

REEF RELIEF  
in cooperation with  
the Negril Coral Reef Preservation Society

**"for our children's children"**

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Introduction

By DeeVon Quirolo, Project Director, REEF RELIEF

The living coral reef is the most diverse marine ecosystem on Earth, rivalled only by the tropical rain forests on land. Reefs are the product of growth that has taken place over geologic time and have been in existence over 200 million years.

These living underwater gardens provide unlimited pleasure from diving, snorkeling and fishing; many local economies depend on the commercial harvest from the reef. However, since most coral reefs are in coastal areas with increasing populations, they are threatened with being "loved to death."

The island of Jamaica is blessed with warm, clear, tropical waters, which provide optimum conditions for an abundance of coral reefs. The future of Jamaica's economy depends upon the continued health and vitality of the marine environment.

As Jamaica's tourist economy grows, so will the number of boats visiting the reef. The careless toss of an anchor can destroy decades of coral growth. Fortunately, reef mooring buoys, a system which prevents anchor damage to coral reefs, has been developed by the United States National Marine Sanctuaries Program and adapted for use by private non-profit organizations such as REEF RELIEF. Reef mooring buoys provide an alternative to anchoring on the fragile living coral.

REEF RELIEF is a non-profit conservation organization dedicated to protecting Florida's coral reefs. REEF RELIEF was the first private group to install reef mooring buoys at heavily-visited reefs in the Florida Keys. Recent acquisition of mooring buoy installation equipment now enables us to assist others interested in creating coral reef protection programs with actual installation of buoys to eliminate anchor damage.

Our information -sharing with a number of private and government entities from all over the world regarding reef mooring buoys and coral reef awareness efforts brought us into contact with the Negril Coral Reef Preservation Society.

The opportunity to assist this group to protect Negril's reefs led to a cooperation venture between REEF RELIEF and the Negril Coral Reef Preservation Society to install reef mooring buoys at heavily-visited reefs off of Negril, Jamaica. After

traveling to Negril to identify the sites for possible buoy installation, the level of interest expressed by local resort and dive shops, the Negril Chamber of Commerce, the Jamaican government, the scientific community and neighboring countries spurred us to host a workshop along with the installation process in order to provide a learning experience for those interested in the project.

A workshop entitled "Protecting Jamaica's Coral Reefs: Reef Mooring Buoy Workshop" was held November 15 - 17th, 1991, in Negril and co-hosted by the Negril Coral Reef Preservation Society and REEF RELIEF. The workshop offered a fast-paced, hands-on, informative agenda on protecting Jamaica's coral reefs, with a focus on the installation and use of reef mooring buoys.

In addition, thirty-five reef mooring buoys were actually installed at Negril's coral reefs during November by members of the Negril Coral Reef Preservation Society in a cooperative project utilizing the equipment and expertise of REEF RELIEF.

Workshop participants experienced the actual installation process, followed by sessions on the development and use of mooring buoys by REEF RELIEF Founder and Executive Director Craig Quirolo. Katy Thacker, President of the Negril Coral Reef Preservation Society, described local efforts to save Negril's reefs by this volunteer organization.

But mooring buoys are only part of the solution to protecting Jamaica's coral reefs. The workshop agenda featured world renown coral reef expert Dr. Thomas Goreau, who addressed long term changes in Jamaica's coral reefs. Carl Aiken, fisheries expert and Lecturer at the University of the West Indies, spoke on Jamaican fisheries. Eco-tourist authority Herber Hiller spoke about future trends in the tourist industry and how a healthy economy depends on a healthy environment. An address by Bobby Stevens of the Jamaica Tourist Board noted how important the project was to Jamaica's future.

A splicing party on the beach at Negril provided a learning opportunity on how the buoy lines are spliced and prepared prior to hooking them up at the reef. The workshop ended with a celebration as the first reef mooring buoys were hooked up at Negril's coral reef.

This report provides some of the most important information from the workshop and installation project. It was an exciting and successful event. We hope this report will enhance the efforts of others who are either involved or merely curious about protecting coral reefs.

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## [Reef Mooring Buoy](#) [Installation, Use And Maintenance](#)

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[Eyebolt-Type Buoy Installation/ How To Use Mooring Buoys](#)

[Reef Relief'S Maintenance And Inspection Program](#)

[Suppliers: Reef Mooring Buoy Components](#)

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### Background

A former charterboat skipper, Craig founded REEF RELIEF in 1986 to "Preserve and Protect the Living Coral Reef of the Florida Keys." Since that time, he has installed over one hundred reef mooring buoys at seven reefs near Key West, Florida. He maintained a state of the art maintenance program for these buoys until they were transferred to the Florida Keys National Marine Sanctuary in October, 1997. His reef conservation activities on behalf of REEF RELIEF have resulted in numerous awards, not the least of which was personal presentation of a Point of Light Award from President George Bush on Earth Day, 1990.

