

Creating and Managing Marine Protected Areas in the Philippines



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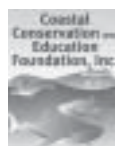


Creating and Managing Marine Protected Areas in the Philippines

White ■ Aliño ■ Meneses



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Fisheries Improved for Sustainable Harvest Project
Implemented by the Government of the Philippines
Supported by the United States Agency for International Development

Coastal Conservation and Education Foundation, Inc.
Supported by the Pew Fellows Program for Marine Conservation of the Pew Charitable Trusts

University of the Philippines Marine Science Institute

Cebu City, Philippines

2006

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Printed in Cebu City, Philippines

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Citation:

White, A.T., P.M. Aliño and A.T. Meneses. 2006. **Creating and managing marine protected areas in the Philippines.** Fisheries Improved for Sustainable Harvest Project, Coastal Conservation and Education Foundation, Inc. and University of the Philippines Marine Science Institute, Cebu City, Philippines. 83 p.

This publication was made possible through support provided by the United States Agency for International Development (USAID) under the terms and conditions of Contract No. AID-492-C-00-03-00022-00, USAID/Philippines Environment Governance 2 Project under Contract No. AID-492-C-00-04-00037-00 and the support provided by the Pew Fellows Program for Marine Conservation of the Pew Charitable Trusts. The views expressed and opinions contained in this publication are those of the authors and are not intended as statement of policy of USAID or the authors' parent organization. This publication may be reproduced or quoted in other publications as long as proper reference is made to the source.

Copy editing: Marie Sol M. Sadorra

Layout and graphics: Ysolde Collantes-Jatulan

Front and back cover illustrations: Amiel Rufo

Cover photos: (L-R): CRMP file photo, Homer de Dios and Al Linsangan

FISH Document No. 19-FISH/2005

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acronyms & abbreviations

CO	community organizer
CRM	coastal resource management
DA-BFAR	Department of Agriculture - Bureau of Fisheries and Aquatic Resources
DENR	Department of Environment and Natural Resources
FARMC	Fisheries and Aquatic Resources Management Council
GMPS	general management planning strategy
ICM	integrated coastal management
IEC	information, education, and communication
LGU	local government unit
M/CFARMC	Municipal/City Fisheries and Aquatic Resources Management Council
MPA	marine protected area
NGO	nongovernment organization
NIPAS	National Integrated Protected Areas System
OIWS	Olango Island Wildlife Sanctuary
PAMB	Protected Area Management Board
PCRA	participatory coastal resource assessment
PO	people's organization
SMC	Sanctuary Management Committee
SPAGS	spawning aggregations

This book reflects the effort of many individuals and institutions that over the last 15 years have contributed to the development and management of marine protected areas in the Philippines. It builds on the foundation provided by the publication in 2001: “Managing Coastal Habitats and Marine Protected Areas” published by the Department of Environment and Natural Resources (DENR), the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR), the Department of the Interior and Local Government (DILG) and the Coastal Resource Management Project (CRMP) supported by the United States Agency for International Development (USAID), authored by A. White, S. Nakashima and M. Gleason.

This current edition incorporates lessons and tools regarding marine protected area management that have been learned through the joint efforts of the Coastal Conservation and Education Foundation, Inc. (CCEF), the University of the Philippines-Marine Science Institute (UP-MSI) and the Fisheries Improved for Sustainable Harvest (FISH) Project together with many other partners. Individuals and their institutions that deserve special mention for contributing to this book include:

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 Florendo Barangan, Director, Coastal and Marine Management Office, DENR
 Hilconida Calumpong, Ph.D., Director, Marine Laboratory, Silliman University
 Marciano Carreon III, M.M.M., Chief of Party, FISH Project
 Margarita T. Dela Cruz, Executive Director, Guiuan Development Foundation, Inc.
 Daisy Flores-Salgado, Project Liaison Officer, Local Marine Managed Areas Network
 Benjamin Francisco, Palawan Coordinator, FISH Project
 Edgardo Gomez, Ph.D., Professor, UP-MSI
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This book was designed and laid out by Ysolde Collantes-Jatulan and copy edited by Marie Sol M. Sadorra, both of the FISH Project.

preface

How to establish and manage marine protected areas (MPAs) in all their variations in the Philippine context is the theme of this book. MPAs are increasingly seen as an effective tool for protecting and managing coastal habitats and for enhancing nearshore fisheries in the country. MPAs are now scattered throughout the Philippines with most municipalities and cities having established one or more along their shores. Equally, the national government has established about 30 MPAs under the National Integrated Protected Areas System that cover large areas of valuable coral reefs, seagrass beds, mangroves, estuaries and other shallow habitats. Yet, the record of effective management in many to most of these MPAs needs improvement. Many of these areas are declared in name only and effective management is just beginning.

Efforts in the country to improve coastal and marine management and conservation are ever increasing. Many individuals and institutions are striving to improve coastal resource and fisheries management systems in their own areas through coastal resource management (CRM) and MPAs or some variation thereof. In response to these numerous efforts, this book will assist CRM projects and provide simple and practical guidance on how to improve MPA effectiveness and on how to integrate MPAs in larger coastal management programs and MPA networks.

This book is largely derived from the Philippine experience with CRM and MPAs. It reflects the many small and some larger successes that exist around the country and extracts useful lessons and tools. It provides a planning process to follow and a MPA Report Guide to use that makes the collection and analysis of data for MPA planning and management more systematic and available for sharing nationwide. Finally, this book draws on the experience and knowledge of the best MPA and coastal management practitioners and experts in the country. Our intention is to help multiply successful and effective MPAs nationwide!

The Authors

Why Use Marine Protected Areas for Managing Coastal and Marine Habitats and Fisheries?

Coastal marine habitats are being exploited beyond their capacity to recover as overfishing and destruction of coral reef, mangrove, seagrass and estuarine habitats continue. In the Philippines, reducing fishing pressure and habitat destruction often means providing alternative sources of income. Tourism increasingly supplements or substitutes as an income source for coastal communities. Thus, there is a growing realization that maintaining high biodiversity levels and pristine coastal areas is vital to attract and sustain tourism and to maintain healthy populations of fish for food security. Yet, even the advent of tourism gives rise to additional conflicts in coastal resource use.

Marine protected areas (MPAs) such as reserves, sanctuaries and parks can achieve protection of particular, well-defined areas and critical habitats (Agardy 1997). When properly designed and well managed, a MPA can meet various marine and coastal conservation needs by preserving habitat and important species and protecting specific areas. Coral reef fisheries, in particular, can be effectively managed through implementation of “no-take” areas on reefs (Roberts and Polunin 1993). This approach has been adopted by leading conservation organizations as the number one objective in a global strategy for conserving areas of high biological importance and productivity.



Aerial view of a coastline fringed by a coral reef.

A MPA site or area for a network of MPAs is usually chosen for having high productivity and biodiversity or because it serves a special ecological function like a spawning and/or feeding ground for one or more marine species. An ideal sanctuary is large enough to include sections from all the critical habitats such as coral reefs, seagrass beds, mangroves or other habitats, as they are interconnected and provide benefits to each other (DENR *et al.* 2001; White 2001) (Figure 1). Such a sanctuary or network of MPAs can be particularly effective at promoting long-term productivity of shallow-water fisheries in the Philippines where about 10-15 percent of the marine fish production is supplied by coral reefs. For some small islands, reefs support more than 70 percent of the total fish catch and provide most of the protein consumed by residents (Savina and White 1986). Mangroves and seagrass beds provide the nursery habitat for many species of fish and should be included in management strategies. Basic criteria for selection of MPA sites may include (Agardy 1997; Hermes 1998; Kelleher 1999; Salm and Clark 2000):

- ♦ Relative naturalness: Areas still in good condition.
- ♦ Representativeness: Areas that are unique, include important ecological functions such as spawning, nursery or feeding areas, and/or vulnerable species.

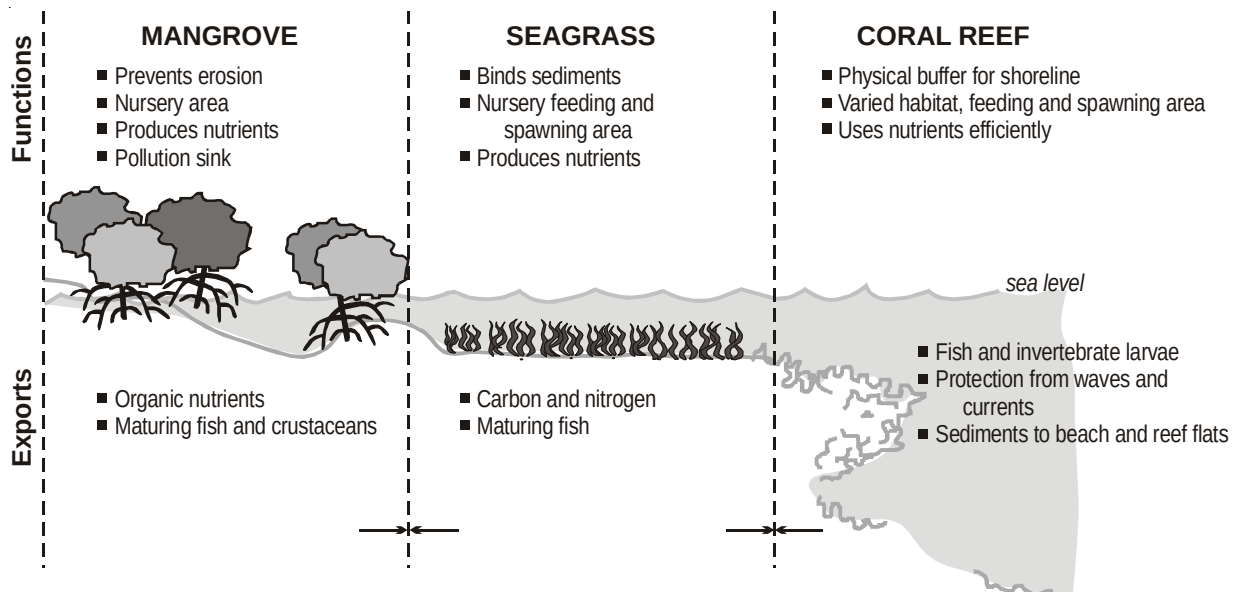


Figure 1. Exchange of mutual benefits among mangrove, seagrass, and coral reef ecosystems (White 2001).

- ♦ Biodiversity: Areas with high diversity of species/ecosystems.
- ♦ Vulnerability: Areas with rich resources/biodiversity that are relatively vulnerable to disturbance or destruction.
- ♦ Fisheries value: Areas that are strategic to enhance fisheries.
- ♦ Tourism value: Areas that could, if protected, enhance appropriate recreational uses and tourism revenues.
- ♦ Social acceptance: Acceptability of all stakeholders.
- ♦ Practicality of management: Relative ease of management.

Reserves help to sustain and increase biotic and genetic diversity by protecting rare, threatened, and endangered species, subpopulations and their habitats. By managing fish harvest, sanctuaries give many species the chance to freely reproduce. As fish inside a sanctuary grow larger and multiply more easily, this leads to a faster turnover of fish from the reserve to the nonreserve through spillover of fish and improved recruitment outside the reserve. This in turn increases yields for fishers (White 1988b; Russ and Alcala 1996a, 1996b; Russ *et al.* 2004). Some species like grouper, parrotfish, and snapper do not breed until they are 4-6 years old. In addition, especially groupers, depend on “spawning aggregations” or “SPAGS” for successful reproduction (Colin *et al.* 2003). Lacking protection, SPAGS can be disrupted or destroyed and juveniles, if taken before they reach breeding age, risk local depletion or extinction. Selective removal of species disrupts the foodweb and can lead to unforeseen ecological consequences. For example, removal of grazers like sea urchins, parrotfish and others may allow too much algae to grow, smothering the reef and thus decreasing its natural productivity (Hughes 1989).

(L-R): Mangroves in Bohol; *Enhalus acoroides* or broadblade seagrass; hard corals in the clear waters of Tubbataha Reefs.



The first so-called municipal marine park or sanctuary in the Philippines was established in 1974 on Sumilon Island, Cebu, under the guidance of Silliman University and its marine laboratory (Figure 2). Sumilon Island Marine Sanctuary is often cited in the Philippines and even internationally as the best example of why coral reef sanctuaries contribute to improved reef fisheries management (White 1988b, 1989; Russ and Alcala 1996a). This initial experiment in reef management, that in fact stopped all fishing on a portion of the Sumilon Island reef for about 10 years, allowed researchers to collect substantial data on the effects of such management on the coral reef and its related fisheries (Alcala 1988).

- ♦ First, the coral reef substrate condition improved remarkably because all destructive fishing practices were halted. Living coral cover more than doubled to about 50 percent.
- ♦ Second, the fish abundance on the reef, as measured in terms of fish individuals per 500 m², more than doubled with the most significant increase among those fish targeted by fishers.
- ♦ Finally, and most importantly, the yearly fish catch to fishers fishing on the Sumilon Island reef, but not in the sanctuary, increased from about 14 t/km² to almost 36 t/km² (Russ and Alcala 1996a, 1996b) (Figure 3).



Sumilon Island fringing reef offers an excellent variety of sea life. It is frequently visited by divers and snorkelers.

This unprecedented fish catch and large measurable increase convinced scientists, reef managers and fishers alike that fish sanctuaries did indeed improve reef fisheries, and most importantly benefit the fishers dependent on the area through export of fish and their larvae (White and Savina 1987; Alcala and Russ 1990) (Figure 3). Unfortunately in 1984, the fish sanctuary on Sumilon was violated and that marked the beginning of a fish yield decline in years thereafter for that particular reef as noted in Figure 3.

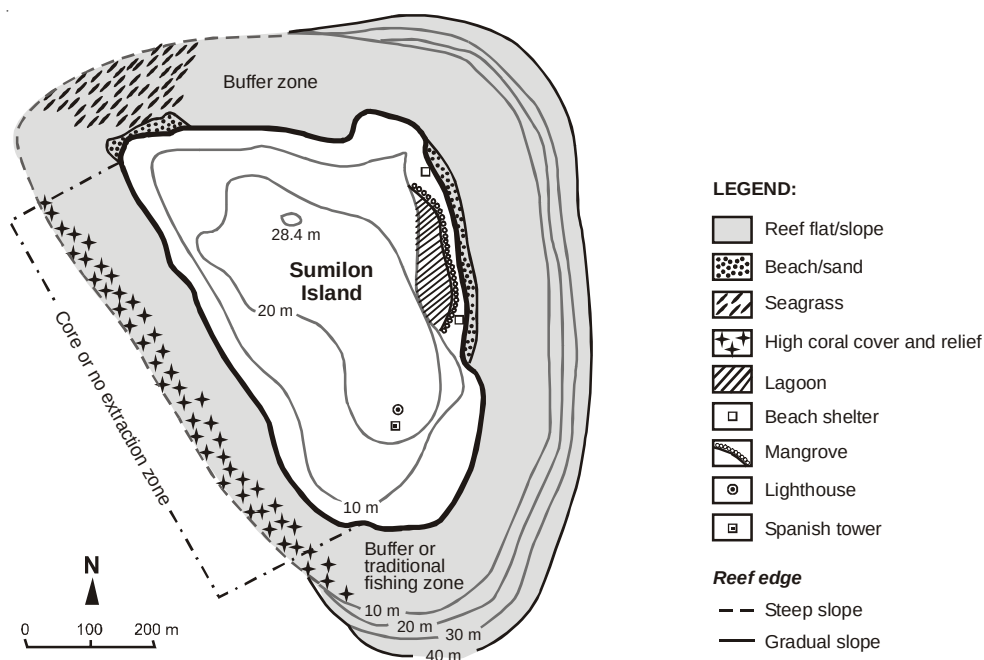


Figure 2. Sumilon Island, Cebu: Coral reef and reserve (circa 1984).

Apo Island Marine Reserve is a protected area in Dauin, Negros Oriental, established shortly after Sumilon in 1985 and is a successful example of a community-based MPA with an increasing fish yield to the present time (Figures 3 and 4). The Apo Island fishing community has continued to attest to improvements in their fish catch outside of the sanctuary. This has recently been documented through a study that measured the extent to which adult fish “spillover” to the fished area outside of the sanctuary as shown in Figures 5 and 6. It can be noted that the spillover distances for adult fish are not far but that they are significant in increasing fish catch in the adjacent areas (Russ *et al.* 2004).

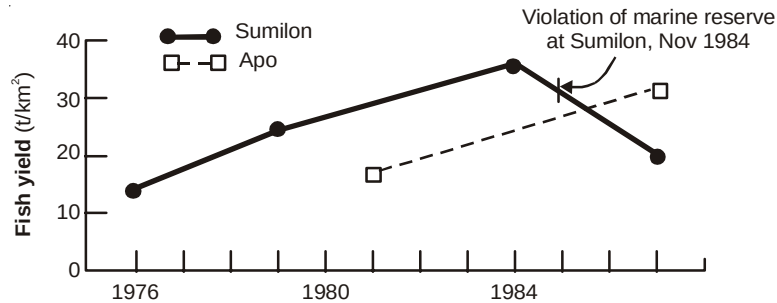


Figure 3. Change in fish yield reported for Sumilon and Apo Islands from 1976 through 1986, reflecting the effects of different management regimes (White 1989).

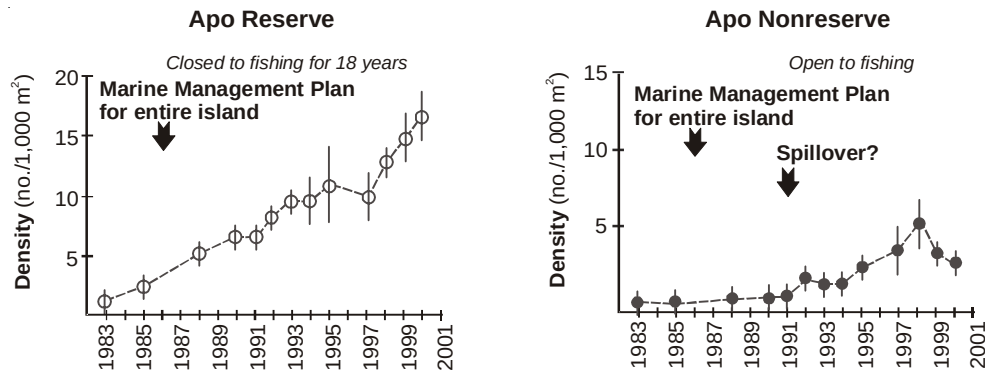


Figure 4. Increase in the biomass of large predators inside and adjacent to the Apo Island reserve over 20 years (Maypa *et al.* 2002; Russ and Alcala 2003).

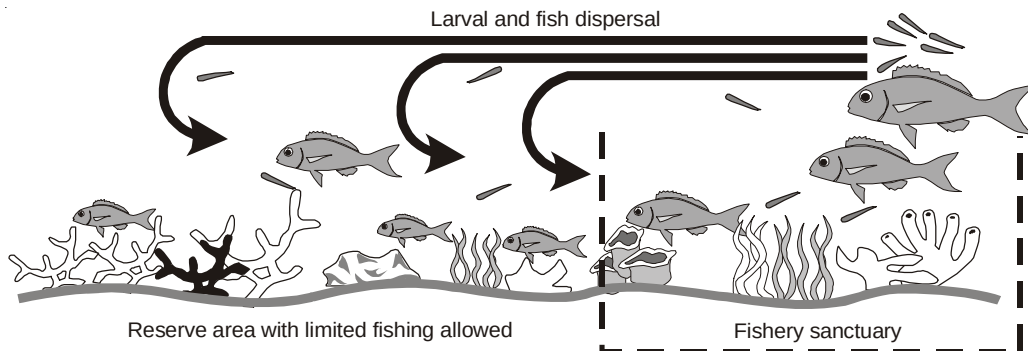


Figure 5. Dispersal of fish and larvae from the sanctuary of a marine reserve enhances reproduction and recruitment outside (Bohnsack 1990).

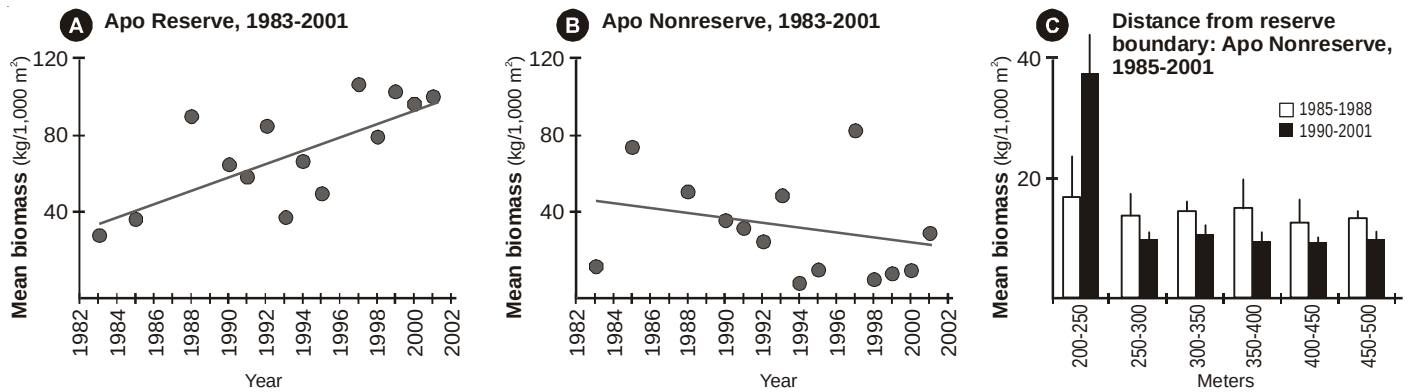


Figure 6. Estimates of biomass of surgeonfish and jackfish at Apo Island, Philippines. Visual census estimates of biomass (a) in the no-take reserve and (b) in the fished nonreserve, 1983-2001. (C) Spatial distribution of biomass of these families of fish outside the reserve at different distances from the reserve boundary in the early (1985-1988) and late (1990-2001) phases of protection of the no-take reserve (Russ *et al.* 2004).

The examples of MPAs at Sumilon and Apo Islands and now more than 300 other locations in the Philippines are showing that the benefits from protected areas management are multiple and substantial. Controls on fishing, boating and other resource uses promote the recovery of degraded coral reefs and their associated habitats by reducing the incidence of physical damage. Incompatible uses can be separated by zoning, which then simplifies awareness building for compliance and enforcement measures. Sanctuaries serve educational and research functions by allowing us to compare protected areas to open areas. They also provide cultural and recreational amenities that can generate revenue for management and livelihoods. MPA establishment is becoming a popular means for communities to demonstrate active participation in conservation.



Fish abundance inside the no-take zone of the Apo Island Marine Reserve has increased, providing direct benefits to the community from diving tourism and higher fish catch outside the sanctuary.

MPAs were initially established to improve fisheries through habitat protection and by allowing natural breeding and reproduction of fish and invertebrates that might otherwise be captured as juveniles. The major benefits from this strategy shown above are now being multiplied by all well managed MPAs. In addition, MPA objectives are also expanding to include social, economic and tenure concerns. Many are now generating



Coral reef monitoring is needed to measure changes over time.

revenues for local governments and communities through user-fees paid by visitors to the area who want to swim or scuba dive inside the MPA. The substantial improvement in habitat quality and the quantity and diversity of fish is increasingly attracting visitors to many MPAs. The revenue being generated is a bonus to the other conservation and fishery rewards and is stimulating many MPA managers and communities to manage their MPA as a tourism resource as well as a fishery management tool. Finally, well-managed MPAs bring pride and empowerment to communities that in turn assist their development potential more broadly.

Integrated Coastal Management and Marine Habitat Protection

Safeguarding critical habitat for increasing fish production, preserving biodiversity and genetic resources, protecting scenic and coastal areas, and enjoying the natural environment are important reasons for implementing strict protection through marine protected areas (MPAs) to retain some areas in their natural productive state. Yet these goals can create conflicts among different interests, user groups, levels of government and national government agencies. Where competition for coastal resources exists, careful design and implementation of integrated coastal management (ICM) or more narrowly focused coastal resource management (CRM) schemes can ensure continued benefits from some natural areas.

ICM is a process aimed at guiding coastal area development in an ecologically sustainable fashion. ICM embraces all of the coastal and upland areas, the uses of which can affect coastal waters and the resources therein. The ICM process tries to break down the barriers erected by traditional sectoral management of natural resources as well as the divide that exists among local government, national agencies, community groups, and nongovernment organizations (NGOs). ICM strives to improve and integrate the administrative, policy, and regulatory processes that affect coastal management (Figure 7). A thorough discussion of ICM can be found in *Guidebook 1: Coastal Management Orientation and Overview* and *Guidebook 3: Coastal Resource Management Planning* in the *Philippine Coastal Management Guidebook Series* (DENR et al. 2001).

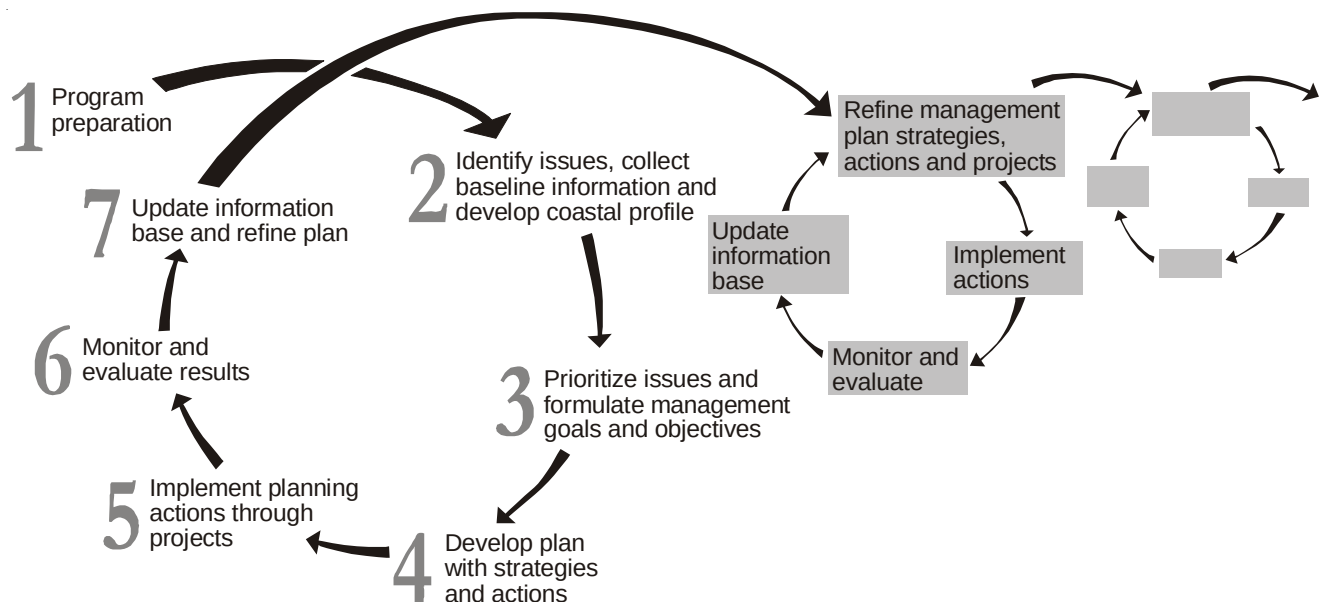


Figure 7. Cyclical ICM data collection, planning, implementation, and monitoring process (White 1997; Olsen et al. 1998).

MPAs can be one important management strategy within a larger area-wide coastal management framework which broader goals may include: maintaining essential ecological processes and life support systems, maintaining genetic diversity, ensuring sustainable utilization of species and ecosystems, watershed management, and others. MPAs are closely linked to issues of ownership and control over specific pieces of coastal marine space. Their management outcomes help to arrest activities that degrade local coastal conditions and may depend on a variety of management tools and approaches within the context of ICM (Figure 8).

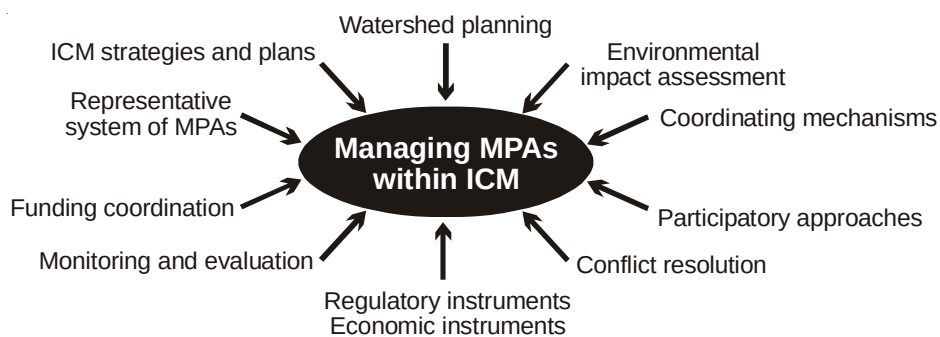


Figure 8. Tools to manage MPAs in the context of ICM (adapted from Belfiore *et al.* 2004).

Depending upon community needs and management concerns within the context of a larger ICM or CRM plan, MPAs can be designed and managed to accommodate various objectives and activities. Pursuing one benefit (e.g., sustaining biodiversity or fisheries production) therefore does not necessarily exclude pursuit of others such as revenue generation, tourism or other social benefits, and thus allows various management options. A typical ICM or CRM program for a municipal/city coastal and marine area will have a variety of interventions to address the needs of coastal and fisheries resources management as in Figure 9. Still, the underlying premise is to conserve and protect natural resources. *Guidebook 3: Coastal Resource Management Planning* (DENR *et al.* 2001) outlines the basic planning steps for establishing and managing MPAs.

The ICM program for Balayan Bay being implemented by the Batangas Provincial Government provides useful lessons in addressing the long and short-term threats surrounding the conservation areas and sanctuaries found in Mabini and Tingloy municipalities. These towns host a high diversity of coral and fish species. But the threats to marine diversity include land form changes, offsite pollution, incompatible land uses between towns, watershed impacts on coral reefs, sedimentation, foreshore developments, oil spills and destructive fishing. ICM provides for intermunicipal, intersectoral planning and coordinated actions to address these threats (Tongson 2004).



Community participation in ICM and MPA planning and management is essential to promote local ownership.

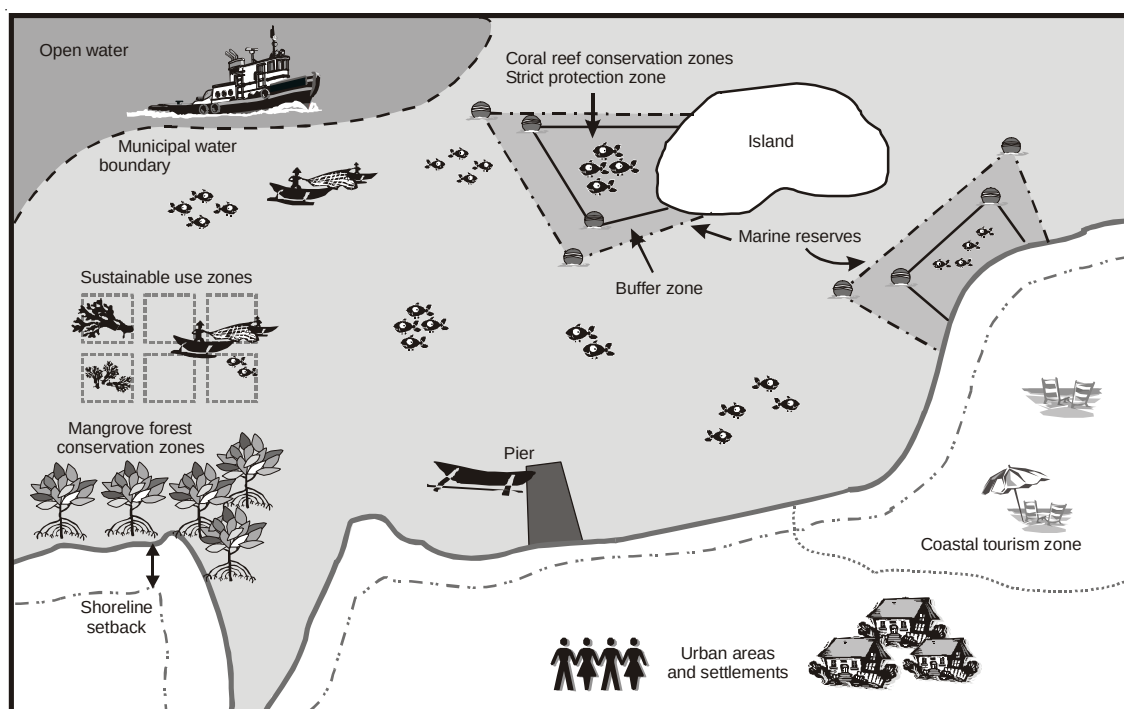


Figure 9. Municipal or city management area with various CRM interventions including MPAs.

In addition to bringing ICM planning to a more local level, an MPA can serve as a learning area for the process. As one establishes and manages an MPA, the day-to-day conflicts of community development and natural resource protection provide opportunities to learn. The lessons learned are transferred to the policy debates associated with the larger ICM process. Thus the experiences gained at the local level provide feedback and reinforce the national or regional policy and planning processes.

A key lesson being learned in the Philippine context for MPAs is that community involvement and ownership of the planning and implementation process are essential to succeed (White *et al.* 1994; White *et al.* 2002). The real stewards of carefully managed small areas of coral reef and shorelines are the local resource stakeholders (White 1988a; Bolido and White 1997; Hermes 1998). Nevertheless, local resource stakeholders need substantial assistance and mentoring to become effective MPA managers. The process of involving communities in MPAs is described in Chapter 5 and in *Guidebook 4: Involving Communities in Coastal Management* (DENR *et al.* 2001).

Knowing communities well is essential since there exist many power inequalities and interests based on the status of people and their sources of income. Logically, people look after their own interests. Recognizing these sources of conflict, it is a challenge for MPA practitioners to help resolve differences and to enable various groups arrive at a common vision for their MPA. Some outcomes must be negotiated such as compensation, training, and alternative livelihoods for affected fishers.

The lessons of Philippine coastal management projects with the implementation of MPAs are summarized in succeeding chapters. In addition, useful books on MPAs, coral reef management, and habitat assessment are listed in Table 1.

Table 1. Useful publications on MPA management in the Philippines.

- Arceo, H.O., M.M.S. Aguinaldo and P.M. Aliño. 2001. **Marine protected areas - Coastal resource management tools**. Marine Environment and Resources Foundation, Inc., Quezon City, Philippines.
- Arquiza, Y.D. and A.T. White. 1999. **Tales from Tubbataha: Natural history, resource use and conservation of the Tubbataha Reefs, Palawan, Philippines**. 2nd ed. Sulu Fund for Marine Conservation Foundation, Inc. and Bookmark, Inc., Philippines. 190 p.
- Deguit, E.T., R.P. Smith, W.P. Jatulan and A.T. White. 2004. **Participatory coastal resource assessment training guide**. Coastal Resource Management Project of the Department of Environment and Natural Resources, Cebu City, Philippines. 134 p.
- De La Cruz, M. and M.C. Militante. 1996. **Marine reserve monitoring manual for communities**. Guian Development Foundation, Inc., Tacloban, Philippines. 28 p.
- DENR (Department of Environment and Natural Resources), DA-BFAR (Department of Agriculture-Bureau of Fisheries and Aquatic Resources) and DILG (Department of the Interior and Local Government). 2001. **Philippine coastal management guidebook series no. 5: Managing coastal habitats and marine protected areas**. Coastal Resource Management Project of DENR, Cebu City, Philippines. 106 p.
- Hermes, R. 1998. **Establishment, maintenance and monitoring of marine protected areas: A guidebook**. Philippine Business for Social Progress, Manila, Philippines. 63 p.
- IIRR (International Institute of Rural Reconstruction). 1998. **Participatory methods in community-based coastal resource management**. 3 volumes. IIRR, Cavite, Philippines.
- Pomeroy, R.S., J.E. Parks and L.M. Watson. 2004. **How is your MPA doing?** International Union for the Conservation of Nature and Natural Resources, Gland, Switzerland.
- Uychiaoco, A.J., S.J. Green, M.T. dela Cruz, P.A. Gaite, H.O. Arceo, P.M. Aliño and A.T. White. 2001. **Coral reef monitoring for management**. University of the Philippines-Marine Science Institute, United Nations Development Programme Global Environment Facility-Small Grants Programme, Guian Development Foundation, Inc., Voluntary Service Overseas, University of the Philippines Center for Integration and Development Studies, Coastal Resource Management Project, and Fisheries Resource Management Project. 110 p.
- White, A.T. and H.P. Vogt. 2000. **Philippine coral reefs under threat: Lessons learned after 25 years of community-based conservation**. Mar. Pollut. Bull. 40(6):537-550.
- www.coast.ph (contains the MPA Database generated by the MPA Report Guide shown in Appendix 1).
- www.oneocean.org (contains many references).

Is It a Marine Protected Area, Park, Reserve, or Sanctuary?

“What’s in a name? The bottom line is effective protection and management!”

Marine protected area (MPA) is a broad term for sites which boundaries have been established in order to provide some level of management with the primary intent of protecting the site’s natural resources. There are different classifications for MPAs with some used inconsistently and interchangeably, such as parks, reserves, refuges, and sanctuaries. Confusion can arise further because MPAs also can be established at different levels of government, such as national and local. In the Philippines, MPAs can be established through the National Integrated Protected Areas System (NIPAS) Act (national) or through local (municipality or city) government planning and ordinance. The process for establishing MPAs under the NIPAS Act is distinct and is described in a publication by the Department of Environment and Natural Resources and briefly summarized in Chapter 4. The process for local government and community-based establishment is described herein and also has much relevance for MPAs under NIPAS.

There is inconsistency in terminology among the various enabling regulations that provide the legal basis for establishing a protected site in the Philippines. Referring to the examples from national legislation in Table 2 we can see that the term used to refer to a protected area varies depending upon the designating authority as well as the type and quality of the resources and the intent.

Table 2. Examples of national and local categories for protected areas.

National Fisheries Act of 1998 (RA 8550) provides the following:

Fishery refuge and sanctuary: A designated area where fishing or other forms of activities which may damage the ecosystem of the area are prohibited and human access may be restricted.

Fishery reserve: A designated area where activities are regulated and set aside for educational and research purposes.

National Integrated Protected Areas System Act of 1992 (NIPAS – RA 7586) contains definitions for the following:

Protected area: ...identified portions of land and water set aside by reason of their unique physical and biological significance, managed to enhance biological diversity, and protected against destructive human exploitation.

National park: A forest/marine reservation essentially of natural wilderness character which has been withdrawn from settlement, occupancy or any form of exploitation except in conformity with approved management plan and set aside as such exclusively to conserve the area or preserve the scenery, the natural and historic objects, wild animals and plants therein and to provide enjoyment of these features in such areas.

Resource reserve: An extensive and relatively isolated and uninhabited area normally with difficult access designated as such to protect natural resources of the area for future use and prevent or contain development activities that could affect the resource pending the establishment of objectives which are based upon appropriate knowledge and planning.

Continued on next page

Table 2. Continued.

Wildlife sanctuary: ...an area which assures the natural conditions necessary to protect nationally significant species, groups of species, biotic communities or physical features of the environment where these may require specific human manipulation for their perpetuation.

Buffer zones: ...identified areas outside the boundaries of and immediately adjacent to designated protected areas ...that need special development control in order to avoid or minimize harm to the protected area.

Barangay Council, Gilutongan Island, Cordova, Cebu (Barangay Resolution No. 0023, Series of 1991):

Fish sanctuary: A protected water area where fish are able to spawn, feed and grow undisturbed and where fishing and other activities are absolutely prohibited.

Municipal Council, Dauin, Negros Oriental for Apo Island (Ordinance approved 3 November 1986):

Marine reserve and fish sanctuary: The entire coral reef and waters surrounding Apo Island to 500 m offshore are protected from destructive fishing activities and a smaller area is a fish sanctuary where no extraction is allowed.

For the purposes of this book on MPAs, we will apply the following terms that were agreed upon in a national workshop and since published (Miclat and Ingles 2004):

- ♦ **Marine protected area (MPA):** Any specific marine area that has been reserved by law or other effective means and is governed by specific rules or guidelines to manage activities and protect part or the entire enclosed coastal and marine environment.
- ♦ **Marine sanctuary:** An MPA where all extractive practices, such as fishing, shell collection, seaweed gleaning and collecting of anything else is prohibited. It also allows for control of other human activities, including access, in order to protect the ecosystem within the specific site.
- ♦ **Marine reserve:** An MPA where strict sanctuary conditions are not mandated for the entire area yet there is still a desire to control access and activities, such as boating, mooring and various fishing techniques. It allows for zones that include a sanctuary area.



All marine sanctuaries should have a sign that explains the rules and shows the boundaries.

- ♦ **Marine park:** An MPA where multiple uses are encouraged that emphasize education, recreation and preservation; usually implemented by zonation schemes that can include a sanctuary area (White 1988a).



ALAN WHITE

Welcome sign at Apo Island Marine Reserve shows a map of the island and reef and lists management rules.

A common Philippine MPA model is a municipal marine reserve established by municipal or city governments that includes a core sanctuary or “no-take” zone (Figure 10). In another model, an MPA can be specified for specific species. For example, a local ordinance was passed in Donsol, Sorsogon, which declares the entire municipal waters as a whale shark sanctuary. There is also increasing awareness about the need to plan and implement “MPA networks” such that individual MPAs can complement each other within the local and regional ocean environment where they are located. Such networks must be planned and evolve over time as we gain more knowledge of the ocean currents, larval movements, spawning areas and other factors in coordination with social acceptance considerations important in planning a “network” effect (see Chapter 6).

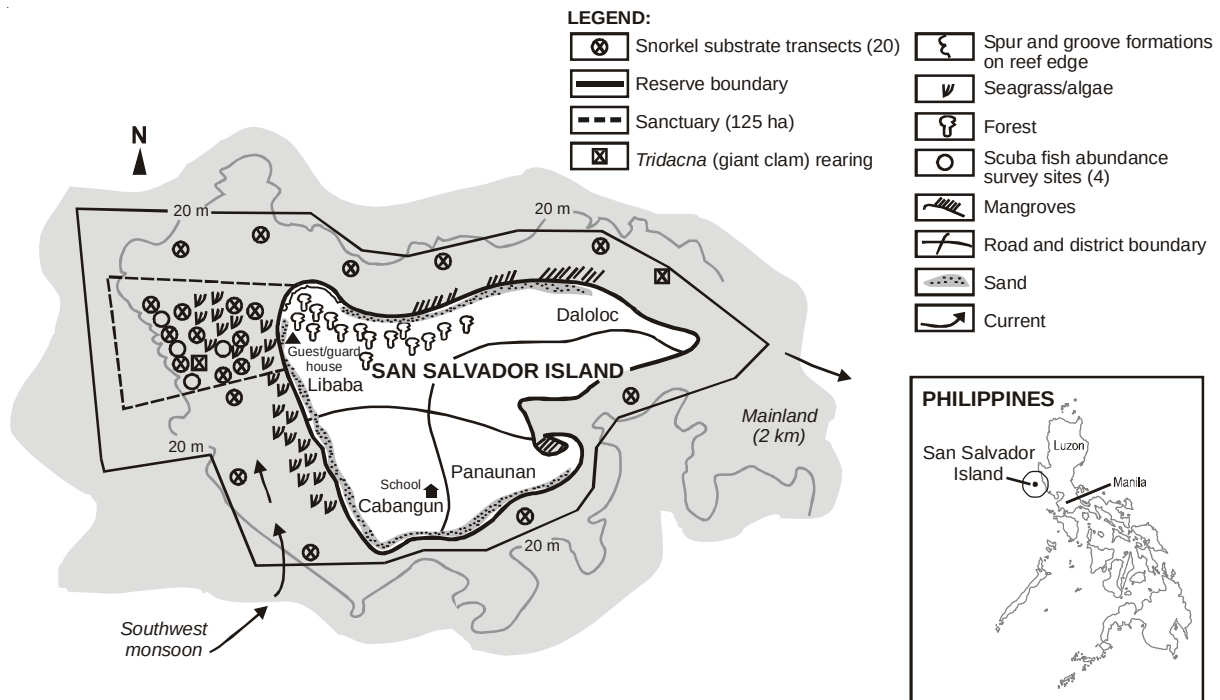


Figure 10. Marine reserve boundaries and zones, survey locations and political subdivisions on San Salvador Island, Masinloc, Zambales (White et al. 1994).

Legal and Jurisdictional Concerns for Marine Protected Areas

“Jurisdictions are essential but they must be clearly understood to be useful.”

The authority to establish and manage marine protected areas (MPAs) is held by three jurisdictions—the local government unit (LGU), the Department of Environment and Natural Resources (DENR) and the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR). Both national government agencies have responsibilities for protecting marine environments, although their mandates may sometimes overlap. For example, DA-BFAR is mandated in the Fisheries Code of 1998 (RA 8550) to “achieve food security as the overriding consideration in the utilization, management, development, conservation, and protection of fishery resources in order to provide the food needs of the population” and to “manage fishery and aquatic resources, in a manner consistent with the concept of an integrated coastal area management in specific natural fishery management areas...” Meanwhile, the DENR has been given authority to regulate the “development, exploration and utilization of marine, freshwater, brackish water and overall aquatic resources.” (Section 1 of Title XIV). In addition, the DENR has the authority over all nationally declared protected areas by virtue of the National Integrated Protected Areas System Act of 1992. This law encompasses the process by checking and managing national protected areas through a Protected Area Management Board with local government and stakeholder representatives (Table 3). This law and its contents are explained in detail in *Philippine Coastal Management Guidebook 2: Legal and Jurisdictional Framework for Coastal Management* (DENR et al. 2001). The important MPAs declared under the NIPAS Act and their areas and primary habitat are listed in Table 4.

