

MONROE COUNTY, FLORIDA
SUBMISSION TO DEP FOR RESTORE ACT STATE FUNDING

Project Name: Keys-Wide Mooring Field System

The purpose of the proposed Keys-Wide Mooring Field System is to provide mooring fields in historically used anchorages throughout the Keys as a management tool to address a variety of anchoring impacts, consistent with the objectives of the 2013 Monroe County Comprehensive Plan. Unmanaged anchorages are known to generate derelict and abandoned vessels, cause seagrass and coral damage due to inappropriate anchoring techniques, and are a concentrated source of illegally discharged vessel sewage. New mooring fields, proposed for Jewfish Creek and Buttonwood Sound in Key Largo and Boca Chica Basin in the lower Keys will provide secure, environmentally friendly moorings and appropriate shoreside access and services, eliminate benthic damage, reduce the number of derelict and abandoned vessels, and ensure the proper disposal of vessel sewage.

The proposed project will provide for a complete Keys-wide system of mooring fields, adding to existing mooring fields at Pennekamp State Park, Boot Key Harbor in Marathon, and the Seaplane Basin in Key West, as well as a smaller system of moorings in the Lignumvitae Key area. This Keys-Wide Mooring Field System will provide convenient, well distributed infrastructure for both local and transient boaters, while reducing or eliminating environmental impacts currently generated in unmanaged anchorages. This implementation supports tourism, protects the Keys' natural resources, creates jobs, and furthers the objectives of the Florida Keys National Marine Sanctuary.

Contact Information *(Include at least one name, phone number, email address, and organization name if applicable):*

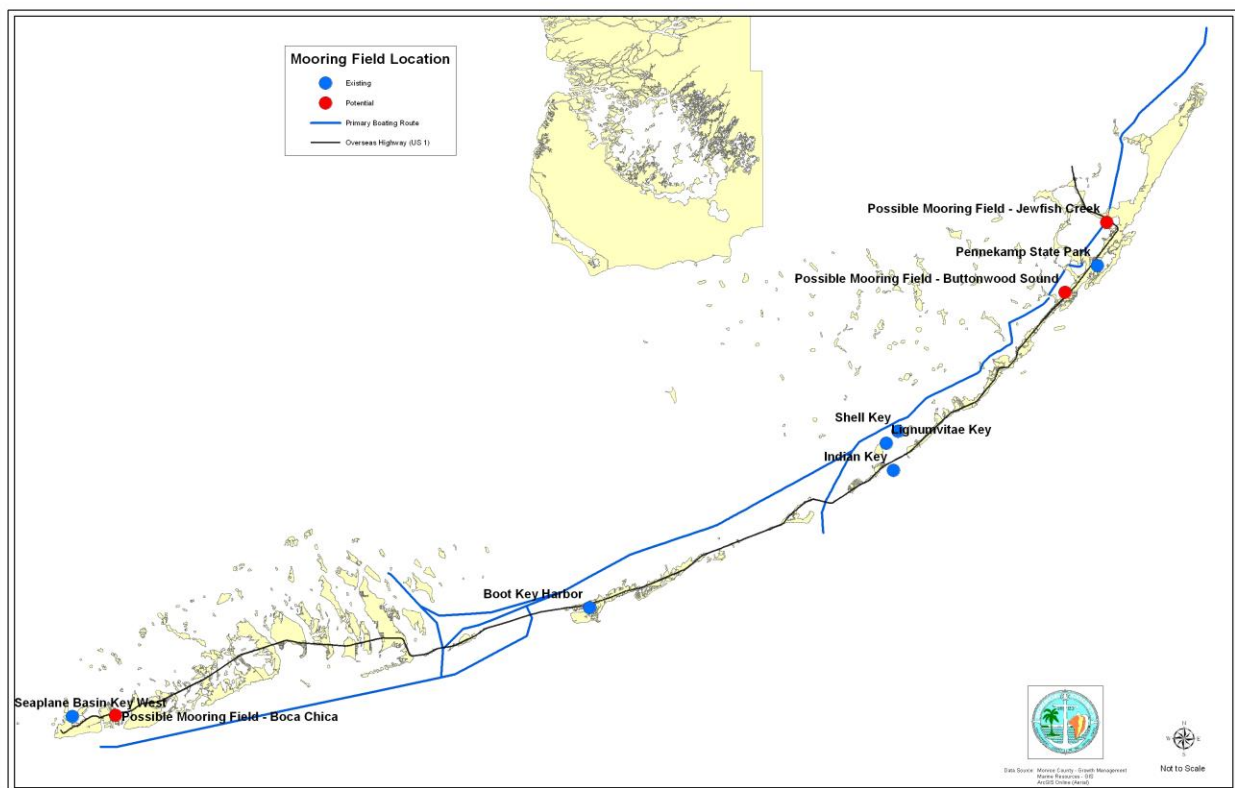
Applicant: Monroe County Board of County Commissioners