Physical contact with living coral by boat anchors and chain causes a considerable amount of unnecessary damage to the reef-building coral polyp, a living animal. As tourism increases worldwide and the popularity of diving and snorkeling continues to grow, tourist destinations fortunate enough to be blessed with living coral reefs will find it necessary to adopt a plan for protecting these biologically diverse habitats. Wise management now will insure the very survival of delicate coral reef ecosystems for the enjoyment and appreciation of future generations.

Boats anchoring on or near a living coral reef damage the fragile coral polyps and other sealife. Impacts from the drop of the anchor, movement of the chain or line attached to it, and subsequent anchor dragging on the ocean bottom can physically scar corals and other sealife, opening it up to infection and disease. Physical damage by anchors and chain can be eliminated through the installation and use of the reef mooring system.

Reef mooring buoys serve a variety of purposes besides eliminating anchor damage. They act as fish attractive devices (FADS), they act as aids to navigation, divers ascend and descend on the down lines, tired swimmers and divers have been known to hold onto the buoys in emergencies, the eyebolt acts as an underwater reference point for scientific research, they act as a catalyst to rally community support for reef protection

programs and they symbolize an attempt to protect the living coral.

## REEF MOORING BUOYS

### Core Type Eyebolts

The original reef mooring buoy design by John Halas of the Key Largo National Marine Sanctuary is ideal for areas of hard coral rock bottom. The installation utilizes a stainless steel eyebolt which is hydraulically-cemented into a 2 1/2" by 24" deep hole on the ocean bottom. The eye extends above the surface of the bottom to which the mooring system is attached.

The eyebolt is the highest quality stainless called 316 stainless steel. One end of the 5/8" rod of such steel is rounded to create a closed eye that is 3' in diameter. The rod is twenty inches (20") long with a cross bar a few inches in length welded to the other end. This end is inserted into the core hole leaving the end with the eye bolt extending above the surface. Hydraulic cement is then packed into the hole around the eyebolt.

The mooring line is divided into three separate yet interlocking section, the down line, the buoy line and the pickup line. The reasoning for the three sections is that each one wears out at different times and it is less costly and more expedient to replace the sections as they wear out. The loop at the bottom of the buoy line is large enough so that it can be interlocked through the upper eye splice on the down line and over the buoy from the surface, eliminating the need to dive when replacing a broken buoy.

Ultra violet-treated polypropylene line is used for the pickup and down line because it floats. The theory is to keep the down line floating up away from the bottom and to keep the pick-up line floating on the surface. The buoy line is a two-part polydacron line which has excellent wearing capabilities and far outlasts polypropylene for this purpose. The eye splice at the bottom of the down line is encased in a plastic, nylon-reinforced hose which protects it from chafing on the bottom and at the shackle.

The ball buoy itself is an eighteen inch (18") spherical polyethylene buoy filled with polyurethane foam that provides one hundred pounds of buoyancy. A 1 inch PVC pipe runs through the middle of it with tapered reducing bushings extending out each end through which is passed the buoy line.

The shackle currently in use is a wichard bow shackle, with the ability to handle 13,230 pounds of pressure. The shackle pin is 15/32th of an inch in diameter and when screwed closed, secures the bow. It tightens and the pin can be replaced when worn.

### Big Boat Buoys

A second type of eyebolt was designed and has been successfully used at Key West area reefs by REEF RELIEF. It is called a "Big Boat Buoy". The eyebolt rod is shaped like a horseshoe and both ends are inserted into separate core drillings and hydraulically-cemented into the ocean bottom. The additional strength of a second cemented base increases the stress that the buoy can absorb and is ideally suited for use by boats over forty feet in length. The rest of the buoy components are identical to those described above.

## Manta Rays

A second type of mooring used at coral reefs is the manta ray which is ideally suited to areas of rubble bottom. Both core-type and manta ray installations were utilized for the Negril mooring buoy project. (See diagram.)