Table 3. The National Integrated Protected Areas System (NIPAS).

The NIPAS applies only to those areas or islands established by a national law, decree, proclamation or order. Most of the MPAs established by LGUs *do not* fall within this category of national management.

The NIPAS was instituted through Republic Act (RA) 7586 in 1992. Designation of a new site for inclusion in the NIPAS presently requires a Presidential Proclamation followed by the appropriate enabling law passed in Congress. The DENR is mandated through NIPAS to classify and administer “all designated protected areas in order to maintain essential ecological processes and life support systems, to preserve genetic diversity, to ensure sustainable use of resources found therein, and to maintain their natural conditions to the greatest extent possible.” It requires the preparation of a site-specific “general management planning strategy” (GMPS) as part of a larger national strategy for management of protected areas (Protected Areas and Wildlife Bureau). Preparing each GMPS requires input from national government organizations (NGOs) and local communities while a Protected Area Management Board (PAMB) oversees management of each site.

LGUs exercise great local authority for resource protection even in NIPAS sites through the local PAMB. The PAMB is usually dominated by local community representatives from the municipality or city, barangay, tribal community, NGO or other local organization. Therefore, PAMB decisions often carry the majority vote of LGU representatives. Even when the initiative for establishing a sanctuary comes from a national agency, LGU approval still must be obtained.

Table 4. Important national MPAs in the Philippines declared under NIPAS.

Name of Protected Area	Region	Proclamation Number	Date Established	Area (ha)
Agoo-Damortis Protected Landscape and Seascape	1	277	4-23-2000	10,513
Apo Island Protected Landscape and Seascape	7	438	8-09-1994	691
Aliguay Island Protected Seascape and Marine Reserve	9	106	5-06-1999	1188
Apo Reef National Park	4-B	868	9-06-1996	15,792
Balingao Protected Landscape/Seascape	10	418	11-22-2000	295
Batanes Protected Landscape and Seascape	2	335	2-28-1994	213,578
Biri-Larosa Protected Landscape/Seascape	8	291	4-23-2000	33,492
Cuatro Islas Protected Landscape/Seascape	8	270	4-23-2000	12,500
Dumanquilas Protected Landscape/Seascape	9	158	8-10-1999	25,948
El Nido Managed Resource Protected Area	4-B	32	10-8-1998	89,135
Great and Little Sta. Cruz Islands Protected Landscape and Seascape	9	271	4-23-2000	1,877
Guiuan Protected Landscape and Seascape	8	469	9-26-1994	60,448
Initao-Libertad Protected Landscape and Seascape	10	260	9-16-2002	1,301
Malampaya Sound Protected Landscape and Seascape	4-B	342	7-11-2000	200,115
Masinloc and Oyon Bays Marine Reserve	3	231	8-18-1993	7,568
Murcielagos Island Protected Landscape and Seascape	9	281	4-23-2000	100
Palaui Island Marine Reserve	2	447	8-28-1994	7,415
Pujada Bay Protected Landscape and Seascape	11	431	7-31-1994	21,200
Sagay Protected Seascape	6	592 RA 9106	6-01-1995 4-14-2001	28,300 32,000
Sarangani Bay Protected Seascape	12	756	3-05-1996	215,950
Selinog Island Protected Landscape and Seascape	9	276	4-23-2000	960
Siargao Protected Landscape/Seascape	13	902	10-10-1996	278,914
Taklong Island National Marine Reserve	6	525	2-08-1990	1,100
Talibon Group of Islands Protected Landscape/Seascape	7	131	7-05-1999	6,457
Tubbataha Reef National Marine Park	4	306	8-11-1988	33,200
Turtle Island Wildlife Sanctuary	9	171	8-29-1999	242,967

Source: www.pawb.gov.ph

Despite the mandate of the DENR to establish and manage MPAs under the NIPAS Act, LGUs are the most active participants due to the direct role of municipalities and cities and their coastal communities in making MPAs effective. The DA-BFAR is mandated to assist LGUs with MPAs or to establish and manage MPAs outside of municipal waters. The Local Government Code of 1991 confers several important measures that enhance the administrative abilities of the LGU: political autonomy (decentralization) and the ability to generate and mobilize economic resources through taxes and fees. Together with powers devolved through the Fisheries Code of 1998 (see Table 5), LGUs possess broad powers to control fishing activities occurring within their municipal waters. Consequently, LGUs are able to set conditions for marine resource use by local ordinance.

Table 5. Fisheries Code of 1998.

The Fisheries Code of 1998 consolidated numerous existing laws, decrees, rules, and orders. One principal outcome was to implement the constitutional and statutory mandates in favor of LGUs and the subsistence fisherfolk by limiting open access to fishery resources, giving priority to municipal fisherfolk and including people empowerment in the management process through formation of local councils. The code also declared its intent to manage fishery and aquatic resources in specific areas using integrated coastal management. The code also provides controls for commercial fishing and aquaculture in an effort to promote sustainable development in Philippine coasts and waters.

LGUs (municipalities/cities) were given the primary responsibility for “management, conservation, development, protection, utilization and disposition of all fish and fishery/aquatic resources within their respective municipal waters.” They may establish fishery refuges and sanctuaries by ordinance after consultation with the advisory body known as the Municipal/City Fisheries and Aquatic Resources Management Council (M/CFARMC). The M/CFARMC, composed mostly of representatives from local fisherfolk, assists in the preparation of a Municipal Fishery Development Plan, recommends appropriate municipal ordinances, assists in law enforcement, and advises the *Sangguniang Bayan/Panlungsod* on fishery matters. FARMCs may also be formed at the level of the *barangay* as well as at a higher level for shared resources like lakes, bays, gulfs, and rivers which are bounded by two or more municipalities/cities.

The Fisheries Code of 1998 mandates that where applicable, at least 15 percent of the total municipal waters in each municipality shall be identified, based on the best available scientific data, and automatically designated as fish sanctuaries by the LGUs in consultation with the FARMCs. Although statutorily there is not a mandate that an MPA be incorporated into an approved ICM process or CRM plan, there are benefits to doing so. Ideally, such sanctuary areas would be established as part of each Municipal CRM Plan. Effective planning to integrate sanctuary locations would be enhanced if the CRM Plan is prepared in harmony within a larger Integrated Coastal Management and Fisheries Plan or a Provincial Plan.

Such measures must be at least as strong or stronger than the conditions set by the national government agencies. They can never be weaker. The strong local power can be a benefit if used properly to manage and protect marine resources. Provincial governments are also mandated to assist municipalities and cities in their coastal management and MPA implementation efforts through technical assistance, training, policy guidance, and funding. The role of provinces is important in helping sustain MPAs over time.

Municipal marine reserves or sanctuaries are one of the most important coastal resource management tools available for protecting and improving local marine resources. Within their regulatory boundaries, LGUs are able to establish sanctuaries, limit access to marine resources, prescribe zones for different uses, as well as collect taxes or fees associated with the use of these municipal resources. LGUs do not require the approval of the national government agencies to establish municipal reserves or sanctuaries. Thus, together with the province and the assistance of national agencies as well as NGOs and academe, municipalities and cities are well positioned to establish and implement MPAs as part of their coastal management programs.

Although 600 or more MPAs have been legally established in the Philippines by municipalities and cities, the actual management status is known and documented for only about 350 of these through a common database established by a number of cooperating institutions (CCEF and Partners 2005) (Figure 11). There is a need to conduct monitoring and evaluation of all MPAs on their basic management effectiveness so that their quality can be improved. Additional challenges are to determine how to make the existing MPAs form effective networks to address larger ecosystem conservation needs, how to scale up efforts to cover larger areas that are more strategically selected; and how to provide more monetary and moral support to those existing and newly established MPAs in the country.

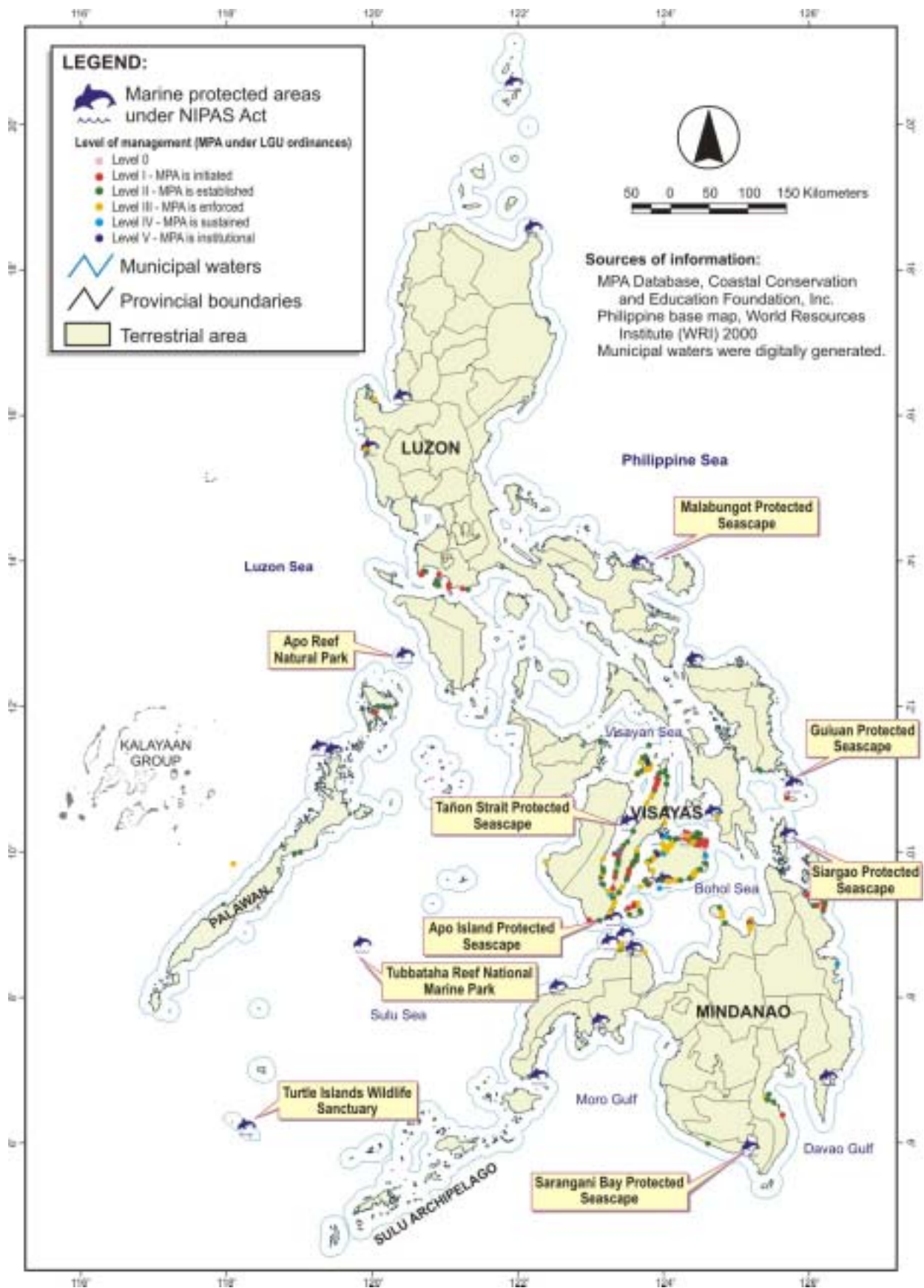


Figure 11. MPAs documented in the Marine Protected Coast, Reef and Management Database (CCEF and Partners 2005).

Planning and Establishing a Marine Protected Area

“There are no bad MPAs, only MPAs that have been set up the wrong way.” (Salm and Clark 2000)

Planning and establishing a marine protected area (MPA) occurs through a process that covers several stages. The stages in the community-based approach described below occur somewhat sequentially yet several will also run concurrently. The process for developing and implementing an MPA adapts the coastal planning process described in detail in *Philippine Coastal Management Guidebook 3: Coastal Resource Management Planning* (DENR *et al.* 2001) and through the guidebooks of the International Institute of Rural Reconstruction (IIRR 1998). Though each site and its management measures are unique, the techniques for encouraging community support and establishing a marine reserve are widely applicable. Participatory approaches to improve community support for MPAs are described in *Philippine Coastal Management Guidebook 4: Involving Communities in Coastal Management* (DENR *et al.* 2001). The importance of community organization, community participation and public education in the successful examples of MPAs is well-documented. This chapter adapts the principles applied in the Philippines and as described by other authors (White 1988a; Buhat 1994; Wells and White 1995; Hermes 1998; Salm and Clark 2000). The general process and activities essential for successful MPA establishment are outlined in Table 6.

Phase 1. Issue identification and prioritization, and baseline assessment

Recognition of a need and program preparation

The recognition of the need and desire for an MPA often comes from the community itself. In some cases, especially in the past, such recognition came from outside the community, such as from a local conservation organization or scientists aware of the biological significance of the area or may come from within the local government unit (LGU) in response to concerns about fishery resources or other issues. On the Philippine island of San Salvador, a Peace Corps Volunteer identified the potential site for a community-based reserve and documented the basic status of the reefs. He introduced the concept of marine sanctuary to the local people and made contacts with agencies involved in natural resource management. The community, together with its local government, clarified the main objectives of the marine sanctuary they proposed as a first step in its development. Examples from San Salvador (Buhat 1994; White *et al.* 1994) are used throughout this discussion to illustrate the principles.

In some cases, the staff of an existing coastal project or natural resource management agency may be able to provide some of the preparatory steps that help communities to recognize the need. In other instances, a mayor, a few concerned citizens, private interests or a community group may initiate the first discussions and investigations. Once the success of a few initial sites became known, other communities then began approaching local conservation groups, universities, development projects and government agencies for assistance in establishing their own reserves. Recognition of need increases as people became more aware of the benefits of MPAs and the status of their own resources.

Table 6. Phases and activities for MPA establishment and management within local government jurisdictions.

Phases of coastal management*	Stages and activities for MPA establishment and management**
1. Issue identification and prioritization, and baseline assessment	Recognition of a need and program preparation Integration with the community and assessment of issues 1. Stakeholder identification and analysis 2. Community organization and mobilization 3. Conduct of baseline studies 4. Information, education, and communication
2. Plan preparation and adoption	Definition of goals and objectives: Formation of the core group and development of the management plan 1. Formation of the core group 2. Definition of goals and objectives 3. Preparation of management strategy and action plan 4. Determination of reserve boundaries and zones
3. Action plan and project implementation	Implementation: Formalization of the reserve, implementing management strategies, enforcement and community strengthening 1. Formalization of the reserve through local ordinance 2. Implementation of strategies for managing the reserve 3. Enforcement 4. Permits and user fees 5. Strengthening of community involvement
4. Monitoring and evaluation	Monitoring and evaluation Refinement of the management plan
5. Information management, education and outreach	Review of status of MPA and its benefits Refinement of education program from experience Development of outreach program as appropriate

**Described in detail in Philippine Coastal Management Guidebook Series 1 and 3 (DENR et al. 2001) as the overall phases for coastal resource management planning and implementation.*

***These stages and activities are different from those prescribed under the NIPAS Act because of the focus on MPA within local government jurisdiction.*

Integration with the community and assessment of issues

The effectiveness of a marine reserve is closely linked to the traditional resource use patterns of the people who live within or close by the site. Thus, the process to establish a reserve must include a complete understanding of the people in their local environment as well as the ecology of the target species and their critical habitat. Knowing how people use their resources is crucial when establishing a range of management strategies within the context of a marine reserve. This stage is very important and thus requires sufficient time to develop thorough consultation, participation and negotiations with different user groups and community interests. See *Philippine Coastal Management Guidebook 4: Involving Communities in Coastal Management* (DENR et al. 2001) for more information.

1. Community organization and mobilization

The Philippine model uses trained community workers or community organizers (COs) to enter an area for a period of 6 months or longer. While living in the community they introduce and elaborate the idea of marine sanctuary, meet local leaders, attend local meetings, and generally become familiar with the local culture and management issues. This process can also be termed “stakeholder-ship management”. Rather than being strictly biologists, the COs require skills in sociology, negotiation and diplomacy to quickly develop knowledge of the local natural resource management issues as well as their “authorizing environment” (the social, economic, and political context which determines the decision-making process). The ideal candidate also possesses basic skills in marine resource monitoring and fishery assessment (White and Vogt 2000).

The key information being sought during this stage tries to determine what entity will become the institutional anchor for the MPA and to answer the classic question, “Who wins and who loses if an MPA is established?” Gathering this information, a form of stakeholder analysis, will draw out the stakeholder groups who will be benefiting from an MPA, who will pay the cost, identify vulnerable groups, determine different views from each stakeholder and map their interest as basis for future negotiations. Typical information will include:

A. Basic information and inputs required for planning:

- ♦ basic resource management issues to be addressed;
- ♦ causes of overfishing; what species are affected most;
- ♦ existing and traditional socioeconomic and resource use patterns for the area;
- ♦ groups or institutions that control or may be affected by changes in resource use patterns;
- ♦ goals people expect as outcomes from MPA intervention;
- ♦ participants in the planning process for establishing a reserve and in the day-to-day operations; and
- ♦ area required to adequately meet the management goals.

B. Information needs for refining the plan and management:

- ♦ boat mooring issues and locations;
- ♦ public access and encroachment or squatting;
- ♦ research;
- ♦ too much or too little tourism;
- ♦ sanitation;
- ♦ activities to be allowed or curtailed in the protected areas;
- ♦ management methods acceptable or unacceptable to the local population;
- ♦ what scale will management be applied; and
- ♦ need for physical enhancement of area.

This information helps to determine the scope of the physical environment baseline studies that are a part of Phase 1. This review of the “authorizing environment” along with the baseline studies is compiled to form a coastal environmental profile about the proposed management site.

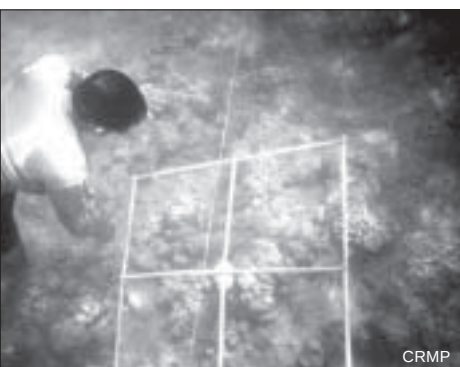
2. Conduct of baseline studies

Compiling the available information as a coastal environmental profile facilitates discussions about establishing the goals and objectives of a MPA management plan in Phase 2. A sample outline for a coastal environmental profile is shown in Table 7 and is discussed in detail in the *Participatory Coastal Resource Assessment Training Guide* (Deguit *et al.* 2004).

Table 7. Key chapters in a coastal environmental profile.

- ♦ Introduction of the location, description of area, history and summary of issues;
- ♦ Physical features: land area, topography, hydrology, soil, land uses and climate;
- ♦ Natural resources and trends: mineral, forest, coastal (resource maps);
- ♦ Sociopolitical setting: political/administrative boundaries, demographics, public health and sanitation, settlements, infrastructure;
- ♦ Economic sector: fisheries, aquaculture, tourism, industry, agriculture, forestry;
- ♦ Institutional and legal framework: relevant laws, local/national government, NGOs, community organizations; and
- ♦ Management issues and opportunities: environmental, economic, political/institutional.

To establish an MPA, one must be familiar with the resources and people who will be enjoined to manage. Data collection and scientific studies of the area should start early in the process of establishing an MPA. The baseline information is used for development of a management plan and later for evaluating the impact of the marine reserve. The baseline information collection should be tied to the MPA objectives so that their measurement is facilitated. Information collection methods should follow those used previously in the



Monitoring of shallow reef flats can be done using quadrats by community members.

MPA to establish time-series data and establish trends that can be consistently measured over time. By assembling the best data available for the site, people can be confident that everyone is using the same information and that their decisions are based on sound information. It can also point to gaps in the data that can be acquired later as part of the MPA management plan.

Local community members should be encouraged to contribute to baseline data collection with the assistance of project or other technical staff. Local residents can often provide great detail on seasonal variations of species, distribution of various marine ecosystems, resource use and weather patterns. Techniques such as the participatory coastal resource assessment (PCRA) can be used. More information about PCRA is available in the PCRA Training Guide by Deguit *et al.*

(2004) and IIRR (1998). Participation at this early stage improves the likelihood that the local community will feel ownership of the MPA. A key strategy is the development of coastal resource maps that can be used to identify the appropriate location of an MPA (Figure 12). Maps and boundaries should ultimately be certified by a geodetic surveyor for accuracy.

Members of the local academic community are valuable partners as they can provide local technical knowledge and perhaps bring their own institutions into the process. Schools and universities often can provide eager receptive audiences, lab facilities, venues for meetings, and student volunteers for gathering data and community outreach. They may eventually align their research interests with those of the proposed reserve (White and Vogt 2000).

Although monitoring and evaluation appear later in our planning framework, it is useful to discuss them now. Monitoring and evaluation are an extension of the process that begins with the baseline studies. Therefore, the scope and criteria of the baseline



Coral reef monitoring using line-intercept and fish visual census methods provide information in changes in live coral cover as well as fish diversity and abundance.

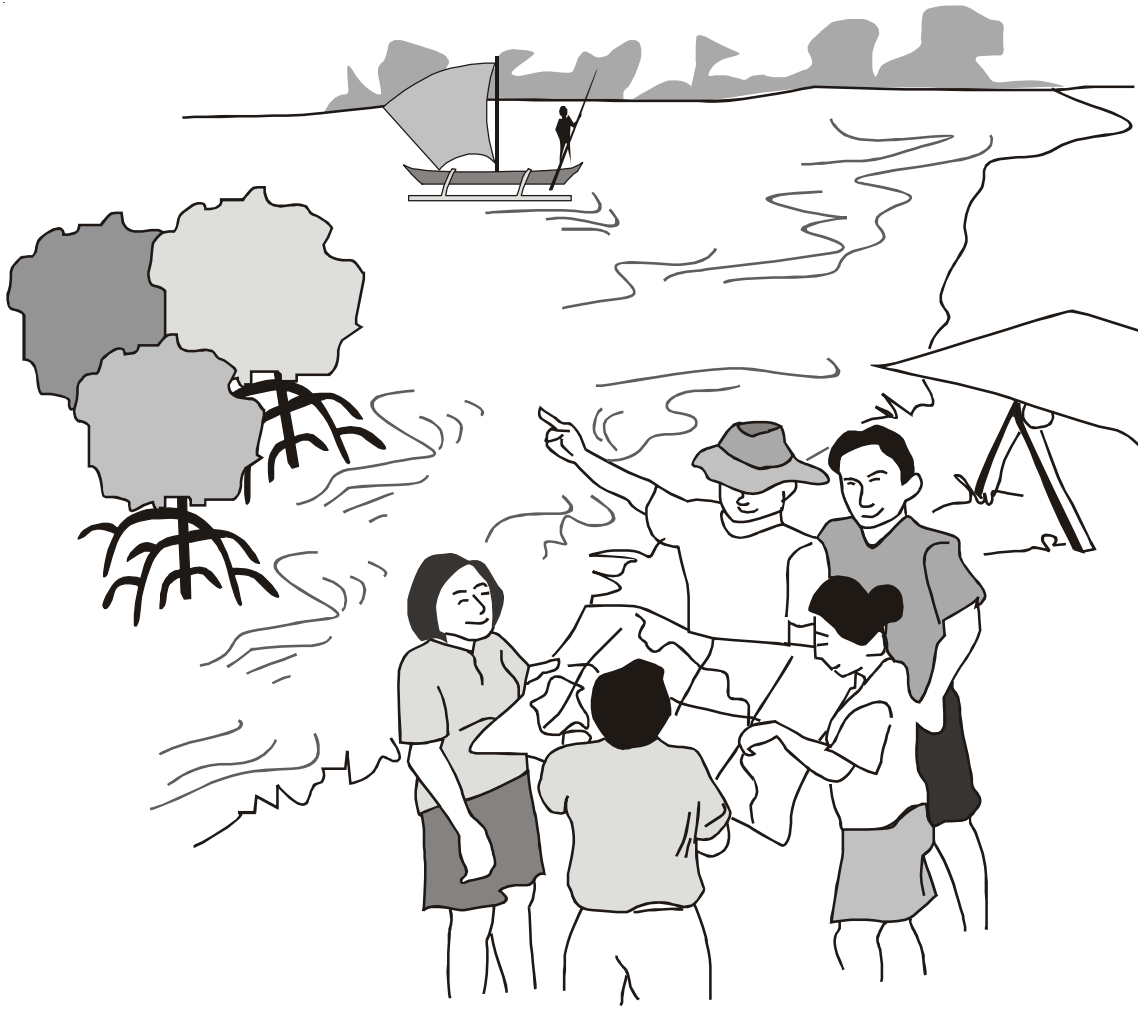


Figure 12. PCRA exercise to refine maps (Deguit *et al.* 2004).

studies should include indicator criteria suitable for monitoring progress, tracking changes, and evaluating the effectiveness of the MPA interventions. Monitoring is a continuous process and not a single event. Monitoring and evaluation also have to evolve with the management context that often dictates change and adaptation to new concerns. Thus, feedback from monitoring, through posters, graphics, illustrations, discussions, or other means, is essential to catalyze improved management, change, and refinement of the MPA objectives and plan.

Monitoring and evaluation provide the foundation for learning lessons and defining future program development. Changes in policies should be guided by monitoring results of improvements in coral reef conditions (substrate, fish density, and fish catch or yield) rather than by popular opinion. Simple monitoring methods can include reef surveys using standard techniques of snorkeling, line intercept transects, and general observation as recommended by Uychiaoco *et al.* (2001). Monitoring, using these methods can be done by community members, after training by a capable government, NGO, or academic institution. Public opinion itself also may change as monitoring results become available. Publicizing the results of the scientific work helps to increase interest in and acceptance of the marine reserve by local people.

3. Information, education, and communication

The education process occurs throughout all stages of development and implementation for a marine reserve. Initially, the focus is on explaining to local people the basic principles of marine ecology and resource management. The connection among a healthy marine system, the present conditions, and the proposed MPA must be clear. This can occur through small group meetings and also in more formal presentations using slides, posters, and other visual aids. As the process for establishing an MPA matures, then the topics may shift to learning about the political process, funding options, management strategies, enforcement and monitoring, and then discerning lessons learned from experience. Several suggestions include:

- ♦ Use nonformal methods that encourage participation, interaction, and personal contact that are gender-sensitive.
- ♦ Prepare a good map to help people relate to their areas of specific interest.
- ♦ Encourage local enthusiasm for the project by recruiting academics, divers, fishers, resort owners, and others who have personally noted changes in the quality of the habitat to share their observations and positive opinions about results.
- ♦ Organize cross-visits to successful sites for local leaders. Discussion with local leaders who have established successful reserves is very convincing.
- ♦ Use monitoring information as it becomes available to prepare education programs that describe the observed changes in ecology, biodiversity, and quality and quantity of fish stocks. Trends are very important to track over time.
- ♦ Refining knowledge of threats, use patterns in the area, and management options, is an important outcome of information and education activities for all key stakeholders.

Approach all IEC activities with a gender-sensitive lens. Try to use different approaches so that all members of the community—men, women, elders, youth, and others—are engaged and not isolated through the process.

Phase 2. Plan preparation and adoption

Defining goals and objectives: Formation of the core group and development of the management plan.

1. Formation of the core group

A key step in establishing most marine reserves is the formation of a local committee (“anchor”) that is directly interested and committed to planning, implementation, and management of the proposed MPA (White *et al.* 1994; Deguit *et al.* 2004). In the Philippines, the CO helps to initiate a Sanctuary Management Committee (SMC), a barangay level FARMC, or a committee or group with a different title. For our purposes, the term SMC will suffice. In other cases, the SMC may form in response to some common concern, such as a fish kill or the decline in tourism bookings. The SMC could be under the policy direction of the barangay or municipal FARMC and must be recognized by the LGU to be effective. In some cases, a multisectoral committee or board chaired by the mayor can be formed through a municipal ordinance. Such a board can be more appropriate in capturing diversity of interests compared to a FARMC that is more fishery-focused. In this case, the FARMC chair can sit on the multisectoral board. Establishing a committee or board, as the case may be, is important to transfer real responsibility and power to the community in association with its LGU, for management of the proposed MPA. This surpasses the level of participation that holding a public meeting can provide. As the process continues, more in-depth training can be arranged on specific aspects of resource management and leadership. At the same time, community training on the basic concepts of marine resources protection continues to broaden awareness and the base of support.

Formation of small subgroups usually occurs as people respond to different interests and issues. This strengthens the group by increasing the diversity of interests and broadening the base of support in the community. It also allows people to concentrate their investigation of various management strategies for inclusion in a management plan (Table 8).

Several pluses and minuses of committees are:

- ♦ Making decisions by consensus allows people to relax and feel confident that their interests will be represented.
- ♦ The coordination capabilities of small committees may be overwhelmed easily. Plan activities carefully to avoid overloading.

Table 8. Sample outline of a site management plan.

Chapter 1: Introduction (rationale, scope of plan, legal basis, overall goal, etc.)
Chapter 2: Profile of the MPA site or general area
A. General information
1. Location (technical description, size, map, etc.)
2. Facilities (physical structures present in the area)
3. Current uses/activities in the area
4. Policy review
B. Biophysical condition
1. Habitat condition (condition of coral reefs, seagrasses, mangroves, etc.)
2. Resource and resource use map (site map within larger municipal/city jurisdiction)
C. Socioeconomic condition
1. Immediate community (all potential beneficiaries or users of area)
2. Issues and concerns
3. Resource value estimates
Chapter 3: Goals and objectives for MPA management
Chapter 4: Management interventions (each with strategies and activities)
A. Habitat management (required)
B. Management zones—spatial allocations and regulations (required)
C. Constituency building—community organizing and education (required)
D. Compliance and enforcement (required)
E. User fee system (optional)
F. Alternative/supplemental livelihood program (optional)
G. Shoreline or foreshore management (optional)
H. Solid waste management (optional)
I. Others
Chapter 5: Implementing structure
A. Management board, committee or council (members and positions)
B. Duties and responsibilities (specific roles and functions)
C. Organizational chart
D. Budget for each management intervention or by regular line items
Chapter 6: Monitoring and evaluation
A. What will be monitored (reef substrate cover, fish stock, socioeconomics, etc.)
B. Methods to be used
C. Institutional and scheduling arrangements (who will do it, how often, etc.)
D. Budgetary and equipment requirements
E. Reporting and feedback mechanisms (schedules, formats, to whom, etc.)
Annexes:
A. Data figures and tables, maps
B. Monitoring and evaluation forms
C. Photographs
D. Ordinance

2. Definition of goal and objectives

A simple management plan for the MPA should include the basic ingredients of a plan as outlined in Table 8. This plan can be incorporated into a municipal or city ordinance to formalize the management of the area. The goal and several objectives for setting up the MPA should clearly state the overall purpose for establishing the MPA. Objectives should be measurable and stated explicitly. Some example objectives include but are not limited to the following:

- ♦ to define management long-term goals and initial objectives;
- ♦ to protect the coral reef or other types of critical habitat from any physical damage caused by humans;
- ♦ to increase fish abundance, diversity, and biomass on the coral reef;
- ♦ to stabilize and improve the living coral cover on the reef;
- ♦ to increase the fish catch to fishers operating outside of the marine sanctuary; and
- ♦ to attract diving tourists to generate income for sanctuary enforcement and operation costs as well as for extension activities for the local community.

3. Preparation of management strategies and action plan

A SMC or management board can become involved in a broad range of activities from identifying a unifying strategy to debating associated management options, many of which are later included in a management plan. Some examples of actions supporting management strategies include:

- ♦ Define membership and responsibilities of a management committee.
- ♦ Reach consensus agreement on permissible activities and the limits of use.
- ♦ Set boundary and mooring buoy locations and points of embarkation.
- ♦ Define community enforcement and links to municipal or national enforcement agencies.
- ♦ Draft a local resolution or ordinance to establish the reserve.
- ♦ Develop resource restoration schemes like mangrove or coral planting or raising *Tridacna* giant clams as appropriate.
- ♦ Establish procedures for reviewing proposed projects for impacts on the reserve.
- ♦ Establish and fund an office or interpretive center.
- ♦ Plan and implement education, fund raising or cleanup events.
- ♦ Conduct monitoring to refine baseline data and research to fill data gaps.

4. Determination of reserve boundaries and zones

Delay drawing boundary lines on a map for as long as possible. Lines tend to polarize stakeholders and draw attention away from the issues. Instead focus discussion and negotiation on the objectives you hope to meet with your MPA and what is practical to achieve given stakeholder capacity to manage the area. It is useful to first develop a zoning or use plan for the entire municipal area. Once there is agreement on the objectives and general uses, then lines can be drawn (Table 9).

The reserve is an area management technique that limits use within a defined space. The uses permitted, to what extent they are limited, and by what means may be defined by different zones within a reserve or park. A zoning plan provides the basis for management of an area sufficiently large for zones to justify different forms of management and use. By providing for a gradation of restriction, a zoned management scheme can be easier to establish and police since it can satisfy the requirements of a range of resource uses. There is no definitive list of zones and what they may or may not achieve. The mix depends upon the site, its unique characteristics and the decisions of the stakeholders. Multiple zones may not be suitable for very small reserves because they are difficult to establish and enforce.

Table 9. Factors to consider when establishing reserve boundaries.

Management objectives for the MPA: Objectives for establishing an MPA may include:

- ♦ protecting biodiversity;
- ♦ restoring or rehabilitating damaged habitat;
- ♦ increasing fish yield for harvest;
- ♦ increasing (or decreasing) tourism visitation;
- ♦ improving public safety; and
- ♦ increasing or controlling public access

Size and shape:

- ♦ Reserves should have clearly defined boundaries and be large enough to offer true protection for target species. If they are too small or have highly contoured boundaries, fish may migrate out too often and be susceptible to fishing.
- ♦ Clear boundaries help prevent inadvertent fishing in the sanctuary and simplify enforcement.
- ♦ For reef fish, at least 20 percent of an ecosystem type should be in a reserve to protect the future of the species. A reserve should include all types of habitat important to marine life, including seagrass beds, mangrove fringes, and reef areas. Many species migrate between these habitat types during various life stages.
- ♦ Smaller reserves still provide important benefits but are less effective overall.
- ♦ What areas are fishers willing to forego as fishing grounds?

Species: The species present will influence the boundaries and size of a sanctuary.

- ♦ Sanctuaries can be effective for territorial reef species, like snappers and groupers, and many other reef fishes and invertebrates.
- ♦ Far ranging species like tuna may not be effectively protected in a small reserve and sanctuary.

Prevailing currents: Locate reserves upstream, when possible, of important fishing areas and habitat to maximize the replenishment to areas outside the reserves. Larvae and excess individuals will travel on the current to repopulate areas outside the reserve.

Enforcement: To be effective, reserves must be enforced through statutory ordinance, by voluntary or peer pressure motives and by organized and legally mandated enforcement.

- ♦ How close are they to the homes of the SMC or the Bantay-Dagat? Is someone from the SMC or Bantay-Dagat appointed to monitor use of the area violations?
- ♦ Will close proximity to another political jurisdiction or other user groups create resource conflict? Are they outside this management process? Can they be included?

A common reserve model includes both the core “no-take” sanctuary and a “traditional use” buffer zone that controls various activities (Figures 13 and 14). The core sanctuary preserves ecosystems, habitats, species, processes, and genetic diversity within a more strictly protected “no-take” area where all destructive and/or collecting activities, such as fishing, may be prohibited. The general guideline is that large protected areas tend to be more effective in maintaining ecological processes and species diversity than smaller areas. A minimum size of 300 ha has been suggested to successfully maintain coral species diversity (Salm and Clark 1984). In contrast to this, reports from sanctuaries as small as 10 ha indicate that the incidence of large individuals of prized fish species increases within the safety of the sanctuary (Roberts and Hawkins 1997). Ideally, the minimum size encompasses the general vicinity in which all species are certain to be found and reproduce. Thus, the sanctuary or core zone should contain not only the coral reef but portions of its neighboring habitats such as reef flats, seagrass communities, mangroves, algae beds, beaches, or sand flats as appropriate and feasible. Making a sanctuary 20 ha or more in size is considered a good guide for a MPA. The Fisheries Code of 1998 mandates that a minimum of 15 percent of the total coastal area in a municipality be identified and designated as fish sanctuary. In the Philippine context, most municipal MPAs range in size from 5 to 100 ha. For a sanctuary to be effective, 10 ha should be an absolute minimum size (White and Vogt 2000; Arceo *et al.* 2004).

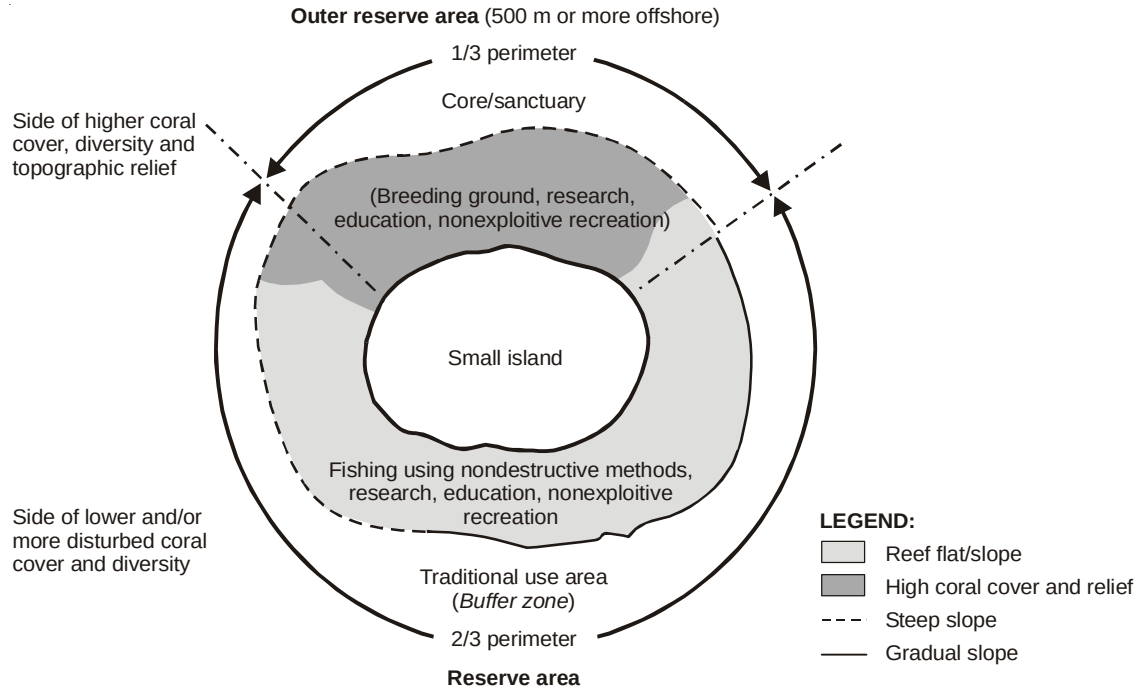


Figure 13. Example of reserve system with core sanctuary and “traditional use” buffer areas applied to small islands (White 1988a).

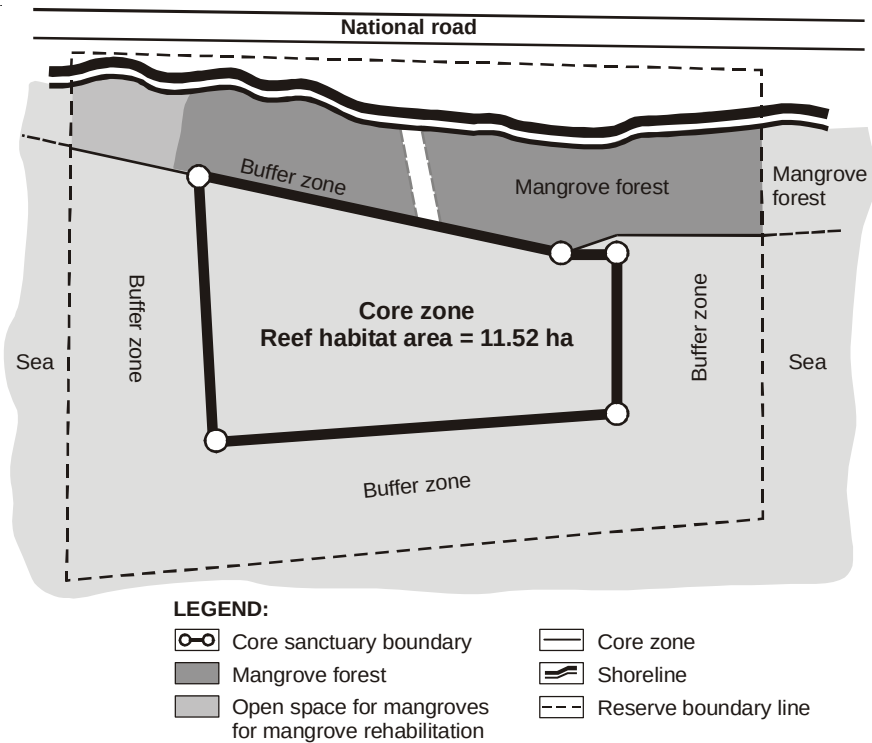


Figure 14. The “box and border” model where a sanctuary is established along the coastline and a buffer zone of a certain width is created around its perimeter to form the “reserve area”.

The buffer zone (multiple use or traditional use zone) provides a transition space between the inner core sanctuary and the outer nonsanctuary or less managed areas. They may include neighboring habitats (seagrass beds, mangrove swamps, beaches and estuaries) which functions are crucial for the continued health of the core ecosystems. Less strict regulations are applied to the buffer zone. A combination of different uses may be included in the buffer zone but it should be kept as simple as possible. Different uses may include the following:

- ♦ visitor use areas for appropriate recreation and general education activities;
- ♦ traditional use grounds where exploitation using ecologically sound methods (gleaning or hand line) is allowed and monitored;
- ♦ research and education zone where ecologically sound and nondisturbing research and education activities are permitted; and
- ♦ sustained yield/fishery management zone where sites of breeding and spawning activities or concentrations of fish stocks or target species are closely regulated for use and access.

Zoning schemes can take on many different forms depending on the needs of an area to be managed. A multiple-use zoning plan is shown in Figure 15 for an idealized coastal area in the Philippines where different uses are accommodated within one municipal area. Such a zoning plan can be planned and formalized through municipal ordinance. Of course, for effective management to occur, the community and important stakeholders must be fully involved in the planning and implementation activities.

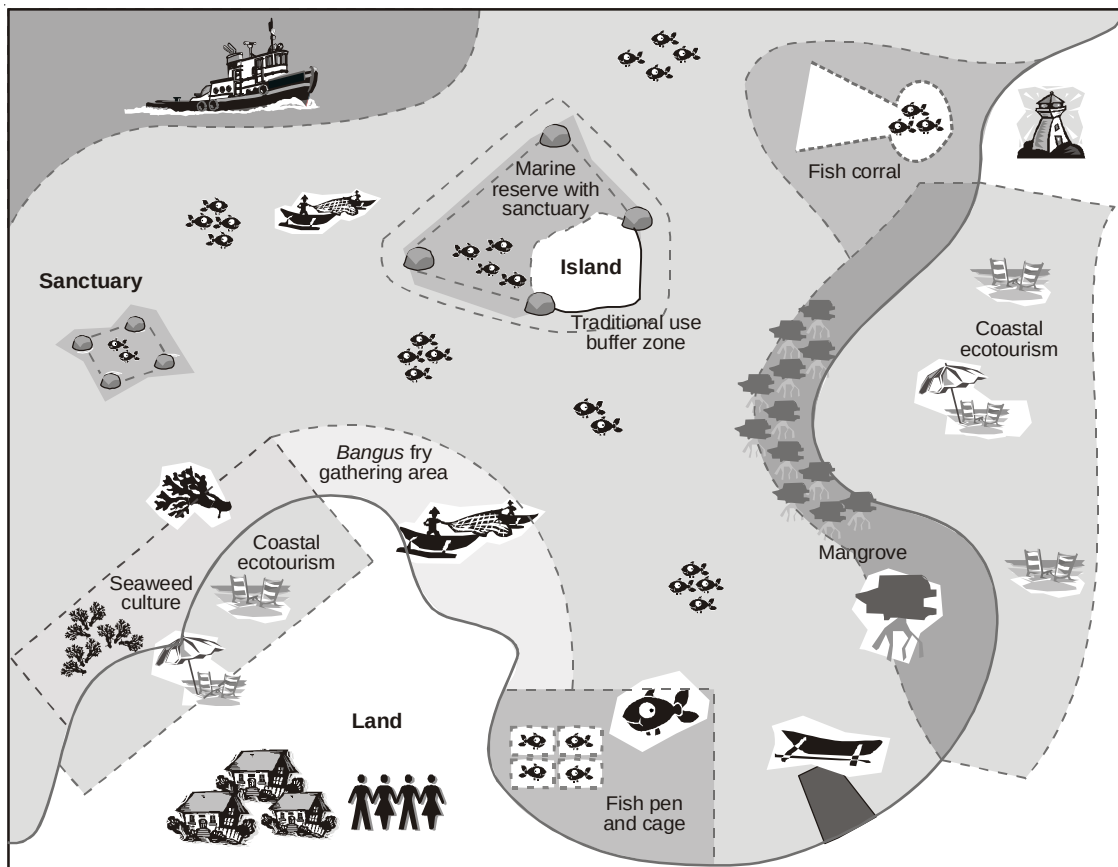


Figure 15. The “multiple use marine reserve model” where a section of the marine area is a sanctuary and the remaining areas form a reserve with various zones for different activities.

