



“Big Boat” Vessel on Patrol in Tortugas Waters

The 57’ high-speed catamaran known as the P/V *Peter Gladding* is the newest law enforcement vessel on patrol in the sanctuary’s Tortugas Ecological Reserve (TER), a fully protected zone 80 miles off Key West. LT Joe Scarpa is the captain of the *Gladding*, which sleeps four and remains on station for several days at a time.

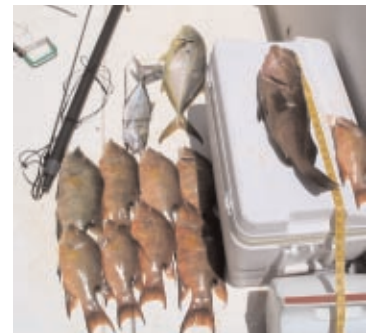
The Florida Fish and Wildlife Commission (FWC) officers who serve on the vessel are cross-deputized for enforcement in both state and federal waters. The vessel is one of five FWC “big boats” in the state and is suitable for operation in deep and shallow water, where low wake and shallow draft are required.

A formal ceremony dedicating the vessel was held on April 11, 2006 in Key West. The high-speed catamaran was named for Peter Gladding, 1948-2004, a commercial fisherman who exhibited leadership in establishing the Tortugas Ecological Reserve. The TER includes critical spawning grounds for important fish and invertebrate species.



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Law Enforcement: From ATBA to Wildlife Violations



While on duty in the sanctuary, law enforcement officers document wildlife violations that include: harvesting undersized fish and lobster (*above left, center*); spearing fish (undersized or otherwise) in areas that are closed to spearfishing; and taking more than bag limits allow for that species (*bottom, left*). Occasionally, a large vessel is cited for operating within the *Area To Be Avoided (ATBA)*, an area closed to vessels greater than 50 meters (~ 150 feet) that could cause damage to coral reefs and other shallow-water habitats.

Volunteers Make Things Happen Everyday

The Florida Keys National Marine Sanctuary recognizes seven outstanding volunteers for their service to the sanctuary during 2005:

Maritime Heritage: **J.J. Kennedy** served as the volunteer point-of-contact for the Anglo Danish Maritime Archaeological Team on the Button Wreck archaeological project. In this capacity, he provided many hours of vessel and dive support.

Operations: **Alan Muse** has worked side-by-side for years with the upper region mooring buoy team, splicing line, cleaning buoys and providing vessel support.

Reef Medic: **Nancy Karas Perez** contributed not only her time, but her ideas for making a better program. Thanks to Nancy, Reef Medic volunteers now collect debris and trap line as part of their mission. Nancy has also made contributions to the FKNMS Maritime Heritage Program.



Volunteers of the Year were recognized at an annual banquet. Pictured from left to right: J.J. Kennedy, Carmen Powers (*Bleach Watch Volunteer of the Year for Mote Marine Lab*), Jan Blackmon, Martin "Skip" Moe. Photo credit: Nick Tagliareni

Sanctuary Advisory Council: **Martin Moe** is a great spokesperson for the Sanctuary Advisory Council (SAC) and spends time on almost every SAC working group. He also worked on the *Diadema* (long-spined urchin) Restoration project, designed to increase the numbers of this important herbivore on Keys coral reefs.

Special Projects: **Chrissie Fernandez**, a recent Coral Shores High School graduate, provided many hours of office support in organizing and digitizing slide images for preservation purposes.

Special Projects: **Emily Ritchie**, a recent high school graduate, helped to develop Ocean Voices, a new sanctuary volunteer program. As part of Ocean Voices, Emily recorded Public Service Announcements (PSAs) about boat grounding prevention. These can be heard on local radio stations in her hometown of Sarasota, Florida.

Team OCEAN: **Jan Blackmon** has used her excellent communication skills to teach other Team OCEAN volunteers about proper boating etiquette and the wise use of sanctuary resources.



During her senior year at Coral Shores High School, Chrissie Fernandez spent many hours digitizing the education slide library housed in the Upper Keys office.



Team O.C.E.A.N.'s Jan Blackmon is shown here with a boat-load of trash collected from Keys' waters. Many sanctuary volunteers and staff have participated in cleaning up the coastlines and underwater areas of the Keys.



A Quick Little Quiz about a Keystone Herbivore

Martin "Skip" Moe, Marine Biologist



***Diadema* urchins can produce millions of eggs at spawning and it may be possible to rear large numbers of juveniles for restoration experiments. Martin Moe, shown here attempting controlled spawning of these urchins, is working with the Mote Marine Laboratory to develop the basic techniques for large scale propagation of *Diadema* urchins.**

What coral reef animal was super abundant on the reefs of the Florida Keys 30 years ago, and was abhorred by lobster divers and greatly feared by snorkelers? Another clue--this animal suffered a great plague in 1983 that reduced its numbers throughout the western tropical Atlantic by about 98 percent. At first, most divers were happy to see them gone because they were no longer subjected to frequent and painful encounters with this little beast.

The answer, of course, is the long-spined sea urchin, *Diadema antillarum*. This species was the keystone herbivore on the coral reefs of the tropical Atlantic Ocean.