This system involves the use of a long galvanized rod either three quarter inch or one inch in diameter with an eyebolt on one end. The length of the rod can range from three one-half feet to eight feet, depending on the holding capacity required. The rod is attached to an anchor-type device (the manta) at the other end and can also vary in size. Holding capacity ranges from five thousand to thirty thousand pounds. The manta ray rod and anchor are jack-hammered into the rubble bottom with a hydraulic hammer and gad set, leaving the eyebolt exposed above the surface as with the core-type installation. (See diagram.)

After installation, identifying numbers are usually affixed to the buoys along with an identifying decal by the organization responsible for maintaining the buoys. This enables members of the public to return any lost buoys and identifies the sponsoring organization of this reef conservation project.

## THE INSTALLATION PROCESS

The drilling procedure requires hands-on experience and hydraulic drilling equipment and compressor. For the Negril project, REEF RELIEF provided the equipment to install both manta and core-type buoys.

Components were ordered and shipped from the United States and were hand-walked through Customs in order to have them available when the project began. This enabled the project coordinators and volunteers to begin cutting the lines and assembling the buoy components prior to actual installation. A buoy splicing party was held to train local volunteers how to splice lines. Six splices are required for each buoy assembly.

Experienced mariners usually know how to splice lines. Utilizing volunteer boat skippers is an effective way of incorporating local user groups into the reef mooring buoy program.

Once assembled, the assembled reef mooring buoy can be shackled to the eyebolt on the ocean bottom by divers.

## CEMENTING UNDERWATER

A new method of delivering the cement to the core hole was perfected in Negril.

One important innovation was developed during the Negril buoy installation project. The use of an injection tube proved to be a significant improvement in the process of cementing the eyebolt into the core hole on the ocean bottom.

By using an injection tube to carry the cement from the boat to the core hole underwater, the amount of turbidity in the water during the cementing process was reduced. This system requires that the cement mixture be in a liquid state, which allows for better penetration into the substrate and reduces the chances of having voids in the cemented core. The process also allows the core hole to be filled from the bottom up, the desired method for pouring hydraulic cement underwater.

Using the injection method also conserves cement as a known amount of cement is required to fill each injection tube. The liquid consistency allows the cement to pour freely into the tubes.

The injection tube, plunger and funnel are all made from PVC plastic parts. To crate one, drill a 2 1/2 inch hole in the center of a 6" end cap and cement a 2 1/4 inch sleeve onto it. The sleeve will fit over the 2 1/4 inch PVC injection pipe allowing the cap to be used as a funnel. The injection tubes are 2 1/4 inch PVC pipe and approximately two and one half feet long. For the Negril project, two tubes were used even though one longer tube would have sufficed. The ends of the injection tube are sanded down so that the end caps fit extremely loosely on the ends. Water pressure will keep the caps securely fastened upon descent although it is necessary for the diver to hold each end cap in place. When the mixture is poured into the tube, the bottom end cap must be held in place to avoid spilling the mixture out the bottom. All parts of this system must be rinsed immediately after using them to avoid the cement from hardening in any of the parts.

When the diver arrives at the site, the tube is placed just above the core hole. The ocean bottom end cap is removed and the tube is slid down into the hole. Once the injection tube hits bottom, the top cap is removed and the plunger is gently placed into the tube.

The idea is to pull the injection tube up out of the hole as the plunger stays stationary allowing the cement to flow freely into the hole. As soon as the core hole is full of cement, the eyebolt is placed into the hole and is covered either by the divers hands or by using a lead covering pad. If for some reason, the uppermost cement is swept out of the hole, a small amount of cement mixed to a putty-like consistency can be used to

top off the hole, making sure the welds of the eyebolt are covered and embedded in the mixture.

## MAINTENANCE AND INSPECTION PROGRAM

REEF RELIEF suggests that the Negril Coral Reef Preservation Society develop a regular programming of inspecting and maintaining the buoys based on the current program that we follow, which has worked well. Stockpiling components in one central location and making arrangements for regular inspection and replacement of defective parts promptly insures that the buoys are dependable. Cleaning off marine growth becomes an almost weekly tasks, especially during the warmer summer months when algal growth proliferates. We have stopped cleaning the down-lines because the growth creates a fish attracting device. Likewise, only the eyesplice on the pick-up line is cleaned to encourage boaters to add an extra length of line to the pick-up, which reduces the horizontal pull on the buoy and permits the algal growth to act as an ultra-violet light inhibitor on the line. See attached Maintenance and Inspection Program, which is followed to maintain the 199 reef mooring buoys which REEF RELIEF has installed at seven Key West area reefs.

