

The Reef Environmental Education Foundation



1999 Annual Report

REEF Board, Staff and Advisors

Board of Trustees

Paul Humann, REEF Founder
Ned DeLoach, REEF Founder
Jim Dalle Pазze
Dr. Jim Bohnsack
Dr. Gina Green

New World Publications
New World Publications
Saul, Ewing, Remick and Saul
National Marine Fisheries Service
The Nature Conservancy

REEF Advisory Board

The members of the REEF Advisory Board are distinguished members in their fields and have all committed their time and expertise to the REEF Board and Staff.

Billy Causey
Dr. Ken Deaver
Kalli De Meyer
Deena Wells Feeley
Stephen Frink
Professor Robert Ginsburg
Dr. Steve Gittings
Wolcott Henry
William Horn
Peter Hughes
Dr. Tom Isgar
Jennifer Lash
Dr. Carol Lorenz
Ken Marks
Chris Ostrom
Dr. Emily Schmitt-Lavin
Dr. Edwin Steiner
Dr. Kathleen Sullivan Sealy
Anne Walton

Florida Keys National Marine Sanctuary
Ethnoscience
Coral Reefs Park program, Coral Reef Alliance
Florida Dept. of Environmental Protection
Rodales' Scuba Diving/ Stephen Frink Photo.
Univ. of Miami Rosenstiel School
Marine Sanctuary Division, NOAA
The Henry Foundation & The Munson Foundation
Florida Fish and Wildlife Conservation Commission
Peter Hughes Diving
Seluera, Inc.
Living Oceans Society

Bites and Pieces Consulting
Marine Sanctuaries Division, NOAA
Chaminade-Madonna College Preparatory
Mo' Alem, Inc.
The University of Miami
Channel Islands National Marine Sanctuary

REEF Staff

Laddie Akins
Denise Mizell
Dr. Christy Pattengill-Semmens
Leslie Whaylen
Laurie Wilson

Executive Director
Administrative Assistant
Scientific Coordinator
Field Operations Coordinator
Development and Media Coordinator

Executive Director's Message

Last year was our first occasion to gather during the Advisory Board and Sustainer's Event. Any of you able to attend surely walked away from that day feeling as uplifted and motivated as I did. Another year has passed and I am even more excited to meet with you all again to discuss REEF's standing and direction for future.

Last year proved to be a year of change, of increased activity, and of new partnerships. Our membership continues to increase. Our education and outreach programs are evolving. Our survey database is growing faster than ever before. Our program is expanding to new regions. And new projects and opportunities are presenting themselves every day. We have gone from an organization looking to make ourselves available, to one working hard to manage all of the requests for our services. We find ourselves making a difference.

This report is produced each year in preparation for the annual REEF Advisory Board and Sustainer's event. It represents an overview of current REEF status, activities, programs and financial status. It also serves as the basis for planning upcoming programs and activities as well as a catalyst for direction. As you read though it, realize that the efforts represented here are not only the work of a small REEF staff, but also the work of a large REEF membership. Our volunteers and members make REEF work.

In Thanks,

Laddie Akins
Executive Director

REEF ENVIRONMENTAL EDUCATION FOUNDATION

Our Mission

To educate, enlist and enable divers and non-divers alike to become active stewards in the conservation of coral reefs and other marine habitats.

Our Vision

The oceans have always inspired a sense of awe and wonder. Of even greater importance, the very health and well-being of our water planet depend on the continued health and well-being of the oceans. And yet, the oceans remain one of the last natural histories to be extensively explored. We do know that marine habitats provide some of the world's most diverse ecosystems. Coral reefs support communities comprising may tens of thousands of species; they are unique, valuable, and irreplaceable places of great aesthetic, environmental and commercial value. They are also under increasing threats from human impacts that permanently destroy habitat and deplete resources.

Recreational divers and snorkelers are in a unique position to observe, record and publicize the effects of these threats. Armed with knowledge and the opportunity to become involved, these divers can make significant and ongoing contributions to the conservation of marine habitats.

Our Goals

- * To educate and enlist a growing corps of volunteer divers and snorkelers to conduct surveys of marine life.
- * To provide the marine science, resource management, and conservation communities with a reliable, geographically broad, and continuing source of marine biodiversity data for practical application in habitat conservation and resource management.
- * To encourage the support and implementation of effective marine conservation strategies developed through government, private or public frameworks.
- * To educate divers and the general public about threats confronting the marine environment and to encourage them to become active stewards in ocean conservation.
- * To promote the diving community as an active partner in the long-term conservation of coral reefs and other marine habitats.
- * To work cooperatively with other like-minded people and organizations to effectively and efficiently achieve these goals.

