

CERMES Regional Project on Enhancing Management Effectiveness at Three
Marine Protected Areas in St. Vincent and the Grenadines, Jamaica & Belize

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Training notes for evaluating
Marine Protected Area
Management Effectiveness (MPA-ME)



Centre for Resource Management and Environmental Studies (CERMES)
University of the West Indies, Faculty of Pure and Applied Sciences
Cave Hill Campus, Barbados

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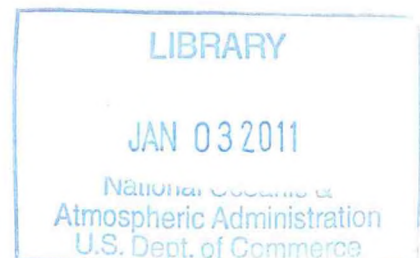


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**Centre for Resource Management and Environmental Studies (CERMES)
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Disclaimer

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Background

These training notes are the fourth and final component (production of training materials based on the process and on lessons learned) of the “*CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize*”. The goal of this project was to promote and institutionalise improved and adaptive coastal and management practices and policies in the Caribbean through the use of applied research and interdisciplinary training. The project was expected to contribute towards building capacity in Marine Protected Area (MPA) management effectiveness evaluation in the Caribbean. It is hoped that these lecture notes and accompanying fact sheets and PowerPoint presentation slides (see following section, *Using these training notes*) will be useful as training tools to build this much needed capacity in evaluating management effectiveness.

These training notes were developed from a number of useful sources on MPAs, management effectiveness evaluation and adaptive management.

Using these training notes

These training notes should be used in conjunction with the accompanying fact sheets, slide presentation, “*Training in Evaluating Marine Protected Area Management Effectiveness*”, and the guidebook, “*How is your MPA doing?*” by Pomeroy et al. 2004. The slide presentation is a combination of and adaptation of two presentations, ‘*How is your MPA Doing?: A Training Workshop for Evaluating MPA Management Effectiveness*’ and ‘*How the MPA Guidebook is used*’ presented by Dr. Robert Pomeroy and Dr. Patrick McConney, respectively. These training materials are aimed at MPA managers, practitioners and staff and will be most useful for teaching students with a background in MPA management.

The notes are divided into two parts covering protected areas and more specifically MPAs; and management effectiveness evaluation and use of guidebook. Blue coded boxes throughout the text highlight key points. Green coded boxes provide definitions of important terms. Recommended reading material is highlighted in purple coded boxes. Suggested questions which can be used to stimulate discussions and group work are given in the yellow-coded boxes.

PART 1

What is a protected area?

Defines what a protected area is and briefly outlines the six types of protected area according to IUCN criteria. Highlights major points relevant to protected areas in the Caribbean

All about MPAs

Begins with a background to one type of protected area, marine protected areas (MPAs), their characteristics, why they are important, the benefits of their implementation, types of MPAs, design, management characteristics and concludes with an overview of the MPA situation in the Caribbean

PART 2

What is management effectiveness?

In this section management effectiveness is defined and a background to why it should be evaluated is provided. Using the IUCN management effectiveness framework the evaluation is explained. The costs and benefits of such an evaluation are also examined

MPA guidebook introduction and adaptive management

Managers and other conservation practitioners are introduced to the process and methods to evaluate management effectiveness of MPAs for the aim of adaptive management

PART 1

1 PROTECTED AREAS

1.1 What is a protected area?

Protected areas are globally recognised as a major tool in conserving species and ecosystems. They also provide a range of goods and services essential to the sustainable use of natural resources. As a result, countries often have extensive systems of protected areas developed over many years. These systems vary considerably from country to country, depending on national needs and priorities, and on differences in legislative, institutional and financial support.

Information on protected areas is essential to enable a wide range of conservation and development activities. However, there is wide variation in the types of protected area, objectives of management, and degree of protection.

There are more than 115,000 protected areas in the world (WDPA 2006). They vary greatly in the precise purposes for which they are managed; the species, ecosystem or landscapes which they protect; their size; the type of management body responsible; the resources available for management; the principal management challenges; as well as the names given to them at the national level. The International Union for Conservation of Nature and Natural Resources (IUCN) has adopted and promoted a categories system for protected areas, based upon the objectives for which they are managed (see Section 1.1.1). This system was developed to bring some order to the confusing protected area picture, to standardise international terminology, and to promote a range of complementary approaches to protected area planning and management (Phillips 2002).

Although the number of protected areas worldwide has grown within the last 20 years, their abundance and coverage can be misleading indicators of conservation, particularly for marine areas as their establishment is not necessarily followed by effective management and enforcement regulations. Only about 12% of the world's land surface is included within protected areas. Less than 1 % of the world's marine ecosystems are protected globally, with the Great Barrier Reef and the northern Hawaiian islands making up one-third of all marine protected areas. The coverage of freshwater systems by protected areas is poorly known and even when rivers or lakes are under protection it is difficult to manage processes affecting water quality or species beyond the protected area boundary.

Traditionally viewed as national parks, nature reserves and protected landscapes, the 'protected area' encompasses more recent approaches such as sustainable use reserves and wilderness areas. The generally accepted IUCN (1994) definition of a protected area is:

“An area of land and/or sea especially dedicated to the protection of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.”

See Box 1.1 for key points to note about this definition. Although all protected areas meet the general purposes contained in this definition, in practice the precise purposes for which protected areas are managed differ greatly (Box 1.2).

Box 1.1 Some key points to the IUCN definition of a protected area

This definition:

- applies to both the marine and terrestrial environment
- requires that there should always be a special policy for the conservation of biodiversity (but it need not be the pre-eminent one);
- allows for conservation of natural resources, and of those cultural resources which are associated with these
- requires that a management regime is in place, but acknowledges that in some sites this may be done effectively through tradition, customary laws or ownership rather than in a formal legal manner

Source: Phillips, A. (2002). Management Guidelines for IUCN Category V Protected Areas: Protected Landscapes/Seascapes. IUCN Gland, Switzerland and Cambridge, UK. 122pp.

Box 1.2 Purposes for protected area management

- Scientific research
- Wilderness protection
- Species and genetic diversity preservation
- Environmental/ecosystem services maintenance
- Protection of specific natural and cultural features
- Tourism and recreation
- Education
- Sustainable use of resources from natural ecosystems
- Maintenance of cultural and traditional attributes

Source: <http://sea.unep-wcmc.org/wdbpa>

1.1.1 Protected area categories

The IUCN has designated six types of protected areas depending on their primary management objective. The six categories, applicable to marine and terrestrial protected areas worldwide, range from areas managed as strict nature reserves to multiple-use areas managed mainly for sustainable use. A summary of categories and their definitions is provided below in Table 1.1.

Table 1.1 Summary of IUCN protected area categories with definitions

Category	Definition and designation
Category Ia	Strict nature reserve: protected area managed mainly for science Area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring
Category Ib	Wilderness area: protected area managed mainly for wilderness protection Large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition
Category II	National park: protected area managed mainly for ecosystem protection and recreation Natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible
Category III	Natural monument: protected area managed mainly for conservation of specific natural features Area containing one or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance
Category IV	Habitat/Species management area: protected area managed mainly for conservation through management intervention Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species
Category V	Protected Landscape/Seascape: protected area managed mainly for landscape/seascape

Category	Definition and designation
	<p>conservation and recreation Area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area</p>
Category VI	<p>Managed resource protected area: protected area managed mainly for the sustainable use of natural ecosystems Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs</p>

Adapted from: IUCN (1994) Guidelines for Protected Areas Management Categories

These categories reflect a gradient of management intervention. In Categories I-III, strict protection is the rule and natural processes are of great significance; with Categories II and III combining this with facilities for visitors. In Category IV, the managed nature reserve, the manager intervenes to conserve or if necessary restore species or habitats. Category V is reserved for protecting cultural, lived-in landscapes, with farms and other forms of land-use. The new Category VI, the sustainable use reserve, is a protected area deliberately set up to allow use of natural resources, mainly for the benefit of local people. See Box 1.3 for points to note about this categories system.

Effective national systems of protected areas are most likely to need a combination of categories, established and managed strictly according to the criteria. The key issues may be judging the proportion of a protected area system that should fall under each category to ensure that all ecosystems are represented and that a range of ecological and social goals are met, and ensuring that all areas are effectively managed to meet their management objectives.

Box 1.3 Interesting points regarding the IUCN categories system for protected areas

• **Categorisation of protected areas is by primary objective**

Assignment to categories should be made on the basis of the primary management objective as contained in the legal definitions on which it was established. In assigning an area to a category, national legislation or similar effective means such as customary agreements or declared objectives of a non-governmental organisation will need to be examined to identify the primary objective for which the area is to be managed

• **Assignment to a category does not denote management effectiveness**

What an area is to be and how it is to be run are separate and distinct judgments

• **The system of categories is international**

The category system provides the basis for international comparison and is intended for use worldwide. Therefore the guidelines for protected area management categories is fairly general and will need to be interpreted with flexibility at national and regional levels. Additionally, the final responsibility for determining categories should be taken at the international level.

Adapted from: www.unep-wcmc.org/protected_areas/categories/eng/c1.pdf

1.1.2 Threats to protected areas

Setting aside areas of land, water and sea in protected areas is a strategy that is rooted in the assumption that these areas will be permanent such that the biological, cultural and aesthetic values they contain will be protected for the foreseeable future. However, protected areas, although designated may not always be implemented on the ground and as such are called ‘paper parks’. Others have been badly designed or located so that they cannot function efficiently.

Many well designed and properly implemented protected areas also suffer an array of threats ranging from poaching to air pollution and climate change. Even if protected areas themselves remain relatively intact, they can suffer from isolation and fragmentation if surrounding land use changes or intensifies. See Box 1.4 for a summary of threats to protected areas.

Box 1.4 Examples of threats to protected areas

• **Paper parks**

Governments have the intention of establishing a protected area before putting in place the legal structure for it. The park therefore exists in name only but has no legal status, no staff, no infrastructure and may not even be clearly defined.

• **Lack of support of local people**

In general the establishment of protected areas often generates resentment in local user communities (stakeholders), undermining the viability of the protected area. Stakeholder non-compliance, bad practices or non cooperation can undermine MPA management programmes and management will therefore become increasingly difficult or impossible. The active participation of stakeholders in the planning and management of a MPA can improve the success MPA.

• **Lack of financing**

Financial sustainability is necessary for successful management of protected areas

• **Design shortcomings**

Many protected areas have been poorly planned. In some cases the size and location of the protected area have been constrained by political considerations. This has resulted in protected areas being isolated from suitable habitat, too small, missing key components or being incorrectly located.

• **Habitat change**

This is the most important impact on protected areas and may be caused by infringement (human settlement and agriculture), the impacts of fire and large-scale drainage.

• **Legal or illegal resource extraction (hunting, fishing, wildlife trade, fuelwood and fodder collection, logging, mining and oil and gas extraction)**

The impacts of these threats are less obvious than those of major habitat change but they are just as important. In extreme cases they can result in the disappearance of the species for which the protected area was created. Resource extraction is of two types: that practised by local people or park dwellers and that emerging from outside interests.

• **Land use change**

Large dams have affected several important protected areas sometimes causing dramatic changes in ecology.

• **Pollution**

Atmospheric pollution is an important threat to both terrestrial and marine protected areas, particularly in the more developed countries. Pollution events can destroy many plants and animals in a short time. Chronic pollution can degrade and reduce biodiversity.

• **Climate change**

Climate change is perhaps the greatest challenge to protected areas and biodiversity. The impacts of climate change on biodiversity have already been widely observed and documented. These impacts create specific challenges for protected areas which are static and often constrained by human land uses. Since climate change will not cease immediately, three broad responses may be taken to safeguard protected areas – impact avoidance (building barriers to prevent flooding due to sea-level rise; diversion of rivers to maintain stable conditions in wetland areas; removal of invasive species or control of pests that might benefit from climate change), impact alleviation (ensuring connectivity between protected areas via biological corridors) and adjustment (‘letting go’ of some species or habitats from protected areas under changing conditions to allow for drying out, flooding, emigration or immigration processes and accompanying change in management regimes).

Adapted from: Mulongoy, K.J. and S.P. Chape. 2004.

1.1.3 Protected areas in the Caribbean

In the Caribbean, as for the rest of the world, protected areas have been the main approach to conserving biodiversity. The Caribbean has had a long history of promoting, designating and

implementing protected areas dating back the late 1700s. The Main Ridge Reserve in Tobago (the Caribbean's first terrestrial protected area) was established in 1765, with the first marine protected area, the Pedro and Morant Banks in Jamaica, established in 1907. Many protected areas in the Caribbean have been recently created, with major activity in the last 20 years, following the 1992 Rio Earth Summit. There are approximately 640 protected areas in the Caribbean, greater than 100 are marine and are of increasing importance in conserving vital fisheries resources. The remainder include coastal and terrestrial elements.

The region's protected areas have been established to conserve representative samples of natural ecosystems, conserve endangered species of flora and fauna, provide watershed protection and ensure water supplies, provide opportunities for education and research, recreation for local populations, provide renewable resources and to protect traditional land tenure, resource use and existing and alternative sustainable livelihoods of indigenous communities. However, these objectives are only being partially achieved, specifically due to a lack of institutional capacity and the assortment of environmental problems that affect the region. These issues endanger the future protected areas in the Caribbean and that they benefits that they could provide to societies.

The protected network in the region is uneven with key gaps, for example, in Guyana, Haiti, Trinidad and Tobago, and some of the lesser Antillean islands. Biological assessments are providing a detailed picture of the protected areas and systems necessary to conserve the full range of biodiversity, but in general, national and regional strategies to establish protected areas have not been successful.

Initiatives to establish protected areas in the Caribbean have and still involve the efforts of individuals, national organisations (public sector and civil society), regional non-governmental organisations (NGOs), regional inter-governmental institutions, international NGOs and international multilateral institutions. A number of regional and international organisations have implemented and currently are implementing regional projects or programmes in support of protected areas (Boxes 1.5 and 1.6).

Protected area development in the Caribbean has taken place primarily on a project by project basis and as such it has been argued that this project approach has led to some of the sustainability problems being experienced by protected areas. It is hoped that the lessons learned from past activities will be useful in influencing the design of future PA projects and programmes.

Box 1.5 Past regional projects or programmes in support of protected areas

Caribbean Conservation Association - Marine Parks Project

The Caribbean Conservation Association (CCA), with the financial support of Canada's International Center for Ocean Development, implemented a marine parks project that focused on a wide range of actions in 10 Caribbean countries during the period 1991-96. One of the outputs of the project was the establishment of the Marine Parks and Marine Protected Areas Managers Network (MPANET).

Caribbean Natural Resources Institute - Parks and Protected Areas Programme

Protected areas formed one of the two initial programme areas of the Caribbean Natural Resources Institute (CANARI). The programme focused on technical cooperation, training, networking, and demonstration projects. CANARI also published the Caribbean Park and Protected Area Bulletin until 1994.

Organisation of Eastern Caribbean States - Protected Area Programme

Protected areas formed one of the areas of focus for the Natural Resources Management Unit (NRMU) of the OECS during the period 1992-96. Though no longer a programme area, the NRMU continues to support protected area activities in the OECS countries.

Source: UNEP/CAR-RCU (2000).

Box 1.6 Current regional programmes and protected area networks in support of protected areas

Regional programmes

IUCN-The World Conservation Union : The Caribbean is one of IUCN's protected areas programme regions. The IUCN maintains an active network of protected area professionals in the region through its World Commission on Protected Areas. The programme, has focused on assistance to regional organisations, networking, information collection and exchange, and training. Efforts to establish a regional protected area trust fund continue.

The Nature Conservancy (TNC) - Caribbean Programme: TNC maintains a protected areas programme in the Caribbean, focusing mainly on assistance to partner institutions in several countries. Major initiatives of the TNC programme are the Parks in Peril programme and the establishment of Conservation Data Centres in several countries of the Wider Caribbean Region.

United Nations Environment Programme/Caribbean Environment Programme - Specially Protected Areas and Wildlife Programme: The adoption in 1990 of the Protocol on Specially Protected Areas and Wildlife by Caribbean governments, provided the basis for what is currently the most extensive protected areas programme in the Wider Caribbean Region. The (SPAW) programme implements activities in the following areas: promotion of best practices and training for sustainable coastal tourism; coral reef monitoring, management, and conservation; strengthening of protected areas through technical assistance and a regional training programme for trainers; development of a regional network of marine protected area managers (CaMPAM); development and implementation of guidelines and recovery plans for species conservation; and development and implementation of guidelines for establishment and management of protected areas, and revenue generation.

