

REEF Notes



Reef Environmental Education Foundation

An active organization of divers and other marine enthusiasts committed to ocean conservation

Ocean Science 2.0:

REEF Pioneers New Approach to Understanding Ocean Ecosystems

With more than 112,000 REEF surveys collected to date – on fish, critters, even algae – we often hear the question: “what do you do with all that data?” The simplest answer is to highlight a growing list of peer-reviewed scientific publications that use REEF data at www.reef.org.



Volunteers in Monterey Bay, CA, suit up before a survey dive. Courtesy John Wolfe.

The better answer is to explain how REEF programs represent a new way of understanding the underwater world, what we call “Ocean Science 2.0.”

Building a baseline. Often, the first piece of information any scientist needs to know is what the system looked like before s/he started research. Traditionally, scientists rely on professionals in their field - research divers, technicians, graduate students - to collect this baseline data. Recent growth in volunteer monitoring programs like the REEF Volunteer Survey Project has resulted in a large corps of trained data collectors to provide the “before of the before and after comparison at minimal cost to the science community.

Volunteers who meet testing and survey experience requirements join the Advanced Assessment Team (AAT) and assist REEF with specialized monitoring and assessment projects.



The AAT assists with monitoring and assessment of special sites, such as the Channel Islands National Marine Sanctuary, CA.

Courtesy Christy Semmens.

Strength in numbers. There is a lot of REEF data - 4.81 million data points to be exact. More than fourteen years of data on marine life biodiversity and abundance throughout the coastal Americas, Caribbean, Hawaiian Islands and the tropical eastern Pacific provides a large and uniquely powerful scientific tool that can be used to address a variety of research questions, such as the effectiveness of marine reserves by the National Park Service or changes to stock assessments by the National Marine Fisheries Service.



AAT experts monitor sites near the world's only undersea laboratory, Aquarius Reef Base in Key Largo, FL. Courtesy Lillian Kenney.

Science as inquiry. Most REEF volunteers have no formal science training, yet they can contribute significantly to the ocean science field through inquiry-based observation. As part of the REEF Grouper Moon Project, for example, volunteers document reproductive behavior of endangered Nassau grouper. Engaging volunteers in the process of asking “why?” is critical to increasing national ocean science literacy by promoting a dialogue between scientists and the general public.

Community-based conservation. Undersea communities are no less complex than human communities, where change is both inevitable and potentially devastating if members do not work together to adapt. REEF programs engage diverse stakeholders in working toward shared conservation goals. The Exotic Species Sightings Project, for example, is exploring ways to involve non-traditional allies such as spear fishermen in controlling populations of exotic invasive lionfish in the south Atlantic.



The dive community conveys important underwater information to the topside science community. Courtesy Emily Schmitt.

Much of what remains to be answered in ecology and conservation are big questions on big temporal and spatial scales, questions well-suited for large volunteer networks to help answer. Citizen science programs like those run by REEF are an innovative way to channel information, volunteers and resources to these remaining questions.

At a recent conference of leading citizen science organizations, volunteer-driven science was likened to the next generation of the internet, or Web 2.0. “Science 2.0,” the group proposed, could be the way future generations will seek to understand and live in the world around them. REEF was the only conference participant monitoring marine biota – others included bird watchers, weather watchers, even earthworm watchers.

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With the help of partners and volunteers, REEF continues to explore innovative ways to apply terrestrial monitoring and assessment paradigms to the marine environs, where science has only begun to understand important biological associations. The following pages offer a glimpse of how REEF projects help shape the future of ocean science and conservation. We invite you to dive in ...



Director's Corner



Greetings from REEF HQ!

It's hard to believe it was only year ago when we hit the 100,000 survey mark. Since then, you-our valuable volunteers-have conducted 12,000 more marine life surveys. Will it ever end?

I hope not! Because of your overwhelming participation in the Volunteer Fish Survey Project, REEF contributes in ever more meaningful ways to the growing field of citizen science. As you read on, learn about continuing REEF efforts to help monitor artificial reefs, study MPAs, combat exotic species and conserve the endangered Nassau grouper. Targeted outreach efforts have resulted in an international network of partners to help recruit and train REEF volunteers while a new REEF.org website helps make "fish watching" easier. Finally, the newly-unveiled 2008 Field Survey schedule promises a year of fun and educational travel for both veteran and virgin fish watchers.

Looking ahead, 2008 has been designated the International Year of the Reef by the International Coral Reef Institute. REEF and others in South Florida are excited to welcome experts from around the world to the 11th International Coral Reef Symposium in Ft. Lauderdale July 7-11. New and bigger partnerships will expand REEF programs in the National Parks, enhance our research of endangered Nassau grouper and push the Volunteer Fish Survey Project further west, with the launch of the VFSP at Fagatele Bay National Marine Sanctuary, American Samoa.

