The governance indicators

Introduction

By definition, an MPA is a governance tool. It limits, forbids or otherwise controls use patterns and human activity through a structure of rights and rules. Resource governance is the way in which users and their intentions are managed through a set of rights, rules, and shared social norms and strategies. This includes enforcement mechanisms, such as policing measures and punishments, as well as incentives to direct human behaviour and use. Resource governance can include: a) formal and informal forms of resource ownership; b) use rights and the laws that support these rights; and c) the rules, rights and regulations that dictate how resources can and cannot be used. Resource governance is defined by formal organizations and law, traditional bodies, and/or accepted practice. Resource governance takes place at four related levels: local, provincial/state, national, and international. In this guidebook, we are particularly interested in the governance of the MPA and marine resources.

MPAs may be managed under a variety of arrangements. The three most general arrangements are centralized, community-based (or locally managed), and collaborative (or co-management). The differences between the three primarily relate to the degree of stakeholder participation in the process and the location of management authority and responsibility. Centralized management tends to involve limited participation by stakeholders and management authority and responsibility are located in a central agency or office of government. Community-based or locally managed tends to involve a great deal of local stakeholder participation and management authority and responsibility are located at the community or local organization level. Co-management is a sharing of authority and responsibility between government and local stakeholders, which may take many forms, and involves a high degree of stakeholder participation. This guidebook has been written to allow for MPA evaluation under any of these three arrangements.

This guidebook has a large focus on participation in MPA management, as experience has shown that the imposition of an MPA located near human settlements and without broad stakeholder participation, consensus and acceptability can lead to failure. Where local stakeholders have a high degree of participation in MPA planning and management, there is greater sense of ownership by them of the MPA and this leads to stronger and longer-term conservation success. This is not to say that all MPAs have or should have a high degree of stakeholder participation, as many centrally managed MPAs have also been successful. It is crucial, therefore, to understand the social, economic, political and governance context of the MPA. For this reason, the indicators should be analysed together so that linkages between the socio-economic and governance indictors can be identified and examined. Among the 16 governance indicators, several measure stakeholder participation, particularly G9, G11, G12 and G13. Each indicator measures a distinct aspect of stakeholder participation in MPA management.

Most of the governance indicators attempt to measure the goals and objectives, and in many cases are true 'process' and 'input' indicators (e.g. G14 and G15 for enforcement and G10 and G11 for training). A few are 'output' indicators (e.g. G3 for management plan and G12 for stakeholder satisfaction), but none are 'outcome' indicators.

A marine protected area by definition imposes new property rights arrangements at the site by restricting or forbidding access. As such, no individual indicator on property rights has been developed. The MPA may cause shifts in property rights in areas surrounding it but it was felt that the methods to identify changes in property rights were too complex and beyond the scope of the MPA manager. If necessary, a side research study could be conducted on property rights in the area of the MPA.

Transaction costs, the costs of gaining information about the resource and what users are doing with it, the costs of collective decision-making, and the costs of operation, are integral to the MPA management arrangement. Transaction costs of MPA management can increase or decrease over time depending upon the administrative arrangements, the functions of management, and the efficiency with which the MPA is managed. While an important indicator of management effectiveness, again, no indicator has been developed due to the complexity of measuring transaction costs. However, as a proxy, shifts and trends in the MPA budget can be analysed through information from indicator G6 – Availability and allocation of MPA administrative resources.

Figure 4　Governance goals, objectives, indicators

Governance goals (n=5) and objectives (n=21)
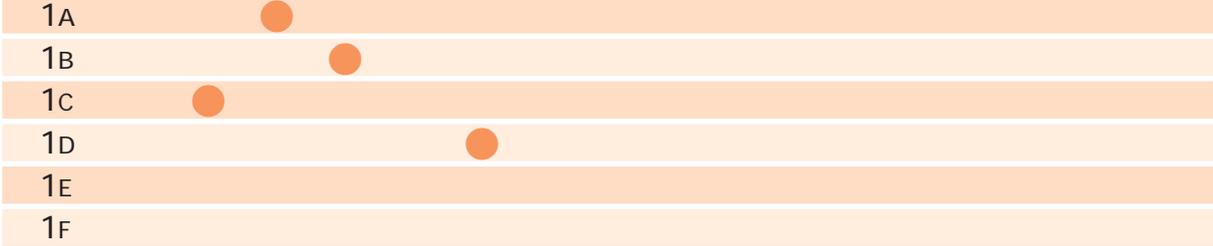*commonly associated with MPA use*

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 organizing 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*

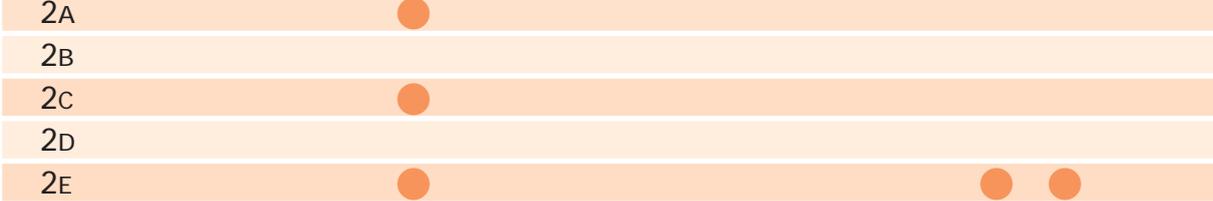| GOAL 5	Resource use conflicts managed and reduced
5A	*User conflicts managed and/or reduced: 1) within and between user groups, and/or 2) between user groups and the local community or between the community and people outside it*

How the governance indicators relate to the common goals and objectives

Column headers (G1–G16):

- 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 organization(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 & satisfaction in participation
- G13: Level of stakeholder involvement in surveillance, …
- G14: Clearly defined enforcement procedures
- G15: Enforcement coverage
- G16: … information dissemination …

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16
GOAL 1																
1A			●													
1B				●												
1C		●														
1D					●											
1E																
1F																
GOAL 2																
2A					●											
2B																
2C					●											
2D																
2E					●								●	●		
GOAL 3																
3A												●				
3B											●					
3C								●								
GOAL 4																
4A						●							●	●	●	
4B									●				●			●
4C										●						
4D													●			
4E				●	●											
4F																
GOAL 5																
5A	●															
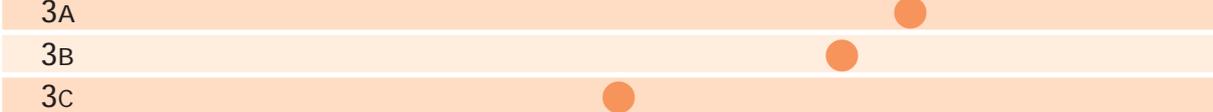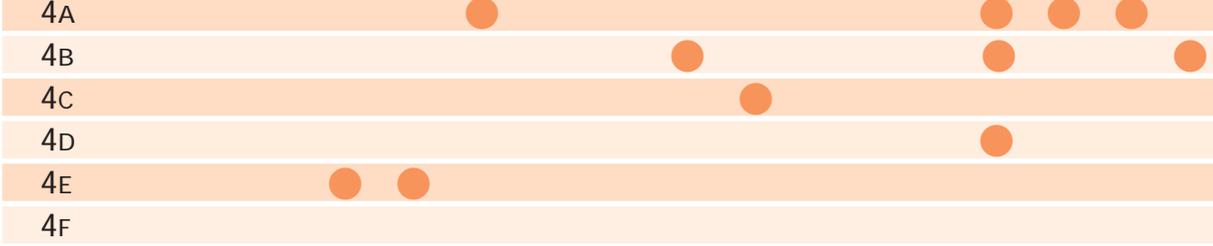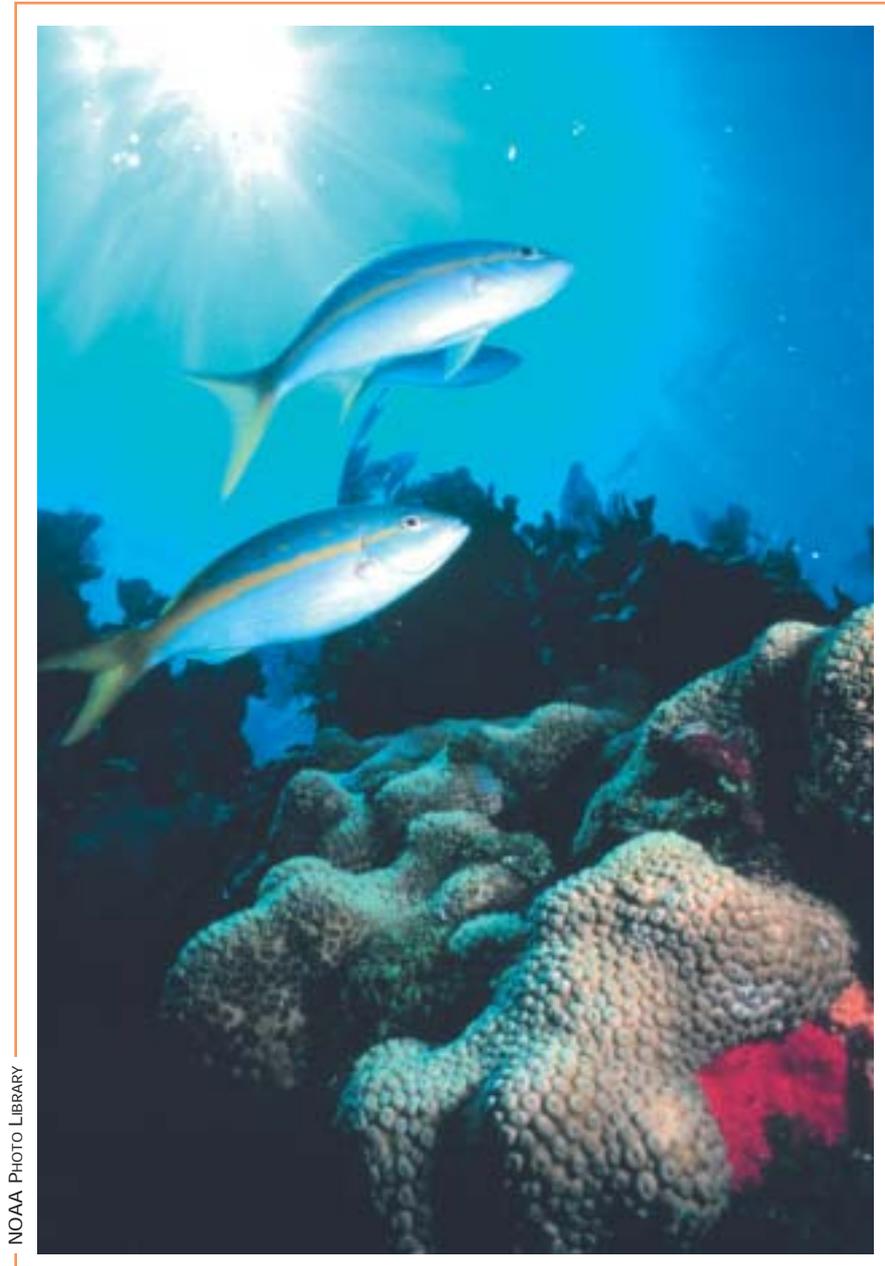
The colourful life of a coral reef epitomises the diversity and attraction of marine protected areas.

1

What is 'level of resource conflict'?

Level of resource conflict associated with the MPA is a measure of the nature and characteristics of conflict associated with planning, management and decision-making for the MPA.

Therefore, the term 'conflict' can be taken to mean just about any situation in which there is a clash of interests or ideas. In the context of an MPA, it usually means that there is a group or groups whose interests are in opposition to those of the MPA. It is often very difficult to precisely define the limits of MPA conflicts because they are frequently rooted within a particular cultural, economic, political and social context. It is important to realize that, to the extent that conflict represents the productive interaction of competing interests and values, it is a useful and ever-present function in a dynamic society.

Why measure it?

The use of this indicator will enable a determination of whether or not conflicts associated with the MPA are increasing or decreasing over time, as well as the nature and characteristics of the conflicts. This information can be used to determine how well MPA management is responding to conflicts associated with the MPA.

MPA staff face the challenge of trying to respond to conflicts so that unproductive consequences can be avoided while human well-being and the natural environment are protected. Conflicts involving MPAs are inevitable as, for example, an area is taken out of production, new rights and rules for use of marine resources are implemented, and individual and group interests in the marine resources are affected.

How to collect the data

A conflict assessment is the systematic collection of information on conflicts associated with the MPA. Conflict is dynamic, with new conflicts

arising and conflicts being managed or resolved continuously over time. As such, the conflict assessment process must be dynamic, where key informants are interviewed periodically to identify the existence and characteristics of conflicts associated with the MPA.

The first step in the conflict assessment process is to identify if a conflict exists. This may not be as easy as it seems at first, as conflicts may be very public or may be kept relatively quiet within a small group of stakeholders. Also, conflicts may surface through traditional systems of conflict management, such as fishers going to a senior fisher or village official, which reflect the unique social and cultural context of the area, or through more formal and public fora, such as town meetings, for conflict management. It will be necessary to identify key informants in the area of the MPA, such as elected community officials, senior fishers, respected village leaders, community organizations, and the MPA manager, to interview and ask an initial question about whether or not an MPA-related conflict exists. It will be important to separate conflicts associated with the MPA from other types of conflicts which may exist in the community.

The second step is to identify the issues at stake in the conflict and the stakeholders concerned. Class dimensions often put those who manage the resource against those who own nothing but whose livelihoods depend on the resource. Conflicts can take place at a variety of levels, from within the household to local, regional, societal, and global scales. Conflict may cut across these levels through multiple points of contact. The intensity of conflict may range from confusion and frustration among community members over poorly communicated management policies to violent clashes between groups and government.

To determine the characteristics of conflict, the following questions are asked in the conflict assessment:

❏ Who are the stakeholders concerned?

❏ What are the issues at stake in the conflict?

❏ What is the time period of the conflict (when did it begin, is it ongoing, date of resolution)?

❏ Who are the leaders/spokespeople?

❏ What is the intensity of conflict?

❏ What is the scale of conflict?

❏ Is the conflict ongoing?

❏ Has the conflict been managed or resolved?

❏ How and by whom was the conflict managed or resolved?

Requirements

■ Key informants.

■ One interviewer.

■ Paper/pencil.

■ Records of conflict management meetings (if available).

❏ What agreement was reached?

If needed or desired, more detailed information about the conflict could be obtained by interviewing the leaders/spokespeople and, if appropriate, the individual or institution that negotiated/mediated/arbitrated the conflict.

Some MPAs or communities have established a conflict management forum or committee to address conflict. This forum or committee will hold with regular meetings or meetings on demand. They usually keep records or minutes of the meetings which could provide information to answer the questions above. Contact should be made with the MPA manager or community leader to determine if such a conflict management forum or committee exists.

How to analyse and interpret results

The conflict assessment will provide detailed information on each conflict associated with the MPA. Write this information in a brief narrative report. Prepare as a matrix a table of conflicts associated with the MPA, showing each conflict: issue, stakeholders, time period, intensity, scale, ongoing/managed/resolved, and how managed/resolved.

Strengths and limitations

When analysed over time, this information can provide the MPA management with information on the range of issues, the stakeholders, and the approaches to management/resolution. It can also provide information on whether or not conflicts associated with the MPA are increasing or decreasing.

Outputs

- A narrative which reports the nature and characteristics of conflicts associated with the MPA.