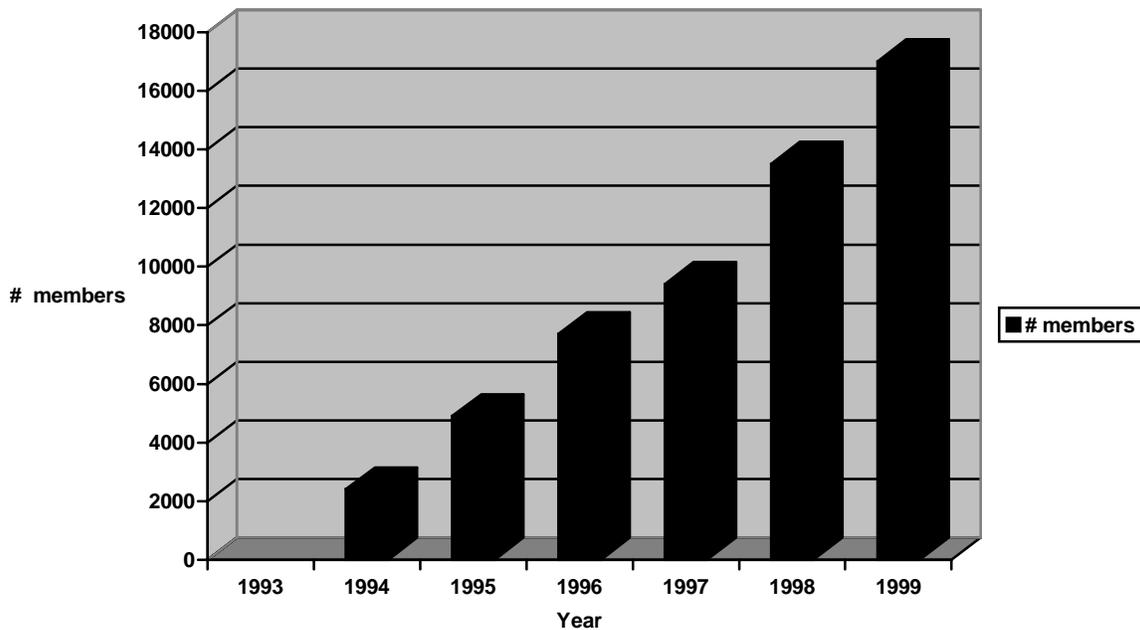
REEF 1999 Summary

- Addition of over 4,000 'no-fee' members to build REEF's membership to 17,000;
- Strengthening of REEF's organization structure with the addition of three new staff positions: a Field Operations Coordinator, Scientific Coordinator, and a Development and Media Coordinator;
- Conducting 45 public outreach talks to more than 1,800 people and coordinating an additional 37 fish ID seminars through the Great American Fish Count;
- Publication of our newsletter REEFNotes and maintaining our Website to educate our members and the public-at-large about REEF's mission and volunteer fish survey program;
- Production of a new waterproof color id card for the west coast, including 60 of the most common fishes along the Pacific coast of the US and Canada;
- Completion of an additional 4,000+ surveys by REEF volunteers. The survey database now houses over 22,000 surveys;
- Completion of 10 Field Survey Projects;
- Participation in special projects, including the Atlantic and Gulf Rapid Reef Assessment (AGGRA) Project and the Sustainable Seas Expedition (SSE);
- Collaboration with a variety of groups and resource agencies, including two expansion projects;
- Application of REEF data in six scientific papers and reports;
- Completion of the 1999 Florida Keys NMS Zone Monitoring Project with REEF's Advanced Assessment Team.

REEF Membership

Members are the backbone of the REEF organization. REEF exists to serve its members and in turn, members provide data, support and motivation to carry out or mission. REEF has always maintained a "no-fee" membership policy and continues to provide memberships free of charge to anyone interested. All members are provided with a free membership packet and REEF number. In addition, members receive the newsletter REEFNotes free of charge and may request free survey report forms at any time. During 1999, REEF saw another year of increase in our membership, adding more than 4,000 members to the REEF roles. Most of these new members found out about REEF through dive consumer shows, dive magazines, and the Internet. Due to the increasing importance of on-line resources, an on-line sign-up form was added to the REEF Website. To facilitate the ever-growing REEF membership, a custom database was developed by REEF Advisory Board member Ken Marks.

REEF's Membership Growth



Education and Outreach

A significant portion of REEF's mission is to educate divers, snorkelers, and the general public about marine issues. REEF accomplishes this primarily through talks, our newsletter, and the REEF Website.

Educational/Outreach Talks

Each year REEF staff and volunteers conduct numerous talks for primary, secondary and university school groups, dive clubs, and other NGO and conservation-minded groups. These talks include a variety of subjects from fish identification to behavior to basic coral reef ecology, and always include a strong conservation message and focus on measures to help protect our marine resources. In 1999, more than 45 talks were presented to over 1,800 people. Local partners conducted an additional 37 Introduction to Fish Identification seminars in conjunction with the Great American Fish Count.