I'd like to recognize the REEF staff team – Lad, Christy, Joe, and our newest member, Kim - for their hard work and dedication over the last year. This small group of passionate professionals consistently puts in long hours to help REEF achieve its mission through a myriad of unique, high-quality programs. I am honored to work alongside you.

From all of us at REEF, we thank you for your continuing support and wish you a happy, healthy remainder of 2007. See you in the water ...

Best 'fishes',

Leda

Leda A. Cunningham
Executive Director



Clara Taylor, Ned DeLoach, Joe Glenn, Anna DeLoach, Paul Humann and Amy Slate enjoy the 2007 Sustainers Event. Courtesy Clara Taylor.

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In Memoriam:

Mr. Kawika Chetron, whose prolific surveying put him at the top of the list for REEF surveyors in the Pacific region, at nearly 500 surveys.

Ms. Kelly Stack, an environmental enthusiast and friend to the REEF community.

Special Thanks to:

Audrey and Ken Smith for continuing help with data processing and REEF HQ maintenance;

Dr. Michael Coyne for continuing assistance with REEF database programming;

Barb Bohnsack, Elaine Morden and Mary "Evie" Seats for helping out at REEF HQ;

Amy Slate for hosting the 2007 Sustainers Event;

Mike Brooks, John Crandon, Anna DeLoach, Paul Humann, Joy King, Paul Moen and Tim Hicks for assisting with the 2007 Sustainers Event;

Sue Thompson and Keith Cunningham for assistance during the Tortola Field Survey;

Holly Martel-Bourbon, Vincent Malkoski and Sarah Taylor for assistance during the New England Field Survey;

Tom Isgar, Mike Phelan, Lillian Kenny and James Brooke for helping REEF at the DEMA (Diving Equipment and Marketing Association) dive show;

Dave Grenda, for his leadership role in Florida AAT projects;

Tom and Nancy Pletcher for helping interns move into their semester home;

Kathleen Antona, Hilary Harder, Joy King, Theresa, Eric and Peter Leahy, Wayne Manning, Glenn and Janet Phipps, and Pug Pugliese for help at OceanFest 2007;

Key Largo Field Stations for providing dive opportunities for REEF interns;

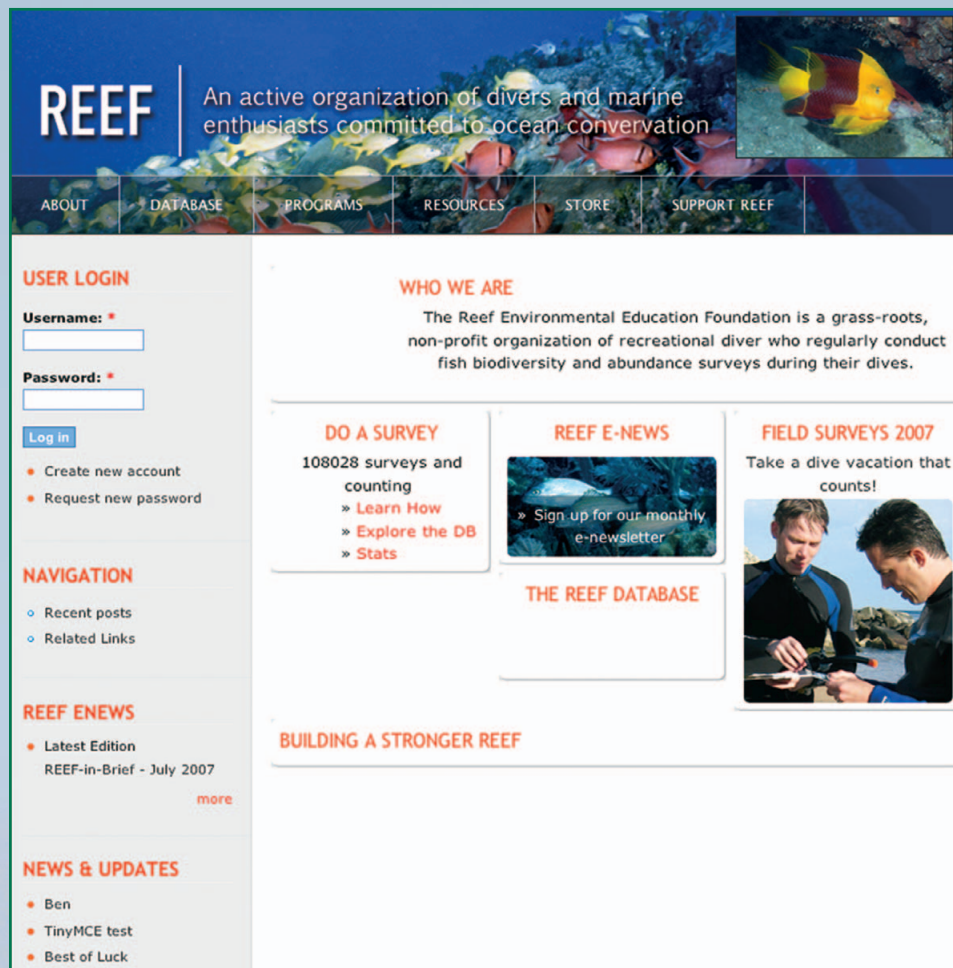
Horizon Divers and Quiescence Diving Services for continued boat support of Florida AAT projects;