UNESCO - Man and the Biosphere Programme (MAB): UNESCO's MAB programme was initiated in 1972, as an approach to protecting entire ecosystems. The programme facilitates monitoring, research, training, implementation of demonstration projects, and site establishment for conservation of representative ecosystems and biodiversity (e.g. Virgin Islands National Park & Biosphere Reserve, approved 1976).

Protected area networks

Wider Caribbean Marine Protected Areas Management Network (CaMPAM) The CaMPAM Network has adopted as its mission, the "enhancement of marine and coastal area management in the Wider Caribbean Region through sharing and collaboration to strengthen the national and regional systems of existing and future marine and coastal protected areas". Participants from twenty-two (22) countries of the Wider Caribbean Region initially joined the network, and the number has since increased to 65.

Caribbean Community Ocean Sciences Network (CCOSNET): CCOSNET is "a mechanism for marshalling the oceanographic science resources of CARICOM Member States". The Network, which is coordinated by the

Institute for Marine Affairs (Trinidad), has the following responsibilities; the establishment and maintenance of a regional ocean sciences database; the establishment and maintenance of an inventory of human and physical resource needs in ocean sciences in the region in the short to medium term; facilitating the procurement of berths and coordinating the use of ships of opportunity and other data-gathering sources in systematically acquiring knowledge in the region; facilitating access to relevant marine and environmental-related data and information regionally and inter-regionally; and providing a forum to facilitate the exchange of information, experience, and expertise in areas of mutual interest.

World Commission on Protected Areas (WCPA): The WCPA is a worldwide network of experts in protected areas, more than 50 of which are Caribbean residents. The network supports protected area activity through: collection, storage, and dissemination of information; provision of technical assistance on protected area policy, planning, and management; networking; production of relevant documentation (including guidelines and best practices); information and policy support to international organisations on protected areas and related issues.

Latin American Network for Technical Cooperation in National Parks, Protected Areas, and Wildlife (LAN-NPPAW): LAN-NPPAW is a joint FAO-UNEP programme that seeks to improve coordination in protected areas management throughout Latin America and the Caribbean. Activities include: publication of a bulletin covering network activities; organisation of workshops and seminars on different aspects of protected areas management; publication of technical reports; and facilitation of technical assistance.

Source: UNEP/CAR-RCU (2000).



Activity #1

Can you name some PAs in your country/region and their purpose?



Recommended reading

- Chape, S., J. Harrison, M. Spalding and I. Lysenko. 2005. Measuring the extent and effectiveness of protected areas as an indicator for meeting global biodiversity targets. *Philosophical Transactions of the Royal Society B* 360:443-455.
- IUCN (1994). *Guidelines for Protected Area Management Categories*. CNPPA with the assistance of WCMC. IUCN, Gland, Switzerland and Cambridge. 261pp.

Download a pdf copy from:

http://www.unepwcmc.org/protected_areas/categories/eng/c1.pdf

- IUCN and WCPA. 2000. *Protected areas: Benefits beyond boundaries*. WCPA in action.
- Mulongoy, K.J. and S. Chape. 2004. *Protected areas and biodiversity: An overview of key issues*. CBD Secretariat, Montreal, Canada and UNEP-WCMC, Cambridge, UK. 51pp.
- Visit www.unep-wcmc.org and <http://www.iucn.org/themes/wcpa/region/caribbean/caribbean.html#issues> for more on protected areas globally and within the Caribbean
- UNEP/CAR-RCU and CZMC. 2000. *Training manual: Training of trainers in marine protected areas management*.

1.2 Marine Protected Areas (MPAs)

1.2.1 What is a MPA?

There are several definitions of MPAs worldwide that include more or less human activities.

Box 1.7 Alternative MPA names

- Marine reserves
- Marine parks
- Marine sanctuaries
- Ocean sanctuaries
- Fishery management zones
- National seashores
- National parks
- National wildlife refuges
- State conservation areas
- State reserves

These include marine reserves, fully protected marine areas, no-take zones, marine sanctuaries, ocean sanctuaries, marine parks, and locally managed marine areas, among others (Box 1.7). Many of these have different levels of protection, and the range of activities allowed or prohibited within their boundaries also varies considerably (e.g. closed areas, no-take areas and multiple-use zoning).

The IUCN (1999) definition of a MPA is the most used and accepted worldwide:

“Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and

cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment.”

This definition is intentionally very broad and encompasses areas established for a variety of purposes, including fisheries management, provided they have a conservation objective. This definition also covers areas protected by ‘effective means’ other than statutory legislation, and as such includes areas set up under customary tenure or voluntary agreements, provided these are deemed ‘effective’.

According to the World Database on Protected Areas, in 2005 approximately 4,600 MPAs had been designated, protecting around 2.2 million km², or 0.6%, of the world’s oceans and roughly 1.6% of the world’s claimed exclusive economic zones. Most are small and located in coastal areas where the potential for increasing human impacts is the greatest but unfortunately the vast majority of them suffer from little or no effective management. This is despite the fact that MPAs not only help protect biodiversity but can also benefit fisheries and people. Of the small number of MPAs that have been established, the vast majority suffer from no or limited management. Fewer than 10% of the established MPAs are not achieving their management goals and objectives, almost all are open to tourism and recreation, and 90% are open to fishing. Due to the wide variety of economic and social activities taking place in the coastal zone and sea, as well as activities taking place further inland and upland, MPA functioning can be significantly impacted.

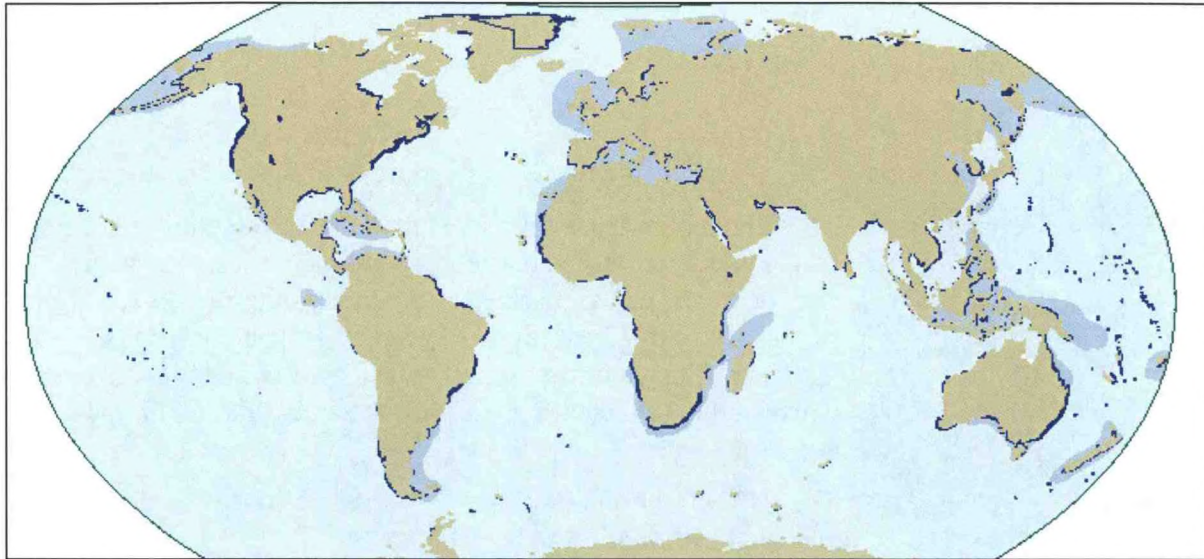


Figure 1.1 Global distribution of marine protected areas

Source: Marine Protected Areas: Providing a future for fish and people. Global Marine Programme. WWF International, Switzerland.

1.2.2 Benefits and costs of MPAs

The potential benefits to establishing MPAs are numerous and varied and are summarised in Table 1.2. Boxes 1.9 and 1.10 provide case studies of benefits provided by two MPAs in the Caribbean.

Table 1.2 MPA benefits

	Benefits associated with MPAs
Biodiversity conservation	Maintaining biodiversity and providing refuges for exploited species
Habitat and species protection	Protecting critical habitats and species from damage and exploitation by destructive fishing practices and other human activities and allowing damaged areas to recover
Refuge for exploited species and increasing species richness	Providing areas where fish are able to spawn and grow to adult size
Fisheries management tool	MPAs can be used alone and in combination with other fishery management measures depending on the circumstances. They may be used to control fishing mortality on target species, reduce ecosystem impacts of fishing, as part of rights based fishery management, to distribute benefits geographically and to add robustness to fisheries management.
Increased productivity of fisheries	Increasing fish catches (size and abundance) in surrounding fishing grounds due to 'spillover' effects
Enhancing ecosystem resilience	Building resilience to protect against damaging external impacts, such as climate change
Sustained or improved quality of life for coastal communities	Helping to maintain local cultures, maintain or improve economies, and maintain or provide alternative livelihoods which are intricately linked to the marine environment (tourism or park management)
Protection of cultural and historical resources	Assure the continuation of traditional uses, cultural practices, and sacred sites
Scientific research and education	Serving as benchmarks for undisturbed, natural ecosystems, that can be used to measure the effects of human activities in other areas, and thereby help to improve resource management
Enhancement of non-extractive uses	For example uses such as diving, kayaking, and tourism, which can provide benefits, both economic and noneconomic

Box 1.8 Tradeoffs in stakeholder benefits

Different groups of stakeholders depend on the marine environment for their livelihood, recreation or overall well-being in numerous ways. Therefore they will often have different attitudes to MPAs and their potential benefits. E.g. subsistence and commercial fishermen who may be displaced from their usual fishing grounds by a closure of the area, will be concerned about their ability to make a living or their food security. The needs of dive operators are often different to those of fishers and it is these differences that have the potential to cause conflict between groups and require tradeoffs to be made in the level of benefits derived by each. See Section 1.2.4. for more on conflicts in the context of Caribbean MPAs.

Box 1.9 The SMMA provides benefits to fisheries in St. Lucia

The Soufriere Marine Management Area (SMMA) was launched in 1995. The management area covers 11km of coast but extends only 100m from shore, or to 70m depth. The area is divided into a series of zones including 1) marine reserves – all extractive uses are forbidden, but diving is permitted; 2) fishing priority areas – where diving and other uses are permitted but fishing takes precedence; 3) yacht mooring areas – where mooring buoys are provided for yachts; and 4) multiple use areas – where all uses are permitted, except for those activities forbidden throughout the SMMA, such as jetskiing, and coral extraction. The main objectives for establishing the SMMA, incorporating both ‘no-take marine reserves’ and fishing priority areas, were to manage the local reef fishery and prevent further decline in reef fish catches and the health of the coral reef ecosystem.

By 2001, the SMMA was already successfully protecting reef fish stocks. Annual monitoring of reef fish biomass since the implementation of management has shown a four-fold increase in commercial fish biomass inside the marine reserves and a three-fold increase in the adjacent fishing grounds. After five years of effective management, total catches and catch per unit effort of reef fishers using the two main fishing gears had both increased. Catch per unit effort increased by 46% for large traps and 90% for small traps. Since overall fishing effort was similar between 1995/6 and 2000/1, it was concluded that the reserves had increased total reef fish landings above the levels at the time of implementation of the reserves even though the area accessible to fishing had decreased.

Catch composition has also improved. There is now a greater mix of species in both large and small pots used in the reef fisheries. In 2000/1 fishers caught over 100 species of fish from Soufrière’s reefs. The diverse range of exploited fish species showed a wide variety of responses to the closed areas, inside and outside the reserves. One of the reasons for the success of SMMA in terms of increasing reef catches is the network-based design with the four main areas of no-take reserves interspersed with fishing priority and multiple-use areas. The practice of ‘fishing the line’ along the boundaries of the marine reserves, confirms the belief of many fishers that there are ‘better fish inside the marine reserves’.

Source: Lutchman, I. 2005.

Box 1.10 Tourism benefits to communities near the Hol Chan Marine Reserve, Belize

Ambergris Caye is the largest and most northerly island in the Belize Barrier Reef. In the past, San Pedro, the island’s main town, was mainly a fishing village. It is now considered to be one of the most important tourist destinations in Belize. Fishing in San Pedro began to decline in the late 1970s. At the same time, the tourism industry was growing and some fishermen were finding alternative, or additional, work as tour guides, taking people snorkelling, diving or on fishing trips. Conflicts between the two groups led to a series of consultations in the late 1980s and an agreement to legally establish the Hol Chan waters as a multi-user marine reserve.

The HCMR is now one of the key tourist attractions for San Pedro. In 2001, Hol Chan was the most visited protected area in Belize with over 38,000 visitors. The densities and sizes of large fish species such as snappers and groupers are far above those commonly found elsewhere in the Caribbean. San Pedro also offers a variety of other recreational activities from sport fishing, diving, and snorkelling to birding and manatee watching. There are now many opportunities for local jobs, not only in the tourist industry but also in the supporting services (in banking, shops etc). With the start of the lobster season coinciding with the low season for tourists, many people now alternate jobs on a seasonal basis.

In contrast to other Caribbean islands, in San Pedro, the locals drove the development of tourism, as opposed to

developers from elsewhere in the country or from overseas. Almost all hotels and restaurants on Ambergris Caye are family run and there are few large resorts. The lack of all-inclusive hotels also means that small businesses benefit more from the tourist trade. The San Pedro Tour Guide Association and the Belize Tourism Industry Association have been instrumental in ensuring that tourism development brought benefits to the local community.

Source: Lutchman, I. 2005.

However, there are potential costs associated with MPAs, including an increase in direct costs, such as those costs associated with establishing and monitoring MPAs and enforcing regulations; as well as indirect or opportunity costs such as a loss of earnings, an increase in illegal activities, and the added costs to fishermen of having to fish in other areas, perhaps further offshore. There are also risks associated with how the fishing industry will adapt to closed areas and increased congestion and conflict on remaining open fishing grounds (Table 1.3). Boxes 1.11 and 1.12 provide short case studies of direct and indirect MPA costs in two sites in the Caribbean.

Table 1.3 MPA costs

Costs associated with MPAs	
Direct	Capital costs <ul style="list-style-type: none"> • Infrastructure construction • Boundary demarcation • Establishment of legal basis
	Operational costs (include MPA operation, enforcement, staff, equipment) <ul style="list-style-type: none"> <i>Daily costs</i> <ul style="list-style-type: none"> • Salaries • Fuel • Equipment • Maintenance <i>Investment costs</i> <ul style="list-style-type: none"> • Vehicle purchase • Boat purchase • Visitor centres • Staff training
Indirect and opportunity	<i>Indirect</i> <ul style="list-style-type: none"> • Value of negative impacts of increased visitor numbers • Increase in illegal activities • Compensation payments to those adversely affected by the establishment of the MPA e.g. fishermen losing fishing grounds due to closure of these areas • Development of alternative livelihood options • Increased harvest costs for fishing communities <ul style="list-style-type: none"> • time and fuel costs travelling to and from far away fishing grounds • Increased occupational risks to fishermen who have to venture out to more distant fishing grounds
	<i>Opportunity</i> <ul style="list-style-type: none"> • Losses in potential earnings due to short-term or long-term management actions, e.g. prohibited activities in the MPA or management measures put in place to replenish diminished populations

Box 1.11 Direct management costs for MPAs in Belize

There are 14 MPAs in Belize, eight marine reserves that are the responsibility of the Fisheries Department and six protected areas that are the responsibility of the Forest Department. Half are co-managed by different local NGOs, while a further three have no management yet in place but are expected to be brought into the system soon. In 2003, the annual operating cost for the eleven active MPAs was estimated at US\$1.4 million. Estimated investment costs were a further US\$ 200,000, bringing the total cost to US\$ 1.6 million. When all 14 MPAs are implemented by 2008, the annual cost estimates are expected to remain in the order of US\$1.6 million as the then-completed initial investment costs of the 11 MPAs will be replaced by the extra start-up costs for the additional three sites. In addition to these site-based costs, the national operating costs of the Coastal Zone Management Authority and Institute (CZMAI) for managing the protected areas system was estimated at over US\$0.9 million per year.

Source: Lutchman, I. 2005.