In addition to subtidal areas, the MPA zoning land use plan and supporting ordinances may also consider proper management of the adjacent shoreline. For example, under Presidential Decree No. 1067 as supplemented by DENR Administrative Order No. 97-05, the following shoreline distances are “subject to the easement of public use in the interest of recreation, navigation, floatages, fishing, and salvage” namely 3 m in urban areas, 20 m in agricultural areas and 40 m in forest areas.

A good example of an area in the Philippines where a multiple-use zoning plan is coming into effect is that of Olango Island, Cebu. Olango Island and its accompanying islets are located just 5 km from Mactan Island, Cebu, Philippines. This low-lying group of limestone islands shown in Figure 16 is known for its extensive intertidal mudflats, wide fringing coral reefs and seagrass beds, and mangroves. The Olango Island Wildlife Sanctuary (OIWS), a national park under the National Integrated Protected Area System (NIPAS), is located on the southwestern portion of Olango Island for birds traveling the East Asian Migratory Flyway. Portions of Gilutongan and Nalusuan Island and Barangay Talima coral reefs have been designated as municipal marine sanctuaries and are popular scuba diving destinations.

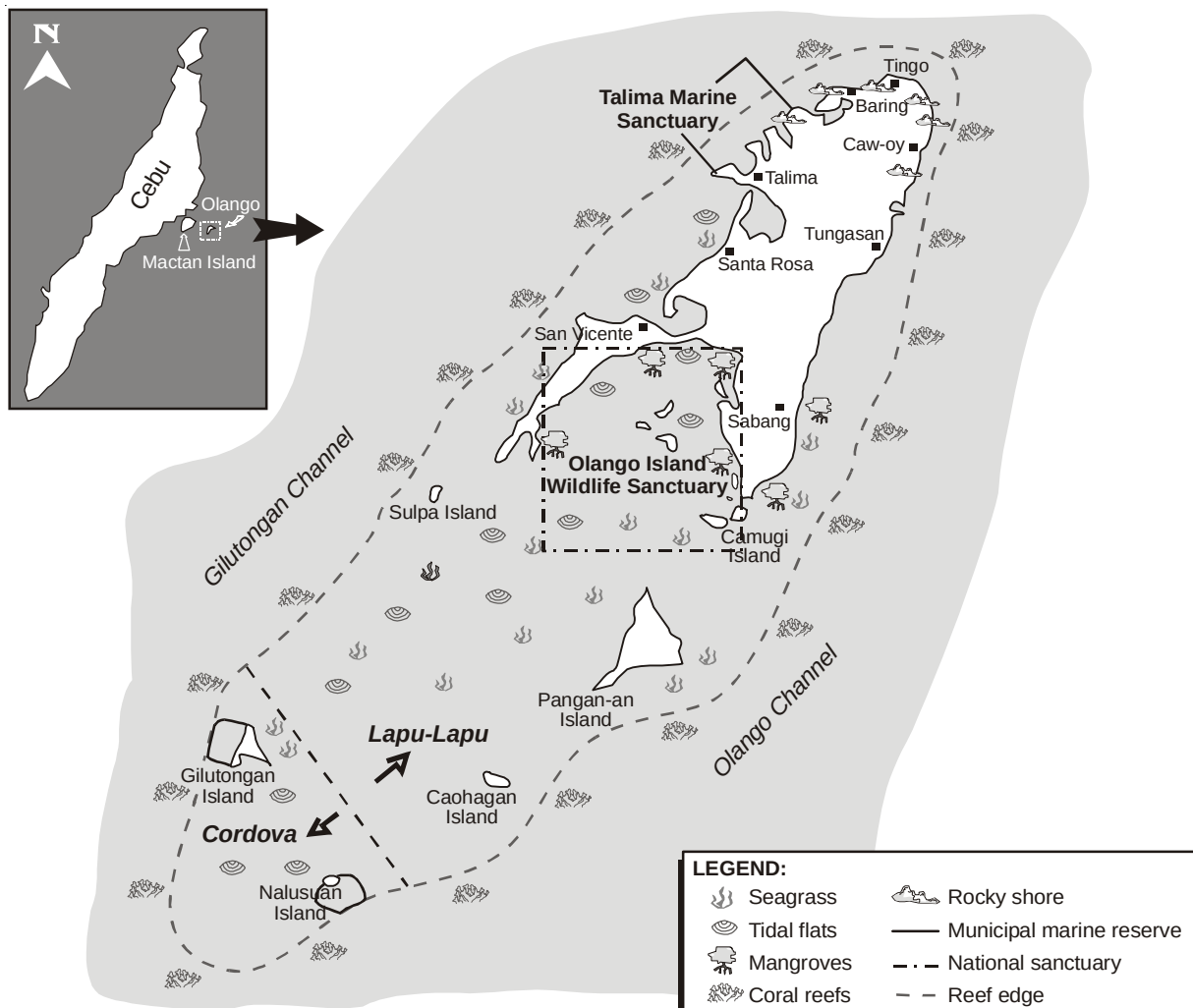


Figure 16. Olango Island, Cebu: An example of zoning for multiple uses (Parras et al. 1998).

Olango Island provides few resources for the more than 20,000 inhabitants except those derived from coastal habitats (Parras *et al.* 1998). Thin soils and meager freshwater supplies limit agriculture. Livelihoods are primarily aimed at exploiting coastal resources with most residents engaged in some type of fishing or collecting activity. Now, tourism from scuba diving is providing local benefits since dive and snorkeling tours within the marine sanctuaries at Gilutongan and Nalasuan Islands, Cordova; and at Talima Sanctuary in Lapu-Lapu are paying entrance fees. Benefits of the OIWS are also being realized to the islanders who are now part of tours to the area.

Following community awareness-building efforts in 1997, a field trip sent LGU representatives, Olango barangay officials, and the Coastal Resource Management Project facilitators to two other municipal sanctuaries at Apo Island and Bais Bay in Negros Oriental. The local policymakers observed and appreciated the value and importance of marine sanctuaries. Support has grown for managing Olango in an integrated manner that will protect the OIWS and the several marine sanctuaries and also provide opportunities for alternative livelihoods. These alternative enterprises are site-specific and commodity or product-specific as follows:

Location	Enterprise	Target user groups
Sabang	Ecotourism in OIWS	Fishers, youth and women
Pangan-an Island	Seaweed farming	Blast fishers and coral miners
Gilutongan	Seaweed farming, ecotourism	Fishers
San Vicente	Alternative crafts, marketing	Marine collectors, shellcraft makers

As interest grows to manage the area, it is becoming apparent that zoning of uses is necessary to avoid conflicts. For example, San Vicente residents complain that seaweed farms in Gilutongan encroach into San Vicente waters, thus preventing fishing there. These conflicts illustrate the importance of clearly designating specific uses for different zones. Ongoing efforts to promote long-term sustainable development and resource use require effective coastal resource management and planning. This has to be done through an open participatory process that involves all affected stakeholders. Planning also has to consider water circulation patterns to avoid pollution and excessive warm water among other factors.

A final lesson regarding the development and use of zones for a coastal and marine area is that zoning should be established before the community has agreed on the final sanctuary boundaries and before the sanctuary is legislated through a municipal ordinance. Once consensus on resource uses and guidelines for uses, zones and their boundaries is reached, a final plan and ordinance can be drafted and passed. Table 10 indicates compatible and restricted uses within potential zones of a typical MPA in the Philippines.

Table 10. Compatible and restricted activities within potential management/use zones for different types of MPA.

Type of MPA	Typical Management Zones	Activities/Uses Allowed	Activities/Uses Prohibited
Strict sanctuary ¹	No entry	None	All
Marine sanctuary ¹	No-take or “sanctuary” (core) zone	Regulated swimming and diving, anchoring on mooring buoys, research	Fishing or extraction of any kind, anchoring, boating, dumping
Marine reserve ²	Sanctuary, no-take (core) zone	Regulated swimming and diving, anchoring on mooring buoys, research	Fishing and extraction of any kind, anchoring, boating, dumping
	Traditional use (buffer) zone	Same plus limited and specified traditional fishing and boating	Illegal and specified legal fishing methods, anchoring, dumping
Marine park ²	Sanctuary, no-take (core) zone	Regulated swimming and diving, anchoring on mooring buoys, research and education	Fishing and extraction of any kind, anchoring, boating, dumping
	Traditional use (buffer) zone	Same plus limited and specified traditional fishing and boating	Illegal and specified legal fishing methods, anchoring, dumping
	Education and/or recreation (buffer) zone	Regulated swimming and diving, anchoring on mooring buoys, research, education, and/or recreation activities	Same

¹Typically contains only one zone where all extraction or collection is prohibited.
²Typically contains more than one use/activity zone.

Phase 3. Action plan and project implementation

Implementation: Formalizing the reserve, implementing management strategies, enforcement, and community strengthening

Implementation refers to several key steps: formalizing the reserve, implementing management strategies, enforcement of regulations, and strengthening the community by implementing the key recommendations of the management plan. There is a need to identify the participation, concurrence, and support of the stakeholders.

1. Formalizing the reserve

- ♦ Ensure that designating the proposed site as an MPA will not create legal or jurisdictional conflicts with management measures as established by previous proclamation, order, or other uses or designations such as a foreshore lease agreement.
- ♦ Consult with municipal and/or barangay FARMCs and other key stakeholders, including owners of any private coastal lands bordered by two MPAs.
- ♦ Ensure agreement by the LGU to support the management plan.
- ♦ Pass supporting legislation such as a barangay resolution and municipal ordinance to legally create the reserve (see sample ordinance).
- ♦ Allocate 6-12 months for completing municipal ordinance.
- ♦ Locate and mark boundaries for the reserve and any applicable zones.

2. Managing the reserve

The following are examples of strategies that can be used for managing the reserve (Figure 17).

Limits on fishing methods

The method of harvest is the main determinant as to the effects of fishing upon the coral reef or other habitat. Separating competing fishing gear categories is a way to reduce the intense competition among fishers. Fishing in reserves should be limited in the type of equipment and the amount of effort. It must also be nondestructive. Fishing methods normally permitted in designated MPA traditional use areas or zones are:

- ♦ hook and line using traditional equipment;
- ♦ throw nets and gill nets with mesh size large enough to allow the escape of small fish species and juveniles of larger fish;
- ♦ traps that are placed and maintained without disturbance to coral in noncoral areas; and
- ♦ reef gleaning in ways that do not overturn or break corals, stir up sediments, nor crush corals while walking (reef gleaning is best not allowed within a marine reserve).

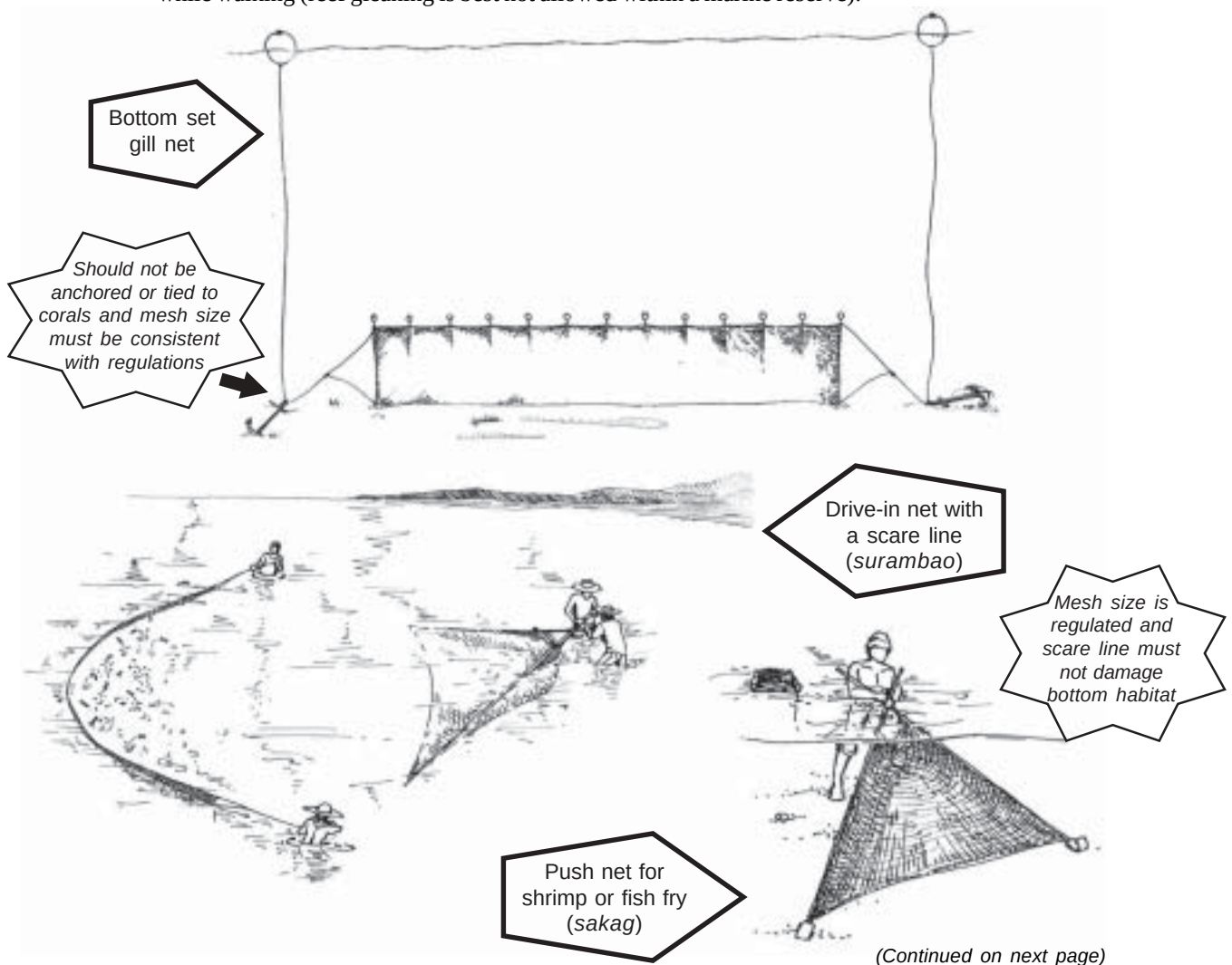


Figure 17. Nonactive gear generally permitted to operate in municipal waters (but not within most marine reserves) provided they are not damaging to habitats under local circumstances (adapted from Umali 1950 and Smith *et al.* 1980).

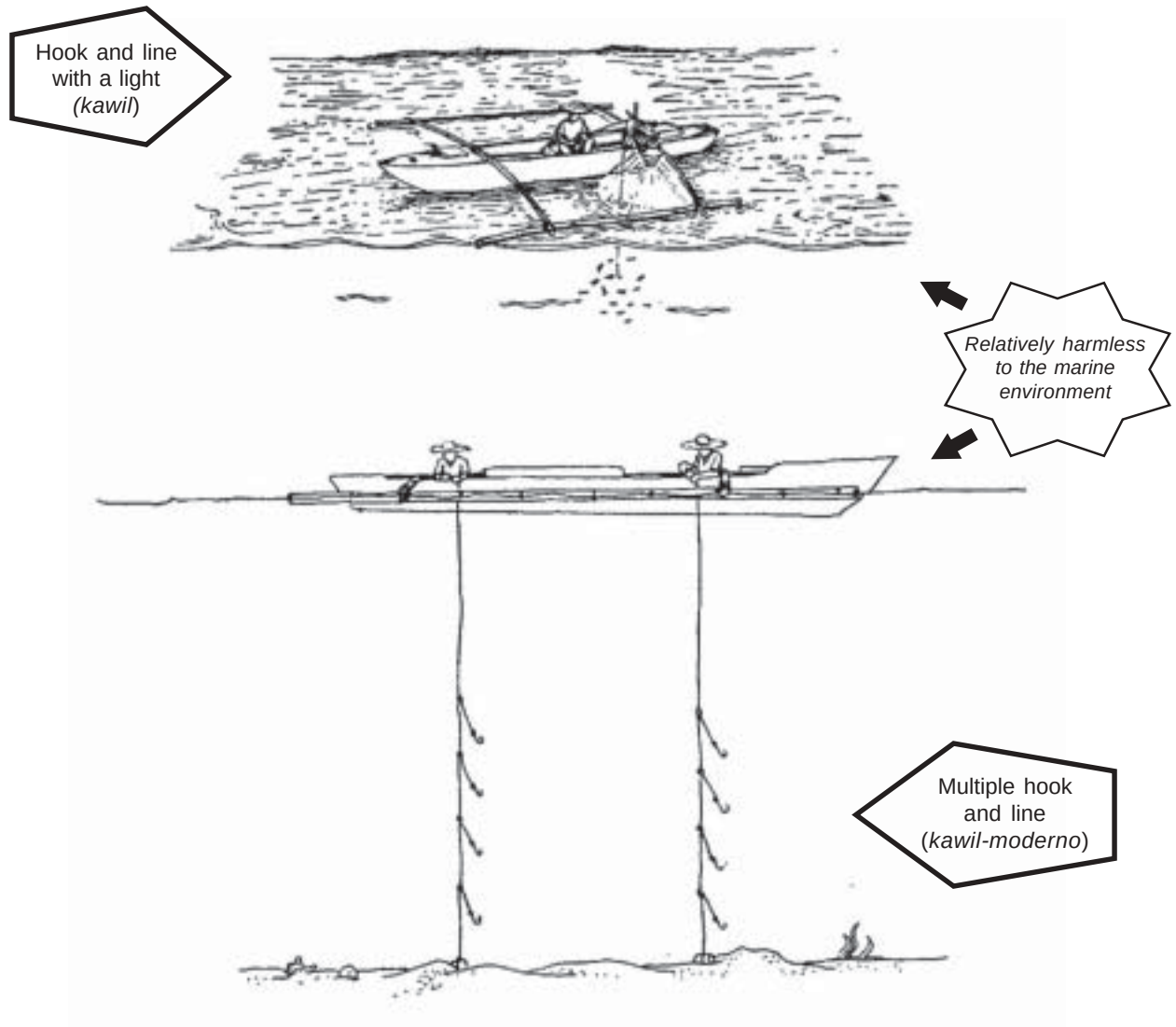


Figure 17. (continued)

Fishing methods normally not permitted in designated MPA traditional use zones and often not within municipal waters are (Figure 18):

- ♦ use of scuba or hookah diving for underwater gathering and spear fishing;
- ♦ any active gear where sweeping the water to drive fish or motorized pursuit is involved including all types of *muro-ami*, *kayakas*, and variations thereof;
- ♦ beach seine drag or throw nets that tend to disturb bottom habitat;
- ♦ reef gleaning when the potential impact from many reef walkers is excessive; and
- ♦ any illegal method such as use of poison, explosives, bottom trawls, and others.

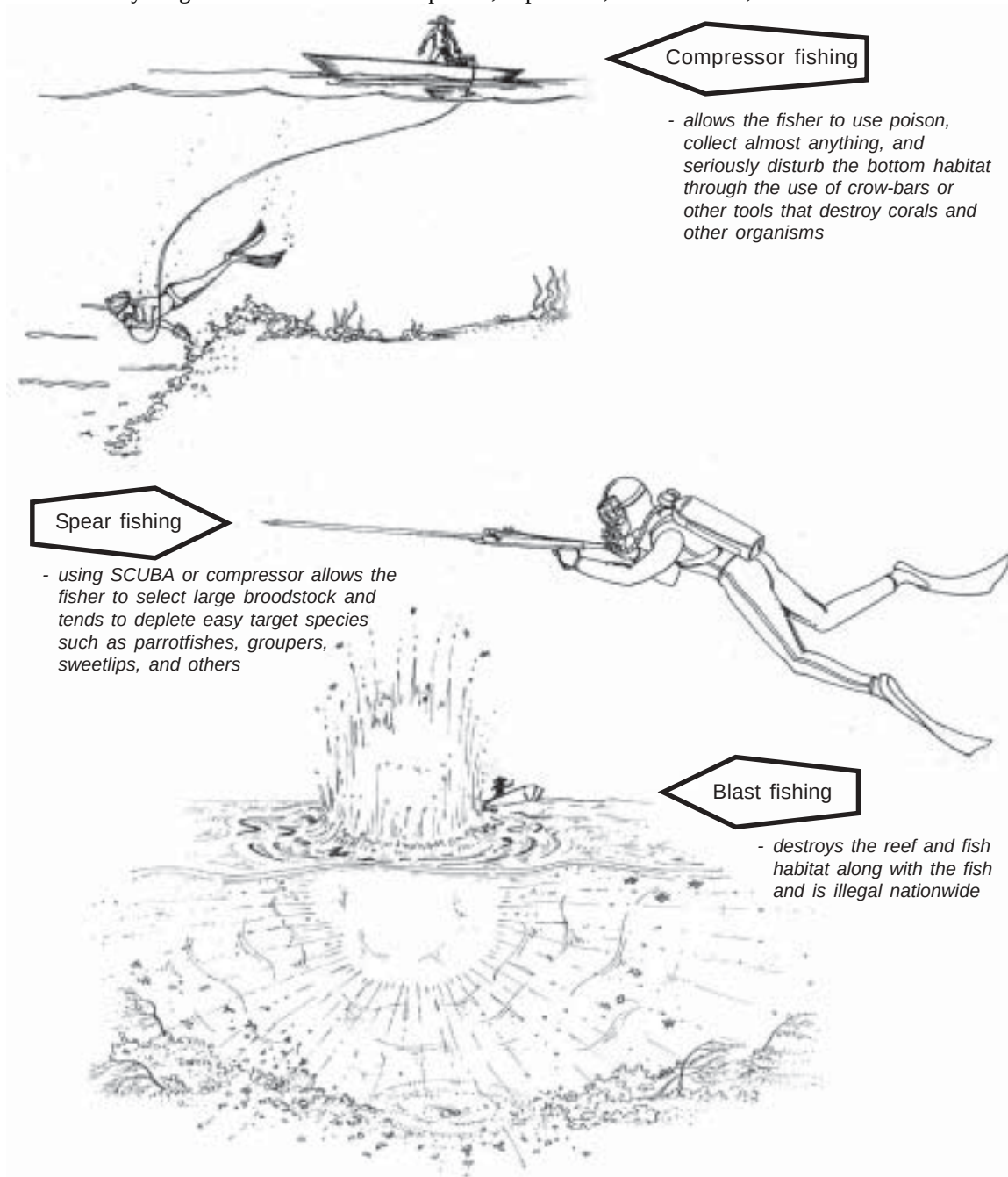
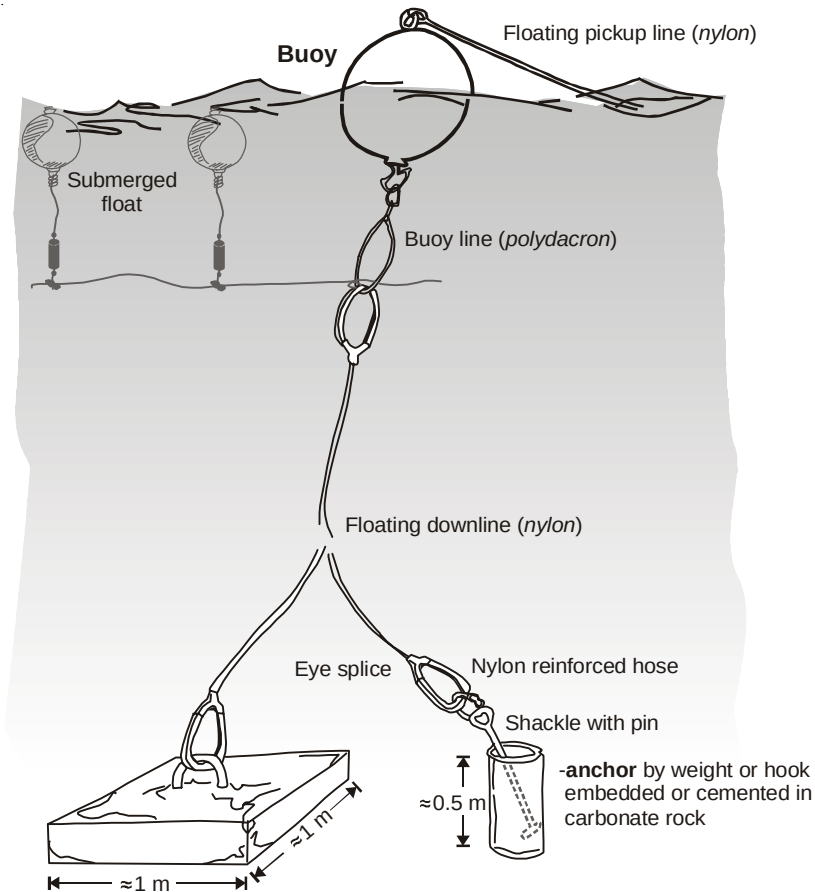


Figure 18. Common fishing gear (nationally or locally) in the Philippines and the potential damage caused by the gear (adapted from Smith *et al.* 1980).

Permanent mooring buoys

Permanent mooring buoys can be located in strategic areas to minimize the coral damage due to dropping anchors and chains, a substantial source of reef damage. High-quality reefs popular for scuba diving and snorkeling need well-placed mooring buoys. One misplaced anchor can totally destroy a large coral head. The anchor chain and line also extend the radius of the damage by sweeping across the live coral as it rises to the surface. Permanent mooring buoys incorporate a permanent anchor connected to a floating line leading to a surface buoy (Figure 19). In addition to preventing anchor damage, permanent buoys also help to centralize diver activity so that coral damage due to divers themselves is less dispersed.



Reminders for installing and maintaining an anchor buoy system:

- Selection of mooring buoy sites should be based on the agreed MPA management and zoning plan;
- Inspect regularly to monitor condition and to repair shackles, links, and lines;
- Remove during periods of routine extended heavy weather (monsoon season) when mooring is not possible during the season;
- Use nylon or other strong synthetic line for the downline and pickup lines because it floats;
- Buoy line should be two-part polydacron for durability. Alternative, lower cost buoy line materials (such as rubber strips made from used tires) may be locally available;
- Loop at the end of the buoy line should be large so that it can easily be connected;
- The eye-splice connecting the bottom of the downline should be encased in plastic, nylon reinforced hose; and
- The shackle should have a removable pin that can be replaced easily.

Figure 19. Components of a permanent mooring buoy (DENR *et al.* 2001).

Note: Anchors can use several systems. Conventional cement or heavy objects can be used if placed carefully. Another system uses eyebolts that are sunk into the bottom sediment and cemented into place using hydraulic portland cement (contains 10 percent plaster of paris by weight). The systems vary depending upon the bottom type (hard and compacted versus loose sand or coral rubble) and the anticipated load, as larger boats require more substantial anchors. The length of the downline should include consideration of depth at highest tides and adequate “scope” or angle of the line to avoid direct, upward pull on the mooring anchor. When anchor system is being placed in deep water, more than about 20 m depth, or in areas subject to storm waves, it is good idea to place a submerged float to keep the line relatively shallow in case the buoy on the surface is removed.

Designate boat trails or travelways in heavily visited areas

Heavily visited sites may need a trail to help boat captains avoid damage by accidental grounding and to avoid swimming areas. This is effective when there are only limited routes through barrier reefs to sites with high visitor preference. One can also set visiting hours for sensitive sites based on the tide cycles to avoid accidental grounding during low tides (e.g., no glass-bottom boat visits for one hour before to one hour after maximum low tide).

Establish regular embarkation points to control access to sanctuaries

This facilitates collection of entrance fees and helps if one desires to set up boat queues for passenger pickup. It also provides a central point for boat inspections if safety and seaworthiness are conditions for receiving permits or licenses for travel within the sanctuary. Centralized embarkation points also allow an opportunity for educational activities and communication of reserve regulations. Damage due to boat docking also can be minimized rather than dispersed all along the coastline abutting the sanctuary.

3. Enforcement (inside and outside of the MPA)

The success of most small reserves lies in the amount of support within the community. The SMC and Bantay-Dagat (“sea watch”) organized and deputized for coastal law enforcement activities are key to successful enforcement. Enforcement by the community through peer group pressure and local incentives and disincentives is often more effective and less costly than government enforcement and legal prosecution. However, government assistance may be necessary in instances when the reserve area is very large, where there are strong conflicting uses and where violations are from fishers from other communities or in some cases, powerful individuals involved in disruptive activities. While education and monitoring can gradually reduce the need for enforcement and police action, there must be adequate enforcement through regular police presence and action to avoid harassment suits that may be filed against the Bantay Dagat. In addition, effective penalties for offenders must be in place.

Few government units have the budget or human resource necessary to keep a constant and close watch on a sanctuary. The SMC and the police must be able to work together with locally organized and deputized village watch groups. Community watch groups can enhance the municipality’s ability to monitor sanctuary activity as well as fishing activities outside of the sanctuary. Groups can range from a simple network of observers to actually deputizing people with the authority to assist in enforcing the regulations. The group can help to bring peer pressure upon known violators and to safeguard the resource from outside intruders. Ideally, the group should be able to derive some direct benefits from their vigilance. Benefits can be through improved fish catch or perhaps sharing benefits funded by entrance fees, fines, licenses, or permits for regulated activities occurring in the protected areas. A sanctuary manager may deserve a stipend and insurance coverage as an incentive to maintain close watch on the area.

In El Nido, a municipal ordinance allows 50% of the administrative fine to be awarded to the apprehending team and 50% to a trust fund held under the municipal treasury but earmarked for coastal management activities. This sharing scheme provides incentives for the underpaid Bantay-Dagat and fish wardens to be vigilant in detecting poachers and illegal acts. The municipal ordinance allows for the confiscation of the boat and gear that makes it more expensive for the operator to violate laws.

4. Permits and user fees

Open access to a free resource prompts people to take all that they can now for fear that the next person who comes will take everything. There is no incentive to conserve in such situations and overfishing is the inevitable result. Yet few LGUs currently restrict access by applying licenses, fees, taxes, or other controls to the use of municipal waters. Most LGUs have neither an established CRM plan that zones municipal water use nor an appropriate tax or fee structure that collects economic rent.

Permits for reef use are a way to limit access to what otherwise would be a free resource. Permits allow the LGU to control access to the resource by setting conditions for the use of the resource, such as harvest limits, harvest methods, and harvest seasons. The number of permits should be limited to ensure that the resource can be used in a sustainable manner. Trading permits may be allowed so that people can exchange permits in return for some financial benefit. This ensures that the permits are held by persons who really value the use of the resource as shown by their willingness to pay to maximize their returns.

Paying a fee to receive a permit establishes a basic value to that resource. It sets the minimum that people are willing to pay in order to have the privilege of a permit. The fee should be high enough to reflect the willingness-to-pay of having access to the resource. Setting a token nominal level for a fee is meaningless. It should be high enough to warrant its collection and to act as a barrier to entry for casual users. In some cases a multiple-tier fee schedule can be used. For example, a foreign tourist can be expected to pay more for snorkeling in a coral reef sanctuary than a visiting student from a local university or a local resident. The tourist values the resource very highly as shown by his willingness to travel long distances and pay hundreds of dollars in order to get to that sanctuary. They can probably afford and are probably willing to pay a little extra, particularly if it is clear that the fee supports sanctuary management activities such as at Tubbataha Reefs National Park. In setting fees, LGUs also must consider the costs for research and monitoring the impacts of management. The basic assumption to be made is that eventually without management, net revenues from coastal activities will fall to zero as the resource is destroyed.

The generation of revenues serves the following purposes:

- ♦ to set tangible and easily measurable values on municipal water use zones and the resources of the coastal zone;
- ♦ to provide the community with an obvious economic incentive to protect and manage their coastal waters and resources;
- ♦ to regulate and limit the extraction of resources; and
- ♦ to generate funds for the continued implementation of coastal resource management.

Taxes, fees, and other charges that LGUs may apply for use of municipal waters or to access a MPA include:

- ♦ fees for management, utilization, and exploitation of coastal resources, including marine sanctuary entrance fees and diving/snorkeling fees;
- ♦ fines imposed on violators of fisheries and related laws;
- ♦ license to operate tourist boats;
- ♦ license for municipal fishing gear or for registration of fishers;
- ♦ fishery charges such as rentals for mariculture; and
- ♦ licenses and taxes on income derived from sustainable use of resources in the multiple use zones such as concession fees from appropriate businesses.

Fees are often based on the cost of administering the procedure and the cost of conducting surveillance to ensure compliance. Rarely do fees include the true value of natural resources, which includes, not only the marketable goods they produce, but also the services and benefits they provide—many of which are difficult to measure. An example of a municipal ordinance that outlines all rules of fee structure is shown in Table 11. Apo Island has progressed from a basic municipal ordinance with use regulation in 1986 to a more comprehensive system approved in 1999 by the Protected Area Management Board. Finally, permits and user fees should clearly state what is collected for what use area, e.g., entry to a MPA or uses outside a MPA in municipal waters. Another example in Table 12, highlights the development of the user fee system for the Tubbataha Reef National Marine Park.

The Gilutongan Marine Sanctuary in Cordova, Cebu, started collecting a daily entry fee from each diver or snorkeler (for multiple dives) in year 2000. This simple fee system has generated substantial revenues as shown in Figure 20 that are shared between the barangay community (30%) and the municipal treasury (70%). Expenses for maintenance of the sanctuary such as salaries, marker and anchor buoys, guardhouse, and others are taken from the 70% portion of the revenues that goes to the municipality.

5. Strengthening community involvement

The initial activities to define a reserve and to develop the management plan often create a lot of action and energy among the SMC and the community. As the process matures and initial implementation actions are completed, the interest may begin to subside. Often that coincides with the end of project assistance that was facilitating development of the MPA. Technical assistance and community organizers may reduce their involvement in the community and begin moving on to new sites. The challenge for this later implementation stage is sustaining the interest of the community and strengthening its capability to manage process. Feedback, community extension and partnerships are good strategies for strengthening community involvement.



When local residents make their own buoys, the buoys tend to be cost effective and sustainable.

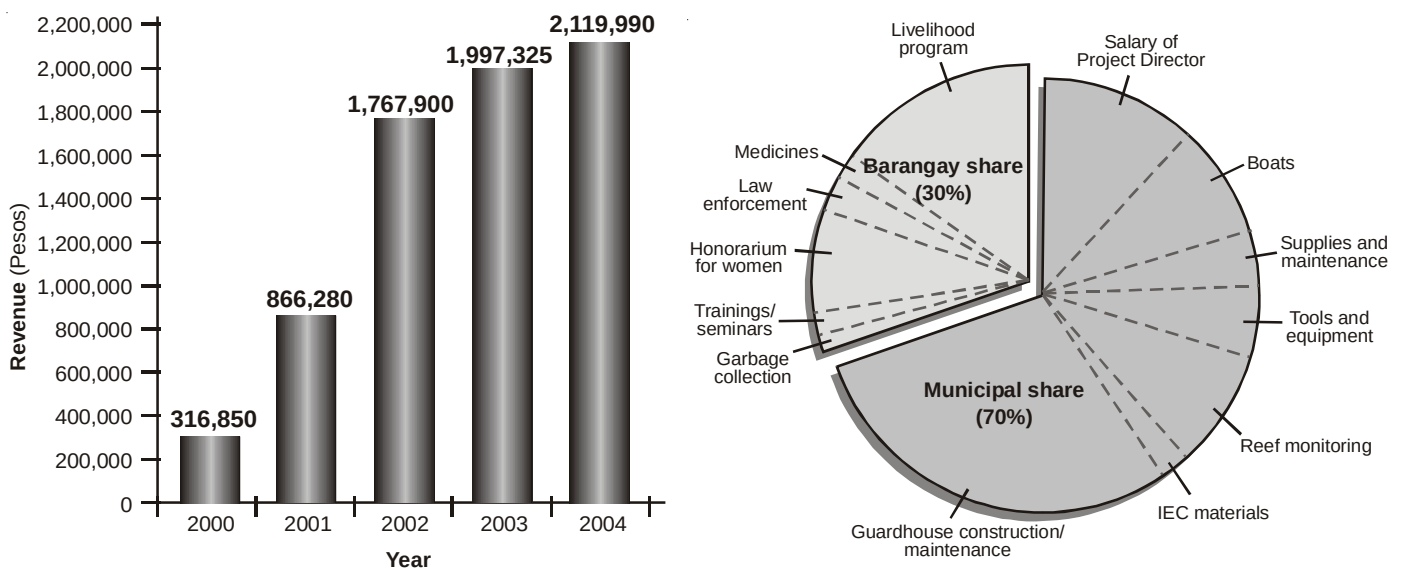


Figure 20. Amount and allocation of user fees collected from divers and snorkelers visiting the Gilutongan Marine Sanctuary, Cordova, Cebu.

Table 11. Summary of ordinances that have served the Apo Island Marine Reserve, 1986 and 1999.

**EXCERPTS FROM THE MINUTES OF THE SANGGUNIAN BAYAN'S REGULAR SESSION HELD AT THE
OFFICE OF THE MUNICIPAL MAYOR ON MONDAY, NOVEMBER 3, 1986.**

WHEREAS, the rationale for the marine reserve and fish sanctuary is as follows:

- a) The coral reef serves as habitat for fish and once physically disturbed supports fewer and fewer fish;
- b) A fish sanctuary is necessary to allow coral reef fish to breed and grow to maturity without fishing so that reproduction rates may increase potential fish catch to local fishermen;
- c) A fish sanctuary where increased numbers of tame fish reside will attract scuba diving and snorkeling tourists and non-tourists to Apo who will give a small amount in the form of donation that will go to the community development project, e.g. toilet facility, beach cottages, etc.
- d) The entire marine habitat surrounding Apo be declared a marine reserve to help prevent illegal and destructive fishing activities done by outsiders to Apo;
- e) The area extending at least 500 meters on the southeast corner to be chosen as a fish sanctuary because this topographically diverse drop-off area with strong currents provides good breeding habitat for fishes which will circulate around the island, and the minimum 500 meters area is necessary to insure breeding and protection for sufficient number of species.

NOW THEREFORE, to fully protect the reserve area, particularly Apo Island fish sanctuary, Dauin, Negros Oriental, the body RESOLVE, as it is HEREBY RESOLVED, to adopt an ORDINANCE protecting the reserve area from all fishing methods or other ways destructive to the coral reef habitat, viz:

ORDINANCE NO. 1

**"AN ORDINANCE PROTECTING THE MARINE RESERVE AND FISH SANCTUARY
OF APO ISLAND, DAUIN, NEGROS ORIENTAL"**

Be it ordained by the *Sangguniang Bayan* that:

Section I. The entire marine habitat around Apo Island, from the high tide mark to a distance of 500 meters offshore be protected from all fishing methods or other ways destructive to the coral reef habitat including:

- a) dynamite fishing
- b) *muro-ami* type of fishing or related methods using weighted scare lines or poles
- c) spear fishing using SCUBA
- d) cyanide or other strong poisons and
- e) every small mesh gill net.

Section II. A coral reef fish sanctuary and breeding area be located on the southeast corner of the island where the following rules apply:

- a) no fishing or collecting is permitted
- b) anchoring of boats is allowed but destruction of corals be avoided

Section III. The marine habitat outside of the fish sanctuary but within the marine reserve be called a traditional fishing area where all destructive fishing methods are prohibited and where the following traditional fishing methods are permitted:

- a) hook and line
- b) bamboo traps
- c) gill nets
- d) spear fishing without scuba
- e) other types of netting and
- f) traditional gleaning

Section IV. The Apo Marine Reserve area be protected by municipal resolution and managed by the Apo Barangay Marine Management Committee in conjunction with the Dauin Municipal Council with logistic and legal support from the BFAR and PC-INP in Negros Oriental and management advice from the Marine Conservation and Development Program of Silliman University.

Section V. This Ordinance shall take effect immediately upon approval.

Continued on next page

Table 11. Continued.

PROTECTED AREA MANAGEMENT BOARD (PAMB)
APO ISLAND PROTECTED LANDSCAPE/SEASCAPE
Municipality of Dauin
Province of Negros Oriental

BOARD RESOLUTION NO. 1
Series of 1999

**A RESOLUTION PROHIBITING, REGULATING AND PRESCRIBING
FEES FOR ACCESS TO AND SUSTAINABLE USE OF RESOURCES IN APO
ISLAND PROTECTED LANDSCAPE/SEASCAPE.**

Pursuant to Republic Act No. 7586 known as National Integrated Protected Areas System (NIPAS) Act and Presidential Proclamation No. 438, dated August 9, 1994 that declared the Apo Island and its surrounding waters as Protected Landscape/Seascape situated within the Municipality of Dauin, Province of Negros Oriental, containing an area of 681.45 hectares is established and reserved for the purpose of protecting and conserving the ecological, scientific, educational, economic and recreational values of the area. Sustainable development of the area shall be pursued to address the social and economic needs of the local communities without causing adverse impact on the environment.

Section 1. Basic Policy – The Protected Area Management Board (PAMB) hereby adopts the following policies on the sustainable use of resources within Apo Island Protected Landscape and Seascope:

- 1.1 The use of resources and facilities in the protected area shall be regulated.
- 1.2 Fees and charges shall be collected for every access to and sustainable use of resources and facilities located in the protected area for recreational, commercial, educational, subsistence, and all other purposes.

Section 2. Registration Requirement – All tourists/visitors including their carrier or boat are required to register at the Apo Protected Landscape and Seascope (APLS) Visitor Assistance Center, to give the following information: name, age, status, sex, address, occupation, purpose of visit, the proposed duration of stay and activities, number of logged dives/certification level for scuba divers and such other information of a similar nature.

Section 3. Anchoring/Mooring Area – Anchoring/mooring shall be allowed at the following designated areas only as shown in the map below which are marked buoys.

For purposes of this resolution, anchoring is distinguished from mooring. Anchoring is understood as the throwing of the anchors overboard while mooring shall mean the act of tying the boat into a mooring buoy.

- 3.1 For boats weighing less than 1.5 tons
 - a. From Baluarte Point to Point Pook at Sitio Baybay on the west side of the island, provided that the anchor is within 40 meters from the beach at the mean lowest tide level.
 - b. In front of the beach at Sitio Cogon on the east side of the island in the vicinity of the canal, provided that the anchor is within 40 meters from the beach at the mean lowest tide level.
 - c. On the eastern boundary of the marine sanctuary at Sitio Ubos on the south side of the island in the vicinity of the canal, provided that the anchor is within 40 meters from the beach.
- 3.2 For boats weighing 1.5 tons or more but not to reach 5.0 tons:
 - a. From Baluarte Point 200 meters southward at Sitio Baybay on the west side of the island, provided that the anchor is within 40 meters from the beach.
- 3.3 Boats weighing 5.0 tons or more are prohibited to anchor in the whole-protected seascope. However, these boats are allowed to moor at designated mooring buoys.

Section 4. Diving Regulation – The number of divers and snorkelers inside the marine sanctuary shall be regulated.

- 4.1 Only fifteen (15) scuba divers including 3 dive guides shall be allowed to dive in the marine sanctuary area (Strict Protected Zone) per day, provided that they have registered in accordance with Section 2 thereof. A guide or watcher shall be required for every four (4) scuba divers in order to monitor the activities of the divers.
- 4.2 Only eight (8) snorkelers shall be allowed to swim in the marine sanctuary at any one time. Swimming and bathing in the marine sanctuary are strictly prohibited. The term “snorkelers” does not include swimmers and bathers.
- 4.3 **Entry and Exit Area** – Scuba divers and snorkelers shall use the designated entry and exit points in the marine sanctuary area (Strict Protected Zone).
 - 4.3.1 **Diving Gear** – Scuba diving with spear guns is strictly prohibited in the Apo Island Protected Landscape and Seascope (APLS). Spear guns carried around the APLS except those carried by Apo Island residents is disallowed, hence it shall be deposited in the APLS Center.

Continued on next page

Table 11. Continued.

- 4.3.2 Scuba divers and snorkelers shall not wear gloves, except for research purposes and with prior approval by PAMB thru PASU
- 4.3.3 Divers are not allowed to dive or approach within 100 meters from fishers conducting fishing activities in the APLS.

Section 5. Fees and Charges – It shall be collected from every tourist/visitor at the APLS Visitor Assistance Center or at other designated areas.

5.1 Visitor Entrance Fee:

- | | | |
|----------------------|-----|-------|
| a. Adults (local) | PhP | 10.00 |
| b. Students (local) | | 5.00 |
| c. Foreign nationals | | 20.00 |

5.2 Additional Charges/Fees:

5.2.1 Scuba diving per day/per diver or fraction thereof:

- | | | |
|--------------------------------|-----|---------|
| a. Within marine sanctuary | PhP | 150.00 |
| b. Outside marine sanctuary | | 75.00 |
| c. With camera (still picture) | | 50.00** |

5.2.2 Snorkeling per day or fraction thereof:

- | | | |
|----------------------------|-----|-------|
| a. Within marine sanctuary | PhP | 25.00 |
| b. Outside | | 10.00 |

5.2.3 Camping per day or fraction thereof:

- | | | |
|-------------|-----|-------|
| a. Adults | PhP | 20.00 |
| b. Students | | 10.00 |

5.2.4 Filming for movie production, TV, and commercials per day or fraction thereof:

- | | | |
|--|-----|----------|
| a. Landscape area | PhP | 500.00 |
| b. Seascape (within marine sanctuary) | | 1,000.00 |
| b. Seascape (outside marine sanctuary) | | 750.00 |

Acknowledgement of the area shall be included in the film production for promotion.