It may be difficult to separate conflicts associated with the MPA from other types of conflicts which may exist in the community.

Useful references and Internet links

Borrini-Feyerabend, G. (ed.) (1997). *Beyond Fences: Seeking Social Sustainability in Conservation*, 2 vols. IUCN, Gland, Switzerland.

Buckles, D. (ed.) (1999). *Cultivating Peace: Conflict and Collaboration in natural Resource Management.* International Development Research Centre, Ottawa, Canada and World Bank Institute, Washington, DC, USA.

Lewis, C. (1996). *Managing conflicts in protected areas.* IUCN, Gland, Switzerland and Cambridge, UK.

▼ *A workshop with Imraguen fishermen in Banc d'Arguin National Park, Mauritania. Limiting resource use conflicts between stakeholder groups is of major concern to MPA managers due to the negative impacts that such conflicts can have on effective management efforts.*

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What is 'existence of a decision-making and management body'?

Existence of an MPA decision-making and management body is a measure of the recognition of an institution that governs how the MPA is managed and used and a transparent process for management planning, establishing rules and regulations, and enforcing the rules and regulations.

Why measure it?

The existence of a legally mandated MPA decision-making and management body will lead to more professional management of the MPA, that management will be more effective and accountable, and it will become easier to have a successful MPA. It should be noted that in some cases the management body (the group implementing the MPA management plan) may or may not be the same as the decision-making body and that this has implications for the likely effectiveness of the MPA (more effective when both bodies are the same).

How to collect the data

First, the institution(s) that have some level of decision-making and management authority and responsibility for the MPA (international, national, regional, municipal) must be identified. This information is typically available in the MPA management plan. A typical MPA management plan will have an organization chart showing the lines of authority and responsibility for MPA management. If such an organization chart does not exist, one can be developed through interviews with MPA staff. The distance (both geographical and administrative) of the decision-making and management body from the MPA needs to be gauged as do the hierarchies of bodies and the relationships between them.

Second, the existence of each body should be confirmed by identifying a person responsible for its operation. The person should be interviewed to collect any documents explaining the function and powers of the body.

Third, the legal and formal or informal authority of the body should be recorded from papers of incorporation, plans or other documents.

Fourth, the frequency of meetings to determine the functionality of the decision-making body must be identified. The next stage is to observe the operation of the body at a meeting to witness the decision-making process and the roles and responsibilities of the different actors.

Optionally, key informants (resource users) in the community can be interviewed to identify and describe how and whom they believe has decision-making and management authority and responsibility for the MPA.

How to analyse and interpret results

Develop an organization chart for the MPA listing all bodies with decision-making and management authority and responsibility. Prepare a narrative description of the authority and responsibility of each body as well as the mandate (formal/non-formal, legal) of the body.

Strengths and limitations

While this indicator will list and describe each decision-making and management body associated with the MPA, it will not evaluate the effectiveness, credibility and accountability of the body. A more complete survey will need to be undertaken to collect this information.

Relates to goals and objectives

GOAL 1

1C

G2

Difficulty Rating
2
1–5

Requirements

- MPA management plan.

- Papers of incorporation of an MPA decision-making and management body.

- Location of MPA decision-making and management body.

- Identification of MPA staff.

- Dates and location of meeting of body.

- One interviewer.

- Paper/pencil.

Outputs

- List and narrative description of the different MPA decision-making and management bodies, including a description of their mandate to make management decisions.

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▲ *Decision-making processes within the effective management of an MPA typically involve multiple parties and the input of stakeholders.*

Useful references and Internet links

Berkes, F., Mahon, R., McConney, P., Pollnac, R. and Pomeroy, R. (2001). *Managing small-scale fisheries: alternative directions and methods.* International Development Research Centre, Ottawa, Canada. Available at www.idrc.ca/booktique

Box G1

EXAMPLE FROM THE FIELD

At the Far Eastern Marine Reserve in Russia, in addition to the MPA administration (directors and his deputies), there is a Scientific Board including not only the scientists of the Institute for Marine Biology but also a group of reputable specialists from other scientific institutions. As a consultative body, a Council for Sustainable Development was established with participation of important local stakeholders, enforcement and environmental agencies.

What is 'existence and adoption of a management plan'?

Existence and adoption of a management plan is a measure of the existence of a document which states the overall MPA goals and objectives to be achieved, the institutional structure of the management system, and a portfolio of management measures and whether the plan is enforceable.

Why measure it?

The MPA management plan sets out the strategic directions for the MPA management programme. The effective management of the MPA is based on the achievement of goals and objectives through the use of appropriate management measures. The existence and adoption of a management plan means that there are strategic directions and actions for implementation of the MPA. An enforceable plan means that there is legislative support for the plan to be implemented.

How to collect the data

First, the MPA manager should be sought out and asked to provide a copy of the MPA management plan and legislation in support of the MPA at the national and/or local level.

Second, a checklist should be prepared with the information listed on the right.

How to analyse and interpret results

Using that list, prepare a narrative text describing the existence of the plan, its adoption, content/characteristics, and the enforceability (legal basis) of the plan.

The existence and adoption of an MPA management plan informs us that the MPA is guided by goals and objectives to achieve certain outcomes (for example, conservation, protection, research), that there is a basic strategy to achieve these goals and objectives, and that the overall plan has a legal mandate for implementation.

In some cases a formal management plan may not exist but there may be informal or goals and objectives that have been agreed upon by those associated with the MPA. This should be noted and described in narrative text.

Requirements

- Name and address of the MPA manager or management body.

- Established time and place to meet with MPA manager.

- Management plan.

- Legislation in support of the MPA.

- Paper/pencil.

Relates to goals and objectives

GOAL 1

1A

G3

Difficulty Rating **2** 1–5

Checklist of items on the existence and adoption of a management plan

1) The actual existence of the plan in printed form.

2) The management plan is reviewed to determine the:
   a) date of the current plan
   b) date of any updates
   c) adoption of plan
   d) date of adoption
   e) signatories of the plan adoption
   f) level of plan adoption (international, national, regional, municipal, local).

3) Completeness of the plan. Does it have sections addressing the following components:
   a) goals
   b) objectives
   c) management strategy
      i) advisory committees
      ii) interagency agreements
      iii) boundaries
      iv) zoning plan
      v) regulations
      vi) social, cultural, and resource studies plan
      vii) resource management plan
      viii) interpretive plan
   d) administration
      i) staffing
      ii) training
      iii) facilities and equipment
      iv) budget and business plans, finance sources
   e) surveillance and enforcement
   f) monitoring and evaluation of plan effectiveness.

4. Enforceability of the plan. Is there legislation at the national or local level to provide a legal basis for the plan and to be able to enforce the management measures?

Strengths and limitations

While an MPA management plan may exist, that does not guarantee that it is good or that it is being followed or that its legitimacy is recognised by the local resource users. A bad or inappropriate plan that is implemented may be worse than no plan.

Note that in the case of a private MPA, the plan may not fit the level of completeness described above as this list is oriented toward recognition of the MPA by a national or locally defined authority. In the case of a private MPA, it is better to define completeness via the rights and rules given by the private MPA.

Useful references and Internet links

Hockings, M., Stolton, S., Dudley, N. and Parrish, J. (2002). *The Enhancing Our Heritage Toolkit, Book 2.* pp. 24-30.
Available at www.enhancingheritage.net

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition).* Chapter 2. "Site Planning and Management". IUCN. Washington, DC, USA.

Outputs

- Narrative text about the management plan.

Box G2

EXAMPLE FROM THE FIELD

At the Sian Ka'an Coastal Biosphere Reserve in Mexico, the current Management Plan (MP) is the result of a review done in 1996. The main purpose of this MP is to be a tool for the integration, follow-up and evaluation of the protection and sustainable use of natural resources' strategies. It is an instrument for planning and regulation, in which the activities, actions and basic regulations for the management and administration of the protected area are established. The MP contains a description of the physical, socio-cultural and natural resources' use characteristics of the MPA. After listing the major objectives of the Reserve, the MP states the strategy for the short-, medium- and long-terms, based on the following goals:

a) Guarantee the physical integrity of the area.

b) Promote reasonable use of the natural resources.

c) Foster social participation and representation in management and in the sustainable use of natural resources.

d) Spearhead research and education towards a better understanding and utilization of the natural resources of the areas and the environmental benefits that this would provide for the region.

e) Secure financing for the permanent and continuous operation of the area.

According to these goals, the MP is divided into five components with sub-components. Each of them has specific objectives and implementation strategies. The MP includes a section describing the basic legal framework and an annex in which are established Use Regulations and Zoning inside the limits of the PA – Core Zones, Buffer Zones and Critical Zones.

The MP is not a legal instrument because it has not been published in the Official Diary of the Federation. At the time of its creation, the Sian Ka'an Biosphere Reserve management was not aware of the importance of its official publication, and it was just published as a public policy to guide the management of the protected area. Despite the fact that the MP has no legal recognition, local resource users recognise, respect and observe its regulations. This means that they recognise the authority of the management body and, in some cases, collaborate with them in order to succeed in common management goals and objectives.

Local understanding of MPA rules and regulations

What is 'local understanding of MPA rules and regulations'?

Local understanding of MPA rules and regulations by the community is a measure of whether stakeholders are aware of the rules and regulations and whether they understand the intent of the rules and regulations.

Why measure it?

MPA rules and regulations define specifically what acts are required, permitted and forbidden by stakeholders and government agencies within the MPA. When stakeholders are aware of and have an understanding of the rules and regulations for management of the MPA, there is a greater chance for success of the MPA. Stakeholders may violate rules and regulations if they are not well understood or if they don't make sense to the stakeholders.

How to collect the data

A sample of the stakeholders should be interviewed using a questionnaire to determine their awareness of and understanding of the MPA rules and regulations. In the case of a comprehensive plan for a large area, there may be a large number of rules and regulations with slight temporal or spatial variations. These variations should be considered when the questionnaire is designed.

Requirements

- Copy of the MPA management plan.
- Copy of MPA rules and regulations.
- Questionnaire to be used to interview key informants.
- Data on rules and regulations violations.
- One interviewer.
- Paper/pencil.

First, the relevant MPA rules and regulations and the institution(s) which declare each rule and regulation should be listed and briefly described.

Next, a series of questions should be asked to determine awareness and understanding. Any discussion that illustrates the thoughts of the respondents should be recorded. Questions to be asked include:

1. Are you aware of the existence of any rules and regulations for the management of the MPA? Yes_____ No_____

2. What are these rules and regulations? Please list as many as you know.

3. Which institution(s) have declared and developed each rule and regulation.

Relates to goals and objectives

GOAL 1
1B

GOAL 4
4F

G4

Difficulty Rating
3
1–5

▼ *For effective management to occur, the rules of the MPA must be accessible and clearly articulated and understood by all potential users.*

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4. For each informant, ask whether they regard the rules and regulations as being simple and clear:

    1 = rules and regulations are very complex and difficult to understand
    2 = rules are complex and difficult to understand
    3 = rules are of average complexity
    4 = rules are simple and easy to understand
    5 = rules are very simple and easy to understand

5. Do you feel that the rules and regulations design process was participatory?

6. Do you feel 'ownership' of the rules and regulations?

7. Do you feel that the rules and regulations are credible and appropriate?

8. Do you feel that the rules and regulations are socially acceptable to the stakeholders?

9. Which rules and regulations do you feel are acceptable or unacceptable?

10. Why?

11. Why were the rules and regulations designed the way they are?

These data can be collected at the start of the project and every year thereafter.

How to analyse and interpret results

Tabulate the responses from all the questionnaires. Use simple statistical analysis (median, mode, standard deviation) on the data. Analyse the percentage of the MPA rules and regulations that individuals can name to measure understanding and awareness. Present in narrative format with tables. Record any interesting discussion about awareness and understanding of the rules and

Outputs

- Narrative description of the rules and regulations as understood by the stakeholders.

Box G3

EXAMPLE FROM THE FIELD

Based on the number of signs, public outreach efforts, and media attention, it would be assumed that the public understand the rules and regulations for the Bird Island Marine Sanctuary of the Commonwealth of the Northern Mariana Islands. In contrast, recent events and violations suggest that the public does not have a clear understanding of the area's rules and regulations. A survey of users of the site, particularly non-English speaking users such as Japanese SCUBA divers, may shed additional light on community understanding (including dive operations). Since the known violations have all related to the taking of protected species, it could be reasoned that a more thorough understanding of the rules and regulations would enhance management effectiveness there.

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regulations that may be useful for supporting or revising the rules and regulations. The responses should be cross-checked against the rules and regulations in the plan.

Strengths and limitations

A limitation of the indicator is that it does not measure level of participation of stakeholders in creating the rules and regulations and their perception of fairness of the rules and regulations. It should be noted that in some cases people who do not like the rules could pretend that they do not know about them or can provide other misleading responses making it difficult to obtain correct information.

Useful references and Internet links

ICLARM/IFM (1996). *Analysis of fisheries co-management arrangements: a research frame-work. Fisheries Co-management Research Project WP 1.* ICLARM/.World Fish Center, Penang, Malaysia. www.co-management.org

Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action.* Cambridge University Press, Cambridge, UK.

What is 'existence and adequacy of enabling legislation'?

Existence and adequacy of legislation to enable the MPA to accomplish its goals and objectives is a measure of formal legislation in place to provide the MPA with a sound legal foundation so that the goals and objectives of the MPA can be recognised, explained, respected, accomplished and enforced. In some areas, traditional law may also serve as a foundation for the MPA.

Why measure it?

The establishment of an MPA more often than not requires the drafting and adoption of appropriate supportive legislation and in some cases the recognition of traditional laws. The purpose of this indicator is to ensure that the MPA management plan is supported by adequate legislation in order for its successful implementation.

How to collect the data

The form and extent of legislation for MPAs will vary widely from country to country. The legal arrangements for MPAs may depend upon many elements, including the form of government, available finances, public administrative structures, level of government centralization/decentralization, lines of jurisdiction and decision-making, existence and legitimacy of traditional laws, and commonly accepted practice.

The first step is to collect all legal documents of pertinent laws relative to the MPA. These may exist at international, national, state/provincial and local levels. The laws may be identified in the MPA management plan. This will require talking to the MPA manager and reviewing the management plan and supporting documents. It may also require contacting various government agencies and offices to collect the documents. It should be noted that in addition to legislation related to the MPA, the achievement of the MPA goals and objectives may require that activities be undertaken outside of the MPA, such as water quality and integrated coastal zone management. Legislation related to these other associated activities should also be identified.

Second, a legal analysis should be conducted. It will involve three steps. First, to determine the existence of legislation to support the MPA. Second, to compare the MPA management plan (the goals and objectives, rules and regulations, management authority and responsibility, enforcement powers) with the existing legislation to determine compatibility. Third, to assess the appropriateness of the legislation.

To undertake the legal analysis, the questions to be asked include:

❏ What laws (formal and traditional) are in place (e.g. fisheries, tourism, water quality, integrated coastal zone management, forest)?

❏ What institutions are in place to implement the laws (governmental, non-governmental, traditional)?

❏ How current are the laws (when were they approved (year)?

❏ What is the form and extent of the legislation?

❏ Is the law at the appropriate level (local, state/province, national) to support the MPA?

❏ Does the legislation support the goals and objectives of the MPA?

❏ Are there sufficient laws to support the MPA?

❏ Are the laws appropriate to support the MPA?

❏ Are there legal provisions for sufficient penalties for violators of MPA rules and regulations?

