

MODULE 6

MARINE PROTECTED AREA PLANNING

OBJECTIVE

To understand the planning process and requirements for the establishment of marine protected areas.

THEMES

- 6.1 Basis for Establishment of Marine Protected Areas
- 6.2 Institutional Arrangements for Marine Protected Area Management
- 6.3 Resource Assessment, Data Collection, and Mapping
- 6.4 Development of Zoning Plans
- 6.5 Management Plans
- 6.6 Operational Plans

DELIVERY TIME

3 Hours

MODULE 6	MARINE PROTECTED AREA PLANNING
THEME 1	Basis for Establishment of Marine Protected Areas
OBJECTIVE	<ol style="list-style-type: none">1. To introduce the policy frameworks within which marine protected areas are normally established.2. To clarify the conservation objectives for marine protected areas.
SIGNIFICANCE	Many of the problems related to lack of political or popular support that are experienced by protected areas result from not having management objectives that are linked to national policy frameworks and/or conservation objectives.
PRESENTATION	Lecture, Discussion
EQUIPMENT / MATERIALS	Overhead projector
EXERCISE	Group discussions
TIME	2 Hours

POLICY FRAMEWORK

At the **international level**, the policy framework is determined to a large extent by policy statements of IUCN (the World Conservation Union) (Kelleher & Kenchington, 1991) and the Convention on Biological Diversity, in particular its Jakarta Mandate (Anon., 1995). See Appendices 6.1-6.5.

According to IUCN policy, the primary goal of marine conservation and management is: *“To provide for the protection, restoration, wise use, understanding and enjoyment of the marine heritage of the world in perpetuity through the creation of a global, representative system of marine protected areas and through the management in accordance with the principles of the World Conservation Strategy of human activities that use or affect the marine environment”*.

The main elements of the IUCN policy statements are:

- a. Implementing integrated management strategies to achieve the objectives of the World Conservation Strategy;
- b. Involving all stakeholders in the development of these strategies; and
- c. Cooperative action to develop national systems of marine protected areas.

The CBD/Jakarta Mandate focuses on five thematic issues:

- a. Integrated Marine and Coastal Area Management;
- b. Sustainable use of marine and coastal living resources;
- c. Marine and coastal protected areas;
- d. Mariculture; and
- e. Alien species.

The CBD/Jakarta Mandate includes a Ministerial Statement which recognizes the critical need to address the conservation and sustainable use of marine and coastal biological diversity and a multi-year program of work on marine and coastal biological diversity. Other policy elements can be found in the World Heritage Convention and the Ramsar Convention.

EXERCISE 6.1

Ask participants to identify the main differences between the above-listed policies.

At the regional level, policy is determined primarily by the Cartagena Convention and its SPAW Protocol (Anon., 1990). See Appendix 6.6. Article 4 of the Protocol describes the policy for the establishment of protected areas as follows (text shortened by author): *Each Party shall, when necessary, establish protected areas to sustain the natural resources of the Wider Caribbean Region and to encourage ecologically sound and appropriate use, understanding and enjoyment of these areas.*

Such areas shall be established in order to conserve, maintain and restore, in particular:

- a. Representative types of coastal and marine ecosystems of adequate size to ensure their long-term viability and to maintain biological and genetic diversity;
- b. Habitats and their associated ecosystems critical to the survival and recovery of endangered, threatened or endemic species of flora and fauna;
- c. The productivity of ecosystems and natural resources that provide economic or social benefits and upon which the welfare of local inhabitants is dependent; and
- d. Areas of special biological, ecological, educational, scientific, historic, cultural, recreational, archaeological, aesthetic, or economic value, including in particular, areas whose ecological and biological processes are essential to the functioning of the Wider Caribbean ecosystems.

At the national level, policies with respect to MPAs are likely to be part of broader protected area policies, of national environmental strategies, or of a protected area system plan. National protected area system plans are called for under article 8 of the Convention on Biological Diversity. System planning aims at:

1. Defining the priority of protected areas as a worthwhile national concern; defining the relationships between (a) different units and categories of protected areas; and (b) protected areas and other relevant categories of land.
2. Taking a more strategic view of protected areas.
3. Defining roles of key players in relation to protected areas and the relationships between these players; this may include building support and a constituency for protected areas (i.e. as a means to that end, not as an end in itself).
4. Identifying gaps in protected area coverage (including opportunities and needs for connectivity) and deficiencies in management.

5. Identifying current and potential impacts - both those affecting protected areas from surrounding lands and those emanating from the protected areas which affect surrounding lands. (Davey, 1998).

EXERCISE 6.2

Participants will briefly review national policies for their respective countries.

OBJECTIVES

Objectives for MPAs have been defined by the 4th World Parks Congress (1992, Working Group III.2). See Appendix 6.7. These objectives appear to be closely related to the policy outlined in the SPAW Protocol. IUCN also gives conservation objectives for protected areas in general (McNeely *et al.*, 1994). See Appendix 6.8. Objectives for MPAs may vary depending on the overall goal of the area. Defining clear objectives at the outset of the planning process is essential to give direction to the design, management, legal, and institutional requirements of the MPA.

EXERCISE 6.3

Participants will list the objectives of the MPA with which they are most familiar.

CRITERIA FOR SELECTION OF MPAS

Salm and Clark (1984) provides a detailed list of criteria, with the following major headings: social criteria, economic criteria, ecological criteria, regional criteria, and pragmatic criteria. See Appendix 6.9.

Kelleher and Kenchington (1992) also provides a listing of criteria, while a similar version can be found in Kelleher *et al.* (1995). See Appendices 6.10 and 6.11. Kenchington and

Hudson (1988) provide a listing of questions and considerations that need to be addressed in order to determine realistic options for management of coral reef areas.

EXERCISE 6.4

Participants will identify selection criteria that have been or are being applied in their respective countries.

LEGAL ISSUES

The legal authority to establish MPAs must be anchored in legislation and is usually vested in a particular Minister or in Cabinet. However, the authority, as well as the legal procedures that lead up to the designation of MPAs, vary widely, depending on the status of the country (independent nation, semi-independent, Crown Colony, Overseas Department). In the independent English-speaking Caribbean nations, such authority is usually vested in Cabinet or in a particular Minister. The French Overseas Departments (DOM) and the Netherlands Antilles represent two extremes in terms of authority. In the French departments, the final designation of an MPA must be approved by the Minister of the Environment in Paris, whereas in the Netherlands Antilles that authority has been delegated entirely to the respective Island Governments.

Generally speaking, coastal and marine waters come under the public domain and can be considered as commons. However, in planning MPAs, possible traditional ownership or use rights must be carefully considered. In most countries the public domain includes a portion of the land adjacent to the waters. The extent of this public land varies among the different countries. Considering the importance for MPAs of being able to control land-based activities that may impact on the MPA, it is extremely relevant to research the legal status of the land immediately adjacent to the planned MPA.

In most countries, the enabling legislation for protected areas is a framework that authorizes the establishment of such areas. Such legislation may be separate conservation legislation, or it may be a part of fisheries or forestry legislation. The actual designation of protected areas and the establishment of rules and regulations are usually done at a lower level. This approach allows a measure of flexibility and facilitates amendments of regulations or zoning as may be required to respond to changing circumstances or uses.

EXERCISE 6.5

Participants will give a brief overview of national legislation and the processes that lead to the designation of a MPA.

MODULE 6	MARINE PROTECTED AREA PLANNING
THEME 2	Institutional Arrangements for Marine Protected Area Management
OBJECTIVE	To reinforce the concept that cooperation between several institutions is usually required for MPA management.
SIGNIFICANCE	Factors impacting on MPA management usually fall within the perview of several government agencies. Additionally, the activities of a number of NGOs may also impact on the MPA. Successful management is therefore dependent on the cooperation between these institutions.
PRESENTATION	Lecture, Discussion
EQUIPMENT / MATERIALS	Overhead projector
EXERCISE	Group discussions
TIME	2 Hours

ARRANGEMENTS FOR MARINE PROTECTED AREA MANAGEMENT

Few countries in the Wider Caribbean can afford to have completely separate agencies for the management of protected areas. In many instances that responsibility has been delegated to an existing agency such as a Forestry or Fisheries Division. In the case of Puerto Rico and the US Virgin Islands, protected areas are managed by an agency of the metropolitan government. In some countries, so-called statutory bodies (also known as para-statal) have been created to undertake responsibility for management. In a number of countries protected areas are managed by NGOs or jointly by Government agencies and NGOs. An overview of institutional arrangements for protected area management in the Caribbean can be found in Putney (1994). See also Appendix 6.12. It is interesting to note that none of the areas rated as “fully managed”, were administered by local government agencies (Putney, 1994).

Irrespective of the type of institutional arrangement for management, there is always a need for cooperation in planning, establishing and managing a MPA. The need for cooperation arises from the following considerations:

1. Government, the private sector, and user groups or individual users each has a stake in the resources that will be protected and managed through the MPA. The greater the involvement of all stakeholders in the planning process and the management, the better chances will be of broad support for the MPA, and consequently, of achieving the objectives for which the MPA was created.
2. There is often overlapping jurisdiction between government agencies, and cooperation will help to avoid conflict.
3. Resources for the planning, establishment and management of MPAs are limited, and pooling of resources alleviates the burden on a single agency.

A number of instruments for cooperation in MPA planning and management are available, and include:

- a. Legislation that prescribes the roles and responsibilities of the respective partners;
- b. Formal or informal memorandum of understanding (MOU); and
- c. Formal and binding collaborative management agreements between two or more partners (this is treated in the module on participatory planning).

Establishing collaborative agreements on paper is one thing; making them work in practice is the challenge. Guidelines for making them work include:

1. Establish mechanisms of effective communication among partners (this is a section of the module on participatory planning);
2. Establish a mechanism for conflict management;
3. Ensure involvement of all partners in decision making; and
4. Ensure credit sharing among all partners.

EXERCISE 6.6

Participants will review existing institutional arrangements for MPA planning and management and evaluate these as to their advantages and disadvantages.

MODULE 6	MARINE PROTECTED AREA PLANNING
THEME 3	Resource Assessments, Data Collection, and Mapping
OBJECTIVE	To emphasise the importance of resource information in the planning process.
SIGNIFICANCE	Successful MPA management is dependent to a large extent on the degree of coverage of important resources, which itself is determined by the resource information used in the planning and design of the site.
PRESENTATION	Lecture, Discussion, Group exercise
EQUIPMENT / MATERIALS	Overhead projector
EXERCISE	Group discussions
TIME	3 Hours

RESOURCE ASSESSMENTS, DATA COLLECTION, AND IMAPPING

EXERCISE 6.7

Assume a hypothetical situation where there is a need to design a system of MPA's in an island archipelago, but where no information is available on the marine environment and its resources. How would you approach this?

The hypothetical situation as described above is probably non-existent, since most of the time there will be some idea of the areas that should be protected. However, the boundaries may need to be defined, and the kind of activities that can be permitted in all or parts of the area may need to be determined. In other words, the following main questions need to be answered:

1. What is the extent and distribution of the different ecosystems and habitats in the area?
2. What is the condition of these systems and habitats?
3. What are the most important functions of these systems and habitats?
4. How are they being used and by whom and when?

Even in well-studied areas, the available information and data is usually incomplete. There is a need to identify the gaps and determine which information is absolutely essential in order to design the MPA or system of MPAs. Most likely there will be a compromise between what ideally should be known and what time and resources permits. **The establishment of a MPA should not be postponed because of the impression of having insufficient data., if such postponement could lead to serious degradation of resources or endangering species, or if it could lead to the loss of an opportunity.**

The process of information gathering can be summarized as follows:

1. Determine the information needs;
2. Compile available information from published literature and unpublished reports;
3. Identify information gaps;
4. Determine the most suitable data collection methods;
5. Collect data; and
6. Analyze and map data.