Box 1.12 Indirect costs to fishers' in the SMMA, St. Lucia: Short-term compensation costs

The benefits to fisheries due to the successful implementation of the Soufriere Marine Management Area (SMMA) in St Lucia were described in Box 6. This success was not without some conflicts and costs. The reef fishers lost 35% of their original fishing grounds and found the first couple of years of management very difficult. Some of their best fishing grounds were prohibited and fishermen had to travel further to reach new fishing sites. To help the worst affected fishermen, one reserve area was reopened to fishing. While fish stocks were rebuilding in the other sites, compensation of US \$150/month was paid for one year to 20 of the oldest pot and gillnet fishers who were judged to be the most dependent on fishing for food and income. Today, while illegal fishing is still a problem, mainly with recreational fishers, compliance with the regulations for SMMA is generally good. The compensation allowed the fishermen the time to become knowledgeable with the benefits of the reserve and they are now reaping the benefits of spillover from the fish reserves. Compensation played an important role in ensuring the welfare of displaced fishers at a critical time when catches initially fell.

Source: Lutchman, I. 2005.

1.2.3 Guidelines for good MPA management

Globally MPAs are facing unprecedented human pressure and demands on their valuable resources. Threats to MPAs include illegal fishing and unsustainable tourism, which are compounded by inadequate resources for enforcement. Without long-term financing, many of these MPAs will be unable to adjust management aims, enforce boundaries and closed areas or monitor marine biodiversity. To further exacerbate the problem, MPA managers often undertake management activities with limited budgets and staff. Capacity is a major problem, as is finding the resources to conduct training and capacity building workshops.

The vast majority of existing MPAs suffer from little or no management. Without effective management, they cannot provide benefits such as biodiversity conservation, improved fisheries, and an improved quality of life for coastal communities. When management arrangements are in place they may include customary tenure (e.g. in the Pacific region), management on a voluntary basis (e.g. in the UK), private sector management (e.g. Chumbe, Zanzibar, Tanzania), local community management (e.g. Philippine fishing villages), collaborative management systems (e.g. SCMR, Belize; NMP, Jamaica) or management by government agencies (TCMP, St. Vincent and the Grenadines).

MPAs are only successful if resource users have a stake in their success. In general the establishment of protected areas often generates resentment in local user communities (stakeholders), undermining the viability of the protected area. Stakeholder non-compliance, bad practices or non cooperation can undermine MPA management programmes and management will therefore become increasingly difficult or impossible. The active participation of

stakeholders in the planning and management of a MPA can improve the success MPA. Furthermore, stakeholders are likely to feel ownership of and are more likely to support the MPA if they feel their views and concerns are being considered in the process. If stakeholders are not satisfied with the management process and activities, they are unlikely to support the MPA. Therefore stakeholders can be potential partners or threats in managing the MPA. See Box 1.13 for additional guidelines that should ensure good MPA management.

Box 1.13 Management guidelines for MPAs

- **MPAs must be tailored to local conditions, attitudes, and needs, and designed to achieve specific objectives, which should evolve according to changing circumstances if necessary**

No single MPA model will fit all situations therefore it is essential that the socio-cultural, economic, and ecological contexts of each site are reflected in management plans and design. Some MPAs have one, narrow objective, such as protecting a single threatened species; others, such as multiple-use areas, have a number of objectives and aim to manage conflicts between diverse interests. The objectives of an MPA may also change over time. Similarly, management objectives may need to evolve to address new threats or changing conservation priorities.

- **Stakeholders must be involved at all stages of MPA planning and management**

All stakeholders should be involved from the outset in an MPA and should be viewed as partners who will share in the responsibility of planning and implementation. The participatory approach aides in identifying potential conflict areas early on and solutions or alternatives may be put forward at this stage. Full participation takes time. In some instances, particularly in developing countries, basic needs must be met before conservation will be considered by a community. Only if participation is voluntary, rather than mandatory, will full stakeholder support be given. The objectives and anticipated benefits of an MPA should be explicitly communicated to all stakeholders, particularly when the site is being established at the initiative of the government or an outside agency.

- **MPAs often benefit from having a legal basis**

A sound legal basis is often essential to ensure the long-term survival of a MPA and to support the efforts of local people. The legislation should reflect national conservation policy and reinforce regional and international obligations. Wherever possible, legislation should be consistent with traditional or customary laws, and provide definitions of legal terms that can be understood by local stakeholders. Given the multiplicity of government agencies that are often involved, legislation should define clearly the roles and precedence of relevant agencies, government departments, and other legislation.

- **All MPAs need a management plan**

A management plan is an essential framework for the success of a MPA. However, many MPA management plans have been prepared but never implemented and many MPAs lack a plan altogether. All plans should clearly describe the objectives of the MPA (taking into account the availability of human and financial resources) and the actions needed to ensure that they are achieved. The roles of different agencies involved must be defined, and a regular monitoring process developed that will evaluate how well the objectives of the MPA are being achieved. All stakeholders should be involved in the development and implementation of the management plan and their opinions should be taken into account.

- **Local communities have a role in enforcement**

Enforcement costs can be low where public support has been successfully generated. Communities which have a sense of 'ownership' of a MPA, having been involved in its establishment, and who receive direct benefits from it are more likely to adhere to the regulations voluntarily. However, addressing external threats is usually beyond the capacity of local communities, and these have to be undertaken by government agencies.

- **MPAs require sufficient, well-trained personnel**

A major constraint on long-term effective management is the lack of skilled, trained park managers and other personnel.

• **MPAs must be financially sustainable**

MPAs are unlikely to be successful unless they are financially self-sustaining or have a sustainable source of external funding. Where MPAs are linked with spectacular scenery or are popular recreational diving destinations, they may attract sufficient visitors to cover the costs of management through entrance or user fees. Many MPAs, particularly those in temperate areas where visitor numbers are much lower, are unlikely to become self-financing through tourism, and for those in particularly sensitive areas attracting visitors may not be desirable. In such cases, funds will have to come from external sources such as governments, intergovernmental organizations, and conservation organizations. Trust funds are an increasingly common means of financing protected areas and have proved successful some areas.

• **MPAs should be established within a framework of Integrated Coastal Management (ICM)**

An ICM framework is increasingly recognized as essential to the successful management of MPAs. ICM addresses the interconnected nature of marine systems and the lack of coordinated jurisdiction between national agencies. Where MPAs are established in isolation, impacts from outside their boundaries and beyond the control of the responsible agencies may rapidly undermine their effectiveness.

• **MPA management effectiveness should be monitored and evaluated**

Methods for monitoring and evaluating management effectiveness of a MPA should be identified in the management plan, and a monitoring and evaluation programme should be put in place as early as possible. Information from this provides essential baseline data and feedback for managers, and permits 'adaptive management', whereby management interventions are refined and modified when conditions change or if they are found to be inadequate. Monitoring and evaluation methodologies should be kept simple, and should be appropriate not only for the indicators that are selected for monitoring, but also for the available institutional and manpower capabilities.

Source: Wells, S. 1998.

1.2.4 MPA design

There are many practical considerations in designing MPAs that should be addressed during the planning phase. These include the location of MPA facilities; types of boats and motors for surveillance and transport; boundary demarcations; zoning of activities to separate incompatible uses where necessary; recruiting and training of staff; the development schedule and budgets; analysis of visitor use compatibility and safety considerations; conflict resolution and cooperative arrangements with local communities and industries; and such ecological factors as the types of habitats to include, the size of the protected area and its different zones.

There is no general rule for the optimal size and design of MPAs. There are proponents of establishing a number of small protected areas (disaggregation) and of establishing fewer larger areas (aggregation). The arguments for disaggregation are best applied to the terrestrial protected areas for which they were formulated; they do not seem to hold so well for underwater areas, where aggregation seems the best approach coupled with an effective use zoning scheme.

The size, shape and means of implementation in any MPA are a function of the primary objectives the protected area sets out to achieve. If the goal of the MPA is to protect a vulnerable habitat type from a specific type of use, then the MPA can be simple in design and management. However, if the conservation goal targets a wide range of habitats or resources, the protected area will need to be more complex (Table 1.4).

Table 1.4 Relationship between marine protected area objectives, size and design complexity

Specific MPA objective	Relative size	Complexity
Protecting an endangered species	Small to medium	Simple
Protecting a migratory species	Large (or network)	Simple to complex
Protecting habitat from single threat	Medium	Simple
Protecting habitat from multiple threats	Medium to large	Complex
Preventing overfishing	Small	Simple
Enhancing stocks	Small to medium	Simple
Protecting an area of historic or cultural interest	Small	Simple
Providing a CZM model or empowering local people	Small to medium	Somewhat complex
Promoting marine ecotourism	Small	Simple
Providing site(s) for scientific research	Small	Simple
Conserving biodiversity	Large (or network)	Simple to complex

Source: Briand, F. 1999.

MPAs are typically designed to permit several controlled and sustainable uses within their boundaries. But often particular uses need to be confined to particular zones within the MPA where they are appropriate or where their uses do not conflict with other uses. Zoning is therefore an important component of overall management. It can assist in the reduction of user conflicts and provide great protection for the most ecologically sensitive areas, while allowing access to other areas for extractive or touristic purposes (Box 1.14). There are no rules or restrictions as to the kinds and numbers of zones that may be applied to a MPA.

Box 1.14 Specific uses of zones

- Selective control of activities at different sites, including both strict protection and various levels of use.
- Establishment core conservation areas as sanctuaries where disturbing uses are prohibited
- Separation of incompatible recreational activities to increase the enjoyment and safety of the different pursuits
- Enable damaged areas to be set aside to recover
- Protection of breeding populations of fishes and other organisms for the natural replenishment of neighbouring fishing areas and devastated or overfished areas nearby
- Cost-effective means of managing different uses, since manpower and maintenance needs are minimal

Source: Pomeroy, R. and M. Sissenwine. In prep.

MPA site selection or location and design relate to the specific goals and objectives that MPA establishment sets out to achieve. MPAs are only successful if they are designed correctly, that is if they are large enough, the correct shape and contain all necessary habitats. Small, isolated reserves are of only limited value because the populations of many of their species will be too small to survive indefinitely.

For those countries that have the resources to do so, it is useful to organise MPAs by a national system rather than creating them on a case-by-case basis. Planning a national system of marine and coastal protected areas may appear to be daunting, yet the job is not as difficult as it may first appear. MPA system planning is seen as most desirable for the full development of a country's marine and coastal protected area programme.

While selection of marine protected areas through a systematic MPA planning exercise is preferable, in actuality MPA selection is most frequently determined by opportunity (a strong show of public and/or government support) or crisis (a high level of threat to a site that is considered important for any reason). Selection of sites according to a well-laid plan that includes clearly understood goals and objectives, and a list of focused, practical criteria to guide

site selection is preferable to selection by *ad hoc* means, such as by opportunity or crisis. Opportunities and crises are likely to arise at intervals, but one needs to try to get ahead of them if selection is to proceed along systematic and programmatic lines.

Strategic criteria for siting MPAs fall under three approaches:

- Preservation of ocean or coastal areas that remain relatively pristine and are usually chosen for their high diversity
- Resolution of current or future conflicts among users
- Restoration of degraded or overexploited areas

In developing a systematic logical approach for selection of marine protected areas, there are four essential steps to site selection. These are the collection, analysis and synthesis of data leading to the identification of candidate sites, followed by the application of criteria to select specific sites for protection.



Recommended reading

Briand, F. 1999. Scientific design and monitoring of Mediterranean marine protected areas. CIESM Workshop Series. Porto Cesareo, Italy, 23-26 October 1999. 64pp.

Pomeroy, R. and M. Sissenwine. FAO Technical Guidelines on Marine Protected Areas and Fisheries Management. Draft. In prep.

Salm, R.V. J. Clark and E. Siirila. 2000. Marine and coastal protected areas: A guide for planners and managers. IUCN, Washinton DC. 371pp.

1.2.5 MPA situation in the Caribbean

Many marine protected areas (MPAs) throughout the Caribbean have been established as tools for conserving and managing coastal resources. Burke and Maidens (2004) identified approximately 285 MPAs in the wider Caribbean (Figure 1.2). In 2001, Geoghegan et al. identified seventy-five MPAs in seventeen insular countries and territories of the Lesser Antillean and Central Caribbean biogeographic zones, including Belize and the Turks and Caicos.

The first marine protected area, the Pedro and Morant Banks in Jamaica was established in 1907. Within the insular Caribbean, only one MPA, the Virgin Islands National Park in the US Virgin Islands was legally established in the 1950s. During the 1960s, two more MPAs were established, the Buck Island Reef National Monument (US Virgin Islands) and Parque Nacional Caguanes (Cuba). From the 1970s onwards there has been a gradual increase in the establishment of MPAs with a proliferation during the 1990s with nearly half of all MPAs in the insular Caribbean established. For example, Glover's Reef Marine Reserve in Belize (1993); Soufriere Marine Management Area, St. Lucia (1995); Tobago Cays Marine Park, St. Vincent and the Grenadines (1997); Negril Marine Park, Jamaica (1998). Growth in MPAs has diminished, with only seven being established at the beginning of the turn of the century. For example, Soufriere/Scotshead Marine Reserve, Dominica (2000/2001); Gladden Spit/Silk Cayes Marine Reserve, Belize (2000); Canaries-Anse La Ray Marine Management Area, St. Lucia (2000).

The majority of Caribbean MPAs are coastal or nearshore and as such have linkages with or impact in some way on nearby coastal communities. MPAs have succeeded to varying degrees in achieving their primary objectives, which have usually been ecologically based (e.g. to conserve biodiversity and sustain fisheries), while struggling to gain acceptance from stakeholders and effectively implement management measures. Therefore management effectiveness varies greatly from one country to another. In many cases the MPAs lack adequate control mechanisms, and are inadequately protected from increasing pressure on their space and resources. Little attention has been paid to the impact on poorer sectors of the community who rely on the resources within MPAs, impacts that may help explain some of the problems MPAs have had with implementation and compliance. The size of protected areas varies, too. Small reserves can often protect a large number of species, although large reserves are required to support viable populations of species that have large home ranges.

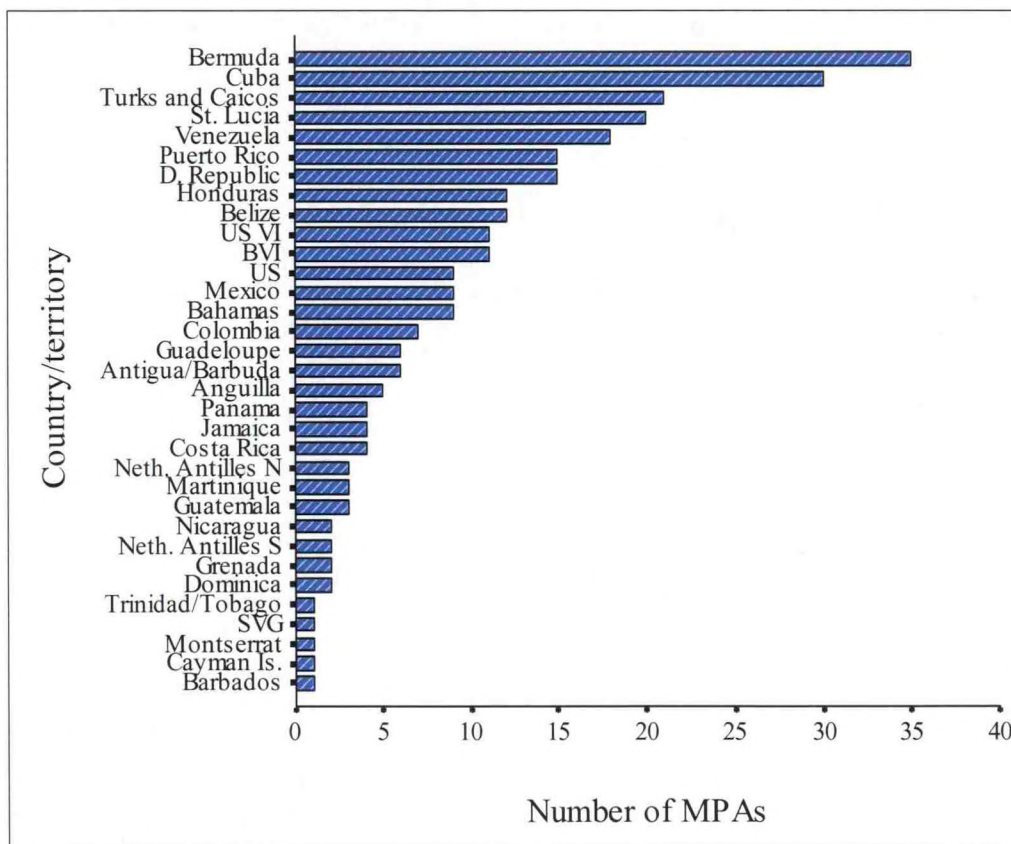


Figure 1.2 Marine protected areas in the wider Caribbean

Data source: Burke and Maidens. 2004.