5.2.5 Lodging at cottages

- | | | |
|-------------------------------------|-----|-------|
| Per person/day or fraction thereof: | PhP | 50.00 |
|-------------------------------------|-----|-------|

5.2.6 Per picnic shed per unit/day or fraction thereof:

- | | | |
|--|-----|-------|
| | PhP | 50.00 |
|--|-----|-------|

5.2.7 Mooring per boat/day or fraction thereof: (1 day=24 hrs.)

- | | | |
|---|-----|--------|
| a. Less than 1.5 tons | PhP | 50.00 |
| b. 1.5 tons or more but not to reach 5.0 tons | | 100.00 |
| c. 5.0 tons or more | | 500.00 |

5.2.8 Anchoring per boat/day or fraction thereof at designated areas: (1 day=24 hrs.)

- | | | |
|---|-----|--------|
| a. Less than 1.5 tons | PhP | 50.00 |
| b. 1.5 tons or more but not to reach 5.0 tons | | 100.00 |

Section 6. Mode of Collection. The following procedure shall be observed in the collection of fees and charges:

- 6.1 Entrance fee shall be collected from tourists/visitors at the APLS's Visitor Assistance Center after filling-up the registration form. Corresponding tickets or official receipts shall be issued for such fees.
- 6.2 Charges for resource/facility use and services shall be collected upon reservation and corresponding official receipts shall be issued for such payments.
- 6.3 Payment of fees and charges shall be made on cash basis only. Personal checks or credit cards shall not be honored.

Section 7. Collection Responsibilities: The following shall be responsible for the collection and account of pertinent fees, charges, and donations.

- a. The Protected Area Superintendent (PASU)
- b. PASU duly appointed representative concurred by PAMB. All collecting officers shall be bonded.

(The remainder of the Resolution describes penalties and is not included here.)

**These samples are indicative only. They should not be copied but rather adapted for any given area and its requirements.*

***Since most divers carry a small camera as a normal accessory, the collection of a camera fee is often ignored and is suggested not to be included in the ordinance.*

Table 12. User fee system for the Tubbataha Reef National Marine Park.

The Tubbataha Reef National Marine Park (33,200 hectares) is located off Palawan Island in the Sulu Sea. The Park is managed in accordance with the NIPAS Act, which requires the creation of a multi-sectoral governing body (or PAMB) to ensure the implementation of the site management plan. However, government funds to protect and manage the Park have always been insufficient.

Despite the premium quality and popularity of Tubbataha for scuba diving, its biodiversity value has been grossly underestimated. To enhance the Park's recreational value and at the same time maintain its ecological integrity, the Board, in cooperation with the diving community and other stakeholders and NGOs, developed a user fee system that would best capture and monetize the recreational benefits from tourism. A willingness-to-pay study in 1999 showed that an average diver was willing to pay \$41 per visit. Using these results, a two-tiered pricing scheme was developed whereby local divers pay \$25 and foreign pay \$50 for entrance. The collection system is managed by the Tubbataha Management Office under a park superintendent and is consistent with the government's guidelines on determining fees in protected areas (DENR-DAO 2000-51).

The Park has generated a total income of PHP 9.3 million from diving fees since 2000. In 2004, an income of PHP2.5 million from entrance fees and fines was enough to cover 41% of the annual core costs of PHP6 million to protect Tubbataha. The experience shows the importance of adopting a business approach to instituting user fee systems for long-term sustainable financing of MPAs while being careful not to compromise the long-term benefits from biodiversity.

Source: Tongson and Dygico (2004).

Positive feedback

One of the most effective ways to strengthen the community is by providing positive feedback and publicity about the success of the MPA. Favorable comments from visitors, government counterparts and tourists will help to confirm the value of the MPA in the eyes of the community. Incorporating an MPA management plan as the keystone for a Municipal Development Plan or for the Municipal Fisheries Development Plan demonstrates the importance placed by municipal officials on the MPA. The community may also want to enter into a stewardship agreement that stipulates its role in managing the sanctuary together with the LGU, other agencies or NGOs working in the area. This can strengthen motivation and help resolve conflicts about the roles of various stakeholders in the management process.

For a community-based MPA, steady contact with relevant government agencies, marine research facilities and NGOs is essential. These organizations must be willing to provide support when problems arise (such as those involving politics, legal issues and planning decisions) that the community may lack the necessary skills or authority to handle. This assistance must be provided through the channels set up by the community and in a way that is acceptable. Community support often is eroded if an agency or organization abruptly takes over an activity normally being handled by the local community.

Community outreach

Exchange programs with other communities involved with MPAs can generate further interest and pride as people learn from each other's experiences. The sanctuary can be used as a training site and incorporate key local individuals as part of the training team. Involved groups may develop a case study that can be used as an example for training, cross-visits and extension activities.



Gilutongan Marine Sanctuary receives many study tour participants who learn from the sanctuary's success.

Partnerships

Building partnerships for coastal resource management mobilizes the resources and energies of various players and stakeholders towards achieving a common goal, such as marine reserve management or empowering communities to manage and develop their resources. Cutting across different sectors, partnerships can bring together various groups with diverse roles. Partnerships offer the following benefits:

- ♦ Foster dialogue and understanding among various sectors of the community and bring them to a consensus on certain principles, issues and resolutions relating to a particular resource or the coastal environment in general.
- ♦ Build on the unique strengths of different groups toward the achievement of a common goal.
- ♦ Mobilize resources and funding for implementing programs and activities.
- ♦ Provide venue to pilot test and scale-up programs and to push for local policy reform.

Involving a broad range of community groups fosters support for an MPA. Schools, NGOs, and local media can be involved in the provision of printed materials, newsletters, T-shirts and special events as a way to reach the broader community. The private sector, particularly resort and dive operators, as well as concerned individuals can help to fund, construct, and maintain visitor facilities and exhibits, signs, and trails. A popular strategy is to establish an adoption campaign (“Adopt a Bay”, “Adopt a Trail”, “Adopt a Reef”, “Adopt a Species”, etc...) that enables people and concerned businesses to support some aspects of an MPA either financially or in kind.

Phase 4. Monitoring and evaluation

Monitoring the marine reserve should be repeated at regular intervals throughout the management process (De la Cruz and Militante 1996; White *et al.* 2004). Assessing key biological and governance indicators begins with baseline studies. Increases in fisheries stocks and diversity both inside and outside the reserve confirm the



Reef monitoring volunteers discuss results with community members.

value of conserving the stock within the sanctuary. Changes in a standard list of governance indicators will also reveal how well the MPA is being managed. The results should be conveyed to the communities; positive results can be celebrated and negative results evaluated to identify management problems.

Evaluation should occur and is used to determine the effectiveness of the management process and to determine future directions. It answers the questions, “Were the objectives of the project met? How well is the MPA doing? Why or why not?” or “What are the reasons for the success/failure of the MPA?”

To answer these questions, it is necessary to identify indicators that show whether one is meeting the project goals and objectives as described in the management plan and elaborated in general in the MPA Report Guide shown in Appendix 1. For example, the parameters that might show improvements in coral reef habitat could be environmental (i.e., changes in fish diversity, size of individual fish, or percent live coral cover). It is important that these parameters are monitored using standardized methods as described in *Coral Reef Monitoring for Management* (Uychiaoco *et al.* 2001) and the MPA report guide. Indicators for improved management and enforcement such as administrative processes, community support, marker buoys and signs in place, and others can be measured and monitored by applying the MPA management rating system that is part of the MPA report guide in Appendix 1 and shown in Table 13. The effectiveness of education programs can be measured through both the effectiveness of management and changes in the biophysical indicators. The number of tourist visits and their duration probably indicates improvements in both environment and management.

Table 13. MPA rating system for municipal/city MPAs.^{1,2}**MANAGEMENT RATING**

This simple rating system is dynamic and is not a definitive statement on the status of any MPA rated. Put a check mark (✓) in the box provided if the criterion is fully satisfied or accomplished.

Date of survey: _____

Level 1: MPA is initiated - Passing (Year 1 since legal establishment) (1-6 points)

1a	MPA concept accepted (MPA started through local initiative or social acceptance sought through public consultations by external groups. Consulted members of affected stakeholders: fishers, other resource users and social groups, both men and women.)	
1b	Site surveyed using standard/accepted methods with baseline assessment complete, preferably conducted in a participatory process (Reports completed on fish abundance, coral cover and profile on community and coastal management.)	
1c	Site selected (Site chosen based on baseline assessment results and public consultations.)	
1d	Education program raising awareness about MPA functions and benefits started (Conducted a series of public education activities.)	
1e	Management body membership tentatively determined (Management core group starting to conduct regular meetings with proper documentation.)	
1f	Preliminary management plan drafted	

Level 2: MPA is established - Fair (Year 1 or 2 since legal establishment) (16 points required)

2a	Community acceptance gained and documented (Documented through public consultation documents, e.g., Barangay Resolutions and/or signature campaigns.)	
2b	Ordinance passed and approved by the Municipal Council (Ordinance should be well-drafted and enforceable and should be consistent with the concepts of sustainable use and equitable sharing of resources.)	
2c	Management body formally organized and recognized (Management group has legal mandate and is recognized by the local government; for POs – registered with SEC or DOLE.)	
2d	Management plan adopted by community and LGU or PAMB (Management plan initially implemented and endorsed by LGU/PAMB.)	
2e	Management activities started (Conducted initial MPA activities such as: installation of enforcement support structures, patrolling and surveillance, apprehension of violators, etc.)	
2f	Biophysical monitoring includes local participation (Locals were trained to do biophysical survey using standard/accepted method.)	
2g	IEC activities conducted to raise understanding on MPA rules and regulations (MPA rules and regulations disseminated using appropriate and practical means to target all direct users and other stakeholders; initial stakeholder knowledge assessment conducted.)	
2h	Anchor buoys, marker buoys and/or boundary markers installed	
2i	MPA rules and guidelines posted at strategic locations	
2j	MPA outpost or other structures constructed (Guardhouse and/or other MPA-related structures constructed.)	

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¹A slightly modified form is used for NIPAS declared MPAs that reflect their national status (www.coast.ph).

²Adapted from the work of the Coastal Resource Management Project team of Negros Oriental (William Ablong and Erwin Dolumbal) with assistance from A. White, 2001.

Table 13. Continued**Level 3: MPA is enforced - Good (Only applies for 2 years or older) (24 points required)**

3a	Education program sustained public awareness and compliance (A long-term IEC program exists and is currently being implemented in support of enforcement and the general MPA objectives.)	
3b	Regular biophysical monitoring measuring habitat condition and changes conducted (Documented surveys conducted at least once annually using standard/accepted method.)	
3c	Collaborative patrolling and surveillance conducted by mandated enforcement group and local community volunteers (Fish wardens on rotation assigned to guard and patrol the MPA, day and night with assistance from local community volunteers.)	
3d	MPA billboard signs, boundary markers and anchor buoys maintained (Funds allocated for maintenance of enforcement support structures. May be part of the municipal CRM budget.)	
3e	Management body active (Implements the management plan; coordinates enforcement activities; members attend meetings regularly; coordinates and participates in regular monitoring activities.)	
3f	Budget from local government or from other sources allocated and is accessible for MPA management (There is a legal document by the local government or an agreement with the private sector allocating budget for MPA management.)	
3g	Fishing effectively stopped inside of sanctuary zone (No fishing-related violations/apprehensions reported in the sanctuary for the past year.)	
3h	Illegal and destructive fishing reduced outside of MPA (Violations/apprehensions reported within 500 m from the MPA boundary was reduced by 50% for the past year.)	

Level 4: MPA is sustained - Very good (Only applies for 3 years or older) (30 points)

4a	MPA management plan updated in a participatory process (Management plan amended with the participation of various stakeholders: fishers, resort and diveshop operators, LGUs, other resource users, both men and women.)	
4b	Annual biophysical monitoring and feedback of results supervised by the managing body and implemented for 2 years or more (Documented surveys using standard/accepted method. Reports are available.)	
4c	Budget from government or from other sources allocated and was accessed for 2 or more consecutive years (There is a legal document made by the local government or an agreement with a funding group allocating budget for MPA operations; financial report available.)	
4d	Management body trained and capacitated to run the MPA independently (Management body supervises management activities [implementation of plans, enforcement, budgeting, monitoring and evaluation] and coordinates activities with partners.)	
4e	Enforcement system fully operational (Enforcement group with mandate and workplan; enforcement support structures maintained and patrolling activities sustained over the years.)	
4f	Illegal and destructive activities stopped inside and within the vicinity of MPA (No violations/apprehensions reported inside and within 500 m from the MPA boundary in the past year.)	
4g	Environment-friendly enterprise and/or user fees collected as a sustainable financing strategy (Sells environment-friendly products/goods to tourists; imposes collection of user-fees; etc.)	

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Table 13. Continued

Level 5: MPA is institutionalized - Excellent (Only applies for 4 years or older) (40 points)

5a	Information and education program on MPAs maintained over the years (Information dissemination activities sustained according to long-term IEC program.)	
5b	Ordinance passed by the Provincial Council giving MPA stronger political support (Gives MPA institutional support to strengthen enforcement and collaboration.)	
5c	Management plan refined for adaptive management (Incorporates further refinements after gaining much experience and lessons to improve management strategies.)	
5d	Management plan incorporated in the LGU development plan (MPA incorporated within the long-term LGU area-wide development plan.)	
5e	Evaluation of impacts on ecology and socioeconomics conducted and feedback of results completed (Assessment of resource status and long-term trends conducted. Analysis of change in local economy and long-term trends of user groups conducted. Reports of these studies have been completed and reported back to stakeholders.)	
5f	Revenues from enterprise and/or user fees sustained and accounted for (Existing sustainable financing mechanisms are well-managed and well-documented; financial reports easily accessible.)	
5g	Management body capacitated for financial management and fund sourcing (Management body is well-trained to manage funds effectively [facilitates proper handling, wise use and proper documentation]. The members are also trained to seek for financial assistance [formulated and submitted proposals].)	
5h	MPA emphasizes on public education and is being used as a study tour site; residents advocate for MPA (After much experience, members are ready to share lessons and impart knowledge. Presence of an identified group that conducts tours and is capable of giving talks on MPA. Paper/s written on their success stories published.)	
5i	Expansion strategies or enhancement programs initiated (MPA coverage is expanded, e.g., from a sanctuary to a park, or scope of conservation activities is heightened, e.g., coral reef restoration, re-seeding of clams, etc.)	

Total points accumulated: _____

- ♦ Total possible points: 40
- ♦ All points are cumulative.
- ♦ Points from higher levels can be used to satisfy lower rating levels.

Name(s) of assessor, position, and affiliation:

Contact information (phone, fax, email, postal address):

Important considerations for baseline assessment and monitoring include:

- What information about habitat conditions, activities, and program achievements is needed?
- When should information be collected as baseline for later comparison?
- Who needs the information and will use it?
- How will the information be used?
- Who will generate the various types of information?
- What are the procedures for collecting, storing, retrieving, and analyzing the data?
- What kind of qualitative and quantitative information can indicate improvements in the environment, the people's awareness about their environment, and the socioeconomic condition of people?

Monitoring and evaluation are activities that must include all the stakeholders. Planners, local communities, user groups, NGOs, academics, and the private sector should be involved in the participatory monitoring and evaluation of a project since all will share in the responsibility for implementing the plan and in reaping its benefits (Uychiaoco *et al.* 2001).

Biophysical monitoring on Balicasag Island has been conducted over the years (Figure 21). The beneficial impacts of the marine reserve are clearly indicated by improvement in living coral cover and fish abundance (Figure 22). In addition, the management rating in 2004 achieved Level 3: MPA is enforced (good) requiring 24 of the 40 possible points.

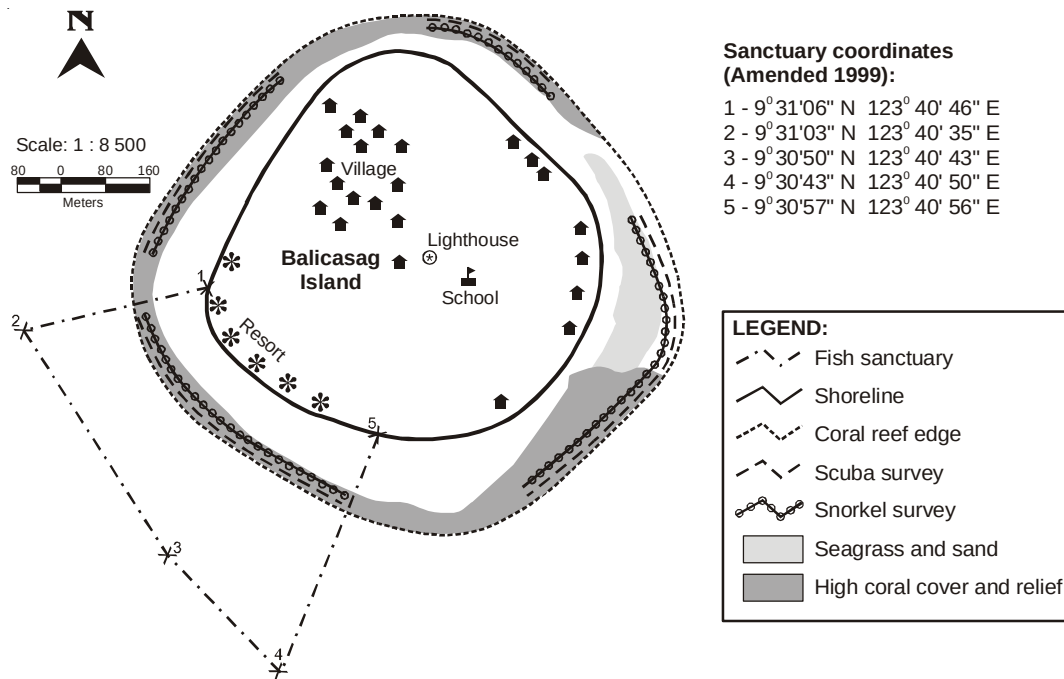


Figure 21. Balicasag Island, Bohol Sanctuary and coral reef with monitoring locations (White *et al.* 2003).

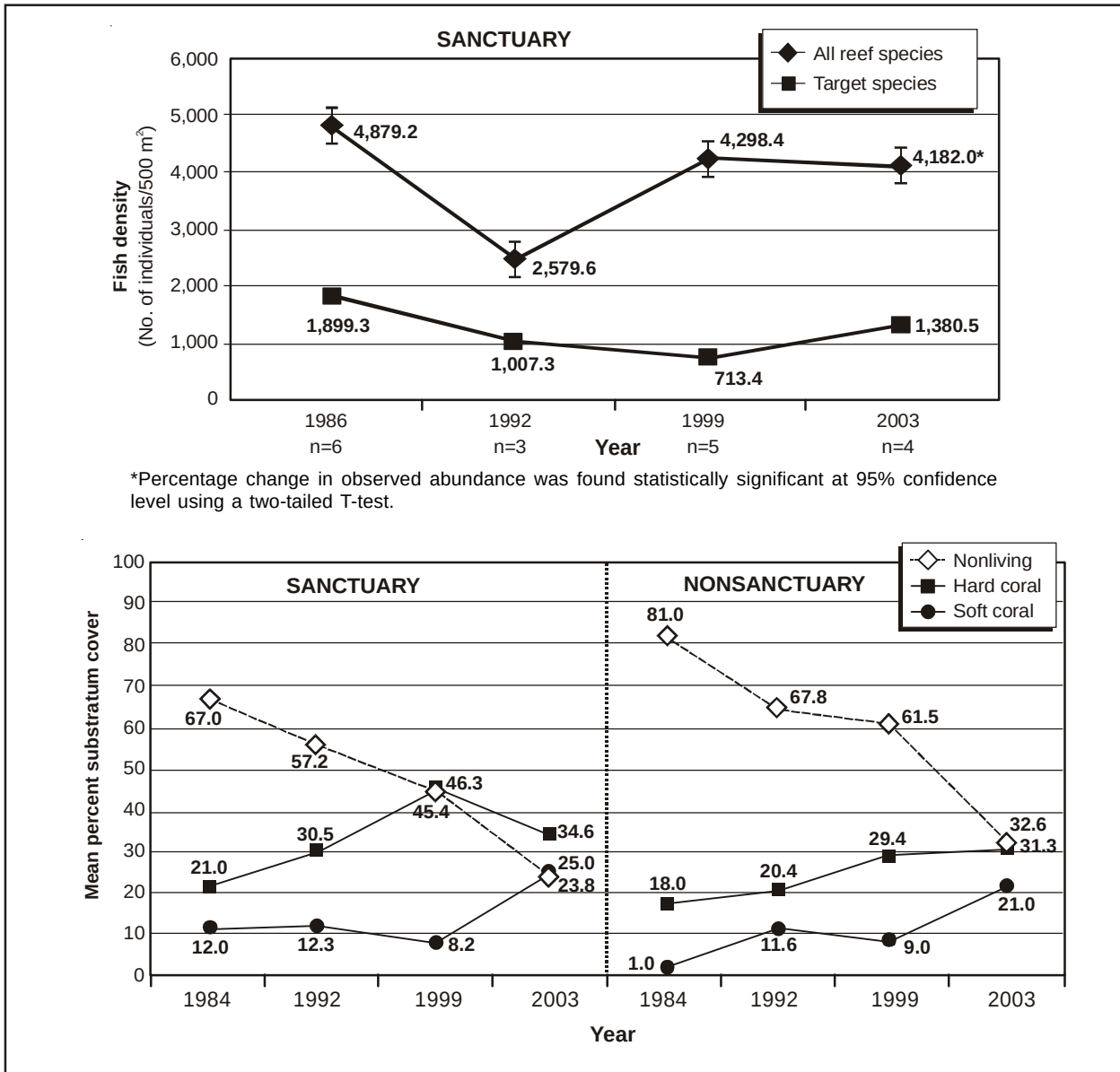


Figure 22. Comparison of mean percent living and dead substrate cover (sanctuary and nonsanctuary) and fish density (sanctuary) for Balicasag Island, 1984, 1992, 1999, and 2003 (White *et al.* 2003).

Refinement of management plan

The MPA management plan is not a static document. Modification and refinement of a plan is a normal occurrence that is based on new knowledge and experience and monitoring and evaluation. The best tool for monitoring and evaluation is the MPA management rating system as shown in Appendix 1 as part of the MPA Report Guide (Table 13). Goals and strategies often need to be modified to reflect changes in the reserve conditions, the surrounding community, the knowledge base and the regulatory/administrative authorizing environment. The monitoring and evaluation processes will alert one to these changes in conditions. Based upon these new conditions, the next iteration of the plan and thus management can be improved. Making such improvements indicates whether or not the community can or wants to manage the MPA on its own.

Phase 5. Information management, education, and outreach

Review status of MPA and its benefits

The monitoring and evaluation activities will highlight how well the MPA is being managed and what benefits are being derived from its management. Data should be stored and managed effectively to support long-term efforts. It is important that this information be collected and used to refine information on the MPA for use by the community and the local government. A successful MPA, if monitored carefully, will reinforce its own implementation success of increased benefits for local resource users as shown for Balicasag Island (Figure 22).

Refine education program from experience

The education materials used to help the community to plan and implement their MPA should be updated after implementation is in place. Results from the monitoring activities can be incorporated into the information and education materials. An example of this would be that fish abundance or fish yields have been recorded for two years showing some level of improvement resulting from the marine sanctuary enforcement. The data reflecting this improvement should be shared with the community and all stakeholders as evidence of their success. This can also be used to convince the local government officials about the importance of supporting an MPA within their jurisdiction and providing needed assistance to maintain the area.

Develop appropriate outreach program

Outreach programs based on a successful MPA can help other communities to establish their own. Successful project sites can also be used for study tours from other interested communities in the vicinity or even from other countries. The Apo Island Marine Reserve, for example, has hosted many such study tours from around the Philippines and as far away as Indonesia and Sri Lanka where people want to learn about establishing similar management approaches. Also, one criterion within the MPA management rating system (Appendix 1) is that the MPA community is hosting study tours for groups interested to establish their own MPA.

Planning summary

The planning, and implementation and refinement of management process has been explained in this chapter as outlined in Table 6 above. It is worth remembering that the process is not always linear and is usually cyclical as indicated in Figure 23.

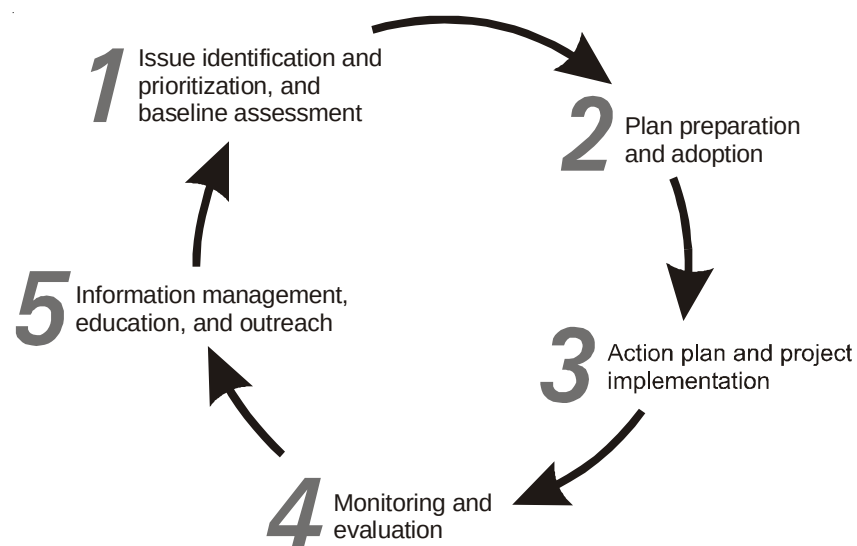


Figure 23. Cyclical MPA planning and implementation process.

Creating Networks of Marine Protected Areas

“The power of synergy is great, let’s make it work for MPAs!”

The Philippines has come a long way in establishing many marine protected areas (MPAs) around the country through innovative approaches and devolution of responsibility to local governments (Aliño *et al.* 2002; White *et al.* 2002). A major objective for the establishment of MPAs since the early 1980s has been to enhance coral reef fisheries. This occurs through habitat protection and the improved ability of reef fishes to grow to mature sizes for enhanced reproduction and spillover of larvae and adult fishes to adjacent areas outside of no-fishing zones within an MPA (Russ *et al.* 2004). In recent years, additional benefits that have been recognized as equally important for local stakeholders include enhanced livelihood opportunities from tourism and related economic activities associated with a MPA as well as protection for species of special concern and seascapes.

It is also recognized that MPAs are generally more effective and successful when implemented within the context of an integrated coastal management (ICM) regime through the local government system in the country as highlighted in Chapter 2 (White *et al.* 2005). Equally, networking among people and integration of ecosystem-based management within various governance hierarchies is being initiated. Thus, to meet the continuing challenges of coastal degradation, all levels of government and private sector must coordinate with each other through ICM and networking arrangements.

Learning how to improve the management of fisheries and biodiversity conservation through the implementation of MPAs is ongoing. An immediate objective to enhance fisheries is to improve the effectiveness of existing MPAs and to increase the area of coastal and fisheries habitat that is included within MPAs. It is also known that “MPA networks” can enhance fisheries management and biodiversity conservation beyond what individual MPAs can achieve alone (Palumbi 2003). In this regard, the purpose of this chapter is to identify the objectives and means for creating and enhancing MPA networks.

Two or more MPAs that complement each other form a network. We thus need to plan to form networks of MPAs so that we can maximize possible complementation from one MPA to another through synergistic effects. Networks take various forms. There are social networks formed by communication and sharing of results and coordination of administration and planning. There are ecological networks formed by ensuring that natural connections between and within sites enhance ecological functions and benefits of one or more MPAs. In the Philippine context, both types of network, social and ecological, need to be integrated and coordinated to maximize their potential benefits. But to form effective social and ecological networks of MPAs, we must consider factors that will ensure the networks created will add value to existing management efforts.

What is an ecological MPA network?

An MPA network is a collection of MPAs carefully chosen to achieve either (1) biodiversity conservation or (2) biodiversity conservation and fisheries enhancement. We can better understand “MPA network” by noting the basis of these objectives. An MPA network designed to conserve biodiversity is a group of MPAs selected on the basis of:

- ♦ biogeographic and habitat representation; and
- ♦ presence of species or populations of special interest (e.g., threatened and vulnerable species).

A network designed to enhance fisheries is a group of MPAs selected on the basis of:

- ♦ size of reserves necessary to protect viable habitats;
- ♦ presence of exploitable (target) species;
- ♦ vulnerable life stages of selected species;
- ♦ connectivity among reserves and links among ecosystems; and
- ♦ provision of ecosystem services to people.

A key premise of a network is that the MPAs interact through ecological linkages. These connections may include:

- ♦ connections of adjacent or continuous habitats such as coral reefs and seagrass beds;
- ♦ connections through regular larval dispersal in the water column between and within the MPA sites;
- ♦ regular settlement of larvae from one MPA to inside another MPA; and
- ♦ movements of mature marine life in their home range from one site to another dependent on habitats or because of regular or random spillover effects from MPAs.

Biophysical and ecological advantages of an MPA network

There are biophysical and ecological advantages of a MPA network over MPAs that are randomly placed or MPAs that simply maximize habitat protection. These advantages that partially depend on ecological linkages include:

- ♦ ensuring that the most valuable marine habitats are at least partially protected as reflected by habitat quality and species richness;
- ♦ ensuring that some of the larvae dispersed from a given MPA will either end up settling back inside the MPA or a MPA within the dispersal range or spatial neighborhood of the typical species residing in it;
- ♦ ensuring that threatened, vulnerable or overexploited species of a given area will have adequate habitat space to reside and be able to continue reproducing and to disperse larvae into surrounding areas as a result of the MPA network (e.g., giant clams, grouper, lobsters, etc.); and
- ♦ enhancing fisheries production for a given management area because the larval production and dispersal, and fish spillover effects are maximized through planning to the benefit of both fisheries and conservation.

The administrative and pragmatic advantages of a MPA network over MPAs that are randomly placed and not coordinated in any way might include knowing that the investment in the establishment and management of the MPA network is maximizing its potential return to local stakeholders. Also, in forming a network, an information base for the MPAs in an area is created that helps develop logical choices in how to expand MPAs effectively and how to efficiently manage them based on the network design. Finally, a network provides a rationale for individual MPA stakeholders or communities to coordinate with each other to share their experiences and to enhance efforts in managing and protecting their respective MPAs.

Broad basis for ecological MPA networks

The Philippines lies in the center of the Indo-west Pacific Region, considered the area of highest marine biodiversity in the world. Its role in a global network of MPAs is crucial to the protection of global biodiversity. At least five major biogeographic regions are present as shown in Figure 24. Based on the criteria for a global representative system of MPAs, the Tubbataha Reefs found in the Sulu Sea basin is an important world heritage marine park. It is a fine example of fulfilling both the important source and sink functions for the marine ecoregion. Its connection with other areas contributes to the maintenance of high biodiversity in adjacent areas.

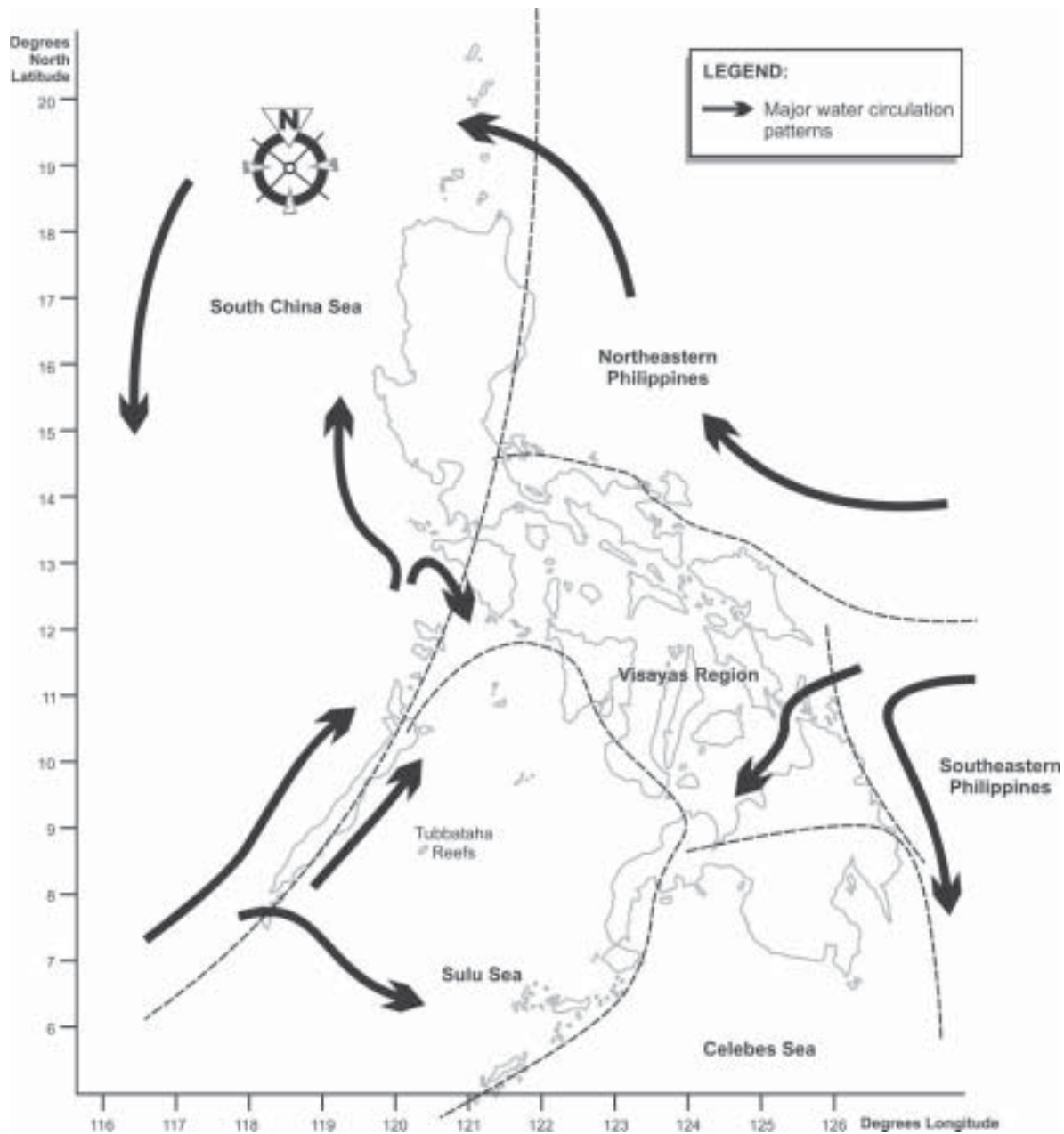


Figure 24. Biogeographic areas important for marine conservation planning based on geomorphology, basins, bathymetry, and major water circulation patterns.

A good starting point for the MPA system design in the Philippines is the context of the linkages of geomorphology of the basins and the role of bottom topography in current circulation among basins. The positions of the major marine corridors are found in the transition areas of the major biogeographic regions or inland sea basins (Figure 25). Along these areas are found critical nesting, nursery, and feeding grounds for important marine species. These habitat functions facilitate gene flow, spawning and larval exchange. Connectivity of ecosystems as facilitated by marine corridors is an important criterion to facilitate network linkages among priority biogeographic areas.

Marine corridors must be designed to consider how conservation targets can be optimally achieved. The target of at least 10% full protection by 2020 as espoused by the Philippine Marine Sanctuary Strategy through a network of MPAs is an indicative goal to project contributions from each municipality and province in a corridor. Examples of areas that serve as sources and sinks of ecosystems being connected where spawning and larval dispersal pools are entrained include the Calamianes Islands, the Visayas and the Sulu-Tawi-Tawi

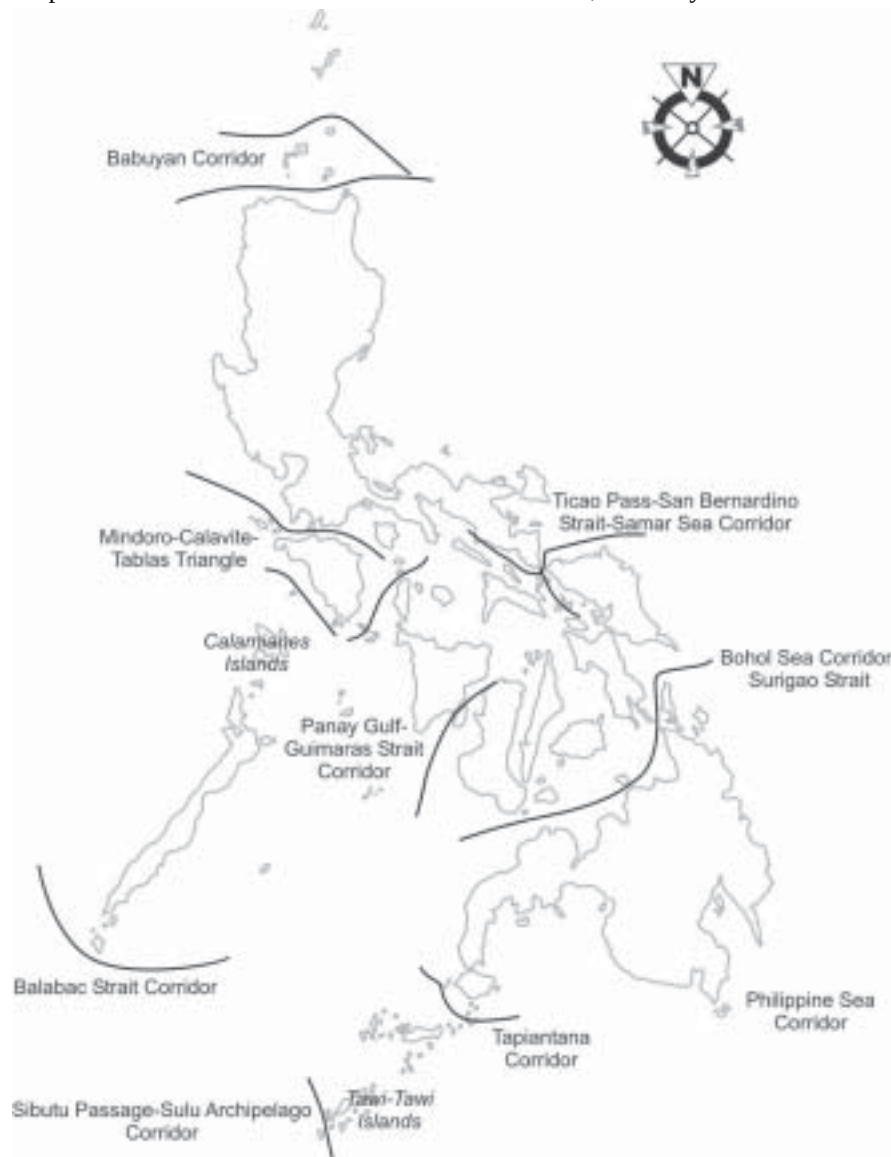


Figure 25. Primary marine corridors of the Philippines (Ong *et al.* 2002).

Islands, among others. Such areas must receive special attention through intensive localized management as well as protection through broader provisions that regulates shipping (e.g., transport, fishing, others) within the overall management framework of the MPA network.

MPA network design

As a prerequisite to establishing and improving MPAs and networks of MPAs, we should understand what design features of a MPA will make it effective to enhance fisheries production and conserve ecosystems and species in a given area in relation to the social and cultural context. General factors and criteria to consider in determining sites for a MPA or a series of MPAs are described in Chapter 1. In short, the site must have relatively intact, natural, representative and diverse resources. In addition, if the site has fisheries and social economic values associated with it, the likelihood of good management will be enhanced.

Considering these criteria is important to help ensure sustainability for any MPA since it will exist in the broader social and cultural context of a community and local government, and must achieve multiple objectives to succeed. There are additional factors that need to be considered to try and maximize the fisheries value of a MPA. The criteria that may weigh a decision towards an area with more potential for fisheries enhancement are:

- ♦ habitat quality: Areas with generally superior habitat quality or better than the average for the general area (e.g., coral cover, seagrass, water quality, etc.);
- ♦ fish habitat: Areas that maintain higher than average abundance, density, and species richness of fishes or contain spawning aggregations of fish;
- ♦ oceanography: Areas with favorable currents that tend to aggregate larvae and organisms inside the sanctuary but with periodic flushing to the outside;
- ♦ biodiversity: Areas with higher than average biodiversity and range of animals on the food chain from large to small;
- ♦ size: Areas that cover at least 10 ha and preferably 20 ha or more of critical fisheries habitat;
- ♦ social acceptance: Areas that will not arbitrarily remove the most desired fishing ground from a community and do not create unnecessary social conflicts;
- ♦ practicality of management: Areas where no fishing and extraction can be enforced given the resources that will be available for protection; and
- ♦ quality of management: Areas that can achieve MPA rating system level 3 where the rules are sufficiently enforced to ensure tangible fisheries benefits.

The above criteria or rules of thumb, if met, will provide relative assurance that a single MPA will contribute significantly to fisheries enhancement and general conservation in its area of operation. Additional factors must be considered if more than one MPA is being planned to form a network. And, although a network will have both social and environmental dimensions that can be defined separately, these may become intertwined in the practical implementation of a network. Attributes of a functional network of MPAs are (Figure 26):

1. Individual MPAs will meet minimum criteria for MPAs in general and those contributing to fisheries and managed at MPA rating level 3 or more.
2. The broad management area shall be analyzed from the perspective of critical habitats, fisheries, oceanography, and existing MPAs as a first step in planning an area-wide network of MPAs.
3. Site-specific areas (complementation potentials at the barangay level to intermunicipality) shall be analyzed from the perspective of critical habitats, fisheries, oceanography, and existing MPAs as a second step in detailed planning for MPAs' priority sites and networks.
4. Existing MPAs and new sites that maximize fisheries enhancement should be identified.

5. Five to ten percent of critical habitat for a given planning area should be included within an MPA.
6. MPA management bodies will be capacitated to improve the management of their MPA and linked to other MPA management bodies in the network area.
7. MPA management bodies together with their local governments and other assisting organizations will be engaged in planning and implementing their MPA network for area of concern.
8. A MPA network will be within the context of ICM plans and regimes of one or more municipal governments with provincial assistance.

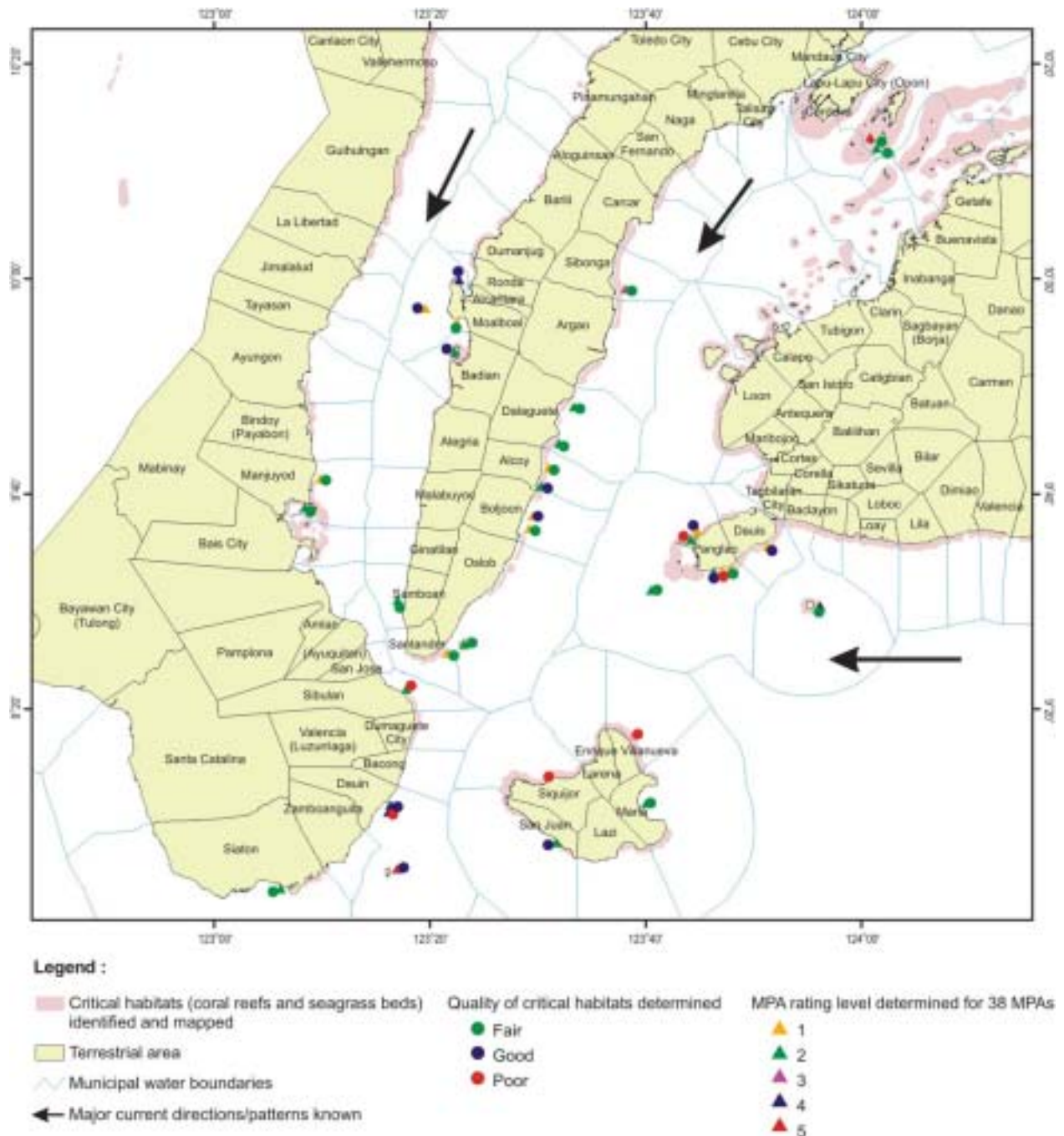


Figure 26. Requirements for an effective MPA network, Cebu Strait and surrounding areas.