REEFNotes Newsletter

The REEFNotes newsletter is produced and mailed free of charge to all US REEF members (over 12,000 households) and to foreign contributing members. REEFnotes has grown to a substantial size from meager beginnings. In 1994, the first REEFnotes was comprised of only 4 pages. Current issues now struggle to fit into 14 pages. Each issue of REEFNotes costs approximately \$10,000.00 and over 100 hours to write, edit, layout, print and mail. Barbara Doenbach deserves special thanks for her generous contribution in laying out and prepping each issue. A big thanks also to the volunteer editors for getting the ideas into proper written form.



REEF Website- WWW.REEF.ORG

In 1996 the REEF Website became a reality as a novel way to reach our members and to display the fish survey data. Today it is a necessity. The site now includes a very active discussion area, fish quizzes, related links, and of course lots of data. It has become one of the most active and efficient ways of maintaining contact with our members and the general public. The site now receives over 5,000 hits each day and over 150,000 each month.

Much of the Website design and maintenance has been conducted by the generosity of volunteers. Ken Marks helped design and maintain. This year, REEF's Leslie Whaylen took over data management duties. This has enabled REEF HQ to upload data and update the site on a timely basis as new data come in. REEF is also grateful to our volunteer Discussion Area monitor Jose' Kirchner. Jose' spends a great deal of his time and energy visiting the discussion area to answer informational requests, point members in the right direction, and moderate discussion topics on the site.

REEF expanded its Web potential in 1999 by purchasing our own server and moving the site from a volunteer host location to a fully accessible web hosting service. With this move we are also working on a new design and increased functionality that should be implemented in mid-2000. These new directions should enable a number of new services including an on-line REEF store and new GIS-based data mapping.

REEF's Fish Survey Project

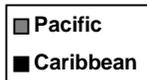
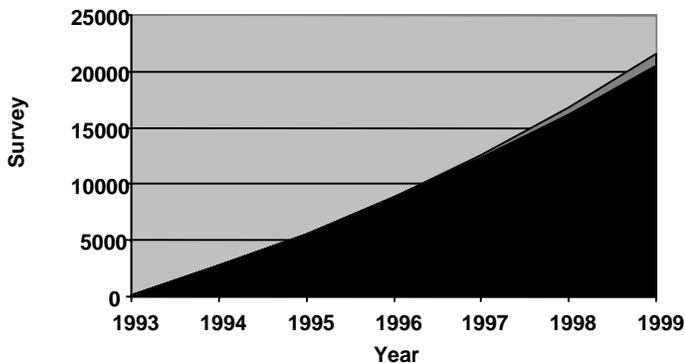
The heart of REEF's program lies in the fact that members can not only financially support a conservation organization, but can also actively participate in helping to protect the marine environment. REEF's primary mission is to provide the SCUBA diving community a way to contribute to the understanding and protection of marine populations. We accomplish this goal primarily through our volunteer Fish Survey Project. Participants in the Project not only learn about the environment they are diving in, but they also produce valuable information. The data generated through this program have become the most comprehensive collection of fish presence and abundance information, and is filling a gap in the understanding fish distribution patterns. Data for the Project are generated through three primary activities: individual member surveys, REEF Field Surveys, and special projects and partnership programs. Individual surveys account for approximately 50% of all survey data, REEF projects account for nearly 40%, and newly established partnerships are providing approximately 10%.

Data

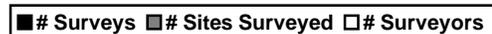
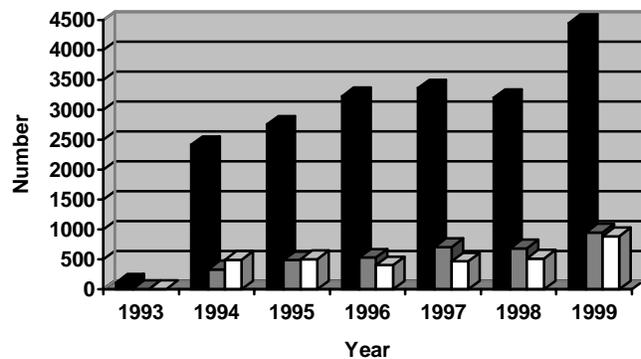
REEF's first data collection took place in 1993 and the database has grown to include more than 20,000 volunteer surveys. Each year has seen a steady increase in the number and rate of survey activity. Volunteer effort in 1999 brought in over 4,000 individual surveys.

To accommodate the increase in survey scope and activity, in 1999 REEF dedicated the Field Operation Coordinator's position to managing all incoming survey data. This has dramatically quickened the timeframe between receiving member surveys and getting the data up on the Web.

**Cumulative REEF surveys:
Caribbean, Pacific**



**Annual Survey Summary:
Florida, Bahamas & Caribbean**



Reef Field Surveys

REEF's Field Surveys are week-long diving adventures that are not only lots of fun, but they are educational and environmentally important. Each REEF Field Survey is led by REEF staff and includes seminar time as well as dive time, providing large-scale, focussed data collection at key sites and regions. Through our Field Surveys, we have built a core group of interested and very experienced survey members. The location of our projects at key locations around the Caribbean and Gulf has also allowed us to focus attention at marine protected areas, helping to establish baseline data and continued monitoring for use by park managers and scientists. These trips are a great way for members to improve their fish identification skills and they provide a way for members to meet and get to know each other.