Mike and Terri Fausnaugh for starting the Fish Identification Network (FIN) on Maui; and

Partners at the Cayman Islands Department of the Environment and Oregon State University, REEF volunteers and the many Cayman Island businesses who continue to support the Grouper Moon Project.



Joe Cavanaugh presents 10-year office volunteer Audrey Smith with award and free spot on a 2008 REEF Field Survey. Courtesy Joe Cavanaugh



REEF.org Redefined: **REEF Launches New Website**

The online presence of REEF recently underwent a significant overhaul. Thanks to a small grant from the Norcross Foundation and a huge amount of work and patience by Ben Weintraub, we are pleased to present the new and very much improved REEF.org. Ben, a University of Washington Computer Sciences student, created the new site, which includes several new interactive features as well as many of the existing content and features in an updated, easy to navigate and user-friendly site.

Ben did an incredible job of sorting through our endless lists of “wouldn’t it be great if our members could do this?” and “it would make our jobs so much easier if we could do that.” We urge you to visit the new site. Just a few of the features you will find are:

- More ways to explore your own data, including a REEF Survey Log.
- Interactive discussion boards, including “ID Central”, a place where you can post identification questions and images of unknown critters for others to comment on.
- Member content forums that enable you to post REEF survey trip reports, information on your favorite place to survey, and stories from the field such as an interesting animal behavior you encountered underwater or a rare find.
- A searchable map of REEF Field Stations, including information on upcoming REEF classes and organized survey dives.
- Learning resources including quizzes and galleries.

To get the most out of the new website, you will need to become a registered REEF.org user, so be sure to create a user login profile.

Test drive the new REEF.org today! While you’re there, please update your contact information so we can keep in touch.



AAT volunteer and Education Coordinator for the Channel Islands National Marine Sanctuary, Laura Francis, conducts a REEF survey during a recent monitoring project.
 Courtesy Claire Fackler/NOAA.

Studying MPAs in the Channel Islands

Dr. Christy Pattengill-Semmens is participating in a series of workshops this fall to analyze REEF and other data gathered from the Channel Islands Marine Protected Areas (MPAs). Originally established in 2003 (and then expanded to include Federal waters earlier this year), this network of no-take marine reserves protects 318 square miles around the northern five Channel Islands off the coast of California. In 2008, the California Fish and Game Commission will conduct a 5-year review of the MPAs to evaluate the effectiveness of the reserve network.

Results from the evaluation will inform future Commission decisions under California's Marine Life Protection Act. The data group workshops, held at the National Center for Ecological Analysis and Synthesis, will culminate in a series of publications summarizing the cumulative efforts of dozens of monitoring programs within the Channel Islands MPAs, with an emphasis on analyses that can best address key management questions concerning the reserves. These results will be presented during a special symposium associated with the California Islands Symposium.

Coincident with marine reserve establishment in 2003, REEF initiated a program to monitor sites inside and outside the reserves to complement ongoing REEF volunteer survey activities in the area. Surveyors on the Pacific REEF Advanced Assessment Team (AAT) participate in annual cruises with the Channel Islands National Marine Sanctuary, generating more than 800 surveys to date. These data, along with REEF surveys conducted prior to 2003, will provide information on fish assemblages (and recently, key invertebrate and algae species) of the Channel Islands.

