



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 2010.



2010

ANNUAL REPORT

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In 2010, Reef Environmental Education Foundation (REEF) once again accomplished a successful year with significant advances in research, outreach, and education. REEF continued to manage the world's largest fish sightings database, with over 146,000 surveys conducted by volunteer divers and snorkelers. These surveys have been used in numerous scientific publications since REEF's inception in 1990, and requests for data hit an all time high in 2010. Last year, REEF expanded lionfish outreach by publishing the Lionfish Cookbook and conducting derbies, helping to educate and engage the dive community. In efforts to increase outreach, REEF added 3,441 new members and teamed up with 49 new REEF Field Stations, which serve as active centers of fish identification education. Next year promises to be just as exciting with new Grouper Moon larvae tracking research, continued lionfish outreach, and new fish identification webinar classes. Our Staff and Board of Trustees are excited to bring you the 2010 REEF Annual Report and hope you join us in 2011!



Best "Fishes"
Paul Humann

VOLUNTEERS OF THE YEAR



REEF proudly awarded the 2010 Volunteer(s) of the Year award to Donna Brown and Liz Foote. Donna and Liz both live on Maui in Hawaii, where they have been active volunteers since 2001. Donna has been a REEF member since 1994, and Liz has been a member since 1999. Both are members of the Hawaiian Islands Advanced Assessment Team and have collectively conducted 361 surveys.

Donna and Liz were instrumental during the REEF Volunteer Survey

Program expansion to Hawaii in 2001. They provided technical assistance in the development of survey and training materials and supported a growing network of local REEF surveyors. The Fish Identification Network (FIN), a local REEF group, grew out of their efforts. Through the years, Donna and Liz served as incredible ambassadors of the program, generating a core group of dedicated REEFers. 10 years and 10,000 Hawaii surveys later (as of January 2011), REEF is still going strong on the islands. Donna and her husband George have also been a part of the South Pacific expansion team and participated in two REEF training trips to American Samoa.

The REEF Staff and Board of Trustees extend a big thank you to Liz and Donna. We congratulate them on all of their marine conservation efforts and great work on behalf of our organization!

REEF KEY LARGO COMMUNITY VOLUNTEER SERVICE AWARD

REEF awarded Nancy Perez the 2010 Key Largo Community Volunteer Award. Nancy was the 589th REEF member and joined REEF in 1993. Nancy's biggest impact has been through her role coordinating the Fish and Friends gatherings at REEF Headquarters. During these monthly meetings, which started in 2009, REEF supporters come together to socialize with fellow fish followers and listen to presentations about various marine species and habitats. Fish and Friends became increasingly popular in 2010, with an average of 40 people attending each month. This popularity could not have been achieved without the hard work Nancy puts in to finding speakers, getting volunteer hosts, coordinating the snacks and beverages, and always wearing a smile.



MEMBERSHIP OVERVIEW

Members are the key to REEF's success! Signing up as a member is free and can be done easily online at www.REEF.org. In 2010, REEF welcomed 3,441 new members, bringing the total number of REEF members to 43,432.

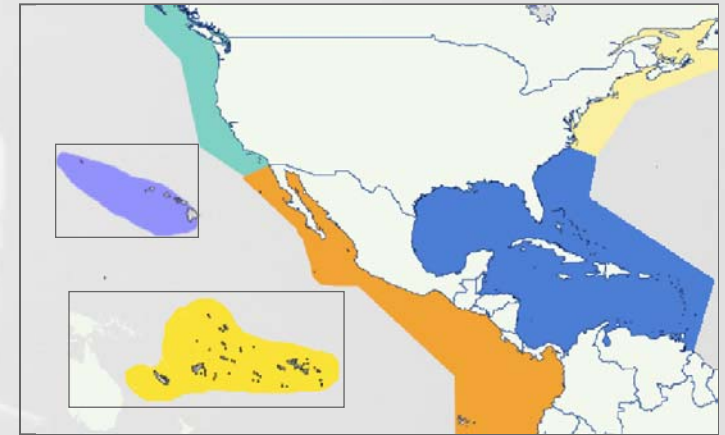


THE FACES OF REEF

The Volunteer 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 – www.REEF.org.