How to analyse and interpret results

Prepare a narrative report that focuses on answering the following three questions:

❏ Does a law exist to support the MPA? Yes/No

❏ Is it compatible with the MPA management plan? A little/mostly/very much

❏ Is it supportive of the MPA management activities and interventions? A little/mostly/very much

Requirements

■ Legal documents of pertinent laws at different levels (international, national, state/provincial, local) for MPAs.

■ MPA management plan.

■ One interviewer.

■ Paper/pencil.

Relates to goals and objectives

GOAL 2
2A 2C
2E

GOAL 4
4E

G5

Difficulty Rating
2
1–5

Outputs

- A report on the existence of laws for MPAs, the compatibility of the laws for MPAs, and recommendations (needs and types of legislation) for the MPA.

Strengths and limitations

A subjective analysis can be biased by the opinion of the person doing the legal diagnosis. There is a need for a good understanding of the management goals and objectives and the legislative process.

Useful references and Internet links

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition).* Chapter 6. Institutional and Legal Framework. IUCN, Washington, DC, USA.

Box G4

EXAMPLE FROM THE FIELD

The Bird Island Marine Sanctuary in the Commonwealth of the Northern Mariana Islands was established as a Class 1 No-Take Zone marine protected area in 2001 under Public Law 12-46. The Act explicitly states a number of permitted and prohibited activities relative to taking, hunting, fishing, harassment or destruction of fish, game, wildlife, plants, corals, reef, habitat, and marine life. Vessels are not allowed to enter the sanctuary and access to Bird Island proper, which contains a seabird colony, is prohibited. The Act promotes stewardship by having the site serve as a "living laboratory for educating students and teachers". The Act foresees criminal penalties (fines and imprisonment) for violations. Accordingly, any violation within the marine sanctuary related to a taking incurs a tripling effect in its prosecution (the Act, DFW protected area regulations, DFW takings regulations). However, the Act does not apply to the vast majority of the adjacent land areas (SUMBA, WCA) in the Bird Island Sanctuary.

TONI PARRAS

Availability and allocation of MPA administrative resources

What is 'availability and allocation of MPA administrative resources'?

Availability and allocation of MPA administrative resources is a measure of the capacity of the management team to administer and complete its various MPA activities through time, based on the degree of access to and level of enabling human, equipment and financial resources.

Why measure it?

The operation of the MPA involves several activities such as surveillance and enforcement, staff training, budget and finances, monitoring and evaluation, environmental education, planning, and advisory committees. For example, surveillance and monitoring are critical parts of any MPA enforcement programme. The rationale is that some degree of illegal activities (for example, fishing, boating, pollution) can be anticipated as a response to a regulatory framework established for the MPA. An understanding of the availability of adequate budget, human resources and equipment to undertake surveillance and monitoring is important because these are the people and associated equipment which will be needed to undertake this activity. It is assumed that the more budget, human resources and equipment allocated to this activity, the greater will be the level of compliance with rules and regulations.

Requirements

- Copy of the MPA management plan.
- List of MPA activities.
- List of MPA staff and associates involved with each activity.
- List of equipment available for each activity.
- List of minimum requirements or of ideal requirements to effectively undertake each activity from the management plan.
- MPA budget.
- One interviewer.
- Paper/pencil.

How to collect the data

First, the various activities undertaken for MPA management such as the monitoring, control, surveillance and enforcement programme; environmental education; monitoring and evaluation; advisory committees; staff training etc., need to be identified.

The management plan should include sections which describe the activities. This will provide information on programme design for comparison with the current structure. The management plan should also provide information on the minimum requirements for or of ideal requirements for each activity. This can be used for a comparison with the existing resources available for these activities. If no such information exists, an interview should be conducted with the MPA manager to determine a list of activities undertaken by the MPA and minimum requirements or ideal requirements for the activities.

Next, an interview is conducted with the MPA manager and the designated staff member for each activity to obtain information about the current availability and allocation of resources to the activity. The focus of the questions asked should be:

- The access to and adequacy of resources to undertake the task.
- The appropriateness of operation of the activity to undertake the task.

It should be noted that some MPAs leave certain activities to other organizations, for example, surveillance may be conducted by national agencies, such as the Coast Guard or marine patrol. In this situation, the questions will need to be adapted to reflect this arrangement.

Questions to be asked of the MPA manager and the designated staff member include:

- What is the number of MPA staff assigned to the programme?
- What is the number of non-MPA staff (community members, fishers) assigned to the programme?
- What kind/level of training is provided to management and staff?
- What is the experience (type and years) and education (level) of each staff member?
- What is the budget for the activity?
- What equipment is available (boat, guard house, radio, GPS, binoculars, uniform, dive equipment, computers) for the activity?

Relates to goals and objectives

GOAL 1
1D

GOAL 4
4A

G6

Difficulty Rating
2
1–5

❑ What is the age and condition of equipment used?

❑ What is the level of equipment maintenance?

❑ What record keeping procedures are used?

Staff may be asked about the management arrangements (plans, senior staff, information feedback) to undertake the task.

How to analyse and interpret results

Prepare a narrative report on the current availability and allocation of resources (budget, staff, equipment) for each activity. The report should address allocated resources as compared to needed resources and make recommendations for resources to undertake the programme. Record in the report feedback from the staff on the appropriateness of the resources, equipment and management to undertake the task.

The number of staff will give a measure of the importance given to this programme and is useful when planning the activity. The staff should have an adequate supply of resources and good quality equipment to undertake their assignment.

Strengths and limitations

It may be difficult to separate out allocations for each individual activity.

Useful references and Internet links

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition).* IUCN, Washington, DC, USA.

Outputs

■ Report on the current staffing and equipment for undertaking the surveillance and monitoring programme.

▼ *Adequate financial support and investment mechanisms are required for most long-term MPA operations, such as for the purchase of boats. Creative solutions, which may at first seem trivial, such as visitor souvenirs and gift shops, can sometimes end up providing significant sources of sustained revenues to assist management efforts.*

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G6

Box G5

EXAMPLE FROM THE FIELD

In Biosphere Reserve Banco Chinchorro in Mexico, the following administrative resources were identified in the MPA:

Equipment

1 Vessel of 33.3 feet. Belongs to the National Institute of Fisheries but is used in this MPA under an agreement between CONANP and INP.

3 Boats, 27 feet with two out-board motors (75 hp Yamaha) each.

4 Pick-ups of different characteristics (capacity).

1 Ultra light airplane – staff are still being trained to use it.

1 Office in Cancun City.

1 Biological Field Station (includes laboratory and facilities for communication, kitchen, library, and compressor for filling up SCUBA tanks). The building of this station has cost nearly US$500,000.

The equipment is rather new or has been renewed (GPS, radio, dive equipment, etc.). The equipment was ranked of medium to excellent condition.

Personnel

There is a lack of personnel, especially for the monitoring of recreational service permits and fishing activities. Due to the lack of personnel, there are problems for controlling poaching and fishing management regulations. Four navy personnel are expected to be enrolled in surveillance activities. A comparison of the desired number of personnel mentioned in the management programme, shows that the programme ideally needs 22 people. The actual number is six (28% of the desired number of personnel in the MPA).

Only two staff personnel are assigned for surveillance activities. Personnel in charge of surveillance are trained. They belong to the Navy or SAGARPA (Ministry of Agriculture & Fisheries).

Staff experience

Staff	Experience
Director	4.5 years
Sub-director	4 years
Secretary	8 months
Technician	2 years
Administrator	6 months

Financing

The total budget (including personnel wages) is 2.7 million Mexican pesos (approximately US$270,000) a year. This amount is only 37% of the amount requested by the management programme for the year 2003. Given that it is so short, it is easy to understood why there is a significant need for personnel in this MPA.

With support from the Summit Foundation, a fund (Fondo Patrimonial) has been established. One hundred and fifty thousand US dollars (US$150,000) have been incorporated and interest (approximately US$12,500) will now be used for different purposes and needs of the BRBCH. Fortunately this fund allows the hiring of personnel thereby solving one of the main constraints for this MPA.

Within the next nine years, this fund is expected to increase to a total amount of US$1,550,000.

Interest will provide approximately US$100,000 a year. This will double the annual available budget and have the advantage of allowing the hiring of new staff.

Difficulty Rating

2

1–5

What is 'existence and application of scientific research and input'?

Existence and application of scientific research and input is a measure of how research activities and scientific knowledge generated by studies at the MPA feed back into improved management; that is, the ability of the management team to access and use science to inform their management actions.

Why measure it?

The management of complex ecosystems, such as those in which MPAs are established, is often subject to complex natural processes and significant human pressures. Because of this, effective management cannot occur in the absence of science. The natural sciences are vital to understanding ecosystem functions and change, and the social sciences are essential to identifying the sources of human-induced problems, and testing and applying appropriate solutions. Successful MPAs typically involve collaboration between managers and scientists at all stages, including: 1) in the formulation of MPA management policy and activity planning; 2) in the design and implementation of an MPA; and 3) in conducting, interpreting, and

applying evaluative research to future management action.

To be useful, scientific information relevant to the marine environment and MPA practice must not merely exist. It must also be applicable to and actively used by MPA staff for management purposes. Scientists play a critical role in this process by bridging the information needs of managers, politicians, and the public as 'neutral' brokers.

How to collect the data

There are four phases of data management for this indicator.

First, the presence and extent of scientific study will need to be determined. To do this, evaluators must determine whether scientific research is being conducted in or around the MPA. This can be done by checking relevant records and minutes of planning and management meetings for discussion and/or coordinating with scientific study. Subsequently, it will be necessary to interview those management staff who are in charge of supporting and/or coordinating with scientific researchers to learn about the needs, presence, and extent of current and completed scientific study, and how such work links to the management of the MPA. In some cases, there may be a designated group of scientists among MPA staff with whom to talk. There may also be a scientific advisory board with which to consult as to the type of research that is being undertaken or has been completed.

Second, scientific staff, coordinators, and/or external researchers need to be interviewed to obtain more detailed information and characterize the research designated activities. Questions to ask (for each study) include:

❑ What scientific study is being done? Have other similar studies already been completed?

Common types of scientific study that can be useful to MPAs

There are many scientific techniques and procedures that can be useful to managers in their MPA planning and adaptation. In particular, these include:

- Environmental impact assessments.

- Marine and costal resource surveys.

- Focal species life history and reproductive biology studies.

- Ecological and population modelling.

- Economic assessment and valuation.

- Hazard and risk assessment.

- Legal and institutional analysis.

- Social and cultural profiling.

- Testing and review of management and control measures.

- Public education engagement.

Requirements

- Access to MPA staff.

- Access to scientific study and results.

- Minutes of management meetings and processes.

- One interviewer.

- Paper/pencil.

G7

▲ *At Lenger Island MPA, scientific research is presented back to the local community who are involved in the management of the protected area.*

❏ Why is the study being done (what is the objective)? What is being measured and what methods are being used?

❏ Who is conducting the study? Who is the lead (principal investigator)? Which staff and external researchers are involved?

❏ Where is the study being done?

❏ What is the process of the study and what stage is it at?

❏ What is the study timeline? If the study has been completed, over what period was it completed?

In the case where a scientific study has already been completed, the following questions should be asked to determine to what degree the management team has had access to the results:

❏ What outputs were generated from the completed study?

❏ Who on the staff received the study findings? Which staff have ready access to scientific information?

❏ When were the results of the study formally presented to stakeholders, and precisely to whom? What forms of communication and results dissemination were used?

❏ Where are the outputs of the study currently located? How accessible are the results by the management team and public?

Outputs

■ Report on the current staffing and equipment for undertaking the surveillance and monitoring programme.

Finally, the extent to which scientific research and completed studies are being actively applied within the management and planning context of the MPA needs to be determined. To do this, MPA staff must be interviewed to determine if and how outputs from scientific studies and consultation are being applied. In this interview, the staff should be asked if there is a formal or informal mechanism for scientific information to enter into the MPA decision-making and/or management and planning processes. If so, has the scientific information actually been found to be useful after it has been brought into this process (i.e. is it applied and used?). Next, staff should be asked how scientific studies are identified and prioritized. It needs to be determined if there is an adequate budget for scientific studies and/or if outside funding is being sought. Lastly, the extent to which scientific results and expertise are being used for adaptive management and future decision-making should be determined.

How to analyse and interpret results

The focus of the indicator is to determine whether or not scientific studies lead to changes in or outputs from management of the MPA.

Prepare a short narrative report which provides information on the characteristics of scientific research at the MPA and the uses of the outputs for management. Within this report, characterize the degree of presence, development, access, and application for each study or research need identified. Highlight any future research needs.

Strengths and limitations

It may be difficult to identify the link between scientific research conducted at the MPA and its application in MPA management. All MPA staff and board of directors will need to be interviewed to identify if and how scientific studies are used.

Useful references and Internet links

GESAMP(IMO/FAO/UNESCO-IOC/WMO/WHO/ IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) (1996). "The contributions of science to coastal zone management". *Rep. Stud. GESAMP, (61)*. FAO, Rome.

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition)*. IUCN Washington, DC, USA.

▲ *Research and scientific knowledge generated by studies at the MPA can inform management.*

Existence and activity level of community organization(s)

What is 'existence and activity level of community organization(s)'?

Existence and activity level of community organization(s) measures whether a community organization exists, whether it is effectively organized to participate in management, and how active it is in MPA decision-making and management.

Why measure it?

A community organization is a vital means for representing resource users and stakeholders and influencing the direction of MPA decision-making and management. The indicator provides useful information on community organizations associated with the MPA management. An understanding of these organizations can assist the MPA management in improving participation and representation of stakeholders in management and decision-making.

Requirements

- List of community organizations.
- List of community organizations associated with the MPA.
- Minutes of previous meetings.
- One interviewer.
- Paper/pencil.

How to collect the data

First, a list of community organization(s) associated with the MPA will need to be developed. A list may be available from the MPA management office. If no such list exists, the community organization(s) will need to be identified. This can be done through interviews of key informants. Key informants include, but are not limited to, government officials, community leaders, members of other organizations in the community, senior fishers, religious organizations, and non-governmental organizations.

Second, for each organization, the following information must be collected:

- ❏ Objectives/mission statement
- ❏ Functions/responsibilities
- ❏ Period of existence
- ❏ Number of different management bodies in which the organization participates

In addition, the following additional information may be collected on the organization:

- ❏ Spatial jurisdiction
- ❏ Legal authority
- ❏ Formal/informal administration

▼ *Some individuals will choose to participate in the MPA management process through their membership within an organized community organization or other formal stakeholder group.*

Relates to goals and objectives

GOAL 3

3C

Difficulty Rating
3
1–5

G8

JOHN PARKS/WWF

- ❏ Organizational chart
- ❏ Leadership structure
- ❏ Membership (number, requirements)
- ❏ Staff (number, expertise)
- ❏ Budget
- ❏ Meeting schedule
- ❏ Rules of operation
- ❏ Relationships/affiliations with other organizations

Third, to determine how active the organization is, it is useful to attend at least one of their meetings, and more if possible. At these meetings, the following should be observed:

- ❏ How many people attend the meeting
- ❏ The issues and level of discussion
- ❏ The procedures followed
- ❏ The decisions and consensus reached
- ❏ Whether rules of order are observed at the meeting
- ❏ Whether everyone is given a chance to talk
- ❏ Whether the meeting environment is organized or disorganized

Fourth, the leaders and members should be asked if they are satisfied with their ability to participate in management.