1999 Bonaire Field Survey

In 1999, the Field Survey Program expanded to new regions, including the Venezuelan Los Roques Archipelago, as well as revisiting past sites to increase data and provide comparison information. Over 100 divers joined in on 10 projects providing more than 1,500 surveys.

REEF Field Survey Summary 1999

Field Survey	Date	# Participants	# Surveys	# Sites	# Species
Los Roques (week 1)	5/99	12	181	13	206
Los Roques (week 2)	6/99	11	171	13	199
Bonaire	6/99	17	222	25	242
Grand Cayman	7/99	9	143	20	197
Flower Garden Banks	8/99	17	153	5	143
Florida Keys (week 1)	9/99	12	162	20	201
Florida Keys (week 2)	9/99	16	205	20	212
St Croix	10/99	11	128	12	189
Saba	11/99	8	119	16	187
Cozumel	12/99	8	77	12	172
TOTALS		121	1,561	156	

Special Projects

In 1999, REEF staff and members conducted fish surveys as part of several special projects.

Atlantic and Gulf Rapid Reef Assessment- In 1998, REEF staff were involved in an international scientific effort to develop a new rapid assessment protocol for the inter-American seas region. The protocol was termed the Atlantic and Gulf Rapid Reef Assessment (AGRRA). The fish monitoring portion of the protocol includes REEF's Roving Diver methodology and data management program. To help facilitate the various assessment programs throughout the Caribbean, in 1999 REEF helped train scientists to carry out the program and joined in on 3 AGRRA assessments. The work completed during 1999 was conducted in partnership efforts with the University of the Virgin Island in St Croix, the Marine Education and Environmental Research Institute (MERRI) in Little Cayman, and NOAA in the Flower Garden Banks. The projects' results will be published this year in technical reports and journals.



AGRRA survey team at the Flower Gardens

Sustainable Seas Expedition- The Sustainable Seas Expedition (SSE) is a five-year project to explore the deeper regions of the National Marine Sanctuaries by submarine. It is headed by Dr. Sylvia Earle and is a partnership between the National Geographic and NOAA that is funded by the Goldman Family Fund. The subs, called Deepworker 2000, are one-person, unteathered subs capable of diving to 2,000 feet. In its first year of exploration in 1999, REEF's Executive Director, Laddie Akins, participated in missions at three of the Sanctuary sites. Laddie completed eight dives between 70' and 200', conducting deep-water fish surveys using a modified version of REEF's Roving Diver Technique. This survey data will help characterize the different hard bottom sites. Some of the most interesting things he encountered were an aggregation of feeding black sea bass and a group of three ocean sunfish or mola mola, both at Gray's Reef NMS.



Laddie gets ready to pilot the Deepworker.

REEF has also contributed to the SSE by sitting on the Taxonomic Committee and worked on the design of the education program for pilot training.

Partnerships/Expansions

REEF's success in 1999 can be partly attributed to its many partnerships with a variety of groups, resource agencies, and organizations.

Expansions

Two of our partnerships have been the result of expansion projects. The geographic coverage of the REEF survey program has also grown steadily as increased demand for the program comes from new regions. The program now encompasses the entire Caribbean, the Southeast US Atlantic coast, the Gulf of Mexico, the entire West Coast of the US and Canada, and very recently the Gulf of California. A new expansion to Hawaii is currently underway and discussions with other regions are also taking place.

Pacific Northwest- As part of REEF's expansion to the Pacific Northwest in 1998, we formed a partnership with the Living Oceans Society (LOS), based in British Columbia. Our relationship with LOS has been instrumental in evolving the Pacific Northwest REEF program. This

partnership, called the Living REEF Project, has led to ongoing fish ID training seminars and group survey dives throughout BC. In 1999, LOS revised the fish ID training curriculum to include behavior and habitat information, and over 187 divers were trained using this curriculum. Living REEF Project staff from LOS also attended seven conferences and dive shows and coordinated 5 media coverage events. The Project is currently establishing a pilot program for an invertebrate monitoring program that is patterned after the REEF fish survey and reporting methodologies.



Staff from REEF, NOAA, and LOS getting ready for a survey dive in Vancouver.