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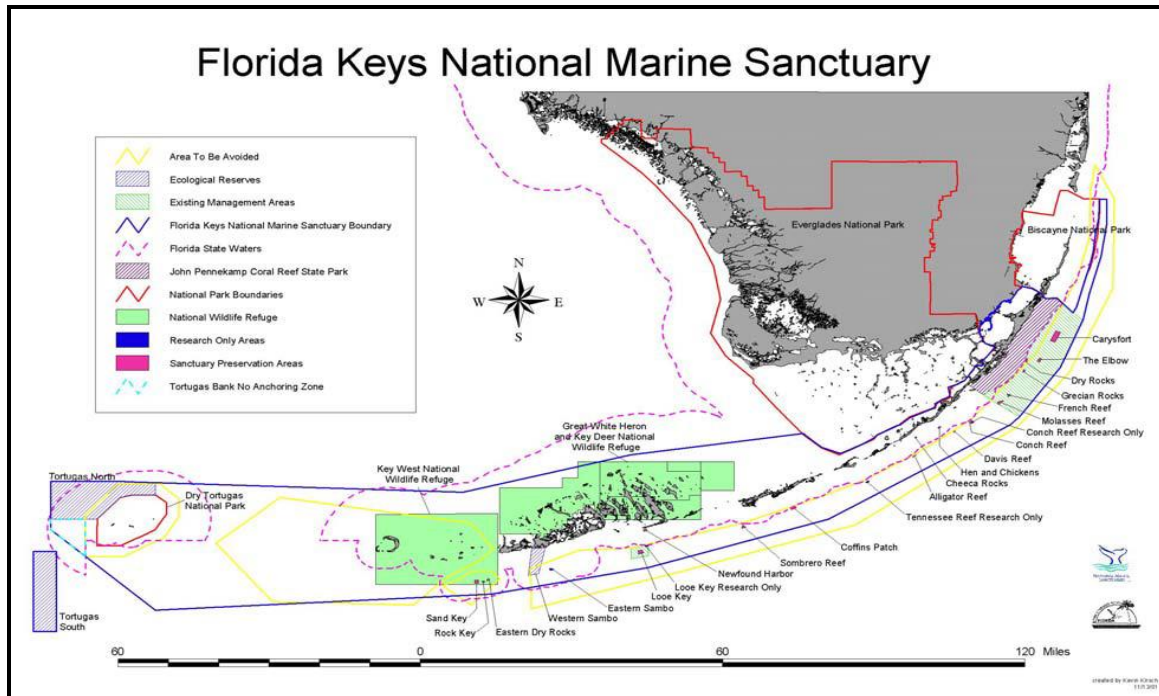
Project Location (Include a map, if possible, and the city, county, longitude/latitude, and watershed):

Mooring fields for the proposed Keys-Wide Mooring Field System are sited for Jewfish Creek on the bayside of Key Largo in the upper Keys (25° 10.81'N -80° 23.33'W), Buttonwood Sound also on the bayside of Key Largo (25° 05.71'N -80° 26.80'W), and Boca Chica Basin on the oceanside of the lower Keys (24° 34.27'N -81° 43.68'W). The Mooring Field Location map (below) illustrates the distribution of existing and proposed mooring fields in Florida Keys within Monroe County.