Outputs

- ■ A narrative report which identifies community organizations involved in MPA management and describes their characteristics and level of active involvement in MPA management.

If possible, an informal discussion should be held with the leaders and members to determine their feelings about the organization, how well it operates, and how well it represents their interests.

Finally, at meetings of the MPA, how many of the community organizations regularly participate in the meetings, and how active they are in terms of providing input and discussion at the meeting, should be observed. It is possible to evaluate how active the community organization is in the MPA management meetings by observing if:

- ❏ The input from the community organization represents the interests of one or two people or the whole group.
- ❏ Only representatives of the community organization attend the meetings or do members as well.
- ❏ The input provided by the community organization is relevant to the current issues being discussed.

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G8

Box G6

EXAMPLE FROM THE FIELD

At Tubbataha Reef National Marine Park in the Philippines, four community organizations in Cagayancillo were assisted through training and facilitation of organizational processes. Of the four organizations involved in seaweed production, law enforcement, communication and training and livelihood fund management, only two remain active:

- Cagayancillo Core of Trainers (CATCO) – organized to provide training and communication services to the various activities of the Coastal Resource Management Team; and

- Cagayancillo Livelihood Committee – organized to manage a livelihood fund for sustainable resource management.

The seaweeds group and the law enforcement group had problems with leadership and are being assisted in possible re-structuring.

At the Banco Chinchorro Biosphere Reserve in Mexico, the MPA community is defined as a group of cooperatives and free fishers who conduct fishing activities within the limits of the reserve, living in palafitos, or huts (but with residences elsewhere). Other regular users who might increase in number are those people providing recreational services.

Community organizations involved in MPA management are the same as those on the Technical Advisory Committee (TAC) for the Biosphere Reserve.

How to analyse and interpret results

Prepare a narrative report which lists the organization(s), mandate, organizational structure, period of existence, membership, resources, and relationship/affiliation with other organizations. The report should identify, for example, those organizations opposed and supportive of the MPA. The report should also include observations on the level of activity of each organization.

This indicator will provide information on the number of community organizations associated with the MPA, the objectives and structure of each organization, and how active the group is in terms of providing input to the MPA and in terms of other activities of its members. The results need to be interpreted against the background of the level of community or collective action in the country or location, which may be low in some cases.

Strengths and limitations

It should be noted that not all MPAs have community organizations, for example, a high seas MPA or an isolated coral atoll with no one living on it or an MPA which is managed by a centralized authority. In these cases, this indicator is not relevant.

Useful references and Internet links

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition).* IUCN, Washington, DC, USA.

G8

185

Difficulty Rating
2
1–5

What is 'degree of interaction between managers and stakeholders'?

Degree of interaction between managers and stakeholders is a measure of the number of regularly scheduled meetings between MPA managers and staff and stakeholders to discuss compliance with MPA management plans.

Why measure it?

Discussion, input and participation from stakeholders with MPA staff about compliance with MPA management plans will lead to greater compliance and increased success of the MPA.

How to collect the data

First, MPA staff are requested to provide records of regularly scheduled meetings between themselves and stakeholders. The number and location of meetings each year are recorded. Information is requested on the formal agenda, minutes of the meetings, topics of discussion, conflicts and solutions, and those in attendance. A review of these records will provide information on problems and issues related to compliance and enforcement.

▼ *Regular interaction between MPA staff and relevant stakeholders allows for timely information exchange and an adequate period to gain community buy-in on management activities and changes.*

Requirements

- Records of regular meetings.
- Interview MPA staff and stakeholders.
- Meeting schedule between MPA staff and stakeholders.
- One interviewer.
- Paper/pencil.

Second, an interview should be conducted with stakeholders involved in these meetings to determine topics of discussion, conflicts and solutions. The stakeholders should be asked:

❏ Are there regularly scheduled meetings with MPA staff to discuss issues of compliance?

❏ Do you feel that your views are listened to and acted upon by MPA staff?

❏ Are these meetings open and transparent to all stakeholders?

❏ Are you allowed to participate in the making of rules and regulations?

JOHN PARKS/WWF

Box G7

EXAMPLE FROM THE FIELD

At the Banco Chinchorro Biosphere Reserve in Mexico, MPA managers and stakeholders were interviewed to assess the number of regularly scheduled meetings. We were told that there have been meetings of the Technical Advisory Committee to deal with tourist activities. Key stakeholders have always been present at these meetings. During these meetings different aspects of recreational activities have been discussed and clarified. Also, some decisions taken by the MPA staff have been taken during these meetings. For example, it was decided that none of the companies could bring tourists to Banco Chinchorro until agreements were established between the new tourist cooperatives agreed by fishers (co-ops) and experienced recreational operators.

Informal meetings have taken place to present different issues concerning tourism in BRBCH and fishing activities. There are no regular meetings to discuss problems or to clarify any aspect concerning this MPA. Records of meetings including agenda, minutes of the meetings, topics of discussion, conflicts and solutions and those in attendance were not provided.

According to managers of this MPA, not all the problems are solved. But if these are solved not all those attending fully agree. It was explained that this is very normal for any MPA. Not everyone has to agree to all aspects. Nevertheless consensus has to be reached as a part of the agreement procedure.

Outputs

- A narrative report describing meetings between MPA staff and stakeholders.

How to analyse and interpret results

Prepare a narrative report on the interviews and data collected. The report should include information from interviews with both MPA staff and stakeholders. It is important to identify any differences in information provided on number of meetings, discussion, and conflict and solutions. Tabulate the various topics discussed, resolutions made, and documentation of any consensus arrived at.

Strengths and limitations

This indicator will provide useful information for improving surveillance, monitoring and enforcement arrangements through stakeholder input and participation; overall improvement in compliance behaviour of stakeholders; and reduction in enforcement costs.

Useful references and Internet links

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition).* IUCN, Washington, DC, USA.

Difficulty Rating

3

1–5

What is 'proportion of stakeholders trained in sustainable use'?

Proportion of stakeholders trained in sustainable resource use is a measure of the number of stakeholders who participated in training and with knowledge about sustainable resource use.

Why measure it?

This indicator can be used to determine whether capacity-building efforts are resulting in a shift towards sustainable use of resources by stakeholders inside and outside the MPA. The linkage between training and education for stakeholders on sustainable resource use will be shown, as well as overall improvements in resource management and resource use. Information can be disaggregated for different types of training and broader awareness building. The results can be used to improve the effectiveness of the programme.

How to collect the data

First, the total number of stakeholders and stakeholder organizations associated with the MPA must be identified.

Second, records should be sought from MPA staff on the number of stakeholders trained and the number and types of workshops and training and information dissemination on sustainable resource use provided to the stakeholders during planning and implementation of the MPA.

Third, MPA management staff must be interviewed and asked questions about capacity-building activities including:

❏ How large is the capacity-building budget compared to overall MPA budget?

Requirements

■ Records of training and workshops.

■ Interviews with participants of training and workshops.

■ Interviews with volunteer groups and community organizations.

■ One interviewer.

■ Paper/pencil.

JOHN PARKS

▲ *Training of interested public in the sustainable use of their marine environment can not only change user behaviour and increase stakeholder knowledge of their natural surroundings, but can also help to secure community support for MPA efforts.*

❏ Were capacity-building activities provided during planning for the MPA to train stakeholders to use resources sustainably?

❏ Were capacity-building activities undertaken during implementation and are they still provided?

❏ Who makes decisions about the number and types of capacity-building activities – MPA management, resource users, both?

Next, the stakeholders must be interviewed to determine their level of knowledge and satisfaction with capacity-building activities and the quality of the activities. A short questionnaire should be used which would include questions such as:

❏ Were workshops and training courses provided to you during the planning of the MPA?

❏ How many and what types were provided?

❏ Were workshops and training courses provided to you during implementation of the MPA?

❏ How many and what types were provided?

❏ Were you satisfied with the workshops and training courses? Yes/No

❏ Why?

❏ Were you involved in the selection of the workshops and training courses?

❏ Have the workshops and training courses affected the way that you use resources? Yes/No

❏ Why?

G10

- ❏ What types of information dissemination were most useful?
- ❏ What is sustainable resource use?
- ❏ Do you follow sustainable resource use practices?
- ❏ Have your resource use practices (for example, fishing, anchoring of boat) changed as a result of the training and workshops?
- ❏ If yes, in what way?
- ❏ If no, why not?

Many workshops and training sessions conduct evaluations after the activity to assess the effectiveness of the programme. These evaluations may be available from the trainers and can be reviewed to determine participant's level of satisfaction and knowledge gained from the activity and the skill level of the people trained.

How to analyse and interpret results

Prepare a narrative report which provides an evaluation of the number of stakeholders who participated in training and with knowledge about sustainable resource use.

Strengths and limitations

Those involved in capacity-building activities may not be able to answer all the questions.

Useful references and Internet links

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition).* IUCN, Washington, DC, USA.

Outputs

- ■ A narrative report.

JOHN PARKS/WWF

Box G8

EXAMPLE FROM THE FIELD

At the Far East Marine Reserve in Russia, more than 25 persons have been trained or have had consultations with the MPA staff on the development of tourism business or aquaculture in the areas surrounding the reserve. This is clearly insufficient and a special programme is needed to facilitate the process.

Difficulty Rating
2
1–5

What is 'level of training provided to stakeholders in participation'?

Level of training provided to stakeholders in participation in MPA management is a measure of the amount and effectiveness of capacity-building efforts to empower stakeholders with knowledge, skills and attitudes to participate in MPA management.

Why measure it?

To participate effectively in MPA management, stakeholders need to be empowered to have greater awareness about the needs for and functions of the MPA. Stakeholders need to be equipped with knowledge, skills and attitudes to prepare them to carry out new tasks and meet future challenges. Capacity-building must address not only technical and managerial dimensions but also attitudes and behavioural patterns. Capacity-building may be carried out by the MPA staff or by another organization, such as a non-governmental organization (NGO).

How to collect the data

The first step is to identify if there is an operational training programme in place for stakeholders. This information should be available from MPA staff. Any documents describing the training programme should be obtained.

▼ *Providing training opportunities for people to become involved in the management process not only secures public support for MPA efforts, but can also help to cut operating costs through the use of volunteers, such as this women's group in Fiji.*
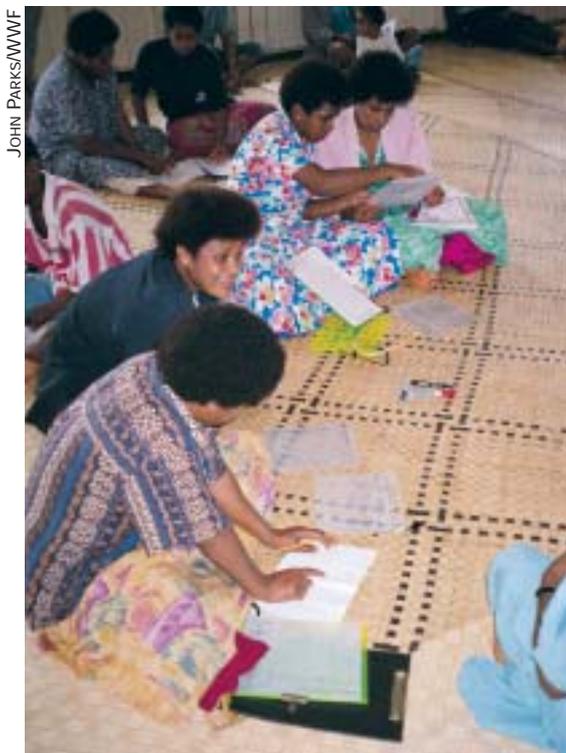
JOHN PARKS/WWF

Requirements

- Copy of MPA capacity-building programme.

- Access to workshop and training records provided to stakeholders by the MPA management or other organization.

- Interview of stakeholders to assess satisfaction with capacity-building activities.

- Interview of MPA management or other organization to assess level of attendance of stakeholders at capacity-building activities.

- One interviewer.

- Paper/pencil.

Second, the number and types of workshops and training courses provided to the stakeholders during planning and implementation of the MPA should be recorded. This information should be available from the MPA management office or other organization providing capacity-building.

Third, MPA management staff or other organizations providing training should be interviewed and asked questions about capacity-building activities including:

❏ How large is the capacity-building budget compared to overall MPA budget?

❏ Were capacity-building activities provided during planning for the MPA to empower stakeholders to actively participate in the planning?

❏ Were capacity-building activities undertaken during implementation and are they still provided?

❏ Who makes decisions about the number and types of capacity-building activities – MPA management, stakeholders, both?

❏ What are the skills of the staff who provide the training and do they need more training?

❏ Is the capacity-building budget sufficient to carry out the activities?

❏ Are there evaluation reports from the workshops/training or follow-up reports?

Fourth, the stakeholders should be interviewed to determine their satisfaction with capacity-building activities and the quality of the activities. A short questionnaire can be prepared; it should include questions such as:

❏ Were workshops and training courses provided to you during the planning of the MPA?

❏ How many and what types were provided?

❏ Were workshops and training courses provided to you during implementation of the MPA?

❏ How many and what types were provided?

❏ Were you satisfied with the workshops and training courses? Yes/No

❏ Why?

❏ Were you involved in the selection of the workshops and training courses?

❏ Have the workshops and training courses affected your support for the MPA? Yes/No

❏ Why?

❏ Were you satisfied with the training skills of the staff?

❏ Make a list of all the workshops and training and ask participants to rate their satisfaction on a scale of 1 (poor) to 5 (excellent).

Many workshops and training courses conduct evaluations after the activity to assess the effectiveness of the programme. These evaluations may be available from the trainers and can be reviewed to determine participants' level of satisfaction and knowledge gained from the activity.

As a follow-up activity to the workshops and training courses, the stakeholders' participation in MPA management meetings over time can be observed to determine if there are changes in participation and input as a result of the capacity-building activities. It will be possible through careful listening and observation, and using records of meetings, to determine if new ideas presented through the capacity-building activities are being presented and discussed at the meetings. For this data collection method to work, observations would be required prior to capacity-building activities and afterward.

Informal discussions with individual stakeholders can help to assess their level of satisfaction with their ability to participate in MPA management as a result of their participation in the workshops and training. Notes can be taken to record comments.

How to analyse and interpret results

From the results prepare a narrative report which provides an evaluation of the achievements of capacity-building activities and makes recommendations for future activities.


Box G9

EXAMPLE FROM THE FIELD

At the Sian Ka'an Biosphere Reserve in Mexico, one of the components of the annual operative programme is environmental education, which means that the federal government gives a particular amount of money for this component. Nevertheless, due to limited resources, it has been very hard to design and implement a formal education and training programme.

In response to these limitations, Sian Ka'an Biosphere Reserve has worked hard to find mechanisms, such as agreements with NGOs and exchanges empowered by financing organizations, to secure effective capacity-building actions in local communities. But even with limited funds, Sian Ka'an Biosphere Reserve has been offering environmental education to community members for many years. Since 1999, a training course for tour guides has been offered by the reserve to all those interested in conducting tourism activities in the community. This course provides the attendees with special accreditation to develop their activities. Other courses include using GPS, fly fishing, English, bird identification and co-management. Besides these courses, staff of the reserve have also worked with women and children in the community, offering courses in composting, and environmental education in elementary and secondary schools.

After all these years of work, 55% of community members (N=51) feel that one of the major things that SKBR has done well, as a management authority, is to provide environmental education to improve their quality of life, and to offer training courses that have contributed to the development of alternative and sustainable livelihoods in their community. Some 94% of respondents to the questionnaire have attended at least one of these courses, workshops or exchanges, and most of them – 80% – said that the information obtained from them has been indispensable/very useful in improving their economic activities.