Tropical Eastern Pacific(Gulf of California to the Galapagos Islands)- In 1999, REEF developed a partnership with the Sonoran Sea Aquarium, to expand our program to the Gulf of California. Staff



King Angelfish

from REEF, NOAA, and the Aquarium conducted an exploratory survey mission to the northeast Gulf in October. Among the most interesting things encountered include scalloped hammerheads, king angelfish, fanged blenny, hieroglyphic hawkfish, a huge school of skipjack tuna, and lots of sea lions! With funding from the National Wildlife Federation and PADI Project AWARE and guidance from the Aquarium and Instituto Nacional de la Pesca, the Mexican fisheries agency, REEF began development of a new set of survey materials to cover the tropical

eastern Pacific. The new program was launched in March of 2000 and the program are bi-lingual with English and Spanish, and include a new scanform, color ID card, waterproof survey paper, training curriculum, and survey database programs.

Partnerships

Biscayne Bay Foundation- The Biscayne Bay Foundation (BBF) is now employing REEF survey methods to quarterly monitor two key reefs within Biscayne National Park off Southeast Florida. This monitoring and subsequent data will be used by BBF to record changes over time especially with a new development proposed for the area adjacent to both Biscayne National Park and Everglades National Park. REEF has worked with BBF to train numerous staff and volunteers and will manage all fish survey data from the project.

Great American Fish Count- In 1999, the GAFC continued to focus national attention on marine life and fish watching. REEF worked with the American Oceans Campaign to hire Brian Huff as the GAFC Coordinator. Brian worked with Christy Semmens to manage the GAFC Website, schedule training seminars, and set up media events. Thirty-seven fish ID seminars were conducted throughout the US for the event. In 2000, REEF will coordinate the event with support from the NMSP, other NGOs, and local partners to increase the scope and reach of the event.

NOAA's Biogeography Program- In 1999, Biogeography Program staff began to use REEF data from the Florida Keys to examine the relationships between fishes and habitats in the Florida Keys National Marine Sanctuary (FKNMS). During the next two years, the project aims to define, map, and model the spatial and temporal distribution and abundance of reef fishes among benthic habitats of the FKNMS using REEF data. This collaboration with the Biogeography Team has provided REEF with the technical boost to begin its Reef Fish Distribution Atlas for the Tropical Western Atlantic.

REEF Field Station of Northwest Florida - In 1999, Danielle Dowdy, a marine biology student at University of West Florida formed this very active field station. Their activities include regular fish ID seminars and survey dives, monthly REEF meetings, and coordination of the area's GAFC events. Their surveys have produced some of the first REEF data from the northern Gulf of Mexico and Danielle's public talks, GAFC seminars, and scheduled dives have generated tremendous publicity and awareness.

Santa Monica Baykeepers- Starting in 1999, this local group of the Baykeepers incorporated REEF surveys into their regular kelp forest monitoring of the Bay. This landmark area in Southern California is slowly making a comeback and REEF fish ID training and surveys are providing valuable information to the Baykeepers and to the REEF database.

State of Florida's Fish and Wildlife Conservation Commission- The Fish and Wildlife Conservation Commission (FWCC) is Florida's principal environmental agency. FWCC manages an artificial reef program using manmade materials to attract and replenish fish stocks and contracts with coastal counties to conduct ongoing monitoring studies of these artificial reefs. In 1999, REEF began a training program to assist these local teams to standardize their methodology and reporting scheme. Implementing the REEF survey methodology and using REEF's database will provide the state quick access to collected data and allow scientists to compare fish assemblages at the different artificial reef sites statewide.

PADI Project AWARE- In association with PADI Project AWARE, REEF developed a series of Fish Identification Specialty courses that made their debut in 1999. Each slide-based training module is based on a particular region and introduces students to fish identification and the REEF Fish Survey Program. Modules currently available are Caribbean/Florida, Mid-Atlantic, Southern California, Northern California, Pacific Northwest, and the Gulf of California.

Applications of REEF Data

As the REEF database grows, it is becoming an important source of information for scientists, resource managers, and other conservation organizations. In 1999, NOAA's National Marine Sanctuary Program and the Munson Foundation provided REEF the funds to hire a Scientific Coordinator. The Coordinator acts as a liaison with the scientific and resource agency communities, facilitates the use of REEF data by others, and writes scientific papers and reports using REEF data.

Conferences and symposia attended during 1999:

- Florida Keys National Marine Sanctuary Zone Monitoring Performance meeting in Marathon, February.
- National Coral Reef Institute Meeting in Ft. Lauderdale, April.
- Southern California Monitoring Conference on Catalina Island, October.
- Gulf and Caribbean Fisheries Institute meeting in Key West, November.

Papers and reports produced in 1999:

- Pattengill-Semmens, C. V., and B. X. Semmens. 1999. Assessment and monitoring applications of a community-based monitoring program: The Reef Environmental Education Foundation. International Conference on Scientific Aspects of Coral Reef Assessment, Monitoring, and Restoration. April 14-16, 1999. National Coral Reef Institute. Ft. Lauderdale, FL.

A poster presentation on the REEF Fish Survey Project with examples of three applications of data generated by the Project. These include evaluating the effect of marine protected areas, mapping species distribution, and applications in general assessment.