The ecological importance of the grazing done by the *Diadema* urchins was soon very apparent when the large fleshy macro algae quickly began to overgrow corals and trap coral-killing sediments on and near corals. At first, it was thought that because of their vast reproductive potential, *Diadema* would recover quickly to their previous population levels. But after almost 25 years this has not occurred, and the reefs continue to decline. The loss of *Diadema* is not the only cause of the decline of our coral reefs, but was a tipping point, and many of the problems we are facing today are a result of that catastrophic loss. Our reefs have little chance of resisting the effects of global warming and human impacts without the natural presence of an effective grazer to maintain the balance between coral and algal growth.

Diadema are still present on Florida reefs, but are widely scattered over extensive reef areas. Thus, individuals are isolated and as broadcast spawners, their eggs and sperm are released so far apart that fertilization is ineffective and their reproductive potential is severely compromised. It may be many, many decades, if ever, before they regain their past population levels.

We may, however, be able to help them return to the reefs. There are two avenues for this effort. The first is to relocate and concentrate the small juveniles that settle each summer and fall on the shallow rubble zones on the reef crests. These rubble areas are very suitable for settlement of juveniles, but the storms of fall and winter churn these rocks and destroy the little urchins before they can reproduce. Moving them to deeper reefs where they have a chance to grow to adults helps both the reefs and the urchins. Ken Nedimyer is spearheading the effort to save these at-risk urchins.

The second avenue is to culture and grow these urchins in the laboratory to a size that allows them to best survive on the reefs and use them, along with the juveniles rescued from the rubble zones, to create and maintain "*Diadema* reefs" at various intervals all along the reef line. These *Diadema* reefs will allow certain high value reef areas to grow and live with the historic natural balance of coral and grazers and also provide areas of urchin densities that will facilitate natural *Diadema* spawning.

In summary, the Florida Keys National Marine Sanctuary, Mote Marine Laboratory, Florida Institute of Oceanography, The Nature Conservancy, Ken Nedimyer and myself are working together to rescue at-risk rubble zone juveniles and develop the technology for production of laboratory cultured juvenile *Diadema* urchins for experimental restoration on specific coral reefs of the Upper Keys. If these efforts are successful, we may, through science, management, and community effort, be able to restore the natural balance of coral and algae to at least some of our most valuable coral reefs.



Ken Nedimyer, a marine biologist and marine life fisherman, has worked on research projects to move and save as many of these valuable algae grazing urchins as possible to help extend their populations and effect some control of algal growth on certain reef areas. Here, Ken is collecting these urchins on the rubble zones of Conch Reef.

Recovered British Cannon on Display in Key Largo

Cheva Heck, Communications Manager

During a ceremony held on December 13, the Florida Keys National Marine Sanctuary and the Key Largo Chamber of Commerce unveiled an 18th century British cannon and a series of educational panels that will give visitors a deeper appreciation for the maritime history that lies beneath the waters of the Keys. NOAA manages the sanctuary in partnership with the state of Florida.

“We are delighted to have the cannon on display at the chamber’s visitor center,” said Jackie Harder, president of the Key Largo Chamber of Commerce. “We know our 71,000-plus annual visitors will enjoy it and, at the same time, learn more about the Keys’ fascinating maritime history.”

The cannon is one of 13 first documented near Carysfort Reef off North Key Largo in 1994 by volunteers from the sanctuary’s maritime heritage research inventory team. Little evidence of a shipwreck has been found, leading archaeologists to believe the cannons may have been heaved overboard in a successful attempt to free the vessel from the reef. The cast iron gun was manufactured between 1760 and 1780, weighs more than one thousand pounds, and was capable of firing a four-pound ball.

“Archaeological information and documentation indicates that the cannon has considerable historic significance,” said project archaeologist Duncan Mathewson. “The cannon may have been mounted for defense on a British privateer or naval ship at the time of the American revolution, when the colonies were at war with England and Florida was not yet a state.”

The sanctuary recovered the cannon in 2003. Working with sanctuary volunteers and staff from the National Undersea Research Center, sanctuary managers sought to learn more about the significance of the site through markings and construction details revealed as the conservation process removed centuries of limestone concretion from the gun.

Longtime volunteer Denis Trelewicz, whose research suggested the site dated to the 1700s, paid for the conservation of the cannon by Mel Fisher’s Motivation Inc. laboratory in Key West, and hired cannon expert Lawrence Campbell to construct a replica carriage mount. Trelewicz passed away just over a year ago.

“This Key Largo Chamber of Commerce display stands as a tribute to Denis Trelewicz and serves as an example of the many outstanding contributions made by our sanctuary volunteers,” commented Cmdr. Dave Score, sanctuary superintendent. “We are pleased that our partnership with the business community in the Upper Keys will allow us to reach so many visitors with the message of the importance of preserving our maritime heritage resources.”

The cannon display is located at the Key Largo Chamber of Commerce visitor center, mile marker 106, open daily from 9:00 a.m. until 6:00 p.m.



During a recent ceremony held at the Key Largo Chamber of Commerce visitor center, the 18th century British cannon recovered from Keys’ waters was unveiled. The following persons assisted with the unveiling (from left to right): U.S. Congresswoman Ros-Lehtinen’s representative Debbie Zimmerman, Sanctuary Superintendent Cmdr. Dave Score, Monroe County Commissioner Sylvia Murphy, Sanctuary Southeast Regional Director Billy Causey, former Chairman of the Board for the Key Largo Chamber of Commerce Jim Lupino. The current Chairman of the Board, Mike Shipley, also participated in the unveiling, but is hidden in this photograph.