The information needs will vary considerably between areas and are obviously dependent on the complexity of an area, the uses and threats, and how well the area has been studied. Three types of information can be identified: resource information (data on the occurrence, distribution and condition of biological resources), physical information (water quality, oceanographic data) and social and economic information (uses, threats, conflicts).

The resource information needs may include:

1. Occurrence and characteristics of coral reefs and coral communities (location, extent, number of hard coral species, percent live coral cover).
2. Occurrence and characteristics of seagrass beds (location, extent, number of species, percent cover).
3. Occurrence and characteristics of mangrove forests (location, extent, number of species, tree height and diameter).
4. Characteristics of reef fish populations (census of commercially important species, presence of indicator species, calculation of biomass).
5. Occurrence of endangered species (what species, location).
6. Occurrence of migratory species (what species, location, period).
7. Occurrence of habitats critical to the survival of species (breeding, feeding, nesting, roosting, nursery).
8. Occurrence of archaeological and historical resources (shipwrecks, artifacts, etc.).

When collecting field data, the use of a global positioning system (GPS) is highly recommended.

Physical information is usually not critical to the planning and design of MPAs, although it is often useful to have information on:

- a. Water quality (especially when water quality is suspected to be affected by sewage or industrial pollution); and
- b. Current regimes (may determine distribution of species, dispersal of larvae and recruitment of certain species).

Social and economic information needs may include:

- ◆ Fishing (methods, location, number of fishers, number of boats, species targeted).
- ◆ Recreation and tourism (type of activity, numbers, location).
- ◆ Traffic (ships' movements, both commercial and recreational).
- ◆ Waste disposal (solid and liquid, location, type).
- ◆ Sand mining (location, extent).
- ◆ Industrial activities (type, location).
- ◆ Traditional use rights (type, location).
- ◆ Identification of stakeholders.

The next step includes the mapping and analysis of the information. First of all, a good base map needs to be prepared. The use of GIS is highly recommended, but if this is not available, manual mapping techniques will also be quite acceptable. One map will be prepared for each parameter (e.g. a map for the distribution of coral reefs, a map for trap fishing, a map for dive sites, etc.). In GIS, each parameter will be one layer that can be superimposed on other layers. In manual mapping, each parameter should be mapped on transparency film so that they can be overlaid and projected on an overhead projector for further analysis.

The maps will show how the resources are distributed, how they are being used, and where endangered species and critical habitats are situated. The resource information maps will provide the basis for determining the size and boundaries of the MPA. The overlay mapping will show us where impacts or potential impacts on the resources occur and where conflicts between different user groups occur.

MODULE 6	MARINE PROTECTED AREA PLANNING
THEME 4	Developing Zoning Plans
OBJECTIVE	To introduce the concept of allocation of resource and resource use on a spatial basis.
SIGNIFICANCE	Successful MPA management often involves the allocation of resource use or activities to well-defined areas.
PRESENTATION	Lecture, Group exercise
EQUIPMENT / MATERIALS	Overhead projector, maps of an MPA
EXERCISE	Preparation of a zoning plan
TIME	4.5 Hours

DEVELOPING ZONING PLANS

The establishment of MPAs should not be a goal in itself. The ultimate goal is the management and wise use of marine and coastal resources. MPAs can serve as useful tools in the accomplishment of that goal, while trying to establish integrated coastal area management (ICAM) programmes. The development of ICAM programs is a slow process because there are so many conflicting interests in the coastal zone. Following this line of thought, the next best approach to ICAM is to try and establish MPAs as large as possible, and zone them to allow for a range of activities and uses.

Zoning in the context of protected areas can best be defined as ‘spatial or temporal allocation of specific uses and activities to well-defined areas within a protected area.’ Zoning can fulfill a number of different functions, including:

- ◆ Protect the ecosystem, of species, or of the habitat critical to the survival of species;
- ◆ Provide a buffer between managed and unmanaged areas;
- ◆ Manage resource uses;
- ◆ Reduce or eliminate conflict between resource users; and
- ◆ Reserve areas for specific purposes such as research and education.

The maps that have been produced as part of the resource assessment and data collection process are going to be the base of the zoning plan. Overlaying these‘ maps in various combinations will show us where threats, impacts, and conflicts are occurring. In fact a zoning plan almost dictates itself, once the required information is there and the overlay mapping process is carried out.

There are no rules or restrictions as to the kinds and numbers of zones one may apply. Examples of zoning are available, of course, but MPA planners have complete freedom as to designing a zoning system that suits their area best. **However, stakeholder involvement and public consultation, with a view to consensus building, should take place from the very beginning of the planning process.**

EXERCISE 6.8

Participants will receive a series of resource maps and use maps for a proposed MPA, which they will use to develop a draft zoning plan. The draft zoning plan will be presented at a stakeholder meeting in a role playing exercise.

MODULE 6	MARINE PROTECTED AREA PLANNING
THEME 5	Management Plans
OBJECTIVE	To introduce the steps in management planning, using different management plans as case references.
SIGNIFICANCE	Management planning is required to ensure successful MPA management.
PRESENTATION	Lecture, Discussion, Group exercise
EQUIPMENT / MATERIALS	Overhead projector, Copies of management plans
EXERCISE	Group discussion
TIME	3 Hours

MANAGEMENT PLANS

Management includes a series of decisions, actions and activities that will result in achieving the objectives of the MPA. In order to manage effectively and efficiently, planning is required. What are the tasks that need to be carried out as part of the management process, what resources need to be allocated to carrying out these tasks, by whom will they be carried out, how and when? All of these questions will be addressed in the management plan.

Although the concept of management planning is widely accepted, there is a high incidence of management plans that bear little resemblance to what is actually happening in the area to which they refer. Kenchington and Ch'ng (1994) mention the following reasons for this:

1. MPA staff has not been involved in preparing the plan and therefore has no feeling of “ownership”;
2. The users have had no input or opportunity to comment on the provisions of the plan;
3. The plan has no legal status and can therefore be over-ridden or ignored at a variety of decision-making levels in the organization;
4. The plan has been written to satisfy a legal requirement and not a management need; and
5. The plan has no built-in procedures for review and evaluation.

These factors must be taken into account at the outset of the management planning process to ensure that the plan becomes a useful document.

There is no single “ideal” model for a management plan. It is therefore best to analyze several existing management plans, to identify the elements of these plans that are applicable to a particular situation, and then develop a revised model. Kelleher and Kenchington (1991) provide a comprehensive model for a management plan that will be useful to most MPA planners and managers (see Appendix 6.13). The simpler model of Salm and Clark (1984) is attached as Appendix 6.14. Appendices 6.15-6.20 give examples of the analysis of several existing management plans, and Appendix 6.21 is the model that was developed on the basis of this analysis and the model by Kelleher and Kenchington (1991) for the marine parks in Kenya.

The legitimacy and authority for developing management plans will generally be based on legislation. The requirements of the planning process will therefore be determined by the

authorizing legislation. Kenchington (1990) distinguishes five phases in the planning process:

1. Initial or pre-management information gathering and preparation;
2. Public participation or consultation prior to the preparation of a plan;
3. Preparation of draft plan;
4. Public participation or consultation to review the draft plan; and
5. Plan finalization (this should include the approval and adoption of the plan by the authority as specified in the legislation).

EXERCISE 6.9

Participants will review several management plan models, and develop a model that is most applicable to a MPA with which they are familiar. They will identify the goals and objectives for management, the major management issues and actions to address these, and recommend procedures for review and evaluation.

A less well-known management planning process is the Limits of Acceptable Change (LAC) process, originally developed for North American terrestrial wilderness settings. The process has been modified somewhat to suit the context of MPAs (Stankey & McCool, 1996 Appendix 6.22), and has been applied for the first time to a marine park (Schultz *et al.*, 1999). The LAC process consists of 10 steps, which include determining the essential values or attributes of the area, the goals and objectives of the MPA, determining the “desired” conditions for the attributes, identify indicators for the desired conditions, determine standards against which change can be measured, develop a monitoring program to detect change, and determine management interventions if limits of acceptable change are exceeded. The key factor in the LAC planning process is the stakeholder involvement and consensus building about all steps, including the management interventions.

MODULE 6
THEME 6
OBJECTIVE
SIGNIFICANCE
PRESENTATION
EQUIPMENT / MATERIALS
EXERCISE
TIME

MARINE PROTECTED AREA PLANNING

Operational Plans

To reinforce the concept that management plans have to be translated into operational plans, which are then used for the day-to-day management of the MPA.

The achievement of management objectives is dependent on the practical guides developed to implement management plans.

Lecture, Group discussion

Overhead projector

N/A

1 Hour

OPERATIONAL PLANS

The purpose of operational plans is to provide practical guidance for the implementation of management plans. Operational plans may have the form of annual or biannual work plans. There is no prescribed format for operational plans, but they need to make clear to all MPA staff who is supposed to do what, where, when and with what resources or means. Since many operational tasks are routine, some MPAs have developed “Management Manuals”, which describe all tasks and functions in detail. Such manuals should include two sets of tables: one which lists all tasks with frequency and responsible staff persons, and another which is a calendar of daily, weekly, monthly, etc. tasks. Such manuals are particularly useful in MPAs where frequent staff changes take place. They can provide guidance to all staff.

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APPENDIX 6.1: Jakarta Mandate, Background

In December 1994, at its first meeting held at the Bahamas, the Conference of the Parties (COP) to the Convention requested its Subsidiary Body on Scientific Technical and Technological Advice (SBSTTA) to advise on scientific, technical and technological aspects of the conservation and sustainable use of marine and coastal biological diversity.

SBSTTA considered this item at its first meeting (SBSTTA-I), held in Paris in September 1995, and produced recommendations I/8 on scientific, technical and technological aspects of the conservation and sustainable use of marine and coastal biological diversity.

At its second meeting held in Jakarta in November 1995, COP adopted decision II'10 on the conservation and sustainable use of marine and coastal biological diversity, supporting selected recommendations among the ones produced by SBSTTA-I, and subject to additional conclusions by COP, which are reported in Annex I to decision IWO). At the same occasion, the Ministerial Statement on the implementation of the Convention on Biological Diversity referred to a new global consensus on the importance of marine and coastal biological diversity as the "Jakarta Mandate on Marine and Coastal Biological Diversity."

Furthermore, through decision II/10, the Conference of the Parties requested the Executive Secretary of the Convention to provide, in accordance with Annex II to the decision, SBSTTA with advice and options for recommendations to COP in further elaborating the recommendations of SBSTTA-1. This annex also referred to annual reports to SBSTTA to be produced by the Executive Secretary to the Convention, as part of further work of the Secretariat on marine and coastal biological diversity. The first report will include a three-year work plan.

In accordance with decision II/IO, the Executive Secretary established a Roster of Experts on Marine and Coastal Biological Diversity, on the basis of country input; and convened, drawing from the Roster, the First Meeting of the Group of Experts on Marine and Coastal Biological Diversity (Jakarta, March 1997).

The outcome of this meeting provided the basis for the elaboration by the Executive Secretary of a three-year programme of work on marine and coastal biological diversity. This programme of work was considered and amended by SBSTTA at its third meeting, held in Montreal in September 1997. The meeting produced a recommendation including consideration of a draft three-year work plan on marine and coastal biological diversity.

Based on the recommendations of SBSTTA, the Conference of the Parties adopted at its fourth meeting (Bratislava, May 1998) decision IV/S on the conservation and sustainable use

of marine and coastal biological diversity, including a multi-year programme of work arising from decision II/10. (The decision also contains two sections specifically addressing the issue of coral reefs and the special needs and considerations of Small Island Developing States in the implementation of the programme of work.)

APPENDIX 6.2: Jakarta Mandate, Thematic Issues

Within the Jakarta Mandate, five thematic issues have been identified:

- ◆ Integrated Marine and Coastal Area Management;
- ◆ Sustainable Use of Marine and Coastal Living Resources;
- ◆ Marine and Coastal Protected Areas;
- ◆ Mariculture; and
- ◆ Alien Species.