- Pattengill-Semmens, C. V. and B. X. Semmens. 1998. An analysis of fish survey data generated by nonexperts in the Flower Garden Banks National Marine Sanctuary. *Journal of the Gulf of Mexico Science*. 2: 196-207.

The quality of fish census data generated by REEF volunteers of various experience levels is examined and compared with data generated by experts. The similarity in species reported, the similarity in abundance category recorded, and the statistical power to detect change are used in the comparison. Species composition and structure is comparable between the skill levels. When sighted, most species are reported with similar abundance categories. The ability to detect change in many species is better for the nonexpert data, a result of higher survey effort for the nonexperts. Species that are cryptic or rare have low power (change had to be large before it could be detected) regardless of the skill level, but are generally better using expert data.

- Pattengill- Semmens, C.V. in press. The reef fish assemblage of Bonaire Marine Park: an analysis of REEF Fish Survey Project data. 52nd Gulf Carrib. Fish. Inst. Proc.

A total of 362 species have been reported from 77 sites around Bonaire and the neighboring Klein Bonaire. This makes the Bonaire Marine Park one of the most species rich areas in REEF's database. The paper also showed that the composition of species (presence and abundance) on Klein Bonaire and Bonaire are distinct. In addition to providing data for site characterization, the thousands of surveys in REEF's database will provide a baseline against which future change can be assessed. This paper provides the most comprehensive species list published to date for the Park.

- Pattengill, C.V. 1999. Occurrence of a unique color morph in the smooth trunkfish (*Lactophrys triqueter*) at the Flower Garden Banks and Stetson Bank, northwest Gulf of Mexico. *Bull. Mar. Sci.* 65(2): 587-591.

As a result of REEF surveys and Christy Semmens' graduate research, a new color phase of the smooth trunkfish was documented at the Flower Garden Banks. The occurrence of this golden morph is reported in this paper.

- Pattengill-Semmens, C.V. and B.X. Semmens. in prep. The status of reef fishes in the Cayman Islands (B.V.I.).

This paper is the result of the 1999 AGRRA expedition to the Cayman Islands that was coordinated by MERRI. The paper uses the REEF database (over 1,200 surveys from the Cayman Islands) and the AGRRA fish data to provide an updated species list for the Islands, a comparison between islands (Grand Cayman and Little Cayman) and sites (33 sites), and an analysis of the relationships between herbivorous fishes and algal cover. Thanks to the REEF database, 44 species were added to the list of fishes known to occur on the Islands. A site's location (windward or leeward) appeared to be an important factor in community composition. Additionally, many species had significantly higher abundances on Little Cayman, including groupers which is probably an indication of the difference in anthropogenic impacts between the two islands.

- Pattengill-Semmens, C.V. and T. Shyka. submitted. Flower Garden Banks National Marine Sanctuary- A Rapid Assessment of Coral, Fish and Algae using the AGRRA Protocol. NOAA Conservation Series Tech. Report.

The results of the AGRRA expedition to the Flower Garden Banks are summarized in this technical report. A total of 117 fish species were recorded during the expedition, and REEF surveys documented a new record for the banks, a sharptail eel.

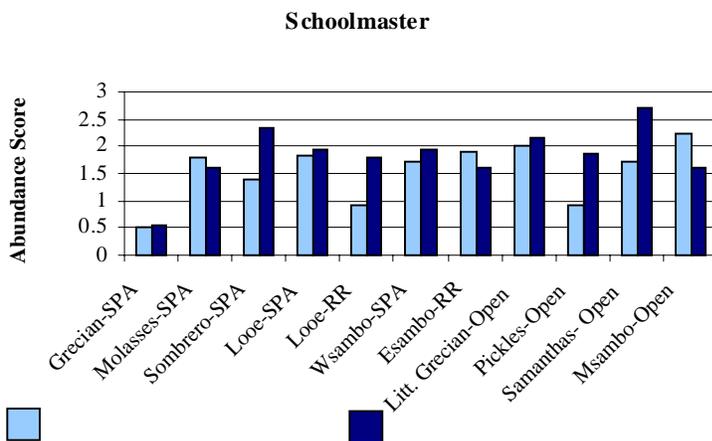
Current Research Projects:

Florida Keys National Marine Sanctuary Zone Monitoring

During 1999, REEF's Advanced Assessment Team (AAT) conducted its third year of monitoring to the Florida Keys National Marine Sanctuary (FKNMS). The main purpose of this project is to evaluate the effect of harvest restrictions on the fish assemblages at 16 no-take sites within the Sanctuary. The AAT conducts a minimum of 6 roving diver surveys at each no-take site, and at reference areas that are similar to the protected sites but where harvest has not been restricted.

Monitoring is also being conducted at 6 sites in the Dry Tortugas. In 1999, 231 species were documented during 218 surveys. The AAT data are used in a variety of analyses.

