

Reef Environmental Education Foundation

2009 ANNUAL REPORT



The Reef Environmental Education Foundation (REEF) conserves marine ecosystems for their recreational, commercial, and intrinsic value by educating, enlisting, and enabling divers and other marine enthusiasts to become active stewards and citizen scientists. REEF links the diving community with scientists, resource managers, and conservationists through marine-life data collection and related activities. This report documents REEF's success and growth in 2009.



A NOTE FROM THE PRESIDENT

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Founded in 1990, Reef Environmental Education Foundation (REEF) has grown enormously over the past 20 years due to tens of thousands of loyal volunteers, donors, and members. REEF now houses the world's largest fish sightings database, with over **134,000 surveys**. **Fifty-nine scientific research papers** have been written using REEF data, with over **12,000 REEF volunteer divers** contributing to the online database. Additionally, REEF conducts special projects, such as **Nassau Grouper** research and the invasive **lionfish** program. We are proud to bring you our 2009 Annual Report and hope you join us on our underwater adventures, where diving counts!

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NOAA Southeast Fisheries Science Center

*Best "Fishes"
Paul Humann*

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Spotted Boxfish



A male Yellowhead Jawfish guarding eggs

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David Jennings

VOLUNTEER OF THE YEAR

REEF awarded our 2009 Volunteer of the Year award to **David Jennings**, a dedicated REEF surveyor and ambassador. David has been a member of REEF since 2006, has conducted **154 REEF surveys**, and is a member of the **Pacific Advanced Assessment Team (AAT)**.

While conducting AAT surveys in the Olympic Coast National Marine Sanctuary on the outer Washington coast, David identified a significant decline in the population levels of two rockfish species, **China (*Sebastes nebulosus*)** and **Tiger (*Sebastes nigrocinctus*)**. These two species amazingly live to be over 75 and 115 years old, respectively. After analyzing REEF data and existing harvest rules, David put together a series of proposed rule changes and submitted them to the Washington Department of Fish and Wildlife (WDFW). He then took the extra step of getting involved directly. In June 2009, **David was appointed** by the Washington Governor to a six-year term as one of **WDFW's Commissioners**. David Jennings is a volunteer who has truly gone beyond the call of duty, and REEF is proud to name him "2009 Volunteer of the Year."

MEMBERSHIP OVERVIEW

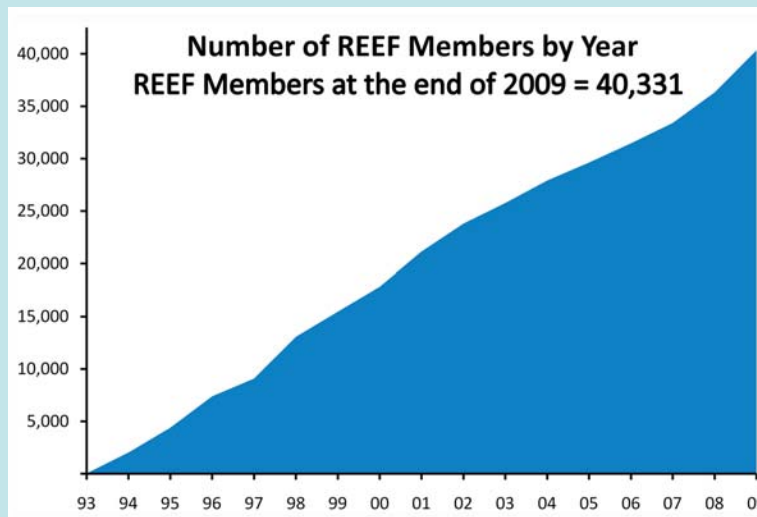
Members provide the data and support necessary to carry out REEF's mission. REEF is proud to maintain a no-fee membership. Since 2007, signing up has never been easier with the new, online system. **In the last five years alone, REEF increased membership by 12,432 members!**



Bermuda Field Survey



A volunteer surveying Monterey Bay



MEMBERS

"Diving that counts. What a true statement on so many different levels. REEF keeps me headed back in for more diving. The chance to encounter another rare or unusual critter, or to get a better understanding of what the changes are over time keeps me coming back and filling out my surveys."

- David Jennings

Membership is **FREE!** To start surveying and receive REEF's e-newsletter, please visit www.REEF.org.

REEF relies on contributions of our volunteers. Whether it is conducting a marine life survey, donating financially, helping in the Keys office, or participating in a conservation project, all REEF volunteers make a difference.