Proposed (and existing) mooring fields are located adjacent to primary boating routes, and have been sited based on the current anchoring patterns and distribution of local liveaboards and cruising boaters. Mooring fields are distributed such that sailing vessels can easily and safely transit from one mooring field to the next in one day's sail. Mooring fields will be available for vessels utilizing either the inside (bay/gulf side) or outside (Atlantic Ocean) routes.

The area of the proposed Keys-Wide Mooring Field System is entirely within the jurisdiction of Monroe County and the boundaries of the Florida Keys National Marine Sanctuary (see below).



Project Description *(Describe all aspects of the project):*

The Keys-Wide Mooring Field System project includes the design, permitting and installation of three mooring fields and the establishment of associated upland service facilities.

Background

Monroe County waters have traditionally been utilized for anchoring of liveaboard vessels, consistent with the water-oriented lifestyle of Florida Keys inhabitants. However, an increase in liveaboard numbers and anchorages in recent decades has generated a variety of negative environmental impacts associated with improper boating behaviors and practices, including:

- *Haphazard anchoring techniques*
- *Overboard dumping of vessel sewage*
- *Generation of derelict and abandoned vessels*
- *Shoreside dumping of solid waste*
- *Habitat degradation*

In 1990 Florida Sea Grant conducted a boat liveaboard study (Antonini, et al., 1990) which estimated the number of liveaboards in Monroe County at 274 and cited associated impacts including floating debris, sewage, garbage, noise, crowding, abandoned boats, lack of appropriate shoreside access and crime. Twenty years later, an inventory of liveaboards by Monroe County cited a significant increase in liveaboard vessels, documenting at least 14 anchorages containing an estimated 600-800 liveaboard vessels. That inventory documented boating impacts in crowded

anchorages including seagrass damage from ground tackle, lack of space for transient vessels, abandoned and derelict vessels, sunken vessels, marine debris, and illegal discharge of sewage.

To address environmental impacts associated with inappropriate anchoring practices the Florida Keys National Marine Sanctuary (FKNMS) established a *Mooring Buoy Action Plan* in 1996. Since that time mooring fields have been established in Key West and Marathon, producing positive environmental impacts and modifying the mooring habits and behavior of liveaboard boaters in those locales. The use of mooring fields to address remaining unmanaged liveaboard anchorages was further documented in the 2002 Keys-Wide Mooring Field System study by Monroe County, which evaluated anchorages Keys-wide and provided a prioritization list for additional mooring field implementation. And in 2009 the Florida Legislature passed Statute 327.4105 promoting the establishment and use of mooring fields by directing the Florida Fish & Wildlife Conservation Commission (FWC) to create a Pilot Program for Anchoring and Mooring. Monroe County was included in the statute as a participant in the Pilot Program, due to the high demand for moorings in the Keys and regional impacts associated with unmanaged anchorages. Pilot Program workshops were conducted in the Keys in 2011, and received input from the public in support of additional mooring fields.

In 2012 the Board of County Commissioners (BOCC) made a commitment to further address liveaboard anchoring impacts, directing staff to pursue development of an additional mooring field (the Board recognized the DEP ‘Drop A Hook’ Program, no longer active, which promoted mooring fields every 25-50 miles along the Intra-Coastal Waterway to both provide for visiting boaters and reduce anchoring impacts). Monroe County staff responded to the BOCC directive by soliciting proposals for a Feasibility Study to 1) evaluate the current need for mooring fields, 2) prioritize a list of suitable mooring field sites, 3) prepare conceptual mooring field designs, and 4) conduct pre-application meetings with applicable state and federal agencies. The BOCC has committed County funds to provide for design/engineering/build of one additional mooring field in FY’14 and ‘15 based on the recommendations of the Feasibility Study.