Monitoring Artificial Reefs

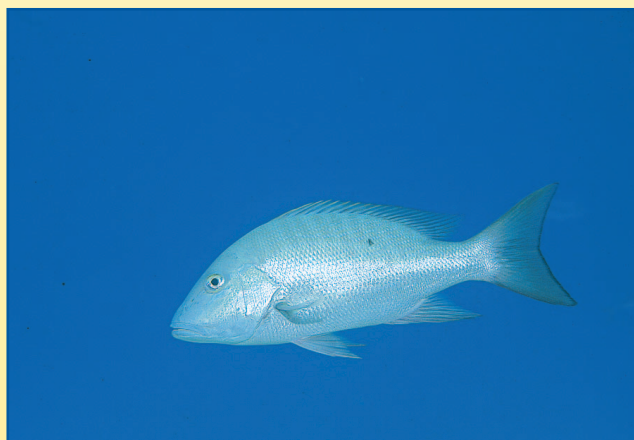
REEF recently completed 5-year monitoring projects on the fish assemblages of two modified reef areas off Key Largo, Florida. The first included an area damaged by the *M/V Wellwood*, a 122-meter freighter that ran aground on Molasses Reef in 1984, destroying 1,285 square meters of living corals. Limestone reef modules were placed in the injured area in 2002 to provide substrate for new coral colonization. The second project focused on the *U.S.S. Spiegel Grove*, a 510' Navy Landing Ship Dock that was intentionally sunk in 2002 as a recreational diving and fishing artificial reef. Monitoring included the ship and 7 nearby natural and artificial reef sites.

Both projects yielded valuable information about natural reef alteration management actions. Methods included Roving Diver Technique visual surveys on each artificial reef and nearby reference sites. Belt transect surveys were also conducted at the *Wellwood* to document size frequency shifts and quantitative shifts in densities of key species. In 2008, REEF will embark on a new monitoring project with the planned sinking of the *USAFS Gen. Hoyt S. Vandenberg* off Key West, a 523' Air Force missile-tracking ship. Similar to the *Wellwood* and *Spiegel Grove* projects, Vandenberg monitoring will be conducted by the REEF AAT over 5 years.

Visit the *Projects* section of www.REEF.org to learn more about these and other monitoring projects that involve REEF volunteers.



Artist rendering of the Vandenberg, to be sunk 6 miles south of Key West, FL. Painting by David Harrison Wright.



REEF data contribute to stock assessment of mutton snapper (*Lutjanus analis*) in SE U.S. Courtesy New World Publications.



Putting REEF Data to Work

As REEF volunteers continue to submit marine life surveys, the utility and statistical power of the REEF database increase dramatically. The scope of data applications also increases as longer time series are amassed and geographic coverage of REEF activities broadens. Recent examples of how REEF data contribute to marine science include:

- As a fisheries-independent data source in a stock assessment of southeast U.S. populations of mutton snapper conducted by the SouthEast Data, Assessment, and Review (SEDAR), a cooperative Fishery Management Council process;
- As an indication of non-consumptive diver use patterns as part of the California Central Coast Marine Life Protection Act Stakeholder Group Regional Profile, used to implement a network of marine reserves; and
- As a historical baseline on the status and trends of fish assemblages in the Flower Garden Banks National Marine Sanctuary in the Sanctuary Management Plan Review process.

Visit the *Publications* section of www.REEF.org to learn more about these and other ways scientists put REEF data to work.

Grouper Moon Project: **Conserving a Caribbean Icon**

by Dr. Brice Semmens, Grouper Moon scientist

While Nassau grouper are well known by Caribbean fish watchers, they are not often seen by divers these days. Nassau grouper aren't just icons of the Caribbean—they are a social and ecological cornerstone of the region's coral reefs. Reports from the 19th century describe Nassau grouper as abundant on Caribbean reefs and critically important to commercial fisheries.

Typically solitary and territorial, Nassau grouper gather at reef sites for a few days each year to find mates. These reproductive aggregations are irresistible to fishermen, who can catch thousands of fish from such sites in a few short days. Fishing on aggregation sites has caused a collapse of regional populations of Nassau grouper. By the 1990's Nassau grouper had declined so significantly that they became one of the first Caribbean reef fish to be listed as endangered by the International Union for the Conservation of Nature (IUCN).

In 2003, REEF started the Grouper Moon Project, a cooperative research program with the Cayman Islands Department of the Environment (CIDOE) in which REEF volunteers and staff document one of the last remaining large Caribbean aggregations on Little Cayman Island (currently estimated to include more than 2,000 Nassau grouper each winter). In 2005, we added an electronic tagging component that allows us to follow grouper movements as they migrate to and from the aggregation site.

The Grouper Moon Project enables REEF and CIDOE scientists to take advantage of the latest advances in marine acoustics and telemetry to characterize the reproductive behavior of Nassau grouper attending a healthy aggregation. In 2007, with support from the J. Edward Mahoney Foundation, REEF piloted expanded research to Cayman Brac, a nearby island where spawning aggregations have been fished to exhaustion. A study to better understand recruitment timing and habitat



Grouper Moon volunteer and AAT member, Brenda Hitt, checks out a Nassau grouper resting during the day at the spawning aggregation site on Little Cayman Island. *Courtesy Phil Bush/CIDOE.*

preferences of juvenile Nassau grouper was also initiated.