APPENDIX 6.3: Jakarta Mandate, Ministerial Statement

THE JAKARTA MINISTERIAL STATEMENT ON THE IMPLEMENTATION OF THE CONVENTION ON BIOLOGICAL DIVERSITY

WE, THE MINISTERS PARTICIPATING IN THE MINISTERIAL SEGMENT OF THE SECOND MEETING OF THE CONFERENCE OF THE PARTIES TO THE CONVENTION ON BIOLOGICAL DIVERSITY, HELD IN JAKARTA, INDONESIA, ON 14 AND 15 NOVEMBER 1995;

1. REALIZE that biological diversity that comprises variability of genes, species and ecosystems is the world's most valuable resource for the sustainability and welfare of all humankind;
2. NOTE that this second meeting of the Conference of the Parties coincides with the commemoration of the fiftieth anniversary of the Republic of Indonesia's independence and of the creation of the United Nations Organization, and RECOGNIZE that such a historic moment offers an unequalled opportunity to further strengthen multilateral cooperation for promoting the objectives of the Convention on Biological Diversity for the benefit of present and future generations,
3. REAFFIRM the Convention as the legal instrument to advance the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the use of genetic resources;
4. REGARD the Convention as a treaty with a global vision based on common concern and mutual assistance, recognition and articulation of national sovereignty over their own biological resources, particularly genetic resources, and recognition of national responsibility for conservation of biological diversity and for using biological resources sustainably and for creating conditions to facilitate access to genetic resources;
5. FURTHER RECOGNIZE that the Convention is based on mutual reliance and fair and equitable sharing of benefits for the prosperity of humankind;
6. REAFFIRM that, by becoming Parties to the Convention, our Governments have committed themselves to the Convention's objectives and its provisions;

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7. REAFFIRM the Convention as a global partnership, based on mutual assistance and international cooperation to achieve the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, for the benefit of present and future generations;
 8. REAFFIRM ALSO that the second meeting of the Conference of the Parties to the Convention on Biological Diversity provides the momentum for global agreement relating to the implementation of Article 19, paragraph 3, of the Convention on the consideration of the need for and modalities of a protocol on the safe transfer, handling and use of any living modified organism resulting from biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity;
 9. RECOGNIZE the urgency of the task we face, and the individual and collective responsibilities of Parties to the Convention for the implementation of biological diversity conservation, sustainable use and sharing of benefits for the equitable welfare of all people;
 10. AWARE of the need for more information and knowledge regarding biological diversity at all levels, and the need to implant the value of biological diversity in the minds and hearts of all people, STRESS the importance of promoting education on biological diversity at all levels of formal and non-formal education systems;
 11. FURTHER REAFFIRM the importance of the clearing-house mechanism for technical and scientific cooperation in support of the implementation of the Convention at national level and emphasize the need for its accessibility to all countries;
 12. ENCOURAGE the Convention, through its relevant organs, to strengthen relationships with other relevant conventions and processes, including the Commission on Sustainable Development and its Intergovernmental Panel on Forests;
 13. WELCOME the establishment of a position within the Secretariat of the Convention on Biological Diversity on all issues pertaining to the implementation of Article 80) of the Convention related to indigenous and local communities;
 14. REAFFIRM that there is a critical need for the Conference of the Parties to address the conservation and sustainable use of marine and coastal biological diversity, and urge Parties to initiate immediate action to implement the decisions adopted on this issue. In this context, WELCOME the commitment of the Government of the Republic of Indonesia to play a major role in facilitating such implementation at the global and regional level and the declaration by the Conference of the Parties of the new global consensus on the importance of marine and coastal biological diversity as the "Jakarta Mandate on Marine and Coastal Biological Diversity";

15. FURTHER ENCOURAGE the Conference of the Parties, through its relevant organs, to actively assist Parties to fulfill their obligations, especially through cooperation, collaboration and partnership;

16. URGE the international community to continue to take action and make every effort to assist developing countries to build their own institutional capacity, including human resource development, to conserve and use sustainable biological diversity including through in-situ and ex-situ conservation and to facilitate the transfer of technology in accordance with the provisions of the Convention;

17. URGE States involved in nuclear testing to take note of the views put forward by a significant number of Parties expressing their strong concern over the impacts of nuclear testing on biodiversity, in particular to the coastal and marine ecosystems.

APPENDIX 6.4: Jakarta Mandate, Multi-Year Programme of Work

Multi-Year Programme of Work on Marine and Coastal Biological Diversity

The fourth meeting of the Conference of the Parties to the Convention on biological Diversity (Bratislava, Slovakia, 4 - 15 May 1998) adopted decision IV/5 on conservation and sustainable use of marine and coastal biological diversity, including a programme of work.

The decision mainly consists of three parts, namely (i) programme of work arising from decision 11/10 - the Jakarta Mandate on Marine and Coastal Biological Diversity; (ii) issues related to coral reefs; and (iii) small island developing States (SIDS). A multi-year programme of work appears in the annex to the decision.

The programme of work aims to assist the implementation of the Jakarta Mandate at the national, regional and global level. It identifies key operational objectives and priority activities within the five key programme elements, namely: implementation of integrated marine and coastal area management, marine and coastal living resources, marine and coastal protected areas, mariculture and alien species and genotypes. It also provides a general element to encompass the coordination role of the Secretariat, the collaborative linkages required and the effective use of experts.

The ecosystem approach, precautionary principle, the importance of science, making full use of the roster of experts, the involvement of local and indigenous communities and three levels of programme implementation (national, regional and global) were identified by the Parties as the six basic principles for the implementation of the programme of work.

The primary basis for this programme of work is action at national and local levels. The Parties should, in accordance with Article 6 of the Convention, develop national strategies, plans and programmes in order to promote the conservation and sustainable use of marine and coastal biological diversity.

At the regional level, organizations, arrangements and bodies should be invited to coordinate activities relevant to the programme of work.

At the global level, the United Nations Environment Programme (UNEP) (including the Global International Water Assessment), the Food and Agriculture Organization of the United Nations (FAO), the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization IOC/UNESCO), the International Maritime Organization (IMO), the United Nations and other relevant bodies should be

encouraged to implement the programme of work. These organizations should be invited to inform the CBD on their efforts to implement the Convention.

The programme of work is the programme of work of the Parties and of the Secretariat. The main function of the Secretariat is to promote the implementation of specific activities and to perform an overall coordination role.

Activities associated with the programme of work should be cost-effective and efficient. Duplication of efforts will be avoided, and harmonization of respective programmes of work will be pursued through strong coordination between the Convention and other relevant bodies, with a particular view to the list of partner organizations mentioned in decision 11/10, paragraph 13, and the Convention on Wetlands of International Importance, especially as Waterfowl Habitat.

The detailed programme of work is contained in decision IV/5.

Secretariat of the
Convention on Biological Diversity

World Trade Centre,
393 St Jacques Street, Office 300,
Montreal, Quebec, Canada R2Y 1N9

APPENDIX 6.5: Jakarta Mandate, Decision II/10

Decision 11/10: CONSERVATION AND SUSTAINABLE USE OF MARINE AND COASTAL BIOLOGICAL DIVERSITY

The Conference of the Parties,

Recalling that the Conference of the Parties decided to address, at its second meeting, advice from the Subsidiary Body on Scientific, Technical and Technological Advice on the scientific, technical and technological aspects of -the conservation and sustainable use of marine and coastal biological diversity,

Being deeply concerned at the serious threats to marine and coastal biological diversity caused by factors including physical alteration, destruction and degradation of habitats, pollution, invasion of alien species, and over-exploitation of living marine and coastal resources,

1. *Takes note* of recommendation 1/8 on scientific, technical and technological aspects of the conservation and sustainable use of marine and coastal biological diversity, adopted by the first meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, held in Paris at the headquarters of the United Nations Educational, Scientific and Cultural Organization, from 4 to 8 September 1995, and;

(a) *Affirms* that it represents a solid basis for future elaboration of the issues presented;

(b) *Supports* the recommendations in paragraphs 10- 19 of recommendation 1/8, subject to Annex I of the present decision and its further elaboration by the Subsidiary Body on Scientific, Technical and Technological Advice and the Conference of the Parties;

(c) *Reaffirms* the importance of future work by the Subsidiary Body on Scientific, Technical and Technological Advice to provide a balanced perspective on the remaining issues presented by the recommendations in 1/8 and Annex I of the present decision relevant to the conservation and sustainable use of marine and coastal biodiversity;

2. *Encourages the use of* integrated marine and coastal area management as the most suitable framework for addressing human impacts on marine and coastal biological diversity and for promoting conservation and sustainable use of this biodiversity;

3. *Encourages* Parties to establish and/or strengthen, where appropriate, institutional, administrative, and legislative arrangements for the development of integrated management

of marine and coastal ecosystems, plans and strategies for marine and coastal areas, and their integration within national development plans;

4. *Takes note* of the recently finalized Food and Agriculture Organization of the United Nations Code of Conduct for Responsible Fisheries, the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and the Washington Declaration *and Global Programme of Action for the Protection of the Marine Environment from Land-based Activities*, and supports their implementation, including that by Parties, in ways that are consistent with, and conform to, the objectives of the Convention on Biological Diversity;

5. *Welcomes the* International Coral Reef Initiative as a means to address threats to coral reefs and *related ecosystems* and encourages participation in International Coral Reef Initiative activities to implement its Framework for Action;

6. *Reaffirms* that under Article 25 the Subsidiary Body on Scientific, Technical and Technological Advice is the only scientific, technical and technological authority under the Convention to provide advice to the Conference of the Parties;

7. *Instructs* the Executive Secretary to provide, in accordance with Annex H, the Subsidiary Body on Scientific, Technical and Technological Advice with scientific, technical, and technological advice and options for recommendations to the Conference of the Parties in further elaborating the recommendations contained in recommendation 1/8, with the exception of paragraphs 3 and 4;

8. *Offers* the Executive Secretary the following guidance for conducting the work described in paragraph 6:

(a) Solicit input from all Parties and, as appropriate, from other countries and relevant bodies;

(b) Establish, on the basis of country input, a roster of experts with specialization appropriate to the work described in paragraph 6;

(c) The roster will draw upon expertise from scientific, technical, technological, social, management, economic, policy, legal, and indigenous and traditional knowledge;

(d) Convene, as appropriate, meetings of experts, drawn from the roster to support the Secretariat in advancing the work described in paragraph 6. Each meeting shall be for a duration of no longer than five days, and shall be comprised of no more than 15 experts with

due regard to geographical representation and to the special conditions of least-developed countries and small island developing States;

9. *Welcomes* the offer from Indonesia to be host country for the first such meeting of Experts on Marine and Coastal Biological Diversity;

10. *Decides* to forward this decision and its annexes to the next session of the Commission on Sustainable Development for its information when considering its review of Agenda 2 1, chapter 17, on oceans;

11. *Decides* to forward this decision and annexes to the Global Environment Facility, other funding agencies and other relevant international bodies, to be taken into account in considering activities related to the conservation and sustainable use of marine and coastal biological diversity;

12. *Requests* the Executive Secretary, in consultation with the United Nations Office for Ocean Affairs and the Law of the Sea, to undertake a study of the relationship between the Convention on Biological Diversity and the United Nations Convention on the Law of the Sea with regard to the conservation and sustainable use of genetic resources on the deep seabed, with a view to enabling the Subsidiary Body on Scientific, Technical and Technological Advice to address at future meetings, as appropriate, the scientific, technical, and technological issues relating to bio-prospecting of genetic resources on the deep seabed;

13. *Invites* international and regional bodies responsible for legal instruments, agreements and programmes which address activities relevant to the conservation and sustainable use of marine and coastal biodiversity, including the United Nations General Assembly, the Food and Agriculture Organization of the United Nations, the United Nations Environment Programme, the International Maritime Organization, the United Nations Office for Ocean Affairs and the Law of the Sea, the United Nations Educational, Scientific and Cultural Organization including its Intergovernmental Oceanographic Commission, the World Conservation Union (IUCN), the Commission on Sustainable Development, the International Coral Reef Initiative, regional fisheries bodies, migratory species agreements, secretariats of regional agreements for the conservation of the marine environment and other relevant international and regional organizations and institutions, to review their programmes with a view to improving existing measures and developing new actions which promote conservation and sustainable use of marine biological diversity, taking into account the recommendations for action by the Parties to the Convention on Biological Diversity adopted by the Conference of the Parties at its second meeting, and provide information on their actions on a regular basis to the Conference of the Parties and, in a first instance, as soon as possible through the Executive Secretary. Furthermore, these various institutions are invited to cooperate with the Conference of the Parties through the Subsidiary Body on Scientific,

Technical and Technological Advice in planning and implementation of programmes affecting marine and coastal biological diversity, so as to reduce any unnecessary duplication or gaps in coverage;

14. *Decides* to request the Subsidiary Body on Scientific, Technical and Technological Advice to carry out a summary review at its next meeting of the first report from the Executive Secretary and to submit in its report to the Conference of the Parties its recommendation on the work of the Executive Secretary.