VOLUNTEER FISH SURVEY PROJECT

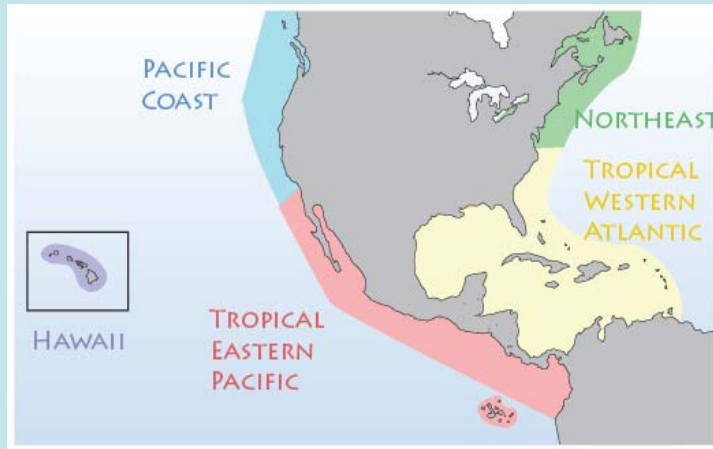
The Volunteer Fish Survey Project is REEF's core program. Volunteer SCUBA divers and snorkelers collect and report information about fish, invertebrate, and algae species.

REEF Volunteers conduct marine life surveys during their regular recreational dives using an easy, standardized method, called the Roving Diver Technique. Data are submitted and housed in a publicly accessible database on REEF's website - REEF.org.

REEF partners with 187 Field Stations worldwide to assist with surveys. Find your nearest Field Station online at REEF.org/resources/fieldstations.



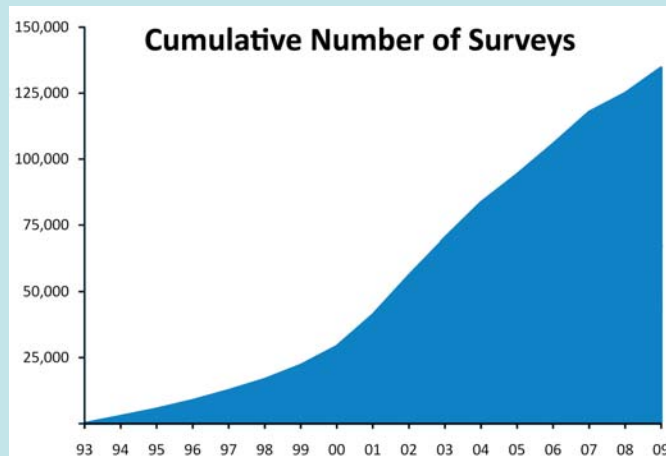
SURVEY REGIONS



REEF volunteers survey fish in the Tropical Western Atlantic, Pacific Coast, Tropical Eastern Pacific, Northeast, and Hawaiian Islands. Invertebrates and algae are also included in Pacific Coast region surveys.

SURVEY SUMMARY

In 2009, REEF volunteers conducted **9,687 surveys** at **1,683 sites** worldwide, spending **9,700 hours** underwater. 63% of surveys were conducted in the Tropical Western Atlantic, 23% of surveys were conducted in the Pacific Coast region, and 11% were conducted around the Hawaiian Islands. The remainder were conducted in the Northeast and the Tropical Eastern Pacific. At the end of 2009, REEF volunteers had completed a **total number of 134,634 surveys**.



Blue Rockfish school



Divers in Bonaire



Kelp Crab



Cozumel field survey



Pacific Coast surveyors



Keto volunteers

TROPICAL WESTERN ATLANTIC

In 2009, REEF staff, board members, and volunteers led seven field surveys in the Tropical Western Atlantic region. In addition to these coordinated survey efforts, hundreds of volunteers submitted over **5,000 surveys** during the year. The total number of REEF surveys conducted in the region topped **100,000 in 2009!** REEF is engaging hundreds of new divers and snorkelers while many surveyors moved up the ladder to become expert surveyors and join the Advanced Assessment Team (AAT), which conducts surveys for government contracts.

NORTHEAST

The New England Aquarium Dive Club once again held the single largest event as part of the 2009 **Great Annual Fish Count (GAFC)**. A record-breaking **119 divers** conducted **140 REEF surveys** at **nine sites** around Cape Ann, MA, reporting 45 fish species. A big thanks goes out to Holly Bourbon and Bob Michaelson, who spearheaded the colossal effort. This GAFC event was one of dozens held throughout REEF's project regions during the month of July that introduced divers, snorkelers, and the general public to the fun and value of fishwatching.