▼ *Level of utility of training courses offered by SKBR to members of the Punta Allen community*
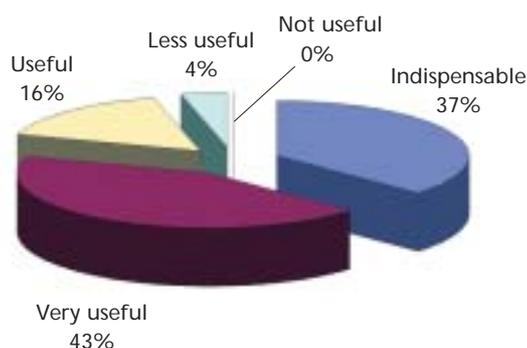
Useful 16%
Less useful 4%
Not useful 0%
Indispensable 37%
Very useful 43%

Strengths and limitations

Empowerment of stakeholders to participate in MPA management is important for its success. Information is provided for further capacity-building activities and evaluating how well past activities have done in terms of knowledge, skills and attitude development.

Useful references and Internet links

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition)*. IUCN, Washington, DC, USA.

TONI PARRAS

12

Level of stakeholder participation and satisfaction in management processes and activities

What is 'level of stakeholder participation and satisfaction in management process and activities'?

The level of stakeholder participation in the management of the MPA is a measure of the amount of active involvement of people in making MPA management decisions or involvement in management activities and of their satisfaction with their level of participation, including if their views and concerns are being heard and considered by MPA managers.

Why measure it?

MPA managers have come to realize that the active participation of coastal resource stakeholders in the planning and management of an MPA can improve the success of the MPA. If stakeholders are involved in the MPA, feel that their views and concerns are being heard and considered, and feel ownership of it, they are more likely to support the MPA. If they are not satisfied, then they are more likely not to support the MPA. Stakeholders are important because they can support and sustain an MPA. They can be potential partners or threats in managing the MPA. An objective of many MPAs is to educate stakeholders that the MPA will lead to benefits. Measuring their level of satisfaction with participation in the MPA is therefore important and evidence of this.

How to collect the data

Stakeholders are individuals, groups, or organizations of people who are interested, involved or affected (positively and negatively) by the MPA. They are motivated to take action on the basis of their interests or values. These stakeholders may or may not actually live within or adjacent to the site, but are people who have an interest in or influence on the MPA.

The process of identifying stakeholders and figuring out their respective importance about decisions in the MPA is called stakeholder analysis. A stakeholder analysis is an approach and procedure for gaining an understanding of a system by means of identifying the key actors or stakeholders in the system, and assessing their respective interests in that system. This method provides insights about the characteristics of individuals and/or groups and their respective relationships to the MPA. It also examines the stakeholders' interests in the MPA and the impact of the activity on the stakeholder. Such an analysis is usually conducted in a participatory way.

The stakeholders are first identified by looking at activities affecting the MPA either directly or indirectly. Primary and secondary stakeholders are identified for each activity. The fisher community or organization is considered a primary stakeholder of coastal resources. Some stakeholders may fall into several categories and should be identified separately. Other stakeholders include government agencies, private/business organizations, non-academic organizations, academic or research institutions, religious/cultural groups and donors.

Relates to goals and objectives

GOAL 3

3A

Difficulty Rating

3

1–5

Requirements

- Identification of stakeholders.

- Questionnaire to identify stakeholder satisfaction.

- Key informants.

- Identification of formal and informal co-management arrangements in the MPA management plan.

- Identification of actual stakeholder participation in decision-making and management activities (when, how and how much).

- One interviewer/facilitator.

- Paper/pencil.

Outputs

- Stakeholder analysis matrix.

- Stakeholder participation matrix.

- Table of overall score of the level of satisfaction of stakeholders with participation in MPA management.

- Narrative which reports the results of satisfaction score and which includes comments from the respondents and observations from the interviewer.

- An overall score of the degree of stakeholder participation in MPA management which can be measured over time to assess changes.

G12

The different stakeholder groups may be listed in a table with information on name, activity, members, leaders/representatives, purpose, and degree of activity (very high, average, little). Stakeholder groups can be divided into smaller and smaller sub-groups depending on the particular purpose of stakeholder analysis. Ultimately, every individual is a stakeholder, but that level of detail is rarely required.

An approach to conducting a stakeholder analysis is to:

❏ Identify the main purpose of activity to be analysed.

❏ Develop an understanding of the MPA and decision-makers in the MPA.

❏ Identify and list stakeholders. Write their names on paper circles. Use larger circles for stakeholders with greater influence or power.

❏ Prepare a stakeholder analysis matrix:

Proposed action: MPA	Positively affected (+)	Negatively affected (-)
Directly affected		
Indirectly affected		

❏ Place stakeholder identification circles from point 3 (above) in the appropriate box of the stakeholder analysis matrix.

❏ Draw lines between the stakeholders to indicate the existence of some form of interaction or relationship.

❏ Identify stakeholder interests, characteristics and circumstances.

❏ Write the information from point 7 (above) for each stakeholder group.

❏ Discuss strategies or courses of action for addressing various stakeholder interests.

Once the stakeholders are identified, their degree of participation can be determined using one of two methods:

a) Observation of their participation in meetings of the MPA to see if the stakeholders and their representatives attend the meetings, express their opinion, and if their opinion is considered. Informal discussions can be held with individual stakeholders to assess their level of satisfaction with participation. Notes can be taken to record comments.

b) A survey is conducted to determine degree of participation. Respondents are asked about

their level of participation. For example, respondents are shown a line with 10 marks on it, the first line indicating no participation and the tenth line indicating full and active participation. Respondents are asked to identify on the line their degree of participation in MPA management. The results are summed up by stakeholder group and by the total stakeholders. This method can be used over time to evaluate changes in participation. In addition, useful discussion about their participation in MPA management is recorded.

A survey is conducted to determine the stakeholder's level of satisfaction with participation in MPA management. Respondents are asked about their level of satisfaction with participation. For example, respondents are shown a line with five marks on it. The first line indicates dissatisfaction with the level of participation and the fifth line indicates full satisfaction with the level of participation. Respondents are asked to identify on the line their level of satisfaction with participation in MPA management. This method can be used over time to evaluate changes in level of satisfaction with participation. In addition, useful discussion about participation is recorded.

## How to analyse and interpret results

The stakeholder analysis provides a stakeholder analysis matrix and a participation matrix.

Sum up the results of the survey by stakeholder group and by the total number of stakeholders and present these in a table. An overall score of the level of satisfaction of stakeholders with participation in MPA management can be calculated and measured over time to assess changes. Write a narrative account which reports the results and includes comments from the respondents and observations from the interviewer.

The results will provide a quantitative measure of the degree of stakeholder participation and their level of satisfaction with their participation in MPA management which can be used to monitor and evaluate community involvement and to provide input for making necessary changes in the co-management arrangements. It should be noted that more participation is not necessarily better, so participation needs to be linked to the MPA plan which may specify low levels of participation.

Strengths and limitations

It is often not easy to identify stakeholders and some may be missed, especially those who are poor, unorganized and powerless. Provides insights
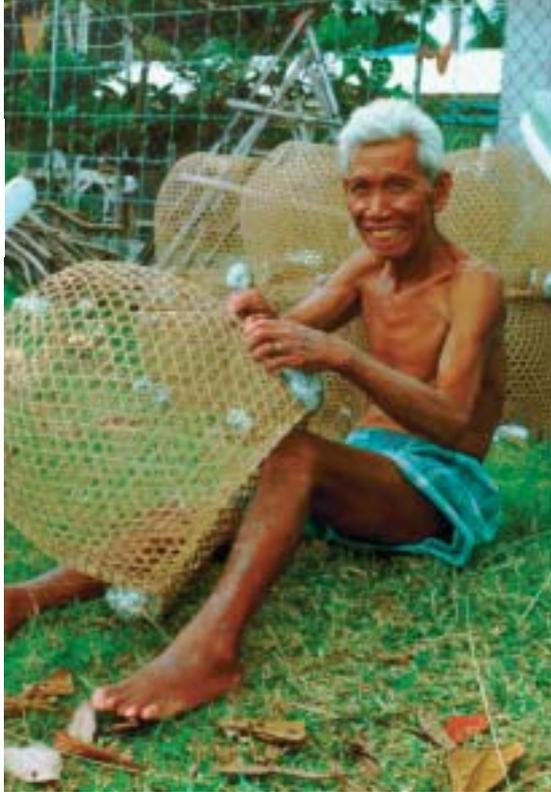
ROBERT POMEROY

into the dynamics and relationships of different stakeholders with the MPA. It should also be noted that some stakeholders have unrealistic and unreasonable expectations of participation, and hence, low levels of satisfaction. Participation does not necessarily equate to satisfaction.

Useful references and Internet links

Langill, S. (compiler) (1999). *Stakeholder Analysis. Volume 7. Supplement for Conflict and Collaboration Resource Book.* International Development Research Centre, Ottawa, Canada.

Box G10

EXAMPLE FROM THE FIELD

At the Sian Ka'an Biosphere Reserve in Mexico, questionnaire responses revealed the following information about the perception of Punta Allen community members, on their level of participation in management decisions:

❏ Does SKBR consult with you about management decisions and strategies?

N=51	%
Yes	60%
No	27%
Informs, not consults	8%
Blank space	5%

❏ Level of participation:

N=51	%
Very active	2%
Active	30%
Some	34%
Few	28%
Blank space	6%

At Mafia Island Marine Park in Tanzania, respondents were asked about their degree of satisfaction with their participation in management with the following results:

	Percent (N=404)		Percent (N=404)	
Question:	1	2		3
Highly involved	11.6	11.6	Very satisfied	23.0
Moderately involved	10.6	10.9	Moderately satisfied	24.3
Less involved	10.6	9.4	Less satisfied	6.2
Not involved	60.9	63.9	Not satisfied	34.7
Don't know	6.2	4.2	Not satisfied at all	7.4
			Don't know	4.5

Questions:
1. *To what extent have you been involved in meetings and discussions with MIMP representatives from preparations to the present?*
2. *To what extent have you been involved in meetings and discussions with village leaders without MIMP?*
3. *Are you satisfied with the way you are involved in the management of MIMP?*

The results show that more than 60% of respondents feel they have not been involved in discussions about the marine park either with MIMP representatives or even with their own village leaders. Despite this, 47% of respondents are very satisfied or moderately satisfied with the level of participation and 42% are not satisfied or not satisfied at all. The results indicate quite a surprisingly high level of both participation and satisfaction considering the large size of the communities; nonetheless they also suggest that continued efforts are needed to improve participation mechanisms both within villages as well as between the villages and MIMP. For this reason a new initiative involving village-based natural resources management planning is being prepared by the MPA management together with district authorities. The results also hint that, not surprisingly, there is a certain proportion of the community that doesn't actually want to participate in management.

Relates to goals and objectives

GOAL 2

2E

GOAL 4

4A 4B

4D

Difficulty Rating

2

1–5

What is 'level of stakeholder involvement in surveillance, monitoring and enforcement'?

Level of stakeholder involvement in surveillance, monitoring and enforcement is a measure of the number of stakeholders who have participated in patrolling or other surveillance and monitoring activities.

Why measure it?

Sharing surveillance, monitoring and enforcement activities with local stakeholders can be effective in controlling non-compliance behaviour through social and peer pressure. Increased participation of stakeholders provides them with more ownership over the MPA which should result in an overall improvement in enforcement and a decrease in violations. The point of this indicator is to document those tasks related to active stakeholder involvement in enforcement activities. These may range from simply stuffing envelopes, to attending enforcement hearings, to helping put up signposts.

How to collect the data

As mentioned above, the type and level of stakeholder involvement in enforcement activities may range from stuffing envelopes containing announcements of new regulations, to attending enforcement hearings, to helping MPA staff put up signposts, to actively patrolling the MPA.

For the latter activity, ideally, all formal patrols are recorded on an ongoing basis so that this indicator should only require a synthesis of the existing patrol records. Patrol records are reviewed to determine who was involved in the patrols including:

❏ Number of non-MPA staff.

❏ Amount of time of non-MPA staff involved in the patrol.

❏ Stakeholder group affiliation of non-MPA staff.

Requirements

■ Patrol records.

■ Interview stakeholders.

■ One interviewer.

■ Paper/pencil.

❏ Type and number of activities that non-MPA staff were engaged in.

If patrols involving stakeholders are not recorded then this may require interviewing key stakeholders within the community who are involved in patrolling. The number of non-MPA staff involved in patrols can be compared to some ideal number of non-MPA staff established in the management plan to determine management effectiveness.

Stakeholders are interviewed to determine if they informally conduct surveillance and monitoring activities when they are in the area of the MPA. The stakeholders are asked:

❏ How they conduct the activity (e.g. causal or formal observation).

❏ How they report violations that they observe.

❏ Who they report violations to.

❏ What is done with reports of violations (is action taken)?

❏ Do you feel that compliance by stakeholders has improved as a result of your involvement?

For the other activities in which stakeholders may be involved, the MPA manager and staff are interviewed to identify what other enforcement activities stakeholders are involved in. As stated above, the number, amount of time and group affiliation of each stakeholder are identified. The names of the stakeholders are identified and they are interviewed to determine the reasons for their involvement, the amount of time involved and who they report to on the MPA staff. The stakeholders should be asked if they feel that their involvement has brought any improvement in overall community compliance and enforcement.

How to analyse and interpret results

Prepare a narrative report which provides an evaluation of the number of stakeholders involved in surveillance, monitoring and enforcement.

Strengths and limitations

This indicator reports on formal involvement in surveillance, monitoring and enforcement. It is much more difficult to obtain information on

Outputs

■ Narrative report.

Box G11

EXAMPLE FROM THE FIELD

At the Sapodilla Cayes Marine Reserve, five local fishers volunteer their time for monitoring and surveillance activities. These volunteers supplement the monitoring and surveillance activities of the regular MPA staff. The volunteers use their own boats and are provided with fuel. They are engaged in these activities for 6 hours a week. They are provided with VHF radios while on patrol and alert the rangers if they identify a violation. The volunteers were given 10 hours of training in rules, regulations and enforcement procedures by the MPA staff.

informal involvement, such as when fishing or when involved in tourism activity in the area.

Useful references and Internet links

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition).* IUCN, Washington, DC, USA.

▼ *When the public becomes actively engaged in surveillance and monitoring activities, such as these volunteers from the Banc d'Arguin, Mauritania, it can lead to win-win opportunities for both managers and the public with respect to the MPA.*

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What are 'clearly defined enforcement procedures'?

Clearly defined enforcement procedures is a measure of the existence and description of guidelines and procedures developed for staff charged with enforcement responsibilities and how they are to act depending on the type of offence encountered.

Why measure it?

Enforcement is a crucial step in the MPA management system. Clearly defined enforcement procedures allow MPA enforcement staff to more effectively undertake their duties and resource users to be aware of consequences of non-compliance.

How to collect the data

First, in the management plan, the section which describes the monitoring, control, surveillance and enforcement programme for the MPA is identified. This will provide information on the enforcement programme and its structure. If no section on enforcement procedures exists, an interview is conducted with the MPA manager and the enforcement staff to identify the monitoring, control, surveillance and enforcement programme.