* St. Kitts and Nevis, Haiti and Aruba have no marine protected areas

Resources protected by MPAs

The following information on resources protected and characteristics of MPAs has been largely obtained from a very comprehensive study, *Characterisation of Caribbean marine protected areas: An analysis of ecological, organisational and socio-economic factors* by Geoghegan et al. 2001, and should be listed as required reading for training in MPA management effectiveness.

MPAs in the Caribbean include samples of most major marine and coastal ecosystem types represented in the Lesser Antilles and Central Caribbean, with the three major coastal ecosystem

types – coral reefs, mangroves and seagrass beds – particularly well represented. The majority of these MPAs are coastal or nearshore, reflecting objectives related to coastal zone management. The majority also include a terrestrial component, though in some cases this consists only of small offshore islands or cays.

Coral reefs of various types are represented in at least 80% of the region's MPAs. Often these reef systems are described as exceptionally extensive or pristine in national terms. They also often coincide with economically important recreational dive sites. The reefs in many MPAs such as the Buccoo Reef Marine Park in Tobago, the Negril Marine Park in Jamaica and the Soufriere Marine Management Area in St. Lucia are considered to have been degraded by human impacts including overfishing, sedimentation from land-based development, land-based nutrient pollution and anchoring. Zoning and regulations are often justified as a means to halt or reverse such degradation.

Recognition of the need to conserve mangrove ecosystems is evident by the frequency in which they occur in MPAs (at least two-thirds of MPAs include mangrove areas, some of which are extensive).

Seagrass beds are the least represented (or the least often mentioned) of the major coastal ecosystems. Unlike coral reefs and mangroves, they do not appear to be a factor in the decision to establish MPAs or in the determination of their boundaries.

A few MPAs have been established for the sole purpose of protecting endangered species (e.g. Refugio de Fauna Las Picuas in Cuba, Santuario de Mamiferos Marinos in the Dominican Republic). A number of other MPAs protect turtle and seabird nesting sites, or important fish spawning areas.

1.2.6 Management characteristics of MPAs

Management arrangements

There is a wide range of institutional arrangements present within MPAs with the trend towards increasing complexity and involvement of non-governmental organisations (NGOs). Most MPAs that have been in operation for 20 years or more are managed either by a government agency (usually a fisheries administration) or a National Trust established by government for the purpose of managing protected areas. For those MPAs established more recently, more complex forms of management have been experimented with, including delegation to NGOs (e.g. Netherlands Antilles and Jamaica), comanagement with NGOs (e.g. Belize, Dominican Republic) and management consortia (Soufriere Marine Management Area, St. Lucia, and Santuario de Mamiferos Marinos, Dominican Republic). These forms of management have had mixed results, and in several instances have been adjusted over time to improve management effectiveness.

Management objectives

While the majority of MPAs in the region have defined and explicit objectives and mission statements emphasising conservation, most MPAs tend to be established for a three-fold purpose:

- Enhancement of the tourism product and recreational opportunities
- Conservation of critical ecosystems
- Sustainable and equitable use of coastal resources.

Therefore MPAs are seen as being at once attractions, refuges and sources of socioeconomic development. It is probable that this multi-dimensional vision may have developed in response to the failure of many early MPAs modeled along traditional conservation lines, which in have today in some cases remained 'paper parks'.

Levels of management

Geoghegan et al. 2001, have described MPAs currently being actively managed according to three levels – high, moderate and low (Box 1.15). Approximately 25% of MPAs in the region have no management arrangements in place. Less than half have more than a low level of management. Of those with moderate or high levels of management, a disproportionate number are in territories of France, the Netherlands, the United Kingdom, and the United States. Level of management is in most cases directly related to availability of financial resources. Financial resources for managing MPAs in the region usually come from government allocations, donor assistance and visitor and user fees.

Box 1.15 MPA management levels defined

High: management is by objectives. A management plan, operations plan or business plan are in place. Adequate human and financial resources are available to address all stated objectives with actions and programmes. There is a high level of awareness of and adherence to management rules.

Moderate: there is active management addressing objectives, but not all elements of high level management are in place. A management plan may be absent, there may be insufficient staff resources or enforcement capability or there may be no or limited programmes addressing all MPA objectives.

Low: Some management activities are in place, but MPA objectives are not stated or not addressed. Resources, both human and financial, are insufficient (see Parsram 2007 for information on regional protected areas training needs assessment). Management rules are not widely adhered to and management may not be evident to visitors.

Source: Geoghegan et al. (2001).

MPAs having high levels of management are all operational and all have functional user fee systems in place that cover all or most management costs. Some of these MPAs include the SMMA, Saba and Bonaire Marine Parks (Netherlands Antilles), Wreck of the Rhone Marine Park (British Virgin Islands), Hol Chan Marine Reserve (Belize) and the Cayman Islands marine park system. It is important to note that user fee systems are only appropriate or effective in areas where there is a high level of water-based tourism use. Therefore it is expected that MPAs in areas with low levels of tourism use and in countries with limited financial resources or interest in marine conservation are unlikely to succeed unless they are able to attract external donor support.

Stakeholder participation

The coastal zone in the many countries of the Caribbean has sustained intense human use and impacts. Competition for the use of coastal and nearshore resources has increased with the development of tourism. The conflicts arising from this competition are costly to the resource base and the users. Therefore MPAs can play an important role in alleviating conflicts, protecting resources for overexploitation and contributing to strategies for sustainable development. However they can only do this if they are planned with the full involvement of those users and other stakeholders who will be affected by MPA management.

Generally, stakeholder consultation and participation are used as management tools at one stage or another in the implementation of MPAs in the region. Greater than half of Caribbean MPAs possess active and formal mechanisms for stakeholder input usually through advisory committees or representation of key stakeholder groups on Boards and other management bodies. This is therefore indicative of a very high level of consensus on the role of participation in effective management. However, there is the recognition that stakeholder processes can be time-consuming, often frustrating and require specific skills not always available within management agencies.

Fisheries management

The role of fishing in the livelihood strategies of Caribbean coastal communities has been taken into account to a greater or lesser degree in the development of virtually all MPAs in the region. In the very few MPAs in which fishing is completely prohibited, less than 15% of active MPAs, it is usually done in the context of meeting broader fisheries management objectives. Zoning is a common form of fishing regulation in the region. Of those operational MPAs for which information is available, nearly 40% use zoning as a fisheries management tool. Zoning has two primary purposes – to reduce conflicts, particularly between fishers and recreational users such as divers; and to protect critical stocks and nursery areas for the purpose of replenishing the surrounding areas.

Fishing is also regulated by type and gear to reduce harmful effects of certain forms of fishing, particularly spearfishing. Local and traditional forms of fishing, such as pot and seine fishing are permitted in some parts of most MPAs. However, fishing communities are initially suspicious of MPAs and are usually concerned about potential loss of livelihood. Some MPAs have invested considerable effort in winning the support of local fishing communities, with programmes addressing community needs in the Negril and Montego Bay Marine Parks in Jamaica, St. Eustatius and St. Maarten Marine Parks in the Netherlands Antilles, the SMMA in St. Lucia and the Cayman Islands system.

MPA user community characteristics

Users of MPAs

Water-based recreation, particularly scuba diving and snorkeling, is in general the most frequent use of MPAs in the Caribbean. However, fishing in Cuba and the Dominican Republic appears to be more or equally important. Fishing is cited as an MPA use in the majority of MPAs, although in many it apparently occurs at quite low levels.

Communities within and adjacent to MPAs

Most MPAs have linkages with or impact in some way on nearby communities since most MPAs are located within the region's crowded coastal zone. Linkages are greatest where tourism dependent on the MPA is an important source of local incomes. MPAs in which there is a high level of dependency by adjacent communities include Hol Chan, Cayman Islands, Parque de Este and Jaragua National Parks in the Dominican Republic, Ilets Pigeon Reserve in Guadeloupe, Negril, Bonaire, and the SMMA.

Conflicts

MPAs in the region have had a role both in mitigating and in creating conflicts between users. The prohibition of traditional uses and the exclusion of those users can and often does create

resentment and resistance that can be felt both at a local and national level. The Folkestone Marine Park in Barbados may be an example of an MPA that has actually increased conflict by catering to “new” recreational users while shutting out traditional users. On the other hand, MPAs such as the SMMA, Negril and Montego Bay were established in large part in order to address existing conflicts and these MPAs have tended to have decision-making structures that provide for substantial input from stakeholders.

The major conflicts occurring within MPAs are between the fisheries and tourism sectors, and specifically between fishers and divers, who are interested in using the same resources for different purposes. Zoning and consultation are the most common management responses to these conflicts. The existence of such conflicts has actually been a stimulant to the establishment of MPAs, the SMMA in St. Lucia being the best documented example. In MPAs with high levels of management and mechanisms for stakeholder participation (e.g. SMMA, Hol Chan), it appears that these conflicts have been mitigated to a considerable degree. Illegal exploitation of resources, mainly by fishers but also by poachers and others, results in conflicts between the park management and user groups. Other conflicts have to do with development within or adjacent to MPAs, which are often opposed by park management and other stakeholders because of the potential environmental impacts on the MPA.

Poverty

Generally MPAs adjoin areas where poverty is significant, and therefore have the potential to improve the livelihoods of the poor through appropriate management. This is the case specifically in Belize, Dominica, the Dominican Republic, Jamaica and St. Lucia. In other locations, including Antigua, Barbados, Guadeloupe, Grenada, Tobago, and the Turks and Caicos, pockets of low-income or at-risk populations exist, which could also benefit from pro-poor MPA management strategies.



Activity #2

- Can you name some MPAs in your country/region?
- Can you discuss:
 - Why it was established?
 - What are its goals and objectives?
 - How is it governed?
 - In your opinion, is it working?
 - What are the benefits?
 - What are threats?



Recommended reading

CZMAI. 2003. Operationalising a financial system for coastal and marine resource management in Belize. Coastal Zone Management Authority and Institute, Belize. 63pp.

Ehler, C., B. Cicin-Sain, and S. Belifore. 2004. Incorporating marine protected areas into integrated coastal and ocean management: Principles and guidelines. IUCN, Gland, Switzerland and Cambridge, UK. 38pp.

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Download a pdf copy from: http://www.canari.org/pdf_files.html#protected

Lutchman, I. 2005. Marine Protected Areas: Benefits and costs for islands. WWF the Netherlands. 62pp.

UNEP/CAR-RCU (2000). Training manual. Training of trainers course in marine protected area management. United Nations Environment Programme and Coastal Zone Management Centre.

PART 2

2 MPA MANAGEMENT EFFECTIVENESS

2.1 MPA management

To achieve the complex aims for which MPAs are established - protecting marine species and habitats, conserving marine biodiversity, restoring fisheries populations, managing tourism activities, and minimising conflicts among diverse resource users - a well-defined management plan is needed for each MPA that clearly describes specific and measurable goals and outcomes, and how these will be achieved. Effective management means that these goals and outcomes are being met.

However, the relationship between actions and outcomes is often not so obvious. Faced with the daily demands of their jobs, many MPA managers are not able to regularly reflect on the cumulative results of their efforts. In the absence of this, scarce resources may not be utilised and management objectives may not be achieved.

In addition, too often in the past, protected area management has been assessed on the basis of how much money has been spent, how many permits issued, how many enforcement actions have been taken, or how many laws and regulations have been adopted. But these are all 'inputs' into management rather than outcomes.

Regular evaluation of management effectiveness is therefore essential. Evaluation offers a structured way to learn from both management successes and failures and helps others understand how and why practices are being adapted and improved over time.



Activity #3

- Are MPAs in your country/region effective?
- What does effective mean to you?



Recommended reading

Garraway, C. and N. Esteban. 2003. Increasing MPA effectiveness through working with local communities: Guidelines for the Caribbean. MRAG Ltd., London, UK. 45pp.

2.2 Management effectiveness: What is it and why is it important to evaluate it?



Definition

Evaluation: the judgement of the status, condition or performance of some aspect of management against predetermined criteria such as a set of standards or objectives. In the case of MPAs the criteria are the goals and objectives for which the MPAs were established

Management effectiveness is the degree to which management actions are achieving the stated goals and objectives of a protected area. In other words, it tells us how a managed area is, or is not, meeting its stated goals and objectives. This allows for the improvement of protected area management through learning, adaptation and the diagnosis of specific issues influencing whether goals and objectives have

been achieved. Additionally, it provides a way to show accountability for the management of a MPA. Box 2.1 summarises the three components of management effectiveness.

Effective management of MPAs requires continuous feedback of information to achieve objectives. The management process involves planning, design, implementation, monitoring, evaluation, communication and adaptation. Evaluating management effectiveness consists of reviewing the results of management decisions and actions taken, and assessing whether these actions are producing the desired outcomes. Evaluation is a routine part of the management process and is something that most managers already practice. The evaluation of management effectiveness builds on this existing routine.

Box 2.1 Components of management effectiveness

Management effectiveness includes three main components:

Design: covering both the design of individual protected areas and of protected area systems. Important elements include: size and shape of individual protected areas; the existence and management of buffer zones and links between protected areas; ecological representation; and the appropriateness of protected areas to achieve their stated function. Design failures can, for example, lead to problems of protected areas that are too small to be effective, fragmentation and isolation, protecting disproportionate amounts of one habitat at the expense of others and failure to leave room for adaptation to environmental change. Techniques such as gap analysis are needed to help assess design success.

Appropriateness: looking at how management is conducted and how well management is responding to challenges, including, for example, aspects of planning, training, capacity building, social relations and implementation. This component looks both at whether there is enough management and at whether management processes and actions are appropriate. Management *failures* therefore range from complete lack of implementation (so-called “paper parks”) through to strategic errors about where to focus effort or how management is conducted. Management *successes* are particularly important in terms of communicating lessons learned.

Delivery: assessing whether protected areas are achieving their stated aims. Measures include both biological elements (such as whether key species are surviving, recovering or declining) and social aspects (such as recreational use or the attitudes of local human communities towards the protected area). A well designed protected area with plenty of trained and dedicated staff will still not be achieving its objectives if, for example, poachers are depleting species or air pollution is damaging sensitive plants and animals.

Source: Hockings, M., S. Stolton and N. Dudley. 2000.

The design of an evaluation process should consider the reasons for undertaking the evaluation, the scope of the evaluation, the level of resources available to conduct an evaluation and the extent of information available to undertake an evaluation. There are many reasons why people want to assess management effectiveness. Funders, policy makers and conservation lobbyists may use the results to highlight problems and to set priorities; or to promote better management policies and practices by management agencies. Managers may wish to use evaluation results to improve their performance or to report on achievements to senior managers, the government or external stakeholders. Local communities and other stakeholders, including civil society, need to establish how far their interests are being taken into account. Increased emphasis on evaluation is in part due to changes in society, especially the increased demand for accountability, transparency and demonstrated “value for money.”

In terms of scope, the approach taken for a system-wide assessment of all protected areas in a country will be different from an assessment of an individual site. The level of resources available to undertake the evaluation is another concern as well as whether the evaluation is intended to be a one-off assessment or an ongoing process integrated into the management of the PA. The extent and depth of information that is available from previous or current monitoring

programs, the kind of data that will be possible to collect in the time available is another consideration of the evaluation process. In general, more effort should be put into monitoring and evaluation for those PAs that possess greatest value and significance, or that are subject to the greatest threat.

In practice, evaluation results are usually multi-purpose (Box 2.2). Information used by managers to improve their own performance (adaptive management) can also be used for reporting (accountability) or lessons learned can be used by others to improve future planning (project planning). Therefore, evaluations should be viewed as a tool to assist managers in their work, not distract them from it.

Box 2.2 Why evaluate management effectiveness?

- Promotes adaptive management
- Improves project planning
- Enhances priority setting
- Promotes internal and external accountability

Evaluation must be used positively to support managers and must be seen as a normal part of the process of management. Funding agencies and NGOs, as well as other organisations or institutions have a legitimate right to know

whether or not a protected area is achieving its stated objectives and it should be recognised that assessment findings will inevitably be used for advocacy.