In summary, the basic attributes of a MPA network as shown in Figure 26 include MPAs that are effective in their own right, protect fisheries habitats, and contribute to fisheries enhancement and biodiversity conservation, following the criteria noted in this chapter. The MPAs should cover a critical minimum area (e.g., 5 to 10%) of the larger planning area. MPA management bodies must be effective and linked to larger planning area through a network of some sort. The management system needs to be both horizontal and vertical for sustainability with local governments playing key roles with supporting partners. Finally, network links should consider their interrelated facets—both environmental and social.

Social, information, and administrative networks

The communication age has facilitated the sharing of information and experiences across many borders and among diverse groups of people. This is also occurring within the marine-associated communities in the Philippines through newsletters, email, and a growing list of loose organizations that form a “network”. There is the Philippine Coral Reef Information Network and others operating nationally (Table 14). Locally, the networking efforts of several site-based peoples’ organizations (POs) are effective. One, a national alliance of community-based MPA managers, the PAMANA Ka Sa Pilipinas Inc., is composed of local representatives of municipal marine sanctuaries (Lavides and Tiburcio 2002). This alliance incorporates within its hierarchy, site-based clustering for bays or island groups and the major islands of Luzon, Visayas, and Mindanao.

The benefits of the various networks include building consensus for common approaches to improved marine conservation through law enforcement, unified fisheries ordinances, delineating municipal waters, establishment of marine sanctuaries, and others. Processes that have led to good practices and scaling up governance derived from networking efforts are: (i) consensus building on common issues; (ii) information sharing and identification of core groups; (iii) institutionalizing mechanisms for administration; (iv) sustainable financing; and (v) adaptive management (i.e., performance and impact monitoring and incentive systems). A bias towards ecosystem-based approaches has also evolved through natural resources management networks. Such a science-based and adaptive management perspective can benefit the formation of effective MPA networks (Table 14).

Table 14. Selected coastal and marine-related networks and primary concerns*.

Type or name of network/organization	Primary concerns or mandate
Coastal Resources Management Network (CRM Net)	Information exchange among all CRM concerned organizations
MPA Management and Monitoring Network (MPA Net)	National network of MPA managers, advocates, and practitioners composed of 27 national and regional government agencies, academic institutions, and NGOs
National Aquatic Resources Research and Development System (NARRDS)	National network of over 40 aquatic research and development institutions
PAMANA Ka Sa Pilipinas Inc.	MPA network for community-based practitioners, both private and government; has about 122 member-sanctuary sites
Philippine Coral Reef Information Network (PhilReefs)	National information sharing among academic groups concerned with reefs
Philippine Fisherfolk Network for CBCRM (FishNet)	NGOs and POs concerned with issues within the fisheries sector
Philippine Locally Managed Marine Area Network (PLMMA)	Promotes adaptive management; about 8 management areas are members in the Philippines where they benefit from capacity building and cross-visits

*See Appendix 3 for full description and contacts of network organizations.

Social MPA networks are motivated by financial and administrative benefits since one of the major constraints to MPA sustainability is long-term financing. Local area networks are collecting user fees and receiving institutional support from their local municipality or city and the province from internal revenue allotments. Local government support also attracts private sector buy-in from tourist resorts, landowners, or others concerned about coastal protection. Valuation studies, research on willingness to pay and user fees together with cost-benefit analyses of networking arrangements are showing large potential benefits and mechanisms for collection and management through networking arrangements.

Networks are also driven by fisheries benefits rebounding to fishers derived from spillover, larval recruitment and protection of reproductive potential. Monitoring of the biophysical, social, and economic outcomes of MPA networking becomes the reason for demonstrating incentives for good stewardship and at the same time buy-in that promote public-private partnerships. Recognition awards and tax deductions for contributions to MPA networks are some options that can be used to stimulate network level collaboration.

Learning from the management of a marine sanctuary is surely enhanced with the shared knowledge from experiences of MPA network partnerships. MPA networks are being mainstreamed through provincial or municipal task forces for law enforcement or simply MPAs within larger ICM efforts that include good governance practices. But one of the greatest challenges in the implementation of a network of MPAs is the action undertaken by local governments to sustain network efforts within a baywide or island clusters ecosystem management framework. Demonstrating that the fishery ecosystem that is being managed is important enough to capture the imagination of separate management bodies to work together at the larger scale is not easy. This requires sharing of results from assessments and showing overlays of habitat maps with the important spawning events and areas together with their fishing practices to plan for management of key areas. Plans must include maps of habitats and sensitive areas of highest threats that need protection. These must be combined with enforcement areas that lead to joint inter-LGU ordinances or common provincial action plans. These are seen in several provincial initiatives such as those undertaken by municipalities in Lingayen Gulf, through the efforts to link community-based MPAs in the Bohol Sea (Indab and Aspilla 2004) and ecosystem-based fisheries management for the Danajon Bank in northern Bohol (Figure 27).

Local communities that have endorsed the stewardship of their marine sanctuaries are encouraged if they see the linkage of their village life with that of their ecosystem stewardship role at a larger scale. The larger scale demonstration of entrainment potential, connectivity, and spawning aggregation applies at both the local village scale and the larger ecosystem and ecoregion scales. The establishment of a combination of village level MPAs in combination with municipal and multimunicipal level management is crucial to create synergistic benefits. Various municipalities in the Visayas now have multiple marine sanctuaries planned and managed within their coastal resource management plans (Figures 26 and 27).

Field approach and process

The basic approach to improving the management of MPAs, identifying and planning for new MPAs and eventually forming a network of MPAs for a given planning area will generally follow the CRM and MPA planning process being implemented in local governments in the Philippines and as highlighted in Chapter 5 of this book. The process of information gathering, analyzing, planning, implementing, and then monitoring and evaluation is tested and effective. The process can also focus on the primary outcome of fisheries management through the implementation of MPAs.

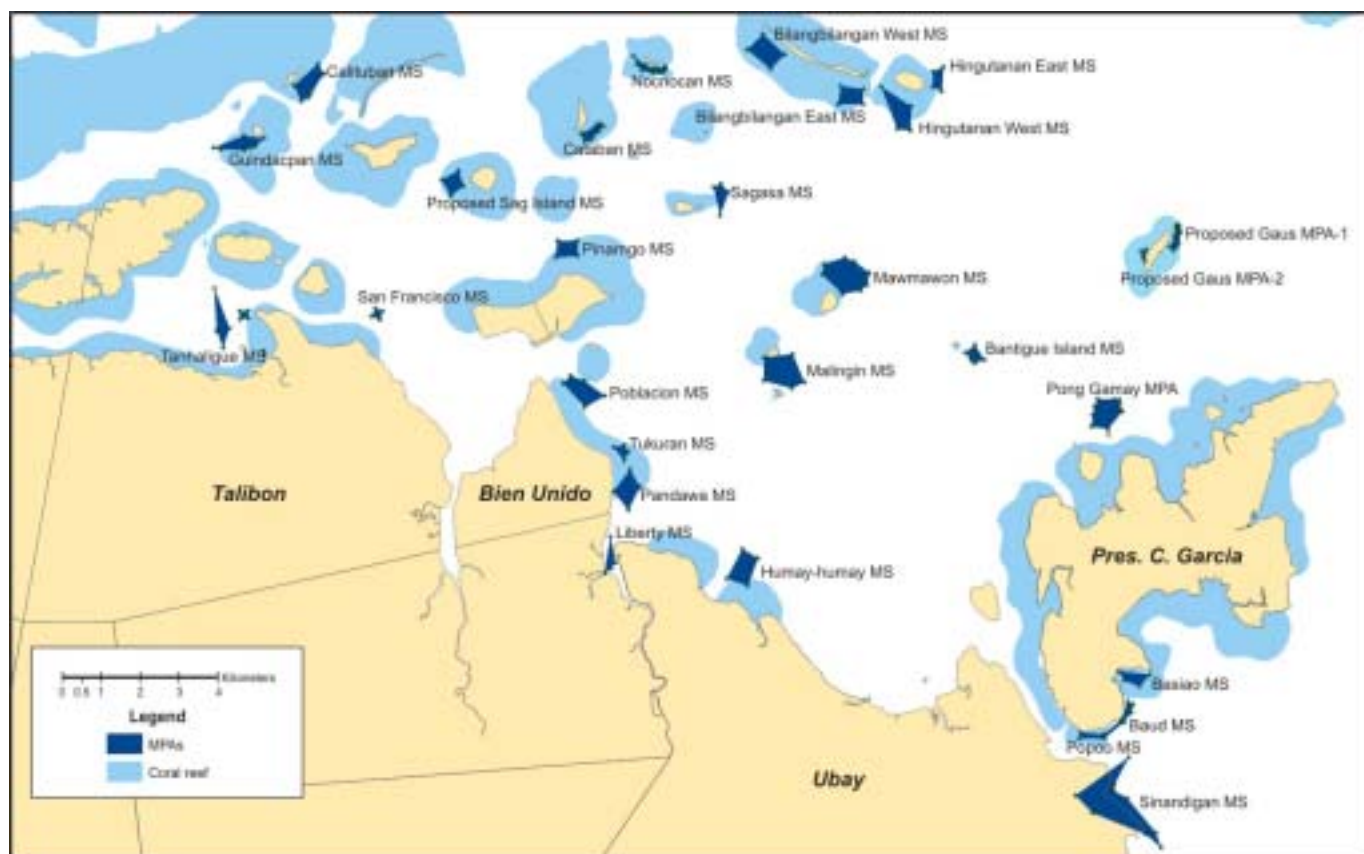


Figure 27. MPAs established in the Danajon Bank are beginning to form a network and are supported by their respective municipal CRM programs.

The CRM and MPA planning and implementation process is always done in concert with the local governments and communities of concern and in coordination with other projects and stakeholders operating in the area. This assumption will result in quite different forms of participation and roles of an assistance project from one planning area to another. The protocols for assisting communities and local government with the planning and implementation of MPAs have been tested in many projects and are the basis for this book. Several lessons to guide projects on how to effectively assist with improving MPA effectiveness and forming MPA networks are:

1. Most MPAs, once planned and operating, will need to strengthen their management body through a community level intervention that helps the management body develop and implement a MPA management plan together with the municipal administration. This MPA plan may ultimately amend the ordinance that established the MPA with refined rules.
2. The project will need to identify partners working in the area who are assisting with CRM and MPAs and coordinate work accordingly. Assisting groups should make a strategic plan and agree on some common objectives that are consistent.
3. Each MPA that will ultimately be part of an effective network will require some level of assistance in some portion of its planning and implementation process. All successful MPAs in the Philippines have received assistance to help make them become sustainable in their own right.

4. Look at how complementation of each network partner can be facilitated to assist in their effectiveness and their biophysical contribution and potential. Thus, through the efficiency of sharing of resources and contributions will the synergy of outcomes occur (e.g., biomass accumulation and cost effectiveness).

Creating MPA networks that are sustainable

MPA networks are not created rapidly but evolve over time with good planning. The above guidelines can assist to improve MPAs, make them more functional and provide guidance towards building a context that will allow MPAs and the organizations that assist them to link and support one another so that a network can evolve. Both biophysical and socioeconomic factors must be considered and tested when planning a network (WWF-SSME Program 2004). Strategic interventions are always required to push the process along and might include:

- ♦ Provide support for MPA monitoring and evaluation that addresses biophysical and management needs using existing protocols as summarized in the MPA Report Guide (Uychiaoco *et al.* 2001; White *et al.* 2004).
- ♦ Summarize all relevant data in a geographical (maps) and graphic manner for feedback to communities and for use in planning and education through simple reports and visual means to keep the data useful at the local level.
- ♦ Train and capacitate local stakeholders to perform the tasks of planning, implementing, monitoring, and evaluating a MPA using tested PCRA and other protocols referred to above (e.g., MPA Report Guide).
- ♦ Conduct targeted research studies on the effectiveness of MPAs, locating new MPAs, social acceptability of MPAs, oceanography of area and location of fish aggregation areas as deemed relevant for planning and education.
- ♦ Mentor all targeted MPA management bodies in a systematic but strategic manner to ensure that management is progressing to a higher level per the MPA rating system.
- ♦ Sponsor workshops and informal meetings among MPA managers, management bodies, and other important stakeholders to help establish social networks for MPA implementation and support.
- ♦ Link all existing and future MPA work (data, results, MPA establishment, etc.) with national programs to support MPAs such as the Protected Area and Wildlife Bureau of DENR, the MPA Database of the Coastal Conservation and Education Foundation, Inc. and Partners and others that may assist in making local efforts more sustainable.

MPA networks—final key points

A MPA network is also a network of people managing the component MPAs, benefiting from the network and promoting the networks' viability and longevity. Not just any collection of MPAs can be called a MPA network. A MPA network is a collection of MPAs that *interact* in some meaningful manner (e.g., source or sink of larvae and propagating organisms, protection for quality habitat and threatened or endangered species, etc.) that enhance fisheries and biodiversity conservation (Palumbi 2004). An effective MPA network is composed of individual MPAs that each satisfies the requirements of an effective MPA as highlighted herein and has both ecological and social components.

The Challenge of Sustainability

“Time is always the test of success.”

We have emphasized the unique and valuable habitats, their associated fish populations and their interactions that are found in the Philippines. These habitats and fisheries provide irreplaceable benefits to the millions of people living along the coast and to the rest of the populace. Sadly, the quantity and condition of these ecosystems are steadily declining as an expanding population increases the pressure on these critical areas and valuable resources. Unclear ownership of coastal resources and conflicting mandates for their protection make management difficult.

Effective coastal resource and fisheries management requires an integrated perspective that identifies and assigns value to coastal and marine habitats and responsibility for their management. Marine protected areas (MPAs), in one of their forms, can help to accomplish this task on both local and national levels.

Establishing an MPA requires an integrated and participatory management process that involves the various stakeholders in the planning and implementation process. Consensus must be the driving force behind the process. The perceived and real issues need to be prioritized and solutions sought that are consistent with environment, social and political realities of the local area of concern (White and Vogt 2000; Arceo *et al.* 2001).

Key aspects of successful MPAs, in all their forms in the Philippines are noted below. All of these points were discussed in this book and are essential for achieving long-term implementation and benefits from MPAs. Although conditions vary from site to site, there are prerequisites that we cannot do without. These are:

- ♦ **Community preparation:** Does the community and the local government understand the need for and process of implementing an MPA?
- ♦ **Resource assessment and mapping:** Has the area been assessed and mapped so that everyone concerned knows the location and condition of resources and the potential boundaries for an MPA?
- ♦ **Stable and functional core group:** Has a functional core group been formed or identified and empowered that can manage the MPA at the local level?
- ♦ **Clear goals and objectives:** Are the objectives for management clear to all the stakeholders and generally agreeable to the majority of the community members?



Marine reptiles are scarce, particularly those that are encountered on coral reefs. Turtles spend their entire lives at sea except when the females come ashore to lay their eggs.

- ♦ **MPA boundaries and zones:** Are the boundaries in accordance with the habitat assessment and are the boundaries and zones sufficient for management and generally agreeable to the stakeholders?
- ♦ **Management strategies for implementation:** Are the strategies simple and easy to implement within the local context of the MPA and reflected in the ordinance legally supporting the MPA?
- ♦ **Law enforcement and monitoring:** Is a group assigned to watch the MPA, monitor all activities, collect fees, and assess changes in the marine environment on a regular basis?
- ♦ **Ongoing education:** Does the education program address the needs of the community and stakeholders so that benefits are highlighted and that questions regarding the need for the MPA are addressed?
- ♦ **Co-management in place:** Is the local government supporting the MPA together with the community in a mutually beneficial manner?
- ♦ **Monitoring and evaluation occurring:** Have baseline data on the condition of the habitat and the status of management, been updated and changes noted? Has this information been incorporated into a standard database for comparison in the future? Has this information been incorporated into an education program for the community and local government?

In the final assessment, MPAs are becoming a primary tool to protect and manage coastal and marine habitats in the Philippines. The reason they are popular and successful is because people residing in the immediate coastal area of concern are the stewards together with the local government and they directly benefit from the MPAs. Although we now have many small successes as examples, there is an urgent need to spread MPAs throughout the coastal areas of the Philippines. MPAs offer opportunities and hope as they provide real



These trevallies are highly esteemed as food fishes. They form large schools that approach divers at close range in well-managed MPAs.



A diver in Gilutongan Marine Sanctuary is being approached by schools of tame fishes.

benefits and provide a challenging but feasible means of empowerment for many communities. MPAs build collaboration between communities and their LGUs or other partners. They create win-win situations! Along these lines, former Philippine President Fidel V. Ramos made an appropriate statement in 1997:

“Let us not forget that we are all, individually as well as collectively, stewards of this heritage”.



This giant wrasse is one of the few predators of the Crown-of-thorns seastar. Marine sanctuaries help protect this sought-after species to maintain abundance in our marine environment.

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- www.coast.ph
- www.pawb.gov.ph

appendices

appendix 1

Marine Protected Area Report Guide

Coastal Conservation and Education Foundation, Inc.
Protected Area Wildlife Bureau of the Department of Environment and Natural Resources (DENR)
Philippine Council for Aquatic and Marine Research and Development of the Department of Science
and Technology
DENR, Region VII
Bohol Environment Management Office
Environment and Natural Resource Division - Negros Oriental
Provincial – Coastal Resource Management, Palawan
Provincial Planning and Development Office of Cebu
World Wildlife Fund for Nature – Kabang Kalikasan ng Pilipinas Foundation, Inc.
Foundation for the Philippine Environment
Conservation International, Philippines
Guiuan Development Foundation, Inc.
Philippine Reef and Rainforest Conservation Foundation, Inc.
Silliman University, Angelo King Center for Research and Environmental Management
PATH Foundation, Philippines
Project Seahorse Foundation
Earth Restoration Trust, Inc.
Bohol Alliance of Nongovernment Organizations
Marine Science Institute - University of the Philippines
Silliman University through the Marine Laboratory
Leyte State University
Mindanao State University, Naawan
Coastal Resource Management Project
Local Governance for Coastal Management Project
Integrated Population and Coastal Resource Management Project
Bohol Marine Triangle Project
Fisheries Improved for Sustainable Harvest Project
Department of Marine and Wildlife Resources of American Samoa, USA
Sea Around Us Project, Canada

appendix 2

Marine Protected Area Training Manual

(CD)

appendix 3

Networks Supporting Marine Protected Areas in the Philippines

appendix 1

Marine Protected Area Report Guide¹

This **MPA Report Guide** can assist in organizing information on individual MPAs and the environment that the MPA protects. If completed yearly, it will provide MPA managers, local government, nongovernment organizations, academe or other interested parties with information on the status and quality of management, the status and quality of the environment and benefits being derived from the MPA. It will also provide feedback on how the MPA is rated compared to other MPAs and on how to improve management of the MPA.

I. MPA DESCRIPTION AND STATUS

Attach MPA legal documents and other relevant documents (e.g., ordinance or proclamation document, map).

MPA name: _____

Region: _____ Province: _____

Municipality: _____

Barangay: _____

Date of survey: _____

MPA size (ha): _____

Habitat/ecosystem(s) within MPA:

- | | | | |
|-------------------------------------|--|---------------------------------------|---|
| ☐ Coral reef | ☐ Seagrass bed | ☐ Sandy bottom | ☐ Rocky intertidal |
| ☐ Mangrove | ☐ Macro-algal bed | ☐ Soft bottom | ☐ Open water |

Type of coral reef:

- | | | |
|-----------------------------------|----------------------------------|--|
| ☐ Fringing | ☐ Barrier | ☐ Pinnacle rock |
| ☐ Patch | ☐ Atoll | ☐ Offshore reef / shoal |

Boundary coordinates (deg-min-sec)

Point	Latitude (e.g., N 9° 41' 11.4")	Longitude (e.g., E 123° 30' 25.4")
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____
8	_____	_____

Year legally established: _____

Basis for legal establishment: ☐ Municipal Ordinance No. _____
☐ NIPAS Act _____
☐ Others, specify: _____

Other laws affecting the area: _____

¹The MPA Database and MPA Report Guide forms can be found on the website www.coast.ph or through the Coastal Conservation and Education Foundation, Inc. office in Archbishop Reyes Avenue, Banilad, Cebu City, Philippines. Phone 63-32-2336947 / Fax 63-32-2336891 / Email: ccef-mpa@mozcom.com.

MPA establishment history (brief chronological order of events): _____

MPA objectives/reasons for establishment: _____

OPERATIONS MANAGEMENT

Indicate classification of group (*select letter to indicate classification*)

[a] People's organization (PO)

[f] NGO

[b] Barangay government

[g] Diveshop/resort owner

[c] Municipal government

[h] Others, specify _____

[d] Provincial government

[e] Government agency (e.g. BFAR)

Current managing group (*main group directly managing the MPA*)

Current assisting group/s:

(*groups providing technical assistance or support for effective implementation of the MPA*)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

Presence of marker buoys? ☐ Yes ☐ No

Number of mooring/anchor buoys? _____

Number of signs posted? _____

Date MPA management plan was approved? _____

Management zones: Size (ha)

Regulations

☐ Core zone

☐ Buffer zone

[] _____
Other zones

[] _____
Other zones

FINANCIAL MANAGEMENT

Sustainable financing mechanism(s) in place?

Guidelines, systems

[] User/entry fee

Sharing scheme	
Beneficiary	% share:
_____ :	_____
_____ :	_____
_____ :	_____
_____ :	_____

[] Gov't. budget allocation _____

[] Trust fund _____

[] _____

Others, specify _____

Who manages the funds?

[] Municipal gov't

[] Barangay gov't

[] Others, specify: _____

How much is the estimated annual gross income of the MPA? PhP _____

How much was spent on annual MPA management/operations? PhP _____

Expenditures covered what items?	Amount (PhP)
[] Trainings/seminars/meetings	_____
[] Monitoring and evaluation	_____
[] Honorarium/salary	_____
[] Enforcement support (e.g., buoys, billboard, guardhouse, pumpboat)	_____
[] Repairs and maintenance	_____
[] Materials and supplies (e.g., office supplies, gasoline)	_____
[] Communication equipment	_____
[] IEC/promotions	_____
[] Others, specify: _____	_____

Supplemental or alternative livelihood created as a result of establishing MPA: _____

ENFORCEMENT

Penalty imposed? ☐ Yes ☐ No

Apprehensions recorded

Nature of violation	Date committed	Final outcome (e.g., fined, imprisoned, dismissed)

Reference(s): _____

Name(s) of assessor, position, and affiliation: _____

Contact information (phone, fax, email, postal address): _____

II. MANAGEMENT RATING

The MPA rating system is intended to assist local governments and communities to improve the management of their MPA. This simple rating system is dynamic and is not a definitive statement on the status of any MPA rated. *Put a check mark (✓) on the box provided if the criterion is fully satisfied or accomplished. Carefully consider MPA age in assessment.*

Date of survey: _____

Level 1: MPA is initiated - Passing (Year 1 since legal establishment) (6 points required)

1a	MPA concept accepted <i>(MPA started through local initiative or social acceptance sought through public consultations by external groups. Consulted members of affected stakeholders: fishers, other resource users and social groups, both men and women.)</i>	
1b	Site surveyed using standard/accepted methods with baseline assessment complete, preferably conducted in a participatory process <i>(Reports completed on fish abundance, coral cover and profile on community and coastal management.)</i>	
1c	Site selected <i>(Site chosen based on baseline assessment results and public consultations.)</i>	
1d	Education program raising awareness about MPA functions and benefits started <i>(Conducted a series of public education activities.)</i>	
1e	Management body membership tentatively determined <i>(Management core group starting to conduct regular meetings with proper documentation.)</i>	
1f	Preliminary management plan drafted	

Level 2: MPA is established - Fair (Year 1 or 2 since legal establishment) (16 points required)

2a	Community acceptance gained and documented <i>(Documented through public consultation documents, e.g., Barangay Resolutions and/or signature campaigns.)</i>	
2b	Ordinance passed and approved by the Municipal Council <i>(Ordinance should be well-drafted and enforceable and should be consistent with the concepts of sustainable use and equitable sharing of resources.)</i>	
2c	Management body formally organized and recognized <i>(Management group has legal mandate and is recognized by the local government; for POs – registered with the Securities and Exchange Commission or Department of Labor and Employment.)</i>	
2d	Management plan adopted by community and LGU or PAMB <i>(Management plan initially implemented and endorsed by LGU/PAMB.)</i>	
2e	Management activities started <i>(Conducted initial MPA activities such as: installation of enforcement support structures, patrolling and surveillance, apprehension of violators, etc.)</i>	
2f	Biophysical monitoring includes local participation <i>(Locals were trained to do biophysical survey using standard/accepted method.)</i>	
2g	IEC activities conducted to raise understanding on MPA rules and regulations <i>(MPA rules and regulations disseminated using appropriate and practical means to target all direct users and other stakeholders; initial stakeholder knowledge assessment conducted.)</i>	
2h	Anchor buoys, marker buoys and/or boundary markers installed	
2i	MPA rules and guidelines posted at strategic locations	
2j	MPA outpost or other structures constructed <i>(Guardhouse and/or other MPA-related structures constructed.)</i>	

Level 3: MPA is enforced - Good (Only applies for 2 years or older) (24 points required)

3a	Education program sustained public awareness and compliance (A long-term IEC program exists and is currently being implemented in support of enforcement and the general MPA objectives.)	
3b	Regular biophysical monitoring measuring habitat condition and changes conducted (Documented surveys conducted at least once annually using standard/accepted method.)	
3c	Collaborative patrolling and surveillance conducted by mandated enforcement group and local community volunteers (Fish wardens on rotation assigned to guard and patrol the MPA, day and night with assistance from local community volunteers.)	
3d	MPA billboard signs, boundary markers and anchor buoys maintained (Funds allocated for maintenance of enforcement support structures. May be part of the municipal CRM budget.)	
3e	Management body active (Implements the management plan; coordinates enforcement activities; members attend meetings regularly; coordinates and participates in regular monitoring activities.)	
3f	Budget from local government or from other sources allocated and is accessible for MPA management (There is a legal document by the local government or an agreement with the private sector allocating budget for MPA management.)	
3g	Fishing effectively stopped inside of sanctuary zone (No fishing-related violations/apprehensions in the sanctuary reported for the past year.)	
3h	Illegal and destructive fishing reduced outside of MPA (Violations/apprehensions reported within 500 m from the MPA boundary was reduced by 50% for the past year.)	

Level 4: MPA is sustained - Very good (Only applies for 3 years or older) (30 points)

4a	MPA management plan updated in a participatory process (Management plan amended with the participation of various stakeholders: fishers, resort and diveshop operators, LGUs, other resource users, both men and women.)	
4b	Annual biophysical monitoring and feedback of results supervised by the managing body and implemented for 2 years or more (Documented surveys using standard/accepted method. Reports are available.)	
4c	Budget from government or from other sources allocated and was accessed for 2 or more consecutive years (There is a legal document made by the local government or an agreement with a funding group allocating budget for MPA operations; financial report available.)	
4d	Management body trained and capacitated to run the MPA independently (Management body supervises management activities [implementation of plans, enforcement, budgeting, monitoring and evaluation] and coordinates activities with partners.)	
4e	Enforcement system fully operational (Enforcement group with mandate and workplan; enforcement support structures maintained and patrolling activities sustained over the years.)	
4f	Illegal and destructive activities stopped inside and within the vicinity of MPA (No violations/apprehensions reported inside and within 500 m from the MPA boundary in the past year.)	
4g	Environment-friendly enterprise and/or user fees collected as a sustainable financing strategy (Sells environment-friendly products/goods to tourists; imposes collection of user-fees; etc.)	

Level 5: MPA is institutionalized - Excellent (Only applies for 4 years or older) (40 points)

5a	Information and education program on MPAs maintained over the years <i>(Information dissemination activities sustained according to long-term IEC program.)</i>	
5b	Ordinance passed by the Provincial Council giving MPA stronger political support <i>(Gives MPA institutional support to strengthen enforcement and collaboration.)</i>	
5c	Management plan refined for adaptive management <i>(Incorporates further refinements after gaining much experience and lessons to improve management strategies.)</i>	
5d	Management plan incorporated in the LGU development plan <i>(MPA incorporated within the long-term LGU area-wide development plan.)</i>	
5e	Evaluation of impacts on ecology and socioeconomics conducted and feedback of results completed <i>(Assessment of resource status and long-term trends conducted. Analysis of change in local economy and long-term trends of user groups conducted. Reports of these studies have been completed and reported back to stakeholders.)</i>	
5f	Revenues from enterprise and/or user fees sustained and accounted for <i>(Existing sustainable financing mechanisms are well-managed and well-documented; financial reports easily accessible.)</i>	
5g	Management body capacitated for financial management and fund sourcing <i>(Management body is well-trained to manage funds effectively [facilitates proper handling, wise use and proper documentation]. They are also trained to seek for financial assistance [formulated and submitted proposals].)</i>	
5h	MPA emphasizes on public education and is being used as a study tour site, residents advocate for MPA <i>(After much experience, members are ready to share lessons and impart knowledge. Presence of an identified group that conducts tours and is capable of giving talks on MPA. Paper/s written on their success stories published.)</i>	
5i	Expansion strategies or enhancement programs initiated <i>(MPA coverage is expanded, e.g., from a sanctuary to a park, or scope of conservation activities is heightened, e.g., coral reef restoration, re-seeding of clams, etc.)</i>	

Total points accumulated: _____

- ♦ Total possible points: 40
- ♦ All points are cumulative.
- ♦ Points from higher levels can be used to satisfy lower rating levels.
- ♦ Adapted from the work of the Coastal Resource Management Project team of Negros Oriental (William Ablong and Erwin Dolumbal) with assistance from A. White, 2001.

Priorities for improved management: [] Lack of community awareness and support (Choose top 3 answers) [] Weak government support [] Weak law enforcement [] Lack of a sustainable financing mechanism [] Need for management capacity development [] Politics [] Multiple resource use conflict [] Lack of supplemental and alternative livelihood [] Others, specify: _____

Name(s) of assessor, position, and affiliation: _____ _____ _____ Contact information (phone, fax, email, postal address): _____ _____ _____

III. MPA SITE SURVEY INFORMATION, BIOPHYSICAL STATUS

Data in this section can be generated through the methods described and the forms provided in *Coral Reef Monitoring for Management* by Uychiaoco *et al.* (2001), ReefCheck by Hodgson *et al.* (2003) and those included herein.

3.1. MPA site description

Date of survey: _____ Time of survey: start: _____ end: _____
Distance from shore (km) : _____
Is this site sheltered? _____ always _____ sometimes _____ exposed
Season _____ northeast monsoon (*amihan*) _____ southwest monsoon (*habagat*)
Water temperature (°C, depth: 0-3 m): _____
Distance from nearest river (km): _____
River mouth width (km) _____ <10 m _____ 11-50 m _____ 51-100 m _____ 101-500 m
Distance to nearest population center (km) _____
Population size (thousand): _____ Population density (persons/km²): _____
Number of resident fishers within 1 km: _____
Presence of mariculture within 500 m: _____ no _____ yes
% of coast buildup with structures: _____
Presence of factories/industries/mining within 5 km: _____ no _____ yes or # observed _____

3.2. Human activities and natural disturbances within the vicinity of MPA

Major coral damaging storms	No: _____	Yes: _____	Date of storm: _____
Mass coral bleaching	No: _____	Yes: _____	Date of bleaching: _____
Overall anthropogenic impact	None: _____	Low: _____	Med: _____ High: _____
Is siltation a problem?	Never: _____	Occasionally: _____	Often: _____ Always: _____
Dynamite fishing	None: _____	Low: _____	Med: _____ High: _____
Poison fishing	None: _____	Low: _____	Med: _____ High: _____
Aquarium fishing	None: _____	Low: _____	Med: _____ High: _____
Harvest inverts for food	None: _____	Low: _____	Med: _____ High: _____
Harvest inverts for curio sales	None: _____	Low: _____	Med: _____ High: _____
Tourist diving/snorkeling	None: _____	Low: _____	Med: _____ High: _____
Sewage pollution	None: _____	Low: _____	Med: _____ High: _____
Industrial pollution	None: _____	Low: _____	Med: _____ High: _____
Commercial fishing	None: _____	Low: _____	Med: _____ High: _____
Fish for the live food fish restaurant trade	None: _____	Low: _____	Med: _____ High: _____
Artisanal/recreational	None: _____	Low: _____	Med: _____ High: _____
How many yachts are typically present within 1 km of this site?	None: _____	Few (1-2): _____	Med (3-5): _____ Many (>5): _____
Level of poaching in protected area?	None: _____	Low: _____	Med: _____ High: _____

Other impacts: _____

Check which activities below are banned:

_____ Spearfishing	_____ Commercial fishing	_____ Anchoring
_____ Recreational fishing	_____ Invertebrate or shell collection	_____ Diving
_____ Others, specify _____		

3.3 Coral habitat surveys (see Benthic Lifeforms and Invertebrates Data Form with Coral Lifeforms)

	INSIDE		OUTSIDE	
	Shallow	Deep	Shallow	Deep
Date of survey				
Survey method used (e.g., PIT; LIT)				
Coordinates: Lat. (deg-min-sec)				
Long. (deg-min-sec)				
Mean depth (m)				
No. of transects/quadrats (n)				
Length of transect (m)				
Reef zone (e.g., flat, slope, crest)				
Mean slope* (degrees)				
Mean topography** (m)				
Mean horizontal visibility (m)				
A. Mean percent of living organisms and nonliving components:				
Corals:	%	%	%	%
Hard corals				
Branching coral				
Massive coral				
Flat/encrusting coral				
Foliose/cup coral				
<i>Subtotal hard:</i>				
Soft corals				
Others:				
Algae				
Fleshy algae				
Turf algae				
Coralline algae				
Seagrass				
Sponges				
Other animals				
Nonliving components:				
Rubble				
Rock and block				
Sand or silt				
White dead coral				
Dead coral with algae				
GRAND TOTAL:	100%	100%	100%	100%

* Approximate steepness of site (angle of slope)

** Mean distance between lowest and highest points on the horizontal transect lines

	INSIDE		OUTSIDE	
	Shallow	Deep	Shallow	Deep
B. Mean invertebrate count (# per 100 m²) [] No data available				
<i>Diadema</i> urchins				
Pencil urchin				
<i>Tripneustes</i> urchin				
Crown-of-thorns starfish				
Giant clam				
<i>Triton</i> shell				
Lobster				
Sea cucumber (edible)				
Banded coral shrimp				
Rare other animals (type/#)				
C. Causes of coral damage (Rate the following as: none = 0, low = 1, medium = 2, high = 3) [] No data available				
Sediment				
Blasting/dynamite				
Boat/anchor damage				
Other breakage				
Seaweed overgrowth				
Coral disease (% of population)				
Trash: fishnets				
plastics				
general				
Bleaching (% of population) (% of colony)				
Other causes (specify)				
Survey team/source of information, affiliation/institution:				
Contact information (phone, fax, email, postal address):				

BENTHIC LIFEFORMS AND INVERTEBRATES DATA FORM WITH CORAL LIFEFORMS

Site name:			Municipality and province:		
Transect no.:	Scuba:	Snorkel:	Coordinates:		
Date (mo/day/yr):			Benthos observer:		Invertebrates observer:
Horizontal water visibility (m):			Depth (m):	Reef zone:	Topography:
Habitat notes:					Slope:
BENTHIC LIFEFORMS		Tally number of points or est. % occupied by each lifeform, e.g., 111-111-111-11 or 12%+34%+22%+...		Total count	% cover
Coral	HC				
	live hard coral				
	branching (CB)				
	massive (CM)				
	flat/encrusting (CE)				
	foliose/cup (CF)				
	SC				
	soft coral				
Dead coral	DC				
	white dead coral				
	DCA				
	dead coral with algae				
Other animals	SP				
	sponges				
	OT				
	other animals				
Plants	TA				
	turf algae				
	MA				
	fleshy macroalgae				
	CA				
	coralline algae				
	SG				
	seagrass				
Nonliving	R				
	rubble				
	RCK				
	rock and block				
	S / SI				
	sand/silt				
TOTAL					
INVERTEBRATES		# within 100 m ²	Causes of coral damage:		
<i>Diadema</i> urchins; <i>tuyom</i> Pencil urchin <i>Tripneustes</i> urchin Crown-of-thorns starfish; <i>dap-ag</i> Giant clam; <i>taklobo</i> Triton shell; <i>tambuli</i> Lobster; <i>banagan</i> Sea cucumber; <i>balat</i> (edible) Banded coral shrimp Rare other animals (type/#)			Rating: none=0, low=1, medium=2, high=3		
			___ sediment ___ bleaching		
			___ blasting/dynamite (___% of population)		
			___ boat/anchor damage (___% of colony)		
			___ other breakage ___ other causes (specify)		
			___ seaweed overgrowth		
			___ coral disease (___% of population)		
			___ trash: fishnets		
			___ plastics		
			___ general		

3.4 Mean fish diversity and density (see Fish Abundance Data Form)

	Inside	Outside
Date of survey		
Survey method used		
Mean depth (m)		
No. of transects (n)		
Length of transect (m)		
Reef zone (e.g., flat, slope, crest)		
Mean slope* (degrees)		
Mean topography** (m)		
Mean horizontal visibility (m)		
Fish diversity (# of species/500 m ²)		
All 19 families***		
Target families***		
Fish density (# of individuals/500 m ²)		
All 19 families***		
Target families***		
No. of species of butterflyfish observed in the general area		
Pelagics and large marine life (approximate number observed in the area) ☐ No data available		
Tuna/mackerel		
Sharks		
Manta rays		
Sting rays		
Sea turtles		
Whales		
Dolphins		
Others (specify)		
Survey team/source of information, affiliation/institution:		
Contact information (phone, fax, email, postal address):		

* Approximate steepness of site (angle of slope)

** Mean distance between lowest and highest points on the horizontal transect lines

*** List of fish – all 19 families and target families are listed on the Fish Abundance Data Form

FISH ABUNDANCE DATA FORM

Site name:		Municipality and province:			
Transect no.:	Depth (m):	Coordinates:			
Date (mo/day/yr):	Time:	Left observer:		Right observer:	
Habitat notes:		Horizontal visibility:	Angle of slope:	Transect orientation:	
FAMILY	Species	Record number of fish per size class			
		1-10 cm	11-20 cm	21-30 cm	specify sizes for >30 cm
<EPINEPHELINAE>* groupers, <i>lapu-lapu</i>					
	Barramundi cod; <i>señorita</i>				
<LUTJANIDAE>* snappers; <i>maya-maya</i>					
<HAEMULIDAE>* sweetlips; grunts; <i>lipti</i>					
<LETHRINIDAE>* emperors; <i>katambak</i>					
CARANGIDAE* jacks; trevallies; <i>talakitok</i>					
CAESIONIDAE* fusiliers; <i>dalagang bukid</i> ; <i>solid</i>					
NEMIPTERIDAE* coral breams; <i>silay</i>					
MULLIDAE* goatfishes; <i>timbangon</i>					
BALISTIDAE triggerfishes; <i>pakol</i>					
CHAETODONTIDAE butterflyfishes; <i>alibangbang</i>					
POMACANTHIDAE angelfishes; <i>adlo</i>					
LABRIDAE wrasses; <i>labayan</i>					
	Humphead wrasse; <i>mameng</i>				
[SCARIDAE]* parrotfishes; <i>molmol</i>					
	Bumphead parrotfish; <i>taungan</i>				
[ACANTHURIDAE]* surgeonfish; <i>indangan</i>					
[SIGANIDAE]* rabbitfishes; <i>kitong</i> ; <i>danggit</i>					
[KYPHOSIDAE]* rudderfishes; <i>ilak</i>					
POMACENTRIDAE damsel fish; <i>palata</i>					
ANTHIINAE fairy basslets; <i>bilang-bilong</i>					
<i>Zanclus cornutus</i>					
	Moorish idol; <i>sanggowanding</i>				
Sharks					
Rays					
Sea turtles					
Others: e.g., tunas					

IV. PERCEPTION SURVEY ON MPA MANAGEMENT AND BENEFITS

Community perceptions about MPA management and benefits

Date of survey	
Barangay/municipality	
No. of respondents	
No. of male and female respondents	_____ Male _____ Female
Years living in community	_____ 1-5 years - recently migrated _____ > 6 years _____ Since birth
Educational attainment	_____ Elementary _____ High school _____ College
Top 3 main occupations	
Top 3 additional sources of income	
Average combined monthly income/household	
Common affiliation of respondents	
Aware of existence of MPA? _____ Yes _____ No _____ Undecided/No answer	
What is the primary purpose of MPA? _____ Breeding place for fish _____ For preservation of organisms _____ For preservation of habitats _____ Protection from fishing _____ Ecotourism site _____ Others, specify _____	
How did you learn these things? (Choose top 3 answers.) _____ Attended assembly meetings _____ IEC materials (e.g., brochures/posters) _____ Attended seminars and trainings _____ Word of mouth _____ Others, specify _____	
In favor of presence of MPA ? _____ Yes _____ No _____ Undecided	
You and your community benefiting from the establishment of MPA? _____ Yes _____ No _____ Undecided	
How do you gauge the change in fish catch adjacent to the MPA? _____ Increased _____ Decreased _____ No change _____ Too early to tell/undecided	
Perceived cause of change _____ Because of MPA _____ Reasons unrelated to MPA	
Types of tourism-related activities _____ Scuba diving and snorkeling _____ Land-based guided tours _____ Others, specify _____ _____ None	
Have your family or anybody from the community benefitted from tourism? _____ Yes _____ No _____ Undecided	
If yes, how?	
Aside from fishing, what other income activities exist? (Choose top 3 answers.) _____ Farming, i.e., crop planting, livestock raising _____ Services (e.g., tailoring, parlor) _____ Construction work labor _____ Public utility vehicle driving _____ Carpentry labor _____ Engaging in small store business _____ Others, specify _____	

Assessment of how MPA is being managed ☐ 0 – Nonexisting ☐ 1 – Poor ☐ 2 – Average ☐ 3 – Good ☐ 4 – Excellent								
Problems/difficulties in management (short answer)								
Suggestions to improve management (short answer)								
How is the community involved? (short answer)								
Since the beginning, what linkages have been established? (name groups/organizations supporting MPA)								
Encountered problems in sustaining linkages? ☐ Yes ☐ No ☐ Undecided								
What problems/issues does your community experience in coastal resource conservation and management? (Choose top 3 answers.) <table border="0"> <tr> <td>☐ Weak law enforcement</td> <td>☐ Lack of institution support</td> </tr> <tr> <td>☐ Politics</td> <td>☐ Budget</td> </tr> <tr> <td>☐ Lack of community awareness and support</td> <td>☐ Multiple-resource use conflict</td> </tr> <tr> <td>☐ Waste management</td> <td>☐ Others, specify _____</td> </tr> </table>	☐ Weak law enforcement	☐ Lack of institution support	☐ Politics	☐ Budget	☐ Lack of community awareness and support	☐ Multiple-resource use conflict	☐ Waste management	☐ Others, specify _____
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☐ Politics	☐ Budget							
☐ Lack of community awareness and support	☐ Multiple-resource use conflict							
☐ Waste management	☐ Others, specify _____							
What do you foresee as possible threats to your fishery resources? (Choose top 3 answers.) <table border="0"> <tr> <td>☐ Exploitation of resources</td> <td>☐ Commercial fishing</td> </tr> <tr> <td>☐ Illegal/destructive fishing (e.g., dynamite, cyanide)</td> <td>☐ Illegal foreshore development</td> </tr> <tr> <td>☐ Increasing population</td> <td>☐ Lack of community awareness and support</td> </tr> <tr> <td></td> <td>☐ Others, specify _____</td> </tr> </table>	☐ Exploitation of resources	☐ Commercial fishing	☐ Illegal/destructive fishing (e.g., dynamite, cyanide)	☐ Illegal foreshore development	☐ Increasing population	☐ Lack of community awareness and support		☐ Others, specify _____
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☐ Illegal/destructive fishing (e.g., dynamite, cyanide)	☐ Illegal foreshore development							
☐ Increasing population	☐ Lack of community awareness and support							
	☐ Others, specify _____							

Survey team/source of information, affiliation/institution: _____ _____ _____ Contact information (phone, fax, email, postal address): _____ _____ _____
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appendix 2

Marine Protected Area Training Manual

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ACRONYMS AND ABBREVIATIONS

CRM	coastal resource management
IEC	information, education and communication
LGU	local government unit
MPA	marine protected area
NIPAS	National Integrated Protected Areas System
CO	community organizing
NTZ	no-take zone
PCRA	Participatory Coastal Resource Assessment
NGO	nongovernment organization
PNP	Philippine National Police

Preface

Background

The Marine Protected Area (MPA) Establishment and Management Training Course is one of the training packages formulated and conducted by the Fisheries Improved for Sustainable Harvest (FISH) Project adapted from the Coastal Resource Management Project (CRMP) of the Department of Environment and Natural Resources (DENR) with support from the United States Agency for International Development (USAID).

This manual was developed from various experiences of CRMP together with their partners as carried out in the CRMP learning areas and the FISH target areas, particularly in the province of Bohol. Various community-based initiatives undertaken with coastal communities have provided valuable lessons in the formulation and development of this training manual. Other contributors to this training manual include the Fisheries Resource Management Project (FRMP) of the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR) and the MPA Project of the Coastal Conservation and Education Foundation (CCEF) supported by the Pew Fellow Program in Marine Conservation.

