



## Stage 2

- Purchase mooring hardware from EMI – “Environmental Moorings International” who specialize in this. We bought 17 “Manta Rays” which jack-hammer into the sandy locations with at least 7ft. of sand. Two eye bolts will be cemented in 2” holes drilled in hard bottoms with chain joining them together for a stronger mooring in deeper water. We chose 24” buoys for deep scuba sites & 18” buoys for anchorages.
- Enlist the Belize Tourism Board’s (BTB) assistance in clearing the equipment duty free through Belize Customs.
- Host classes on splicing rope to teach as many people in the community how to assemble the top side buoys & make up the pickup lines.

**Splicing classes were held twice at the TMM dock. The first one was followed up with food & drink to raise the spirits of all participants.**

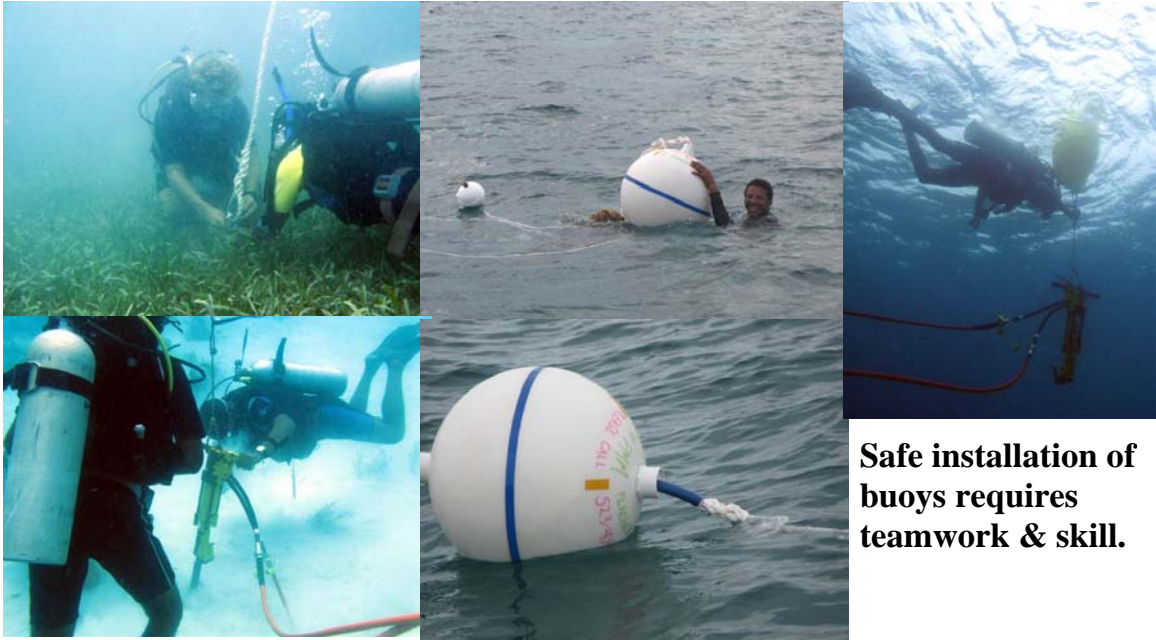


## Stage 3

- Getting the mooring buoys installed.
- Setting up ways to make the project’s monitoring & maintenance program sustainable through voluntary donations & merchandise



**First we installed the Manta Rays inside in shallower waters to practice & teach.**



**Safe installation of buoys requires teamwork & skill.**

**Just as important as the financial donations are the PMM volunteers  
Site Survey Volunteers**



**Erwin Westby - Mooring installation specialist  
Lisa Carne - Consultant Marine Biologist  
Louis Godfrey - Dive Master  
Patti Ramirez - Dive Master/instructor  
Dorian Young - Dive Master  
Ed Carr – Captain  
Boat donated by Joy Tours  
Dive tanks donated by Seahorse Dive Shop  
Fuel donated by TMM charters.**



**Erwin Westby - Mooring installation specialist**  
**Lisa Carne - Consultant Marine Biologist**  
**Chris Lewis - Dive Master**  
**Patti Ramirez - Dive Master/instructor**  
**Dwayne Young - Dive Master**  
**Ed Carr – Captain**  
 Boat donated by Joy Tours  
 Dive tanks donated by South Belize Reef & Jungle  
 Fuel donated by TMM charters.



