

## **ADDITIONAL INFORMATION**

### **Mooring Field Benefits - Addressing Multiple Anchoring Impacts through the Implementation of Managed Mooring Fields**

#### **Background:**

The Monroe County *Boating Impacts Management Plan Final Report* (1992) discusses the need to manage liveaboard vessels due to water quality degradation (i.e. overboard discharge of vessel sewage), user conflicts, inappropriate upland access, generation of trash, derelict vessels, and seagrass damage from the use of traditional ground tackle (i.e. anchor and chain). The report cites the siting and development of mooring fields as a management strategy to address the above mentioned impacts.

In the years following the completion of the *Boating Impacts Management Plan Final Report*, the County continued to consider mooring fields as a critical management strategy in addressing liveaboard impacts. The 2010 Comprehensive Plan includes Goals, Policies, and Objectives that describe the need to site and implement mooring fields. The Florida DEP also established the *Drop a Hook Program* in the late 1990's that addressed anchoring impacts and encouraged the establishment of managed mooring fields to, among other things, mitigate seagrass damage caused by traditional ground tackle and haphazard anchoring techniques.

The 2002 *Keys-Wide Mooring Field System Preliminary Planning Document*, prepared by the Monroe County Marine Resources Department, discusses the need for mooring fields in the Keys as a strategy to eliminate seagrass scarring associated with vessels in unmanaged anchorages. The 2008 *Development of a Boating Management Plan for the Boca Chica Harbor Area* prepared by the Monroe County Marine Resources Department discusses the use of a mooring field in that area to address seagrass scarring generated by vessels utilizing traditional ground tackle and unpermitted debris piles for mooring.

The 2014, the draft Monroe County Mooring Field Feasibility Study cites the benefits of managed mooring fields in addressing multiple anchoring impacts, including seagrass damage. The study describes mooring fields as "...a proven strategy to address the various environmental and social impacts that typically result from haphazard anchoring".

#### **Mooring fields and seagrass protection:**

Benthic surveys, including seagrass density and distribution data, are typically required by the Florida Department of Environmental Protection (DEP) with the application for permitting of managed mooring fields (for baseline information). The DEP places conditions on mooring field permits based on individual mooring field applications, and *does not have standard conditions for monitoring requirements*. Currently there is a new rule being promulgated by DEP to provide for a general permit for mooring fields. The general permit will make the permitting process smoother (less time) and more efficient (less expensive), and will allow for up to 100 moorings without requiring review by the Board of Trustees of the Internal Improvement Trust Fund. *If approved the general permit may not include any monitoring requirements. This lack of requirement for monitoring is based on DEP's recognition that managed mooring fields mitigate for seagrass damage, and that modern technical moorings (equipped with helical embedment anchors and sub-surface buoys to ensure that the down-line does not*

*come into contact with the seafloor) do not allow any physical contact of either the mooring system or the moored vessel with the seafloor.*

### **Findings of seagrass monitoring projects that have been performed:**

- Key West mooring field: a 2004 seagrass monitoring study conducted by Sandra Walters Consultants, Inc. indicated that “The latest data collected shows that no significant changes have occurred at any of the monitoring stations and suggests that moored boats at the Key West Mooring Field do not cause detrimental shading effects to seagrasses”.
- Dinner Key mooring field: A Marine Resource Monitoring Report by Coastal Systems International indicated no adverse seagrass impacts two years after the implementation of moorings at the Dinner Key Mooring Field Facility.
- Boot Key Harbor mooring field: there were no seagrass monitoring requirements
- General mooring fields: A 3-25-2014 communication from Tim Rach, Program Administrator for the Office of Submerged Lands & Environmental Resources Coordination with Florida DEP, indicated that of the three or four mooring fields in Florida permitted in areas of seagrass, none are showing any signs of impacts due to moorings.

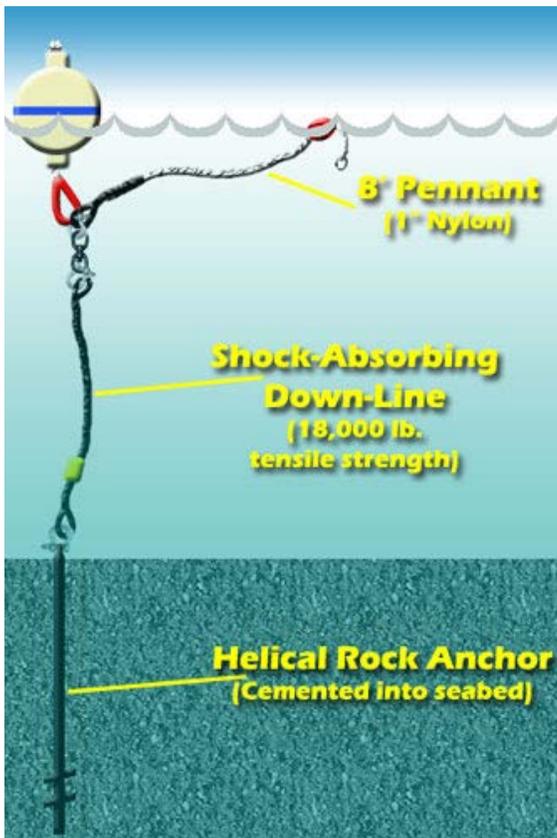
### **Summary:**

A 1997 study entitled *Advances in Environmental Mooring Technology* by John Halas discusses the use of environmentally sensitive moorings as a means to reduce or eliminate anchor damage to seagrasses and other benthic environments. The study indicates that mooring buoy technology has advanced around the world and has become a generally accepted tool for managing anchoring impacts, including the reduction or elimination of seagrass scarring.