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

REEF partners with 223 Field Stations worldwide to assist as active centers of outreach and education. Most offer REEF fish and invertebrate identification courses, organize survey dives, and may sell underwater paper, slates and related fishwatching materials. Find your nearest Field Station online at www.REEF.org/resources/fieldstations.



- Tropical Western Atlantic
- Northeast US and Canada
- Pacific US & Canada
- Hawaiian Islands
- Tropical Eastern Pacific
- South Pacific

SOUTH PACIFIC EXPANSION

REEF expanded the Volunteer Survey Project to the South Pacific in 2010. The new region includes French Polynesia, Fiji, the Tuamotus, Tonga, Samoan Archipelago, and the Line Islands. We kicked off the expansion during a launch in American Samoa that included fish identification training workshops and surveying opportunities. Our efforts are now focused on establishing partnerships with governments, scientists, villages, and businesses, to support snorkelers and divers who will conduct surveys throughout the region. Support for the expansion was received from NOAA's Coral Reef Conservation Program and other donors.

SURVEY SUMMARY

In 2010, REEF volunteers conducted 10,059 surveys at 1,896 sites worldwide, spending 9,215 hours underwater. 53% of surveys were conducted in the Tropical Western Atlantic, 29% of surveys were conducted in the Pacific Coast region, and 12% were conducted around the Hawaiian Islands. The remainder were conducted in the Northeast, the Tropical Eastern Pacific, and the South Pacific. At the end of 2010, REEF volunteers had completed 146,183 surveys.

► www.REEF.org/programs/volunteersurvey



VOLUNTEER SURVEY PROJECT

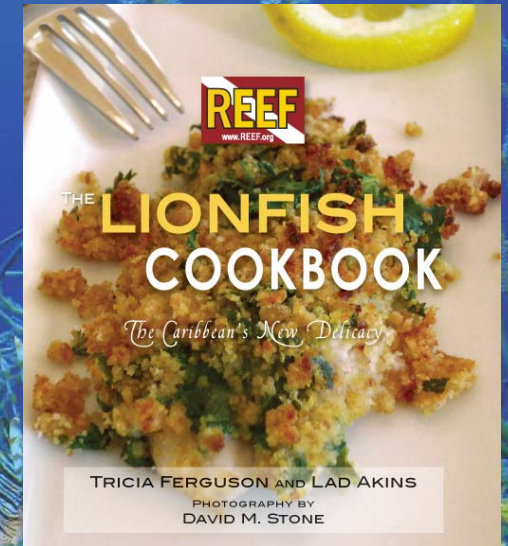
In 2010, REEF continued to lead Caribbean research efforts aimed at addressing impacts of invasive lionfish and developing strategies for control. Studies funded by NOAA's Coral Reef Conservation Program included assessments of lionfish removal frequencies in Puerto Rico and the Virgin Islands. Additional work in the Bahamas addressed impacts of differing lionfish densities on native reef communities, development of lionfish traps, and tagging to determine age, growth, and movement. REEF staff served as co-author on several submitted scientific papers on the lionfish invasion. REEF also organized and co-hosted a lionfish session at the Gulf and Caribbean Fisheries Institute conference and the first regional control strategy workshop with participation from more than 20 countries.

REEF was busy coordinating a variety of lionfish outreach efforts in 2010. We conducted numerous training workshops on lionfish education and outreach, collecting and handling, and permitting for removals in Florida Keys no-take zones. REEF responded to 860 lionfish reports submitted through our website. Through removal derbies, REEF has also been very successful in both educating the public and removing large numbers of lionfish. REEF coordinated the second annual Green Turtle Derby in the Bahamas, attracting over 100 contestants and removing 941 lionfish in one day! REEF also initiated the first Florida Keys derby series in 2010, collectively removing 664 lionfish over three days.

One of the greatest hurdles in encouraging wide-scale lionfish removals is providing incentives for divers and fishers to go out of their way to collect and handle venomous lionfish. One solution is to provide monetary incentive by creating a market for the fish. Luckily, lionfish are tasty and considered a delicacy when caught in their native range. Taking advantage of this, REEF teamed with renowned chef Tricia Ferguson and photographer David Stone to produce and publish the first ever Lionfish Cookbook in 2010. The cookbook includes 45 recipes, a section covering the biology, ecology, and impacts of lionfish, as well as a section on how to safely collect, handle, and prepare the fish. The book is proving to be a valuable tool in creating demand and awareness of lionfish as a food fish. Support provided by an anonymous donor allows 100% of the sales proceeds to go back into lionfish research and education.