The Grouper Moon Project research team will present current results at the annual Gulf and Caribbean Fisheries Institute conference in November, 2007. Results will help guide the preservation and rehabilitation of an endangered, charismatic and socially important reef fish species. Additionally, findings from the Grouper Moon Project will be critical in assisting the Cayman Islands Marine Conservation Board in their evaluation of the spawning aggregation harvest ban that is currently in place until 2011.

For more information, please visit the Projects section of www.REEF.org.

Lionfish Expeditions Lead to New Information

As part of a cooperative effort between the National Oceanic and Atmospheric Administration (NOAA), Bahamian fisheries, the College of the Bahamas and Bahamian dive operators, REEF volunteers are collecting data and samples to determine the range and extent of the recent lionfish invasion in Atlantic waters and address key questions on feeding habits, age and growth, reproduction, genetics, parasites and habitat preference.

REEF has coordinated more than 500 lionfish collections and logged more 700 sightings. Due in large part to this effort, Bahamas government officials recently issued statements encouraging fishermen to remove the fish whenever they are sighted. Fear of significant impacts to important fisheries, coral reef ecosystems and human health issues are the focus of removal efforts. REEF is collaborating with NOAA and the U.S. Geological Survey (USGS) to build a comprehensive lionfish sightings database and provide samples to biologists.

Some lionfish facts:

- Average size in Bahamas: 188 mm total length
- Habitat preference: Lionfish have been found in almost all habitat types including artificial sites, canals, deep reefs, shallow reefs, small ledges, and sand bottom.
- Parasites: Compared to native fish, lionfish have few parasites possibly providing a competitive advantage over native fishes.
- Growth: Lionfish appear to grow faster than similar sized native fish species like graysby and red hind.

For more information or to report non-native marine fish sightings, visit the Projects section of www.REEF.org or contact Lad Akins at (305) 942-7333 or Lad@reef.org.



REEF Board member Andy Dehart collects lionfish in the Bahamas. *Courtesy Sally Thomson/Stuart Cove's Dive Bahamas.*



Juvenile lionfish.
Courtesy Tom DeMayo.

Please Join REEF on an Upcoming Lionfish Expedition

November 11-16, 2007

Stuart Cove's Dive Bahamas (with Ned and Anna DeLoach, Lad Akins, Andy Dehart and Bruce Purdy)

December 8-14, 2007

Blackbeard's Cruises in Grand Bahama

January 26-Feb 1, 2008

Aqua Cat Exumas Project with the National Aquarium in Washington DC

February 9-15, 2008

Cat Ppalu in Eleuthra

March 2008

Aqua Cat in the Exumas – Details TBD

For Stuart Cove's Dive Bahamas project, please call (800) 879-9832.

For Aqua Cat, Cat Ppalu and Blackbeards projects, please call (800) 327-9600.

REEF Field Stations:

Partners on the Ground, in the Water

With lean staffing and resources, REEF relies on partner organizations called Field Stations to help recruit and train volunteers. Field Stations include commercial dive operators, non-profit organizations, National Marine Sanctuaries, National Parks, public aquaria and other ocean science and conservation related institutions, of which 75 are active throughout REEF survey regions: the coastal Americas, Caribbean and Hawaiian Islands and the tropical eastern Pacific. As service centers for the REEF Volunteer Survey Project, Field Stations provide their visitors with the opportunity to see more, know more and give back to the ocean environment they love while promoting fish-watching as a lifelong hobby and diving as a life-long sport. To become a Field Station or to get involved with a Field Station in your area, please visit www.REEF.org.



Horizon Divers in Key Largo, FL, helps REEF do local outreach.

New in 2008! Thanks to a grant, the Field Station start-up fee (\$150) and annual renewal (\$100) have been waived! Sign up to become a REEF Field Station at www.REEF.org.



New England Field Survey team 2007.

Capacity Building in New England

REEF recently completed its first New England Field Survey based in historical Woods Hole on Cape Cod. It was a successful trip in building on efforts started in 2001 to translate the Volunteer Survey Project, our flagship citizen science program, to the New England scuba scene. In contrast to more tropical locales, fish surveying in New England is a shore-based effort, allowing for only a 7-month fish surveying season in most areas (April-October). Few dives shops have charter boats; dive clubs are the main vehicle for divers to connect with other divers.

The REEF team included 9 divers from New Mexico, California, New York, New England and New Brunswick, Canada who surveyed sites from Cape Cod to Cape Ann. New partnerships were forged with the New England Aquarium, Marine Biological Laboratory and Woods Hole Oceanographic Institute to promote fish watching in New England and collaborate on future region-specific outreach and education projects.