APPENDIX 6.6: SPAW Protocol of the Cartagena Convention

Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region

Adopted at Kingston on 18 January 1990

The Final Act of the Conference of Plenipotentiaries Concerning Specially Protected Areas and Wildlife in the Wider Caribbean Region

The Contracting Parties to this Protocol,

Being Parties to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, done at Cartagena de Indias on 24 March 1983,

Taking into account Article 10 of the Convention which requires the establishment of specially protected areas,

Having regard to the special hydrographic, biotic and ecological characteristics of the Wider Caribbean Region,

Conscious of the grave threat posed by ill-conceived development options to the integrity of the marine and coastal environment of the Wider Caribbean Region,

Recognizing that protection and maintenance of the environment of the Wider Caribbean Region are essential to sustainable development within the region,

Conscious of the overwhelming ecological, economic, aesthetic, scientific, cultural, nutritional and recreational value of rare or fragile ecosystems and native flora and fauna to the Wider Caribbean Region,

Recognizing that the Wider Caribbean Region constitutes an interconnected group of ecosystems in which an environmental threat in one part represents a potential threat in other parts,

Stressing the importance of establishing regional co-operation to protect and, as appropriate, to restore and improve the state of ecosystems, as well as threatened and endangered species and their habitats in the Wider Caribbean Region by, among other means, the establishment of protected areas in the marine areas and their associated ecosystems,

Recognizing that the establishment and management of such protected areas, and the protection of threatened and endangered species will enhance the cultural heritage and values of the countries and territories in the Wider Caribbean Region and bring increased economic and ecological benefits to them,

Have agreed as follows:

Article 1 DEFINITIONS

For the purposes of this Protocol:

- a. "Convention" means the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena, March 1983);
- b. "Action Plan" means the Action Plan for the Caribbean Environment Programme (Montego Bay, April 1981);
- c. "Wider Caribbean Region" has the meaning given to the term "the Convention area" in Article 2(1) of the Convention, and in addition, includes for the purposes of this Protocol:
 - i. waters on the landward side of the baseline from which the breadth of the territorial sea is measured and extending, in the case of water courses, up to the fresh water limit; and
 - ii. such related terrestrial areas (including watersheds) as may be designated by the Party having sovereignty and jurisdiction over such Areas;
- d. "Organization" means the body referred to in Article 2(2) of the Convention;
- e. "Protected area" means the areas accorded protection pursuant to article 4 of this Protocol;
- f. "Endangered species" are species or sub-species of fauna and flora, or their populations, that are in danger of extinction throughout all or part of their range and whose survival is unlikely if the factors jeopardizing them continue to co-operate;
- g. "Threatened species" are species or sub-species of fauna and flora , or their populations:
 - i. that are likely to become endangered within the foreseeable future throughout all or part of their range if the factors causing numerical decline or habitat degradation continue to operate; or
 - ii. that are rare because they are usually localized within restricted geographical areas or habitats or are thinly scattered over a more extensive range and which are potentially or actually subject to decline and possible endangerment or extinction.
- h. "Protected species" are species or sub-species of fauna and flora, or their populations, accorded protection pursuant to Article 10 of this Protocol;
- i. "Endemic species" are species or sub-species of fauna and flora, or their populations, whose distribution is restricted to a limited geographical area;
- j. "Annex I" means the annex to the Protocol containing the agreed list of species of marine and coastal flora that fall within the categories defined in Article 1 and that require the protection measures indicated in Article 11(1)(A). The annex may include terrestrial species as provided for in Article 1(c)(ii);
- k. "Annex II" means the annex to the Protocol containing the agreed list of species of marine and coastal fauna that fall within the category defined in Article 1 and that

- require the protection measures indicated in Article 11(1)(b). The annex may include terrestrial species as provided for in Article 1(c)(ii); and
1. "Annex III" means the annex to the Protocol containing the agreed list of species of marine and coastal flora and fauna that may be utilized on a rational and sustainable basis and that require the protection measures indicated in Article 11(1)(c). The Annex may include terrestrial species as provided for in Article 1(c)(ii).

Article 2 GENERAL PROVISIONS

1. This Protocol shall apply to the Wider Caribbean Region as defined in Article 1(c).
2. The provisions of the Convention relating to its Protocols shall apply to this Protocol, including in particular, paragraphs 2 and 3 of Article 3 of the Convention.
3. The present Protocol shall not apply to warships or other ships owned or operated by a State while engaged in government non-commercial service. Nevertheless, each Party shall ensure through the adoption of appropriate measures that do not hinder the operation or operational capacities of vessels they own or operate, that they adhere to the terms of the present Protocol in so far as is reasonable and feasible.

Article 3 GENERAL OBLIGATIONS

1. Each Party to this Protocol shall, in accordance with its laws and regulations and the terms of the Protocol, take the necessary measures to protect, preserve and manage in a sustainable way, within areas of the Wider Caribbean Region in which it exercises sovereignty, or sovereign rights or jurisdiction:
 - a. areas that require protection to safeguard their special value; and
 - b. threatened or endangered species of flora and fauna.
2. Each Party shall regulate and, where necessary, prohibit activities having adverse effects on these areas and species. Each Party shall endeavour to co-operate in the enforcement of these measures, without prejudice to the sovereignty, or sovereign rights or jurisdiction of other Parties. Any measures taken by such Party to enforce or to attempt to enforce the measures agreed pursuant to this Protocol shall be limited to those within the competence of such Party and shall be in accordance with international law.
3. Each Party, to the extent possible, consistent with each Party's legal system, shall manage species of fauna and flora with the objective of preventing species from becoming endangered or threatened.

Article 4 ESTABLISHMENT OF PROTECTED AREAS

1. Each Party shall, when necessary, establish protected areas in areas over which it exercises sovereignty, or sovereign rights or jurisdiction, with a view to sustaining the natural resources of the Wider Caribbean Region, and encouraging ecologically sound and appropriate use, understanding and enjoyment of these areas, in accordance with the objectives and characteristics of each of them.
2. Such areas shall be established in order to conserve, maintain and restore, in particular:
 - a Representative types of coastal and marine ecosystems of adequate size to ensure their long-term viability and to maintain biological and genetic diversity;
 - b Habitats and their associated ecosystems critical to the survival and recovery of endangered, threatened or endemic species of flora or fauna;
 - c The productivity of ecosystems and natural resources that provide economic or social benefits and upon which the welfare of local inhabitants is dependent: and
 - d Areas of special biological, ecological, educational, scientific, historic, cultural, recreational, archaeological, aesthetic, or economic value, including in particular, areas whose ecological and biological processes are essential to the functioning of the Wider Caribbean ecosystems.

Article 5 PROTECTION MEASURES

1. Each Party taking into account the characteristics of each protected area over which it exercises sovereignty, or sovereign rights or jurisdiction, shall, in conformity with its national laws and regulations and with international law, progressively take such measures as are necessary and practicable to achieve the objectives for which the protected area was established.
2. Such measures should include, as appropriate:
 - a the regulation or prohibition of the dumping or discharge of wastes and other substances that may endanger protected areas;
 - b the regulation or prohibition of coastal disposal or discharges causing pollution, emanating from coastal establishments and developments, outfall structures or any other sources within their territories;
 - c the regulation of the passage of ships, of any stopping or anchoring, and of other ship activities, that would have significant adverse environmental effects on the protected area, without prejudice to the rights of innocent passage, transit passage, archipelagic sea lanes passage and freedom of navigation, in accordance with international law;

- d the regulation or prohibition of fishing, hunting, taking or harvesting of endangered or threatened species of fauna and flora and their parts or products;
- e the prohibition of activities that result in the destruction of endangered or threatened species of fauna or flora and their parts and products, and the regulation of any other activity likely to harm or disturb such species, their habitats or associated ecosystems;
- f the regulation or prohibition of the introduction of non- indigenous species;
- g the regulation or prohibition of any activity involving the exploration or exploitation of the sea-bed or its subsoil or a modification of the sea-bed profile:
- h the regulation or prohibition of any activity involving modification of the profile of the soil that could affect watersheds, denudation and other forms of degradation of watersheds, or the exploration or exploitation of the subsoil of the land part of a marine protected area:
- i the regulation of any archaeological activity and of the removal or damage of any object which may be considered as an archaeological object:
- j the regulation or prohibition of trade in, and import and export of threatened or endangered species of fauna or their parts, products, or eggs, and of threatened or endangered species of flora or their parts or products, and archaeological objects that originate in protected areas;
- k the regulation or prohibition of industrial activities and of other activities which are not compatible with the uses that have been envisaged for the area by national measures and/or environmental impact assessments pursuant to Article I-J:
- l the regulation of tourist and recreational activities that might endanger the ecosystems of protected areas or the survival of threatened or endangered species of flora and fauna: and
- m any other measure aimed at conserving, protecting or restoring natural processes, ecosystems or populations for which the protected areas were established.

Article 6 PLANNING AND MANAGEMENT REGIME FOR PROTECTED AREAS

1. In order to maximize the benefits from protected areas and to ensure the effective implementation of the measures set out in Article 5, each Party shall adopt and implement planning, management and enforcement measures for protected areas over which it exercises sovereignty, or sovereign rights or jurisdiction. In this regard, each Party shall take into account the guidelines and criteria formulated by the Scientific

- and Technical Advisory Committee as provided for in Article 21 and which have been adopted by meetings of the Parties.
2. Such measures should include:
 - a. the formulation and adoption of appropriate management guidelines for protected areas;
 - b. the development and adoption of a management plan that specifies the legal and institutional framework and the management and protection measures applicable to an area or areas;
 - c. the conduct of scientific research on, and monitoring of, user impacts, ecological processes, habitats, species and populations; and the undertaking of activities aimed at improved management;
 - d. the development of public awareness and education programmes for users, decision-makers and the public to enhance their appreciation and understanding of protected areas and the objectives for which they were established;
 - e. the active involvement of local communities, as appropriate, in the planning and management of protected areas, including assistance to, and training of local inhabitants who may be affected by the establishment of protected areas;
 - f. the adoption of mechanisms for financing the development and effective management of protected areas and facilitating programmes of mutual assistance;
 - g. contingency plans for responding to incidents that could cause or threaten to cause damage to protected areas including their resources;
 - h. procedures to permit, regulate or otherwise authorize activities compatible with the objectives for which the protected areas were established; and
 - i. the development of qualified managers, and technical personnel, as well as appropriate infrastructure.