Project Scope

The project scope for Restore Act funding includes implementation of three mooring fields (sites at Jewfish Creek, Buttonwood Sound, and Boca Chica Basin) which will, combined with existing mooring fields, comprise the Keys-Wide Mooring Field System. Monroe County has started the groundwork on the project by commissioning the Feasibility Study, being conducted by Coastal Systems International (CSI) which will provide preliminary mooring field designs and ensure the feasibility of required environmental permits prior to commencing the actual design/permit/build contractual process which will be awarded through a Request for Qualifications (RFQ) process. Monroe County has committed \$500,000 towards the mooring field project. In addition to installation of the mooring fields themselves, shoreside service facilities will be identified (during the Feasibility Study) that may be used for the management of the mooring fields through public-private partnerships. In the case of the proposed mooring field site at Boca Chica Basin, no existing appropriate facility has yet been identified and the County proposes to purchase an upland property for development as the shoreside service facility for that mooring field (included in the funding budget). Shoreside service facilities are necessary support infrastructure from which to manage the mooring field, provide dinghy docks, and amenities (laundry, trash, parking, bathhouses, etc.).

Mooring field design and capacity will be based on the projected use of each mooring field (to be determined based on current anchorage use). The projected use, generated by the Feasibility Study, will determine the number of moorings recommended at each site. Each of the three mooring fields is anticipated to provide for 50-100 vessels. Mooring systems will be based on the proven design of helical embedment anchors and Stormsoft downlines which are currently used in the Boot Key Harbor and Key West mooring fields. These mooring systems create negligible bottom disturbance during installation and ensure that the downline does not come into contact with the bottom during use, eliminating the benthic damage associated with the use of traditional ground tackle (i.e. anchor and chain). Each mooring field site and layout will be based on the most practical ingress/egress from adjacent boating routes (intra-coastal waterway on the bayside, and Hawk Channel on the oceanside), and adjacency to the shoreside service facility. Existing mobile vessel pumpout service, contracted by Monroe County, will provide sewage pumpout service to the three mooring fields.

The implementation of the Keys-Wide Mooring Field System and provision of shore-side service facilities will create a level of boating infrastructure sufficient to serve liveaboard vessels and meet the needs of cruising enthusiasts whom recognize the Keys as one of the world's premier cruising destinations. Mooring field policies and procedures (i.e. management) will ensure that current current anchoring impacts are eliminated, providing for environmental protection and the reduction of abandoned and derelict vessels.

Estimated Project Costs *(Describe the estimated costs of the project, including any assumptions for contingency and ongoing operations/maintenance. Identify other secured funding sources such as matching funds, in-kind contributions or state/federal dollars. In addition, if possible, complete and submit the Cost Appendix Sheet associated with this Form):*

Estimated project costs include the following components for the three mooring fields:

- 1) Land acquisition and building retrofit- *Boca Chica Basin site only*
- 2) Design and permitting
- 3) Installation

All three proposed mooring field sites are included in the feasibility study. One of the two Key Largo sites will be implemented using the \$500,000 budgeted by Monroe County. Restore Act funding, if awarded, will be used for the other two sites. The following budget table specifies costs for each of the proposed mooring fields.

As indicated, the budget includes a timeline for the completion of implementation of the three mooring fields. The Jewfish Creek and Buttonwood Sound mooring fields are anticipated to take two years to complete. The Boca Chica Basin mooring field is anticipated to take three years, with the first year to provide for land acquisition and retrofitting of existing buildings to serve as a shoreside service facility to the mooring field.