San Diego Oceans Foundation: Field Station Extraordinaire

The San Diego Oceans Foundation (SDOF) is a model REEF Field Station. In the two years that SDOF has been organizing REEF survey trips, it has more than tripled the amount of data collected in southern California since the REEF program launched there in 1997, training more than 200 divers and snorkelers and conducting more than 473 surveys marine life surveys. And they just keep coming! Thanks to the tireless efforts of Noelle Morris, Courtney Gosch and many dedicated volunteers, SDOF has developed innovative education, training and volunteer incentive programs to keep the REEF Volunteer Survey Project and other marine citizen science initiatives sustainable. For more information, please visit www.sdoceans.org.



SDOF/REEF fish experts Lucille Richard and Herb Gruenhagen geared up for the GAFC. Courtesy Courtney Gosch.

REEF Interns Dive In, Reach Out, Give Back

Each semester, the REEF Marine Conservation Internship Program exposes 2 college-age students to the inner workings of a marine conservation organization to prepare them for careers in ocean science, education and conservation. Based at REEF HQ in Key Largo, FL, interns regularly conduct marine life surveys and coordinate local outreach efforts, including the Great Annual Fish Count (GAFC) and programs with such partner organizations as Biscayne National Park.



Spring 2007 interns Isla Turner and Jenny Arakaki at REEF HQ.

REEF interns are critical to daily operations, processing membership requests, filling REEF Store orders and otherwise helping REEF HQ run smoothly. Interns go on to pursue interesting, meaningful careers. For example, Steve Saul (summer 2003 intern) is a PhD candidate at the University of Miami, studying how fishers and fishing fleets make fishing effort decisions and how these decisions impact the dynamics of marine fish populations. If you or your favorite college student is interested in joining REEF for a semester of hands-on marine conservation, please contact Kim at REEF HQ (Kim@reef.org or 305.852.0030). Housing and a small stipend are provided.

Engaging Divers in the Pacific Northwest



One of the newest REEF Pacific AAT members, Pete Naylor, passes his Expert test.

Courtesy Janna Nichols.

Thanks to a grant from the Russell Family Foundation, REEF has launched a one-year initiative to actively engage new REEF surveyors in the Pacific Northwest region and encourage existing surveyors to move up through the ranks of the REEF Experience Level system. A series of free training workshops and survey dive trips will be held throughout Washington and Oregon.

Traditionally, divers and snorkelers do not receive more than a cursory introduction to underwater ecology or marine life identification. Even after years of experience in the water, most divers can identify only a handful of the species they see while diving. REEF introduces you to the incredible diversity of fishes and other wildlife found in local waters as well as identification resources and survey methods needed to document these species.

Active REEF surveyors advance through 5 experience levels (Novice: 1-3 and Expert: 4-5) based on the number of surveys completed and passing scores on exams. While 536 volunteers have conducted surveys in the Pacific Northwest through the REEF Volunteer Survey Project, only 28 members currently rank as Expert surveyors. Because Experts have conducted roughly a third of all surveys submitted to date, it is clear that as volunteers improve their skills, they are more likely to stay actively involved in data collection.

To learn more about advancing through the REEF Volunteer Survey Project, please visit the Programs section of www.REEF.org.

Giving Back

Benefactors (\$2,500 +)

Ms. Patricia Ayers
Mr. and Mrs. Paul and Marta Bonatz
Dr. and Mrs. Ken and Sherri Deaver
Mr. and Mrs. Ned and Anna DeLoach
Mr. and Mrs. Steve and Mary Dingleidein
Ms. Rosemary Duke
Mr. Neil Ericsson and Ms. Karen Florini
Ms. Chatten Hayes and
Mr. David Steinburg
Mr. Paul Humann
Dr. Murray Kilgour
Drs. Peter and Jeanette Lysne
Dr. Joe Meyer
Mr. Michael Stanfield
Mr. and Mrs. John and Bonnie Swinford
Mr. Roger Swinford

REEF appreciates the generous support of our 'angelfish' donors. To join this important part of the REEF family, please contact Leda at (305) 852-0030 or Leda@reef.org. Gifts received in the last year (Oct. 1, 2006-Sept. 30, 2007) are shown here

Sustainers (\$1,000-\$2,499)

Ms. Kathy Aguilar and Mr. Tony Ramirez
Ms. Deborah Bollag
Ms. Darcy Charlier and Mr. Rob Mougey
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The Nielsen Company
New World Publications
Norcross Wildlife Foundation
The Ocean Foundation
The Russell Family Foundation
Seaspace
Triad Foundation
Washington Scuba Alliance
Washington Sea Grant

*Make the most of your gift!
When planning your REEF contribution, check to see if your employer offers a matching gift program.*

The Bottom Line:

Fundraising from the (Sea) Grass Roots

How do you build a productive, relevant, fun and financially stable place to invest in ocean conservation? It starts with keeping a lean budget.