## MAINTENANCE AND INSPECTION PROGRAM for Reef Mooring Buoy Demonstration Project

The success of the reef mooring buoy project for Key West area reef zones is dependent upon a timely and efficient maintenance program. REEF RELIEF has instituted a program of scheduled inspections and maintenance patterned after that utilized by the National Marine Sanctuaries Program. In addition, we have developed a reporting network including the skippers of the various charterboats that visit the reef regularly.

### 1) Each Month:

Inspect all buoys and pickup lines for condition. Correct deficiencies and replace lost buoys on the spot. Scrub marine growth from buoys and pickup lines. Replace pickup lines having more than six months of continuous service. Replace reflective tape on buoys as needed.

### 2) Every three months:

Inspect down line, shackle and eyebolt for wear. Repair, replace as necessary.

### 3) Every twelve months:

Replace down line. Replace pin in anchor to down-line shackle.

### 4) Replace/repair buoys reported out of service within five days of discovery/report to

REEF RELIEF (weather permitting.)

5) REEF RELIEF monitors any new mooring buoys and their usage closely for the first three months after installation. We also assist local boaters in becoming acquainted with the mooring buoy system.

6) REEF RELIEF has also developed a network within the watersport industry. Several dive and charterboat operations have agreed to assist us in our visual inspection program by noting buoy count and buoy condition. By incorporating the assistance from these commercial dive companies, we can be provided with additional frequent and up-to-date visual reports on the condition of the buoys. REEF RELIEF wishes to stress that these reports will be in addition to our own inspection program.

7) The numbering system of the mooring buoys shall be preserved. Unnumbered buoys may be substituted for a period of not longer than five days while a properly numbered buoy is being repaired or replaced (weather permitting.)

8) REEF RELIEF shall maintain the reef mooring buoys in the 20' Aquasport workboat owned by REEF RELIEF and marked, "REEF RELIEF REEF MOORING BUOY MAINTENANCE" on both sides of the vessel. The secondary maintenance vessel, "Stormy Weather" (1 30' John Alden sloop) will have a sign on both sides of the hull reading "MOORING BUOY MAINTENANCE" when engaged in such activities. Any other vessels used will display similar signage when so engaged.

9) Deficiencies in the mooring buoy system will be corrected as they appear in the inspection/repairs reports.

10) REEF RELIEF shall maintain a log of all maintenance activity including date, location, activity, and comments.

## PLACEMENT OF REEF MOORING BUOYS IN NEGRIL

Traditionally, buoys are placed where boats are dropping anchors on or near living coral.

In September 1991, divers from the Negril Coral Reef Preservation Society and REEF RELIEF spent five days logging fifteen dives inspecting bottom conditions and depths to select mooring buoy sites for the reefs of Negril, Jamaica. All of the sites are used on a daily basis by the commercial dive/snorkel industry as well as by fishermen and were subjected to daily anchor damage. The results of the inspection dive gave us the necessary information to draw up a list of components required for the installation process. We made a determination of what type of anchor system to use at each location, ordered the components, and developed a chart of the potential installation sites which expedited the permitting process. The Negril Coral Reef Preservation

Society then received permits to install forty reef mooring buoys.

### Shallow Reefs

Snorkeling reefs seem to suffer the most . . . people stand on them and they are closest to land-based sources of pollution.

Snorkeling reefs or shallow reefs offer the biggest challenge in reef mooring buoy placement. The buoys must not be placed so far away from the reef that they are not used or so close to the reef that boats will hit bottom while attached to them.

The process we followed was to pre-cut temporary marker lines and attach a float to one end. Next we surveyed the area where the buoy is needed and marked the shallow submerged areas with a few floats. This provides a reference to areas that should be avoided and narrows down the potential locations for the eyebolt. Next, we attached another float to the area that appeared to be free and clear and about right for the buoy's location. A free swing zone must exist for the buoy when it is unoccupied as well as occupied.

The extra scope added to the down line floats beneath the surface because it is weighted and must swing free. Temporary buoys also provided visual bearing on where each buoy will be located at each reef. During REEF RELIEF installations, we leave the temporary buoys floating for a few days which enables the commercial charter fleet to assess their positioning and provide input. Usually, it is good to keep the buoys about 180 feet from one another although there are instances where they are closer.