Article 7 CO-OPERATION PROGRAMME FOR, AND LISTING OF, PROTECTED AREAS

1. The Parties shall establish co-operation programmes within the framework of the Convention and the Action Plan and in accordance with their sovereignty, or sovereign rights or jurisdiction to further the objectives of the Protocol.
2. A co-operation programme will be established to support the listing of protected areas. It will assist with the selection, establishment, planning, management and conservation of protected areas, and shall create a network of protected areas. To this end, the Parties shall establish a list of protected areas. The Parties shall:
 - a. recognize the particular importance of listed areas to the Wider Caribbean Region:

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- b. accord priority to listed areas for scientific and technical research pursuant to Article 17:
 - c. accord priority to listed areas for mutual assistance pursuant to Article 18: and
 - d. not authorize or undertake activities that would undermine the purposes for which a listed area was created.
3. The procedures for the establishment of the list of protected areas are as follows:
 - a. The Party that exercises sovereignty, or sovereign rights or jurisdiction over a protected area shall nominate it to be included in the list of protected areas. Such nominations will be made in accordance with the guideline and criteria concerning the identification, selection, establishment, management, protection and any other matter adopted by the Parties pursuant to Article 21. Each Party nomination shall provide the Scientific and Technical Advisory Committee through the Organization with the necessary supporting documentation, including in particular, the information noted in Article 19(2): and
 - b. After the Scientific and Technical Advisory Committee evaluates the nomination and supporting documentation, it will advise the Organization as to whether the nomination fulfills the common guidelines and criteria established pursuant to Article 21. If these guidelines and criteria have been met, the Organization will advise the Meeting of Contracting Parties who will include the nomination in the List of Protected Areas.

Article 8 ESTABLISHMENT OF BUFFER ZONES

Each Party to this Protocol may, as necessary, strengthen the protection of a protected area by establishing, within areas in which it exercises sovereignty, or sovereign rights or jurisdiction, one or more buffer zones in which activities are less restricted than in the protected area while remaining compatible with achieving the purposes of the protected area.

Article 9 PROTECTED AREAS AND BUFFER ZONES CONTIGUOUS TO INTERNATIONAL BOUNDARIES

1. If a Party intends to establish a protected area or a buffer zone contiguous to the frontier or to the limits of the zone of national jurisdiction of another Party, the two Parties shall consult each other with a view to reaching agreement on the measures to be taken and shall, inter alia, examine the possibility of the establishment by the other Party of a corresponding contiguous protected area or buffer zone or the adoption by

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- it of any other appropriate measures including co-operative management programmes.
2. If a Party intends to establish a protected area or a buffer zone contiguous to the frontier or to the limits of the zone of national jurisdiction of a State that is not a Party to this Protocol, the Party shall endeavour to work together with the competent authorities of that State with a view to holding the consultations referred to in paragraph 1.
 3. Whenever it becomes known to a Party that a non-Party intends to establish a protected area or a buffer zone contiguous to the frontier or to the limits of the zone of national jurisdiction of a Party to this Protocol the latter shall endeavour to work together with that State with a view to holding the consultations referred to in paragraph 1.
 4. If contiguous protected areas and/or buffer zones are established by one Party and by a State that is not a Party to this Protocol, the former should attempt, where possible, to achieve conformity with the provisions of the Convention and its Protocols.

Article 10 NATIONAL MEASURES FOR THE PROTECTION OF WILD FLORA AND FAUNA

1. Each Party shall identify endangered or threatened species of flora and fauna within areas over which it exercises sovereignty, or sovereign rights or jurisdiction, and accord protected status to such species. Each Party shall regulate and prohibit according to its laws and regulations, where appropriate, activities having adverse effects on such species or their habitats and ecosystems, and carry out species recovery, management, planning and other measures to effect the survival of such species. Each Party, in keeping with its legal system, shall also take appropriate actions to prevent species from becoming endangered or threatened.
2. With respect to protected species of flora and their parts and products, each Party, in conformity with its laws and regulations, shall regulate, and where appropriate, prohibit all forms of destruction and disturbance, including the picking, collecting, cutting, uprooting or possession of, or commercial trade in, such species.
3. With respect to protected species of fauna, each Party, in conformity with its laws and regulations, shall regulate, and where appropriate, prohibit:
 - a. the taking, possession or killing (including, to the extent possible, the incidental taking, possession or killing or commercial trade in such species or their parts or products; and
 - b. to the extent possible, the disturbance of wild fauna, particularly during the period of breeding, incubation, estivation or migration, as well as other periods of biological stress.

4. Each Party shall formulate and adopt policies and plans for the management of captive breeding of protected fauna and propagation of protected flora.
5. The Parties shall, in addition to the measures specified in paragraph co-ordinate their efforts, through bilateral or multilateral actions, including if necessary, any treaties for the protection and recovery of migratory species whose range extends into areas under their sovereignty, or sovereign rights or jurisdiction.
6. The Parties shall endeavour to consult with range States that are not Parties to this Protocol, with a view to co-ordinating their efforts to manage and Protect endangered or threatened migratory species.
7. The Parties shall make provisions, where possible, for the repatriation of protected species exported illegally. Efforts should be made by Parties to reintroduce such species to the wild, or if unsuccessful, make provision for their use in scientific studies or for public education purposes.
8. The measures which Parties take under this Article are subject to their obligations under Article 11 and shall in no way derogate from such obligations.

Article 11 CO-OPERATIVE MEASURES FOR THE PROTECTION OF WILD
FLORA AND FAUNA

1. The Parties shall adopt co-operative measures to ensure the protection and recovery of endangered and threatened species of flora and fauna listed in Annexes I, II and III of the present Protocol.
 - a. The Parties shall adopt all appropriate measures to ensure the protection and recovery of species of flora listed in Annex I. For this purpose, each Party shall prohibit all forms of destruction or disturbance, including the picking, collecting, cutting, uprooting or possession of, or commercial trade in such species, their seeds, parts or products. They shall regulate activities, to the extent possible, that could have harmful effects on the habitats of the species.
 - b. Each Party shall ensure total protection and recovery to the species of fauna listed in Annex II by prohibiting:
 - i. the taking, possession or killing (including, to the extent possible, the incidental taking, possession or killing) or commercial trade in such species, their eggs, parts or products;
 - ii. to the extent possible, the disturbance of such species, particularly during periods of breeding, incubation or migration, as well as other periods of biological stress.
 - c. Each Party shall adopt appropriate measures to ensure the protection and recovery of the species of flora and fauna listed in Annex III and may regulate the use of such species in order to ensure and maintain their populations at the highest possible levels. With regard to the species listed in Annex III, each

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- Party shall, in co-operation with other Parties, formulate, adopt and implement plans for the management and use of such species, including:
- i. for species of fauna:
 - a. the prohibition of all non-selective means of capture, killing, hunting and fishing and of all actions likely to cause local disappearance of a species or serious disturbance of its tranquility;
 - b. the institution of closed hunting and fishing seasons and of other measures for maintaining their population;
 - c. the regulation of the taking, possession, transport or sale of living or dead species, their eggs, parts or products;
 - ii. For species of flora, including their parts or products, the regulation of their collection, harvest and commercial trade.
2. Each Party may adopt exemptions to the prohibitions prescribed for the protection and recovery of the species listed in Annexes I and II for scientific or management purposes necessary to ensure the survival of the species or to prevent significant damage to forests or crops. Such exemptions shall not jeopardize the species and shall be reported to the Organization in order for the Scientific and Technical Advisory Committee to assess the pertinence of the exemptions granted.
 3. The Parties also shall:
 - a. accord priority to species contained in the annexes for scientific and technical research pursuant to Article 17;
 - b. accord priority to species contained in the annexes for mutual assistance pursuant to Article 18.
 4. The procedures to amend the annexes shall be as follows:
 - a. any Party may nominate an endangered or threatened species of flora or fauna for inclusion in or deletion from these annexes, and shall submit to the Scientific and Technical Advisory Committee, through the Organization, supporting documentation, including, in particular, the information noted in Article 19. Such nomination will be made in accordance with the guidelines and criteria adopted by the Parties pursuant to Article 21;
 - b. the Scientific and Technical Advisory Committee shall review and evaluate the nominations and supporting documentation and shall report its views to the meetings of Parties held pursuant to Article 23;
 - c. the Parties shall review the nominations, supporting documentation and the reports of the Scientific and Technical Advisory Committee. A species shall be listed in the annexes by consensus, if possible, and if not, by a three-quarters majority vote of the Parties present and voting, taking fully into account the advice of the Scientific and Technical Advisory Committee that the nomination and supporting documentation meet the common guidelines and criteria established pursuant to Article 21;
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- d. a Party may, in the exercise of its sovereignty or sovereign rights, enter a reservation to the listing of a particular species in an annex by notifying the Depositary in writing within 90 days of the vote of the Parties. The Depositary shall, without delay, notify all Parties of reservations received pursuant to this paragraph;
 - e. a listing in the corresponding annex shall become effective 90 days after the vote for all Parties, except those which made a reservation in accordance with paragraph (d) of this Article; and
 - f. a Party may at any time substitute an acceptance for a previous reservation to a listing by notifying the Depositary, in writing. The acceptance shall thereupon enter into force for that Party.
5. The Parties shall establish co-operation programmes within the framework of the Convention and the Action Plan to assist with the management and conservation of protected species, and shall develop and implement regional recovery programmes for protected species in the Wider Caribbean Region, taking fully into account other existing regional conservation measures relevant to the management of those species. The Organization shall assist in the establishment and implementation of these regional recovery programmes.

Article 12 INTRODUCTION OF NON-INDIGENOUS OR GENETICALLY ALTERED SPECIES

Each Party shall take all appropriate measures to regulate or prohibit intentional or accidental introduction of non-indigenous or genetically altered species to the wild that may cause harmful impacts to the natural flora, fauna or other features of the Wider Caribbean Region.

Article 13 ENVIRONMENTAL IMPACT ASSESSMENT

1. In the planning process leading to decisions about industrial and other projects and activities that would have a negative environmental impact and significantly affect areas or species that have been afforded special protection under this Protocol, each Party shall evaluate and take into consideration the possible direct and indirect impacts, including cumulative impacts, of the projects and activities being contemplated.
2. The Organization and the Scientific and Technical Advisory Committee shall, to the extent possible, provide guidance and assistance, upon request, to the Party making these assessments.

Article 14 EXEMPTIONS FOR TRADITIONAL ACTIVITIES

1. Each Party shall, in formulating management and protective measures, take into account and provide exemptions, as necessary, to meet traditional subsistence and cultural needs of its local population. To the fullest extent possible, no exemption which is allowed for this reason shall:
 - a. endanger the maintenance or areas protected under the terms of this Protocol, including the ecological processes contributing to the maintenance of those protected areas; or
 - b. cause either the extinction of, or a substantial risk to, or substantial reduction in the number of, individuals making up the populations of species of fauna and flora within the protected areas, or any ecologically inter-connected species or population, particularly migratory species and threatened, endangered or endemic species.
2. Parties which allow exemptions with regard to protective measures shall inform the Organization accordingly.

Article 15 CHANGES IN THE STATUS OF PROTECTED AREAS OR PROTECTED SPECIES

1. Changes in the delimitation or legal status of an area, or part thereof, or of a protected species, may only take place for significant reasons, bearing in mind the need to safeguard the environment and in accordance with the provisions of this Protocol and after notification to the Organization.
2. The status of areas and species should be periodically reviewed and evaluated by the Scientific and Technical Advisory Committee on the basis of information provided by Parties through the Organization. Areas and species may be removed from the area listing or Protocol annexes by the same procedure by which they were incorporated.

Article 16 PUBLICITY, INFORMATION, PUBLIC AWARENESS AND EDUCATION

1. Each Party shall give appropriate publicity to the establishment of protected areas, in particular to their boundaries, buffer zones, and applicable regulations, and to the designation of protected species, in particular to their critical habitats and applicable regulations.
2. In order to raise public awareness, each Party shall endeavour to inform the public as widely as possible, of the significance and value of the protected areas and species and of the scientific knowledge and other benefits which may be gained from them or

any changes therein. Such information should have an appropriate place in education programmes concerning the environment and history. Each Party should also endeavour to promote the participation of its public and its conservation organizations in measures that are necessary for the protection of the areas and species concerned.