PACIFIC COAST

Members of REEF's Pacific AAT participated in important survey projects in the **Monterey Bay National Marine Sanctuary** and the **Olympic Coast National Marine Sanctuary**. REEF teams conducted the **seventh year of monitoring** in both locations. These long-term data sets are critically important due to limited government funding for detailed nearshore assessments.

TROPICAL EASTERN PACIFIC

The Keto Foundation, a REEF partner in Costa Rica, has undertaken a project that aims to establish a network of community volunteers to monitor fish populations and coral reef health around **Caño Island**. Volunteers conduct REEF surveys and are trained by regional scientists, thus engaging locals in the protection of their coral reefs.

HAWAIIAN ISLANDS

REEF members, Rick Long and Flo Bahr, recruit survey divers through the **Fish Identification Network (FIN)**. FIN provides an opportunity to join friends and fellow fish lovers in exploring the coral reefs of Maui. There are monthly, sometimes weekly, dives at various beaches. At every event, volunteers set up a REEF station with survey materials and identification reference guides in an attempt to lure in new afishionados! Project SEA-Link provides additional support to the Volunteer Fish Survey Project in Hawaii.

SNAPSHOTS FROM THE FIELD

"What transforms a 'normal' diver into a marine life enthusiast? REEF does!"

- Janna Nichols

"I met up with REEF, and my hobby became a meaningful passion! I am now in the water with my handy survey slate several times a week, loving every minute of my ocean time."

- Patricia Richardson

"I enjoy associating and diving with other REEF members. We are all interested in the conservation of our ecosystem and enjoy what we are doing. With the worldwide decline in fish populations and in the health of the oceans, I feel like I am doing something to help."

- Lillian Kenney



SPECIAL PROJECTS

In addition to the Volunteer Fish Survey Program, REEF devotes time to critical issues that affect the health of marine ecosystems worldwide.

“Lionfish have become a major threat to marine resources across the Caribbean, preying on native fishes and crustaceans that are vital to fishing, diving, and tourism industries. Without effective awareness, detection, and control programs, the impacts of this invasion are likely to be severe.”

- Lad Akins, REEF

“The Grouper Moon Project made sense to us as divers, as it is paramount to manage our marine fisheries in a responsible manner.”

- Mike Fowler, Silent Diving



INVASIVE LIONFISH REMOVAL - REEF.org/lionfish

Two species of lionfish (*Pterois volitans* and *Pterois miles*), native to the Indo-Pacific and Red Sea, have been introduced into western Atlantic waters and have **rapidly spread throughout the Southeast United States, Bahamas, and much of the Caribbean**. Recent research indicates invasive lionfish impacts, through their glutinous predation, high reproductive output, and lack of predators are likely to be severe. Since 2006, REEF has been working to better understand and address this critical issue. To date, REEF and our partners have been directly involved in the **removal of over 4,000 lionfish** from the region. In 2009, REEF led numerous workshops throughout the region to increase awareness, build local capacity, and help develop rapid response plans for dealing with the invasion. **Over 600 divers have been trained** in early detection, rapid response, and removal methods. REEF is also conducting detailed research and removal studies, and REEF member data continue to be the mainstay for the United States Geological Survey Non-indigenous Aquatic Species database and range maps. New programs, including market development, removal derbies, and novel control strategies, are now being developed as a result of this success.

GROUPEL MOON PROJECT - REEF.org/groupermoonproject

Since 2001, REEF has led the Grouper Moon Project, a research effort in the Cayman Islands aimed at better **understanding Nassau grouper spawning and their recovery in marine reserves**. This ground-breaking research is currently supported by the Lenfest Ocean Program of the Pew Charitable Trusts. The 2009 spawning season was the most ambitious to date for the project. For the first time, REEF had teams of researchers and volunteers **stationed on each of the three Cayman Islands**: Grand Cayman; Cayman Brac; and Little Cayman. REEF **monitored recovery** into the fate of remnant spawning aggregations on Cayman Brac and Grand Cayman. Aggregations on both of these islands were fished to exhaustion in the recent past. Our most exciting find in 2009 was that the **teams on all three islands witnessed Nassau grouper spawning** on the same night- Valentine's Day!

VANDENBERG ARTIFICIAL REEF MONITORING

The *USNS Gen. Hoyt S. Vandenberg* was sunk in May 2009 as an artificial reef off Key West, Florida. Under contract with the State of Florida and using our Advanced Assessment Team, REEF is coordinating the **monitoring of the Vandenberg site and seven nearby reefs**. Pre-deployment surveys were conducted to compare with quarterly surveys to be taken through 2011. This study will provide valuable data on the changes in the ecosystem brought about by the introduction of artificial reefs.