Pinpointing the exact location of the buoy is now a matter of looking for that "certain spot" near the temporary marker. It is obvious when the bottom is hard and flat, free from voids, fissures, cracks and sand. On these hard bottoms, the exact spot should be as far away from any living coral as possible. If the area is a rubble-type mixed bottom, it is necessary to probe the actual bottom depths first, making sure there is six feet (or whatever the length the manta rod you are using) of rubble to drive into. If hard bottom is found only a few feet down, this spot will not do. On all mooring buoy installations, it is best to work in an area not covered in coral and other sealife. Remember, divers will congregate on the bottom near the buoy eyebolt. Work crews and inspection crews will visit the area as well. Typically the eyebolt is not placed in an area of pristine living bottom.

### Intermediate Reefs

With names like the Throne Room and the Gallery, you know these reefs have to be spectacular.

On intermediate reefs from forty to sixty feet, the placement of buoys becomes less of a strategic problem because the free swing zone for the keel is no longer a problem. The distance between buoys and free swing zones for the down-lines take priority.

In Negril, the intermediate reefs are shelves that protrude up from deep, sandy bottoms. The edge tops of these shelves averaged thirty or so feet and dropped down to about sixty at the edges. One of our biggest problems was to find an area that was not covered in abundant coral and sponge growth in order to give us working room as we drilled. We were able to locate most of the buoys in less than forty feet on the intermediate reefs, eliminating much of the bottom problems that occur when working deeper. Not only were we working at reasonable depths but the buoy placement midway up the shelves allows a boat of divers or snorkelers with varying levels of experience to dive on the same trip; deep water to the left, shallower water to the right.

Because we were working in areas with a tremendous amount of live coverage on the intermediate reefs, we developed a system of anchoring the workboat without having to drop the anchor in the traditional method. First we would ask the captain to anchor in his normal fashion which was well off of the shelf in the sand. A diver with local underwater knowledge would then locate the area where the ideal diving was located. The diver would tie a mooring line to the bottom just up current of the site and let it float to the surface. After the workboat fastened to his mooring line, an anchor would be taken to the bottom and set by a diver. No strain would be placed on the line as it was used only as a safety measure in the event the mooring line parted. In the same fashion a stern line would be set and the equipment would be ready to send down.

## Deep Reefs

Deep Reef buoys have got to attract a lot of fish.

The deep reef buoys installed were all manta ray systems and when executed properly, only took a matter of minutes to install. Deep diving requires teamwork on the decks and should be rehearsed before the actual work begins. Free swing zones on these sandy bottoms were no problem.

The Negril project was a success: thirty-five reef mooring buoys were installed by REEF RELIEF and the Negril Coral Reef Preservation Society within the space of three weeks. It was accompanied by a very successful three-day workshop which provided information on the reef mooring buoy concept and other important coral reef conservation issues to many government, private and public individuals and organizations.

## SUPPLIERS: REEF MOORING BUOY COMPONENTS

1. BUOYS: Rotocast Flotation  
2807 S.F. Austin Road  
Brownwood, Texas 76801

Telephone number is 1-800-351-1363 or 1-915- 646-1566

Specify: RMB 18 inch Mooring Buoy with hardware and reflective Blue stripe with a 1 inch PVC pipe sticking out of each end.

**2. LINE:**

Edge Cordage

4000 NW 31 Avenue

Miami, Florida 33142

Telephone number is 1-800-243-3343

Specify: One inch yellow U.B. treated polypro and one inch poly dacron.

**3. STAINLESS STEEL EYEBOLT:**

Key West Welding and Fabrication

PO Box 2658

Key West, FL 33041

Specify: 316 stainless steel eyebolts 5/8' diameter, 20 inches long, e inch diameter on eye which is welded closed.

**4. SHACKLES FOR EYEBOLTS:**

Viscom International

244 Farms Village Road

West Simsbury, Connecticut 06092

Telephone number is 1-203-638-2201

Specify: Stainless Steel Wichard Bow Shackles 15/32 Self-locking Pin.

**5. MANTAS AND STINGER WITH GAD SET (TO DRIVE IN MANTAS):**

Steffen Midwest

623 West 7th Street

Sioux City, Iowa 51103

Telephone number is 1-712- 279-8080 Fax: 1-712-279-8070

Specify: 6 foot manta rods and MR-1 mantas.

**6. GALVANIZED SHACKLES FOR MANTAS:**

**18" HOSE FOR EACH BUOY:**

West Marine Supply

500 Westridge Drive

Watsonville, California 95075-4100

Telephone number is 1-800-538-0775 Fax: 1-408-728-2736

**7. ANY CONSTRUCTION MATERIALS SUPPLIER:**

Hydraulic cement ingredients:

- Portland Type II cement

- Plaster of Paris (10% by weight)

**8. DRILLING EQUIPMENT**

Hydraulic Tools, Inc.