Course Objectives

The training course is designed to equip participants (technical staff and local communities) with fundamental skills in establishing and managing a community-based and local government supported marine protected areas as well as planning for locating MPAs and MPA networks. Specifically, the participants, at the end of the course will:

- Enhance their knowledge and skills on the processes involved (i.e. resource mapping, baseline data collection, management plan formulation, monitoring and evaluation) in establishing and managing a marine protected areas particularly community-based marine reserves and fish sanctuaries;
- Strengthen capabilities in facilitating MPA establishment and management process with optimum involvement of local communities;
- Demonstrate the process of coming up with a MPA management plan using existing documented information and results of community consultation activities; and
- Enhance knowledge and appreciation for the need to strategically plan for locating MPAs and the value of MPA networks.

Expected Outputs

- Coastal area profile of a study site
- Resource Map delineating boundaries and zones
- MPA management plan (management objectives, strategies, zoning schemes, policies and implementing structure)

Training Package Design

This training package consists of 11 sessions covering a wide range of inter-related topics. Description and objectives of each session as well as the materials required, is included in the session guides. Each topic is supplemented with reading materials for participants' quick reference.

The training program uses various methodologies such as classroom lectures, sharing of experiences in small groups, case analysis, field activity and small group workshops. During field exercises, snorkeling gear and/or scuba diving equipment is required to fully accomplish the activities designed for this purpose.

Notes for the Users

FISH encourages development partners to adopt this package wherever appropriate provided proper acknowledgment is cited. Users may also modify the training package when deemed necessary to fit to the needs of the participants.

Acknowledgments

While this training manual is a collective effort of various partners of CRMP, FISH, and CCEF, it is worthwhile to mention individuals who are at the forefront in the development and formulation of this package spearheaded by FISH and CRMP's training component.

Among those from CRMP are Mr. Stuart Green, Provincial Coordinator of Bohol; Dr. Alan White, Chief of Party; Ms. Evelyn Deguit, CO/CD Advisor; and Mr. Alexis Yambao, CRM Specialist. From FISH are Mr. Cesar Luna, Dr. Alan White, and Mr. Benjamin Francisco.

Others who contributed include Dr. Benjamin Gonzales, ICRM specialist of FRMP; and Mr. Timoteo Menguito of Gilutongan Island, Cordova, who made valuable contributions to the enrichment of some modules. To everyone who in one way or another made this manual possible, your contributions do not go unnoticed.

SESSION 1.0

Introduction to Coastal Ecosystems and Reef Fisheries

OBJECTIVES	At the end of the session, participants will be able to: ▪ describe the biological processes in coastal zone particularly the inter-relatedness between and among habitats; ▪ explain some aspects of the biology and ecology of coral reefs; ▪ expound on the patterns of fish movement and dispersal in the shallow coastal region; ▪ be aware of the relevance of connectivity in the marine environment for planning for marine protected areas (MPAs); and ▪ discuss the issues (causes and effects) of habitat degradation and the need for management.
IMPORTANCE	Basic knowledge on the biological processes in the coastal zone and the understanding of the interconnectedness of the ecosystems is vital in establishment and management of marine protected areas.
METHODOLOGY	Group Activity; Lecture/Discussion
TIME	2 hours
MATERIALS & EQUIPMENT	Idea cards, Manila paper, markers, masking tape, overheads, overhead projector, LCD projector, screen
HANDOUTS & READING MATERIALS	▪ Philippine Coastal Management Guidebook Series # 5 ▪ The Values of Philippine Coastal Resources: Why Protection and Management are Critical ▪ Coral Reefs of the Philippines: A Natural History Guide

TRAINING SESSION 1.0

CONTENT AND ACTIVITY PLAN



20 minutes

Group Activity on Definition of Ecosystem

Break the participants up into groups and refresh their knowledge on coastal ecosystem. Ask the groups to consider:

- What is an ecosystem/habitat?
- How do different habitats link together?
- How do humans affect habitats?

Write down their ideas on overhead transparency. Tell them that these ideas will be considered again after the presentation.



1 hour

Presentation on Critical Habitats

Recall the common tropical coastal ecosystems. Zero in on the characteristics and nature of coastal and marine environment. Emphasize the following points;

- Sea water facilitates reproduction through the spread of gametes and larvae as well as transport of food and other life essentials (nutrients, gases) to and from other places (give sample life cycle of organisms e.g. shrimp, etc., and detritus food chain, food web),
- Open system character of coastal and marine environment is vulnerable to pollutants and infestations (refer to group outputs on some pollutants affecting marine organisms),
- Uses of and threats to coastal habitats and the need for management interventions (i.e. marine protected area)

Lecture outline may include:

- Units of ecosystems
- Coastal habitats (mangrove, seagrass, coral reefs)
- Mechanisms for exchange of benefits among ecosystems
- Nature of seawater
- Reproduction cycle of marine organisms
- Detritus food chain
- Food web
- Reef ecology and biodiversity
- Reef fisheries: reproductive biology and recruitment
- Effects of pollutants to marine organisms
- Typical uses of various coastal and marine habitat
- Human Impacts on Philippine Coastal Environments



30 minutes

Briefing on the Situationer

Present the current ecological situation in the Philippines with respect to coastal resources. If possible, also give a briefing regarding the state of resources at that particular training site (i.e. at the provincial or municipal level), to give them an idea how they are linked to the bigger Philippine scenario. Refer them to handouts for further reading. Use the outline below for the presentation of the status.

- The Philippine Coastline
- Fisheries in Decline
- Mangroves in Trouble
- Lost Reefs
- Marine Pollution



10 minutes

Summary and Discussion

Summarize the concepts discussed under this session by drawing out ideas of the participants on the following points:

- Key biological processes in the coastal zone and ecosystem
- Human activities which have negative impacts on coastal zone

HANDOUT #1

RELATIONSHIP OF MANGROVE, SEAGRASS AND CORAL REEF ECOSYSTEMS

Physical interactions

Seagrasses and mangroves are highly dependent on the hydrodynamic barrier created by coral reef, which reduce wave energy. The growth of seagrasses is enhanced when these barriers are present.

Coral reefs are active producers of carbonate materials. Large amounts of these materials are broken down and washed ashore. These materials form shoals, islands and beaches that may be eventually colonized by seagrasses and mangroves.

Seagrasses on the other hand, trap and stabilize sediments, which is important to coral reefs. Trapping and stabilizing sediments reduces sediment load that could cover the reefs particularly when there is typhoon.

Mangroves act as a depositional basin and are effective binders of sediments. As a result, the sediment load into the coastal waters is reduced. They also reduce the freshwater inflow into the marine environment.

Nutrient transport

Inorganic nutrients particularly phosphorus and nitrogen are essential to the primary producers in the three ecosystems. However, their requirement varies. Mangroves can tolerate a high nutrient input. Seagrasses tolerate high rates of eutrophication. Coral reefs recycle nutrients and do not tolerate large influxes from other sources. Corals grow best in low nutrient areas.

Mangrove and seagrass ecosystems export nutrients as dissolved and particulate organic matter that nourish some coral reef organisms.

Animal migration

There are two types of migration that exist in these ecosystems. These are:

- a. Short term feeding migration - this is exhibited by animals such as turtles, grunt, and snappers that feed on seagrasses and mangroves during the day and return to coral reefs during the night for shelter.
- b. Life history migration between systems this is exhibited by lobster. After spawning, lobster larvae are carried by currents and waves into the shore. The larvae settle among the roots of mangroves and in seagrass beds. As juveniles grow, they move back to coral reefs, where they generally hide during the day and emerge at night to feed.

Human impacts

- a. Mangrove

In the case of riverine mangroves, destruction will allow terrigenous sediments to flow onto seagrass beds and coral reefs. There will be an excessive outflow of sediments that will cause shading and eutrophication.
- b. Seagrass

Sediments may become unstable with removal of seagrasses. This has deleterious effects on coral reefs, mangroves and adjacent seagrass beds.
- c. Coral reefs

Actual removal of the reef framework will lower protection from wave energy and allow erosion of sediments from the coastal zones.

BIOLOGY OF CORALS

Reef types

- Fringing Reef
- Barrier Reef
- Atoll

Food

Organic nutrient excreted by zooxanthellae and from their prey. (Algae supply 98% of the food consumed by corals)

Inorganic nutrients absorbed from the sea and food captured by coral polyps and zooxanthellae (phosphates, nitrates, iron).

Growth

Corals thrive best in depths 0-20m. They are rarely found > 40m. The maximum water temperature is 35° C and minimum is about 20° C.

Massive reef structures are built over thousands of years by tiny coral polyps aided by minute dinoflagellate algae (zooxanthellae) that live their tissues, calcifying algae, and other organisms that secrete calcium carbonate and adhesives. This process of reef formation is heavily dependent upon photosynthesis by these reef-building organisms.

Acropora (*A. hyacinthus*) can grow 10 cm/yr.; branching colonies of staghorn, 15 cm/yr. Massive colonies (8m in height are nearly 1000 years old) and grow only 1-3 cm/year.

Reproduction

- Asexual duplication or sexual reproduction
- Individual polyp bail-out and develop into new colony
- Daughter polyp develop when stress (in *Fungia*)
- Corals having gonads of both sexes may fertilize themselves
- Male release sperm to females for internal fertilization
- Male and female gonads are released for external fertilization

Territoriality and aggression

- Corals attack one another during nighttime when tentacles are extended.
- Other corals are fast growing but vulnerable to the effects of storms or boring organisms. - branching, soft corals

Enemies of coral

- Crown-of-thorns starfish, avoids massive colonies (*Porites*, *Diploastrea*)
- Gastropod (*Drupella*, etc.)
- Boring organisms, mussel and peacock worm
- Fishes are greatest predator, scraping, and biting off. 1/3 of annual growth of coral colony consumed by fishes
- Coral fishes: parrot fish, scrapping and biting off coral; butterfly fish eat coral polyps; and puffer fish, boxfish, gobies, and some damsel fishes eat invertebrates
- Human activities: sedimentation, coral collection, dynamite fishing, anchoring, gleaning, tourism, cyanide fishing, etc.
- Disease called coral bleaching, algae being expelled or die off, turning corals into white

Coral community

Competition within the community

- Sessile coral-reef organism must compete for space.
- Corals compete for space by overgrowing or directly attacking their neighbors. Sweeper tentacles are used to sting neighboring colonies.
- Soft corals are important competitors for space on reefs. They can grow rapidly and are resistant to predators and can occasionally move about.
- Competition on fish species. They have similar diets on corals, algae, and carnivore.
- Corals and seaweeds compete for light as well.

Predation

- The Crown-of-thorns
 - most prominent predator
 - increases in numbers of larvae have been correlated with rainfall and increases in nutrients from rivers during floods
 - human induced activity may be the collection of predator shells (e.g. Triton), forest clearing and, fertilizing crops.
 - periodically attack some Philippine reefs

Grazing

- Grazers help prevent fast-growing seaweeds from overgrowing other sessile organism on the reef.

Living together

- Symbiotic relationships are very important in coral reef communities. Coral reefs have more examples of symbiosis than any other biological communities:
 - corals and zooxanthellae
 - giant clams, sea anemones and snails also have zooxanthellae
 - sponges and cyanobacteria
 - parasites, commensals and mutualist
 - commensalism between corals and crabs, shrimps (40 species), shells, fishes
 - sea anemone and anemone/clownfish

PATTERNS OF FISH MOVEMENT AND DISPERSAL

1. Fish habitats, coastal region

- About 80% of the 10,000 or so fish species in the shallow seas live in warm temperate or tropical waters most associated with coral reefs and atolls, where water temperature doesn't fall below 18°C. Coral reefs are distributed between 30 ° North and 30 ° South latitude.
- At night, squirrelfishes, luminescent pempherids emerge from daytime hiding places, while parrotfish retires to sleep in mucous cocoon.
- Camouflage ambush predators also exist in the coral reefs.

2. Temporal patterns of fish movement

a. Diel Cycle

- Shallow warm water with photoperiods in which the length of day and night are similar and the transition between the two is rapid. This transition is accompanied by change in assemblage of active species.
- Daytime colored species (damsel, parrot) stay close to the reef. Herbivores are generally diurnal species.
- Squirrel fishes and sweepers are nocturnal feeding on zooplankton.
- As sunset approaches diurnal fishes make vertical or horizontal movement from feeding areas to shelter.
- 20 minutes transition period before nocturnal species swim to their feeding areas. Piscivore has visual advantage.

b. Tidal Cycle

- Photoperiod of high activity coincide with the predicted times of high tide.
- Adaptation to an intertidal life is the ability to find shelter because of the

3. Patterns of movement and use of space

a. Shoaling

- Shoaling for social reasons, schooling for swimming migration, aggregating responding to environmental cue (temperature, current)
- Shoaling for foraging, protection, from predator, accuracy of migration to suitable area/habitat.

b. Migration

- Movement to suitable habitats at appropriate times during the life span
 - reproduction
 - feeding
 - refuge/shelter
- Complex if habitats suitable for feeding or refuge are different at different stages in the life cycle.
- Grunts (Haemulidae) refuge on coral reef and prey in sandy or seagrass beds.
 - Transplanted individual learns patterns from local residence.

4. Larval dispersal

- Planktonic larval stages of benthic adults do serve as their dispersal strategy.
 - non-feeding larvae has food stored in yolk form.
 - basically the probability of finding an appropriate place to settle will decrease with distance travelled
- If parents have survived to breeding age in a given area, then that region can be regarded as of guaranteed suitable for the offspring
- The longer these tiny organism spend in the water dispensing, the greater the change being consumed by the predator, thus more must be produced to counter balance such losses
- Tidal and wind driven current carries planktonic larvae

The relationship between length of marine planktonic larval life and the distance likely to be transported away from the point of release (Crisp, 1978)

Duration	Approximate distance transported (km)
3-6 hrs.	0.1
1-2 days	1.0
1-2 weeks	10.0
0.5-3 months	100.0
1 year	1000.0

BENEFITS OF OPENNESS

Transport of gametes and larvae

- One of most important connections between marine habitats involves the transport of gametes (=microscopic eggs and sperm) and larvae (=bizarre, usually microscopic, immature forms of most marine organisms). For most organisms, gametes and/or larvae are planktonic.
- Most organisms release thousands to millions of gametes into the water column. For organisms with a free-living larval stage (either because of direct development from egg to juvenile or because of brooding sperm enters a nearby adult and fertilizes the egg within the body of that adult).
- Many species of corals release buoyant gametes. Larval development to the juvenile form takes several days. The larvae is likely to be dispersed away from the parent reef and that new corals on one reef must come mainly from other reefs. Because of this, the reef depends on each other for a continued supply of larvae. Therefore, individual reefs can not be managed appropriately in isolation. Whether coral disperses a long or short distance, may depend on the species, current patterns or other factors prevailing when spawning occurs.

Transport of food, nutrients and gases

- Most sessile and many mobile marine organisms are planktivorous. Sessile organisms must wait for food and nutrients to be brought to them. When plankton and larger organisms die and begin to decompose, this material is also carried in seawater and is consumed by other organisms. Very little is wasted in marine environments. Decomposing bits of plants and animals (detritus), is a major constituent of diets in many food webs.
- Nutrients (e.g. nitrogen, phosphorus, calcium, silica, and carbonate) and life sustaining gases (e.g. oxygen and carbon dioxide) are transported in particulate or dissolved form in seawater.
- Most marine organisms are well adapted to surviving on low concentrations of nutrients characteristic of most marine environments; but currents allow what little there is to be distributed more or less evenly among marine communities.
- Major natural inputs to the marine environment include rivers and the recycling of nutrients released when organisms die and decompose.

Hazards of Openness

Transport of pollutants and contaminants

- Like larvae and nutrients, pollutants and toxins are easily spread by currents tens to hundreds of kilometers away.
- Spills can spread over the ocean surface, throughout the water column and/or over benthos, i.e. spread in 3 dimensions.
- Contaminants can also be spread by mobile organisms, especially marine ones which usually travel further relative to body size.
- Interconnectedness of marine habitats resulting from transporting properties of sea water makes the marine environment especially vulnerable to pollution.
- Epidemics of noxious or pest organisms e.g. Crown-of-thorn starfish.

Threats of Man's Uses of the Marine Environment

- Overexploitation – removal of resources faster than they can be replaced naturally or artificially
- Destructive techniques of usage – destruction of habitat essential to growth, survival and reproduction of resource or destruction of non-targeted species or juveniles of desired species (e.g. explosive fishing, trawling close to reefs, fish “driving”, etc.)
- Pollution
 - Sewage/detergents* – interfere with physiological processes, i.e. biochemical reactions inside organisms allowing them to feed, grow, reproduce, respond to change and hence survive.
 - Sewage/fertilizers and other nutrient-rich wastes* – stimulate growth of phytoplankton, algae and other plants beyond ability of herbivores to keep them in balance (Eutrophication). These phytoplankton “blooms” often followed by blooms of zooplankton. These, plus increased bacterial production breaking down dead planktonic organisms, can deplete available oxygen in water. Algae can overgrow and smother corals and other sessile organisms.
 - Sediments/turbidity* – excess sediment directly smothers sessile organisms, preventing them from feeding and breathing normally. Increased turbidity (i.e. increased “cloudiness” of water) reduces light penetration and thus ability to photosynthesis.
 - Herbicides* – Damage or destroy zooxanthellae living in tissues of corals, giant clams and other sessile organisms, thus cutting off means by which these animals obtain significant proportion of food. Also damage or kill free-living phytoplankton, algae, seagrasses, even at very low concentration.
 - Pesticides* – Particularly harmful to planktonic larvae. May also destroy or damage other zooplankton or reef communities. Interferes with normal physiological processes.
 - Petroleum hydrocarbons* – Wide range of damaging effects on survival, growth, reproduction, photosynthesis, cell structure, larval settlement, feeding and behavior of marine organisms. Contact poisons physiological processes:
 - Direct coating clogs breathing organs in plants and animals and, in sunny conditions, raises body temperature of affected organisms. Coating on water or sediment raises temperature up to 10°C “cooking” the organism.
 - Larvae of marine invertebrates 10-100 times more vulnerable than adults.
 - Many factors affect nature and magnitude of damage: type and amount of oil spilled, prevailing weather and current conditions, state of tide, type of organisms contacting oil, types of detergents and dispersants used to clean up spill, and interaction with other pollutants.
 - Heated water from power-plants* – since temperature critical factor in distribution, reproduction and other physiological processes, thermal pollution changes overall ecology and nature of communities.

Hypersaline waste water from desalination plants – Salinity is another critical factor in organization and survival of marine communities. Effects of hypersaline waste water similar to effects from heated waste water.

Heavy metals (e.g. mercury, cadmium, lead) – tend to be accumulated in plant and animal tissues, with severe effects on physiology of sessile and mobile species. Heavy metals passed on up food chain to large predators, which may accumulate dangerous or lethal concentrations to man.

Anti-fouling points and agents – likely to be important only near major harbors, shipping lanes and industrial plants cooled by seawater. Destroy or damage zooplankton and reef communities.

SESSION 2.0

Coastal Resource Management as a Basic Service of Local Governments

OBJECTIVES	At the end of the session, participants will be able to: ▪ explain the rationale of coastal resource management (CRM) as a basic service of local governments, ▪ answer basic questions on the concept of CRM and identify the major characteristics, ▪ define the unit of CRM and enumerate the goods and services derived from the coastal area ▪ describe the development and implementation of CRM plans, ▪ relate various coastal management activities (with emphasis on marine protected areas [MPAs]) to the framework of CRM as basic service of local governments
IMPORTANCE	Basic understanding of the concepts of CRM allows the participants to relate marine protected areas (importance and function) to the overall scheme of coastal management.
METHODOLOGY	Small Group Activity; Lecture; Discussion
TIME	1.5 hours
MATERIALS & EQUIPMENT	Idea cards, Manila paper, markers, masking tape, overheads, LCD, overhead projector, screen
HANDOUTS & READING MATERIALS	▪ Philippine Coastal Management Guidebook Series # 1 & 3 (definitions and trends in coastal management; and introduction to the coastal management process in the Philippines) ▪ Coastal Resource Management for Food Security ▪ Monitoring and Evaluating City/Municipal Plans and Programs for Coastal Resource Management

TRAINING SESSION 2.0

CONTENT AND ACTIVITY PLAN



30 minutes

Group Activity on the Concept of CRM

Introduce the session to the participants. Start by asking the participants to recall their understanding of CRM. List the key words/ideas down on a manila paper. Present the definition and elaborate this by relating their ideas to the concept of CRM. The presentation may follow this outline:

- Define coastal resource management
- Why is coastal resource management necessary?
- Coastal environmental management issues
- What are the goals of CRM?
- Principles of CRM
- Major features of the approach
- Basic contents of CRM plan
- Characteristics of CRM programs
- Objectives and strategies of CRM (MPA as one of the strategies)



40 minutes

Presentation on Integrated Coastal Management and CRM as a Basic Service

Go through each of the phases of the CRM process and show examples. Point out that some of these phases are not usually given equal importance during implementation. Zero in on the implementation phase including MPA as one of the strategies and components of CRM implementation.

Also present the legal basis that local government units (LGUs) are in fact mandated to carry out the functions illustrated in the CRM framework. Ask the participants what other legal provisions they know, that support the institutionalization of CRM. Present statistics of LGUs adopting CRM as a basic service and note that very few coastal municipalities thought about adopting CRM as a basic service.

- Evolution of coastal management
- Legal basis of CRM as basic service
- Integrated coastal management framework and activities (highlight MPA in the cycle)
- Institutional arrangements
- Key results indicators (highlight MPA as one of the best practices)
- Status of LGUs adopting CRM
- What can LGUs do to mainstream CRM
- Cases (investments vs. revenues)



20 minutes

Wrap up and Discussion

Stress that the LGUs have already sufficient legal mandate to initiate CRM. What may be needed is to put a little more direction and establishment of programs to start establishing the CRM as a basic service of local governments including most especially, the establishment and effective management of marine protected area.

HANDOUT #2

COASTAL RESOURCE MANAGEMENT

What is coastal resource management?

- Coastal resource management (CRM) is defined as a coherent, multi-sectoral and multi-disciplinary process within a legal and institutional framework that assures equitable involvement and participation from all relevant sectors.
- CRM combines the bio-physical, socio-economic, cultural and political aspects in the conservation and sustainable use of coastal resources.
- CRM is a "...dynamic process in which a coordinated strategy is developed and implemented for the allocation of environmental, socio-cultural, and institutional resources to achieve the conservation and sustainable multiple use of the coastal zone."

Why is CRM necessary?

Increasing populations, with advancing technologies, are making increasing demands on shrinking resources

- 3.5 billion people live in the coastal region (63% of the total global population)
- Impacts on coastal ecosystems increasing
- Ability of coastal ecosystems to provide goods and services decreasing

Coastal ecosystems are a source of food, materials, and income for lower socio-economic groups. If they lose these livelihoods, what will replace them?

- Subsistence activities
- Artisanal fishing
- Small-scale mariculture, tourism
- Small-scale extractive industry

Nations are planning development in the coastal zone to provide jobs and earn foreign exchange in

- Mariculture
- Tourism
- Industrial developments
- Mineral extraction

Why is this happening?

CRM is primarily a governance challenge, and there is traditionally low governance capacity

- Coastal resources are often common property resources
- Little governmental experience in resource management
- Little relationship between laws, technical plans and implementation
- Little commitment to public process
- Lack of constituency or leadership for resource management
- Lack of human capacity to create workable, implementable programs

Significance of coastal resources and regions

Existing and new development

- Tourism
- Coastal mariculture
- Nearshore/offshore gas and oil
- New and intensified industrial development
- Ports
- Coastal mining
- Intensification of fisheries
- Intensification of agriculture
- New and expanding cities

Ecological

- High productivity
- High biodiversity
- Mitigation of flooding and erosion

Sociocultural

- Food
- Fuel
- Cultural religious sites
- Recreation

Institutional Issues in the Philippine Coastal Zone

- Weak law enforcement
- Weak judicial support for enforcement
- Inconsistent laws and ordinances
- Lack of capability and knowledge in planning, implementing and monitoring coastal management
- Overlapping functions among government organizations over the implementation of laws relevant to coastal environment
- Lack of political will in implementing coastal resource management programs

Goals of CRM

- Sustainable development of coastal areas
- Protection and rehabilitation of coastal environments and habitats
- Clean up of polluted coastal water bodies

Major features of the integrated approach

- Multi-sectoral, multi-agency and multi-disciplinary
- Creates opportunities to link planning and implementation
- Directs research at questions of direct relevance to resource management
- Involves those affected by management schemes in all phases of the strategy
- Promotes sharing of experiences among resource managers

Characteristics of a CRM program

- Has continuity
- Has defined boundaries with both seaward and landward components
- Has institutional identity as ...
 - an independent organization
 - or a network of organizations
- Integrates all uses of the coastal zone, including actual and potential
- Is culturally and spiritually responsive
- Is gender sensitive

Principles of CRM

- Holistic, integrated and multi-sectoral in approach
- Consistent with, and integrated into, development plans
- Consistent with the national environmental and fisheries policies
- Must build on, and integrate into, existing institutionalized programs
- Planning and implementation must be participatory
- Builds on local/community capacity for sustained implementation
- Builds self-reliant financing mechanisms for sustained implementation
- Address quality of life issues of local communities as well as conservation issues

Overall process of CRM

- Identification of major issues
- Issues evaluation and prioritization
- Formulation of detailed management plans for selected issues
- Plan adoption
- Plan implementation
- Evaluation and adjustment

Components of a CRM plan

- Objectives for management
- General policies
- Strategies to solve issues
- Actions for each strategy
- Institutional structure for implementation

Characteristics of a good plan

- Issue-based
- Realistic management actions
- Definite criteria for decision-making
- Supported by factual data
- Participatory and popular

Plan formulation

- What are the needs?
 - *Identify issues*
- Which of the needs shall we be able to meet and when?
 - *Issues evaluation and objective setting*
- How shall we meet them?
 - *Strategy formulation*

- Who is to do what?
 - *Implementing structure*
- How can we cope with environmental impacts?
 - *Evaluation mechanisms*
- What resources must be developed?
 - *Resource identification and budgeting*
- When will the steps be taken
 - *Work planning*
- How do we ensure progress?
 - *Monitoring schemes*

CRM Planning

CRM planning is a process of comprehensively studying resources, economic activities, and societal needs, including problems and opportunities in the designated planning area or zone, and proposing future actions (Clark 1995). It is a process of organizing ideas and resource to make things happen. Two questions are important to be answered in planning: (1) What do you want to happen: and (2) How do you want it to happen?

A CRM Plan for any area (*barangay*, municipality or city, multi-municipal wide) requires basic contents to make a good plan. The essential parts of a good plan follow (White 1999):

1. **Description of the area** provides background information. This can include geography, demography, important coastal resource and their condition, socio-economic status of the people, institutions and laws and other relevant information for management.
2. **Maps** of different scales needed. Include a map of the entire area and detailed maps of the coastal area with resource locations and use patterns, existing management interventions and other data.
3. **Management issues** must be clearly stated along with their contributing causes and factors. Trends in decline of resources can be used to illustrate issues of concerns.
4. **Goals and objectives** should derive from the main issues. The goal is broad while each objective must be achievable and measurable within 3 to 5 year life of the plan.
5. **Strategies and actions** are the heart of the plan. One strategy and several actions with assigned responsibilities should address each major issue. A strategy is a well-conceived means to solve a problem. The actions implement the strategy. Actions can be budgeted.
6. **Institutional and legal framework** is needed to support plan implementation. This section explains what institution is responsible and why as supported by law.
7. **Timeline** for implementation helps organize all responsible parties to implement the plan.
8. **Monitoring and evaluation** must be included as a set of activities to provide feedback on plan implementation and impact on environment.

Following are some of the basic programs and strategies on coastal management. There is a number of strategies that have been proven technically feasible and are being implemented in some local government units. However, aside from looking at the technical feasibility of each program and strategy, social acceptability is also important. Note that the success of the implementation of the programs lies both on their technical feasibility and social acceptability.

Strategies are not exclusive to one program. There are strategies that can be used in two or more programs, such as the establishment of sanctuary - a strategy in fisheries management and in habitat management. There are also cross-cutting strategies, such as information, education and communication (IEC) and community organizing, that are applicable in all programs. The strategies can be operationalized through specific activities and actions.

1. Fisheries management

Objectives

- To increase productivity of fisheries resources in order to achieve food security
- To regulate access to the municipal waters and reserve its resources for the benefits of the municipal fishers
- To regulate the exploitation of fisheries resources and limit fishing efforts to sustainable levels
- To ensure the rational and sustainable development and management of the fishery resources
- To develop monitoring, control and surveillance mechanisms and strengthen law enforcement units
- To ensure equity in fisheries exploitation

Strategies

- Establishment and management of marine protected areas or fish/marine sanctuaries
- Designation of closed season in harvesting commercially and ecologically-important fish and invertebrates during their spawning season and/or their juvenile stage.
- Designation of closed areas for identified migration routes of commercially and ecologically-important fish
- Registration, licensing and permitting of fishers, fishing gears and fishing boats
- Sustainable management of coastal aquaculture
- Regulation on the deployment, use of and access to artificial reefs
- Regulation of the construction and operation of fish corrals, other fishing gears and fishing activities that occupy space in the coastal waters
- Restriction of commercial fishing vessels in the municipal waters
- Enforcement of environmental and fisheries laws
- Setting-up of fisheries monitoring mechanisms
- Conduct of massive IEC campaign
- Community organizing and formation of fishers' organization for and conservation

2. Habitat management

Objectives

- To protect, conserve and rehabilitate existing habitats.
- To improve productivity and biodiversity of corals, seagrasses, mangroves and estuaries.
- To enhance community participation in the management of the habitats

Strategies

- Establishment of marine protected areas (corals, mangroves, seagrass)
- Management of mangroves under the Community-Based Forest Management framework
- Protection of seagrass beds by regulating fishing activities destructive to the habitat
- Enforcement of environmental and fisheries laws
- Conduct of massive IEC campaign
- Community organizing and formation of fishers' organization for and conservation

3. Coastal zoning

Objectives

- To delineate zones for specific uses or activities in the municipal waters
- To eliminate use conflict in the utilization of the municipal waters
- To regulate activities in the different zones

Strategies

- Delineation of municipal waters' boundaries
- Designation of zones for specific uses (for strict protection, rehabilitation, aquaculture, tourism, trade and navigation, etc.)
- Regulation of fishing activities and use of fishing gear in every zone
- Conduct of massive IEC campaign
- Community organizing and formation of fishers' organization for and conservation

4. Shoreline management

Objectives

- To protect the shoreline from further degradation due to destructive activities.
- To maintain access of the people to foreshore area
- To regulate activities in the foreshore area that would affect the condition of the shore
- To minimize erosion and loss of beach to natural and human induced forces

Strategies

- Regulation of sand and coral mining
- Protection and conservation of mangroves
- Setting-up and maintenance of coastal setbacks for all development
- Construction and maintenance of seawall
- Conduct of massive IEC campaign
- Community organizing and formation of fishers' organization for and conservation
- Watershed management

5. Coastal tourism management

Objectives

- To provide economic incentives for the municipality and the coastal communities by optimizing the tourism potential of certain areas.
- To develop local capability in ecotourism projects that contribute to better coastal management and community development
- To develop incentives for resource conservation

Strategies

- Regulation on the number of tourism facilities and activities
- Maintenance of wastes disposal facilities
- Ecotourism product development
- Visitors education and management
- User fees and appropriate business development
- Conduct of massive IEC campaign
- Community organizing and formation of fishers' organization for and conservation

6. Enterprise and livelihood management

Objectives

- To develop alternative and supplement employment to fishers in order to lessen their fishing effort and pressure to the sea.
- To diversify income source of the fishers to lessen dependence on fishing.
- To develop environment-friendly enterprise and livelihood projects

Strategies

- Identification and implementation of environment-friendly and economically-feasible projects
- Identification of beneficiaries

7. Waste management

Objective

- To eliminate or minimize the potential adverse impact of wastes to human and environmental health.

Strategies

- Water Quality Monitoring
- Domestic waste segregation
- Sewage waste treatment, especially for tourism and industrial facilities
- Monitoring, control and surveillance
- Conduct of massive IEC campaign

8. Legal arrangements and institutional development

Objectives

- To improve mechanisms and arrangements for local governance on coastal management
- To enhance community participation in coastal management planning, legislation, implementation, monitoring and evaluation
- To strengthen environmental and fishery law enforcement
- To improve the delivery of coastal management-related services
- To strengthen network and linkage with other local government units (LGUs), national government, international and local organizations and community and people's organizations

Strategies

- Legislation of comprehensive CRM ordinance
- Formation and strengthening of peoples' organizations
- Strengthening of Fisheries and Aquatic Resource Management Councils, *Bantay Dagat*, and Fish Warden
- Monitoring, control and surveillance
- Training and staff development on CRM
- IEC
- Fund-sourcing

Following is a proposed outline of a CRM Plan.

**Outline of the
Coastal Resource Management Plan
of the
Municipality of _____**

Chapter One: Introduction

- Why the Plan?
- Scope of the Plan
- History of the Planning Process
- Goals and Objectives of the Plan

Chapter Two: Coastal Environmental Profile

- Introduction
- Brief Historical Background
- Geography and Physical Setting
- Status of Resources
 - Fisheries
 - Coastal Habitats
 - Other Resources
- Population, Demography and Socio-Economics
 - Population Distribution
 - Education
 - Health, Water and Electricity
 - Transportation
 - Markets
 - Livelihood
- Resource Uses
 - Capture Fisheries
 - Culture Fisheries
 - Tourism
 - Mangroves
- Institutional and Legal Framework
 - Ordinances and Resolutions

Chapter Three: Management Issues, Strengths and Opportunities

- Introduction
- Resource Degradation
- Socio-Economic and Livelihood
- Legal, Institutional and Administrative
- Education, Public Awareness and Participation

Chapter Four: Coastal Management Programs, Strategies and Actions

- Introduction
- Fisheries Management
 - Background
 - Recommended Policies
 - Strategies (1, 2,...)
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)

Habitat Management

- Background
- Recommended Policies
- Strategies (1, 2,...)
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)

Coastal Zoning

- Background
- Recommended Policies
- Strategies (1, 2,...)
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)

Shoreline

- Background
- Recommended Policies
- Strategies (1, 2,...)
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)

Enterprise and Livelihood Management

- Background
- Recommended Policies
- Strategies (1, 2,...)
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)

Coastal Tourism Management

- Background
- Recommended Policies
- Strategies (1, 2,...)
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)

Waste

- Background
- Recommended Policies
- Strategies (1, 2,...)
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)

Legal Arrangements and Institutional Development Waste

- Background
- Recommended Policies
- Strategies (1, 2,...)
 - Strategy 1 (Activities, Schedule, Budget, and Agencies)

Chapter Five: Administration and Coordination of Implementation

Introduction

Plan Implementation

Implementing Structure

Monitoring and Evaluation

SESSION 3.0

Marine Protected Area: A Strategy for Managing Habitats and Fisheries

OBJECTIVES	At the end of the session, participants will be able to: ▪ elaborate the definition of marine protected area and other related concepts i.e. fish sanctuary, reserve and park; ▪ explain the brief history of marine protected areas in the Philippines; ▪ distinguish the categories of marine protected area as defined under the National Integrated Protected Areas System (NIPAS) and Fisheries Code; ▪ explain the benefits and possible management objectives of marine protected areas; and ▪ identify key factors in implementing a successful marine protected area (MPA).
IMPORTANCE	Appreciation of the role of marine protected areas in habitat enhancement and fisheries management gives the participants proper perspective how MPAs work.
METHODOLOGY	Lecture/Discussion
TIME	1.5 hours
MATERIALS & EQUIPMENT	Idea cards, Manila paper, markers, masking tape, overheads, overhead projector, screen
HANDOUTS & READING MATERIALS	▪ Philippine Coastal Management Guidebook Series # 5 ▪ How is your MPA doing?

TRAINING SESSION 3.0

CONTENT AND ACTIVITY PLAN



40 minutes

Discussion on the Concept of a MPA

Ask the participants to consider following:

- What is a MPA?
- How is it different from marine sanctuary, reserve, park, etc?
- What were the significant milestones as regards to MPAs in the Philippines?
- Why MPAs for managing habitats and fisheries?
- How MPAs work?

Write down their ideas and process them by clustering related ideas. Process their answers. Link the discussion on the definition of MPA, historical background, categories and characteristics using the outline below as guide.

- Definition of MPA, sanctuary, reserve, park
- Similarities and differences of MPA, sanctuary, reserve, park
- History of MPAs in the Philippines
- National and local categories of MPAs

Elaborate the concept of marine protected area by differentiating marine protected area from sanctuary, reserve, park;

- Emphasize the conceptual and practical similarities and differences,
- Point out the national and local categories for protected areas and their jurisdictional limits,
- Stress that marine protected area is one of the strategies in fisheries and habitat management programs. Give examples.



40 minutes

Lecture on MPA Management Objectives

Emphasize that there are several MPAs having various objectives. Encourage participants to share the objectives they know. Explain that good understanding of benefits of MPA can lead them to clearly think of the possible objectives. Lecture outline may include:

- Benefits of MPA
- Management objectives of MPA
- Factors in implementing a successful MPA



10 minutes

Wrap up

Summarize the presentation by asking the participants some questions using the session objectives as basis.

HANDOUT #3

MARINE PROTECTED AREAS: A STRATEGY FOR MANAGING HABITATS AND FISHERIES

Fisheries and habitat management

Fisheries management aims to reduce fishing effort to sustainable levels and to improve the overall ecological integrity of the fishery and its habitat.

Marine protected areas (MPAs) are merely one of the options under fisheries management and habitat management programs within coastal resource management (CRM). Other management options include:

1. Registration and licenses
2. Gear restrictions and other effort restrictions
3. Minimum mesh sizes
4. Closed seasons, quotas, etc.

Most of these are difficult to enforce and manage and are not so successful in management *because...*

1. Need large amounts of information about the life histories of fish species (which scientists do not always have)
2. Most theory is based on single species theory on stocks which is **not** applicable to multi-species, multi-gear fisheries, as in the Philippines.
3. Enforcement is difficult and expensive

Therefore one Fisheries Management strategy is the fish sanctuary or MPA. It is gaining recognition as an effective fisheries management strategy for implementation because it is equal for all fishers, has positive biophysical benefits and is fairly easy to enforce.

Definition of a protected area

Fisheries Code (R.A. 8550)

- Fishery refuge and sanctuaries
“A designated area where fishing or other forms of activities which may damage the ecosystem of the area is prohibited and human access may be restricted”
- Fishery reserve
“A designated area where activities are regulated and set aside for educational and research purposes”

NIPAS Act (RA 7586)

- Protected area
“ Identified portions of land and water set aside by reason of their unique physical and biological significance, managed to enhance biological diversity, and protected against destructive human exploitation”
- Marine protected area (MPA)
“A defined area of the sea established and set aside by law, administrative regulation, or any other effective means, in order to conserve and protect a part of or the entire enclosed environment, through the establishment of management guidelines. It is considered a generic term that includes all declared areas governed by specific rules or guidelines in order to protect and manage activities within the enclosed area.” (Arceo *et al.* 2004)

- Marine reserve
“An area where access and uses (whether extractive or non-extractive) are regulated or controlled for specific uses or purposes. A marine reserve may include a marine sanctuary within its boundaries. The entire area need not be placed under the same conditions or restrictions as a marine sanctuary, but all uses are still controlled and regulated to the extent necessary to ensure that little or no harm is imposed on the environment enclosed in the reserve.” (Arceo *et al.* 2004)
- Marine park
“A type of marine reserve, in which multiple uses may be allowed through zoning regulations, and where conservation-oriented recreation, education and research are emphasized. A marine park may include a marine sanctuary within its boundaries. An example of a marine park in the Philippines is the Tubbataha Reef National Marine Park.” (Arceo *et al.* 2004)
- Marine sanctuary
“A defined area established and set aside exclusively for the purpose of protecting habitats and species, through the prohibition of all extractive uses and strict regulation of non-extractive uses. This term is synonymous with ‘no-take-zones’ (NTZs). A marine sanctuary may have buffer zones around the area sought to be protected from extractive and non-extractive uses. It may be located within a marine reserve or marine park.” (Arceo *et al.* 2004)

Basically a community-based marine sanctuary or reserve should have the following characteristics:

- No-take in part or all the area
- Managed and enforced by the community and the municipality or city through co-management
- Have a legal basis

Objectives of MPAs

1. Preservation of biodiversity and genetic biodiversity

- Ocean covers over 70% of earth's surface and over 3.5 billion years old (Norse 1993)
- Very biodiverse habitats (variety of life forms, species, communities, populations etc.)
- Species on land have been well researched, coastal poorly yet fish are fat, thin, round, box shape, live in arctic waters and in tropics, yet we still know very little, should therefore take a precautionary approach to fishes and other marine organisms
- Medicines
- Other possible uses

2. Conserving ecosystems and maintaining ecological processes

- Protecting unique areas and the different ecosystems, such as estuaries, coral reefs, seagrasses, mangroves etc.
- Endangered species (but relatively sedentary) e.g. Dugong, protect habitat then you can help protect the species
- Imagine food web/food chain, remove some parts of it begins to break up
- MPA should act as **insurance areas** for conserving certain habitats which are dependent and interlinked with each other

3. Sustainable use of resources

- Three main types of uses of coastal resources:
 - Permanent uses: e.g. urban development, reclamation etc.
 - Extractive Uses: e.g. fishing, mangrove poles etc
 - Non-extractive uses: e.g. public recreation, research, tourism etc.
- Many current practices and activities are already dependent on the coastal ecosystem
- The coastal ecosystems offer us a variety of free services that we often do not consider, once these services begin to slow down or become affected that is when we realize
- Many people live in or near coastal zone

4. Protecting commercially valuable species

- Fisheries and the people/workers and families who depend on these
- Food protein, vitamins, almost 50% animal protein consumed in Philippines comes from sea
- Free mariculture/no need for aquaculture
- Identify bottleneck areas, spawning grounds to include in MPA sites can have huge impact on fisheries

5. Replenish depleted stocks

- Many species, especially more sessile/less mobile species are already depleted, e.g. sea cucumber, giant clams,
- Protection of various habitats, e.g. coral reefs
- Other fishes in bottleneck situations, e.g. spawning aggregations, etc.
- Identify nursery grounds (all organisms are most vulnerable when young)
- MPA can be focused to provide protection and rehabilitation of these areas to ensure that the rest of the areas will be supplied with seed and juveniles

6. Education and research

- Public education and awareness raising on the role of the ocean (it is not just a big mass of blue, but a living and breathing mass or soup of organisms)
- Research stations/marine biology to further understand the ocean and its impacts on our lives, weather etc.
- Advancing science and identifying the role of the various organisms and habitats so that later on perhaps we can avoid other mistakes being made

7. Protection from natural hazards

- Coastal protection
- Fringing and barrier reefs
- Storm protection
- Sea level rise
- Acts as buffer to all these impacts and with MPA can ensure quicker recovery of organisms to area through natural seeding, etc.

8. Recreation and tourism

- Majority of tourists see the sea as a place for recreation and relaxing
- Scuba diving and snorkeling
- An intact MPA can attract many tourists to an area, e.g. Apo Island
- Jobs and economic diversification

9. Multiple objective MPAs

- Most MPAs have one or several of the above-mentioned objectives
- In Philippine case, the most common is to increase fishery productivity and to have the community become managers of their own areas
- Objectives should be reflected in the MPA Management Plan

Four considerations for when you decide your management objectives:

- Participation and equity
 - *What do stakeholders want?*
- Feasibility (realistic)
 - *Size, area, contribute to network, etc.?*
- Contributions to network in area
- Sustainability

How to try and make it as sustainable as possible

- Use Adaptive Management Project Cycle (*ensures better monitoring and lessons to be learned*) and keep referring back to the plan and adjusting as you go along.
In theory all MPAs should all be integrated together to produce a network of MPAs that can cover all representative, unique and critical habitats including species rich areas and the processes which link these marine organisms and habitats together. This would offer us the insurance and pockets of protection which can hasten recovery of degraded habitats, organisms as we will no doubt require in the future.