Evaluations should not only identify problems and their causes but also highlight what is working well. As a result, a learning environment will be created to share knowledge and experience and to ensure that lessons learned are not lost or mistakes repeated.

Adaptive management is based on a circular management process, which allows information concerning the past to feed back into and improve the way management is conducted in the future. Evaluation helps management to adapt and improve through a learning process. The evaluation process consists of reviewing the results of actions taken and assessing whether these actions have produced the desired results. It is something that all good managers already undertake where the link between actions and consequences can be simply observed. However, the link between action and outcome is often not so obvious. Many protected area managers are not able to systematically monitor and review the results of their efforts due to the daily demands of their job. In the absence of such reviews, however, money and other resources can be wasted on programmes that do not achieve their objectives.

Today protected area managers must expect to come under greater pressure to introduce systems of monitoring and evaluation, at both the programme and project level, since there is an ever greater attention to performance and value for money. These systems of monitoring and evaluation will promote and enable an adaptive approach to management where managers strive to learn from their own and others' successes and failures; and keep track of the consequent changes in management objectives and practices so that people can understand how and why management is being undertaken in this way.

Evaluation studies can also be used to improve programme or project planning either at the time of initial design or as a review of previous programmes where the lessons learned will be applied to programmes that follow. Evaluation data can be used to compare results and allow managers to select the best approach where common problems are being addressed in different ways in a number of protected areas. Evaluation, in the form of broad programme review, can be used as a basis for deciding whether programmes should be continued or resources transferred to competing areas of operation.

Accountability for performance is being increasingly demanded across all sectors of society and conservation management is no exception. Traditionally, concerns for accountability focused on issues of financial and managerial integrity but this has now expanded to include concerns for management effectiveness. Therefore accountability is not so much about “checking up” on managers to see where they are failing, but is about developing a professional approach to management. Governments and other funding or regulatory bodies are requiring information on management effectiveness that will allow them to assess whether results are being achieved that are commensurate with the effort and resources being expended and in line with policy and management objectives.

Managers are likely to experience greater support and trust when they provide information about what they are doing and what they are achieving and when management is therefore seen to be open and accountable. Managers can also use the results of evaluations of management effectiveness in developing requests or proposals for additional resources. Such proposals are more likely to win support when they can be justified on the basis of evaluation results.

Although evaluating management effectiveness is beneficial to the management of the MPA, there are some costs associated with the process. See Box 2.3 for a summary of the costs and benefits of conducting evaluations.

Box 2.3 Costs and benefits of MPA management effectiveness evaluation

Costs

- Additional staff time (existing/contract)
- Evaluation training
- Socioeconomics and governance expertise
- Senior management/agency buy-in
- Data collection resources
- Data collection approval
- Budget planning process

Benefits

- Documenting performance
- Assisting with planning and partnerships, including priorities setting and improving relations
- Reporting progress to decision-makers and stakeholders to highlight MPA achievements and challenges
- Improving accountability with donors and stakeholders
- Improved MPA management effectiveness and impacts by adaptive management
- Revision of MPA goals and objectives to be more specific and measurable
- New information on the marine environment and socioeconomic characteristics of MPA communities, as well as information on the impacts of these communities on the marine environment
- Identification of new management priorities for future management action
- Improving the usefulness of monitoring so that adequate mechanisms for tracking progress are in place Enhanced and increased stakeholder participation in the management process
- Highlighting issues for which more support or additional funds are needed

2.2.1 Trends in monitoring management effectiveness

Although there have been several requests for comprehensive protected area evaluation systems few protected area management agencies have implemented such systems. Initiatives have concentrated on biological conditions and cannot be regarded as comprehensive assessments of

management effectiveness. Efforts at addressing management effectiveness more broadly have generally focused on relatively few selected areas and have often depended on staff from educational or research institutions working with managers. One-off evaluations of a management agency or one of its programmes are more common. Monitoring programmes looking at particular aspects of management, or the status of particular resources, are also relatively common, although they do not often provide a reliable guide to overall management effectiveness. However, monitoring programmes of this kind, targeted at resources of special value or concern, should be an integral part of any comprehensive evaluation system.

Less attention has been paid to the state of protected area management at regional and global scales. Until recently with the publication of, *“How is your MPA?: A guidebook of natural and social indicators for evaluating marine protected area management effectiveness”* in 2004, there has been no generally accepted methodology that could be applied and no organisation with direct responsibility to collect or collate such information. Non-governmental organisations are also increasingly undertaking assessments of protected area effectiveness, both on a national or regional scale.

Capacity to manage has many components. The principal dimensions are the system of governance, level of resources and community support (Figure 2.1). The measurement of these dimensions is contextual. Effective legislation in one country may be entirely inappropriate in another with different legal and social systems. Similarly, it is only possible to assess the adequacy of resources for management in the context of some estimation of management needs. Beyond such questions relating to the way in which protected areas are managed, the international community is even more interested in the outcomes of such management, that is, the impact “on the ground”. Issues such as the impact of protected areas on the conservation of biodiversity and on other natural and cultural heritage resources are of great concern, as well as the implications of protected areas for other sectors of public policy, such as social justice and sustainable development. Protected area evaluation programmes should be designed to provide information on such issues.

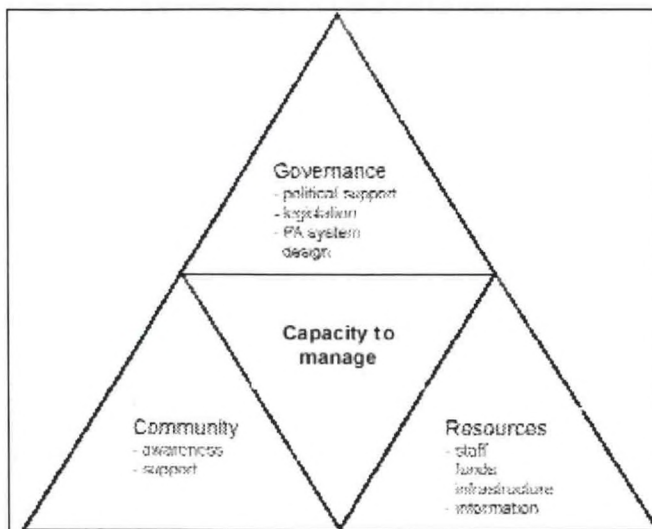


Figure 2.1 Main dimensions of capacity to manage
Source: Hockings et al. 2000.

2.2.2 The IUCN framework for evaluating management effectiveness

Management cycle and evaluation

Management is usually influenced by contextual issues. In the case of a protected area by its significance and uniqueness and the threats and opportunities it faces. Evaluation must therefore take into account all aspects of the management cycle, including the context within which management takes place. The results of evaluation can be fed back into different parts of the management cycle.

The IUCN management effectiveness framework presents an iterative protected area management cycle of design, management,

monitoring, evaluation and adaptation (Table 2.1). Through this process managers are empowered with the ability to diagnose and adaptively improve their management actions.

Table 2.1 Iterative linked phases of management

Management phases
<ul style="list-style-type: none">• Planning• Resource allocation• Implementation• Monitoring and evaluation• Feedback

To begin the monitoring and evaluation process of protected areas management a series of questions must be asked relating to:

- The design of the protected area (*context* and *planning*)
 - What is the *context* in which the protected area is designated?
 - What is the desired result and how will *planning* enable its achievement?
- Appropriateness of management systems and processes (input and process)
 - What *inputs* are required to designate the protected area?
 - What is the *process* used to go about defining it?
- Delivery or achievement of desired protected area objectives (outputs and outcomes)
 - What activities were undertaken and what were the *outputs* or products of this?
 - What *outcomes* or impacts were achieved based on the outputs and their application?

These concepts are summarised in Box 2.4.

Box 2.4 Concepts of management effectiveness

Context – *Where are we now?*

This question looks at the conservation and other values of the protected area, its current status and the particular threats and opportunities that are affecting it, including the broad policy environment. This is not an analysis of management, but provides information that helps put management decisions into context. Where assessment is being used to identify management priorities within a protected area network, or to decide on the time and resources to devote to a particular protected area, this may be the main task required. It also helps to provide information about management focus.

Planning – *Where do we want to be and how are we going to get there?*

This question focuses on the intended outcomes for the protected area system or the individual protected area, the vision for which the system or site is being planned. Assessment may consider the appropriateness of national protected area legislation and policies, plans for protected area systems, the design of individual protected areas and plans for their management. It may consider the design of a protected area in relation to the integrity and status of the resource. The selected indicators for evaluation will depend on the purpose of assessment and particularly whether it is looking at a system of reserves or at an individual protected area.

Inputs – *what do we need?*

This question addresses the adequacy of resources in relation to the management objectives for a system or a site, based primarily on staff, funds, equipment and facilities required at either agency or site level, along with consideration of the importance of partners.

Process – *how do we go about it?*

This question is about the adequacy of management processes and systems in relation to the management objectives for a system or a site. Assessment will involve a variety of indicators, such as issues of day-to-day maintenance or the adequacy of approaches to local communities and various types of natural and cultural resource management.

Outputs – *What did we do and what products or services were produced?*

Questions about output evaluation consider what has been done by management and examine the extent to which targets, work programmes or plans have been implemented. Targets may be set through management plans or a process of annual work programming. The focus of output monitoring is not so much on whether these actions have achieved their desired objectives (this is the province of outcome evaluation) but on whether the activities have been carried out as scheduled and what progress is being made in implementing long-term management plans.

Outcomes – *What did we achieve?*

This question assesses whether management has been successful with respect to the objectives in a management plan, national plans and ultimately the aims of the IUCN category of the protected area. Outcome evaluation is most meaningful where concrete objectives for management have been specified in national legislation, policies or site-specific management plans. Approaches to outcome evaluation involve long-term monitoring of the condition of the biological and cultural resources of the system or site, socio-economic aspects of use, and the impacts of the management of the system or site on local communities. Outcome evaluation is the true test of management effectiveness. The monitoring required is significant, especially since little attention has been given to this aspect of protected area management in the past.

Source: Hockings et al. 2000.

These questions identify six categories of potential indicators for measuring management effectiveness: context, planning, input, process, output and outcome indicators (Figure 2.2; Table 2.2).

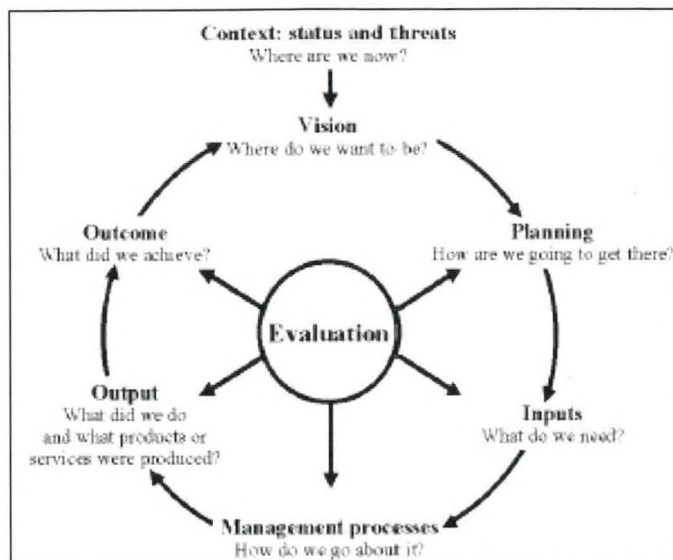


Figure 2.2 IUCN management effectiveness framework

Source: Hockings et al. 2000.

The management effectiveness management framework outlined here is designed to be flexible to accommodate the different needs and circumstances of protected areas worldwide. The framework allows protected area managers to customize a set of appropriate indicators to be used on relevant scales. The framework provides a common language and an important structure from which to improve protected area learning, efficacy and achievement. As a tool for designing an evaluation approach it helps to explain variations in the context, available resources, evaluative purpose and specific management objectives across protected areas.

Table 2.2 Framework for assessing management effectiveness of protected areas and protected area systems

Elements of evaluation	Context <i>Where are we now?</i>	Planning <i>Where do we want to be?</i>	Input <i>What do we need?</i>	Process <i>How do we go about it?</i>	Output <i>What were the results?</i>	Outcome <i>What did we achieve?</i>
Explanation	Assessment of importance, threats and policy environment	Assessment of protected area design and planning	Assessment of resources needed to carry out management	Assessment of the way in which management is conducted	Assessment of the implementation of management programmes and actions; delivery of products and services	Assessment of the outcomes and extent to which they achieved objectives
Criteria assessed	Significance Threats Vulnerability National context	Protected area legislation and policy Protected area system design Reserve design Management planning Appropriateness	Agency resources Site resources Partners	Suitability of management processes	Results of management actions Services and products	Impacts: effects of management in relation to objectives
Evaluation focus	Status		Resources	Efficiency Appropriateness	Effectiveness	Effectiveness Appropriateness

Adapted from: Hockings et al. 2000.

2.2.3 Methodologies for evaluating management effectiveness

Many methods are being developed and tested for evaluating MPA management effectiveness, with several designed specifically for marine areas. This is appropriate as different situations and needs of MPAs require different methods of evaluation. It should be noted that these methods are not mutually exclusive. There is potential for combining parts of them as well as others developed for terrestrial protected areas or more general coastal management initiatives, to create evaluations that cater to specific needs. There are three general types of evaluation methods: broad-scale, fine-scale and scorecards (Table 2.3).

Table 2.3 Evaluation methodologies

Methodology	Characteristics	Strengths	Issues to consider
Broad-scale: these methods include measures and descriptions of a wide range of management elements			
<ul style="list-style-type: none"> World Heritage Management Effectiveness Workbook 	<ul style="list-style-type: none"> Contains worksheets on context, planning, inputs, processes and outcomes Qualitative and semi-quantitative 	<ul style="list-style-type: none"> Incorporates a wide range of views from internal and external participants on all elements of management 	<ul style="list-style-type: none"> Designed for World Heritage sites, so some adaptation may be needed for other Pas Funding is necessary for workshops, and possibly for a consultant if MPA managers are not available Pilot assessments have taken 6-12 months on average to conduct
<ul style="list-style-type: none"> Workbook for the Western Indian Ocean 	<ul style="list-style-type: none"> Based on World Heritage method Has simpler worksheets than World Heritage method Qualitative and semi-quantitative 	<ul style="list-style-type: none"> Same as above 	<ul style="list-style-type: none"> Funding is necessary for workshops, and possibly for a consultant if MPA managers are not available Requires 2-3 months to conduct and the capacity to facilitate workshops and surveys
Fine-scale: these methods provide a more detailed analysis of the conservation and socio-economic impact of a MPA			
<ul style="list-style-type: none"> How is your MPA doing? 	<ul style="list-style-type: none"> Focuses on individual indicators, selectable from a generic list Offers a variety of methods for data collection and analyses of a wide range of indicators Qualitative and quantitative 	<ul style="list-style-type: none"> Provides guidance on linking objectives with indicators Offers good coverage of biophysical and socioeconomic outcomes Gives detailed instructions for collecting and processing data 	<ul style="list-style-type: none"> Most useful for mature management arrangements May be time-consuming, and technically and financially demanding Requires clear management objectives as basis for selecting indicators
<ul style="list-style-type: none"> The Nature Conservancy 5-S framework 	<ul style="list-style-type: none"> Provides criteria, questions and scoring systems to assess status and changes in threats 	<ul style="list-style-type: none"> Focuses on threat reduction, with direct relevance to immediate management decisions 	<ul style="list-style-type: none"> Focuses on outcomes only Provides indications for overall systems, not

Methodology	Characteristics	Strengths	Issues to consider
	and ecological integrity • Qualitative	• Supports strategic planning by gauging ecological integrity • Can be used to compare sites and strategies	specifics for each species or threat • Designed for small-scale and short-term conservation initiatives
Scorecards: offer shortcuts to evaluation providing a general picture of how management is progressing, therefore helping to identify areas that need immediate attention			
• World Bank scorecard to assess progress	• Scorecard initially aimed at MPAs supported by Global Environment Facility projects • Questionnaire addresses context, planning, inputs, processes, outputs and outcomes • Qualitative and semi-quantitative	• Quick, simple and inexpensive • Allows comparisons across sites if used consistently	• May need to be adapted for use by MPAs elsewhere

Adapted from: Wells, and Dahl-Tacconi. 2006.