16209 North Florida Avenue  
Lutz, Florida 33549  
Telephone number is 1-813-962-4822 Fax: -1813-962-8364  
Specify: Power unit, power drill, reel and hydraulic hose, hammer breaker.

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## "Coral Reef Preservation In Negril"

[Chart Of Reef Mooring Buoy Installations](#)

[How To Use Reef Mooring Buoys](#)

*By Katy Thacker*

*President Of The Negril Coral Reef Preservation Society* CORAL REEF PRESERVATION  
IN NEGRIL

By Katy Thacker, President  
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Background:

Katy Thacker is president of the Negril Coral Reef Preservation Society, a broadly supported membership organization. She is on the Board of Directors of the Negril Chamber of Commerce and a PADI dive instructor at Negril Scuba Centre who joined others in her field to form this volunteer, non-profit organization. Katy is an American who has lived in Negril for years.

The Negril Mooring Buoy Installation Project and Workshop entitled "Protecting Jamaica's Coral Reefs" co-hosted by the Negril Coral Reef Preservation Society (NCRPS) and REEF RELIEF, was an excellent example of communities working in harmony to preserve Jamaica . . . with respect.

The coral reefs are second only to the tropical rain forests in the extent of their biologic diversity. They provide habitat for fish and other marine life, protect the beaches from erosion, and, in fact, produce the beautiful white sandy beaches. The coral reefs are part of a unique ecosystem which is the source of income for all businesses in Negril. Negril's contribution to the tourism product is a very significant factor influencing the economy of Jamaica.

The mooring buoy project displays evidence of non-government organizations (NGO's) working together on an international basis. The NCRPS depended heavily on the expertise and experience of REEF RELIEF, a Key West based NGO, for not only the organization and planning of the workshop, but the training in the actual installation of the state-of-the-art eyebolt and manta-type moorings. REEF RELIEF

also generously donated the use of their hydraulic drill, other tools, and in fact, made this entire project financially possible by raising three thousand dollars (US \$3000) at a reggae concert held in Key West to benefit the Negril Mooring Project. The Negril Chamber of Commerce worked very closely with the NCRPS, providing assistance with fundraising, technical assistance, institutional support, and of course, 100% moral support. Institutional support was also provided by the Jamaican Conservation Development Trust (JCDDT), the National Environmental Societies Trust (NEST), the Protected Areas Resource Conservation (PARC) Project, and the Global Coral Reef Alliance. The Rotary Club of Sav-la-mar provided assistance as well.

The Negril Mooring Buoy Project exhibited the effectiveness of NGO's working with government. Technical assistance with duty waivers were given by the Honorable John Junor, Minister of State, Ministry of Finance, Development and Planning. Mr. Junor attended the workshop as a guest of honor and addressed the participants as a guest speaker. Assistance with duty waivers was also received from the Prime Minister of Jamaica, Mr. Michael Manley. The Jamaica Tourist Board provided technical assistance with acquiring duty waivers via the Deputy Director of Tourism, Mr. Kent LaCroiz and the Minister of Tourism, Frank Pringle. Although he was unable to attend the workshop personally, Mr. Robert Stephens, Director of the Jamaica Tourist Board, sent Penelope Budhall to address the welcome function for the reef mooring buoys installation workshop. Yvonne Martin attended the workshop on behalf of Frank Pringle, Minister of Tourism.

The NCRPS was grateful for the support and cooperation from the Natural Resources Conservation Authority and their input is another example of government working together with NGO's. Mr. Lloyd Gardener assisted extensively with the structural organization of the permit proposal for the mooring installation and was assisted by Dionne Miller in the proposal review. Dr. Marcel Anderson was most instrumental in the permit proposal review, institutional support and in the planning of the workshop. Mr. Jacob Taylor of the Beach Control Authority and Commander John McFarland of the Port Authority were also instrumental in the planning and final approval of the mooring proposal permits. Government support was received from Dr. Ken McNeill, Member of Parliament for Westmoreland, who was the guest speaker and guest of honor for the Christening Ceremony, celebrating the installation of the first state-of-the-art reef mooring buoys placed on Jamaica's coral reefs.