Attributes of a good MPA (social and technical)

- ✓ Reasonable quality of resources covering 10 or more hectares, if poor make it larger and include more habitats in habitat area
- ✓ Management committee organized and active with clearly defined roles and medium term action plan
- ✓ All sectors have a role in the sanctuary, women, fishers, youth council etc.
- ✓ At least 60% of community are willing to support the sanctuary
- ✓ Clear and strict guidelines developed through a series of consultations
- ✓ Clear, delineated and marked boundaries and zones with guidelines on the use of each zone
- ✓ Clear, attractive, well positioned and in local dialect, signboards

Factors of the success of MPA

- ✓ Need a good initiator/facilitator with experience in implementation of coastal projects
- ✓ Counterparting of resources and involvement of all agencies with a mandate
- ✓ Involvement of all sectors of community and town – co-management
- ✓ Continuous information, education and communication (IEC)
- ✓ Clear and strict guidelines for the sanctuary
- ✓ A good management committee is established with clear management plan
- ✓ Full time guarding and patrolling
- ✓ Aware and well-informed community
- ✓ Budget needed for future years
- ✓ Variety of strong leaders in the community as well as second liners
- ✓ Utilize MPA rating system as a guide for MPA planning and implementation

Lessons learned and recommendations

- ✓ Slowly go at the pace of the community
- ✓ If there are problems go back a step and start again
- ✓ Need a good area which will offer some positive result within one year
- ✓ Strong IEC even after establishment
- ✓ It is a process which takes 6 months to two years to implement
- ✓ Include large buffer zone with restricted fishing gears
- ✓ Include landward section and other habitats in the area
- ✓ Monitor it!
- ✓ Have a formal launching ceremony
- ✓ Be open to offer technical assistance even after establishment
- ✓ Staff should have a technical background
- ✓ Make the guardhouse an education center
- ✓ Make the sanctuary a showcase with other visitors if it is doing well

Means of monitoring and assessing the effectiveness of MPA is through the MPA Rating System that follows:

MANAGEMENT RATING																				
The MPA rating system is intended to assist local governments and communities to improve the management of their MPA. This simple rating system is dynamic and is not a definitive statement on the status of any MPA rated. <i>Put a check mark (✓) on the box provided if the criterion is fully satisfied or accomplished. Carefully consider MPA age in assessment.</i> Date of survey: _____ Level 1: MPA is initiated - Passing (Year 1 since legal establishment) (1-6 points) <table border="1"><tbody><tr><td>1a</td><td>MPA concept accepted <i>(MPA started through local initiative or social acceptance sought through public consultations by external groups. Consulted members of affected stakeholders: fishers, other resource users and social groups, both men and women.)</i></td><td></td></tr><tr><td>1b</td><td>Site surveyed using standard/accepted methods with baseline assessment complete, preferably conducted in a participatory process <i>(Reports completed on fish abundance, coral cover and profile on community and coastal management.)</i></td><td></td></tr><tr><td>1c</td><td>Site selected <i>(Site chosen based on baseline assessment results and public consultations.)</i></td><td></td></tr><tr><td>1d</td><td>Education program raising awareness about MPA functions and benefits started <i>(Conducted a series of public education activities.)</i></td><td></td></tr><tr><td>1e</td><td>Management body membership tentatively determined <i>(Management core group starting to conduct regular meetings with proper documentation.)</i></td><td></td></tr><tr><td>1f</td><td>Preliminary management plan drafted</td><td></td></tr></tbody></table>			1a	MPA concept accepted <i>(MPA started through local initiative or social acceptance sought through public consultations by external groups. Consulted members of affected stakeholders: fishers, other resource users and social groups, both men and women.)</i>		1b	Site surveyed using standard/accepted methods with baseline assessment complete, preferably conducted in a participatory process <i>(Reports completed on fish abundance, coral cover and profile on community and coastal management.)</i>		1c	Site selected <i>(Site chosen based on baseline assessment results and public consultations.)</i>		1d	Education program raising awareness about MPA functions and benefits started <i>(Conducted a series of public education activities.)</i>		1e	Management body membership tentatively determined <i>(Management core group starting to conduct regular meetings with proper documentation.)</i>		1f	Preliminary management plan drafted	
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1f	Preliminary management plan drafted																			

Level 2: MPA is established - Fair (Year 1 or 2 since legal establishment) (16 pts required)

2a	Community acceptance gained and documented (Documented through public consultation documents e.g. Barangay Resolutions and/or signature campaigns.)	
2b	Ordinance passed and approved by the Municipal Council (Ordinance should be well-drafted and enforceable and should be consistent with the concepts of sustainable use and equitable sharing of resources.)	
2c	Management body formally organized and recognized (Management group has legal mandate and is recognized by the local government; For POs – registered with the Security and Exchange Commission or Department of Labor and Employment.)	
2d	Management plan adopted by community and LGU or PAMB (Management plan initially implemented and endorsed by LGU/PAMB.)	
2e	Management activities started (Conducted initial MPA activities such as: installation of enforcement support structures, patrolling and surveillance, apprehension of violators, etc.)	
2f	Biophysical monitoring includes local participation (Locals were trained to do biophysical survey using standard/accepted method)	
2g	IEC activities conducted to raise understanding on MPA rules and regulations (MPA rules & regulations disseminated using appropriate and practical means to target all direct users and other stakeholders; initial stakeholder knowledge assessment conducted.)	
2h	Anchor buoys, marker buoys and/or boundary markers installed	
2i	MPA rules and guidelines posted at strategic locations	
2j	MPA outpost or other structures constructed (Guardhouse and/or other MPA-related structures constructed.)	

Level 3: MPA is enforced - Good (Only applies for 2 years or older) (24 pts required)

3a	Education program sustained public awareness and compliance (A long-term IEC program exists and is currently being implemented in support of enforcement and the general MPA objectives.)	
3b	Regular biophysical monitoring measuring habitat condition and changes conducted (Documented surveys conducted at least once annually using standard/accepted method.)	
3c	Collaborative patrolling and surveillance conducted by mandated enforcement group and local community volunteers (Fish wardens on rotation assigned to guard and patrol the MPA, day and night with assistance from local community volunteers.)	
3d	MPA billboard signs, boundary markers and anchor buoys maintained (Funds allocated for maintenance of enforcement support structures. May be part of the municipal CRM budget.)	
3e	Management body active (Implements the management plan; coordinates enforcement activities; members attend meetings regularly; coordinates and participates in regular monitoring activities.)	
3f	Budget from local gov't or from other sources allocated and is accessible for MPA management (There is a legal document by the local government or an agreement with the private sector allocating budget for MPA management.)	

3g	Fishing effectively stopped inside of sanctuary zone (No fishing-related violations/apprehensions reported in the sanctuary for the past year.)	
3h	Illegal and destructive fishing reduced outside of MPA (Violations/apprehensions reported within 500 m from the MPA boundary was reduced by 50% for the past year.)	

Level 4: MPA is sustained - Very good (Only applies for 3 years or older) (30 points)

4a	MPA management plan updated in a participatory process (Management plan amended with the participation of various stakeholders: fishers, resort and diveshop operators, LGUs, other resource users, both men and women.)	
4b	Annual biophysical monitoring and feedback of results supervised by the managing body and implemented for 2 years or more (Documented surveys using standard/accepted method. Reports are available.)	
4c	Budget from government or from other sources allocated and was accessed for 2 or more consecutive years (There is a legal document made by the local government or an agreement with a funding group allocating budget for MPA operations; financial report available.)	
4d	Management body trained and capacitated to run the MPA independently (Management body supervises management activities [implementation of plans, enforcement, budgeting, monitoring and evaluation] and coordinates activities with partners.)	
4e	Enforcement system fully operational (Enforcement group with mandate and workplan; enforcement support structures maintained and patrolling activities sustained over the years.)	
4f	Illegal and destructive activities stopped inside and within the vicinity of MPA (No violations/apprehensions reported inside and within 500 m from the MPA boundary in the past year.)	
4g	Environment-friendly enterprise and/or user fees collected as a sustainable financing strategy (Sells environment-friendly products/goods to tourists; Imposes collection of user-fees; etc.)	

Level 5: MPA is institutionalized - Excellent (Only applies for 4 years or older) (40 pts)

5a	Information and education program on MPAs maintained over the years (Information dissemination activities sustained according to long-term IEC program.)	
5b	Ordinance passed by the Provincial Council giving MPA stronger political support (Gives MPA institutional support to strengthen enforcement and collaboration.)	
5c	Management plan refined for adaptive management (Incorporates further refinements after gaining much experience and lessons to improve management strategies.)	
5d	Management plan incorporated in the LGU development plan (MPA incorporated within the long-term LGU area-wide development plan.)	
5e	Evaluation of impacts on ecology and socio-economics conducted and feedback of results completed (Assessment of resource status and long-term trends conducted. Analysis of change in local economy and long-term-trends of user groups conducted. Reports of these studies have been completed and reported back to stakeholders.)	

5f	Revenues from enterprise and/or user fees sustained and accounted for <i>(Existing sustainable financing mechanisms are well-managed and well documented; financial reports easily accessible)</i>	
5g	Management body capacitated for financial management and fund sourcing <i>(Management body is well-trained to manage funds effectively [facilitates proper handling, wise use & proper documentation]. They are also trained to seek for financial assistance [formulated and submitted proposals])</i>	
5h	MPA emphasizes on public education and is being used as a study tour site, residents advocate for MPA <i>(After much experience, members are ready to share lessons and impart knowledge. Presence of an identified group that conducts tours and is capable of giving talks on MPA. Paper/s written on their success stories published.)</i>	
5i	Expansion strategies or enhancement programs initiated <i>(MPA coverage is expanded, e.g., from a sanctuary to a park, or scope of conservation activities is heightened, e.g., coral reef restoration, re-seeding of clams, etc.)</i>	

Total points accumulated: _____

- Total possible points: 40
- All points are cumulative.
- Points from higher levels can be used to satisfy lower rating levels.
- Adapted from the work of the Coastal Resource Management Project team of Negros Oriental (William Ablong and Erwin Dolumbal) with assistance from A. White, 2001.

Priorities for improved management: <i>(Choose top 3 answers)</i>	☐ Lack of community awareness and support ☐ Weak government support ☐ Weak law enforcement ☐ Lack of a sustainable financing mechanism ☐ Need for management capacity development ☐ Politics ☐ Multiple resource use conflict ☐ Lack of supplemental and alternative livelihood ☐ Others, specify: _____
--	---

Name(s) of assessor, position and affiliation: _____ _____ _____
Contact information (phone, fax, email, postal address): _____ _____ _____ _____

BENEFITS OF RESERVES

1. Increased spawning stock

Fishery reserves allow the rapid build up of fish spawning stock biomass. Overall (multi-species) levels of biomass per unit area can double or quadruple within two to ten years of closure. Biomass of some target species vulnerable to overexploitation can increase by more than an order of magnitude within reserves.

2. Increased spawning per unit stock

Reserves increase the numbers of older, larger and more reproductively active fishes within a population closure. This leads to potentially very large increases in larval production by fish stocks because egg production scales exponentially with increasing fish body size. For some species currently being regularly captured below the size of sexual maturity, reserves will increase reproductive output by several orders of magnitude. For sedentary species, benefits from increased spawning stock biomass can be expected to rapidly spread to fishing grounds via larval export. For more mobile species, they will also be transferred via “spillover”.

3. “Spillover” – Enhanced catches close to reserves

The principal benefit from reserves is increased spawning stock size and reproductive output. However, as stocks build up inside, conditions get more crowded and a net emigration from the reserve can occur: “spillover” of juveniles and adults can enhance catches close to reserve boundaries. Fishermen “fishing the line” in places with long-established reserves are prevalent. Catches near to reserves are more valuable due to higher proportion of high-value species and greater numbers of large individuals present.

4. Migratory species also benefit

Migratory species can benefit from permanently closed reserves in several ways:

- Reserves restrict access to a stock for at least part of the year, thereby reducing fishing mortality.
- Reduction of fishing mortality could be considerably greater than simply proportion of area closed, since migratory species almost all go through “bottlenecks” during their migrations. These are areas where the population becomes concentrated and density increases such that the species becomes more vulnerable to capture. Fisheries for many migratory species are highly seasonal, targeting only areas of stock concentration. Reserves sited in such bottlenecks will reduce fishing mortality by amounts significant to the entire stock.
- Reserves located over spawning areas may increase reproductive success by reducing disturbance from fishing operations.
- Migratory species having specific nursery areas may be caught as by-catch by other fishing gears. Reserves sited in nursery grounds should increase numbers surviving to recruit to the fishery and eventually to spawn.
- Migratory species could benefit from enhanced feeding conditions as they pass through reserves. As well as increasing growth and reproductive output, improved feeding conditions are likely to encourage migratory species to remain in protected areas for extended periods during migrations, thus affording greater protection from fishing.
- Some migratory species appear to include non-migratory but reproductively active individuals. Such individuals within reserves would benefit from full protection from fishing.

5. Improved habitats, increased productivity and carrying capacity

Reserves protect habitat from damage by fishing gear in closed areas, thereby recovery of animal and plant populations and increased productivity. Habitat protection leads to increased structural complexity which together with higher productivity will allow the habitat to support higher stock biomass. These benefits can feed into fishing grounds through migration of fishes through or out of closed areas and increased larval production from reserves

6. Maintained genetic diversity within stocks

Natural selection and fishery selection act differently. In an unexploited population, the bulk of reproduction is by older, larger individuals. Fishing selectively removes the most reproductively active individuals favoring those that mature at smaller sizes. Such individuals spawn fewer eggs than large individuals would. Over long periods, genetic diversity is lost from stocks due to selective removal of later maturing fish. By allowing such individuals a refuge in which to grow and reproduce, reserves will help protect the genetic diversity of stocks.

7. Enhanced biodiversity and species protection

Fishing has totally transformed the structure of marine ecosystem. Protecting habitat from damage by fishing gear will benefit literally thousands of species, allowing the redevelopment of complex associations of organisms on the seabed. No-take reserves will enhance populations of target species, many of which are now threatened by overexploitation. Reserves in many regions have shown an increase in biodiversity of both target and non-target species within only a few years of creation. Reserves can also provide refuges for marine mammals, many of whose populations are threatened by pollution and by-catch by various fishing gears.

8. Reduced conflict among fishery sectors and between fisheries and other uses

One fishery sector often impacts on another by catching as by-catch, fish on which the other depends, or by damaging habitats critical to the target species of other fisheries. For example, some fisheries catch juveniles of species important to other sectors of the industry, or damage nursery grounds. Reserves placed in areas upon which different fishery sectors are mutually dependent, can potentially benefit both, thus reducing conflict.

SESSION 4.0

Marine Protected Area Establishment and Management Process and Community Organizing

OBJECTIVES	At the end of the session, participants will be able to: ▪ enumerate the marine protected area (MPA) site selection criteria; ▪ enumerate the phases of MPA establishment and management process; ▪ discuss the essential activities/elements of each of the phases of the process; ▪ identify the activities/elements in establishing a marine protected area; ▪ enumerate steps required to formulate an effective community organizing strategy for MPA establishment and management; and ▪ adopt MPA Rating System to evaluate and refine management plans and implementation.
IMPORTANCE	Knowledge of the MPA establishment and management process allows the participants to relate the community organizing activities.
METHODOLOGY	Group Activity; Lecture; Discussion
TIME	1.5 hours
MATERIALS & EQUIPMENT	Idea cards, Manila paper, markers, masking tape, overheads, overhead projector, screen
HANDOUTS & READING MATERIALS	▪ Philippine Coastal Management Guidebook Series # 4 & 5 ▪ How is your MPA doing? ▪ MPA Database and Rating System

TRAINING SESSION 4.0

CONTENT AND ACTIVITY PLAN



40 minutes

Discussion on MPA Establishment and Management Process

Start the discussion by drawing out the experiences of participants in establishing and managing marine protected areas. Use the guide questions below.

- What are the phases of establishing and managing marine protected areas (MPAs)?
- What are the essential activities/elements in each of the phases?
- What system lays out the key benchmarks of a well-managed MPA?

Process their answers about the phases on establishing and managing MPA (bullet # 1) and seek consensus. Ask each participant to post their answers to question (bullet #2) under appropriate phases of the process. Process the overall activity.

Link the presentation to their output by elaborating the some points that are not properly covered in the activity. Emphasize that the phases of MPA establishment under community or local government unit (LGU) initiative should include:

- Issue identification and baseline assessment
- Plan preparation and adoption
- Action plan and project implementation
- Monitoring and evaluation
- Information management, education and outreach



40 minutes

Group Activity on Community Organizing Process

Link the discussion on community organizing (CO) by noting that closely associated in various phases of MPA establishment and management is the on-going community organizing efforts. Ask the participants;

- Why is community organizing used in MPA establishment and management?
- What is the role of CO in MPA establishment and management?
- What will likely to happen when CO is deficient or ineffective?

Publish their responses. Then, connect their responses to the importance and purposes of community organizing in MPA establishment and management. Emphasize that, critical to the success of an MPA is a strong community awareness the benefits and costs that will be accrued by the stakeholders and the overall acceptability of the endeavor.

Start the discussion of the CO process with a group activity. The big group will be divided into two and each will be given the same set of idea cards where specific activities during each CO phase are written. The facilitator will briefly discuss the different stages/phases in organizing the community for sanctuary establishment and management. Each group will now decide where to stick each activity and under which phase. Facilitator will then process the group outputs and relate the CO process to the MPA establishment and management process discussed in the preceding session.

Another way of discussing the topic on the CO process is to present a case study on CO experiences on MPA. Ask the participants what are the lessons to be gathered on these experiences and proceed to discuss the CO process.

The following is a brief outline of the discussion on the CO for sanctuary establishment and management (see attached reading materials for details)

1. Why involve the community?
2. What is community organizing?
3. Who comprises the community?
4. What is the role of the community organizer?
5. What does community organizing entail? (The CO Process)
 - social preparation
 - integration phase
 - mobilization phase
 - strengthening the organization
 - evaluation and monitoring
 - phase-out/termination



10 minutes

Wrap up

Summarize the presentation by asking the participants some questions using the session objectives as basis.

HANDOUT #4

SITE SELECTION CRITERIA

1. Ecological importance

- How important is the area/ecosystem being chosen?
- What commercially and ecologically important species are there in the area, what parts of their life cycle, etc.
- How many people use the area for gleaning etc.
- Is it good quality habitat still and diverse (many species) i.e. will it be able to recover
- Uniqueness, is it unique or important
- Contains a variety of habitats and encompasses one system
- Strategic location to contribute to marine protected area (MPA) network

2. Social importance

- The area is going to be accepted by the community at large as a closed area
- Is it near to people who will arrange and guard it/within view of the community, if it is too far away it will be difficult to manage
- Are there certain types of fishing gear already in the area, where will they be displaced to
- Are all the involved groups, recreationists, fishers, gleaners willing to close the area
- Heritage, historic, cultural aspects

3. Economic importance

- Is it acting as nursery area/refuge area for fishes at present
- Does the community have enough funds to put buoys in the area, build a guardhouse
- Does it have potential for tourism/diving later on?

4. Practical

- Size, is it going to be biologically feasible? Balance the size based on feasibility and community aspects
- Is it really going to cause a major upset to the community income/livelihood
- Is financial funding available to get the sanctuary up and running
- Is there a lead group in charge etc.

5. Other criteria

Urgency

How badly does the community need or want the sanctuary

Effectiveness

How useful will the sanctuary be to the community and is it manageable

Size and shape of sanctuaries

- Better to have larger sanctuaries (in theory) of at least 10 has.
- All sanctuaries are helping, many processes unknown still and even in a massive area with low habitat there may be larval, eggs and other impacts which are unseen
- Smaller reserves will look after smaller range fishes, larger sanctuaries will allow for fishes with larger ranges. (predators large ranges) damselfishes anenome fishes small range

Opportunity cost

It is actually expensive to set up and manage, patrol and so on a sanctuary.

Therefore the limit of about 10 hectares minimum for a sanctuary is suggested. This will insure that the impact and return on fish catch of the sanctuary is worth the investment and sacrifice of the fisherfolks (again case to case basis). If there is a better impact then much higher chance of sustainability of sanctuary

In theory about 20% of the fishing ground or habitat should be enough to act as insurance policy for main fishes and corals and invertebrates within the area

Design

Should try and include land as part of area and should block off the whole of an area (easier enforcement and some species still move onto land occasionally etc.)

Should try and include coral reefs and other associated habitats and nursery grounds such as seagrasses, mangroves etc.

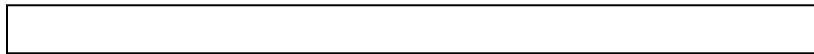
Surface area to volume ratio

‘Leakage’ concept

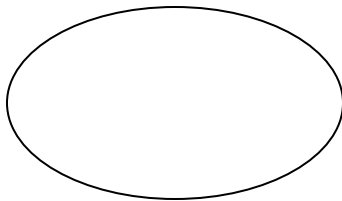
Possible designs for a 10-hectare sanctuary

Rectangle 1000*100

Large surface area, more leakage

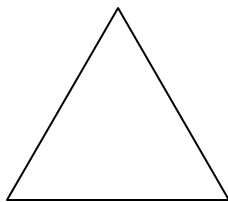


Circle Medium size surface area to volume ratio



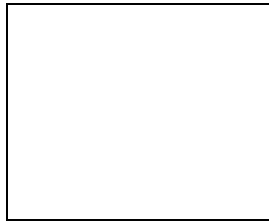
Triangle

Large area for leakage



Square

Smallest surface area compared to volume



However remember to fit your optimum area around the features of the reef (i.e. drop off, inshore portion etc).

Rules of thumb: Lots of guess work, ask the older fisherfolks!!

Try and fit in with the features of the reef and area, i.e. drop off reef crest include all of this and then perhaps add 100-200 meters extra etc. Spill-over tends to occur into a similar habitat area, such as reef to reef of similar depth etc.

Phases and activities for marine protected area establishment and management within local government jurisdictions.

Phases of Coastal Management	Stages and activities for MPA Establishment and Management
1. Issue identification and baseline assessment	Recognition of a need and program preparation Integration with the community and assessment of issues 1. Community organization and mobilization 2. Conduct of baseline studies 3. Information, education, and communication
2. Plan preparation and adoption	Definition of goals and objectives: Formation of the core group and development of the management plan 1. Formation of the core group 2. Definition of goals and objectives 3. Preparation of management strategy and action plan 4. Determination of reserve boundaries and zones
3. Action plan and project implementation	Implementation: Formalization of the reserve, implementing management strategies, enforcement, and community strengthening 1. Formalization of the reserve through local ordinance 2. Implementation of strategies for managing the reserve 3. Enforcement 4. Permits and user fees 5. Strengthening of community involvement
4. Monitoring and evaluation	Monitoring and evaluation Refinement of the management plan
5. Information management, education, and outreach	Review of status of MPA and its benefits Refinement of education program from experience Development of outreach program as appropriate

A Conceptual Framework for Community-Based Marine Sanctuaries in the Philippines

Steps in the Process	Time (months)	Actions Taken	Intermediate and Final Outcomes
1. Community Entry, Preparation and Appraisal	3-6	▪ Larger community consultation for initial identification of issues ▪ Community site selected ▪ Field officer assigned full-time to the community ▪ Baseline surveys conducted ▪ Selected participatory coastal resource assessment (PCRA) activities conducted ▪ Informational meetings (formal and informal) and discussions concerning the project and goals ▪ Preliminary public education activities carried out ▪ Community core group identified ▪ Stakeholder analysis conducted and identification of PCRA participants	▪ CRM issues in the community identified ▪ Socioeconomic, cultural and environmental context understood by project team and members of core group ▪ Widespread community understanding of project objectives and approach ▪ Information of resource status gathered
2. Planning including: ▪ Public education ▪ Capacity building ▪ Community consultation ▪ Ordinance formulation	12-24	▪ Cross-visits with successful marine sanctuary sites ▪ Public education on coral reef ecology, marine sanctuary concept, environmental laws and enforcement ▪ Training on community monitoring and mapping of reef ▪ Selected early actions on issues of concern to the community implemented ▪ Training on financial management and accounting ▪ Study tour, training or development of potential supplemental livelihood opportunities such as tourism ▪ Community core group training on coastal management ▪ Community ordinance contents drafted ▪ Community consultation meetings and discussions (formal and informal) conducted ▪ Community ordinance revised and final version completed	▪ Community understanding of human impacts on coastal resources, environmental laws and sanctuary concept ▪ Map of the coral reef developed by the community to be used as basis of marine sanctuary site selection ▪ Community awareness of local coral reef conditions and capacity for on-going monitoring established ▪ Widespread community support for the project objectives and marine sanctuary concept ▪ Community capacity for participatory planning, implementation and fund management strengthened ▪ Community capacity to address CRM problems with simple solutions strengthened ▪ Widespread participation of stakeholders in planning ▪ Widespread/majority community consensus on marine sanctuary location,

Steps in the Process	Time (months)	Actions Taken	Intermediate and Final Outcomes
			size, allowable and prohibited activities, sanctions and management arrangements
3. Community Ordinance Approval	1-12	▪ Vote of approval for the sanctuary at a community meeting(s) and by <i>barangay</i> resolution ▪ Approval and signatures on the municipal ordinance by the municipal council ▪ Review of municipal ordinance by the province ▪ Formal opening ceremony conducted with government representatives in attendance ▪ Funding mechanisms for implementation (donations, fees, fines, grants, endowments, government allocations, etc.) identified and planned	▪ Formal acceptance of the marine sanctuary by the community and local government ▪ Sound legal basis for management and enforcement ▪ Financial resources for implementation determined
4. Implementation and Adjustment	(forever)	▪ Boundary markers installed and maintained ▪ Information signboards installed ▪ Management plan developed ▪ Management committee meeting ▪ Reef and fisheries monitoring conducted ▪ Enforcement actions occurring ▪ Sanctions taken against violators ▪ Public education ongoing ▪ Implementation activities budgeted ▪ Implementation funds received, spent and accounted for ▪ Coordination and networking with external technical, financial or organizational support institutions occurring ▪ Program monitoring, evaluation and adjustment by the community ongoing	▪ High compliance with rules governing the marine sanctuary ▪ Effective management of the marine sanctuary occurring ▪ Improved coral cover inside the marine sanctuary ▪ Increased fish abundance and diversity in the sanctuary ▪ Increased catch of reef-related target fish species adjacent to the sanctuary ▪ Other quality-of-life improvements/benefits for the community attained ▪ Sufficient resources (financial or in-kind) for the implementation allocated, obtained and utilized ▪ Access to outside support systems maintained ▪ Management measures adjusted as needed

Source: Crawford, 2000.

SESSION 5.0

Information Education and Communication Strategies in Marine Protected Area Establishment and Management

OBJECTIVES	At the end of the session, participants will be able to: ▪ devise steps required to formulate an effective information, education and communication (IEC) strategy for marine protected area (MPA) establishment and management; ▪ utilize appropriate participatory tools to analyze various stakeholders' information and education needs; and ▪ describe various IEC strategies appropriate to specific audience having stake in the MPA.
IMPORTANCE	Basic understanding of the appropriate use of IEC strategies in MPA establishment and management is necessary for effective and efficient use of IEC materials and enhance support to the MPA.
METHODOLOGY	Lecture; Workshop
TIME	1.5 hours
MATERIALS & EQUIPMENT	Idea cards, Manila paper, markers, masking tape, overheads, overhead projector, screen
HANDOUTS & READING MATERIALS	▪ Philippine Coastal Management Guidebook Series # 4 ▪ How is your MPA doing?

TRAINING SESSION 5.0

CONTENT AND ACTIVITY PLAN



10 minutes

Introduction to Information, Education and Communication

Introduce the session noting the lessons with regard to marine protected area establishment and management vis-à-vis information, education and communication. Also relate information, education and communication (IEC) to previous topic on marine protected area (MPA) establishment and management process and community organizing. State the title, objectives, topics and expected outputs of the session.



20 minutes

Discussion on the Rationale and Role of IEC in MPA

Start the session by asking the following questions:

- Why is IEC necessary in MPA establishment and management?
- What is the role of IEC in MPA establishment and management?
- What will likely to happen when IEC is deficient or ineffective?

Publish their responses. Then, connect their responses to the importance and purposes of IEC in MPA establishment and management. Stress that like in community organizing, IEC is a potent tool for building awareness and the costs and benefits of MPA. This needs to be planned.



20 minutes

Workshop on Stakeholder Analysis

Introduce stakeholder analysis as one of the tools to determine various interest groups supportive or non-supportive to marine protected area. Demonstrate the use of the tool. Relate the tool to IEC strategies particularly in identifying IEC messages.



30 minutes

Discussion on Various IEC Strategies used in MPA

Emphasize that IEC strategies vary from one group of audience to another. Stress that attitude and behavior of various stakeholders towards MPA vary. Highlight the need for an information campaign plan to effect change to attitude and behavior of various stakeholders.

Present some lessons from existing and on-going initiatives. Encourage participants to share their experiences regarding IEC activities. Summarize the lessons learned and reinforce the discussion by presenting basic concepts of effective IEC.



10 minutes

Wrap Up

Summarize the presentation by asking the participants some questions using the session objectives as basis.

HANDOUT #5

INFORMATION CAMPAIGNS FOR MARINE PROTECTED AREAS

- A very high level of public information and awareness raising is required for marine protected areas (MPAs)
- The MPA is also a tool which causes the most misperceptions as to its objectives and what it is to do
- Most fisherfolk think that it will do harm to them by removing a fishing ground (and normally their best fishing ground if site selection is carried out properly), but if explained properly however these misconceptions can be dismissed.
- An average fishing community hosts a variety of personalities and opinions ranging from those who see a need for change, to those who are completely against the MPA.

Comments from the community...

- What right to remove the fishing ground that my fathers' grandfather fished in!
- We have a hard enough life and now you want to take away all our fishing rights in the area and therefore livelihood
- You thus need to *be prepared!*

Planning your info campaign

- Info campaigns have to focus on pre, during and post establishment phases, being a cross cutter for the different parts of the cycle
- Most public education campaigns have been aimed specifically at fisherfolk organizations and only to a few other members of the community.

Hands-on lessons (Bohol examples)

- **Balance:** the staff, a potent mix, is composed of community organizers with solid technical backgrounds, e.g. fisheries graduates with experience in community organizing.
- **Concepts and examples:** ideas relevant to the daily life of the fisherfolk must be stressed, for example, what has worked well in Bohol is to explain the MPA as a SEA BANK, an area which will act as a long term bank account with interest that will grow over time. If easy concepts are used the fishers will remember them and be able to do most of the information dissemination themselves.
- **Feedback:** The facilitating staff must also be able to feedback the progress and/or any misconceptions. In a project of this kind it is very common that there are large misconceptions and they must be addressed as soon as they arise, either by the fishers themselves or with the help of the facilitator.
- **Hands-on:** This approach should be adopted. All staff and beneficiaries should be involved in all project components, like in manta tows, resource assessment, teaching the fisherfolk how to conduct semi-scientific research, etc.
- **Localize:** Everything, from language to trainers, use local beliefs, local examples, local names of fish/resources etc.
- **Popular education:** These techniques work best; be creative. Games, acting, role plays all should be used within the trainings and more importantly are fun and therefore get remembered!

- **Production:** Written materials about the MPA; this needs to be done with a lot of graphics and be written in the local dialect and can be very cheap and effective if properly done.
- **Trust:** Must be gained from the community as much as possible; sometimes it is much more effective to sit down and (optional) have a glass of tuba (coconut wine) and listen to the fishers than to keep giving seminars/workshops etc.
- **Visuals:** Use as many as possible, videos, (even better of local area), underwater photos, (needn't be expensive or technical, use disposable cameras), leave the outputs behind.
- **Documentation:** of whole process, involving the community in the process; such as by doing a short, rough video of the whole process, or the community writing their own documentation alongside the facilitator etc.
- **Monitor and Evaluate:** the whole process, a lot of feedback is required to facilitate good community relations and better plans for the future.

Possible target groups, message that should be communicated to them and ways of involving them in the MARINE SANCTUARY awareness raising and education process.

Target Sector	Possible Message regarding the benefits of the MARINE SANCTUARY.	Possible ways of involving the target group in the MARINE SANCTUARY process.
Fisherfolk	- Increased and more consistent fish catch in the long run; - Ability to manage and control a small area which can later be expanded to larger areas and control illegal fishing.	- Attend fisherfolk meetings/give training/seminar - Do a participatory research exercise on land and in the sea. - Cross visit to another MARINE SANCTUARY. - Guarding the MARINE SANCTUARY
Women/gleaners	- Ability to allow one area to rehabilitate and produce more fish/shells in the long run.	- Do a shells/fish identifying exercise/talk to women's organization in area etc. - Be responsible for guarding the MARINE SANCTUARY in the day etc.
Community as a whole	- More consistent fish supplies;	- Involvement in guarding of the area.
Municipal Government	- Possible increase in 'tourism'. - Increased health, social and economic benefits from more fishery products	- To produce and sponsor the declaration of the area as an MARINE SANCTUARY. - To donate materials to the guardhouse.
Private Sector	- The development of tourism and/or more visitors to the area.	- Help with lobbying and possibly donate materials to the MARINE SANCTUARY.
Fish Sellers	- Larger specimens and more higher quality 'food fish' as opposed to 'trash fish', hence more profit	- Video showing/seminar etc.
Barangay Government	- To stress that the barangay development process should include livelihood based/food security activities aside from infrastructure projects such as basketball courts etc. - Increase in barangay incomes/alternative livelihood through ecotourism/visitors to the area etc.	- Facilitate organizing barangay wide beach clean up/mangrove reforestation etc. - Attend Barangay Council meetings. - Invite local barangay officials to all trainings, etc. in the barangay.

Target Sector	Possible Message regarding the benefits of the MARINE SANCTUARY.	Possible ways of involving the target group in the MARINE SANCTUARY process.
Church	- The protection of the resources that were given to us by God. - According to the bible these resources were given to the people to manage, yet at the moment are not being managed very well.	- Attend church council meetings - Invite priest to bless guardhouse etc. - Attend pastoral parish council meetings
Schools	- The insurance of fishing as a livelihood to the school children. - Food security.	- Dramas/poster competitions, essay contests etc. - Attend parent-teacher association meetings.
National and local line agencies	- As mandated by their job.	- To map the sanctuary (DENR)/attend trainings/act as resource speakers to trainings etc. - Help in baseline data gathering.
Provincial Government	- The long-term sustainable development of the province.	- Cross-visits/snorkeling/free diving lessons/lobbying/multi-sector dialogues etc.
Tourists/Dive shops	- Better quality diving/snorkeling - Sustainable diving	- Advertising, handouts, payment of a donation towards the reef protection.
National Government	- Food security, 10-point master plan Agenda 21 etc.	- Letters/documentaries sponsorship of reef.

Clarify the benefits of the marine sanctuary that the community will have

- Protect and increase habitat quality
- Increase abundance and size of fish
- Eggs and larvae increase
- Leakage concept, enhances catches of organisms around area
- Protect populations of fishes particularly vulnerable to fishing ensuring against stock collapse
- Increase genetic diversity
- Easier to enforce than other fisheries management approaches
- “Open access regime” shifts to closed and managed regime which has many spin-offs
- Increased recreational and educational opportunities
- Benefits not so obvious for migratory species
- Maintenance of a more natural population and community structure

SEABANK

Use the concept of "SEABANK" Bangko sa Dagat

- Deposit
- Guard/*bantay*
- Interest
- In a bank interest increases stays level, in a seabank,
- It **increases over time**;
- The longer the timespan the bigger the interest

Why does interest increase over time?

Main impacts of a marine sanctuary

- Marine organisms in a sanctuary will get bigger in size
- Exhibit more species
- Species will become more abundant

This leads to...

1. Fish in the area will grow to maturity (a lot of fish and marine organisms are harvested before they are mature). Many fish in today's markets are immature at a rough guess some 70% of fish in an average market in Bohol are immature (with similar numbers for other parts of the country).
2. The marine sanctuary provides a much more intact food web and food chain for all organisms living within it, therefore in theory encouraging better energy flow, dynamics of the organisms within the area.

Fecundity of fishes

- Bigger fish and marine organisms have much larger fecundity;
- Fecundity increases exponentially with size/age in fishes
- One 10-kg snapper produces the same amount of larvae as 212 one-kg snappers (Bohnsack 1990)

Life histories

Some fish species have interesting and non-predictable life histories, a sanctuary can help provide stability/insurance to those with unpredictable life histories;

Sequential hermaphroditism

e.g. Coral Trout (sono)

- Sex change is partially dependent upon size/age.
- Once these fish reach a certain size/age depending on a series of environmental variables, they will change sex from Female to Male;
- Catch many coral trout = smaller size
- In theory smaller size means more females, less males
- A fish sanctuary will allow fishes of all sizes to grow and get bigger, allowing for more even distribution of sexes and so therefore reproduction within the species;

Some fish also have other similar life history traits which make them very vulnerable to fishing pressure and a sanctuary will ensure their return

Characteristics of fish making them vulnerable to fishing pressure

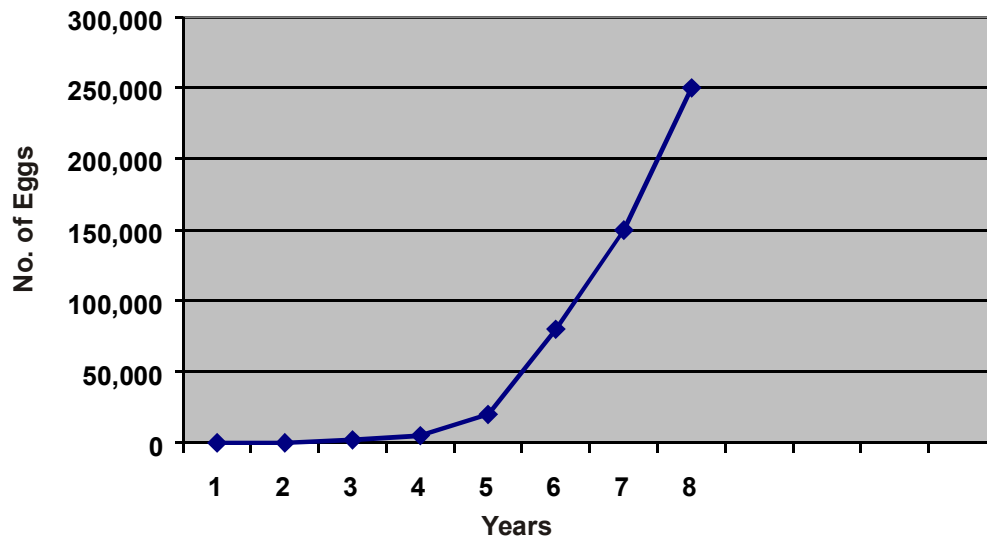
- Long age to maturity
- Slow growing
- Small population density
- Spawning aggregations

Maturity

Some examples of age at maturity

Giant Clam	up to 10 years
Abalone	3-4 years
Sea cucumbers	up to 3 years depending on species
Spiny lobster	7 years
Some groupers	10 plus years

Typical fecundity of a fish over time (no of eggs vs age [years])



IEC bits and bobs....

- Homemade videos: Very effective, perhaps with an underwater camera (expensive) doing a time series analysis of the sanctuary and interviews with the fishers about the area. Or even showing the status of the reef to the barangay folk etc.
- Television: Usually expensive and sometimes will not reach people without television (most fisherfolk in Bohol); this depends on your budget. A cheaper way is to produce a local video and then ask the local cable channel to play the video or show it in the barangay, it is enjoyed a lot by the local community and helps a lot in the education process.
- Radio: Very effective in the barangays as most fishers own radios. Again, target local radio stations to begin with and those that use the local tongue. This can also reach far-flung barangays who otherwise would not hear of such tools.
- Newspapers: Target local newspapers; It is a sure way of getting to the local influential people. One newspaper in Bohol developed a section about the environment specifically for nongovernment organizations (NGOs). Also, journalists are usually quite interested in

environmental stories. If the stories are good enough the local journalists can help you look for more national coverage.

- Meetings/trainings/workshops: Often held to discuss particular agendas and can involve very diverse groups of people; A very good place to learn and listen to different opinions and why the people feel that way regarding the MPA etc. Should encourage participation of all sectors of the community and have a good facilitator.
- Comics/fisherfolk publications: These can be used to disseminate information at the local level; They must be only a few pages long, be in local language and have a clear point relating to daily life with plenty of illustrations; can be produced very cheaply and one copy can reach at least one whole family if well presented.
- Posters/calendars/fixed exhibits: Very effective if placed in the correct place; A poster with underwater photos of the sanctuary can be very effective as long as it is done well and in local language etc. A calendar will stay on a wall for a year!
- T-shirts: Sometimes very helpful in helping with awareness raising e.g. All the fishery wardens or all the members of an organization etc. They are often a good conversation starter and the person wearing the t-shirt is someone who is bound to be quite active and aware.
- Sponsoring events: Local events can be sponsored such as basketball competitions or even a disco held by and for the local fisherfolk. Theme nights about the sea, such as an environmental concert where the fisherfolk all write and sing songs about the changes in the sea in the last twenty years in their barangay are also very effective.
- Curriculum development: We have been able to involve the local schools in the process and have waged a strong Primary and High School advocacy campaign in two of our project areas. This has included inserting some coastal ecology into the syllabus within the High Schools. The Department of Education Culture and Sports system has its subjects with 'Minimum Learning Competencies' and there is ample room for entry of basic marine ecology if the school teachers are open to it.
- Cross-visits of the different involved sectors, teachers and students to an MPA is a good entry point, especially if the MPA is nearby. Our experiences include students who have conducted their High School science projects on the effects of a local MPA, along with them presenting a drama at the local fiesta, and other activities such mangrove reforestation, poster competitions etc. Very effective!
- Recreational activities: One strategy which has worked very well with local politicians and government agencies is to hold picnics/snorkeling days at sea. These are fun and with capable staff, it can enable a lot of informal education.

Next Steps

- The MPA provides a brilliant working IEC example for communities to study and to see what can happen when management is devolved to them. It is therefore of vital importance to tap this learning experience, build upon it, let it evolve and see what can further be gained from it.
- An MPA managed by a community should lead to numerous other possible management measures/research/interest for the community. It also serves as a graphic illustration to a community that should make them realize that not fishing in an area can actually produce more fish, which the idea of truly intrigues some fisherfolk.
- This is the stage when the MPA itself should now begin to be used as a case study and the education process built around the MPA and the target groups expanding to not only fishers but the general public as a whole.
- The guardhouse should be made the educational center as such of the MPA and it should have plenty of photos and educational materials/posters inside it. A logbook of fisherfolk observations/arrests/visitors is also very good to leave in the guardhouse.

SESSION 6.0

Resource Mapping and Baseline Data Gathering

OBJECTIVES	At the end of the session, participants will be able to: ▪ identify necessary data requirements for establishing a marine protected area; ▪ use existing baseline data from Participatory Coastal Resource Assessment (PCRA); ▪ demonstrate techniques in baseline data gathering; and ▪ design forms and format for baseline data collection.
IMPORTANCE	Determining the basic information required to establish a marine protected area (MPA) is necessary in management
METHODOLOGY	Lecture; Workshop
TIME	2.0 hours
MATERIALS & EQUIPMENT	Idea cards, Manila paper, markers, masking tape, overheads, overhead projector, screen, PCRA map
HANDOUTS & READING MATERIALS	▪ Participatory Coastal Resource Assessment Training Guide ▪ Philippine Coastal Management Guidebook Series # 5 ▪ Coral Reef Monitoring for Management Book ▪ Photocopies of selected articles of Participatory Methods in CBCRM ▪ MPA Database User Guide

TRAINING SESSION 6.0

CONTENT AND ACTIVITY PLAN



10 minutes

Introduction

Introduce the session noting the coverage and the expected output at the end of the session and its relation to the overall output of the training program. Recall the discussion on site selection criteria and shapes and sizes of marine protected areas (MPAs). Tell the participants that refreshing their knowledge on these items is vital in this session.



30 minutes

Plenary Discussion and Presentation

Start the discussion using a map showing the area of MPA. It is better that participants will prepare the map themselves. After showing the map, ask the participants what data are needed to establish a marine protected area? Write their answers and process them. The data/information requirements should cover the following:

- Socio-economic and political environment (i.e. basic resource management issues to be addressed; existing and traditional socioeconomic and resource use patterns for the area; individuals, groups or institutions that control resource use patterns; goals people expect as outcomes from resource management intervention)
- Bio-physical factors (mangrove density, seagrass cover, coral cover, presence of fish species indicators; fish species most affected; causes of overfishing).

Inform the participants that PCRA data and other secondary sources can be used in the process of determining the situation of the area being considered.



45 minutes

Small Group Workshop to Finalize Design

Once data requirements are agreed and firmed up, divide the participants into small groups to design forms and formats for baseline data gathering. Show them some data gathering techniques relevant to data needed (i.e. Venn diagram and stakeholder analysis for socio-political environment; and habitat assessment transect, manta tow, and fish visual census for bio-physical factors).



35 minutes

Discussion on Workshop Results

Process the results of the workshop. Ensure that participants agree on the design of the baseline data-gathering design and formats including the process of conducting the same at the community level.

Summarize the presentation by asking the participants some questions using the session objectives as guide.

HANDOUT #6

CRITERIA FOR SITE SELECTION

Your site selection will depend on the objectives of your sanctuary. Possible criteria that you can be used:

1. Ecological importance

- How important is the area/ecosystem being chosen?
- What commercially and ecologically important species are there in the area, what parts of their life cycle, etc.
- How many people use the area for fishing, gleaning, etc.?
- Is good quality habitat still and diverse (many species) i.e. will it be able to recover?
- Uniqueness, is it unique or important
- Contains a variety of habitats and encompasses one system
- Possible contribution to a network of marine protected areas (MPAs)?

2. Social importance

- The area will be accepted by the community at large as a closed area?
- Is it near to people who will arrange and guard it/within view of the community? If it is too far away it may be difficult to manage.
- Are certain types of fishing gear already used in the area? Where will those gears be displaced to?
- Are all the involved groups, stakeholders, recreationists, fishers, gleaners, etc. willing to close the area?
- Do heritage, historic, cultural values exist?

3. Economic importance

- Is it acting as nursery area or refuge area for fishes at present?
- Does the community have enough funds to put buoys in the area, build a guardhouse etc.?
- Does it have potential for tourism and diving now or later on?

4. Practical

- Size, is it going to be biologically feasible? Balance the size based on feasibility and community aspects
- Is it really going to cause a major upset to the community income/livelihood?
- Is there financial support to get the sanctuary up and running?
- Is there a lead group in charge or willing to take responsibility?

5. Other criteria

Urgency

- How badly does the community need the sanctuary

Effectiveness

- How useful will the sanctuary be to the community
- Is the area practical to manage?

Techniques in Resource Mapping

- Select a group which represents many sectors of the community
- Recommend doing at least a one two-day site selection Participatory Coastal Resource Assessment (PCRA) with the community and pick 2-3 sites and have the groups collect data about the areas in the morning using the fish visual census and Manta tow techniques.
- Once finished, present the results to the group and then give a small input regarding the siting and selection of areas as well as size needs with the local NGO or facilitating institution.
- Come up with two or three sites on a map for selection. Then include the criteria mentioned before in the selection, so you not only have the site data but other information about the area. This way you can build up a picture of each area and what would be the best choice.
- Include information like closeness of houses, ease of patrolling and duties, current uses e.g. bunsod, diving area etc.
- Have the group decide on what area is best based on the discussed criteria and considerations.
- Hint: Have older members of the community and fisherfolks help out.