When you give REEF a dollar, approximately \$0.80 of it goes directly to REEF programs. You may be underwriting scanforms, data collection sheets provided to volunteer surveyors free of charge that are the backbone of the REEF dataset, currently 105,000 surveys strong and the world's largest publicly accessible living marine life database. Or you may be supporting staff participation in a scientific conference, helping fund online data entry or contributing to an intern's \$500 stipend.

The remaining \$0.20 subsidizes expenses like utilities and insurance, unglamorous costs that many grants do not cover but that are nonetheless necessary to run the organization. Here is how the numbers break down for 2007 (based on 2nd quarter estimates):

Revenues	(% of Total)
Contracts	\$113,000 (28%)
<i>(Sanctuary monitoring and assessment, e.g.)</i>	
Member donations	98,000 (24%)
Program services <i>(Field Surveys, e.g.)</i>	78,700 (19%)
Foundation support	76,450 (19%)
Sale of merchandise	42,200 (10%)
TOTAL	\$408,350

Expenses	(% of Total)
Fundraising and administrative	\$82,875 (20%)
Volunteer Fish and Invertebrate Survey Project	\$104,300 (26%)
Outreach and Education	\$62,620 (15%)
Field Surveys	\$53,344 (13%)
Monitoring and Special Projects	\$104,609 (26%)
TOTAL	\$407,748

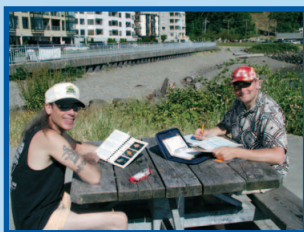
If you ask around, you'll find that 80/20 program/admin ratio to be favorable compared to other organizations. (Finishing the year with a net income of \$602 is probably not standard practice either; I wasn't kidding about lean budgeting!) The key to remaining a sustainable, mission-focused organization is keeping that ratio high while stretching the 80% as far as possible. This is increasingly difficult for REEF for three reasons:

1. Decreasing availability of government funding, our highest revenue source;
2. Rising costs of living, working and insurance in the hurricane-prone Florida Keys; and
3. Growing interest in REEF programs, resulting in spreading our resources thin.

This is where you come in. Even if it's only \$25, every time you contribute to REEF you chip away at that growing chunk of money we need to keep our conservation programs running.

Being a best-bang-for-your-buck, "little organization that could" has served REEF well for 14 years. We have put thousands of volunteers in the water counting fish (and recently, invertebrates, algae and other critters), documented and removed exotic invasive species on both U.S. coasts, contributed to an 8-year fishing ban on the harvest of endangered Nassau grouper and earned a strong reputation for cost-effectiveness – all with few staff, many long hours, almost zero marketing and minimal fundraising efforts.

We sincerely appreciate those who have helped REEF fulfill its mission so far. We are building a stronger REEF and hope you will continue to support our valuable work by making a donation online at the Support Reef section of www.REEF.org.



Become a REEF Business Partner.

Your company can demonstrate its commitment to marine conservation by making a tax-deductible gift of cash, stock or equipment valued at \$2,500 or more. Mr. Roger Swinford, CEO of Calhoun International and a new REEF Business Partner, says [\[quote here\]](#).