The Negril Mooring Buoy Workshop and installation also demonstrated the cooperation between businesses and NGO's in the form of financial and in-kind contributions that made the project possible. The Negril Scuba Centre, owned by Karen McCarthy and located at the Negril Beach Club, offered endless support in every aspect of the planning and execution of the installation of the buoys and the origination of the workshop. The Negril Scuba Center provided vehicles for transportation of volunteers, boats for installation, telephone and fax services, staff for volunteer work, not to mention a considerable amount of financial support.

Thanks to the generosity of Mr. Lee Issa, owner of Swept Away Resort, and the

invaluable assistance from Jeremy Jones, Executive Assistant Manager of Swept Away, the cocktail, the seminar and the meals received sponsorship. Swept Away not only provided their beautiful conference room, slide projector and screen, and overhead projector, but also sponsored the cocktail party.

The co-sponsor for the workshop, Air Jamaica, extended the guest speakers a special service charge for their airfare, and also extended a special price for the shipping of the components from Miami to Montego Bay. The NCRPS thanks Mr. Daniel Chin, the Regional Manager for Air Jamaica in Miami, and Mr. Orville Hart for their cooperation and assistance. Hedonism II provided not only complimentary rooms for the REEF RELIEF team, sponsored a celebration party after the thirty-five moorings were installed, but also donated a considerable large financial contribution. Xtaba, Grand Lido, Poinciana, and Singles - Negril all offered complimentary rooms for the guest speakers and team of volunteer from REEF RELIEF.

Sandals - Negril contributed extensively by offering complimentary rooms for DeeVon and Craig Quirolo - Project Manager and Executive Director of REEF RELIEF, boats for installation, storage facilities for the components parts, lunches for the installation team, and a very significant cash contribution. Peter and Marci Graham of the "Sundowner" offered their lovely glassbottom boat for the installation and workshop so that participants could observe the actual drilling of the cores for the eyebolt moorings.

Volunteers and financial support was also received from Banana Shout, Resort Divers, Addid Kokep, Charela Inn, Nirvana, J.R. Watersports and Sundivers. Avis Rent-A-Car, thanks to Mr. Joslyn Harding, provided a complimentary rent-a-car for one of the workshop guest speakers. Private financial donations were also received from Adline King, John Vosika, Greg Sorman, Mr. and Mrs. Mark Conklin, Howard Clapman, Stanley Gottlieb and Mr. Tali.

A special thanks also is extended to Mr. Wesley Gordon, customs broker, who donated his services so that the component parts sailed through customs in Montego Bay without any delays.

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## Concert Raises Money for Negril Buoy Project

*from the Fall 1991 Reef Line newsletter*

On Saturday night, August 17, reggae artists Pato Baton and the Reggae Revolution and Grammy Award-winning Steel Pulse provided hours of entertainment to Key West concert-goers. Hundreds of ticket purchasers helped REEF RELIEF offer tooling and training to the Negril Coral Reef Preservation Society, a non-profit, non-governmental Jamaican conservation organization.

"The coral reefs off of Negril Beach in Jamaica are threatened with increasing damage as their charterboat fleet grows. We have been working with the Negril Coral Reef Preservation Society (NCRPS) for well over a year to develop a program similar to ours here in the Keys," noted Craig Quirolo, REEF RELIEF's Director of Marine Projects.

The August concert raised approximately \$4000 for the Negril Reef Mooring Buoy Project, a cooperative venture of the Negril Coral Reef Preservation Society and REEF RELIEF. Members of the NCRPS were on hand the week of the concert to witness the installation of several new mooring buoys at Key West-area reefs.

In September, the NCRPS held a well-attended Skipper's Meeting in Negril. Local charterboat captains were briefed on site selections developed by a dive team composed of REEF RELIEF's Craig Quirolo, members of the NCRPS, and local skippers.

The idea of a November workshop arose when the initial dive sites for buoys were selected. "We met with many individuals who expressed an interest in learning about reef mooring buoy installation and usage while we were in Negril," remarked Quirolo. The workshop, scheduled for November 15, 16 and 17 in Negril, is being planned to offer a "fast-paced, hands-on and highly informative agenda on mooring buoys as well as other current issues regarding preservation of Jamaica's coral reefs."

The public and interested parties are invited to register for the Workshop. The cost of the workshop is \$10US. To register, contact either the NCRPS or REEF RELIEF.

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## [Speech By Robert Stevens,](#)

*Jamaican Director Of Tourism* WELCOME ADDRESS

By Mr. Robert Stephens, Jamaican Director of Tourism

Master of Ceremonies, Ms. Katy Thacker, Dr. Thomas Goreau, Mr. Craig Quirolo, Mr. Karl Aiken, Mr. Herb Hiller, and other distinguished guests.