Size and shape of sanctuaries

- Better to have larger sanctuaries (in theory) of 10 hectares or more.
- All sanctuaries are helping, many processes unknown still and even in a massive area with low habitat there may be larval, eggs and other impacts which are unseen but beneficial.
- Smaller reserves will look after smaller range fishes, larger sanctuaries will allow for fishes with larger ranges. Predators tend to have large ranges and damselfishes and anenome fishes have a small range.

Opportunity cost

It is quite expensive to set up and manage, patrol and maintain a sanctuary.

Bohol encouraged the limit of about 10 hectares minimum for a sanctuary. This ensured that the impact and return on fish catch of the sanctuary is worth the investment and sacrifice of the fisherfolks (again case to case basis). A better impact brings a much higher chance of sustainability of the sanctuary.

In theory, about 20% of the fishing ground or habitat should be enough to act as an insurance policy for fishes, corals and other invertebrates within the area.

Data collection and storage

The Participatory Coastal Resource Assessment Training Guide (Deguit *et al.* 2004) provides all the techniques required for a participatory survey of the area. The MPA Report Guide (CCEF 2004) provides the format for storing the information gathered for planning and future reference.

Data Checklist Form								
Question, issue or problem	Possible Indicators	What may cause change	Where to Monitor	When to Monitor	Monitoring Method	Materials Needed	Person(s) Assigned	Target Dates & # days needed
Overfishing Poaching in MPA	Fish sizes & abundance	Changes in fishing effort, natural disturbances, changes in coral cover, management practices	Inside and outside the MPA	Northeast monsoon, southwest monsoon, summer	Fish Visual Census	50-m rope marked at 5-m intervals, mask & snorkels, slates w/ pencils, banca & gasoline, data sheets	MPA monitoring team	1 st weekend of January. 1 st weekend of May.
	Invertebrate abundance	Same as above	Same as above	Same as above	Invertebrate Census	Same as above	Same as above	Same as above
	Fishing Effort, Catch per unit	Increase in fishing effort, management practices like MPA enforcement	Whole village	At least once a week	Fish Catch Monitoring	Data sheets & pencils, logbook or notebook, fish identification materials, resource map, weighing scale, calculator	MPA monitoring team, women's group	Every Wednesday. Collection /submission of data forms 4 th Saturday of the month data summarization
Habitat Degradation	Coral cover	Destructive fishing practices, natural disturbances, management practices like MPA enforcement	Inside & outside the MPA	Once a year	Manta tow, Snorkel Survey	50-m rope marked at 5-m intervals, mask & snorkels, slates w/ pencils, banca & gasoline, data sheets	MPA monitoring team	1 st weekend of May , 1-2 days

MANTA TOW DATA SHEET															
Site Name :		Municipality & Province :													
Date (month/day/year) :		Time :		No.		Observer :		Timer/Mapper :		Notes (e.g. Crown-of-Thorns, starfish, diadema urchins, algae, etc.)					
Tow No.	Start Time	Location			Estimate % substrate cover					Hard Coral	Soft Coral	Dead Coral	DC w/ algae	Sand/ Silt	
		Latitude & Longitude/ Compass Bearing/Landmarks		Depth (m)	Hard Coral	Soft Coral	Dead Coral	DC w/ algae	Sand/ Silt						
		Start	End												
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Design

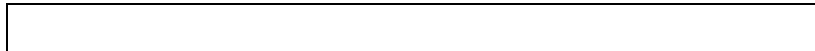
- Should try and include land as part of area and should block off the whole of an area (easier enforcement and some species still move onto land occasionally etc.)
- Should try and include coral reefs and other associated habitats and nursery grounds such as seagrasses, mangroves etc.

Surface area to volume ratio

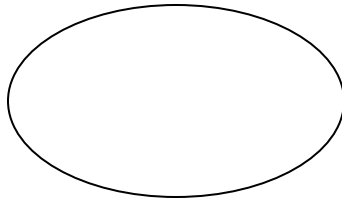
'Leakage' concept

Possible designs for a 10-hectare sanctuary

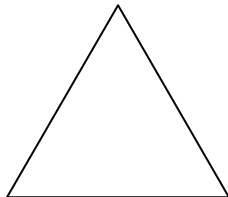
Rectangle 1000*100 Large surface area, more leakage



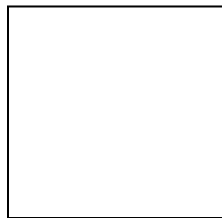
Circle Medium size surface area to volume ratio



Triangle Large area for leakage



Square Smallest surface area compared to volume



- However remember to fit your optimum area around the features of the reef (i.e. drop off, inshore portion etc).
- Rules of thumb: Lots of guess work, ask the older fisherfolks!!
- Try and fit in with the features of the reef and area, i.e. drop off reef crest include all of this and then perhaps add 100-200 meters extra, etc.

Placement conclusions

- Involve community in whole process
- Use mapping as mainstay of process to identify what is the best areas
- Involves compromises
- Consider both social and biological factors
- Include adjoining ecosystems and habitats which fishes use e.g. seagrass with corals etc.
- Include land if possible
- Put it in an area which is easy to protect (visible)
- Put it in an area where there are few full time fishers
- Keep boundaries practical, logical and easy to locate.
- Talk to the older fishers!

SESSION 7.0

Marine Protected Area Plan Preparation and Zoning

OBJECTIVES	At the end of the session, participants will be able to: ▪ discuss the planning process for marine protected area (MPA) establishment; ▪ generate a resource map with indicative zoning scheme for MPA management; and ▪ articulate some policy guidelines and regulatory mechanisms for each of the zone.
IMPORTANCE	Knowledge on MPA plan preparation and zoning process is a requisite to come up with a management plan
METHODOLOGY	Lecture; Workshop
TIME	2.0 hours
MATERIALS & EQUIPMENT	Idea cards, Manila paper, markers, masking tape, overheads, overhead projector, screen, PCRA map
HANDOUTS & READING MATERIALS	▪ Philippine Coastal Management Guidebook Series # 5 ▪ Zoning Types ▪ Basic Contents of MPA Management Plan ▪ Philippine Coral Reefs Under Threat: Lessons Learned After 25 Years of Community-Based Reef Conservation ▪ MPA Rating System

TRAINING SESSION 7.0

CONTENT AND ACTIVITY PLAN



10 minutes

Introduction

Introduce the session noting the coverage and the expected output at the end of the session and its relation to the overall output of the training program. Link the session on baseline data collection and resource mapping to this session. Also recall the discussion on site selection criteria and shapes and sizes of MPAs. Tell the participants that refreshing their knowledge on these items is vital in this session.



45 minutes

Group Sharing on Experiences in Planning

Start the discussion by asking the participants their idea of planning in general and MPA planning in particular. (When possible, start with a group activity before drawing out concepts of planning.) Note down their answers and link to the definition of planning.

Characteristics of effective planning process include the following:

- Participation – planning should be a participatory exercise involving the organization's clients and other outside individuals or groups who will be affected by the plan together with those whole will be responsible for implementing the plan. A plan which seeks to dictate programs without this consultation and involvement is likely to be far less effective.
- Bias towards action – many factors affect how useful any planning exercise will be but none is more important than the presence or absence of a “bias towards action”. There need to be a real commitment from the organization to implementation of the plan. This is sometimes lacking if planning is undertaken just to meet statutory and bureaucratic obligations or because it is “the thing to do”.
- Decision-making framework – circumstances relevant to a plan will change. Plans that propose a series of actions to be undertaken in response to current circumstances without clearly linking these to broader objectives can quickly become outdated. Effective plans establish clear outcomes and objectives, establishing a framework which can be used to guide future decisions and to help formulate strategies to cope with new problems or opportunities.

Discuss the minimum contents of the plan (see handouts). Tell them that they need to come up with MPA management plan at the end of the training.



50 minutes

Group Discussion and Exercises on Zoning

Discuss various zoning schemes by showing the sample resource map. Emphasize the need and the reason for zoning in properly managing an MPA. Ask the participants:

- What types of MPA zones they are familiar with?
- What are the policy guidelines and regulatory mechanisms for each of these zones?

Note their answers and elaborate some points using the prepared acetates. Remind them that a zoning scheme should be part of the MPA management plan they need to produce at the end of the course.



15 minutes

Wrap Up

Summarize the key points in this session and note its link to the expected output of the course. Also ask the participants some questions using the session objectives as guide.

HANDOUT #7

ZONE TYPES¹

Zones	Description
*Core/Sanctuary Zone	Strictly protected no-take area, established for a particular reason (social, economical, ecological, usually to prevent all forms of extraction)
*Buffer Zone	Transition space between the core area and the inner edge of the outside, unmanaged area (may allow limited uses).
Biological Zones	To protect ecosystems, habitats, processes (biological, chemical or physical) and genetic diversity.
Species Zones	Where particular animal and/or plant species are protected.
*Sustained Yield	Where exploitation is allowed at a sustainable level using ecologically sound methods
Fisheries Management Zone	Where particular fish stocks are monitored and catch levels controlled
Water Quality Control Zones	Where potential or existing forms of pollution are closely monitored and catch levels controlled.
*Tourism Management Zones	Where recreational uses of an area are allowed and managed.
Scientific Research Zones	Where ecologically-sound research is allowed in relatively undisturbed, pristine areas
Education Zones	Where instructional activities are permitted for the benefit of participants, the general public and tourists, sometimes in combination with other zones.
Cultural Zones	Areas of cultural significance that are protected or where cultural activities or monuments are preserved.

¹ Zones can overlap and include more than one purpose or use (e.g. core [no-take] zone or be synonymous with biological and species zone).

*Commonly found in Philippine MPAs.

Sample outline of a site management plan

Chapter 1. Introduction (rationale, scope of plan, legal basis, overall goal, etc.)

Chapter 2. Profile of the MPA site or general area

- A. General Information
- B. Bio-physical condition
- C. Socio-economic condition

Chapter 3. Goals and objectives for MPA management

Chapter 4. Management interventions (each with strategies and activities)

- A. Habitat management (required)
- B. Management zones – spatial allocations and regulations (required)
- C. Constituency building – community organizing and education (required)
- D. Compliance and enforcement (required)
- E. User fee system (optional)
- F. Alternative/supplemental livelihood program (optional)
- G. Shoreline or foreshore management (optional)
- H. Solid waste management (optional)
- I. Others

Chapter 5. Implementing structure

- A. Management board (members and positions)
- B. Duties and responsibilities (specific roles and functions)
- C. Organizational chart

Chapter 6. Monitoring and evaluation

- A. What will be monitored (reef substrate cover fish stock, socio-economic, etc.)
- B. Methods to be used
- C. Institutional and scheduling arrangements (who will do it, how often?, etc.)
- D. Budgetary and equipment requirements
- E. Reporting and feedback mechanisms (schedules, formats, to whom, etc.)

Annexes:

- A. Data figures and tables
- B. Monitoring and evaluation forms (MPA Report Guide)
- C. Photographs
- D. Ordinance

SESSION 8.0

Local Legislation and Law Enforcement

OBJECTIVES	At the end of the session, participants will be able to: ▪ discuss the need for legislative action for marine protected areas (MPAs); ▪ explain the legislative process in formulating a community-based MPA; ▪ enumerate the minimum contents of the ordinance declaring a MPA; and ▪ explain the key elements of patrolling schemes applicable for marine protected area management.
IMPORTANCE	Knowledge on the processes involved in local legislation to establish an MPA and vital provision therein is very critical in successful implementation and enforcement
METHODOLOGY	Lecture; Workshop; Discussion
TIME	1.5 hours
MATERIALS & EQUIPMENT	Idea cards, Manila paper, markers, masking tape, overheads, overhead projector, screen
HANDOUTS & READING MATERIALS	▪ Philippine Coastal Management Guidebook Series # 2, 5, 6 & 8 ▪ Sample ordinance declaring a marine protected area ▪ Sample Fisheries Ordinance ▪ Sample Comprehensive CRM Ordinance

TRAINING SESSION 8.0

CONTENT AND ACTIVITY PLAN



10 minutes

Introduction

Introduce the session. Stress the objectives and its relation to MPA establishment and management process.



20 minutes

Question and Discussion on MPA Legislation

Ask the participants the following questions to start the discussion:

- What are their experiences relative to local legislation particularly the process of passing an ordinance?
- Why is it that legislative support in a form of resolution and/or ordinance is important in the establishment and management of a MPA?
- How should the crafting of the ordinance declaring a MPA be made?

Note down their answers and relate these to the presentation.



30 minutes

Presentation on Local Legislation

Link presentation to the points discussed earlier. The presentation may follow this outline.

- The importance of legislative support in MPA establishment and management
- Local legislative process in formulating an ordinance declaring a community-based MPA
- Minimum contents of an ordinance declaring a MPA



20 minutes

Buzz Session to Critique Sample Ordinance

Distribute sample ordinance and form buzz groups. Ask each group to critique the ordinance as regards the contents. Encourage exchange of ideas. Note down their answers.

Relate the outputs to comprehensive coastal resource management (CRM) plan a local government unit may have formulated. Stress the how the two measures relate.



10 minutes

Wrap Up and Summary

Summarize the key points in this session and note its link to the expected output of the course. Also ask the participants some questions using the session objectives as guide.

HANDOUT #8

A SAMPLE MUNICIPAL ORDINANCE IN ESTABLISHING A MARINE SANCTUARY

Republic of the Philippines
Province of _____
MUNICIPALITY OF _____

Excerpts from the minutes of the regular session of the Sangguniang Bayan of _____,
held in its Session Hall on _____.

Present:

Hon. _____, Vice-Mayor and Presiding Officer
Hon. _____, Member, Sangguniang Bayan
Hon. _____, Member, Sangguniang Bayan
Hon. _____, Member, Sangguniang Bayan
Hon. _____, Member, Sangguniang Bayan
Hon. _____, Member, Sangguniang Bayan
Hon. _____, Member, Sangguniang Bayan
Hon. _____, Member, Sangguniang Bayan
Hon. _____, Member, Sangguniang Bayan
Hon. _____, Member, Sangguniang Bayan
Hon. _____, Member, Sangguniang Bayan

Absent : None

Ordinance No. _____ Series of 2000
An Ordinance Establishing a Marine Sanctuary
in the Municipal Waters of _____

BE IT ORDAINED by the Sangguniang Bayan of the Municipality of _____,
Province of _____, That

Section 1. Title. – This ordinance shall be known as the _____ Marine Sanctuary
Ordinance of 2000.

Section 2. Declaration of Policy. – This is hereby declared the policy of the municipality:

1. to manage the coastal and fishery resources of the municipality, in a manner consistent with the principle of coastal resource management;
2. to protect and manage the municipal waters its coastal and fisheries resources for the enjoyment and benefits of the municipal fishers in perpetuity; and
3. to enhance people's participation in the management of the coastal and fishery resources of the municipality.

Section 3. Definition of Terms. – As used in this ordinance, the following terms and phrases shall mean as follows:

1. Marine Sanctuary – a designated area in the municipal waters where fishing and other fisheries activities are prohibited and human access may be restricted and which is characterized by high productivity and/or high biodiversity.
2. MFARMC – shall mean Municipal Fisheries and Aquatic Resources Management Council.
3. Municipal Waters – include not only streams, lakes, inland bodies of water and tidal waters within the municipality which are not the subject of private ownership and not included within the national parks, brackish water fishponds leased by the government, and national fishery reserves, refuge and sanctuaries but also marine waters included between two lines drawn perpendicular to the general coastline from points where the boundary lines of the municipality touch the sea at low tide and a third line parallel with the general coastline including offshore islands and 15 kilometers from such coastline. Where two municipalities are so situated on opposite shores such that there is less than thirty (30) kilometers of marine waters between them, the third line shall be a line equidistant from opposite shores of the respective municipalities.
4. People’s Organization – a bonafide association of citizens with demonstrated capacity to promote the public interest and with identifiable leadership, membership and structure. Its members belong to a sector/s who voluntarily band themselves together to work for and y themselves for their own upliftment, development and greater good.

Section 4. Boundaries of the Marine Sanctuary. There shall be a marine sanctuary in the municipal waters of this municipality within the following geographic coordinates:

From Pt. 1 XX ° XX’ XX” N latitude, XX ° XX’ XX” E longitude

To Pt. 2 XX ° XX’ XX” N latitude, XX ° XX’ XX” E longitude

To Pt. 3 XX ° XX’ XX” N latitude, XX ° XX’ XX” E longitude

To Pt. 4 XX ° XX’ XX” N latitude, XX ° XX’ XX” E longitude

Provided, That fishing and other human activities in the marine sanctuary are prohibited:

Provided, however, That scientific and educational activities shall be allowed in the sanctuary, only if written permission is obtained from the municipal government.

Section 5. Management of the Marine Sanctuary. The municipal government, the people’s organization, the barangay council, and the MFARMC, shall be responsible for the management, protection, conservation and development of the marine sanctuary.

Section 6. Formulation of Sanctuary Management Plan. Within thirty (30) days from the approval of this ordinance, the municipal government, the people’s organization, the barangay council and the MFARMC, shall formulate a management plan for the operation of the sanctuary.

Section 7. Appropriation. The municipal government shall allocate the amount of _____ for the implementation of this ordinance. The Sangguniang Bayan shall provide for the appropriation for the management of the sanctuary for the succeeding years to be included in the annual budget of the municipality.

Section 8. Penalty. Violators of this ordinance shall be penalized with a fine not exceeding two thousand five hundred pesos (₱2,500.00) or an imprisonment for a period not exceeding six (6) months, or both at the discretion of the court.

Section 9. Repealing Clause. All previous ordinances, executive orders, rules and regulations or parts thereof which are inconsistent with this ordinance are hereby repealed and modified accordingly.

Section 10. Separability Clause. If, for any reason or reasons, any part or provision of this ordinance shall be held unconstitutional or invalid, other parts or provisions hereof which are not affected thereby shall continue to be in full force and in effect.

Section 11. Effectivity Clause. This ordinance shall take effect ten (10) days after a copy of the thereof is posted in a bulletin board at the entrance and in at least two (2) other conspicuous places of the municipal building and the ordinance has been published once in a local newspaper of general circulation in the municipality.

SO ORDAINED . . .

APPROVED this _____, 2000 at _____, _____.

I HEREBY CERTIFY the correctness of the foregoing Ordinance.

Secretary to the Sangguniang Bayan

ATTESTED:

Vice-Mayor
Presiding Officer, Sangguniang Bayan

APPROVED:

Mayor

Date of Approval _____

PATROLLING SCHEME

Patrolling scheme formulation does not start only during implementation or establishment of a marine protected area (MPA) but commences right on the planning and consultation stages.

Stages of Patrolling Scheme Formulation

- Planning
 - Identify potential committed individuals who can take charge in the enforcement;
 - Involve where possible the barangay council and other units within the barangay such as the Fisheries and Aquatic Resource Management Council, *Tanod*, Fish Warden, and *Sangguniang Kabataan*;
 - At the municipal level, evaluate the level of support incumbent officials can provide, including the Philippine National Police;
 - In effect, the patrolling scheme commences right at the onset of MPA planning and zoning consultations. Absence of an element of enforcement and patrolling scheme during planning and zoning discussions may be in the longer term not so favorable; and
 - The pulse of local communities as regards these issues can be determined during Participatory Coastal Resource Assessment (PCRA), resource mapping and baseline data collection. This should be actively sought after during this activity.
- Implementation and Maintenance
 - Ensure the arrangements are clear (i.e. committee on enforcement; rotation basis of individuals or task groups, etc.);
 - Ensure provision and maintenance of equipment and infrastructure for enforcement purposes such as; binoculars, radio communication unit, megaphone, guardhouse, boat and gasoline;
 - Encourage volunteerism among community members. But urge barangay council where possible to provide incentives;
 - Collect fees on the use of a designated area within the protected area; and
 - Ensure sharing scheme be agreed and bulk of the revenues be used for the maintenance of the MPA.

Lessons from Gilutongan Marine Sanctuary

- Enforcement should be from the start community-driven, not solely a municipal initiative.
- Continuous education should be pursued. There is no other best law enforcement tool except continuous education.
- Patrolling and law enforcement arrangement should be tied with revenue collection and sharing scheme where possible. The same should be used for the management and maintenance of an MPA.

SESSION 9.0

Annual Programming, Budgeting, and User Fees

OBJECTIVES	At the end of the session, participants will be able to: ▪ come up with initial cost estimates of a proposed marine protected area, ▪ explain the cost-benefit analysis for marine protected area (MPA); and ▪ understand different user-fee systems.
IMPORTANCE	Determining the budget items (both initial and recurrent) as well as the potential revenues from the sanctuary helps the participants appreciate the management and maintenance funding requirements. It also helps decide an appropriate user-fees and collection systems.
METHODOLOGY	Lecture; Workshop
TIME	1.5 hours
MATERIALS & EQUIPMENT	Idea cards, Manila paper, markers, masking tape, overheads, overhead projector, slide projector, screen
HANDOUTS & READING MATERIALS	▪ The Values of Philippine Coastal Resources: Why Protection and Management are Critical ▪ Collected Essays on the Economics of Coral Reefs ▪ Sample budget and cost estimates of an MPA ▪ Case Study of Cost-Benefit Analysis for MPA – Olango Island Case Study ▪ Examples of user-fee systems

TRAINING SESSION 9.0

CONTENT AND ACTIVITY PLAN



10 minutes

Introduction

Introduce the objectives and coverage of the session. Stress its relation to MPA management and maintenance.



20 minutes

Group Activity on Budget Items

Break the participants into small groups. Ask each group to consider what are the items constituting for initial investments and what are the recurrent costs. Let them present their answers and encourage them to explain why they are considered as initial investments and recurrent costs accordingly.



20 minutes

Presentation on Budgeting

Elaborate the various items under initial investments and recurrent costs. Note the importance of these concepts vis-à-vis annual programming and budgeting cycle of local governments or any organization for that matter. Give examples of these costs and its variations. Ensure that these items include the following:

- Initial investment
 - buoys and markers
 - ropes
 - boat
 - guardhouse materials
- Recurrent costs
 - gasoline
 - honorarium
 - IEC materials



40 minutes

Presentation of Cost-Benefit Analysis Case Study

Relate the discussion on budgeting on cost-benefit analysis. Emphasize that in MPA, it does not only talk about benefits but costs as well. Encourage participants to exchange some views on the matter.

Present a case study. Encourage participants to give their comments and critique on the case.

Wrap up the session noting the necessity for investments to generate revenues for the communities as shown in the case.

SESSION 10.0

Developing MPA Networks

OBJECTIVES	At the end of the session, participants will be able to: ▪ define “marine protected area (MPA) networks”; ▪ describe how connectivity in the marine environment works; ▪ know the difference between ecological, social and administrative MPA networks; ▪ articulate how individual MPAs can contribute to a MPA network; ▪ describe the essential factors that permit a MPA to contribute to a network; and ▪ discuss key issues in establishing a functional MPA network.
IMPORTANCE	Understanding the principles that help form a functioning MPA network will encourage practitioners to do better planning for the determination of location for MPAs and also in determining the size and exact boundaries of any given MPA. Applying these principles will ensure that management and protection of coral reef and other nearshore habitats is more strategic and effective in achieving fisheries management and marine biodiversity conservation.
METHODOLOGY	Planning exercise, lecture and discussion.
TIME	1.5 hours
MATERIALS & EQUIPMENT	Large maps of FISH target areas with habitats plotted and general currents shown; paper cut to represent different size MPAs to scale; sticky tape to mount the MPAs on the maps (one set for every 5 persons in training), LCD projector, screen, handouts.
HANDOUTS & READING MATERIALS	▪ “Creating and Managing Marine Protected Areas in the Philippines”

TRAINING SESSION 10.0

CONTENT AND ACTIVITY PLAN



30 minutes

Group planning exercise to set up MPA ecological networks

Break the group into small groups of 5 persons. Give each group a large map of one of the Fisheries Improved for Sustainable Harvest (FISH) Project target areas that has coastal habitats plotted and ocean currents shown together with a set of scaled MPAs that can be placed on the map. Ask the group to make the best arrangement of MPAs on the map so that they develop an ecological MPA network. Allow them 15 minutes to put the MPAs on the map. Then have each group present their maps with MPAs to the larger group in the following 15 minutes. Ask them to explain why they arranged the MPAs in the manner shown on the map.



40 minutes

Lecture presentation on MPA networks

The lecture will define MPA networks in their various forms and give examples of how MPA networks are established and operate in the Philippines. Factors critical for an effective network will be discussed such as:

- Size of reserves necessary to protect viable habitats
- Presence of exploitable species
- Vulnerable life stages of species and implication for management
- Connectivity among reserves
- Links among ecosystems
- Provision of ecosystem services to people

How to make MPAs work individually and as a network in the real world will be discussed through case studies.



20 minutes

Summary and Discussion

Discussion on results of MPA planning exercise in light of what was presented on MPA networks with a focus on the following points.

- a. Develop 5 basic principles required to form a functional ecological MPA network
- b. List 5 considerations to form a MPA social network

HANDOUT #10

Introduction

In the Philippines there is a well-documented history and experience of marine protected areas (MPAs) in terms of their implementation and the benefits derived from successful examples in the country. Published reports on the experience and means of implementing MPAs are numerous (e.g. DENR *et al.* (2001—Volume 5); White *et al.* (2002); Arceo *et al.* (2004); Russ *et al.* (2004); among others). The primary objective for the establishment of MPAs in the Philippines since the early 1980s has been to enhance coral reef fisheries. This occurs through habitat protection and the improved ability of reef fishes to grow to mature sizes for enhanced reproduction and spill over of larvae and adult fishes to adjacent areas outside of no-fishing zones within an MPA. In recent years, additional benefits that have been recognized as equally important for local stakeholders include enhanced livelihood opportunities from tourism and related economic activities associated with a MPA. It is also currently being documented that MPAs are generally more effective and successful in terms of fisheries and other economic and social benefits when implemented within the context of an integrated coastal management regime through the local government system in the country (White *et al.* 2005).

The challenge is how to improve the management of fisheries through the implementation of MPAs. Since MPAs are known to improve habitat quality and the productivity of the associated fisheries when well managed, an immediate objective is to improve the effectiveness of existing MPAs in a given area and to increase the area of coastal and fisheries habitat that is included within the management of a MPA. In addition to this, it is also known that “MPA networks” can enhance fisheries management and biodiversity conservation beyond what individual MPAs can achieve alone (Palumbi 2004). In this regard, the purpose of this session is to identify the objectives for and means of assisting MPAs and MPA networks. What constitutes a “MPA network” and its design is presented.

WHAT IS AN MPA NETWORK?

An MPA network is a collection of MPAs carefully chosen to achieve either (1) biodiversity conservation or (2) biodiversity conservation and fisheries enhancement. We can define the term “MPA network” more completely by taking a closer look at the two general types of MPA networks.

An MPA network designed to conserve biodiversity is a group of MPAs selected on the basis of:

- Biogeographic representation
- Habitat representation and heterogeneity
- Presence of species or populations of special interest (e.g. threatened and vulnerable species)

An MPA network designed to enhance fisheries is a group of MPAs that have been selected on the basis of:

- Size of reserves necessary to protect viable habitats
- Presence of exploitable (target) species
- Vulnerable life stages of selected species
- Connectivity among reserves
- Links among ecosystems
- Provision of ecosystem services to people

MPAs that interact are ecologically linked through various means such as:

- Connections of adjacent or continuous habitats such as coral reefs and sea grass beds
- Connections through regular larval movement in the water column between and within the MPA sites
- Regular settlement of larvae from one MPA inside another MPA
- Movement of mature marine life from one site to another dependent on habitats or because of regular or random spill over effects from MPAs
- Protection of a particular species that tends to be widely dispersed and possibly over-exploited

Biophysical and ecological advantages of an MPA network

The biophysical and ecological advantages of a MPA network over MPAs that are randomly placed or MPAs that simply maximize habitat protection but without an eye for how they interact ecologically might include:

- Ensuring that the most valuable marine habitats are at least partially protected as reflected by habitat quality and species richness
- Ensuring that some of the larval dispersed from a given MPA will either end up settling back inside the MPA or a MPA within the dispersal range or spatial neighborhood of the typical species residing in the MPA
- Ensuring that threatened, vulnerable or over-exploited species of a given area will have adequate habitat space to reside in through time and be able to continue reproducing as a result of the MPA network
- Ensuring that highly threatened species can continue to reproduce and disperse larvae into surrounding areas (e.g. giant clams, grouper, etc.)
- Enhancing fisheries production for a given management area because the larval production and dispersal, and fish spill over effects are maximized through planning to the benefit of both fisheries and conservation

The administrative and pragmatic advantages of a MPA network over MPAs that are randomly placed and not coordinated in any way might include:

- Knowing that the investment in the establishment and management of the MPA network is maximizing its potential return to local stakeholders such as fishers and tourist operators alike
- Having an information base for the MPAs in an area that helps develop logical choices in how to expand MPAs effectively and how to efficiently manage the MPAs through strategic efforts based on the network design
- Providing a rationale for individual MPA stakeholders or communities to coordinate with each other to share their experiences and to enhance each others efforts in managing and protecting their respective MPAs

MPA NETWORK DESIGN

As a prerequisite to establishing and improving MPAs and networks of MPAs, we should understand what design features of a MPA will make it effective to enhance fisheries production in a given area in relation to the social and cultural context. General factors and criteria to consider in determining sites for a MPA or a series of MPAs are:

- Relative naturalness: Areas still in good condition;
- Representativeness: Areas that are unique, include important ecological functions and/or species;
- Biodiversity: Areas with high diversity of species/ecosystems;
- Vulnerability: Areas with rich resource/biodiversity that are relatively vulnerable to disturbance or destruction;
- Fisheries value: Areas that are strategic to enhance fisheries;
- Tourism value: Areas that could, if protected, enhance appropriate recreational uses and tourism revenues;
- Social acceptance: Acceptability of all stakeholders; and,
- Practicality of management: Relative ease of management.

Considering these criteria is important to help ensure sustainability for any MPA since it will exist in the broader social and cultural context of a community and local government and must achieve multiple objectives to be truly successful. There are additional factors that need to be considered to try and maximize the fisheries value of a MPA. These more specific criteria that may weigh a decision towards an area with more potential for fisheries enhancement are:

- Habitat quality: Areas with generally superior habitat quality or relatively better than the average for the general area (e.g. coral cover, seagrass, water quality etc);
- Fish habitat: Areas that maintain higher than average abundance, density and species richness of fishes or contain spawning aggregations of fish;
- Oceanography: Areas that have favorable currents that tend to aggregate larvae and organisms inside the sanctuary and with periodic flushing of water inside the area;
- Biodiversity: Areas with higher than average biodiversity and range of animals on the food chain from large to small;
- Size: Areas that cover at least 10 hectares and preferably 20 or more hectares of critical fisheries habitat;
- Social acceptance: Areas that will not arbitrarily remove the most desired fishing ground from a community to not create unnecessary conflicts for management;
- Practicality of management: Areas where no fishing and extraction can be enforced given the resources that will realistically be available for protection; and,
- Quality of management: Areas where the rules are sufficiently enforced to ensure that fisheries benefits will ensue per the MPA management rating system level 3.

The above criteria or rules of thumb, if met, will provide relative assurance that a MPA will contribute significantly to fisheries enhancement in its area of operation. The next consideration is what to consider if more than one MPA is being planned to form a network. The basic ingredients of a network will contain certain attributes by definition. Also, such a network will have both social and environmental dimensions that can be defined separately but which may ultimately become intertwined in the practical implementation of a network. Attributes of a functional network of MPAs will include:

- Individual MPAs will at least achieve the above criteria for MPAs in general and those contributing to fisheries enhancement;
- Individual MPAs will be managed effectively at level 3 or above;

- General management area shall be analyzed from the perspective of critical habitats, fisheries, oceanography and existing MPAs as a first step in planning for an area wide network of MPAs;
- Site specific area (multi municipal to barangay level) shall be analyzed from the perspective of critical habitats, fisheries, oceanography and existing MPAs as a second step in detailed planning for MPAs priority sites and networks;
- Existing MPAs that maximize fisheries enhancement should be identified;
- New areas that will contribute to fisheries enhancement should be identified;
- 5-10% of critical habitat for a given planning area should be included within an MPA;
- MPA management bodies will be capacitated to improve the management of their MPA and linked to other MPA management bodies in the network area;
- MPA management bodies together with their local governments and other assisting organizations will be engaged in planning and implementing their MPA network for area of concern; and;
- A MPA network will be within the context of integrated coastal management plans and regimes of one or more municipal governments with provincial assistance.

In summary, the basic attributes of an MPA network will thus be:

- Each MPA effective in its own right following above criteria;
- MPAs protect critical fisheries habitats;
- MPAs each contribute to fisheries enhancement;
- MPAs cover a critical minimum area of the larger planning area;
- MPA management bodies effective and linked to larger planning area;
- Management system horizontal and vertical for sustainability; and,
- Network links multifaceted—both environmental and social.

FIELD APPROACH AND PROCESS

The basic approach to improving the management of MPAs, identifying and planning for new MPAs and eventually forming a network of MPAs for a given planning area will generally follow the coastal resource management (CRM) planning process being implemented in local governments in the Philippines. The process of information gathering, analyzing, planning, implementing and then monitoring and evaluation is tested and effective and only needs to be focused on the primary outcome of fisheries management through the implementation of MPAs. Basic steps in the process of gathering information, analysis and planning are:

1. Collection and analysis of existing secondary information on planning area;
2. Review status of CRM in each municipality per book by DENR--CMMO (2003);
3. Review status of all MPAs in planning area by completing the MPA Report Guide (White *et al.* 2004);
4. Review status of CRM plans for each municipality and determine what gaps exist for improving fisheries management in general and for MPAs;
5. Prioritize MPAs, existing and proposed new ones, for management planning and implementation within and among municipalities of planning area;
6. Improve CRM plans that include MPAs and MPA networks for single and multi-municipal areas together with all concerned stakeholders; and
7. Assist with implementation as appropriate and possible through multi-sector approaches that maximize available resources.

It is assumed that all of above steps are done in concert with the local governments and communities of concern and in coordination with other projects and stakeholders operating in the area. This assumption will result in quite different forms of participation and roles of the Project from one planning area to another. The protocols for assisting communities and local government with the planning and implementation of MPAs have been tested in many projects and improved immensely over the last few years. The procedure to assist in implementing an MPA is best described in this training course. Several points will guide projects on how to effectively assist with improving MPA effectiveness and eventually forming MPA networks are:

1. Most MPAs, once planned and operating, will need to strengthen their management body through a community level intervention that helps the management body develop and implement a MPA management plan together with the municipal administration. This MPA plan may ultimately amend the ordinance that established the MPA with refined rules.
2. The project will need to identify partners working in the area who are assisting with CRM and MPAs in the area and divide up the work accordingly.
3. Assisting groups should make a strategic plan for coordination and agree on some common objectives that are consistent.
4. Each MPA that will ultimately be part of an effective network will require some level of assistance in some portion of its planning and implementation process. All successful MPAs in the Philippines have received assistance to help make them become sustainable in their own right.

CREATING MPA NETWORKS THAT ARE SUSTAINABLE

MPA networks are not created rapidly but evolve over time with good planning. The above guidelines can assist to improve MPAs, make them more functional and provide guidance towards building a context that will allow MPAs and the organizations that assist them to link and support one another so that a network can evolve. Strategic interventions are always required to push the process along. Key interventions in summary of what has been explained above include:

- Provide support for MPA monitoring and evaluation that addresses biophysical and management needs using the existing protocols (Uychiaoco *et al.* 2001; White *et al.* 2004);
- Summarize all relevant data in a geographical (maps) and graphic manner for feedback to communities and for use in planning and education through simple reports and other means to keep the data alive and useful at the local level;
- Train and capacitate local stakeholders to perform the tasks of planning, implementing, monitoring and evaluating a MPA using tested PCRA and other tested protocols referred too above;
- Conduct targeted research studies on the effectiveness of existing MPAs, locating new MPAs, social acceptability of MPAs, oceanography of area, location of fish aggregation areas and others deemed relevant for planning and education;
- Mentor all targeted MPA management bodies in a systematic but strategic manner to ensure that management is progressing to a higher level per the MPA rating system;
- Sponsor workshops and informal meetings among MPA managers, management bodies and other important stakeholders to help establish social networks for MPA implementation and support; and,
- Link all existing and future MPA work (data, results, MPA establishment etc.) with national programs to support MPAs such as the Protected Area and Wildlife Bureau of DENR, the MPA Database of CCEF and Partners and others that may assist in making local efforts more sustainable.

MPA networks—final key points

1. An MPA network is also a network of people managing the component MPAs, benefiting from the network and promoting the networks' viability and longevity
2. Not just any collection of MPAs can be called a MPA network. A MPA network is a collection of MPAs that *interact* in some meaningful manner (e.g., source or sink of larvae and propagating organisms, protection for quality habitat and threatened or endangered species, etc.) that enhance fisheries and biodiversity conservation (Palumbi 2004)
3. An effective MPA network is composed of individual MPAs that each satisfies the requirements of an effective MPA as highlighted in this training course.

SESSION 11.0

Monitoring and Evaluation of Marine Protected Areas

OBJECTIVES	At the end of the session, participants will be able to: ▪ describe the tools for monitoring reef cover and fish species; and ▪ demonstrate the use of these tools.
IMPORTANCE	Basic understanding of the concepts and techniques in monitoring and evaluation helps improve sound management of a marine protected area (MPA)
METHODOLOGY	Simulation; Lecture
TIME	2.0 hours
MATERIALS & EQUIPMENT	Idea cards, Manila paper, markers, masking tape, overheads, overhead projector, screen, slate boards, transect tapes
HANDOUTS & READING MATERIALS	▪ Coral Reef Monitoring for Management ▪ Sample Monitoring and Evaluation Document ▪ MPA Report Guide

TRAINING SESSION 11.0

CONTENT AND ACTIVITY PLAN



30 minutes

Group Discussion on MPA Monitoring and Evaluation

Start the discussion by showing MPA establishment and management process. Emphasize the role of monitoring and evaluation for the success of a marine protected area.

Ask the participants what monitoring and evaluation (M&E) tools they are familiar with. Note their answers down. Relate their answers to the earlier session on resource mapping and baseline data collection. Discuss the following tools for monitoring from the MPA Database and Report Guide:

- MPA rating
- Manta tow techniques
- Fish visual census
- Fish catch monitoring
- Community perceptions survey



1 hour

Demonstration of Use of M&E Tools

Group the participants into three or four and ask each group to demonstrate the process of data collection using their assigned tools.



30 minutes

Data Processing and Presentation

Remind participants that data is useless unless the community or other users are make use of it in decision-making processes and other management actions. Explain the procedure in data processing. Show some community level examples.

Summarize the session by highlighting the key points to consider during the field exercises.

HANDOUT #11

MONITORING AND EVALUATION OF MARINE PROTECTED AREAS

- Information is something we all need in every day life in order for us to make informed decisions about things.
- When using the adaptive management cycle this is even more important.
- Many sanctuaries have been implemented but very few have been properly monitored.
- Much money is spent on implementation but again very little on evaluation of these inputs.

Resource assessment

- Assess trends and information and feeds into adaptive management cycle
- Finds out what a resource has, its main features and what is important
- Assesses an area in preparation for planning to occur

Research

- Understanding factors that predict the abundance of the fauna and flora in the area
- Looking for signals of activities that are influencing the area and 'noise', the impacts of these activities and their links
- Assessing causes and changes in an area

Monitoring

- Assess the effectiveness of management – MPA Rating System
- Measure the impact of a specific management intervention
- Looking for temporal changes in both qualitative and quantitative indicators
- Evaluating the success or failure of certain interventions and developing conclusions for future implementation

In conducting assessments of marine sanctuaries there are several techniques which can be used, as facilitator you must be able to choose which is the best for the situation and each will be different for different areas.

The most important though before you do anything is ask the question why are we going to monitor this area, if you are again clear with your objectives then you will be easily guided as to what is best.

It is also advisable to again include your key leaders from the area in the whole process from deciding which tool to use to actual implementation of the research.

Research overview

(Coral Reef Monitoring for Management, Uychaioco *et al.* 2001)

- Selecting representative areas
- Numbers of areas and timeframes
- Manta Tow
- Community-based fish visual census
- Community-based fish catch monitoring
- More technical and scientific monitoring, through the use of diving teams, etc

Conclusions

- Pick the tool based on objectives, why are we doing the monitoring?
- Copious amounts of participation
- Include community in research team
- Feed the information back and validate it properly and solicit feedback
- Publicly publish the results in barangay
- Long term sustainability, budget and so on
- Re-define/adjust your plan based on findings of the monitoring

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appendix 3

Networks Supporting Marine Protected Areas in the Philippines

Name of Network	Purpose/Goals/Objectives	Contact Information
CRM Net Coastal Resource Management Network	CRM Net was formed in 1999 to monitor the impact and accountability of major CRM/ICM programs and develop and pursue an advocacy agenda for strengthening CBCRM practice. It consists of individuals from government, NGOs, POs and the private sector involved in theory and practice of CRM/ICM. It aims at facilitating the exchange of experiences, information and knowledge on CRM/ICM among members of the Net and other similar networks; fostering and nurturing linkages among advocates, practitioners and stakeholders; and promoting and advocating standards of good practice in CRM/ICM.	Resource Center, University of the Philippines College of Social Work and Community Development (CSWCD), Diliman, Quezon City 1001. Tel.: (02) 929-2477. Email: cbcrm_rc1@pacific.net.ph
MPA Net MPA Management Monitoring Network	The MPA Net is a nationwide network of MPA managers, advocates and practitioners composed of 27 national and regional government agencies, academic institutions and NGOs. This network encourages exchange of ideas and sharing of experiences and information for the advancement of MPA implementation. It is promoting the use of the MPA Database System that centralizes data on MPAs to facilitate easy access to information, available in a user-friendly and standardized format to document and monitor change for adaptive management, policy decisions and science.	Coastal Conservation and Education Foundation (CCE Foundation), Rm 302, PDI Condominium, Archbishop Reyes Avenue, Banilad, Cebu City. Tel: (032) 233-6947. Email: ccef@mozcom.com or ccef-mpa@mozcom.com Website: www.coast.ph
NARRDs National Aquatic Resources Research and Development System	The NARRDS is a nationwide network of R&D institutions from academic and government agencies composed of over 40 members which includes national and zonal centers, cooperating stations and collaborating specialized agencies which implement aquatic and marine resources R&D.	Philippine Council for Aquatic and Marine Research and Development (PCAMRD), Los Baños, Laguna. Tel: (049) 536-5578 Email: ersterz@laguna.net; mrd@laguna.net
PAMANAKA Sa Pilipinas (Pambansang Alyansa ng Maliliit na Mangingisda at Komunidad na Nangangalaga sa Santuwaryo at Karagatan sa Pilipinas) National Alliance of Small-scale Fishers Stewarding Sanctuaries and Seas in the Philippines	A nationwide alliance of community-based MPA managers represented by fisher-leaders and barangay-level LGUs. Its focus includes capacity-building, networking and alliance-building, policy advocacy, and participatory action research. This network has 122 member-sanctuary sites.	Saturn St. Gochan Subd., Tisa Hills, Labangon, Cebu City. Telefax (032) 262-2713 Email: pamanaka@mozcom.com

Name of Network	Purpose/Goals/Objectives	Contact Information
PhilReefs Philippine Coral Reef Information Network	PhilReefs was conceptualized to consolidate various reef survey information and facilitate exchange and communication among the different reef workers. With the advent of information technology and the internet, this exchange of information can be operationalized by posting relevant data and information in an online web source such as PhilReefs.	Philippine Council for Aquatic and Marine Research and Development (PCAMRD), Los Baños, Laguna. Tel: (049) 536-1574 Telefax: (049) 536-5578 Email: dedo@laguna.net Website: www.dost.gov.ph
FishNet Philippine Fisherfolk Network for CBCRM	FishNet was formed in 1998 as a network of NGOs and POs with the aim to undertake studies and make institutional stands on the issues and concerns of the fisheries sector. It participates in discussions, launches media campaigns and engages government in action dialogue at various levels. FishNet holds meetings with key sectors and makes concrete recommendations to amend laws, policies and programs, as needed. The principle of community ownership is considered the primary approach towards attaining equitable and sustainable use of fisheries resources.	Philippine Council for Aquatic and Marine Research and Development (PCAMRD), Los Baños, Laguna. Tel: (049) 536-5578 Email: ersterz@laguna.net; mrd@laguna.net
PLMMA Philippine Locally Managed Marine Area Network	The Locally-Managed Marine Area (LMMA) Network is a group of practitioners involved in various marine conservation projects around the globe. Network members share knowledge, skills, resources, and information in order to collectively learn how to improve marine management activities and increase conservation impact. It involves 8 management areas in the Philippines.	Earth Restoration Trust Inc. (ERT), Diliman, Quezon City Email: toni@Immanetwork.org Websites: www.EarthRestore.org www.LMMANetwork.org

1 Community preparation and involvement



Does your MPA meet the following?

2 Resources assessment and mapping



3 Monitoring and evaluation

Essential conditions for a well-managed marine protected area (MPA)



4 Stable and functional management group



Marine protected area or MPA is the general term for marine sanctuary, marine reserve or marine park. It is a designated area in the sea where fishing or other forms of human access and activities are restricted to protect the area's ecosystem and natural resources.

Establishing an MPA requires an integrated and participatory management process involving the partnership of local government units, stakeholders and communities.

5 Formalizing the MPA and co-management in place



6 Law enforcement



7 Ongoing education and strengthening community involvement