Article 17 SCIENTIFIC, TECHNICAL AND MANAGEMENT RESEARCH

1. Each Party shall encourage and develop scientific, technical and management-oriented research on protected areas, including, in particular, their ecological processes and archaeological, historical and cultural heritage, as well as on threatened or endangered species of fauna and flora and their habitats.
2. Each Party may consult with other Parties and with relevant regional and international organizations with a view to identifying, planning and undertaking scientific and technical research and monitoring programmes necessary to characterize and monitor protected areas and species and to assess the effectiveness of measures taken to implement management and recovery plans.
3. The Parties shall exchange, directly or through the Organization, scientific and technical information concerning current and planned research and monitoring programmes and the results thereof. They shall, to the fullest extent possible, coordinate their research and monitoring programmes, and endeavour to standardize procedures for collecting, reporting, archiving and analyzing relevant scientific and technical information.
4. The Parties shall, pursuant to the provisions of paragraph 1 above, compile comprehensive inventories of:
 - a. areas over which they exercise sovereignty, or sovereign rights or jurisdiction that contain rare or fragile ecosystems; that are reservoirs of biological or genetic diversity; that are of ecological value in maintaining economically important resources; that are important for threatened, endangered or migratory species; that are of value for aesthetic, recreational, tourist or archaeological reasons; and
 - b. species of fauna or flora that may qualify for listing as threatened or endangered according to the criteria established under this Protocol.

Article 18 MUTUAL ASSISTANCE

1. The Parties shall co-operate, directly or with the assistance of the Organization or other relevant international organizations, in formulating, drafting, financing and implementing programmes of assistance to those Parties that express a need for it in the selection, establishment and management of protected areas and species.

2. These programmes should include public environmental education, the training of scientific, technical and management personnel, scientific research, and the acquisition, utilization, design and development of appropriate equipment on advantageous terms to be agreed among the Parties concerned.

Article 19 NOTIFICATIONS AND REPORTS TO THE ORGANIZATION

1. Each Party shall report periodically to the Organization on:
 - a. the status of existing and newly established protected areas, buffer zones and protected species in areas over which they exercise sovereignty or sovereign rights or jurisdiction; and
 - b. any changes in the delimitation or legal status of protected areas, buffer zones and protected species in areas over which they exercise sovereignty, or sovereign rights or jurisdiction.
2. The reports relevant to the protected areas and buffer zones should include information on:
 - a. name of the areas of zone;
 - b. biography of the area or zone (boundaries, physical features, climate, flora and fauna);
 - c. legal status with reference to relevant national legislation or regulation;
 - d. date and history of establishment;
 - e. protected areas management plans;
 - f. relevance to cultural heritage;
 - g. facilities for research and visitors; and
 - h. threats to the area or zone, especially threats which originate outside the jurisdiction of the Party.
3. The reports relevant to the protected species should include, to the extent possible, information on:
 - a. scientific and common names of the species;
 - b. estimated populations of species and their geographic ranges;
 - c. status of legal protection, with reference to relevant national legislation or regulation;
 - d. ecological interactions with other species and specific habitat requirements;
 - e. management and recovery plans for endangered and threatened species;
 - f. research programmes and available scientific and technical publications relevant to the species; and
 - g. threats to the protected species, their habitats and their associated ecosystems, especially threats which originate outside the jurisdiction of the Party.
4. The reports provided to the Organization by the Parties will be used for the purposes outlined in Articles 20 and 22.

Article 20 SCIENTIFIC AND TECHNICAL ADVISORY COMMITTEE

1. A Scientific and Technical Advisory Committee is hereby established.
2. Each Party shall appoint a scientific expert appropriately qualified in the field covered by the Protocol as its representative on the Committee, who may be accompanied by other experts and advisors appointed by that Party. The Committee may also seek information from scientifically and technically qualified experts and organizations.
3. The Committee shall be responsible for providing advice to the Parties through the Organization on the following scientific and technical matters relating to the Protocol:
 - a. the listing of protected areas in the manner provided for in Article 7;
 - b. the listing of protected species in the manner provided for in Article 11;
 - c. reports on the management and protection of protected areas and species and their habitats;
 - d. proposals for technical assistance for training, research, education and management (including species recovery plans);
 - e. environmental impact assessment pursuant to Article 13;
 - f. the formulation of common guidelines and criteria pursuant to Article 21; and
 - g. any other matters relating to the implementation of the Protocol, including those matters referred to it by the meetings of the Parties.
4. The Committee shall adopt its own Rules of Procedures.

Article 21 ESTABLISHMENT OF COMMON GUIDELINES AND CRITERIA

1. The Parties shall at their first meeting, or as soon as possible thereafter, evaluate and adopt common guidelines and criteria formulated by the Scientific and Technical Advisory Committee dealing in particular with:
 - a. the identification and selection of protected areas and protected species;
 - b. the establishment of protected areas;
 - c. the management of protected areas and protected species including migratory species; and
 - d. the provision of information on protected areas and protected species, including migratory species.
2. In implementing this Protocol, the Parties shall take into account these common guidelines and criteria, without prejudicing the right of a Party to adopt more stringent guidelines and criteria.

Article 22 INSTITUTIONAL ARRANGEMENTS

1. Each Party shall designate a Focal Point to serve as liaison with the Organization on the technical aspects of the implementation of this Protocol.
2. The Parties designate the Organization to carry out the following Secretariat functions:
 - a. convening and servicing the meetings of the Parties;
 - b. assisting in raising funds as provided for in Article 24;
 - c. assisting the Parties and the Scientific and Technical Advisory Committee, in co-operation with the competent international, intergovernmental and non-governmental organizations:
 - ◆ facilitating programmes of technical and scientific research as provided for in Article 17;
 - ◆ facilitating the exchange of scientific and technical information among the Parties as provided for in Article 16;
 - ◆ the formulation of recommendations containing common guidelines and criteria pursuant to Article 21;
 - ◆ the preparation, when so requested, of management plans for protected areas and protected species pursuant to Article 6 and 10 respectively;
 - ◆ the development of co-operative programmes pursuant to Articles 7 and 11;
 - ◆ the preparation of educational materials designed for various groups identified by the Parties;
 - ◆ the repatriation of illegally exported wild flora and fauna and their parts or products;
 - d. preparing common formats to be used by the Parties as the basis for notifications and reports to the Organization, as provided in Article 19;
 - e. maintaining and updating databases of protected areas and protected species containing information pursuant to Articles 7 and 11, as well as issuing periodically updated directories of protected areas and protected species;
 - f. preparing directories, reports and technical studies which may be required for the implementation of this Protocol;
 - g. co-operating and co-ordinating with regional and international organizations concerned with the protection of areas and species; and
 - h. carrying out any other function assigned by the Parties to the Organization.

Article 23 MEETINGS OF THE PARTIES

1. The ordinary meetings of the Parties shall be held in conjunction with the ordinary meetings of the Parties to the Convention held pursuant to Article 16 of the Convention. The Parties may also hold extraordinary meetings in conformity with

- Article 16 of the Convention. The meetings will be governed by the Rules of Procedure adopted pursuant to Article 20 of the Convention.
2. It shall be the function of the meetings of the Parties to this Protocol:
 - a. to keep under review and direct the implementation of this Protocol;
 - b. to approve the expenditure of funds referred to in Article 24;
 - c. to oversee and provide policy guidance to the Organization;
 - d. to consider the efficacy of the measures adopted for the management and protection of areas and species, and to examine the need for other measures, in particular in the form of annexes, as well as amendments to this Protocol or to its annexes;
 - e. to monitor and promote the establishment and development of the network of protected areas and recovery plans for protected species provided for in Articles 7 and 11;
 - f. to adopt and revise, as needed, the guidelines and criteria provided for in Article 21;
 - g. to analyze the advice and recommendations of the Scientific and Technical Advisory Committee pursuant to Article 20;
 - h. to analyze reports transmitted by the Parties to the Organization under Article 22 of the Convention and Article 19 of this Protocol, as well as any other information which the Parties may transmit to the Organization or to the meeting of the Parties; and
 - i. to conduct such other business as appropriate.

Article 24 FUNDING

In addition to the funds provided by the Parties in accordance with paragraph 2, Article 20 of the Convention, the Parties may direct the Organization, to seek additional funds. These may include voluntary contributions for purposes connected with the Protocol from Parties, other governments, government agencies, non-governmental, international, regional and private sector organizations and individuals.

Article 25 RELATIONSHIP TO OTHER CONVENTIONS DEALING WITH THE SPECIAL PROTECTION OF WILDLIFE

Nothing in this Protocol shall be interpreted in a way that may affect the rights and obligations of Parties under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS).

Article 26 TRANSITIONAL CLAUSE

1. The initial version of the annexes, which constitutes an integral part of the Protocol, shall be adopted by consensus at a Conference of Plenipotentiaries of the Contracting Parties to the Convention.

Article 27 ENTRY INTO FORCE

1. The Protocol and its annexes, once adopted by the Contracting Parties to the Convention, will enter into force in conformity with the procedure established in paragraph 2 of Article 28 of the Convention.
2. The Protocol shall not enter into force until the initial annexes have been adopted in accordance with Article 26.

Article 28 SIGNATURE

This Protocol shall be open for signature at Kingston, from 18 January 1990 to 31 January 1990 and at Bogotá from 1 February 1990 to 17 January 1991 by any party to the Convention.

IN WITNESS WHEREOF the undersigned, being duly authorized by their respective governments, have signed this Protocol.

Done at Kingston, on this eighteenth day of January one thousand nine hundred and ninety in a single copy in the English, French and Spanish languages, the three texts being equally authentic.

APPENDIX 6.7: MPA OBJECTIVES

- ◆ To protect and manage substantial examples of marine and estuarine systems to ensure their long-term viability and to maintain genetic diversity.
- ◆ To protect depleted, threatened, rare or endangered species and populations and, in particular to preserve habitats considered critical to the survival of such species.
- ◆ To protect and manage areas of significance to the life cycles of economically important species.
- ◆ To prevent outside activities from detrimentally affecting the marine protected area.
- ◆ To provide for the continued welfare of people affected by the creation of marine protected areas.
- ◆ To preserve, protect and manage historical and cultural sites and natural aesthetic values of marine and estuarine areas, for the present and future generations.
- ◆ To facilitate the interpretation of marine and estuarine systems for the purpose of conservation, education and tourism.
- ◆ To accommodate within appropriate management regimes a broad spectrum of human activities compatible with the primary goal in marine and estuarine settings.
- ◆ To provide for research and training, and for monitoring the environmental effects of human activities, including the direct and indirect effects of development and adjacent land-use practices.

Source: IV World Congress on National Parks and Protected Areas. Workshop III.2.

APPENDIX 6.8: CONSERVATION OBJECTIVES FOR PROTECTED AREAS

Sample ecosystems. To maintain large areas as representative samples of each major biological region of the nation in its natural unaltered state for ensuring the continuity of evolutionary and ecological processes, including animal migration and gene flow.

Ecological diversity. To maintain examples of the different characteristics of each type of natural community, landscape and land form for protecting the representative as well unique diversity of the nation, particularly for ensuring the role of natural diversity in the regulation of the environment.

Genetic resources. To maintain all genetic materials as elements of natural communities, and avoid the loss of plant and animal species.

Education and research. To provide facilities and opportunities in natural areas for purposes of formal and informal education and research., and the study and monitoring of the environment.

Water and soil conservation. To maintain and manage watersheds to ensure an adequate quality and flow of fresh water, and to control and avoid erosion and sedimentation, especially where these processes are directly related to downstream investments which depend on water for transport, irrigation, agriculture, fisheries, and recreation, and for the protection of natural areas.

Wildlife management. To maintain and manage fishery and wildlife resources for their vital role in environmental regulation, for the production of protein, and as the base for industrial, sport, and recreational resources.