Proposed Mooring Fields Sites and Associated Costs				
Proposed Mooring Field Sites	Year 1 Design/Permitting	Year 2 Installation		Cost
Jewfish Creek anchorage	\$250,000	\$250,000		\$500,000
Buttonwood Sound anchorage	\$250,000	\$250,000		\$500,000
Proposed Mooring Field Sites	Year 1 Land Acquisition/Retrofit	Year 2 Design/Permitting	Year 3 Installation	
Boca Chica Basin anchorage	\$3,500,000	\$250,000	\$250,000	\$4,000,000
Total Cost:				\$5,000,000

Total project cost: \$5,000,000
Other/Secured funding: \$500,000 from Monroe County
Funding requested: \$4,500,000 from Restore Act

Based on Restore Act funding allocations, Monroe County is prepared to proceed with the implementation of the three mooring fields with the deletion of Land Acquisition/Retrofit costs (\$3,500,000) for the Boca Chica mooring field if necessary. While land acquisition appears to be preferable, the County could further seek a shoreside facility arrangement with an existing upland property (most of those adjacent properties are trailer parks or commercial fishing facilities). Based on the deletion of that specific cost, the total cost of the project would be \$1,500,000. With \$500,000 currently budgeted by Monroe County, the reduced overall budget would include a Restore Act funding request of \$1,000,000.

Other Funding (*Indicate if the project is submitted for any potential funding or if it may be used to leverage additional funding, if so please describe the funding source [e.g. State/Federal Grants]*):

Monroe County has budgeted \$500,000 from County Boating Improvement Funds towards the Keys-Wide Mooring Field System. In addition, a Feasibility Study has been funded from Boating Improvement Funds at a cost of \$23,750.

Technical Feasibility (*Describe the technologies involved and any relevant past experience or proven success with similar projects*):

Monroe County is experienced in the development and maintenance of mooring fields. The Monroe County Marine Resource Office performed the planning and design work for the Boot Key Harbor Mooring Field located in Marathon in the middle Keys, and provided oversight for the installation of Phase I, including 25 moorings. That mooring field, now managed by the City of Marathon, has 226 moorings and is one of the most successful mooring fields in the country. Mooring systems are based on the helical embedment anchor system, equipped with Stormsoft down-lines. This system is also used in the Key West mooring field, as well as other mooring fields

throughout Florida. The County anticipates utilizing the same mooring system for the proposed mooring fields.

Monroe County is currently utilizing Coastal Systems International (CSI) for a Feasibility Study to provide preliminary data and recommendations prior to submittal of final design and environmental permit applications for the mooring fields. CSI is experienced in planning and design projects in the marine environment, and has been involved with several mooring field development and build projects in Florida (Dinner Key mooring field, Sarasota mooring field, Naples mooring field).

Environmental Benefits *(Describe the nature, magnitude, and timing of any environmental benefits attributable to the project. If possible, describe potential environmental performance measures [e.g. pollutant reduction]. Please address any potential environmental impacts associated with implementing or maintaining the project [e.g. loss of a habitat or conversion of habitat from one type to another during implementation]):*

Management of currently unmanaged anchorages is necessary to ensure the protection of marine environmental resources in the Florida Keys and address the problem of abandoned and derelict vessels. Anchoring impacts in crowded Keys' anchorages is well documented, and the use of managed mooring fields is an accepted and proven strategy to address the variety of anchoring and boating impacts. Mooring fields are recommended in the Monroe County Comprehensive Plan, the Monroe County Boating Impacts Management Plan, and the Florida Keys National Marine Sanctuary Management Plan. In 2009 the Florida Legislature recognized the need to address statewide anchoring impacts and specifically included Monroe County as one of five Pilot Program sites in the State to test regulatory regimes designed to address anchoring impacts and support the use and development of mooring fields. Monroe County developed anchoring regulations in 2012 for several overcrowded anchorages in the Keys, including Boca Chica Basin. The implementation of additional mooring fields at Boca Chica Basin, and other high priority sites, is supported by the Pilot Program and will serve to enhance the management of vessel anchoring. Managed mooring fields, combined with Pilot Program anchoring regulations, will be part of a comprehensive system of vessel management in Monroe County.