Changes over time in frequency and abundance of harvested species were evaluated using the entire REEF database, including the data collected during the AAT assessment. Changes in abundance of three species of snapper (*Lutjanidae*) and the hogfish (*Lachnolaimus maximus*) were evaluated at sites where sufficient



Comparison of estimated abundance for Schoolmaster before and after zones were implemented. No-take zones are listed as SPA or RR.

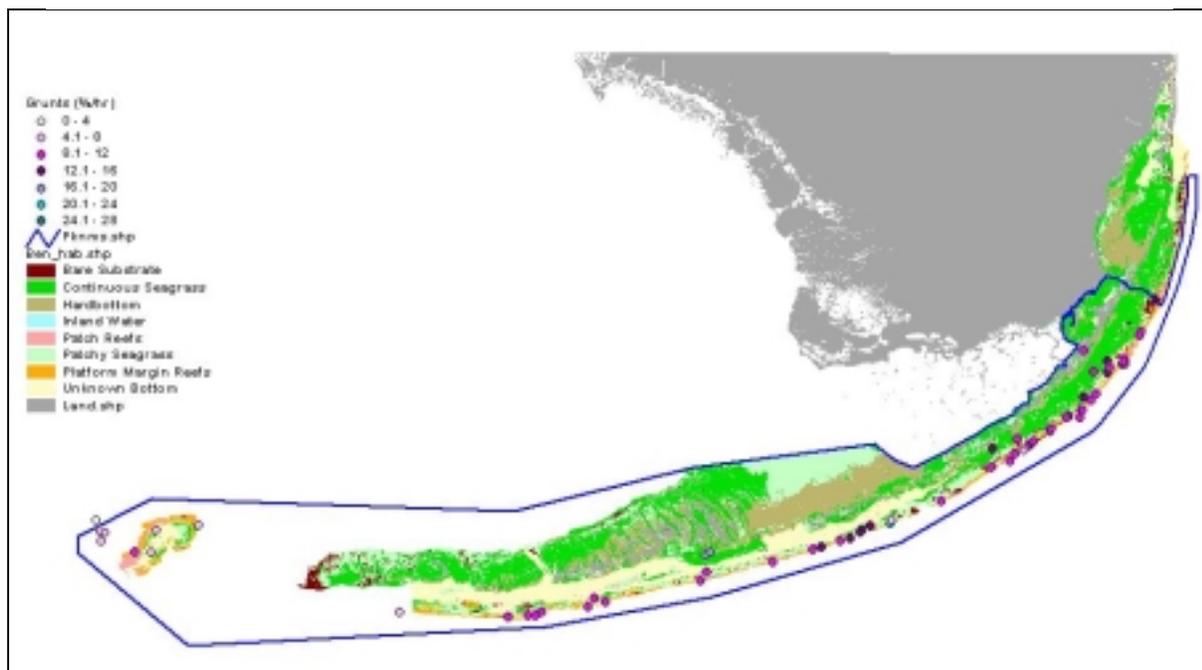
REEF data exist prior to July 1, 1997, when the zones were implemented. The average abundance score before and after July 1, 1997 was calculated for eleven of the SPAs and reference sites. The general trend among all species and sites was an increase in average estimated abundances after zone implementation, with greater increases at the protected sites. Two exceptions were Molasses SPA and Middle Sambo.

Monitoring of the FKNMS, by REEF's AAT, will continue through 2002 when the sanctuary management plan comes up for state and federal review.

Biogeography of Living Marine Resources in the Florida Keys: Coupling of Habitats and Species Distributions via GIS technology

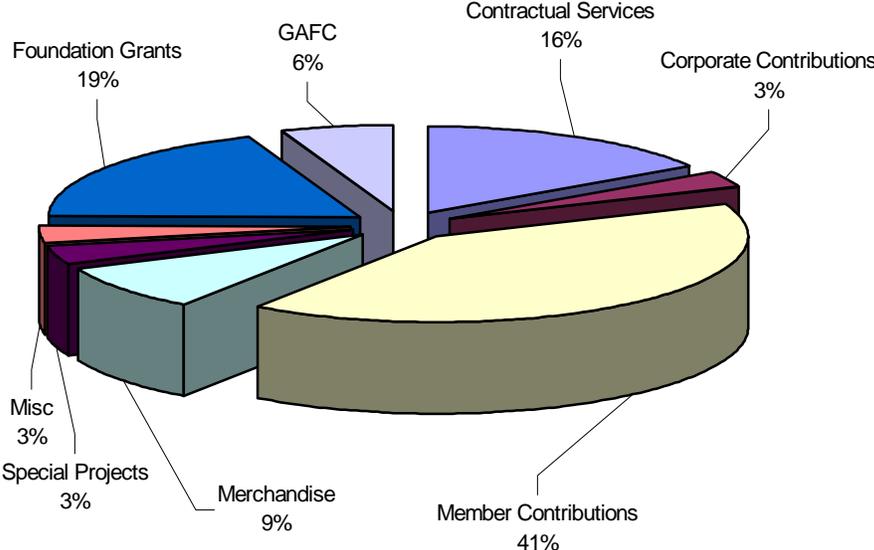
NOAA's Center for Coastal Monitoring and Assessment's (CCMA) Biogeography Program is currently working on a two-year project to use REEF fish data from the Florida Keys to evaluate the biogeography of living marine resources in the Florida Keys National Marine Sanctuary (FKNMS). The spatial distribution of benthic habitats often mediates the effects of ecological processes (e.g., predation, competition, dispersal) that determines the distribution and abundance of tropical fishes. As such, this project will correlate benthic habitat variables with the distribution, abundance, and size of reef fishes within and outside management zones in the FKNMS. The first phase of this project was started in 1999 with mapping the distribution of species. Over the next year, reef fish composition and habitat parameters will be coupled to identify species habitat affinities. Correlation between benthic habitats and fish communities will be analyzed using a number of multivariate statistical techniques such as cluster correspondence and discriminant analyses.