Activity #4

There are a number of methodologies to measure MPA effectiveness. How do they differ and when would you use one versus another?



Recommended reading

Day, J., M. Hockings and G. Jones. 2002. Measuring effectiveness in marine protected areas – principles and practices. Keynote presentation in Aquatic Protected Areas. *What works best and how do we know?* World Congress on Aquatic Protected Areas, Cairns, Australia, August 2002.

Download pdf from: http://www.parks.tas.gov.au/publications/tech/MPA_evaluation/Marine%20PAs.pdf

Hockings, M., S. Stolton and N. Dudley. 2000. Evaluating effectiveness: A framework for assessing the management of protected areas. IUCN, Gland, Switzerland and Cambridge, UK. 121pp.

Hockings, M., S. Stolton, F. Leverington, N. Dudley and J. Courrau. 2006. A framework for assessing the management of protected areas. 2nd Edition. IUCN, Gland, Switzerland and Cambridge, UK. 105pp.

Download pdf copies from: www.iucn.org

Wells, S. and N. Dahl-Tacconi. 2006. Methodologies for evaluating MPA management effectiveness. Pages 2-3 in: Measurement of Management Effectiveness: The Next Major Stage in MPAs? MPA News Vol. 7, No. 10, May 2006.

Pomeroy, R. and M. Sissenwine. FAO Technical Guidelines on Marine Protected Areas and Fisheries Management. Draft. In prep.

3 MPA GUIDEBOOK INTRODUCTION

3.1 How is your MPA doing?

To successfully improve the management of MPAs, park managers must be able to measure the effectiveness of their work in an effort to adapt and improve their management techniques. However, the science and practice of managing marine reserves are fairly young. There are not yet any time-tested design tools or best management practices, although there is wide-spread recognition that they must rapidly be developed if marine reserves are to fulfill their promise as conservation tools.

The World Wildlife Fund (WWF), the World Conservation Union (IUCN), the National Oceanic and Atmospheric Administration (NOAA) and the World Commission on Protected Areas (WCPA) formed the MPA Management Effectiveness Initiative, which developed a methodology to assist park managers, planners, and decision-makers for measuring management effectiveness. This methodology has been compiled in the IUCN publication *How Is Your MPA Doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness*.



The guidebook offers an easy-to-follow, step-by-step process for the evaluation of management as well as a structured way to learn from management successes and failures so that activities can be adapted and management continually improved. It helps park managers and conservation practitioners assess whether their actions have produced the desired results by reaching their goals and objectives more effectively and efficiently and to evaluate and adaptively improve the effectiveness of their MPA efforts through time. It emphasises the importance of broad community and stakeholder involvement in the overall management of MPAs. The methodology was tested in 18 MPAs around the world to ensure that it would meet the needs of modern-day managers.

The guidebook has been written in such a way as to be as practical and applicable as possible so that it can be used by many different MPA managers and conservation practitioners in varying types of MPAs (multiple-use or no-take zones). The methodologies presented have been chosen to reflect more approachable, rather than the more advanced, scientific methods. As such the data collection and analysis techniques lean towards simplicity such that the guidebook would be a starting point in helping MPA managers measure management effectiveness (Box 3.1).

Box 3.1 Guidebook evaluation process

The evaluation process in the guidebook is founded on five main principles. It must be:

- *Useful* to managers and stakeholders for improving MPA management
- *Practical* in use and cost
- *Balanced* to seek and include scientific input and stakeholder participation
- *Flexible* for use at different sites and in varying conditions
- *Holistic* through a focus on both natural and human perspectives

There are a number of methods available for monitoring and evaluating protected areas but until the publication of this guidebook, a comprehensive methodology for monitoring and evaluating management effectiveness of MPAs had not been developed. To fill this gap, this guidebook

includes indicators that address biophysical, socioeconomic and governance aspects of management effectiveness. The majority of these indicators measure outputs and outcomes of MPA management which represent tangible benefits associated with the MPA. Learning from indicator results can help improve MPA management and secure resources and support.

The guidebook is divided into two sections. Section 1 outlines the process for conducting an evaluation and is structured around four steps that can be followed when conducting a management effectiveness evaluation. These steps are set out in four chapters that represent the overall evaluation process (Table 3.1; Figure 3.1).

Table 3.1 Guidebook layout and chapter summaries

Chapter	Summary
<p>Chapter 1: Selecting your indicators</p> <ul style="list-style-type: none"> • Identify MPA goals and objectives • Match relevant indicators to MPA goals and objectives • Review and prioritise the indicators identified • Identify how the selected indicators relate to each other 	<p>This process seeks to match the goals and objectives of the MPA (derived from the management plan or developed on site) with the goals and objectives in the guidebook and to select the relevant indicators.</p>
<p>Chapter 2: Planning your evaluation</p> <ul style="list-style-type: none"> • Assess resource needs for measuring the indicators • Determine the audience who will receive the evaluation results • Identify who should participate in the evaluation • Develop a timeline and a workplan for the evaluation 	<p>This is a critical preparatory activity in any evaluation and seeks to aid managers or practitioners in undertaking a thorough evaluation from the outset. It is useful to develop a plan for the evaluation procedures before starting the evaluation process. The plan should clearly state the objectives of the evaluation; the methodologies employed; who will conduct the evaluation, who will be involved and their responsibilities. Details of the implementation and communication of the results should also be included. The plan may be adjusted and developed during the evaluation to accommodate issues or challenges.</p> <p>For each of the indicators chosen factors related to the evaluation such as human resource needs and the evaluation team, equipment needs, budget needs, timeline, audience and outputs should be considered.</p>
<p>Chapter 3: Conducting your evaluation</p> <ul style="list-style-type: none"> • Implement the evaluation workplan • Collect data • Manage collected data • Analyse collected data • Encourage peer review and independent evaluation of results 	<p>After planning the evaluation, the actual process of assessment is constrained by time and is often an intense series of activities followed by a process of analysis and report writing. Useful tips for conducting the evaluation are provided in this chapter.</p> <p>Data collection involves extracting the relevant information from primary sources such as management plans, monitoring reports, research projects, consultation with stakeholders etc.</p> <p>Consideration of the timing (for data collection and analysis), logistics and the process of data collection, management and analysis is crucial. Key needs for data collection must be addressed as well as considering innovative sampling methods and approaches that may be more acceptable or affordable. Data management is an important stage of the data collection and analysis process and aids the evaluation team in understanding what happens to the data once they have been collected. Analysing the</p>

Chapter	Summary
<p>Chapter 4: Communicating results and adapting management</p> <ul style="list-style-type: none">• Share with target audiences• Use results to adapt management strategies	<p>collected data helps MPA managers address and respond to questions being asked about the MPA. Suggestions for analysis are given.</p> <p>It is important to think about the reporting requirement at the outset of the project, especially the target audience and the way the report style and level of detail are to be tailored to meet their needs.</p> <p>Reports of evaluations should be open, transparent and accessible to the community. An adaptive management approach is essential because MPAs are dynamic natural systems and commonly subject to changing patterns and levels of use, technological, social and political change. The evaluation should be used to feed into, influence and improve ongoing management strategies.</p>

Each chapter includes a set of steps to accomplish each stage; a set of tasks or questions to complete each step; and guidance, supplementary information and references to help the practitioner work through the process (Figure 3.1).



Activity #5

- What are the goals and objectives of a named MPA in your country/region?
- Who developed the goals and objectives?
- How old are they?
- Do they make sense?

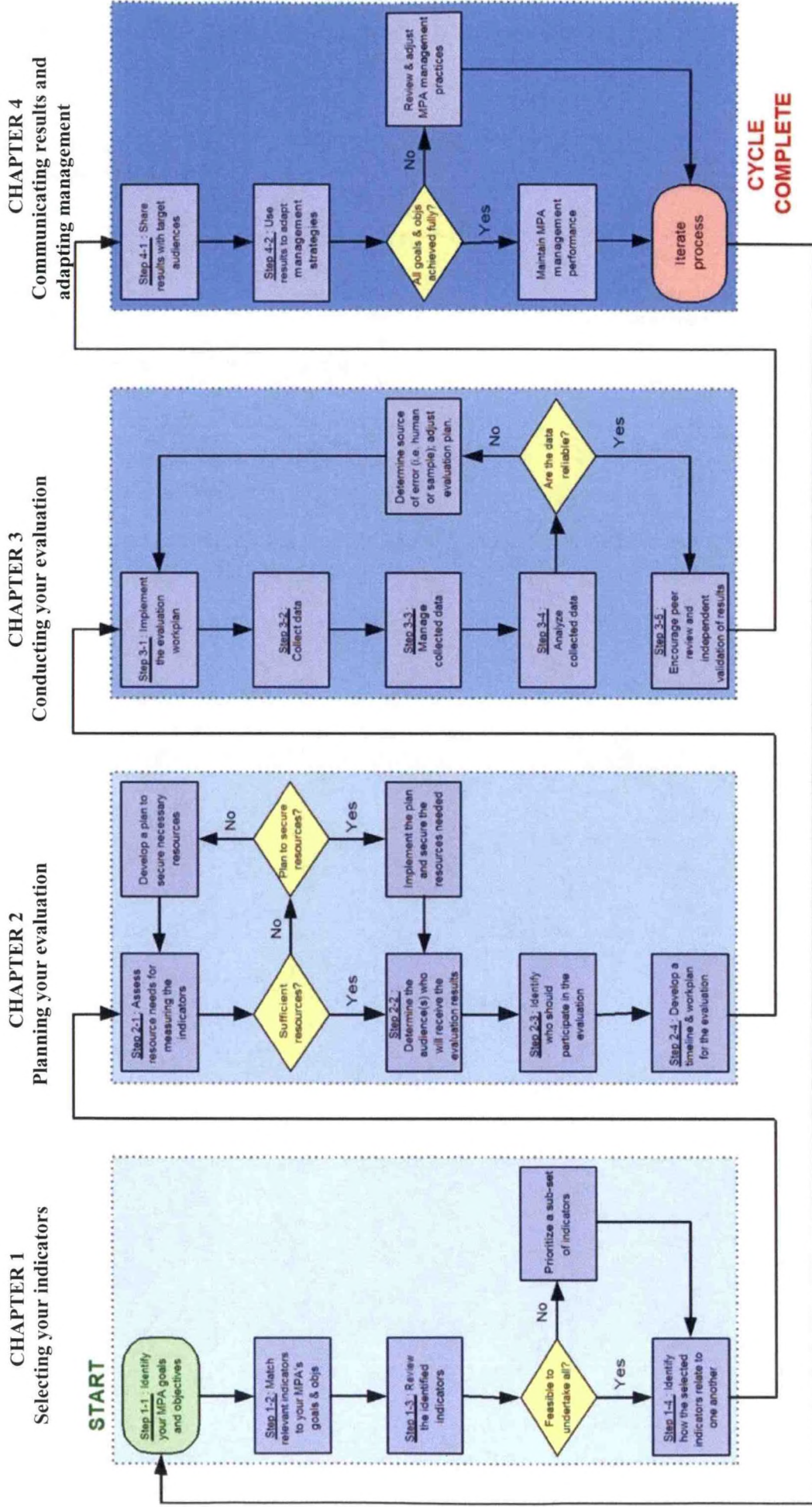


Figure 3.1 Step-by-step flowchart to using the 'How is your MPA doing?' guidebook
Source: Pomeroy et al. 2004.

3.2 MPA management effectiveness indicators

As stated in Section 1.2, the reasons for establishing MPAs are usually of a varied and sometimes mixed nature but generally include biological or ecological purposes (maintenance of biodiversity, protection of critical habitats for endangered or migratory species); social purposes (natural areas for public enjoyment and recreation); economic purposes (tourism, fishing) and governance purposes (as a management tool) to limit, prohibit or control use patterns and human activity through a structure of rights and rules. Therefore it may be said that MPAs are influenced by numerous factors (Figure 3.2) which may be grouped into:

- Biophysical factors
- Socioeconomic factors
- Governance factors

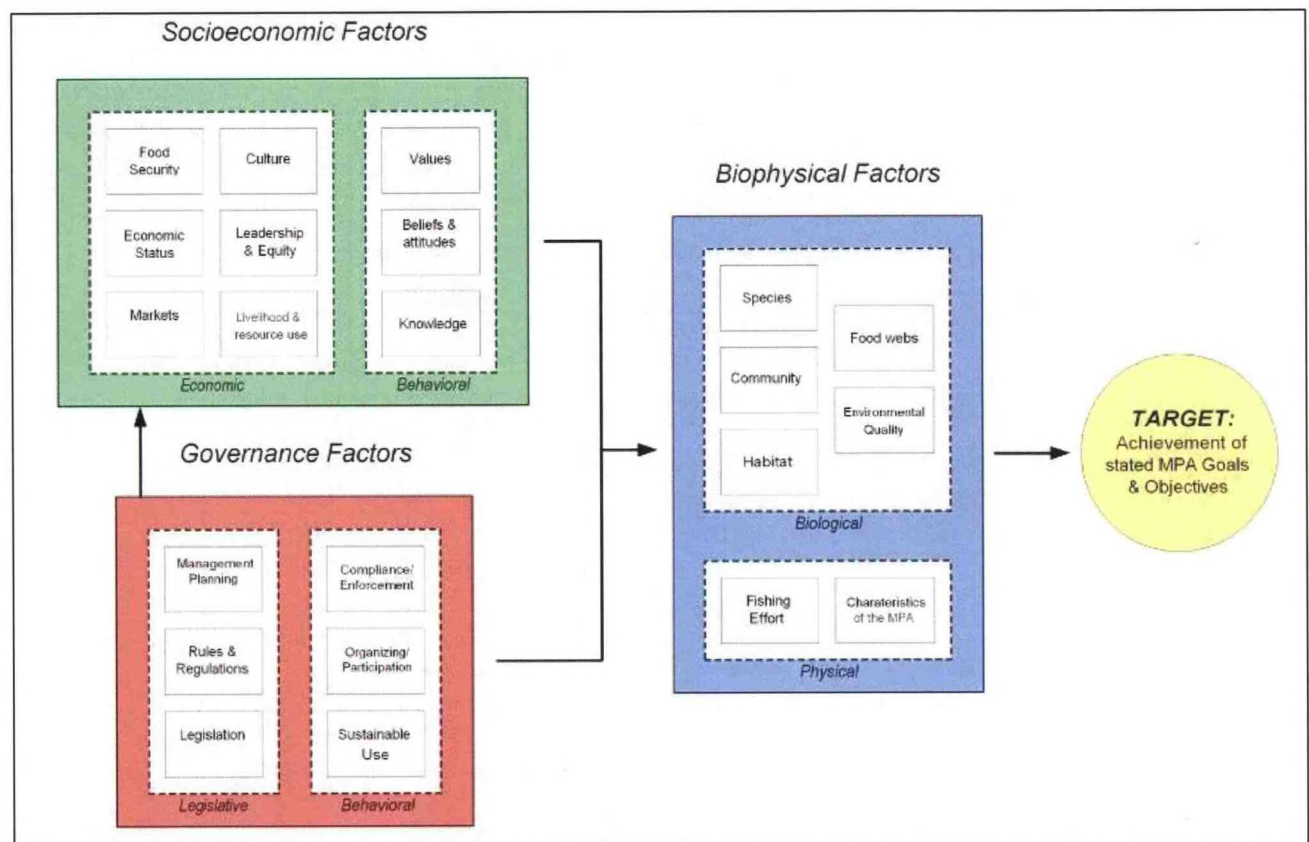



Figure 3.2 The many influences on MPAs

Based on these factors impacting MPAs, a number of indicators have been developed and are presented in the guidebook to measure the influence of each of these factors on MPA effectiveness. A range of indicators should be used when trying to determine ‘how your MPA is doing’ since management effectiveness is a multi-dimensional concept. The indicators can provide evidence of whether the goals and objectives of the MPA are being achieved.

Section 2 comprises an introduction to the MPA



Definition
Indicator: quantitative or qualitative variable measured over time that provides useful information about a criterion and can be used to help measure the status of and trends in protected area effectiveness

effectiveness indicators; summary tables of goals, objectives and indicators; and easy-to-follow outlines of the biophysical, socioeconomic and governance indicators. The guidebook focuses on 42 indicators (Box 3.2) developed through a rigorous process of research, expert review, field testing and revision to make the indicators applicable to a wide range of MPA goals and objectives.