Restore Act funding of Keys mooring fields is anticipated to provide the following benefits:

- *Improved water quality through the provision of mooring field pumpout service*
- *Management of currently unmanaged liveaboard anchorages*
- *Reduction of anchoring generated seagrass scarring and coral damage*
- *Elimination of derelict and abandoned vessels*
- *Economic boost through the creation of additional jobs*
- *Improved/expanded boating infrastructure for cruising vessels*
- *Supports tourism*

Benefits of the Keys-Wide Mooring Field System will be realized at the end of Year 2 of the project, with the implementation of mooring fields at Jewfish Creek and Buttonwood Sound. Boca Chica Basin is scheduled for mooring field completion in Year 3 of the project. Placing local liveaboard and transient vessels on moorings, combined with mooring field regulations and

shoreside service providers, will ensure immediate environmental improvements with the removal of anchors, chains and other marine debris currently used by vessels in anchorages. In addition anticipated mooring field regulations, supported through a state sovereign submerged land lease, will not allow for stored vessels which are often unattended for extended periods of time. These implementations will ensure that only proper, seaworthy vessels are moored and that no benthic damage is allowed to occur. Mobile pumpout vessels will perform regular required pumpouts, ensuring that the anchorages are free of overboard discharge (currently occurring in many crowded anchorages). The managed mooring fields will also save the County and State hundreds of thousands of dollars currently spent for the removal of derelict vessels.

The provision and required use of pumpout vessels in the proposed mooring fields will provide great environmental benefit. The illegal overboard discharge of sewage from vessels creates nutrient loading and presents a significant health concern to the public. The implementation of mooring fields distributed throughout the Keys will ensure that cruising vessels have pumpout facilities when transiting the Keys, and staying in the various mooring field facilities.

Economic and Social Benefits *(Describe the economic and social benefits including those related to the project's improved ecosystem services and any estimates on jobs created or preserved):*

Monroe County's marine environment, including the only barrier reef in the country, both directly and indirectly generates more than 70,000 jobs and \$6 billion dollars in economic activity annually, according to a study published in 2005 by the University of Miami (*Towards Sustainable Multispecies Fisheries in the Florida, USA, Coral Reef Ecosystem, Bulletin of Marine Science, 2005; Ault, Jerald, et al.*). Each year, \$1.3 billion is spent in marine outdoor activities by almost 3 million visitors; it provides 58% of all jobs (FKNMS Revised Management Plan, 2007; Sanctuary Biennial Report Part 2 to Congress 2013). Water related activities, including snorkeling, diving, fishing, and other activities support 33,000 jobs in the Florida Keys (NOAA, FKNMS Socioeconomics Factsheet). From 2007 to 2008, more than 400,000 visitors and residents of the Florida Keys engaged in over 2 million person-days of recreational sport fishing. These recreational fishers spend \$262 million in Monroe County, approximately \$103 million of which was directly spent on fishing items (NOAA, FKNMS Socioeconomics Factsheet). Approximately 739,000 visitors and residents participated in 2.8 million days of diving in the Florida Keys from 2007-2008; \$51.7 million was spent at diving/snorkeling operations. Moreover, divers spend a total of \$450 million in Monroe County, Florida Keys, supporting more than 7,500 jobs (NOAA, FKNMS Socioeconomics Factsheet).

The health of the marine environment is critical to the economy of the Keys and the significant tourism base. Improvements to the environment to be provided by the mooring field project will help ensure the sustainability of boating, diving, and other marine related tourism.

The use of managed mooring fields, particularly by local liveaboards, is a regulated means of ensuring that vessels are maintained and are not allowed to come in contact with the seafloor; a primary cause of benthic damage. In addition, moorings ensure that vessels are secure and not allowed to break loose; a common occurrence with traditionally anchored vessels. The required use of provided mobile pumpout vessels eliminates the occurrence of illegal overboard discharge,

typical in historic unmanaged anchorages. These implementation are anticipated to provide a much needed behavioral and cultural change in living aboard in the Keys, by providing liveaboard boaters with the tools and infrastructure to liveaboard responsibly. In addition, the provision of shoreside service facilities provides mooring field patrons with convenient shoreside access and amenities, eliminating the need to access the shore in, quite often, inappropriate or unapproved locations. These implementations provide a significant social benefit to both boaters and land-side property owners.