**Erwin Westby - Mooring installation specialist**  
**Lisa Carne - Consultant Marine Biologist**  
**Chris Lewis - Dive Master**  
**Patti Ramirez - Dive Master/instructor**  
**Randy Tucker – Captain**  
 Boat donated by Eworth Garbutt  
 Dive tanks donated by Splash Dive Shop  
 Fuel donated by TMM Charters.

**Installation volunteers**



**Erwin Westby - Mooring installation specialist**  
**Mark Tucker - Dive Master**  
**Claudio Trejo – Sailing Captain**  
**Kirk Mayen – Dive Master**  
**Todd Shields – Dive Master/Sailor**  
**Louis Godfrey – Dive Master**  
**Faygon Villeneuve – Dive Master**  
**Nedia Chaplin – Cook**  
 Boat donated by The Moorings, Site boat donated by Aquaterra  
 Dive tanks donated by South Belize Reef & Jungle & Nautical Inn  
 Fuel donated by TMM Charters

## Learning Curve - Pros

Everyone on the steering committee has worked well together & followed through on their personal commitments.

- We all have a better understanding of the work involved for 30 buoys & look forward to year 2, which will concentrate on maintenance & financial sustainability.
- Support from parts of the community beyond the marine tourism industry has been amazing! Local grocery stores, general public & even visitors (ref: Breeze article April 2007) have all donated to the project.
- It has been interesting to note that the main dive operator's donators have been the small Belizean run operations over the large foreign investment resorts. But as we move into phase 2 monitoring & maintaining we hope to get the larger resort operators involved more.
- It's been great to receive quality support from Fisheries, BTB, Friends of Nature & the San Pedro Tour Guide Association, but none of this would be possible without CORAL & WWF. We thank you all!

## Learning Curve – Cons

- **Underestimating Costs** – It's difficult to see all the unknown hidden costs that inevitably arise so count on 20% for this as you would building anything.

**Solution:** Start planning the details as early as you can & don't be afraid to include realities that might not be covered by grant money such as parties to raise interest, labor when voluntary labor is unrealistic & fuel if expensive like in Belize.

- **Underestimating time required** - Factors such as time to placing order to shipping to receiving was much more than anyone expected. Peak Season had arrived & now most of our volunteers had work commitments, as were the boats pledged to us.

**Solution:** Looked to other divers not involved in tourism industry to volunteer & other non-tourist boat owners to donate vessels.

- **Underestimating material needs** – Ran short of rope!

**Solution:** Buy more than you think you need! We were fortunate enough to borrow some from Fisheries. We thought we had enough Helix donated by TMM to complete all pin installations but Fisheries have put ban on their use in Belize, we discovered this type (walk in type) was not suitable for these installations, so we plan to use manatas, but in view of new information coming to PMM in regard to best mooring pins for large vessels, looks like we should educate Fisheries into getting ban lifted.

## Current Status

- Buoys installed to date - 7 dive sites, 1 snorkel sites , 2 dual use - anchorage/snorkel sites & 8 anchorages for leisure/charter vessels are completed & currently in use.
- 18" buoys, more rope & Manta Rays are on order – looking into stronger cement for eye bolts & possibly rigging bridle setups for some sites due to very large boats mooring in the area.
- As should have been anticipated we are experiencing tampering of some of the buoys, solution currently being implemented is to secure shackles to anchor pin with wire rope & ferrule set up, as cable ties have been cut & shackles removed, also to use lok-tight on the swivel top section of manta rays, this will make routine maintenance more lengthy but should deter all of tampering. Use galvanized shackles over S/S to reduce theft temptation. Raise industry & public awareness to counter misconceptions regarding the use of mooring buoys.
- Fund raising wristbands are now in Placencia and are already in stock at various places that the steering committee feels will be promote the program. Wristbands will be sold at