Lastly, REEF helped create and fund a full-time position in 2010 to coordinate lionfish research in the field. This position was made possible through a partnership with The Island School/Cape Eleuthera Institute in the Bahamas. Efforts with NOAA's Coastal Center for Fisheries and Habitat Research, the USGS Non-indigenous Aquatic Species Program, Simon Fraser University, the National Aquarium in Washington DC, and many other local and international governments have provided the basis for continued success of REEF's lionfish programs.

► www.REEF.org/programs/exotic/lionfish



LIONFISH PROJECT

In the winter of 2002, REEF and the Cayman Islands Department of the Environment (CIDOE) initiated the Grouper Moon Project, a multi-faceted research program that aims to understand the dynamics of Nassau grouper adults and offspring, the influence that spawning aggregations have on local and regional grouper populations, and the role that marine reserves play in the long-term recovery and conservation of this endangered species.

The broad goals for the 2010 Grouper Moon Project were to continue monitoring recovery of the large spawning aggregation on Little Cayman and to expand research into the fate of remnant spawning aggregations on Grand Cayman. The Little Cayman team estimated that the number of fish showing up at the aggregation is approaching 4,000. Spawning was observed on four consecutive nights, starting four days after the full moon. The Grand Cayman team was able to get visual estimates of grouper abundance and witness spawning at the historic East End site. The aggregation was very small - only in the range of 500 fish. Tagging work on the island to date suggests that of the three historic spawning aggregations on Grand Cayman, this is the only remaining functioning aggregation. REEF researchers continued to collaborate with scientists from Oregon State University and the University of California Santa Cruz (UCSC).

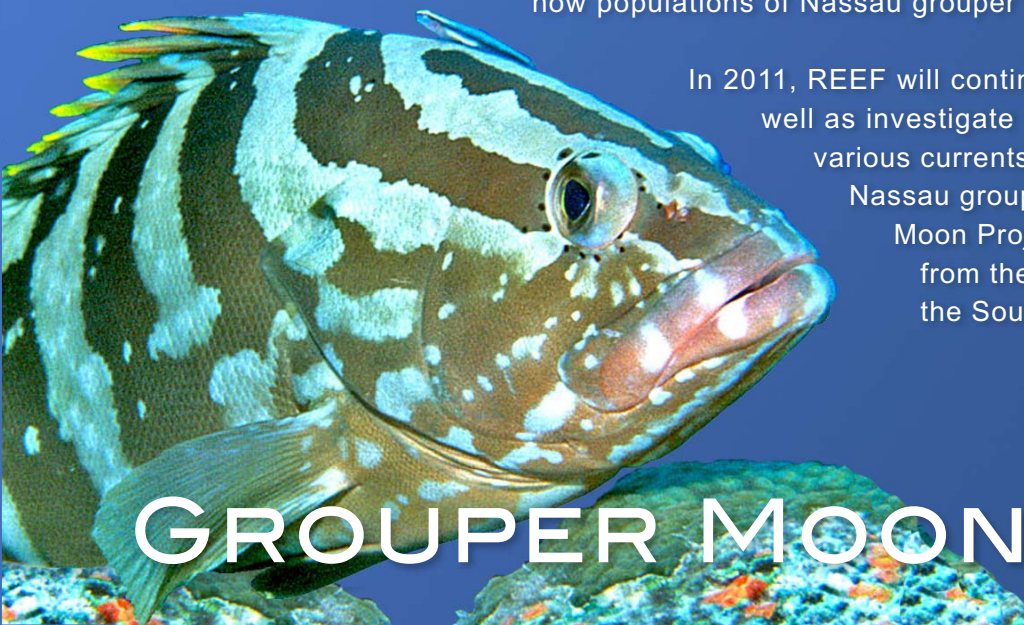


Grouper Moon research results are showing evidence of ongoing recovery of the Little Cayman spawning aggregation and that protecting spawning aggregations can be an effective prescription for recovery of Nassau grouper. Grouper Moon lead scientist, Dr. Brice Semmens, presented these findings to the Cayman Islands Minister of the Environment and the Cayman Marine Conservation Board in February 2010. Grouper Moon Project researchers presented results at the 2010 Gulf and Caribbean Fisheries Institute (GCFI) annual meeting. Alexis Jackson from UCSC won best student presentation at the GCFI meeting for her work using DNA to assess how populations of Nassau grouper throughout the Caribbean are interconnected.