Survey Numbers

REEF Top 25 Surveyors in Each Region, as of September 25, 2007

TWA Top 25 Surveyors	PAC Top 25 Surveyors	TEP Top 25 Surveyors	HAW Top 25 Surveyors	NE Top 25 Surveyors
Peter Leahy (1731)	Kawika Chetron (487)	Richard Baker (477)	Janet Eyre (366)	Clive R. Wood (91)
Linda Baker (1718)	Georgia Arrow (379)	Kandie Vactor (172)	MJ Farr (317)	Amy Maurer (45)
Laddie Akins (1155)	Janna Nichols (354)	Beth Bruton (124)	Patricia Richardson (311)	Stella Martin (44)
Judie Clee (1027)	Mike Delaney (284)	Walter Briney (85)	Liz Foote (221)	Peter Marck (32)
Linda Schilling (980)	John Wolfe (278)	Sandra Percell (83)	Karen Ella Levy (205)	Michael Patterson (31)
Linda Ridley (978)	Stanley Kurowski (243)	Brice Semmens (60)	Nanette Harter (204)	Richard Curtin (30)
Bruce Purdy (927)	Valerie Lytle (231)	Jeff Holmes (59)	Fred Litt (202)	Suzanne Rose (28)
Sheryl Shea (873)	Rachid Feretti (227)	Paul Humann (57)	Robin Newbold (138)	Jim Drew (24)
Dave Grenda (858)	Claude Nichols (226)	Chris Ostrom (48)	Neil Rhoads (123)	John Irza (22)
Leslie Whaylen (795)	Kirby Johnson (218)	Robert Reavis (37)	James Vaughn (118)	Christopher Ranney (21)
Phyllis Blackburn (722)	Tom Dakin (211)	Martin Levy (40)	Michele Vaughn (118)	Bob Michelson (19)
Lillian Kenney (674)	Carl Gwinn (195)	Alvaro Segura (38)	Lynn Hodgson (114)	Brandy Dericckson (15)
Cathy Coughlin (617)	Doug Biffard (186)	Dave Grenda (37)	Michael Fausnaugh (98)	Ann Irza (15)
Jean Kirkpatrick (598)	Alan Dower (162)	Neil Ericsson (30)	Donna Brown (93)	Chris Sargent (15)
Jessica Armacost (579)	Wes Nicholson (158)	Karen Florini (36)	Chatten Hayes (86)	Janet MacCausland (14)
Joe Thomas (556)	Tim Renz (152)	Karen Garcia (36)	Dave Grenda (80)	Alicia Lenci (11)
Rob McCall (555)	Matthew Dowell (144)	Warren Hinks III (32)	Dennis Bensen (69)	Chuck Skinner (10)
Deena Reppen (551)	Pamela Wade (136)	Janet Earnshaw (29)	Douglas Harder (62)	Jeff Laurie (10)
Joyce Schulke (535)	John Williams (124)	Janet Eyre (27)	Mel Gabel (58)	Eileen Byrne (10)
Kris Wilk (516)	Phil Green (107)	Michael Phelan (27)	Christy Semmens (53)	Kerry Hurd (9)
Christy Semmens (492)	Brian Elliott (103)	John Wolfe (26)	Brice Semmens (53)	Jim R Stewart (9)
Franklin Neal (463)	Bryan Nichols (96)	Clive R. Wood (25)	Kayla Serotte (48)	Fred Ward (9)
Patricia Chandler (462)	Paul Weakliem (87)	Kevin White (25)	Carol Grant (44)	Chris Skinner (8)
Carol Grant (458)	Christy Semmens (82)	Christy Semmens (25)	Sandra Percell (42)	Andrew Urh (7)
Douglas Harder (458)	Rhoda Green (82)	Kenny Tidwell (23)	Kandie Vactor (39)	Joseph Cavanaugh (6)

2008 REEF Field Survey Schedule

REEF Grouper Moon Field Survey Expedition

Little Cayman Island • January 20 -27, 2008
Led by Dr. Christy Semmens,
REEF Director of Science
Price: \$2,095 all inclusive

Saba aboard *Caribbean Explorer II*

February 24 - March 1, 2008
Led by Leda Cunningham, REEF Executive Director
Price: \$1,595, all inclusive

Turks & Caicos aboard *Aggressor II*

April 19-26, 2008
Led by Joseph Cavanaugh, REEF Director of Field Operations
Price: \$1,595 - \$2,495 (depending on cabin)

Akumal, Mexico Bahia Principe Resorts

May 17-24, 2008
Led by Joseph Cavanaugh, REEF Director of Field Operations
Price TBD but will be all inclusive (accommodations, meals, dives)



Paul Humann's Key Largo REEF Discovery Tour

June 21-28, 2008
Led by Paul Humann, award-winning
marine life author and photographer
Price: \$1,152 per person based on double occupancy

St. Vincent Island (Grenadines) Cryptic Species Tour

July 26-August 2, and August 2-9, 2008
Led by Paul Humann, Ned and Anna DeLoach
Price: \$1,105 per diver, per week based on double occupancy

Sea of Cortez aboard the *Don José*

October 5-12, 2008
Led by Dr. Christy Semmens, REEF Director of Science
Price: \$1,550 per person

Cozumel, Mexico

December 6-13, 2008
Led by Sheryl Shea, REEF volunteer and local naturalist
Price: \$544 per person based on double occupancy

An additional \$300
REEF program fee will be
applied to each participant.
For more information please
visit <http://reef.org/fieldsurv>

Take a Dive Vacation That Counts!SM

REEF Field Surveys offer a fun and educational way to contribute to marine conservation. Led by expert underwater naturalists, scuba divers and snorkelers will learn to identify marine life and conduct fish population surveys that assist scientists in making informed resource management decisions. A unique combination of classroom presentations, group discussion and survey dives make Field Surveys the ideal choice for people just getting started with diving or "fish watching." We invite you to join a REEF Field Survey team of like-minded divers and snorkelers who want to make a difference for the future of our oceans.

Keep in touch!

Please be sure we have your updated
contact information, including email.
Visit our Membership Update page
at <http://www.reef.org/update.htm>



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