Studies, such as those cited above, describe the use of helical embedment anchors for mooring systems and the implementation of mooring fields (using those systems) to reduce or eliminate seagrass damage caused by vessels in unmanaged anchorages. While the number of monitoring projects for seagrass (in association with managed mooring fields) is limited, those studies all indicate that no seagrass impacts have been documented after the installation of mooring fields. It is generally accepted that mooring fields mitigate (reduce or eliminate) seagrass scarring when installed in areas previous occupied by anchored vessels.

If monitoring of seagrasses, in association with mooring field permitting/implementation, is determined to be necessary or in the best interest of the State of Florida (which issues the submerged land leases for mooring fields) the DEP will provide such permitting conditions. However, based on the current direction of DEP, and the promulgation of a new state rule providing for a general permit for mooring fields, the State recognizes the multiple benefits of managed mooring fields and may not require any seagrass monitoring conditions placed on mooring field permits/leases in the future.

Diagram of a mooring system



Footprint the helical embedment anchor head



**Mooring of an engine block and chain:**  
(creates a halo from the dragging chain)



**Current mooring technology:**



## **ADDITIONAL INFORMATION ON SEAGRASS RESTORATION**

### **SUCCESS OR FAILURE TO MITIGATE OR GROW SEAGRASS**

The County has not performed seagrass restoration projects and is not involved with mitigation. Other agencies primarily have done restoration projects and are involved with mitigation in association with development projects that may impact adjacent resources, or events that generate direct impacts to seagrass beds. The Keys Environmental Restoration Fund (KERF) coordinates with ACOE and DEP on mitigation projects in the Keys in association with individual projects impacting seagrass. For larger projects requiring SFWMD approval, the agency will require mitigation proposed by the actual developer.

NOAA cites vessels for seagrass damage and in some instances will use restitution payments towards seagrass restoration for the specific site damaged or other areas determined to be good candidates for seagrass restoration. The main agencies involved with seagrass restoration in the Keys have been NOAA and Lignumvitae Key State Park. NOAA has been heavily involved in seagrass restoration for many years, and Lignumvitae Key State Park has been the site for several studies due to extensive damage in that area. While seagrass restoration projects occur all over the world, the Florida Keys is one of the few areas that has a high seagrass restoration success rate, based on the variety of indigenous seagrasses and a favorable growth environment. Turtle grass is the most common seagrass in the Keys, but also is slow growing. Other seagrass species tend to grow faster and may respond to restoration more effectively.

Seagrass restoration projects are used to address a variety of seagrass damage including prop scars, blow holes, berms and other grounding impacts. Techniques for restoration include bird stakes, replanting, filling, sediment tubes, nutrient injection, etc. Various studies have provided a range of levels of success. Restoration techniques have improved in recent years. Many of the restoration projects conducted show that seagrass restoration does work, given enough time, but may not result in pre-impact coverage. A combination of restoration techniques often provides the best results. The following is a list/summary of several seagrass restoration projects performed in the Keys using various techniques.

- *N-Control Seagrass Restoration Monitoring Report Monitoring Events 2003-2008 Florida Keys National Marine Sanctuary, Monroe County, Florida.*  
This restoration effort accelerated the recovery of the injured area but the injury has yet to reach pre-grounding baseline levels.
- *Seagrass Restoration efforts at Lignumvitae Key State Botanical Site*  
The most successful restoration method to date has involved planting plugs of Cuban shoal grass into the propeller scars. In conjunction with placing bird roost stakes along the scars, this has shown to produce significant regrowth of shoal grass.
- *Research Into Prop Scar Recovery, It's For the Birds!*  
Results so far indicate the injection method does not assist in seagrass recovery. However, the use of bird stakes improved recovery time to around 3 years. Use of stakes in addition to transplanting seagrass in damaged areas decreased recovery time.
- *Scientist Shares Research on Restoration*

Understanding the natural succession toward a mature turtle grass community is necessary to fully appreciate the "modified compressed succession" restoration technique described by Kenworthy at the workshop. The goal of restoration of a seagrass site is to return the area to the original community, which in many cases is turtle grass. With this method, resource managers "jump start" the succession process, attempting to bring the site back to the original community sooner than would occur in nature.

- *Sanctuary is Site for Seagrass Restoration Techniques*

The scarred seafloor can be returned to its original depth in the deeper blowholes and prop scars by filling the depression with pearock before transplanting. This helps stabilize the substrate to prevent further deterioration from erosion and to prepare the area for colonization by neighboring or transplanted seagrasses. In time and if the conditions hold, the transplants will establish themselves and begin to grow.

- *Restoration Activities Speed Seagrass Recovery in the Florida Keys*

Results of a five-year monitoring effort to repair seagrass damaged in a boat grounding incident suggest that restoration techniques such as replanting seagrass can speed recovery time.