Relative Frequency of Grunts (Haemulidae) Using REEF Data Florida Keys National Marine Sanctuary 1994-1998

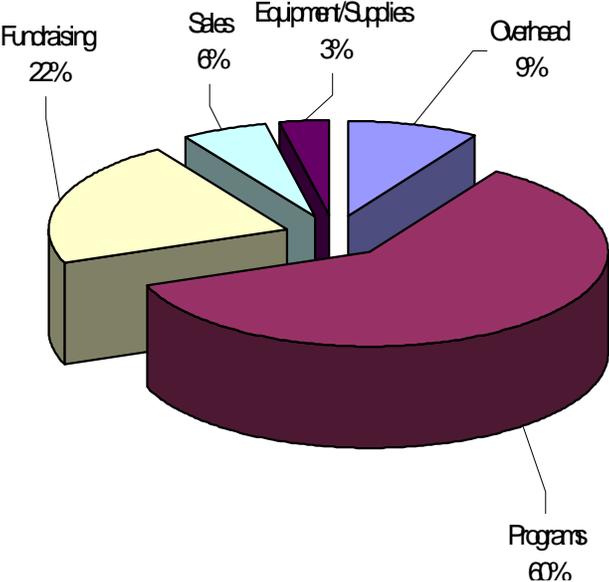


1999 Financial Information

Income



Expenses



This information was generated from REEF's computer bookkeeping systems and was not compiled in a review or audit. Complete and professionally prepared financial statements will be available June 01, 2000.

Major Contributors

In 1999, we were fortunate to have major foundation support as well as the consistent and long-term support of our Sustainers. The Curtis and Edith Munson Foundation awarded REEF \$25,000.00, The Henry Foundation awarded REEF \$20,000.00 and our REEF Sustainers contributed over \$29,000.00 in support of REEF's ongoing activities.

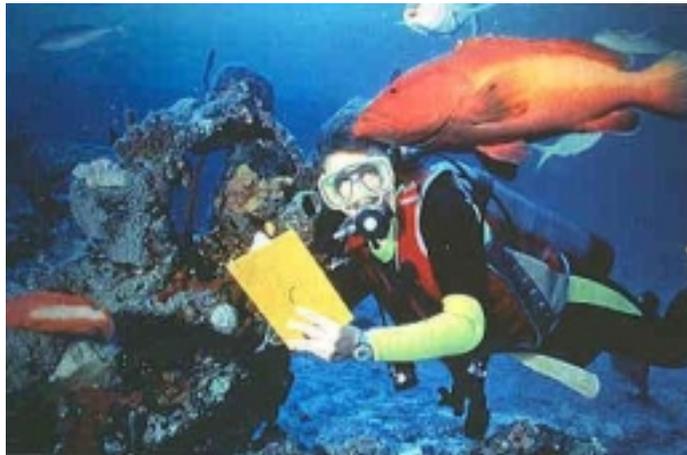
REEF Sustainers

The following REEF members make up the REEF Platinum level Sustainers Club. Our sustainers provide a consistent base of funding by committing contributions of at least \$1,000.00 each year. Many sustainers also contribute valuable volunteer and survey time to REEF activities.

Patricia Ayers
E. Garret Bewkes III
Darcy Charlier
Ken Deaver
Ned and Anna DeLoach
Steve Dingledein
Muns Farestad
Robin Glackin
Kathleen Gunderson
David Herro

Paul Humann
Tom Isgar
Mark Kaehler
Jose' and Barbara Kirchner
Jean Kirkpatrick
Joseph and Linda Meyer IV
David Nank
Carol Lorenz and David
Preston
Jeffrey Nehms

Ole Peloso
Feodor U. Pitcairn
John Pitcairn
William Sheppard
Kenneth Sinibaldi
Hilton C. Smith, Jr.
Edwin Steiner
John Strand
Anne Walton



Reef Environmental Education Foundation
P.O. Box 246
Key Largo, FL 33037
305-451-0312

www.reef.org