In 2011, REEF will continue monitoring the Little Cayman and Grand Cayman aggregations, as well as investigate why spawning aggregations are typically located at places where various currents converge. Using satellite drifters, REEF will track passive transport of Nassau grouper larvae from spawning at protected aggregation sites. The Grouper Moon Project has been made possible by funding support from a multi-year grant from the Lenfest Ocean Program, as well as generous in-kind support from the Southern Cross Club and Little Cayman Beach Resort.

► www.REEF.org/groupermoonproject

GROUPEL MOON PROJECT



VANDENBERG ARTIFICIAL REEF MONITORING

The Gen. Hoyt S. *Vandenberg* is a 523' steel hulled missile tracking ship that was intentionally sunk seven miles off Key West, Florida, in 2009, to serve as a recreational diving and fishing artificial reef. The *Vandenberg* is the largest artificial reef in the Florida Keys National Marine Sanctuary and the second largest artificial reef in the world.

Prior to the sinking, REEF was contracted by the State of Florida to conduct a study to descriptively and comparatively quantify the fish assemblages over time at the proposed *Vandenberg* site and nearby reefs. In 2010, REEF completed this year-long monitoring effort.

In the 12 months following deployment, the total number of fish species present on the *Vandenberg* increased from 30 species documented less than a month after it was sunk to a total of 123 species documented during the entire period. Notable species such as little tunny, school bass, mackerel scad, king mackerel, almaco jack, and bank butterfly fish were sighted only on the *Vandenberg*.



NATIONAL MARINE SANCTUARY MONITORING

Members of REEF's Pacific Advanced Assessment Team (AAT) conducted fish and invertebrate surveys at two United States West Coast National Marine Sanctuaries: the Monterey Bay National Marine Sanctuary (MBNMS); and the Olympic Coast National Marine Sanctuary (OCNMS). These datasets are being used to document changes in key rocky reef fish and invertebrate species. 22 divers conducted over 140 REEF surveys at 12 sites during the week-long MBNMS project. To date, over 2,600 surveys have been submitted from the MBNMS in to the REEF database. During the OCNMS project in 2010, 8 divers conducted 114 REEF surveys at 13 sites.

GREAT ANNUAL FISH COUNT

The Great Annual Fish Count (GAFC) is an event coordinated by REEF that mobilizes and trains volunteer divers and snorkelers to identify and document fish diversity and population trends in marine ecosystems. 2010 was the GAFC's 19th year. Several events were held across REEF regions. On the Pacific Coast, GAFCs were conducted in Pacific Grove, CA, and in Friday Harbor, WA. In Hawaii's Honolua Bay Marine Life Conservation District, REEF surveyors observed and photographed over 70 fish species at their GAFC event. Surveyors in Jacksonville, FL, conducted surveys on the *Spike*, a Coast Guard boat sunk last year as an artificial reef. The team documented 16 species, compared to 6 species counted a week after the boat was sunk in 2009. REEF's largest GAFC event in the Northeast attracted 104 divers, who conducted 114 fish surveys at 13 locations around Cape Ann and southern Maine.

SPECIAL PROJECTS



YELLOW STINGRAY IN THE FLORIDA KEYS



Ward-Paige et al. 2010. *Env. Biol. Fish*

The REEF Volunteer Survey Project generates valuable data on marine life populations, while expanding scientific awareness in its participants. The extensive REEF data set has become an important source of information for documenting shifts and changes in populations and community structure as well as cataloging biological diversity. REEF's database, the largest in the world for fish populations, is continually being used by scientists at institutions such as NOAA's Fisheries Service and the National Marine Sanctuary Program, Fisheries and Oceans Canada, University of Florida, University of California Davis, University of Texas, Washington Department of Fish and Wildlife, and Florida Fish and Wildlife Conservation Commission, to mention only a few. Applications range from studies of Goliath Grouper population recoveries in Florida to deepwater Rockfish population depletion in Puget Sound, Washington. In 2010 there were 19 requests for specialized data files for scientific and conservation analysis. In addition, thousands of REEF.org website visitors explored the REEF database and generated reports on species distribution and abundance information.