Second, an interview is conducted with the MPA manager and the designated enforcement staff member to obtain information about the enforcement guidelines. Questions to be asked include:

❏ Do formal enforcement guidelines and procedures exist?
❏ Do informal enforcement guidelines and procedures exist?
❏ Who prepared these guidelines and procedures?
❏ Describe the guidelines and procedures.
❏ Are they periodically reviewed and updated?
❏ Are staff trained in the guidelines and procedures?

Outputs

■ Narrative report on the current MPA enforcement guidelines and procedures.

Requirements

■ Copy of the MPA monitoring, control, surveillance and enforcement section from the management plan.
■ Copy of the enforcement guidelines.
■ One interviewer.
■ Paper/pencil.

❏ Is there coordination of the guidelines and procedures with other enforcement agencies?
❏ Are the enforcement guidelines and procedures appropriate to the task?
❏ Number of reported violations.
❏ Number of successful prosecutions due to clearly defined enforcement procedures.
❏ Number of attempted prosecutions that failed due to technicalities due to failure in procedure.
❏ Accessibility and availability of enforcement guidelines.

How to analyse and interpret results

Prepare a narrative report on the current enforcement guidelines and procedures, adequacy and availability of the guidelines, procedures to undertake enforcement actions, and recommendations for improvements.

Strengths and limitations

Clearly defined enforcement guidelines and procedures will improve monitoring, surveillance and enforcement of the MPA thus benefiting the MPA management; will allow enforcement staff to act professionally; and will reduce the possibility of legal action against the MPA management by rule breakers. This measure will allow for a review of enforcement guidelines and procedures to ensure that they are implemented in a fair and equitable manner.

If no formal enforcement guidelines and procedures exist, information can still be obtained by interviewing MPA managers and staff and having them describe any informal procedures that they follow.

G14

Box G12

EXAMPLE FROM THE FIELD

In the Bird Island Marine Sanctuary in the Commonwealth of the Northern Mariana Islands there is confusion regarding which laws and regulations are to be enforced, and what penalties and/or prohibitions are applicable to the MPA in both the public's mind and the Division of Fish and Wildlife Enforcement Section. Recently, a number of violations have been overturned or had penalties substantially reduced because regulations conflicted with one another or were not suitably empowered by statute. In another incident, two non-English speaking non-resident workers were arrested for fishing in a marine sanctuary. The two were detained in jail for the majority of a day but the Department of Public Safety officers could not determine the appropriate bail to be set for the release of the alleged perpetrators. Eventually, the two individuals were released without any bail requirement.

This lack of clarity results from a historical lack of adequate focus on policy needs within the Division of Fish and Wildlife and because the agency's comments are frequently not incorporated into newly introduced legislation, amendments, and regulations. Furthermore, dedicated legal council for the agency has been lacking and legal council from the Attorney General's Office (AGO) is provided inconsistently. The limited enforcement activity that does occur tends to impact non-English speaking individuals disproportionately. This could be because they are least likely to be informed about Division of Fish and Wildlife rules and regulations, or because of perceptions relative to their resource use ethic. Overall, the lack of clearly defined procedures and the existence of conflicting laws and regulations reduce the effectiveness of the Division of Fish and Wildlife and create a poor public image.

Useful references and Internet links

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition).* IUCN, Washington, DC, USA.

G14

Difficulty Rating

2

1–5

What is 'enforcement coverage?

Enforcement coverage is a measure of the number of surveillance and monitoring patrols undertaken by MPA staff during a given time period and in a specified area.

Why measure it?

This information is used to review the consistency of patrol activities. This information is a necessary prerequisite for assessing trends in violations or non-compliance since the latter is generally measured as the number of violations per patrol effort. It is also useful in determining how well the MPA management is meeting the goal of surveillance, monitoring and enforcement.

How to collect the data

First, the management plan and the enforcement programme should have a section which describes the planned patrol schedule and procedures. This provides a base of information for comparison of actual patrols. If no such information exists, an interview is conducted with the MPA manager and staff involved in enforcement to describe the patrol schedule and procedures.

Second, patrol records are reviewed to calculate the patrol effort in terms of:

❏ Man-hours

❏ Total hours

❏ Number of patrols

❏ Variation in temporal and spatial patterns of patrols

❏ Patrol area (km^2)

❏ Number and type of infractions per patrol

❏ Number of unauthorized visitors caught and/or noticed

The above data can be disaggregated for different parts of the MPA and also different types of patrols (land, sea, MPA staff, community members). The actions undertaken during each patrol are reviewed to identify problems and needs to improve patrol activity. A map is prepared which shows patrol areas, number of patrols, and variation in temporal and spatial patterns of patrols.

Third, interviews are held with MPA staff to discuss patrol records and to learn about how patrols are undertaken and to identify problems and needs.

Requirements

- Copy of patrol schedule and procedures.
- Patrol records.
- MPA quarterly/annual reports.
- Map of area.
- One interviewer.
- Paper/pencil.

Outputs

- A narrative report
- A map showing distribution of patrols and types of activities occurring in and around the MPA

Fourth, interviews are conducted with resource users and stakeholders to learn about how patrols are undertaken, how the patrol officers act during a patrol, and problems and needs.

How to analyse and interpret results

Prepare a narrative report which includes a discussion of the man-hours patrolling per month/year; hours patrolling per month/year; number of patrols/patrol days per month/year; number of patrols per area and type; and number and type of infractions. Map this information to show coverage of the MPA. Present in a table the types of action taken during each patrol, rank them and map them to identify trends, patterns and needs.

Strengths and limitations

This indicator can lead to improvements in patrol and patrol coverage, in addition to improvements in overall enforcement of the MPA. Note that an increase in the number of illegal activities can not only result from increased patrols (positive trend) but also from increased poaching/violations (negative trend).

The usefulness of the indicator will depend on the accuracy of the patrol records.

Useful references and Internet links

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition).* IUCN, Washington, DC, USA.

EXAMPLE FROM THE FIELD

At Tubbataha Reef National Marine Park in the Philippines, rangers are required to conduct at least three random patrols every week. This is complemented by the operation of the radar at least every three hours. A logbook is maintained to monitor the number of intrusions detected through the radar and actual apprehensions. Apprehensions in the last three years have almost doubled. This may be attributable to the provision of the radar and more reliable patrol boats, enabling rangers' early detection of, and speedy response to, incursions.

NOAA PHOTO LIBRARY

G15

Difficulty Rating

3

1–5

What is 'degree of information dissemination to encourage stakeholder compliance'?

Degree of information dissemination to encourage stakeholder compliance is a measure of the number and effectiveness of capacity-building efforts for stakeholders on the objectives and benefits, rules, regulations and enforcement arrangements of the MPA.

Why measure it?

Training and education will increase stakeholder knowledge about rules, regulations and enforcement arrangements for the MPA in order to change behaviour and attitudes and increase compliance. Improvements in compliance with MPA rules and regulations by stakeholders should result from the training and education programme.

How to collect the data

First, the number and types of workshops and training courses and information dissemination provided to the stakeholders during planning and implementation of the MPA are recorded. This information should be available from the MPA management office.

Second, MPA management staff are interviewed and asked questions about capacity-building and information dissemination activities including:

Requirements

- Copy of MPA capacity-building programme.

- Access to workshop and training records provided to stakeholders by the MPA management.

- Interview of stakeholders to assess satisfaction with capacity-building activities (education, training).

- Enforcement records.

- Records and output of information dissemination (mailings, media, publications, web, signs, etc.).

- One interviewer.

- Paper/pencil.

❏ How large is the capacity-building and information dissemination budget compared to the overall MPA budget?

❏ Were capacity-building activities provided during planning for the MPA on rules, regulations and enforcement arrangements?

❏ Were capacity-building activities undertaken during implementation and are they still provided?

❏ Who makes decisions about the number and types of capacity-building activities – MPA management, stakeholders, both?

❏ What types of information dissemination efforts were undertaken?

Third, the stakeholders are interviewed to determine their satisfaction with capacity-building and information dissemination activities and the quality of the activities. Stakeholders differ, they range from local fishers to foreign tourists. Several questionnaires may need to be developed for different stakeholder groups. A short questionnaire is prepared, including questions such as:

❏ Were workshops and training courses provided to you during the planning of the MPA?

❏ How many and what types were provided?

❏ Were workshops and training courses provided to you during implementation of the MPA?

❏ How many and what types were provided?

❏ Were you satisfied with the workshops and training courses? Yes/No

❏ Why?

❏ Were you involved in the selection of the workshops and training courses?

❏ What types of information dissemination were provided?

❏ Which were most effective for you?

❏ Why?

❏ Have the workshops and training courses affected your compliance behaviour? Yes/No

❏ Why?

❏ Do you have a better understanding of the rules, regulations and enforcement arrangements as a result of the workshops? Yes/No

❏ Do you have a better understanding of the purpose of the MPA as a result of the workshops? Yes/No

❏ Do you have a better understanding of coastal and marine ecosystems as a result of the information provided to you? Yes/No

Many workshops and training courses conduct evaluations after the activity to assess the effectiveness of the programme. These evaluations may be available from the trainers and can be reviewed to determine participants' levels of satisfaction and knowledge gained from the training.

Enforcement records kept by the MPA are reviewed to assess changes in the number of violations by stakeholders who have attended the training. Names of stakeholders who have attended the training should be available from the participants list.

How to analyse and interpret results

Prepare a narrative report describing the capacity-building efforts for stakeholders to enhance and support compliance with MPA rules and regulations. Develop a table showing correlation between capacity-building and information dissemination programmes and enforcement compliance records.

Measure effectiveness by comparing what activities have been undertaken with the different approaches to capacity-building and information dissemination presented in the management plan. The indicator will measure linkages between training and education and information dissemination for stakeholders on objectives and benefits, rules, regulations and enforcement arrangements and overall improvements in compliance. If the stakeholders were not involved in the development of the rules and regulations, compliance has been shown to be lower than if they did participate.

Strengths and limitations

Interviewers need to be aware that stakeholder responses may be biased depending upon their individual or group agenda.

Useful references and Internet links

Salm, R.V., Clark, J.R. and Siirila, E. (2000). *Marine and Coastal Protected Areas: A Guide for Planners and Managers (3rd Edition).* IUCN, Washington, DC, USA.

Outputs

- A narrative report describing the capacity-building efforts for stakeholders to enhance and support compliance with MPA rules and regulations.

- A table showing correlation between capacity-building and information dissemination programmes and enforcement compliance records is developed.

Box G14

EXAMPLE FROM THE FIELD

The Hung Thac Marine Protected Area has provided fishers with four training courses on rules, regulations and enforcement arrangements for the MPA since it was established two years ago. In addition, comic books have been prepared and handed out to fishers to explain the rules, regulations and enforcement arrangements. Rangers meet informally with fishers on a regular basis and they have given a number of presentations at the local fisher organization meetings. Evaluations done at the four training sessions found that participants were well informed about the rules, regulations and enforcement arrangements for the MPA. In the second year of the MPA operation, violations were reduced by 80% from the first year. This is attributed to the training and education programme and to greater knowledge among the fishers.

Ecotourism such as sea-kayaking is often assumed to be a source of income, but several pilot sites indicated concern about the environmental impact of this activity.

To make this guidebook and the indicators accurate, flexible and applicable to your MPA and many other types of MPAs, a working draft of this guidebook was field-tested in diverse MPAs around the world. The MPA pilot projects were an integral part of the development of this guidebook. MPA sites were selected to represent a diversity of site characteristics, including; geographic locations, sizes, and type of management. In addition, sites had to meet several criteria, including; commitment of the site manager, capacity to conduct an evaluation and measure indicators, and available staff to participate. A training workshop was held for representatives from the pilot sites and technical assistance was provided to encourage participants to build on the project for future implementation at the site.

The training workshop was held in the autumn of 2002 and pilot site representatives selected relevant indicators to their sites, provided feedback on the indicator methods, and developed preliminary evaluation workplans. This workshop was followed by a 6-month field-testing period, although each site conducted the testing at various times and in differing amounts of time. At the end of the testing period, each site submitted a detailed report describing the test results and experiences in applying the guidebook at their MPA. These reports were used to revise and improve this guidebook and to provide you with examples on how to use many of the indicators.

There are a few summary points from those pilot sites that completed field-testing by the time this guidebook went to press:

❏ They were able to match their MPA goals and objectives with those in this guidebook.

❏ They were able to pick relevant indicators for their site.

❏ They were able to measure the indicators using the methods and with the participation and expertise of different professionals and other stakeholders at their sites.

❏ The most common constraints included the restriction of time to measure the indicators, interference of seasonal activities and weather, lack of experience to conduct evaluations, and unfamiliarity with certain indicators and methods.

This Appendix presents a summary information on each of the sites that have participated in the WCPA-Marine/WWF MPA Management Effectiveness Initiative.

For more information on the MPA pilot sites go to http://effectiveMPA.noaa.gov/sites/pilotsites.html

Location of Pilot MPAs

1) Banc D'Arguin National Park (Mauritania)
2) Banco Chinchorro Biosphere Reserve (Mexico)
3) Bunaken National Park & Pulau Sebesi Marine Reserve (Indonesia)
4) Channel Islands National Marine Sanctuary (US)
5) Far Eastern Marine Preserve (Russia)
6) Galapagos Islands Marine Reserve (Ecuador)
7) Hol Chan Marine Reserve (Belize)
8) Lenger Island Marine Protected Area (Micronesia)
9) Loreto Bay National Park (Mexico)
10) Mafia Island Marine Park (Tanzania)

11) Managaha Conservation Area & Sasanhaya Fish Reserve (Commonwealth of the Northern Mariana Islands)
12) Miramare Marine Protected Area (Italy)
13) Ngemai Conservation Area & Ulong Channel Grouper Spawning Area (Palau)
14) Piti Bomb Hole Preserve & Achang Reef Flat Preserve (Guam)
15) Sian Ka'an Coastal Biosphere Reserve (Mexico)
16) Tubbataha Reef National Marine Park (Philippines)
17) Upper Gulf of California and Colorado River Delta Biosphere Reserve (Mexico)
18) Saguenay-St. Lawrence Marine Park (Canada)

LME = Large Marine Ecosystems. For more information:
http://www.edc.uri.edu/lme/

RSP = Regional Seas Programme. For more information:
http://www.unep.ch/seas/mappage1.html

Areas (Small ≤ 20 km²; Medium 21–1,999 km²; Large ≥ 2,000 km²)

Aching Reef Flat Preserve (Guam)

- ❏ **LME**: n.a.
- ❏ **RSP**: South Pacific
- ❏ **Date of establishment**: Implemented on May 16, 1997 (Guam Public Law 24–21), but full enforcement began on 1 January 2001
- ❏ **Area (km²)**: 4.85 (small)
- ❏ **Ecosystem type**:
    Coral reef
    Seagrass beds
    Mangroves
    Small estuarine lagoon and channel
- ❏ **Description of special resources; important ecological features; reason for establishing a protected area**: The mangroves and seagrass beds serve as a major nursery area for many juvenile marine animals including reef fishes in southern Guam.
- ❏ **Management objective**: No-take (but seasonal fishing is allowed for juvenile rabbitfish and scad mackerel).
- ❏ **Type of management structure**: Conventional
- ❏ **Geographic coordinates (approx.)**: 13°15'N, 144°40'E
- ❏ **World region**: Tropical
- ❏ **Nearest major city**: Hagatna (Agana)

Banc D'Arguin National Park (Mauritania)