Community Resilience *(Describe if the project assists Florida's ability to anticipate, withstand, or recover from hazards or threats [e.g. hurricane preparedness, establishing living shorelines]):*

Properly designed mooring fields and engineered moorings provide not only secure mooring for vessels during normal weather conditions, but are also far superior to traditional ground tackle during storm events; quite common in the Florida Keys. Rock embedment helical anchors, mated with Stormsoft downlines have proven to be resilient in a number of hurricanes in the Florida Keys and other parts of Florida, with no documented storm-related failures. The shock-absorbing Stormsoft downlines ensure that the shock of vessels being tossed in heavy chop is absorbed, preventing jerking and potential failure of the mooring anchor and hardware. While post-storm recovery presents a significant effort to local governments in the Keys (e.g. derelict vessel cleanup, channel marker rebuilding, etc.) the security of engineered moorings and managed mooring fields lessens the impacts and associated recovery efforts, and ensures that suitable moorings are available after the storm event.

Mooring fields not only keep vessels secure during storm events, but help protect nearby maritime infrastructure including markers, dockage and other shoreline structures. The three mooring fields proposed will help protect marine and other shoreline facilities adjacent to those mooring fields, as well as shallow water resources that would otherwise be impacted by unsecure wind driven vessels.

Conflicts or Complements to Existing Efforts *(Describe any ongoing activities in the project implementation area, if the project is part of another plan, and why the project does or does not interfere with that work. Please consider how the project may complement existing local, regional, and state efforts/plans/objectives):*

The implementation of a Keys-Wide Mooring Field System is consistent with the goals of the Monroe County 2010 Comprehensive Plan and objectives of the Florida Keys National Marine Sanctuary Management Plan, and complements F.S. 327.4105 which established the Pilot Program for Anchoring and Mooring. The goals of the Pilot Program are to encourage the establishment of additional public mooring fields and to develop and test policies and regulatory regimes that: promote the establishment and use of mooring fields, promote public access to waters of the state, enhance navigational safety, protect maritime infrastructure, protect marine environment, and deter improperly stored, abandoned or derelict vessels. The Keys-Wide Mooring Field System supports and provides for the above objectives and furthers the vision and objectives of Monroe County and the Florida Keys National Marine Sanctuary. The regulations authorized by the Pilot Program and

ordained by Monroe County will be optimized with the establishment of additional mooring fields and the authority, through the Pilot Program, to regulate vessels within and outside of those mooring fields.

Implementation of mooring fields in Monroe County furthers the efforts of the DEP Southeast District's former 'Drop a Hook' program to establish managed mooring fields every 25-50 miles throughout the state. The DEP Drop a Hook program was instrumental in the development of the Boot Key Harbor mooring field in the middle Keys.

Complies with Federal, State, Local, and Tribal Laws/Regulations *(Describe any concerns or potential conflicts):*

The proposed Keys-Wide Mooring Field System project is consistent with Monroe County Comprehensive Plan Objective 202.4 which addresses the siting of mooring fields and the reduction of pollutant discharges into surface waters, and Monroe County Code Sec.26-37 which establishes rules and regulations for existing and future mooring fields.

Local, state and federal permit applications will be prepared and submitted for the proposed mooring fields. Monroe County will adhere to all applicable regulations. The Feasibility Study (currently underway) will include pre-application meetings with state and federal agencies to discuss current regulations and criteria and introduce agency representatives to the proposed project. Monroe County anticipates applying for sovereign submerged land leases for the three mooring fields.