Recreation and tourism. To provide opportunities for healthy and constructive outdoor recreation for local residents and foreign visitors, and to serve as poles for tourism development based on the outstanding natural and cultural characteristics of the nation.

Timber. To manage and improve timber resources for their role in environmental regulation and to provide a sustainable production of wood products for the construction of housing and other uses of high national priority.

Cultural heritage. To protect and make available all cultural, historic and archaeological objects, structures and sites for public visitation and research purposes as elements of the cultural heritage of the nation.

Scenic beauty. To protect and manage scenic resources which ensure the quality of the environment near towns and cities, highways and rivers, and surrounding recreation and tourism areas.

Options for the future. To maintain and manage large areas of land under flexible land-use methods which conserve natural processes and ensure open options for future changes in land use, incorporate new technologies, meet new human requirements, and initiate new conservation practices as research makes them available.

Integrated development. To focus and organize conservation activities to support the integrated development of rural lands, giving particular attention to the conservation and utilization of “marginal areas” and to the provision of stable rural employment opportunities.

(after Miller, 1980)

Source: McNeely et al., 1994

APPENDIX 6.9: Selection Criteria cf. Salm and Clark

An Example List of Criteria

The following examples of criteria for protected areas in general have been compiled from IUCN (1981) and Salm (1982); the major headings represent programme goals; the numbered headings are the criteria.'

Social Criteria. Social benefits are measured in the following terms:

1. *Social acceptance*, the degree to which the support of local people is ensured. When an area is already protected by local tradition or practice, it should be encouraged, and the area should receive a higher rating. An "official" protected area designation may not be necessary if local support is high.
2. *Public health*, the degree to which the creation of a protected area may serve to diminish pollution or other disease agents that contribute to public health problems. Granting protected status to contaminated areas, such as shellfish beds or bathing beaches, may result in reduced pollution as the polluting source is recognised and controlled.
3. *Recreation*, the degree to which the area is, or could be, used for recreation by country residents. Areas that provide the local community opportunity to use, enjoy, and learn about their local natural environment should receive a high rating for this criterion.
4. *Culture*, the religious, historic, artistic, or other cultural value of the site. Natural areas that also contain important cultural features should be given high ratings as their protection may help to maintain the integrity of the adjacent ecosystems.
5. *Aesthetics*, a seascape, landscape, or other area of exceptional scenic beauty. Natural areas that also contain features of natural beauty should be given higher ratings since such features depend on maintaining the integrity of the adjacent coastal and marine systems. However, when species diversity and the biological conservation value are low, and the site is picturesque, it retains a high value for recreation.
6. *Conflicts of interest*, the degree to which area protection would affect the activities of local residents. If the area is to be used for recreational purposes, for example, the site should not be a major fishing area and should have few dependent fishermen. In some instances, careful zoning can minimise such conflicts.

7. *Safety*, the degree of danger to people from strong currents, surf, submerged obstacles, waves, etc. The principal users will often be swimmers, snorkelers, divers, and boaters. It is important that they are able to pursue their activities safely.
8. *Accessibility*, the ease of access across both land and sea. Areas to be used by visitors, students, researchers, and fishermen must be accessible to them. The more accessible, the greater the value, but the greater the likelihood of conflicting interests (such as between coral mining and fisheries or fisheries and diving) and the greater the impact of users. Accessibility weighs high for goal one (social), fairly high for goal two (economic), and low for goal three (ecological).
9. *Benchmark*, the degree to which the area may serve as a “control group” in the scientific sense, an un-manipulated area used to measure changes elsewhere. Benchmark areas are essential to an ecological monitoring programme and should receive a higher rating.
10. *Education*, the degree to which the area represents various ecological characteristics and can serve for research and demonstration of scientific methods. Areas that clearly demonstrate different habitat types and ecological relationships and are sufficiently large both to serve conservation and to accommodate teaching (i.e., field trips or on-site learning centres) should receive a higher rating.

Economic Criteria. Economic benefits are measured in the following terms:

1. *Importance to species*, the degree to which certain commercially important species depend on the area. Reefs or wetlands, for example, may be critical habitats for certain species that breed, rest, shelter, or feed there and that form the basis of local fisheries in adjacent areas. Such habitats need management to support these stocks.
2. *Importance to fisheries*, the number of dependent fishermen and the size of the fishery yield. The greater the dependence of fishermen on an area, and the greater its yield of fishes, the more important it becomes to manage the area correctly and to ensure sustainable harvest.
3. *Nature of threats*, the extent to which changes in use patterns threaten the overall value to people. Habitats may be threatened directly by destructive practices, such as fishing with explosives and certain bottom trawls, or by overexploitation of resources. Areas traditionally harvested by local fishermen become important to manage. The numbers of fishermen on these grounds may increase, bringing extra pressure to bear on stocks and habitats. Even if the numbers do not change, the traditional capture

methods may be re-placed by others that yield more per unit effort (an extreme example is the use of explosives). The stocks of some species may not be capable of withstanding such in-creased drains on their breeding populations. In this way whole species have disappeared from fishing grounds or have become exceedingly rare.

4. *Economic benefits*, the degree to which protection will affect the local economy in the long term. Initially, some protected areas may have a short-lived, disruptive economic effect. Those that have obvious positive effects should have higher ratings (for example, for protecting feeding areas of commercial fishes or areas of recreational value).
5. *Tourism*, the existing or potential value of the area to tourism development. Areas that lend themselves to forms of tourism compatible with the aims of conservation should receive a higher rating.

Ecological Criteria. The values of ecosystems and their species are measured in the following terms:

1. *Diversity*, the variety or richness of ecosystems, habitats, communities, and species. Areas having the greatest variety should receive higher ratings. However, this criterion may not apply to simplified ecosystems, such as some pioneer or climax communities, or areas subject to disruptive forces, such as shores exposed to high energy wave action.
2. *Naturalness*, the lack of disturbance or degradation. Degraded systems will have little value to fisheries or tourism, and make little biological contribution. A high degree of naturalness scores highly. If restoring de-graded habitats is a priority, a high degree of degradation may score highly.
3. *Dependency*, the degree to which a species depends on an area, or the degree to which an ecosystem depends on ecological processes occurring in the area. If an area is critical to more than one species or process, or to a valuable species or ecosystem, it should have a higher rating.
4. *Representativeness*, the degree to which an area represents a habitat type, ecological process, biological community, physiographic feature or other natural characteristic. If a habitat of a particular type has not been protected, it should have a high rating. (A classification scheme for coastal and marine areas is desirable in applying this criterion).

5. *Uniqueness*, whether an area is “one of a kind. ” Habitats of endangered species occurring only in one area are an example. The interest in uniqueness may extend beyond country borders, assuming regional or international significance. To keep visitor impact low, tourism may be prohibited but limited research and education permitted. Unique sites should always have a high rating.
6. *Integrity*, the degree to which the area is a functional unit-an effective, self-sustaining ecological entity. The more ecologically self-contained the area is, the more likely its values can be effectively protected, and so a higher rating should be given to such areas.
7. *Productivity*, the degree to which productive processes within the area contribute benefits to species or to humans. Productive areas that contribute most to ecosystem sustainment should receive a high rating. Exceptions are eutrophic areas where high productivity may have a deleterious effect.
8. *Vulnerability*, the area’s susceptibility to degradation by natural events or the activities of people. Biotic communities associated with coastal habitats may have a low tolerance to changes in environmental conditions, or they may exist close to the limits of their tolerance (defined by water temperature, salinity, turbidity, or depth). They may suffer such natural stresses as storms or prolonged immersion that determine the extent of their development. Additional stress (such as domestic or industrial pollution, excessive reductions in salinity, and increases in turbidity from watershed mismanagement) may determine whether there is total, partial, or no recovery from natural stress, or the area is totally destroyed.

Regional Criteria. The contribution of an area to a regional network of protected areas can be assessed in the following terms:

1. *Regional significance*, the degree to which the area represents a characteristic of the region, whether a natural feature, an ecological process, or a cultural site. The role the area plays in contributing nutrients, materials, or support for species (especially migratory ones) to the region as a whole should be evaluated. Both ecological processes and natural resources are often shared among nations, so areas contributing to the maintenance of species or ecosystems beyond national boundaries should have higher ratings.
2. *Subregional significance*, the degree to which an area fills a gap in the network of protected areas from the sub-regional perspective. This contribution may be assessed

by comparing the distribution of protected areas with sub-regional characteristics. If a type of area is preserved in one sub-region, that type should also be protected in another sub-region.

3. *Awareness*, the degree to which monitoring, research, education, or training within the area can contribute knowledge and appreciation of regional values. Areas that can combine such activities as pollution monitoring and education should receive a higher rating.
4. *Conflict and compatibility*, the degree to which the area may help to resolve conflicts between natural resource values and human activities, or the degree to which compatibilities between them may be enhanced. If an area can be used to exemplify the resolution of conflicts in the region, it should receive a higher rating. Protected areas that demonstrate the benefits, values, or methods of protection or restoration should also have higher ratings.

Pragmatic criteria. The feasibility and appropriate timing of protection can be measured in terms of the following:

1. *Urgency*, the degree to which immediate action must be taken, lest values within the area be transformed or lost. Lack of urgency should not necessarily be given a lower rating since it is often best, and least costly, to protect well in advance of the threat.
2. *Size*, which and how much of various habitats need to be included in the protected area. Size is an important factor in designing protected areas. It has often been overlooked in the design process, resulting in severe degradation, even total destruction, of protected areas. The protected area must be large enough to function as an ecological unit to receive a high rating.
3. *Degree of threat*, present and potential threats from direct exploitation and development projects. The farther the protected area is from potential sources of accidental poisoning (such as large ports, petroleum deposits, or river mouths) the better are the survival prospects of species and communities. However, if an important habitat is severely threatened, it may be important to implement a management plan to reduce the threats to tolerable levels.
4. *Effectiveness*, the feasibility of implementing a management programme. A site that satisfies many criteria, but cannot be adequately managed (i.e., monitored, patrolled, and defended) is not of much use. Higher ratings should go to sites that are manageable.

5. *Opportunism*, the degree to which existing conditions or actions already under way may justify further action. An extension of an established protected area should have a higher rating.
6. *Availability*, the degree to which the area is available for acquisition or can be managed satisfactorily by agreement with the owners. The problem of tenure rarely applies to the sea. Beaches also often belong to the central or provincial government. Thus, acquisition of aquatic areas, wetlands, and seashores may not be necessary. However, adjacent lands and islands may be privately owned or leased. Generally, to secure long-term control over these areas, the title or lease will need to be bought from current owners. Higher ratings should go to areas owned by state or national governments.
7. *Restorability*, the degree to which the area may be returned to its former natural state. Areas that can increase in productivity or value to important species and processes should receive higher ratings.

APPENDIX 6.10: Selection Criteria cf. Kelleher and Kenchington, 1992

The following list identifies factors or criteria that can be used in deciding whether an area should be included in an MPA or in determining boundaries for an MPA.

Naturalness - the extent to which the area has been protected from, or has not been subject to human-induced change.

Biogeographic importance - either contains rare biogeographic qualities or is representative of a biogeographic “type” or types.

- contains unique or unusual geological features.

Ecological importance - contributes to maintenance of essential ecological processes or life-support systems .e.g. source for larvae for downstream areas

- integrity.
- the degree to which the area either by itself or in association with other protected areas, encompasses a complete ecosystem.
- contains a variety of habitats.
- contains habitat for rare or endangered species
- contains nursery or juvenile areas.
- contains feeding, breeding or rest areas.
- contains rare or unique habitat for any species.
- preserves genetic diversity i.e. is diverse or abundant in species terms.

Economic importance - existing or potential contribution to economic value by virtue of its protection e.g. protection of an area for recreation, subsistence, use by traditional inhabitants, appreciation by tourists and others or as a refuge nursery area or source of supply for economically important species.