- ❏ **LME**: Canary Current
- ❏ **RSP**: West & Central Africa Programme
- ❏ **Date of establishment**: 1976
- ❏ **Area (km²)**: 12,000 (large)
- ❏ **Ecosystem type**:
    Sand dunes
    Seagrass beds
    Mudflats
    Sand islands and islets
- ❏ **Description of special resources; important ecological features; reason for establishing a protected area**: Vast expanses of sea grass beds and mudflats (ca. 500 km²), which offer ideal conditions for reproduction and growth of many species of birds, fish, shellfish, marine mammals and sea turtles.
- ❏ **Management objective**: Multiple
- ❏ **Type of management structure**: Conventional
- ❏ **Geographic coordinates**: 16°45' W 19°21' N–20°50' N
- ❏ **World region**: Semi-arid
- ❏ **Nearest major city**: Nouakchott

Banco Chinchorro Biosphere Reserve (Mexico)

- ❏ **LME**: Caribbean Sea
- ❏ **RSP**: Wider Caribbean
- ❏ **Date of establishment**: 19 July 1996
- ❏ **Area (km²)**: 1,444 (Medium)
- ❏ **Ecosystem type**:
    Coral reefs
    Seagrass beds
    Mangroves
    Sandy ground
- ❏ **Description of special resources; important ecological features; reason for establishing a protected area**: The largest formation of the Mesoamerican Barrier Reef System, with a 52,494.83 hectares reef lagoon, four Cays (475.22 hectares), and interior lagoons (121.93 hectares).
- ❏ **Management objective**: Multiple
- ❏ **Type of management structure**: Conventional
- ❏ **Geographic coordinates**: 18°48'–18°21'N / 87°11'-87°28' W
- ❏ **World region**: Mesoamerican Caribbean
- ❏ **Nearest major city**: Chetumal, located 130 km from Mahahual

Bird Island (Commonwealth of the Northern Mariana Island – CNMI)

- ❏ **LME**: n.a.
- ❏ **RSP**: South Pacific Regional Environment Programme (SPREP)
- ❏ **Date of establishment**: April 2001
- ❏ **Area (km²)**: 1.3 (Small)

❏ **Ecosystem type**:
  Native limestone
  Fringing coral reef
  Forest

❏ **Description of special resources; important ecological features; reason for establishing a protected area**: Fringing coral reef, blowhole used as popular swim hole and dive entrance to underwater tunnels, caves and fringing reefs, and rock island just off shore containing a seabird nesting colony.

❏ **Management objective**: No-take

❏ **Type of management structure**: Conventional

❏ **Geographic coordinates**: 145°48' E & 15°15' N. Boundaries: 1000ft seaward of low tide mark and 500ft inland

❏ **World region**: Tropical

❏ **Nearest major city**: San Roque, Saipan

Bunaken National Park (Indonesia)

❏ **LME**: Indonesian Sea

❏ **RSP**: East Asian Seas

❏ **Date of establishment**: 1991

❏ **Area (km^2)**: 790 (Medium)

❏ **Ecosystem type**:
  Coral reef
  Mangrove
  Seagrass
  Deep coastal seawall & trenches

❏ **Description of special resources; important ecological features; reason for establishing a protected area**: Diverse corals and coral reef fish communities, diversity and abundance of mangroves extensive seagrass beds supporting dugong and sea turtle populations, and newly discovered group of resident coelacanths.

❏ **Management objective**: Multiple

❏ **Type of management structure**: Co-management

❏ **Geographic coordinates**: 1°35'N; 124°44'E

❏ **World region**: Tropical

❏ **Nearest major city**: Manado, North Sulawesi

Channel Islands National Marine Sanctuary (USA)

❏ **LME**: California Current

❏ **RSP**: North-East Pacific

❏ **Date of establishment**: 1980

❏ **Area (km^2)**: 4,349 (Large)

❏ **Ecosystem type**:
  Kelp Forest
  Rocky Intertidal

❏ **Description of special resources; important ecological features; reason for establishing a protected area**: n.a.

❏ **Management objective**: n.a.

❏ **Type of management structure**: Co-management

❏ **Geographic coordinates**: 34°N, 120°W

❏ **World region**: Temperate Pacific

❏ **Nearest major city**: Santa Barbara, CA

Far Eastern Federal Marine Preserve (Russian Federation)

❏ **LME**: Sea of Japan

❏ **RSP**: Northwest Pacific

❏ **Date of establishment**: 24 March 1978

❏ **Area (km^2)**: 0.64 (Small)

❏ **Ecosystem type**:
  Rocky Shore

❏ **Description of special resources; important ecological features; reason for establishing a protected area**: Coastal marine and island environment of Peter The Great Bay containing more than 2,700 marine species (many under international protection).

❏ **Management objective**: Multiple

❏ **Type of management structure**: Conventional

❏ **Geographic coordinates (approx.)**: 42.5°N, 131.5°E

❏ **World region**: Temperate and subtropical

❏ **Nearest major city**: Vladivostok

Galapagos Islands Marine Reserve (Ecuador)

❏ **LME**: n.a.

❏ **RSP**: Southeast Pacific

❏ **Date of establishment**: 1998

❏ **Area (km^2)**: 135,000 (Large)

❏ **Ecosystem type**:
  Upwelling
  Volcanic Substrate

- ❏ **Description of special resources; important ecological features; reason for establishing a protected area**: The highly productive coastal waters support a rich food chain that extents not only from plankton to sharks and whales, but also to land plants, insects and birds. Galapagos sits on the equator but also lies in the path of cool nutrient rich currents, a combination that separates it apart from all other major island groups. Here corals, manta rays and other plants and animals typical of tropical seas share islands with penguins, fur seals and cool water species

- ❏ **Management objective**: Multiple

- ❏ **Type of management structure**: Co-management

- ❏ **Geographic coordinates**: 2°S/2°N, 89°/92°W

- ❏ **World region**: Tropical/arid

- ❏ **Nearest major city**: Guayaquil

Hol Chan Marine Reserve (Belize)

- ❏ **LME**: Caribbean Sea

- ❏ **RSP**: Wider Caribbean

- ❏ **Date of establishment**: 2 May 1997

- ❏ **Area (km^2)**: 8 (Small)

- ❏ **Ecosystem type**:
    Coral Reef
    Seagrass
    Mangrove

- ❏ **Description of special resources; important ecological features; reason for establishing a protected area**: Reserve status was called by the community and by international organizations due to the unique formation of the channel, the abundant fishery resources (including conch and lobster) and the feasibility of including an interlinked system of coral reef, seagrass and mangrove habitats in this area.

- ❏ **Management objective**: Multiple

- ❏ **Type of management structure**: Co-management (semi-governmental)

- ❏ **Geographic coordinates (approx.)**: 17.7°N, 87.7°W

- ❏ **World region**: Mesoamerican Caribbean

- ❏ **Nearest major city**: San Pedro Town, Caye Caulker

Lenger Island Marine Protected Area (Pohnpei Island, Federated States of Micronesia)

- ❏ **LME**: n.a.

- ❏ **RSP**: South Pacific Regional Environment Programme (SPREP)

- ❏ **Date of establishment**: February 2001

- ❏ **Area (km^2)**: 2 (Small)

- ❏ **Ecosystem type**: Coral Reef

- ❏ **Description of special resources; important ecological features; reason for establishing a protected area**: Siganidae spawning and aggregation site; Turtle hatchery; Diverse invertebrate species; and WWII Base.

- ❏ **Management objective**: No-take

- ❏ **Type of management structure**: Community-based

- ❏ **Geographic coordinates**: 7°N, 158°13'E

- ❏ **World region**: Tropical

- ❏ **Nearest major city**: Kolonia

Loreto Bay National Park (Mexico)

- ❏ **LME**: Gulf of California

- ❏ **RSP**: Northeast Pacific

- ❏ **Date of establishment**: 19 July 1996

- ❏ **Area (km^2)**: 2,065 (Large)

- ❏ **Ecosystem type**:
    Dune vegetation
    Desert scrub
    Mangrove
    Rocky reef, sand and mud flats
    Rodolites

- ❏ **Description of special resources; important ecological features; reason for establishing a protected area**: Fish fauna of least 260 species. Five sea turtles in the Gulf of California are present in the park, all of them under protection. 90 terrestrial and 110 aquatic birds compose the bird fauna. 30 species of marine mammals out of 35 species reported in the Gulf of California (nine of them under protection).

- ❏ **Management objective**: Multiple

- ❏ **Type of management structure**: Conventional

- ❏ **Geographic coordinates**: 25°35'-26°07'N, 110°45'-111°21'W

- ❏ **World region**: Semi-arid

❏ **Nearest major city**: Loreto and La Paz, Baja California Sur

Mafia Island Marine Park (Tanzania)

❏ **LME**: Agulhas Current

❏ **RSP**: Eastern Africa

❏ **Date of establishment**: 1995

❏ **Area (km²)**: 822 (Medium)

❏ **Ecosystem type**:
>Mangroves
>Seagrass beds
>Coral reefs
>Intertidal reef flats
>Lagoon
>Coastal forest

❏ **Description of special resources; important ecological features; reason for establishing a protected area**: The archipelago is formed of a number of very large islands and small-uninhabited coral atolls. Due to its position alongside the barrier, the island is the meeting place of large oceanic fish and the vast variety of fish common to the Indian Ocean coral reefs. There are over 400 species of fish in the park.

❏ **Management objective**: Multiple

❏ **Type of management structure**: Conventional with Co-management

❏ **Geographic coordinates**: 7°45'-8°9'S, 39°54'-39°30'E

❏ **World region**: Tropical

❏ **Nearest major city**: Dar es-Salaam

Miramare Marine Protected Area (Italy)

❏ **LME**: Mediterranean

❏ **RSP**: Mediterranean

❏ **Date of establishment**: 1986

❏ **Area (km²)**: 1.2 (Small)

❏ **Ecosystem type**:
>Tidal area
>Rocky shore
>Soft bottom

❏ **Description of special resources; important ecological features; reason for establishing a protected area**: Miramare focuses on issues related to education activities, scientific research, related to the reproductive biology of fish species and water quality.

❏ **Management objective**: No-take

❏ **Type of management structure**: Co-management

❏ **Geographic coordinates**: 45°42'N, 13°42'E

❏ **World region**: Mediterranean Sea

❏ **Nearest major city**: Trieste

Ngemelis (Palau)

❏ **LME**: n.a.

❏ **RSP**: South Pacific

❏ **Date of establishment**: 1995

❏ **Area (km²)**: 30 (Medium)

❏ **Ecosystem type**:
>Coral Reef

❏ **Description of special resources; important ecological features; reason for establishing a protected area**: Highly diverse reef wall.

❏ **Management objective**: No-take

❏ **Type of management structure**: Conventional

❏ **Geographic coordinates (approx.)**: 7.2°N, 134.6°E

❏ **World region**: Tropical Pacific

❏ **Nearest major city**: Koror

Piti Bomb Holes Preserve (Guam)

❏ **LME**: n.a.

❏ **RSP**: South Pacific

❏ **Date of establishment**: 16 May 1997

❏ **Area (km²)**: 3.36 (Small)

❏ **Ecosystem type**:
>Coral Reef
>Sparse seagrass beds

❏ **Description of special resources; important ecological features; reason for establishing a protected area**: Extensive patch reefs in unique dissolution holes within Piti reef flat. Site includes various habitats needed for the life cycle of marine animals.

❏ **Management objective**: No-take

❏ **Type of management structure**: Conventional

❏ **Geographic coordinates (approx.)**: 13°27'N, 144°42'E

❏ **World region**: Tropical Pacific

❏ **Nearest major city**: Hagatna (Agana)

Saguenay-St. Lawrence Marine Park (Canada)

- **LME**: Newfoundland-Labrador Shelf
- **RSP**: n.a.
- **Date of establishment**: 8 June 1998
- **Area (km^2)**: 1,138 (Medium)
- **Ecosystem type**:
  Cold-water estuary
  Tidal mud flats
  Underwater cliffs
  Nutrient rich cold-water upwellings
  Fjord
  Marshes
- **Description of special resources; important ecological features; reason for establishing a protected area**: Established for the protection of a severely depleted and endangered population of beluga whales. The area is a major summer feeding ground for a host of visiting whales species migrating from the Northern Atlantic. Fin, minke, blue, and humpback whales all converge on this area to feast on the high concentrations of krill found in the nutrient-rich waters.
- **Management objective**: Multiple use
- **Type of management structure**: Conventional (federal and provincial governments)
- **Geographic coordinates (approx.)**: 47°39' - 48°23' N, 69°17' - 70°42' W
- **World region**: Cold temperate
- **Nearest major city**: Saguenay and Rivière-du-Loup (within 15 km)

Sasanhaya Fish Reserve (CNMI)

- **LME**: n.a
- **RSP**: South Pacific
- **Date of establishment**: October 1994
- **Area (km^2)**: 0.8 (Small)
- **Ecosystem type**:
  Fringing coral reef
  Fish reserves
- **Description of special resources; important ecological features; reason for establishing a protected area**: Unique coral features; popular dive site; fringing coral reef; historic WWII wrecks
- **Management objective**: No-take

- **Type of management structure**: Conventional
- **Geographic coordinates (approx.)**: 14°07'05" N, 145°10' E,
- **World region**: Tropical Pacific
- **Nearest major city**: Song Song, Rota

Sian Ka'an Biosphere Reserve (Mexico)

- **LME**: Caribbean Sea
- **RSP**: Wider Caribbean
- **Date of establishment**: 20 January 1986
- **Area (km^2)**: 6,000 (Large)
- **Ecosystem type**:
  Coral Reef
  Coastal Lagoon
  Mangrove
  Tropical forest
- **Description of special resources; important ecological features; reason for establishing a protected area**: Coral reef and platform with a length of 120 km and depth of 60 m towards the Caribbean Sea, it is part of the second largest coral reef in the world.
- **Management objective**: Multiple
- **Type of management structure**: Conventional
- **Geographic coordinates (approx.)**: 19°05' – 20°06'N, 87°30' – 87°58'W
- **World region**: Mesoamerican Caribbean
- **Nearest major city**: Cancun and Carrillo Puerto

Tubbataha Reef National Marine Park (Philippines)

- **LME**: Sulu-Celebes Sea
- **RSP**: East Asian Seas
- **Date of establishment**: 11 August 1998
- **Area (km^2)**: 332 (Medium)
- **Ecosystem type**:
  Atoll
  Coral Reef
- **Description of special resources; important ecological features; reason for establishing a protected area**: An atoll reef with a very high density of marine species; the North Islet serving as a nesting site for birds and marine turtles. A pristine coral reef with a 100 m perpendicular wall, extensive lagoons and two coral islands.

❏ **Management objective**: No-take

❏ **Type of management structure**: Co-management

❏ **Geographic coordinates**: 8°45'-9°00'N, 119°45'-120°04'E

❏ **World region**: Tropical

❏ **Nearest major city**: Puerto Princesa City, Palawan

Upper Gulf of California and Colorado River Delta Biosphere Reserve (Mexico)

❏ **LME**: Gulf of California

❏ **RSP**: Northeast Pacific

❏ **Date of establishment**: 10 June 1993

❏ **Area (km²)**: 9,340 (Large)

❏ **Ecosystem type**:
  Wetlands
  Shallow coastal marine
  Delta
  Estuary

❏ **Description of special resources; important ecological features; reason for establishing a protected area**: <u>Marine/coastal habitats</u>: Shallow marine-coastal semi-open waters, soft-bottom and sandy/muddy coastline, rocky areas (coquina formation), delta floodplain (intertidal and brackish wetlands, saltflats). <u>Terrestrial habitats</u>: Gran Desierto sand dunes, San Felipe desert (Sonora Desert)

❏ **Management objective**: Multiple

❏ **Type of management structure**: Conventional

❏ **Geographic coordinates**: 21°-22.5°N; 113°-116°W

❏ **World region**: Sub-tropical

❏ **Nearest major city**: San Diego, CA, and Mexicali, Mexico

GLOSSARY

Abiotic: Factors that are non-biological but play an important role in an organism's environment (e.g. substrate, temperature, currents, pH).