- \$5US each (wholesale \$4US). A marketing push is currently underway by email and the local tourism newspaper *The Placencia Breeze* to get the word out.
- Brochure is being printed and should be back in the Placencia area for distribution early next week.
  - Members of the steering committee have been invited to attend the next local BTIA (tourism industry) and Tour Guide Association meetings – both to take place in August – to raise awareness about the entire program.
  - Throughout the entire project the Placencia Mooring Masters have run a series of articles in local paper *The Placencia Breeze*, which is distributed throughout the country of Belize, parts of the United States, Canada and Honduras and can also be seen online at [www.placenciabreeze.com](http://www.placenciabreeze.com).
  - Into the future beyond maintaining what we, since completing the installations we have, we are now being asked to address the larger vessels traveling the greater Placencia waters, the buoys we have installed are really for 40ft max. We are now being advised that most Guatemalan & the larger charter fleets are now bringing vessels over 43ft into Belize, to address this we will need to upgrade some of the current installations & all future installations. This will mean using thicker rope than 7/8", helix mooring pins or epoxy resin to set drilled pins, 2 or 3 leg bridle systems. We are currently talking with operator in BVI who has installed 100's of mooring buoys for large vessels in BVI waters for advice. So we will be looking for further funding to achieve this, better to be a step ahead than fall behind.

## Supporting the Implementation of Voluntary Standards for Recreational Boat Operations through the Improvement of the Existing Marine Infrastructure of the Roatan Marine Park

### Project description:

The grant awarded by CORAL in 2006 was used to improve the marine infrastructure of the Roatan Marine Park which in turn raised operational standards through the implementation of rules and guidelines and improvement of facilities. The projects the Park focused on were the renovation of current dive moorings and the installation of new sites, the installation of channel markers, the emplacement of yacht moorings, the creation of shallow reef swim areas, and the erection of signs throughout the Park.

### Dive Moorings:

Before the grant was received, there were approximately 25 dive sites in use within the Park. Many of the sites' groundings had been installed years prior using sand screws, large pins, or stainless steel chain in cement. All were in dire need of inspection and maintenance. New heavy duty, highly visible buoys were required as the polystyrene balls or plastic bottles used at many dive sites were cosmetically unpleasant and a hazard to boats. The older lines were in poor array due to the wear and tear incurred over years of constant use. Many were covered in fire coral or hydrozoans, making it a hazard for divers. With limited sites and 14 dive shops, most operating 2 boats, it was not a rare occurrence for several boats to share the same mooring. This endangered divers and caused friction between many of the dive shops.

We have increased the number of dive sites within the Marine Park by **sixty percent**, bringing the total number of operational sites to 40. Included in the additional 15 dive sites are 5 Open Water training sites, which provide safe locations for dive shops to bring students. This has ensured that dive shops do not have to compete with one another for suitable training locations, increasing diver security. The abundance of new dive sites has reduced animosity between dive shops by ensuring that no more than one boat occupies a dive site at any given time.

One of the problems encountered during the installation program was the lack of sand patches deep enough to install sand screws. Therefore, the majority of new sites were installed using the concrete and chain method. This simple and easy method does not limit the placement of additional dive locations. Another problem encountered was the loss of mooring lines, which floated off or broke loose when moored to. The previous method of using D-pins to attach the lines to the grounding proved ineffective. Leader wire was then used to secure the pins but this still failed to prevent the lines from breaking free of the groundings. The solution was to abandon the pins and use stainless steel quick links. This method has proved much more reliable. Another improvement made to all moorings was the elongation of the lines. An additional 5-10 feet of line was added to each mooring, reducing the strain on the grounding thereby lengthening their life span.