Box 3.2 Management effectiveness indicators (n=42)

- 10 biophysical
- 16 socioeconomic
- 16 governance

Each indicator is also given a difficulty rating ranging between 1 and 5 according to ease with which the particular indicator can be measured using the most basic recommended methods. This ranking takes into account the time, technical

skills, finances and other resources necessary to measure the indicator.

Information on how to use each of the indicators is laid out in the guidebook according to various headings which describe the indicator and why it should be measured, the resources required to collect and analyse data on the indicator, ways to collect, analyse and interpret the results, expected outputs as well as the strengths and limitations of the indicator. Additionally, the difficulty rating for measuring the indicator is given, the goals and objectives related to the indicator and an example of using the indicator are provided as well as a number of helpful references and internet links for additional sources of information (Table 3.2).

Table 3.2 Guidebook layout for using the management effectiveness indicators

Heading	Meaning
Name	Number and name of indicator
Goals and objectives	Which goals and objectives the indicator corresponds with (relating to the larger generic list of MPA goals and objectives developed by the project)
Difficulty rating	A rank of how difficult the indicator is to measure
What is “(indicator name)”?	Brief description of the indicator
Why measure it?	The purpose and rationale of the indicator
Requirements	Resources (people and equipment) needed to collect and analyse the information.
How to collect the data	The method and approach used to collect information on the indicator.
How to analyse and interpret the results	The methods and procedures to analyse the data and suggestions on how to present the results.
Outputs	What are the results and how can they be used by the MPA?
Strengths and limitations	How useful is the indicator overall and what problems may occur in using the indicator?
Example for the field	An example of use of the indicator.
Useful references and internet links	Suggested sources of information on methods, and further explanation of the indicator.

Source: Pomeroy et al. (2004)

3.2.1 Biophysical goals, objectives and indicators

The guidebook outlines five biophysical goals and 26 objectives commonly associated with MPA use (Table 3.3) and relates them to the ten biophysical indicators (Tables 3.4; 3.5). The indicators fall into biotic, abiotic and aerial groupings. As outlined in Section 1, Chapter 1 of the guidebook, the biophysical goals and objectives of the MPA for which management

effectiveness might be measured are used to identify overlapping goals and objectives in the guidebook and their associated biophysical indicators. The indicators chosen for measurement are then examined in detail and prioritised before the final selection of indicators is made. These steps are repeated for both socioeconomic and governance goals, objectives and indicators. For detailed information on all indicators it is recommended that you thoroughly read Section 2 of the “How is your MPA doing?” guidebook.

Table 3.3 Biophysical goals

GOAL 1 Marine resources sustained or protected

- 1A Population or target species for extractive or non-extractive use restored to or maintained at desired reference points
- 1B Losses to biodiversity and ecosystem functioning and structure prevented
- 1C Population or target species for extractive or non-extractive use protected from harvest at sites and/or life history stages where they become vulnerable
- 1D Overexploitation of living and/or non-living marine resources minimized, prevented or prohibited entirely
- 1E Catch yields improved or sustained in fishing areas adjacent to the MPA
- 1F Replenishment rate of fishery stocks increased or sustained within the MPA

GOAL 2 Biological diversity protected

- 2A Resident ecosystems, communities, habitats, species and gene pools adequately represented and protected
- 2B Ecosystem functions maintained
- 2C Rare, localised or endemic species protected
- 2D Areas protected that are essential for life history phases of species
- 2E Unnatural threats and human impacts eliminated or minimized inside and/or outside the MPA
- 2F Risk from unmanageable disturbances adequately spread across the MPA
- 2G Alien and invasive species and genotypes removed or prevented from becoming established

GOAL 3 Individual species protected

- 3A Focal species abundance increased or maintained
- 3B Habitat and ecosystem functions required for focal species’ survival restored or maintained
- 3C Unnatural threats and human impacts eliminated or minimized inside and/or outside the MPA
- 3D Alien and invasive species and genotypes removed or prevented from becoming established

GOAL 4 Habitat protected

- 4A Habitat quality and/or quantity restored or maintained
- 4B Ecological processes essential to habitat existence protected
- 4C Unnatural threats and human impacts eliminated or minimized inside and/or outside the MPA
- 4D Alien and invasive species and genotypes removed or prevented from becoming established

GOAL 5 Degraded areas restored

- 5A Populations of native species restored to desired reference points
- 5B Ecosystem functions restored

GOAL 5 Degraded areas restored

- 5C Habitat quality and/or quantity restored or maintained
- 5D Unnatural threats and human impacts eliminated or minimized inside and/or outside the MPA
- 5E Alien and invasive species and genotypes removed or prevented from becoming established

Table 3.4 Biophysical indicators for measuring MPA management effectiveness

Indicator no.	Name	Grouping
B1	Focal species abundance	BIOTIC
B2	Focal species population structure	
B3	Habitat distribution and complexity	
B4	Composition and structure of the community	
B5	Recruitment success within the community	
B6	Food web integrity	
B7	Type, level, and return on fishing effort	
B8	Water quality	ABIOTIC
B9	Area showing signs of recovery	AERIAL
B10	Area under reduced human use/impacts	

Biotic indicators measure:

- population and species status
- ecological conditions
- level of biological goods generated from the marine environment within and beyond the MPA boundaries

Abiotic indicator measures:

- abiotic conditions of the environment

Aerial indicators measure:

- spatial biophysical change



Recommended reading

For detailed information on these 10 biophysical indicators refer to pages 49-112 in the “How is your MPA doing?” guidebook (Pomeroy et al. 2004).

Pomeroy, R., J.E. Parks and L.M. Watson. 2004. How Is Your MPA Doing? A guidebook of natural and social indicators for evaluating marine protected area management effectiveness. IUCN, Gland, Switzerland and Cambridge, UK. 216pp.

Download a pdf copy of the guidebook from: <http://effectivempa.noaa.gov/guidebook/guidebook.html>

Table 3.5 Summary table to show how the biophysical indicators relate to the common goals and objectives

		R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
GOAL 1	Marine resources sustained or protected										
1A	Populations of target species for extractive or non-extractive use restored to or maintained at desired reference points	●	●	●	●	●	●	●	●	●	●
1B	Losses to biodiversity and ecosystem functioning and structure prevented	●	●	●	●	●	●	●	●	●	●
1C	Populations of target species for extractive or non-extractive use protected from harvest at sites and/or life history stages where they become vulnerable	●	●	●	●	●	●	●	●	●	●
1D	Over-exploitation of living and/or non-living marine resources minimized, prevented, or prevented entirely	●	●	●	●	●	●	●	●	●	●
1E	Catch yields improved or sustained in fishing areas adjacent to the MPA	●	●	●	●	●	●	●	●	●	●
1F	Replenishment rate or recovery stocks increased or sustained in the MPA	●	●	●	●	●	●	●	●	●	●
GOAL 2	Biological diversity protected										
2A	Resilient ecosystems, communities, habitats, species, and genetic pools adequately represented and protected	●	●	●	●	●	●	●	●	●	●
2B	Ecosystem functions maintained	●	●	●	●	●	●	●	●	●	●
2C	Rare, abundant or endemic species protected	●	●	●	●	●	●	●	●	●	●
2D	Areas protected that are essential for life history phases of species	●	●	●	●	●	●	●	●	●	●
2E	Unnatural threats and human impacts eliminated or minimized inside and/or outside the MPA	●	●	●	●	●	●	●	●	●	●
2F	Risk from unacceptable disturbances adequately managed across the MPA	●	●	●	●	●	●	●	●	●	●
2G	Alien and invasive species and genotypes removed or prevented from becoming established	●	●	●	●	●	●	●	●	●	●
GOAL 3	Individual species protected										
3A	Focal species abundance increased or maintained	●	●	●	●	●	●	●	●	●	●
3B	Habitats and ecosystem functions required for focal species survival restored or maintained	●	●	●	●	●	●	●	●	●	●
3C	Unnatural threats and human impacts eliminated or minimized inside and/or outside the MPA	●	●	●	●	●	●	●	●	●	●
3D	Alien and invasive species and genotypes removed or prevented from becoming established	●	●	●	●	●	●	●	●	●	●
GOAL 4	Habitat protection										
4A	Habitat quality and/or quantity restored or maintained	●	●	●	●	●	●	●	●	●	●
4B	Ecological processes essential to habitat existence protected	●	●	●	●	●	●	●	●	●	●
4C	Unnatural threats and human impacts eliminated or minimized inside and/or outside the MPA	●	●	●	●	●	●	●	●	●	●
4D	Alien and invasive species and genotypes removed or prevented from becoming established	●	●	●	●	●	●	●	●	●	●
GOAL 5	Degraded areas restored										
5A	Populations of native species restored to desired reference points	●	●	●	●	●	●	●	●	●	●
5B	Ecosystem functions restored	●	●	●	●	●	●	●	●	●	●
5C	Habitat quality and/or quantity restored or maintained	●	●	●	●	●	●	●	●	●	●
5D	Unnatural threats and human impacts eliminated or minimized inside and/or outside the MPA	●	●	●	●	●	●	●	●	●	●
5E	Alien and invasive species and genotypes removed or prevented from becoming established	●	●	●	●	●	●	●	●	●	●

3.2.2 Socioeconomic goals, objectives and indicators

It has been shown that social, cultural, economic and political factors, more so than biological or physical factors, shape the development, management and performance of MPAs. Additionally, MPAs impact and are impacted by people. Therefore the goals and objectives of many MPAs include socioeconomic considerations. It is essential for MPA managers to have an understanding of the socioeconomic context of stakeholders involved with and/or influenced by the MPA in order to assess and manage MPAs. Six socioeconomic goals and 21 objectives commonly associated with MPA use are outlined in the guidebook (Table 3.6) and are related to the 16 socioeconomic indicators (Tables 3.7 and 3.8).

Table 3.6 Socioeconomic goals

GOAL 1 Food security enhanced or maintained

- 1A Nutritional needs of coastal residents met or improved
- 1B Improved availability of locally caught seafood for public consumption

GOAL 2 Livelihoods enhanced or maintained

- 2A Economic status and relative wealth of coastal residents and/or resource users improved
- 2B Household occupational and income structure stabilized or diversified through reduced marine resource dependency
- 2C Local access to markets and capital improved
- 2D Health of coastal residents and/or resource users improved

GOAL 3 Non-monetary benefits to society enhanced or maintained

- 3A Aesthetic value enhanced or maintained
- 3B Existence value enhanced or maintained
- 3C Wilderness value enhanced or maintained
- 3D Recreation opportunities enhanced or maintained
- 3E Cultural value enhanced or maintained
- 3F Ecological services values enhanced or maintained

GOAL 4 Benefits from the MPA equitably distributed

- 4A Monetary benefits distributed equitably to and through coastal communities
- 4B Non-monetary benefits distributed equitably to and through coastal communities
- 4C Equity within social structures and between social groups improved and fair

GOAL 5 Compatibility between management and local culture maximised

- 5A Adverse effects on traditional practices and relationships or social systems avoided or minimized
- 5B Cultural features or historical sites and monuments linked to coastal resources protected

GOAL 6 Environmental awareness and knowledge enhanced

- 6A Respect for and or understanding of local knowledge enhanced
- 6B Public's understanding of environmental and social 'sustainability' improved
- 6C Level of scientific knowledge held by the public increased
- 6D Scientific understanding expanded through research and monitoring

Table 3.7 Socioeconomic indicators for measuring MPA management effectiveness

Indicator no.	Name
S1	Local marine resource use patterns
S2	Local values and beliefs about marine resources
S3	Level of understanding of human impacts on resources
S4	Perceptions of seafood availability
S5	Perceptions of local resource harvest
S6	Perceptions of non-market and non-use value
S7	Material style of life
S8	Quality of human health
S9	Household income distribution by source
S10	Household occupational structure
S11	Community infrastructure and business
S12	Number and nature of markets
S13	Stakeholder knowledge of natural history
S14	Distribution of formal knowledge to community
S15	Percentage of stakeholder group in leadership positions
S16	Changes in conditions of ancestral and historical sites/features/monuments

Source: Pomeroy et al. 2004



Recommended reading

For detailed information on these 16 socioeconomic indicators refer to pages 113-162 in the “How is your MPA doing?” guidebook (Pomeroy et al. 2004).

Table 3.8 Summary table to show how the socioeconomic indicators relate to the common goals and objectives

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
GOAL 1 Food security enhanced or maintained																
1A Nutritional needs of coastal residents met or improved																
1B Improved availability of locally caught seafood for public consumption.																
GOAL 2 Livelihoods enhanced or maintained																
2A Economic status and relative wealth of coastal residents and/or resource users improved																
2B Household occupational and income structure stabilized or diversified through reduced marine resource dependency																
2C Local access to markets and capital improved																
2D Health of coastal residents and/or resource users improved																
GOAL 3 Non-monetary benefits to society enhanced or maintained																
3A Aesthetic value enhanced or maintained																
3B Existence value enhanced or maintained																
3C Well-being value enhanced or maintained																
3D Recreation opportunities enhanced or maintained																
3E Cultural value enhanced or maintained																
3F Ecological services value enhanced or maintained																
GOAL 4 Benefits from the MPA equitably distributed																
4A Monetary benefits distributed equitably to and through coastal communities																
4B Non-monetary benefits distributed equitably to and through coastal communities																
4C Equity within social structures and between social groups improved and fair																
GOAL 5 Compatibility between management and local culture maximized																
5A Adverse effects on traditional practices and relationships or social systems avoided or minimized																
5B Cultural features or historical sites and monuments linked to coastal resources protected																
GOAL 6 Environmental awareness and knowledge enhanced																
6A Respect for and/or understanding of local knowledge enhanced																
6B Public's understanding of environmental and social 'sustainability' improved																
6C Level of scientific knowledge held by the public increased																
6D Scientific understanding expanded through research and monitoring																

3.2.3 Governance goals, objectives and indicators

Resource governance is the way in which users and their intentions are managed through a set of rights, rules and social norms and strategies and may include enforcement mechanisms (policing measures and punishments) as well as incentives to direct human behaviour and use. In general resource governance may be defined by formal organisations and law, traditional bodies, and/or accepted practice. In the “How is your MPA doing?” guidebook, governance of the MPA and marine resources is of particular importance.

The three most general arrangements for MPA management are centralised, community-based (locally managed) and collaborative (co-management) with the differences between these relating to the degree of stakeholder participation in the process and the location of management authority and responsibility (Figure 3.3). The guidebook has been written to allow for MPA evaluation under any of these three arrangements and focuses greatly on participation in MPA management since it has been shown that a high degree of stakeholder participation in MPA planning and management leads to stronger and greater conservation success over the long term. As such, several of the governance indicators address varying aspects of stakeholder participation in the management process. The “How is your MPA” guidebook outlines five governance goals and 21 objectives commonly associated with MPA use (Table 3.9) and relates them to the 16 governance indicators (Tables 3.10 and 3.11).

