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**CORAL REEF  
MONITORING  
FOR  
MANAGEMENT**

**fisheries  
resource  
management  
project**



# CORAL REEF MONITORING FOR MANAGEMENT

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# History and Acknowledgments

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Reef survey systems such as ReefCheck by Hodgson (1999), methods adapted for Earthwatch volunteers and conservation projects by White *et al.* (2000), and ReefBase's Aquanaut system by McManus *et al.* (1997) are available for SCUBA divers who wish to do coral reef monitoring with the benefit of some initial training. There are also other methods such as the Global Coral Reef Monitoring Network system described by English *et al.* (1997) for reef scientists who wish to achieve more detailed monitoring. But because there are not enough volunteer SCUBA divers and reef scientists to monitor all the world's coral reefs or even Philippine reefs, simpler methods for non-SCUBA divers were developed from the existing methods. This is a guide for communities and field level staff who are involved in project implementation in how to do low-cost, less technical surveys to evaluate the effectiveness of their coastal management efforts.

This guide began from independent efforts of M.T. dela Cruz in 1995 in Eastern Samar and S.J. Green in 1996 in Bohol to guide local fisher communities in the underwater monitoring of their marine environment and protected areas. M.T. dela Cruz of the Guiuan Development Foundation, Inc., and University of the Philippines Visayas at Tacloban was then supported by the Foundation for the Philippine Environment and assisted by M.C.G. Militante. S.J. Green was a British volunteer under the Voluntary Service Overseas (VSO) program working in the Bohol Integrated Development Foundation, Inc. In 1996, A.J. Uychiaoco of the University of the Philippines Marine Science Institute (UP-MSI) proposed a dissertation to the Department of Ecology and Evolution, State University of New York at Stony Brook to investigate the effectiveness of Philippine fish sanctuaries in restoring reef functional diversity.

Dela Cruz, Green, and Uychiaoco met and planned collaborative arrangements through the various activities of the Philippine Coral Reef Information Network (PhilReefs) in late 1996. Funding was obtained from the University of the Philippines Center for Integrative and Development Studies initially and the work began. Later on, the Coastal Resource Management Project of the United States Agency for International Development and the United Nations Development Programme Global Environment Facility-Small Grants Programme joined in 1997. In addition, resources were contributed by the UP-MSI, the Guiuan Development Foundation and the Bohol Integrated Development Foundation, Inc. Through this joint effort, the methods described up to Chapter 9 have been field tested by various teams of non-SCUBA diving local community volunteers.

Field testing and improvement of the methods resulted from the participation and assistance of many persons and groups in various locations as follows: Samar: Cathy Capanang of Guiuan Development Foundation, Inc.; Camanga Monitoring Team (especially Cornelio Macatimpag and Victor Duran) and the Duran family; Bohol: Lomboy Farmers, Fishers and Carpenters Association, Pangangan Island, Calape especially the local monitoring team composed of Zosimo Cuadrasal, Al Asunto, Boboy, and various others; Mayor Atty. Julius Caesar Herrera and Kagawad Gerardo Cuadrasal, Jr. also provided financial assistance and their time in the development of the monitoring system within Calape; Nagkahiusa Mananagat sa Cabacongan (The United Fishers of Cabacongan), Cabilao Island, Loon, especially the local monitoring team composed of Natalio Lajera, Eduardo Castiotos, Teodoro Mulato, and various others; the Municipality of Loon was fully supportive of the monitoring activities and provided counterparts and assistance to the monitoring through Mayor Cesar Tomas Lopez, M.D. and Vice-Mayor Atty. Raul Barbarona; Patricio Semante, Julie Cavero, Pedro Caet, and Victor

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Field activities that culminated in this guide were coordinated by A.J. Uychiaoco, S.J. Green, M.T. dela Cruz, H.O. Arceo, P. Gaito, and M. Teves. Writing of the guide, in addition to the main authors, was assisted by Ma. Fritzie D. Uychiaoco. Those responsible for review, editing, and various insights were: S.J. Green, A.T. White, Kai-Jens Kuhlmann, P.M. Aliño, Ma. F.D. Uychiaoco, Gregor Hodgson, C. Morales, M. Ross, Arlene Brookes (VSO), Maeve Nightingale (VSO), Karen Vidler (Philippine Rural Reconstruction Movement), Maike Waltemath (German Development Service), other participants of the VSO sponsored Marine Protected Areas Workshop and the UP-MSI sponsored MPA workshop in December 1997. Participants of the workshop to produce a source book on participatory methods for community-based coastal resource management held in September 1997, organized by the International Institute for Rural Reconstruction, also helped in refining the writing and methods.

Finally, in view of all the welcome assistance and participation in conceiving, developing an experiential basis for, and writing this reef monitoring guide, the authors assume responsibility for the result and any errors or discrepancies that remain.

# Preface

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Coral reefs are the focus of the methods in this guide because reefs are less accessible to monitor and evaluate than either mangroves or seagrasses. Due to their naturally high productivity and aesthetic attractiveness, coral reefs are more frequently the centerpiece of marine protected areas, as well as the target of extractive activities. Mangroves are also of high priority for management and important for the physical protection of reefs from sediments and storms but are addressed in other publications.

We must manage our coral reefs wisely so we can continue to benefit from them. We must keep track of changes on coral reefs so that we can tell whether present use and management is sustainable and where and how management can be improved. We must also be able to respond appropriately to changes on reefs from whatever cause. This guide describes ways that local communities, volunteers, and other interested parties can use to monitor and evaluate changes on their reefs for improved management. These methods should only be introduced to communities after they have already had basic environmental education, understood the value of coral reefs, and preferably have demonstrated their commitment to coral reefs (e.g. by having set up a sanctuary).

This guide describes a system to monitor and evaluate coral reefs designed for local coastal communities who have no training in SCUBA diving. However, those who wish to use these reef monitoring methods must be good snorkelers. This guide outlines the importance of monitoring reefs, the steps to gather data, to analyze trends, and to choose solutions based on the observations. The simple methods described here are not unique or original. They were adapted from the other methods developed for volunteer SCUBA divers and reef scientists (see History and Acknowledgments). This system was especially designed to collect data that are comparable to data collected by those other methods. It is hoped that the skills in monitoring and the knowledge from monitoring will help empower local communities to be more effective managers of the resources on which they depend.

This guide is intended for both development workers and members of local community monitoring teams. Notes for trainers have been incorporated in each chapter. It is emphasized that trainers must be trained in and have practiced monitoring and evaluation of coral reefs. Trainers must encourage trainees to openly discuss local and personal observations, methods, and ideas. Each trainee should have his/her personal copy of this guide to use and keep notes on. All trainees are encouraged to later become trainers!

Fish and invertebrate guides are especially important. Each team should have a copy of one or more basic coral reef life guidebooks. Each team should also have at least two sets of mask and snorkel and four sets of underwater slate boards of their own. Geographic positioning systems (GPS) have also become extremely handy for determining exact locations.

This user-friendly guide is intended for field use. Read it, test it, use it, and make adaptations for successful field monitoring of coral reefs for management!