Readiness for Implementation *(Describe if the project has had any design or permitting work started or completed [attach permits or design work]. Please address any issues that may delay start or finish of the project):*

Monroe County has begun a Feasibility Study (conducted by Coastal Systems International) to evaluate the three proposed mooring field sites, consider physical and environmental permitting factors, and provide preliminary design plans. The products of the Feasibility Study will help streamline the final design/permit process by providing the groundwork for the mooring field development, as well as identification of any potential permitting issues. The Feasibility Study final report (scheduled for completion in September) is anticipated to be presented to the County Commission in October 2013. Based on BOCC acceptance of the Feasibility Study recommendations, the Year 1 tasks (design/permitting) may proceed as early as late fall 2013.

Monroe County does not anticipate any issues that may delay the start or completion of the project. Mooring field implementation has the full support of the Board of County Commissioners (BOCC). Based on BOCC direction to proceed, the County will issue a Request for Qualifications to award a contract for the design/permit/build of the proposed mooring fields.

Public Acceptance *(Describe any known or potential public approval or opposition to the project):*

Based on numerous stakeholder input meetings during the development of anchoring regulations under the Pilot Program for Anchoring and Mooring in 2011, the public understands the benefit of mooring fields as a means of managing anchoring impacts, and indicated acceptance for the installation of additional mooring fields. The objective of mooring fields also received input during the public process for the Monroe County 2030 Comprehensive Plan, currently in development. During the Feasibility Study process, CSI will also present the study findings and recommendations for additional mooring fields at meetings of the Monroe County Marine & Port Advisory Committee and the Board of County Commissioners.

The management and protection of the marine environment is of highest priority for Monroe County. While the County honors the maritime heritage of the Keys, and the freedom and tradition of living aboard, the Board of County Commissioners recognizes the growth of unmanaged anchorages and the associated impacts the present. Mooring fields are a locally and regionally accepted management strategy for addressing those impacts, while providing desirable infrastructure for local and visiting boaters.

Additional Information you wish to provide *(Please include any maps, designs, drawings, photos, or background resources that may assist in completely and accurately understanding the project):*

The attached Keys-Wide Mooring Field System Preliminary Planning Document (2002) provides data on anchorages and vessels throughout the Keys, and describes associated anchoring impacts. The document includes recommendations and prioritization for future mooring fields. The Jewfish Creek anchorage site (and mooring field recommendation) is not included in the document, as that site has become a growing anchorage since the time of the report. The Jewfish Creek site is, at this time, considered the fastest growing anchorage in Monroe County.

Also attached is the Vessel Mooring Study for Boca Chica Harbor commissioned by Monroe County in 2010 and completed in 2011 by Terramar Environmental Services, Inc. The study included monthly surveys anchored vessels at Boca Chica Basin over a period of a year as part of the County's participation in the Pilot Program for Anchoring and Mooring. The study describes, and documents in photos, the overcrowded conditions in that unmanaged anchorage and the variety of environmental impacts generated due to irresponsible anchoring practices. The study further describes managed mooring fields as an important tool in addressing impacts associated with the long-term mooring of vessels.

Cost Appendix Sheet	
Cost Item	Cost Estimate
Planning	
Contracts	
Feasibility	
Engineering, Design, Land Rights, & Bid Prep	\$750,000.00
Restoration Plan	
Site Visits & Cost of Site Selection	
Administration, Overhead, and Indirect	
Other	\$3,500,000.00
Planning Subtotal:	\$4,250,000.00
Construction	
Contracts	\$750,000.00
Administration & Mobilization/Demobilization	
Other	
Construction Subtotal:	\$750,000.00
Monitoring	
Contracts	
Data Collection	
Monitoring Administration	
Other	
Monitoring Subtotal:	\$0.00
Project Cost	
Supervision	
Subtotal:	\$5,000,000.00
Contingency	
TOTAL:	\$5,000,000.00

Estimated Costs by Year	
Year 1	\$4,000,000.00
Year 2	\$750,000.00
Year 3	\$250,000.00
Year 4	
Year 5	
Year 6	