Lionfish removal



Nassau Grouper aggregation



Vandenberg before sinking



Canary Rockfish, threatened in Puget Sound



Great Barracuda, a big fish on the decline



Nassau Grouper, an endangered Caribbean icon

PUBLICATIONS AND DATA USE

Due to the large geographic coverage of the REEF Volunteer Fish Survey Project, the information is particularly well suited for use by scientists looking at region-wide patterns. One such application was a 2009 paper in the science publication *PLoS One*, evaluating the effect of human population size on Caribbean reef fish populations. The sweeping study, conducted by researcher **Dr. Chris Stallings** of Florida State University, revealed that sharks, barracuda, and other **large predatory fishes are less abundant** in areas of higher human population compared to less populated areas. The study used data collected by REEF volunteers at sites in **22 Caribbean nations over 15 years**.

REEF programs and data also provide much needed information for scientists and resource agencies charged with evaluating the status of threatened and endangered species. A recent example is a National Marine Fisheries Service proposal to **list three species of rockfish in the Puget Sound under the Endangered Species Act**. The status review was published in April 2009, and REEF data were used extensively in the assessment.

The **lionfish research** that REEF is conducting in the western Atlantic is focused both on the basic ecology of the invader as well as ways to mitigate their impacts. Working with key partners, REEF Director of Operations, Lad Akins, co-authored several publications in 2009, including a *Marine Biology* paper on genetics of the invasion, an *Environmental Biology of Fishes* paper on lionfish predation, and a review of lionfish biology and ecology published in the *Proceedings of the Gulf and Caribbean Fisheries Society*. Many of the samples used in these studies were collected during REEF's volunteer lionfish projects.

LOOKING FORWARD

In 2010, REEF will:

- Launch the Volunteer Fish Survey Project in the **South Pacific**;
- Continue **studying fish population trends** with emphasis on changes due to human impact, such as the construction of artificial reefs and boat groundings;
- **Increase REEF Volunteer Fish Survey Project training** and outreach capacity throughout our project regions, including **new home study courses** and general public presentations;
- Work with the Cayman Islands government to help **ensure long-term protections for Nassau grouper** spawning aggregations before current legislation expires in early 2011; and
- **Continue studying** the impacts of the **invasive Indo-Pacific lionfish** in western Atlantic waters, as well as developing innovative ways to **control and curb the spread** of this voracious predator.

PUBLICATIONS DATA USE

Data from REEF are often used in scientific publications, which demonstrate the power of volunteer and community research efforts by citizen scientists.

"Trained citizen scientists become excellent stewards of the resources, and coupled with the complementary nature of REEF survey data, the REEF program continues to be an important partner in the Sanctuary's efforts to involve the diving community, manage effectively, and educate the public."

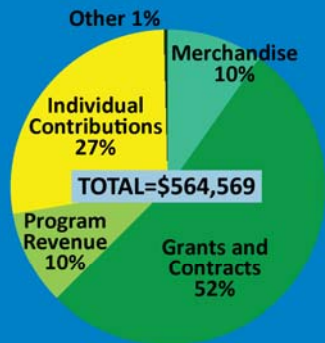
- Steve Lonhart, Ph.D.
Monterey Bay NMS

LOOKING FORWARD

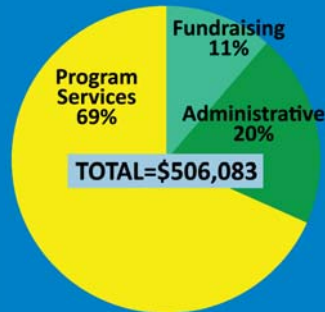


2009 FINANCIAL STATEMENT

INCOME



EXPENSES



Complete and professionally prepared financial statements will be available by August 1, 2010.

To donate online,
please visit
REEF.org/contribute.



REEF HEADQUARTERS DEDICATED TO LOCKWOOD

In April 2009, REEF was awarded a major grant from the estate of **James E. Lockwood**. These funds are enabling us to refurbish the historic 1913 building that serves as REEF's headquarters, expand our outreach and Field Station programs, and upgrade our technology capabilities. Mr. Lockwood was one of the dive industry's early pioneers. He invented an early form of rebreather technology in 1938, built underwater film sets, and served as editor of the 1950's dive magazine, *Undersea Digest*. REEF is proud to pay tribute to his memory by naming our headquarters in his honor.



REEF headquarters



Longsnout Seahorse

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Ned & Anna DeLoach
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Paul Humann
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