



THE GLOBAL CORAL REEF CRISIS

TRENDS AND SOLUTIONS 1997 - 2001

Reef Check was developed in 1996 as a volunteer, community-based monitoring protocol designed to measure the health of coral reefs on a global scale. Now in its sixth year of operation, Reef Check is active in over 60 countries and territories throughout the tropical world. During this time, Reef Check has evolved into an international environmental organization with the following goals:

- to educate the public about the coral reef crisis;
- to create a global network of volunteer teams which regularly monitor and report on reef health;
- to scientifically investigate coral reef processes;
- to facilitate collaboration among academia, NGOs, governments and the private sector;
- to stimulate local community action to protect remaining pristine reefs and rehabilitate damaged reefs worldwide using ecologically sound and economically sustainable solutions.

Reef Check scientists train teams of volunteers about the value of coral reefs, their ecology and how to scientifically monitor them. During surveys, the work is supervised and checked by a scientist. Teams are composed of a diverse range of volunteers ranging from all scientists to recreational divers to village fishermen. Through this process, Reef Check has raised public awareness about the global coral reef crisis and potential solutions. The teams have collected a wealth of valuable data from reefs around the world. These have been analyzed and the results are presented in this five-year report, providing a synoptic assessment of global coral reef health using a standard method.

Reef Check teams collect four types of data: 1) a description of each reef site based on over 30 measures of environmental conditions and expert rating of human impacts, 2) fish counts along an 800 m² section of shallow reef, 3) shellfish counts over the same area, and 4) a measure of the percentage of the seabed covered by different substrate types including live and dead coral. Sixteen global and eight regional indicator organisms were selected to serve as specific measures of human impacts on coral reefs. They were chosen based on their economic and ecological value as well as their sensitivity to human impacts. For example, the humphead wrasse (*Cheilinus undulatus*) is the most sought after fish in the live fish trade, whereas the banded coral shrimp (*Stenopus hispidus*) is collected for the aquarium trade. In areas where these organisms are targeted, their populations are expected to decrease.

Monitoring was carried out from 1997 through 2001 at over 1500 reefs in the Atlantic, Indo-pacific and Red Sea. Following quality assurance procedures, 1107 sites were accepted for analysis. The analyses examined spatial and temporal changes in indicator abundance and correlations between abundance and ratings of human impact provided by the teams. The key findings were:

- At the global scale, zero spiny lobster were recorded at 83% of shallow reefs indicating severe overfishing; there was a significant decline in lobster abundance in the Atlantic;
- The mean abundance of *Diadema* sea urchins decreased significantly in the Indo-Pacific from 1998 to 2000, approaching levels similar to those found in the Atlantic and possibly indicating

5
YEARS OF
REEF CHECK



- ecological destabilization;
- A total of 101 triton were recorded indicating severe overfishing for the curio market;
- Globally, there was a significant decrease in the abundance of butterfly fish from 1997 to 2001;
- There were zero grouper larger than 30 cm recorded at 48% of reefs surveyed indicating overfishing of these predators;
- Four species of fish are in critical condition: Nassau grouper were absent from 82% of shallow Caribbean reefs – only eight reefs had more than one fish. Barramundi cod, bumphead parrotfish and humphead wrasse were missing from 95%, 89% and 88% of Indo-pacific reefs respectively;
- Moray eels were not recorded on 81% of reefs, and in the Indo-pacific, 55% of all reefs surveyed were devoid of parrotfish greater than 20 cm;
- Globally, the mean hard coral cover was 32%. The percent hard coral cover was significantly higher on reefs having no anthropogenic impacts than on reefs with high levels of such impacts. Only 34 reefs had greater than 70% hard coral cover and none had higher than 85% cover.
- The 1997-98 bleaching event reduced live coral cover by 10% globally, indicating that coral reefs are a sensitive indicator of global warming;
- Algal cover was higher on reefs rated as having high sewage inputs;
- Natural differences between reefs in the two oceans are the relatively high abundance of fish of the families Haemulidae and Scaridae on Atlantic reefs and fish of the families Chaodontidae and Lutjanidae on Indo-pacific reefs.
- Marine protected areas (MPAs) in developing countries are showing some success. Five of ten fish and one of ten invertebrate indicators were significantly more abundant inside than outside MPAs.

ACHIEVEMENTS IN EDUCATION AND MANAGEMENT

A review of the first five years of Reef Check indicates that the basic program of education and monitoring works well. Reef Check is a major partner with the International Coral Reef Initiative and the Global Coral Reef Monitoring Network (GCRMN). Dozens of Reef Check/GCRMN training workshops have been carried out at national and regional levels throughout the world. These workshops provide training in Reef Check and more

taxonomically detailed protocols as well as supplying information on sustainable financing and media relations. In 2001, a Southeast Asia Regional Training Center was established in Phuket, Thailand which offers quarterly workshops. Ideally, new training centers can be set up in the Caribbean and East Africa. Reef Check supplies raw data to ReefBase and metadata to GCRMN for status reports.

Prior to 1997, coral reefs were rarely featured in the international press. Beginning that year, Reef Check has been successful in attracting mainstream media attention to the plight of coral reefs. The public awareness campaign continues to build with the help of new private sector partners including Quiksilver and MacGillivray Freeman Films whose film and advertising capabilities offer mechanisms for delivering the message to the general public.

Reef Check also aims to design, test, and implement solutions to the problems facing coral reefs. As people learn more about coral reefs, they develop a sense of stewardship, and a desire to become involved in managing their local reefs.

Participation in Reef Check has already led to the initiation of new coral reef management activities such as establishment of measurably successful marine parks.

THE NEXT STEPS

During the first five years of Reef Check, over 5,000 people took part in monitoring 1,500 reefs in more than half of all coral reef countries. The Reef Check network brought together hundreds of diverse groups from all sectors to work together towards a common goal. In the future, Reef Check will devote more effort to facilitating ecologically sound and economically sustainable coral reef management.

For copies of the full report, please contact
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