In 2010, the following publications were published in the scientific literature that included REEF data:

Holt, B, E Cote, and B Emerson. 2010. Signature of Speciation? Distribution and Diversity of *Hypoplectrus* (Teleostei: Serranidae) Colour Morphotypes. *Global Ecology and Biogeography*. 23 April 2010

Victor, BC. 2010. The Redcheek Paradox: The Mismatch Between Genetic and Phenotypic Divergence. *Journal of the Ocean Science Foundation*. Vol 3, 15 April 2010

Ward-Paige, CA, C Mora, HK Lotze, CV Pattengill-Semmens, L Mcclenachan, et al. 2010. Large-Scale Absence Of Sharks On Reefs in the Greater-Caribbean: A Footprint of Human Pressures. *Plos One*. 5(8): E11968. Doi:10.1371/Journal.Pone.0011968

Ward-Paige, CA, CV Pattengill-Semmens, RA Myers, and HK Lotze. 2010. Spatial and Temporal Trends in Yellow Stingray Abundance: Evidence From Diver Surveys. *Environmental Biology of Fishes*. 20 November 2010

Beyond data, an engaged public who can serve as stakeholders and advocates for healthy ocean ecosystems is a powerful driver behind successful, long-term protections. Citizen science programs, such as the Volunteer Survey Project, provide a participatory approach to increasing ecological knowledge.

REEF STATISTICS

Total number of surveys completed at the end of 2010: 146,183

Number of surveys completed in 2010: 10,059

Number of hours spent underwater by volunteers in 2010: 9,215

Number of REEF surveyors: 12,394

Number of REEF survey sites: 9,128

Most frequently reported fish in:

TWA - Bluehead Wrasse (85% of all surveys)

PAC - Lingcod (58% of all surveys)

TEP - King Angelfish (88% of all surveys)

HAW - Saddle Wrasse (93% of all surveys)

NE - Cunner (72% of all surveys)

Most species rich sites:

TWA - Bari Reef, Bonaire, 389 fish species

PAC - La Jolla Shores, California, 154 fish species

TEP - Club de Yates, Acapulco, 139 fish species

HAW - Kahekili Beach, Maui, 245 fish species

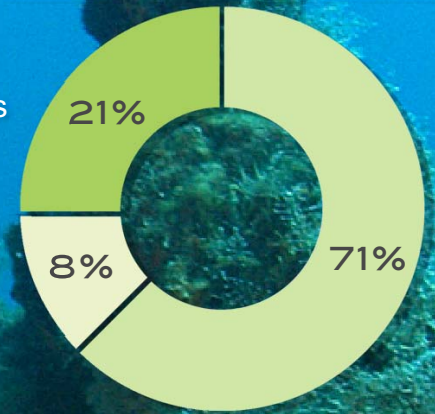
NE - Folly Cove, Massachusetts, 50 fish species



DATA USE & PUBLICATIONS

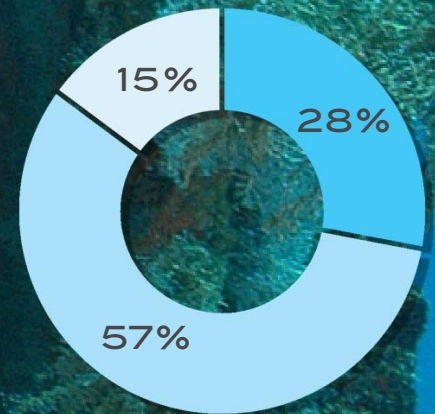
EXPENSES:

- \$450,362 - Program Services
- \$129,467 - Administration
- \$ 50,637 - Fundraising
- \$630,466 - Total



INCOME:

- \$391,416 - Grants, Contracts, & Program Revenue
- \$193,413 - Individual Contributions
- \$100,665 - Merchandise
- \$685,494 - Total



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Complete and professionally prepared financial statements will be available by August 1, 2011

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