I must express my deep appreciation to Ms. Thacker for inviting me to attend this very timely reef mooring installation workshop. I am extremely pleased, and I am sure that the entire tourism industry is just as happy, that the Negril Coral Reef Preservation Society has taken this initiative to provide protection for the coral reefs on this side of the island.

As Director of Tourism, I would like to take this opportunity to welcome our guests from overseas who have taken the time to be here with us for this workshop. People like Craig Quirolo, the executive director of REEF RELIEF and his team; Dr. Thomas

Goreau, President of the Global Coral Reef Alliance and Herb Hiller, who we all know is an authority on eco-tourism and an award winning travel writer.

We are extremely grateful to you for coming here to our beautiful island and for your willingness to share your knowledge and experiences with us.

As I mentioned before, I consider the staging of this workshop to be very timely, as a lot of attention is now being focused on the coral reef situation here in Negril. Recent reports indicate that raw sewage is flowing into the Negril River and into the sea, and damaging the coral reefs along this beautiful coast.

This problem, added to the other threats facing the preservation of coral reefs, such as overfishing, dynamiting of fish, and the breaking off of coral for sale, makes our job protecting these vital structures even more difficult.

But we cannot afford to roll over and die in the face of these problems. We, and here I speak of the Jamaica Tourist Board, the Negril Coral Reef Preservation society, the Natural Resources and Conservation Department and any other government and private agency committed to the preservation of our environment, now have to increase our efforts at educating the public that this whole subject of environmental protection affects us all.

With regards to the coral reefs, we cannot emphasize enough the importance of these marine ecosystems to our country. We need to devise strategies that will effectively make our people understand and appreciate the many benefits of coral reefs to our social and economic well-being.

When every single Jamaican can recognize and appreciate the fact that our coral reefs provide barriers against strong waves, that they provide food and shelter for a wide variety of marine life, and that they contribute directly to the creation and preservation of our white sand beaches, which we all know are major attractions among our visitors, then, I am sure, we will have solved half the problem of coral reef destruction.

The other half will come with getting people to obey the laws which have been passed in favor of protecting these corals.

On May 1 this year, the Natural Resources Conservation Authority placed a ban on the sale of black and white coral. Our information at the Tourist Board is that the majority of vendors have heeded the ban. Of course, there are a few who will resist,

but they are in the minority and I foresee a total cessation of this practice in the near future.

The passing of the Natural Resources Conservation Authority Act earlier this year, is definitely an indication of government's commitment to efforts here to protect the environment. This act empowers the Natural Resources Conservation Authority to take whatever steps necessary for the effective management of Jamaica's physical environment in order to ensure conservation, protection and proper use of the island's natural resources. It also mandates the authority to promote public awareness of Jamaica's ecological systems and their importance to the social and economic life of the island.

The authority will therefore be depending on organizations such as the Negril Coral Reef Preservation Society for support in its efforts. But I have no doubt that they will get all the help they need from you.

While I recognize that the project you are embarking on this weekend, that of installing 30 reef mooring buoys in the waters here, will not totally solve the problem of reef destruction, I must commend you for taking what I consider to be a first step in solving the problem. In fact, your effort is a perfect demonstration of the concept on which the new tourism coalition is based - that is the coming together of a number of groups and individuals from the private and public sectors, churches, trade unions, politicians, service clubs, etc. . . . to work on and solve the problems affecting the tourism industry and the country as a whole.

I see a perfect opportunity for the entire business and tourism community here in Negril to come together and formulate a strategy to solve this sewage problem now affecting the area. You could all donate the funds to repair the treatment plant or install a new one . . . whichever is more feasible. Just remember that we can't all depend on the government to do everything.

Ladies and gentlemen, I could not close without acknowledging the contribution of Air Jamaica, who flew down the guest speakers and the entire REEF RELIEF team for this workshop. Air Jamaica has never failed to show its commitment to Jamaica's Tourism Industry or its duty as a good corporate citizen and for that we are truly grateful. I must also thank Swept Away for hosting this wonderful workshop. It is my understanding that they have always been very accommodating to the Negril Coral Reef Preservation Society. And last, but certainly not least, I must thank the REEF RELIEF team for coming to help us install these mooring buoys. They can be assured that we really appreciate their effort in helping us protect our valuable coral reefs.

Ladies and Gentlemen, thank you very much.