsible for the project delivery, as opposed to the owner potentially mediating between the engineer and contractor, should issues arise during construction through a conventional DBB process. DB can also facilitate the construction schedule by having the engineer and contractor work together and prepare to mobilize for a project and order long lead time materials prior to completion of construction plans. However, for public sector projects, a design criteria professional must be retained to prepare a DB procurement package. This process adds time to the overall schedule; the same procurement process is required to retain a consultant for the DBB process.

## 11.0 RECOMMENDED ACTION ITEMS

1. **Bathymetric Survey:** Conduct a comprehensive bathymetric survey to confirm water depths within and adjacent to the recommended Project area in Buttonwood Sound. Demonstration of sufficient water depths for the size of vessels the moorings will accommodate, for ingress and egress from the mooring field, and to determine the maximum length/draft of vessels that the site will permit, will be required. A formal bathymetric survey is recommended to identify the depth contours within the Project site, as well as the adjacent controlling water depths. The bathymetric survey should depict one foot contours.
2. **Quantitative Marine Resource Survey:** Conduct a detailed quantitative marine resource survey. Efforts to avoid, minimize, and mitigate impacts to submerged aquatic resources will be required in order to secure permits. The survey must provide sufficient detail to demonstrate that the selected mooring field limits provide the least environmental impacts. Detailed marine resource information will also be necessary to micro-site the proposed mooring anchors to areas that are devoid of resources. Additionally, this information will be utilized to determine the best location for access walkways associated with any proposed dinghy docks.
3. **Refine Conceptual Mooring Field Design:** Based on the comprehensive bathymetric and marine resource surveys, the conceptual mooring field design will be refined and engineered in order to provide sufficient water depths for the draft of vessels proposed, avoid and minimize impacts to submerged aquatic resources, show the lengths of vessels the site can accommodate and corresponding swing circles, and depict the location of any navigational fairways.

4. **Develop Managed Mooring Field Management Plan:** A Managed Mooring Field Management Plan that will regulate activities within the managed mooring field will be required to secure the permits. It is recommended that this comprehensive Plan be developed prior to application preparation and referenced and included in the permit applications upon submittal to streamline the permitting process.
5. **Public Meetings:** It is recommended that once a mooring field conceptual design is refined, public meetings be held to disseminate the County's plan for the mooring field and to solicit public input into the design and location of the proposed project. Public support is critical for the success of this proposed project.
6. **Pre-Application Meetings:** The conceptual design should be presented at pre-application consultation meetings with the Corps and DEP to present the Project design, submerged aquatic resources impact avoidance/minimization/compensation efforts, and the findings of this Feasibility Study to identify any site-specific information the agencies recommend including within the permit applications. Inclusion of information requested during pre-application meetings can help to streamline the permitting process.
7. **Prepare Permit Applications:** Utilize the information assimilated to date and any information identified during agency pre-application meetings to prepare comprehensive permit applications that demonstrate Project purpose and need, impact avoidance and minimization, facility design, best management practices for construction, and upland riparian interest, as well as other permit specific criteria, necessary for application review. Preparation of a complete permit application reduces the number of agency RAIs and therefore reduces permitting costs and permit processing duration.
8. **Prepare Draft Agreement between Monroe County and Upland Support Facility:** Prepare draft Professional Services Agreement between the County and the Upland

Support Facility that will manage the mooring field and provide upland amenities to the mooring field patrons. Enter discussions with potential upland vendors to confirm interest and prepare Request for Proposals in order to select an upland facility to contract with, if necessary.

## 12.0 CONCLUSIONS

The primary challenges associated with permitting the proposed Project will be securing proprietary approval and demonstrating avoidance, minimization, and compensation of ecological resource impacts. Monroe County will need to partner with an existing upland facility or purchase an upland parcel, as required to demonstrate sufficient upland interest to secure a submerged lands lease. Although the environmental regulatory and commenting agencies are looking towards mooring fields to reduce impacts to submerged aquatic resources, past experience dictates that these agencies are still opposed to authorizing moorings over even sparse submerged aquatic resources.

All three anchorage sites (Jewfish Creek, Buttonwood Sound, and Boca Chica Basin) warrant mooring fields based on current use and need. However, based on criteria evaluated within this Feasibility Study, if the County decides to move forward with the design, permitting, and construction of one managed mooring field at this time, Coastal Systems recommends proceeding with the anchorage at Buttonwood Sound.

Overall, this Feasibility Report is meant to provide Monroe County with an overview of the potential regulatory issues and procedural requirements of the local, county, State and federal agencies. We believe that a mooring field in the Buttonwood Sound location, with a design refined from the preliminary conceptual design provided in this Report based upon detailed surveys, would likely meet the permit requirements of the DEP and Corps. If the County decides to pursue a managed mooring field in this area, we recommend initiating pre-application consultations to introduce the Project to these various agencies to present the findings to date. In addition, we recommend that the County develop focus groups consisting of potential mooring field user groups or conduct a charrette for the purpose of developing a Managed Mooring Field Management Plan, which will be required by the environmental permitting agencies.

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