### Channel Markers:

There are 4 major channels located within the West End and West Bay region, all of which were poorly marked. **Eight regulatory channel markers were purchased** using the grant money. Each marker displays the words “No Wake” and “Slow” and is equipped with reflectors for night time use. The markers have made boating safer by clearly defining the channels, especially to visiting yachters, tourists renting speed boats, kayakers, and others less knowledgeable of the reef.

The maintenance of the channel markers has been an ongoing battle since installation. Large storms and the daily rise and fall of waves continuously pull the chains taught, placing great stress on the system. It became apparent that we would have to alter our methods after one channel marker was lost and another was damaged during a large storm. A tire was added to give the system elasticity and quick links were used rather than D-pins. In addition, the galvanized chain needed to be replaced with stainless steel as it degraded too rapidly from emersion in salt water and the constant abrasion from the tire.

### Yacht moorings:

Prior to the grant, all yacht moorings within the Park had been put in by yacht owners. These consisted of engine blocks, sand screws, or concrete blocks. The plan for the grant is to leave the sporadically spaced “private” moorings in place and install new yacht moorings together in one area. This would enable the Park to keep a closer eye on those using the moorings and simplify inspection and maintenance. Several of these yacht mooring have already been installed using 6ft sand screws and large quick links. The project is ongoing.

A dilemma faced with this project was whether to limit line length to encourage yachters to use a longer bow line or to install a long line to minimize risk of damage to the grounding. After careful consideration, it was decided to use a short line. Leaflets were also created to inform people of yachting procedures within the Marine Park.

The initial plan was to use 3 sand screws per yacht mooring but it became apparent that this was unnecessary. Due to the depth of the channel restricting access of larger yachts, one 6ft screw would sufficiently support any boat using the mooring. In addition to strengthen the mooring line, the proposed polypropylene rope was exchanged for nylon.

### Shallow reef swim areas:

Another ongoing project is the creation of shallow area snorkel locations. There are several shallow reef areas close to shore that are routinely subjected to impacts from snorkelers. It was decided that sites located in West Bay and West End would be designated as experienced snorkel regions and be roped off. This preventative measure is firstly to protect the reef and secondly the snorkelers. Signs will be erected in high traffic areas to reinforce messages displayed elsewhere about protecting the reef.

Accounts:

Below is a very brief breakdown on how the grant money was spent. There were alterations from the original grant due to unplanned circumstances and this is evident in the item totals.

<b>Items Purchased</b>	<b>Total Spent, \$</b>
Mooring buoys	5,995
Channel Markers	2,195
Rope	1,180
Signs	1,500
Chain	1,000
Quick links	650
Sand screws	600
Swivels, shackles & Eyelets	550
Cement	215

Alliances forged:

The Marine Park has been able to strengthen relations between dive shops through the calling of general assemblies. Meetings attended by dive shop owners, instructors, and dive masters have addressed issues regarding operational standards and dive etiquette. There has been an increased awareness of the Park and its responsibilities by involving the diving community. Communication between shops and the Park have ensured that standards are met and maintained, with dive professionals acting as additional watchdogs.

In recent months the Park was instrumental in the creation of the Fishermen's Alliance, an official entity which works alongside the Marine Park to help conserve Roatan's reef. This has helped forge a partnership between divers and fishermen, reducing conflicts and confrontations. Boat operational standards have been introduced in the meetings and the Alliance intends to develop their own fishing moorings, FADs and other infrastructure to the Park.

Community involvement has greatly increased in the past months, not only with those in the dive industry and fishermen, but with other marine users and the local schools. Ties with the local municipality and the police have been strengthened, enabling the Marine Park to be an entity who people can contact.

Future Plans:

The infrastructure project will be an ongoing program which will require continuous supervision and maintenance. Moorings will need to be monitored and replaced when necessary, channel markers and buoys will need to be cleared of algae and epiphytes regularly. Daily wear and tear means the Park will need to inspect all new placements.

A proposed expansion of the Park will require further dive moorings, channel markers, signs etc. to be installed. This project will need funding and we are currently applying for a grant from PMAIB, a group responsible for managing the Bay Islands.