Abundance (of species): The number of individuals of a particular species occurring within a defined area.

Accountability: For this guidebook, this term implies the state of being accountable, subject to the obligation to report, explain or justify the establishment of an MPA, its achievements and failures, and the resources (material, financial, and human) spent for its functioning.

Adaptive management: The cyclical process of systematically testing assumptions, generating learning by evaluating the results of such testing, and further revising and improving management practices. The result of adaptive management in a protected area context is improved effectiveness and increased progress towards the achievement of goals and objectives.

Allocation of resources: The process of distributing resources among the various stakeholders or interested parties.

Assessment: See Evaluation. For the purpose of this guidebook, assessment and evaluation are used interchangeably, although we recognise that this term can be defined as the act of determining the importance, size or value of an object or process.

Audience: The participating, reading, viewing or listening public (the MPA stakeholders or group of interests).

Basemap: A map containing geographic features used for locational reference.

Benthic (species): An organism that lives and/or reproduces in the Benthic Zone.

Benthic (zone): A primary subdivision of the oceans that includes the entire sea bottom.

Biomass: The quantity of living matter (living organisms) expressed as unit of weight per unit area or unit volume.

Biota: The number of organisms that occupy an ecosystem.

Broken stick: A statistical model of random distribution of resources among species. It is as if a stick was broken into several pieces with no underlying relationships determining the size of each piece.

Code sheet: The translation of meaning of data collected and their codes.

Co-management: A partnership in which government and stakeholders share the authority and responsibility for making decisions about management of the resource. It may take many forms and involves a high degree of stakeholder participation.

Community (biophysical definition): A collection of different and interacting populations of organisms (biota) found living together in a defined geographic area, including indigenous and exotic organisms.

Community (human/social definition): A group of people with common interests (possibly living in a particular local area).

Community composition: The diversity and makeup of all species present within a community and their relative abundance (respective to one another). Species richness, dominance, diversity and relative abundance are all characteristics of community composition.

Community-based management: People-focused and community-focused management with a great deal of local stakeholder participation.

Control groups: A set of people used as a standard of comparison to the experimental group. The people in the control group have characteristics similar to those in the experimental group and are selected at random.

Cryptic (species): Species that for their characteristics (life-cycle, environmental requirements, feeding patterns, etc.) are hard to find, or can be considered rare.

Database: The storage location of a data entry. A collection of data organized especially for rapid search and retrieval.

Data cleaning: Reviews of the data set in order to check for completeness and errors.

Data coding: The process of translating each datum point to prepare for analysis.

Data entry: The (often lengthy and tedious) process of moving cleaned, coded data into a permanent storage location from which to export the data so that it can be analysed.

Data management: The act, process or means by which data is managed. This may include the compilation, storage, safe-guarding, listing, organization, extraction, retrieval, manipulation and dissemination of data (Lake and Water Word Glossary – http://www.nalms.org/glossary/glossary.htm).

Ecotone: A transition area between two distinct habitats, where the ranges of the organisms in each bordering habitat overlap, and where there are organisms unique to the transition area.

Environmental Impact Assessment: The assessment of the environmental impacts likely to arise from a major action (i.e. legislation, a policy,

a programme or project, etc.) significantly affecting the environment.

Evaluation: The judgement or assessment of achievement against some predetermined criteria; in this case the objectives for which the protected areas were established. Information on which such assessments can be based could come from many sources, but monitoring has a particularly important contribution to make in providing the basic data that should underpin the evaluation (Hockings *et al.*, 2000).

Evaluation workplan: A scheme of action, a method of proceeding planned in advance to perform an effectiveness evaluation (see Box 6).

Focal species: An organism of ecological and/or human value that is of priority interest for management through the MPA.

Food web: A representation of the energy flow through populations in a community.

Food web integrity: A measure of how supportive (for the members of the community) and reliable the trophic relationships are within the interconnected food chains of a community.

Formal knowledge: The degree of awareness of information generated by the scientific community and held by stakeholder and user groups about MPA use and ecosystem impacts.

Geographic Information System (GIS): An organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyse and display all forms of geographically referenced information that can be drawn from different sources, both statistical and mapped (EPA Terminology Reference System).

Goal: A broad statement of what the MPA is ultimately trying to achieve.

Habitat: The living space of an organism, population, or community, as characterized by both its biotic and physical properties. Habitat types are distinguished from one another by their distinct biotic and abiotic composition and structure that forms living space.

Habitat complexity: The extent (area in km^2) and diversity (number) of habitat types and distinct zones found within a specified area.

Habitat distribution: The structure and spatial characterization of all habitat types represented.

Habitat integrity: The extent to which the distribution and complexity of living space in an area will persist over time.

Indicator: A unit of information measured over time that allows you to document changes in specific attributes of your MPA. It helps you to understand where you are, where you are going and how far you are from the goal (adapted from Hockings *et al.*, 2000).

Intertidal (zone): Area located between the elevation of the lowest yearly tide and the elevation of the highest yearly tide.

Key informant: People with rank, experience or knowledge who can provide extensive insight information on a specific issue or situation (adapted from Bunce *et al.*, 2000).

Log-normal: A statistical model of distribution of resources among species determined by a number of interacting factors. This leads to a log-normal distribution in abundance classes, which means that the number of species falling within each class are plotted against the log value of the class category.

Management body: An institution (board of directors, executive committee, advisory board) that governs how the MPA is managed and used.

Management effectiveness: The degree to which management actions achieve the goals and objectives of a protected area.

Marine Protected Area (MPA): Any area of intertidal or subtidal terrain, together with its overlying waters 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 (IUCN).

Messaging: A process for sharing evaluation results with a target audience. It should consider which messages and what formats will be used to communicate the results.

Neritic (zone): The shallow regions of a lake or ocean that border the land. The term is also used to identify the biota that inhabits the water along the shore of a lake or ocean.

Non-market value: The economic value of activities that are not traded in any market, which includes direct uses, such as divers who have travelled to the MPA by private means; and indirect uses, such as biological support in the form of nutrients, fish habitat and coastline protection from storm surge.

Non-use value: Values that are not associated with any use and include existence value (the value of knowing that the resource exists in a certain condition), option value (the value of being able to use the resource in the future), and bequest value (the value of ensuring the resource will be available for future generations).

No-take zone: An area that is completely (or seasonally) free of all extractive or non-extractive

human uses that contribute impact (some exceptions are permitted for scientific/research activities). Also called a "reserve" or "fully protected area".

Objective: A specific statement of what must be accomplished to attain a related goal.

Ordinal scale: A measurement that represents a ranking of a variable's values to observe overall trends. The ranking provides an indication of whether one value is "greater than" or "less than" other values.

Outcomes: The consequences, effects or real impacts of management actions. Outputs assess the extent to which the management objectives are being achieved.

Outputs: Resulting products and/or services, or achievements of a planned work programme that arise from a management activity.

Participatory (Participation): A process involving/providing the opportunity for an individual person (every relevant stakeholder) to participate in management.

Phenology: Relations between environmental conditions (e.g. climate or temperature) and periodic biological events (e.g. reproduction).

Practitioner: Someone experienced in the technical skills and practice of conservation.

Qualitative (data): Non-numerical data, often in the form of categorical data (e.g. preference, opinion, attitudes, etc.)

Quantitative (data): Numerical data obtained by measuring objects or events.

Recruitment success: The degree of juvenile recruitment and survivorship experienced across populations of organisms that exist within a community.

Results delivery strategy: A method that outlines how to communicate the presentation formats identified and assigned to target audiences.

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Sedentary (species): An organism that lives in a fixed location, as with most plants, tunicates, sponges, etc.

Semi-structured interviews: An interview based on the use of a guide (e.g. notes or a questionnaire), but that has the freedom of an open conversation. It is recommended when there is only one chance to interview someone.

Sessile (species): Describes an animal that is unable to move, or does not move very much. Examples include coral, sponges, barnacles and sea squirts.

Stakeholder: An individual, group or organization that influences or is otherwise interested, involved or affected by a particular MPA management strategy.

Strategy: The way you will move forward with your conservation and management efforts; what it is that you will actually do.

Subtidal: Area below the low-tide level.

Survivorship: The survival rate (probability) from a (recruitment) process or event.

Telemetry: The use of radio waves, telephone lines, etc., to transmit the readings of measuring instruments to a device on which the readings can be indicated or recorded.

Threats: Those factors that immediately impact biodiversity, food security, and livelihood.

Trophic level: The stage in a food chain or web leading from primary producers through herbivores to primary and secondary consumers.

t-test: A statistical parametric test assuming a normal distribution. The t-test is appropriate when you have a single interval dependent and a dichotomous independent, and want to test the difference of means of a criterion variable for two independent samples or for two dependent samples (for more information see, for example, A. Agresti and B. Finlay, *Statistical Methods for the Social Sciences*. 3rd edition, 1997).

Other marine conservation books from IUCN
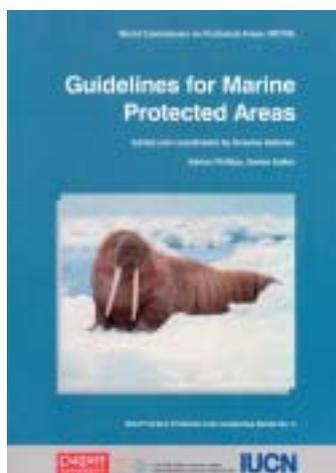
Guidelines for Marine Protected Areas

Edited and coordinated by Graeme Kelleher
Series editor: Adrian Phillips

Creation and effective management of Marine Protected Areas (MPAs) have lagged behind those of protected areas on land, but they are just as important. The world urgently needs a comprehensive system of MPAs to conserve biodiversity and to help rebuild the productivity of the oceans. The aim of these Guidelines is to help countries establish systems of MPAs as a key component of integrated management of coastal and marine areas and as part of their sustainable development. The various actions to make an effective MPA are set out, from early planning stages to implementation. These Guidelines aim to help policy-makers, planners and field managers, whether working on conservation of nature or sustainable use of marine resources.

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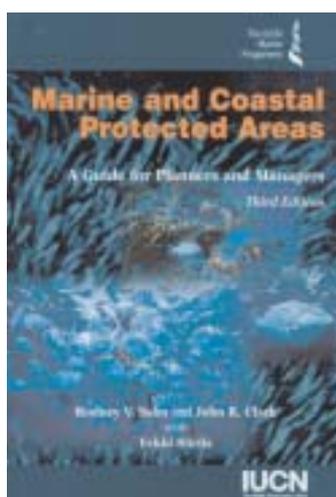
Marine and Coastal Protected Areas: A guide for planners and managers

Rodney Salm, John Clark and Erkki Siirila, 3rd Edition

This is a new edition of the classic textbook on marine protected area (MPA) management in the tropics, originally produced as an output of the Bali World Parks Congress in 1982.

Approaches to planning and managing MPAs have evolved considerably. Major advances include innovative financing mechanisms, partnerships with the private sector and NGOs, and collaborative management between government and coastal communities. These advances have brought new approaches for MPA establishment and management that are more participatory, involving communities through interaction and collaboration rather than prescription. With new case studies and illustrations, the guide comes in a water-resistant cover for field use. It is intended for those who plan individual and/or national MPA systems and gives philosophical context for MPAs along with some basic principles and approaches.

ISBN 2-8317-0540-1, 2000   260 x 155mm, 387pp., b/w photos
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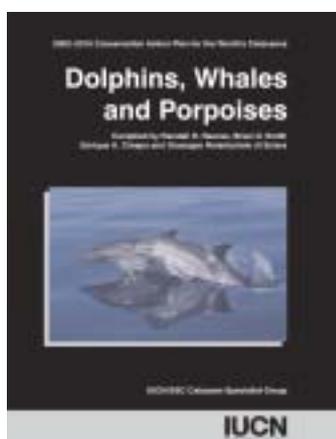
Dolphins, Whales and Porpoises

2002–2010 Conservation Action Plan for the World's Cetaceans
Compiled by Randall Reeves, Brian D. Smith, Enrique A. Crespo and Giuseppe Notarbartolo di Sciara and the IUCN/SSC Cetacean Specialist Group

Consistent evaluation and new recommendations for action are required of protective measures to address threats that were unrecognised or non-existent until recently. Global warming, noise pollution and reduced availability of prey are now of great concern.
The all too familiar threats of accidental killing in fishing gear and exposure to toxic chemicals remain almost intractable. This Action Plan reviews threats and offers possible solutions. It also contains a thorough review of the status of species and a list of 57 recommended research projects and education initiatives.

ISBN 2-8317-0656-4, 2003   280 x 215mm, xi + 139pp., tables, b/w photos
£15.00, US$22.50   Order no. B1157

# Visit the project website

http://effectiveMPA.noaa.gov

This website provides information on the WCPA-Marine/WWF MPA Management Effectiveness Initiative (MPA MEI). It is intended for MPA managers, the international MPA community, and the general public interested in tools for measuring management effectiveness of MPAs.

The website is divided in the following major categories:

- General information on the MPA MEI.

- A PDF version of the present guidebook.

- Demonstration case reports from four MPAs that field-tested a draft version of the guidebook.

- Key documents on MPAs and management effectiveness (links and downloads).

- Profiles of the pilot MPAs that participated in field-testing the draft guidebook.

- Links to relevant information, national and international, on the management effectiveness of MPAs.

- News and updated information on initiatives and projects related to MPA management effectiveness – with a section for users to submit news and comments.

The website is administered by NOAA/NOS International Programs. It will be updated periodically with news, events and information submitted by partners and the public. We invite everyone interested in being part of this initiative, as well as MPA managers interested in applying the guidebook and experience in their sites, to submit information or comments to mei_contact@noaa.gov.
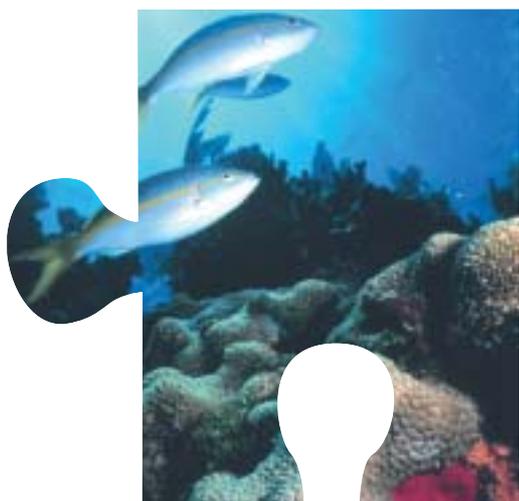
IUCN – The World Conservation Union

Founded in 1948, The World Conservation Union brings together States, government agencies and a diverse range of non-governmental organizations in a unique world partnership: over 1000 members in all, spread across some 140 countries.

As a Union, IUCN seeks to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

The World Conservation Union builds on the strengths of its members, networks and partners to enhance their capacity and to support global alliances to safeguard natural resources at local, regional and global levels.

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