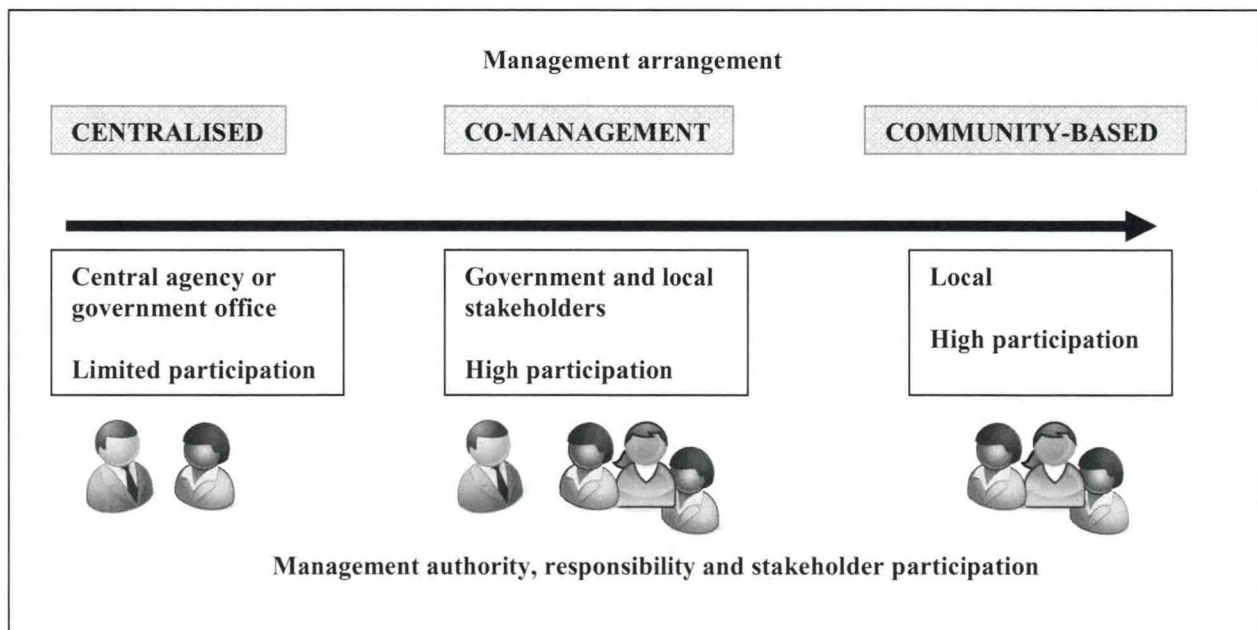


Figure 3.3 Differences between MPA management arrangements

Table 3.9 Governance goals

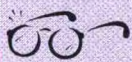
GOAL 1	Effective management structures and strategies maintained
1A	Management planning implemented and process effective
1B	Rules for resource use and access clearly defined and socially acceptable
1C	Decision-making and management bodies present, effective and accountable
1D	Human and financial resources sufficient and used efficiently and effectively
1E	Local and/or informal governance system recognised and strategically incorporated into management planning
1F	Periodic monitoring, evaluation and effective adaptation of management plan ensured
GOAL 2	Effective legal structures and strategies for management maintained
2A	Existence of adequate legislation ensured
2B	Compatibility between legal (formal) and local (informal) arrangements maximized or ensured
2C	National and/or local legislation effectively incorporates rights and obligations set out in international legal instruments
2D	Compatibility between international, national, state and local rights and obligations maximized or ensured
2E	Enforceability of arrangements ensured
GOAL 3	Effective stakeholder participation and representation ensured
3A	Representativeness, equity and efficacy of collaborative management systems ensured
3B	Resource user capacity effectively built to participate in co-management
3C	Community organising and participation strengthened and enhanced
GOAL 4	Management plan compliance by resource users enhanced
4A	Surveillance and monitoring of coastal areas improved
4B	Willingness and acceptance of people increased to behave in ways that allow for sustainable management
4C	Local ability and capacity built to use resources sustainably
4D	User participation in surveillance, monitoring and enforcement increased
4E	Application of law and regulations adequately maintained or improved
4F	Access to and transparency and simplicity of management plan ensured and compliance fostered
GOAL 5	Resource use conflicts managed and reduced
5A	User conflicts managed and/or reduced: (1) within and between user groups, and/or (2) between user groups and the local community or between the community and people outside it

Source: Pomeroy et al. (2004)

Table 3.10 Governance indicators for measuring MPA management effectiveness

Indicator no.	Name
G1	Level of resource conflict
G2	Existence of a decision-making and management body
G3	Existence and adoption of a management plan
G4	Local understanding of MPA rules and regulations
G5	Existence and adequacy of enabling legislation
G6	Availability and allocation of MPA administrative resources
G7	Existence and application of scientific research and input
G8	Existence and activity level of community organisation(s)
G9	Degree of interaction between managers and stakeholders
G10	Proportion of stakeholders trained in sustainable use
G11	Level of training provided to stakeholders in participation
G12	Level of stakeholder participation and satisfaction in management processes and activities
G13	Level of stakeholder involvement in surveillance, monitoring and enforcement
G14	Clearly defined enforcement procedures
G15	Enforcement coverage
G16	Degree of information dissemination to encourage stakeholder compliance

Source: Pomeroy et al. (2004)



Recommended reading

For detailed information on these 16 governance indicators refer to pages 163-204 in the “How is your MPA doing?” guidebook (Pomeroy et al. 2004).

Table 3.11 Summary table to show how the governance indicators relate to the common goals and objectives

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16
GOAL 1	Effective management structures and Strategies Maintained															
1A																
1B																
1C																
1D																
1E																
1F																
GOAL 2	Effective legal structures and strategies for management maintained															
2A																
2B																
2C																
2D																
2E																
GOAL 3	Effective stakeholder participation and representation ensured															
3A																
3B																
3C																
GOAL 4	Management plan compliance by resource users enhanced															
4A																
4B																
4C																
4D																
4E																
4F																
GOAL 5	Resource use conflicts managed and reduced															
5A																



Activity #6

The mission of the Tobago Cays Marine Park (TCMP), St. Vincent and the Grenadines is “*to protect, conserve and improve the natural resources of the Tobago Cays.*”

The goal of this MPA as defined in the 2007 first draft of the management plan (Hoggarth 2007) is “*to protect and enhance the natural resources of the TCMP and allow for their sustainable and equitable use by local people and visiting tourists, by developing and implementing effective participatory management systems.*”

The overall objective of the TCMP is “to maintain or restore the quality of the park’s natural resources and the scenic aspect of the islands and thereby support the economic development of St. Vincent and the Grenadines.

Secondary objectives include:

- Protecting the biodiversity of the park
- Conserving the marine resources
- Ensuring the park is managed along commercial lines
- Working with other relevant agencies using the media to promote the marine park as a tourist resort and attraction
- Public awareness and stakeholder participation
- Public education
- Protecting sustainable livelihoods

Using the guidebook, select eight indicators of varying types to determine if the TCMP is being managed effectively? Design 8-month workplans (March to October) for the indicator assessments. These workplans should comprise training, data collection and reporting components of the evaluation.

3.3 Towards MPA management effectiveness in the Caribbean

Marine protected areas are important ecological, economic, social and cultural assets for Caribbean countries partly due to their significance to tourism earnings in the region. Despite many projects and proposals, as well as good intentions, management authorities and small field staffs have struggled with very inadequate capacity to manage most MPAs in the region.

3.3.1 CERMES regional project on enhancing management effectiveness at three marine protected areas in St. Vincent and the Grenadines, Jamaica and Belize

In an attempt to remedy this situation, the Centre for Resource Management and Environmental Studies (CERMES) of the University of the West Indies (UWI), Cave Hill Campus, began to implement a regional project to evaluate MPA management effectiveness, and to learn lessons from this process at three MPA sites in the Caribbean in 2005 –Sapodilla Cayes Marine Reserve (SCMR), Belize; Negril Marine Park (NMP), Jamaica and Tobago Cays Marine Park (TCMP), St. Vincent and the Grenadines.

The primary objectives of the project were to:

- To conduct participatory management effectiveness research and evaluations by training at least 30 people across three MPA sites.

- To improve MPAs in the region by monitoring outcomes documented in lessons learned combined with training and communication materials for coursework, research, management and coastal policy.

Box 3.3 provides a brief overview of the situation across all three project sites.

Box 3.3 MPA situation analysis across all three project sites

- Reefs vary in condition from good to bad
- Different types of tourism and impacts
- None to elaborate management plans
- Struggling with financing for operations
- Keen NGOs associated with management
- Not much used to evaluating effectiveness

Methods used to conduct the evaluations

At all three project sites, inception training workshops for evaluating MPA management effectiveness were held. Bob Pomeroy, lead author of the guidebook and the project's method trainer and adviser, introduced the marine protected area management effectiveness (MPA-ME) methodology.

Participants were then trained in the use of the guidebook with accompanying worksheets to identify (NMP and SCMR) or determine (TCMP) applicable goals and objectives for their MPAs. Goals and objectives that were most relevant and feasible to evaluate were selected by a combination of discussion and open voting. These goals and objectives were then used to identify overlapping goals and objectives in the guidebook and their associated indicators (bio-physical, socioeconomic and governance). The indicators were then examined in detail and prioritised, resulting in the selection of 10 indicators for the SCMR, eight indicators for the Negril Marine Park and 13 for the Tobago Cays Marine Park.

For each of the three types of selected indicators, participants considered factors related to the evaluation such as human resource needs and the evaluation team, equipment needs, budget needs, timeline, audience and outputs. Details of these requirements are provided in each of the inception training workshop reports (see Recommended readings).

Participatory management effectiveness research and evaluations pertaining to the selected indicators was intended to begin in February 2006, with all data collection scheduled to be completed by September 2006, followed by draft report writing in October 2006.

An evaluation workshop of researchers and representatives from all study sites was held to discuss lessons learned from the evaluation experience (Table 3.12) and the consequent recommendations for adaptive management. The draft site evaluation reports were presented at the workshop held on 4 November 2006. This preceded the 59th Gulf and Caribbean Fisheries Institute conference in Belize City, Belize, at which a presentation on the progress of the project was made. Project results sharing meetings were held at each site to share information on the results of the CERMES project on evaluating the management effectiveness of the particular site along with the other marine protected areas in the two other sites. Training materials (such as these training notes) based on the process and products of the evaluation of management effectiveness, and on lessons learned at the three MPA sites, are being produced as a final output of the project.

Table 3.12 Summary of lessons learned at the three MPA sites

Lessons learned	
Good	Bad
<ul style="list-style-type: none"> • Management authorities appreciate the importance of evaluating management (all sites) • Reasonable capacity exists to conduct in-house evaluations (all sites) • Willingness to learn, to adapt and to improve management (all sites) 	<ul style="list-style-type: none"> • Poor links between management plan objectives and activities (all sites) • Weak agency culture of evaluating management (all sites) • Lack of systems to assess some bio-physical indicators (all sites) • Need for well-structured management and business plans (TCMP) • Staff and administrative resources lacking (all sites) • Longer training sessions necessary to build expertise (TCMP and NMP)



Activity #7

How can you apply the lessons learned from previous management effective evaluations to your MPA?

3.3.2 OECS Protected Areas and Associated Sustainable Livelihoods (OPAAL) Project

Another regional project with components aimed at improving management effectiveness of protected areas, including marine protected areas, within the Caribbean region is the Organisation of Eastern and Caribbean States (OECS) Protected Areas and Associated Sustainable Livelihoods (OPAAL) Project. The OECS through its Environment and Sustainable Development Unit (ESDU) in 2004 developed a project with the purpose of improving the management of protected areas in six member states – Antigua and Barbuda, St. Kitts and Nevis, Dominica, St. Lucia, St. Vincent and the Grenadines, and Grenada – by introducing sustainable development ideas and methods. This project is the first phase of a proposed 15 year program.

This project came about from the need to remove barriers to effective management of protected areas and increase the involvement of civil society and the private sector in the planning and management of protected areas and the sustainable use of these areas.

The four components of the OPAAL project are as follows:

- Policy, legal and institutional reform (Component 1)
- Protected area management and associated livelihoods (Component 2)
- Capacity building for protected area planning and management (Component 3)
- Project management (Component 4)

Component 2 which is primarily concerned with improving management effectiveness, involves assisting countries prepare management plans or update existing management plans for their demonstration site and reviewing or evaluating the sustainability of livelihood opportunities

within or associated with the selected protected areas. To achieve this objective the following activities have and will be conducted:

- Site inventories, demarcation and mapping of the protected areas, and biodiversity baseline establishment
- Development or updating of existing management plans
- Investments in basic park infrastructure and equipment
- A monitoring and evaluation program
- Training and technical support based on site-specific needs assessment
- Field studies and workshops to identify potential economic opportunities
- Review, evaluation and selection of livelihood opportunities
- Technical assistance and training for sustainable livelihood beneficiaries
- Implementation of alternative sustainable livelihood sub-projects



Recommended reading

The following project documents for *CERMES regional project on enhancing management effectiveness at three marine protected areas in St. Vincent and the Grenadines, Jamaica and Belize* may be downloaded in pdf format from the CERMES website, <http://cavehill.uwi.edu/cermes>:

- CERMES. 2005. Report of the Inception Training Workshop for Enhancing the Management Effectiveness of the Tobago Cays Marine Park, St. Vincent and the Grenadines. Union Island 19-20 December 2005. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize. Report No.1. 25pp.
- CERMES. 2006a. Report of the Inception Training Workshop for Enhancing the Management Effectiveness of the Negril Marine Park, Jamaica, 26-27 January 2006. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize. Report No. 2. 31pp.
- CERMES. 2006b. Report of the Inception Training Workshop for Enhancing the Management Effectiveness of the Sapodilla Cayes Marine Reserve, Punta Gorda, Belize, 4-5 February 2006. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize. Report No. 3. 26pp.
- Pena, M and D. Roach. 2006. Report of the Workshop on MPA Evaluation Products and Process, Punta Gorda, Belize, 4 November 2006. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize. Report No. 4. 47pp.
- Pena, M. 2006. Report on Management Effectiveness at the Tobago Cays Marine Park (TCMP), St. Vincent and the Grenadines. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize. Report No. 5. 59 pp.
- Pena, M. and P. McConney. 2007. Report of the meetings to share TCMP evaluation results and lessons learned, 31 January 2007 on Union Island and 1 February 2007 in Kingstown, St. Vincent and the Grenadines. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize. Report No. 6. 22 pp.
- Roach, D. 2007a. Report on Management Effectiveness at the Negril Marine Park (NMP), Jamaica. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize Report No. 7. 68pp.
- Roach, D. 2007b. Report of the meeting to share NMP evaluation results and lessons learned, 5 March 2007, Negril, Jamaica. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize. Report No. 8.



Recommended reading

- McConney, P. 2007. Report of the meeting to share SCMR evaluation results and lessons learned, 24 February 2007, Punta Gorda, Belize. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize. Report No. 9. 14 pp.
- Roach, D and C. Garcia. 2007. Report on Management Effectiveness at the Sapodilla Cayes Marine Reserve (SCMR), Belize. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize Report No. 10. 51pp.

OECS Protected Areas and Associated Sustainable Livelihoods (OPAAL) Project

For more detailed information on OPAAL project, project documents and to keep track of its progress, visit <http://www.oecs.org/esdu>

4 ADAPTIVE MANAGEMENT

The aim of conducting an evaluation of management effectiveness is essentially for MPA staff and decision-makers to use the information generated to adapt and improve the management, planning, accountability and overall impact of the MPA (Box 4.1). It is therefore a critical process to understanding the importance of adaptive management. Adaptive management emphasises learning-by-doing. It is the circular and cyclical process of systematically asking



Definition

Adaptive management: an adaptive approach to management based on learning from experience. The adaptive management process allows information concerning past management activities to feedback into and improve future management

specific questions, generating learning by evaluating the results of these questions and further revising and improving management practices (Figure 4.1). The result of adaptive management in the context of a protected area is improved effectiveness and increased progress towards the achievement of the goals and objectives of the protect area. It is

important to note that effective learning occurs not only on the basis of management successes but also failures.

Box 4.1 Some questions asked in the process of adaptive management

- How can the management team best understand the conditions at the site where it is working?
- What goals should the management team be trying to accomplish?
- What actions should the management team take to efficiently achieve the goals?
- How can the management team measure its success and the extent to its actions have contributed to change?
- What can the management team do to work more effectively in the future?
- How can the management team avoid making the same mistakes again?
- How can the management team share and communicate its findings with other protected area managers or conservation practitioners?

It should be noted that adaptive management (particularly in the Caribbean) following MPA effectiveness evaluation, may be a long process when MPA management capacity is limited and when there has been a non-existent or weak agency culture of adapting management. Without appropriate staff resources and adequate training, implementing adaptive management actions

can be delayed and may even be ignored. This is exemplified in the *CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize* one goal of which was to promote and improve adaptive coastal management practices in the Caribbean. With generally successful evaluations at all three sites, each MPA was then given a sub-grant of US \$1,500 to undertake at least two adaptive management activities based on the results of the evaluation and lessons learned. Each site was given approximately one month in which to implement and report on relatively simple activities such as determining how a Junior Ranger Programme could be implemented (TCMP); communication and dissemination of educational environmental information (SCMR) and raising awareness among the tourist population through brochures to be placed in hotels (NMP) (See recommended reading below for relevant evaluation and results sharing reports). None of the sites were able to accomplish their adaptive management activities within the specified deadline and required substantial encouragement from CERMES to begin and report on the adaptive management process. The SCMR, Belize, was the only site that managed to accomplish the majority of its activity. The TCMP experienced significant problems in merely planning an inception workshop to discuss the possibility of developing a Junior Ranger Programme. Feedback from the NMP on their activity was particularly poor. In general, feedback from the TCMP and NMP was lacking and primarily was only received after repeated reminders from CERMES (visit www.cavehill.uwi.edu/cermes for this project's final report).



Recommended reading

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