Social importance - existing or potential value to the local, national or international communities because of its heritage, historical, cultural, traditional aesthetic, educational or recreational qualities

Scientific importance - value for research and monitoring

-
- International or National significance - is or has the potential to be listed on the World or a national Heritage List or declared as a Biosphere Re-serve or included on a list of areas of international or national importance or is the subject of an international or national conservation agreement.
- Practicality/feasibility - Degree of insulation from external destructive influences.
- social and political acceptability, degree of community support.
 - accessibility for education, tourism, recreation.
 - compatibility with existing uses, particularly by locals.
 - ease of management, compatibility with existing management regimes.

Appendix 6.11: Selection Criteria cf. Kelleher et al, 1995

Criteria for Selection of Priority Areas

Biogeographic criteria

- ◆ Presence of rare biogeographic qualities or representative of a biogeographic “type” or types; and
- ◆ Unique or unusual geological features.

Ecological criteria

- ◆ An essential part of ecological processes or life-support systems (for example, is a source for larvae for downstream areas);
- ◆ Area’s integrity, or the degree to which the area either by itself or in association with other protected areas, encompasses a complete ecosystem;
- ◆ The variety of habitats;
- ◆ Presence of habitat for rare or endangered species;
- ◆ Nursery or juvenile areas;
- ◆ Feeding, breeding or rest areas;
- ◆ Rare or unique habitat for any species; and
- ◆ Genetic diversity (is diverse or abundant in species terms).

Naturalness

- ◆ Extent to which the area has been protected from, or has not been subject to, human-induced change.

Economic importance

- ◆ Existing or potential contribution to economic value by virtue of its protection (for example, protection of an area for recreation, subsistence, use by traditional inhabitants, appreciation by tourists and others or as a refuge nursery area or source of economically important species).

Social importance

- ◆ Existing or potential value to the local, national or international communities because of its heritage, historical, cultural, traditional aesthetic, educational or recreational qualities.

Scientific importance

- ◆ Value for research and monitoring.

International or national significance

Potential to be listed on the World (or national) Heritage List, declared a Bio-sphere Reserve, or included on a list of areas of international or national importance, or is the subject of an international or national conservation agreement.

Practicality/or feasibility

- ◆ Degree of insulation from external destructive influences;
- ◆ Social and political acceptability, degree of community support;
- ◆ Accessibility for education, tourism, recreation;
- ◆ Compatibility with existing uses, particularly by locals; and
- ◆ Ease of management or compatibility with existing management regimes.

APPENDIX 6.12: Institutional Arrangements for Management

Institutions Taking Part in the Management of Protected Areas								
Country	MG	GA	QC	NG	LC	PE	BA	MA
Anguilla			X	X				
Antigua and Barbuda			X			X	X	
Aruba			X					
Bahamas			X					
Barbados		X						
Bermuda		X	X	X				
British Virgin Islands			X		X	X		
Cayman Islands		X						
Cuba		X						
Dominica		X						
Dominican Republic		X		X			X	
Grenada		X						X
Guadeloupe			X		X			
Haiti		X					X	X
Jamaica		X		X	X			
Martinique			X		X			
Montserrat			X					
Netherlands Antilles				X	X	X		
Puerto Rico	X	X		X				
St Kitts-Nevis				X				
St Lucia		X	X	X	X			
St Vincent and the Grenadines			X					
Trinidad and Tobago		X	X	X	X			
Turks and Caicos		X	X					
U.S. Virgin Islands	X							
Totals	2	13	13	9	7	3	3	2
Key: MG: national government agencies of metropolitan countries; GA: Government agencies; QC: Independent statutory, or quasi-governmental, bodies; NG: Non-governmental organisations; LC: Local communities or resource user groups; PE: Private entities; BA: Bilateral aid organisations; MA: Multilateral aid organisations.								
Source: WCMA, 1991								

APPENDIX 6.13: Model of Management Plan cf. Kelleher and Kenchington

DETAIL OF CONTENT OF AN MPA MANAGEMENT PLAN

This example of the content of an MPA Management Plan is provided to assist those involved in the preparation of plans and submissions in government agencies and non-government organisations. It should be viewed as an ideal since it implies a planning situation where there is a high level of description and understanding of the area under investigation. The precise format adopted will depend upon the provisions of the legislation establishing the MPA and the government 'processes required for putting a management plan into effect.

The relationship between a management plan and a zoning plan is optional. In large, multiple use MPAs, the zoning plan may be the primary document that defines the strategic framework for management. In such cases it will be supplemented by various subordinate tactical documents such as guidelines and day-to-day management plans.

The example that follows refers to the case where the management plan is the primary policy - setting document and the zoning plan is subordinate to it. In many cases the items 1- 4.1 may form a preliminary document which establishes the initial case for protection of the area in question.

All the information listed in the following example should be provided in one document or another.

TITLE PAGE

This includes:

- ◆ The name of the area subject to the plan and its status;
- ◆ The words - MANAGEMENT PLAN;
- ◆ The name of the agency/agencies responsible for implementing the plan; and
- ◆ The date when the plan was prepared and the expected date for review.

EXECUTIVE SUMMARY PAGE

- ◆ On this page are summarised:
- ◆ The reason why the plan was prepared;

- ◆ The period of time for which it applies;
- ◆ Any special conditions which controlled its preparation including the legislative basis and authority for plan development;
- ◆ The principal provisions of the plan;
- ◆ The estimated budget; and
- ◆ Acknowledgements.

CONTENTS PAGE

The headings of the body of the plan are listed here against the appropriate page numbers. It may be preferable to list only the main headings, but sub-headings are usually included.

BODY OF THE PLAN

1. Objectives for Management

The goal and objectives for management are stated in this section. They will reflect the purpose(s) for which the area is protected and the use(s) that will be permitted.

2. Resource Description

This section provides information on the following categories for the areas to be protected. Maps will be an important feature of this section.

2.1 Name of Area and Location

To include the geographic location (State district, etc.); latitudes and longitudes (preferably on a map); surface area (square kilometres, hectares or other units of area).

2.2 Geographic and Habitat Classification

The area should be categorised according to a habitat classification scheme to identify its geographic zone, substrate type(s) and major biological feature(s).

2.3 Conservation Status

This should indicate the area's degree of naturalness, aesthetic values, degree and nature of threats (if any), jurisdiction(s) and present ownership. The degree of habitat representativeness should also be indicated.

2.4 Access and Regional Context

The regional land and sea surroundings and access routes to the area are described, in addition to the character and use of contiguous areas, emphasising their effectiveness as buffer zones.

2.5 History and Development

This section contains a summary account of direct and peripheral human involvement in the area. This section may be divided into several sub-sections e.g.:

2.5.1 Archaeology

A summary description of the people who used the area before historical times, including any known areas of religious significance, species taken and if closed seasons or closed areas were ever used as management techniques. Archaeological information could also provide clues to species that were found in the area.

2.5.2 Historical relics

This sub-section should identify submerged wrecks and any submerged structures.

2.5.3 Written and oral history

2.5.4 Recent developments

Give a brief history of fishing and other human use of the area and developments on the land that may have had a major influence on the area.

2.5.5 Current human use and development

In this section the current use of the area by subsistence, artisanal, commercial and recreational fishermen, tourists and others is discussed. It is most important to establish who the users are, where they conduct their activities, at what times of the year, and for how long, and the social and economic importance of their use. A user survey may be helpful. This information is just as important as biophysical data.

2.6 Physical features

In this section the non-living features of the area are described. Maps in addition to descriptions should be included.

2.6.1 Coastal landforms

Nearby landforms should be described together with islands and underwater formations.

2.6.2 Bathymetry

A map showing isobaths is needed. The depth of water can provide an important insight into the dynamics of the system. Major trenches, canyons and shallows should be described in as much detail as is available.

2.6.3 Tides

A description of the tidal regime and resultant currents and water movements associated with phases of the tidal cycle.

2.6.4 Salinity and turbidity

Measurements of salinity and turbidity in all seasons are desirable.

2.6.5 Geology

A description in geological terms about how the area was formed and how that process is continuing with the deposition of present day substrates and by erosion processes observable in the area.

2.6.6 Dominant currents

A description of physical oceanographic features of the area, wind-driven, tidal and residual currents, on a seasonal basis.

2.6.7 Freshwater inputs

Major river and estuarine areas should be noted.

2.7 Climate

2.7.1 Precipitation

Annual precipitation figures and a chart to indicate average precipitation on a monthly basis should be included.

2.7.2 Temperature

Monthly charts for both air and average sea temperatures (surface and at given depth). If possible include a monthly chart of solar radiation received.

2.7.3 Winds

Monthly charts of rose diagrams plus a description of any unusual feature of the local winds.

2.8 Plant life

This section should contain at least a description of dominant marine plant life, and wherever possible a comprehensive summary of the plant community and related environmental factors such as the depth of occurrence, together with any botanical features that may have special scientific, recreational or other interest. Phytoplankton could be included if information is available. Plant species identified in the area should be listed in an appendix.

2.9 Marine fauna

As a minimum, a description of the dominant marine or estuarine fauna is required, with an account of their ecological relationships if known. Include sections on Mammals, Reptiles, Amphibians, Fish, Birds, Invertebrates and Zooplankton as appropriate. A separate appendix should list the species.

Note: Sections 2.8 and 2.9 could be amalgamated to one section entitled “Marine Wildlife”. Wildlife would be defined as animals and plants that are indigenous to the nation, to its coastal sea, to its continental shelf or its overlying waters; migratory animals that periodically or occasionally visit its territory; and such other animals and plants, not being domesticated animals or cultivated plants, as are prescribed by legislation.

2.10 Miscellaneous

This can be a varied section that includes those matters which do not fit under any of the other descriptions of the plan. Each plan will be site specific and could therefore have features or problems which are not encountered in other plans.

3. Description of Management Issues

A summary of past, present and possible future threats and management conflicts should follow.

-
- 3.1 **Historic and current conflicts**
A brief statement of any historic or current conflicts between uses or user groups.
 - 3.2 **Pollution**
Include point and non-point sources of external pollution within the area and in nearby areas, especially those up-current, e.g. runoff, sewage inputs, fish processing, industrial pollution and pollution from tourism and shipping.
 - 3.3 **Future demand**
Estimate future demand for recreational and other uses, and if applicable, future pollution loading and proposed developments.
 - 3.4 **Potential conflicts**
Potential conflicts specific to the area within and close to the boundary of the MPA should be described. Any potential conflicts due to more distant regional influences should also be identified. This should include review of sectoral development plans and propose projects for, or likely to influence, the area in question.
4. **Management policies**

In this section the management plan comes to grips with the threats and conflicts and prescribes solutions.

- 4.1 **Objectives**
The goal of protecting the area is briefly reiterated. The objectives of management are stated clearly. If the area is to be subdivided, sub-objectives should be stated for each zone or subdivision of the managed area.
- 4.2 **Resource units**
It could be useful to divide the area into resource units.
 - 4.2.1 **Natural**
Each MPA will have unique characteristics and the resource units will be site specific. An area could be divided into resource units such as beaches, islands, deep-water trenches, turtle or seal rookeries etc.

4.2.2 Development areas

Another category could be areas that are either developed or proposed to be developed.

4.2.3 Areas of impact

Areas showing marked impact from human activity could be identified.

4.3 Zoning

The resource units defined above may provide a basis for zoning, which should be kept as simple as practicable, consistent with avoiding unnecessary restriction on human activities. Zoning must be easy to understand both from the point of view of the manager and the managed. This section should explain why a particular area has been given a zone classification and what activities are permitted and prohibited within each zone.

Special habitats or wildlife areas such as a seagrass bed or a turtle rookery, may require additional management provisions such as seasonal closures or permanent restrictions to human access. Unusual prescriptions may be needed in the short term and these should be described in this section.

4.4 Management policies for resource units

In the draft management plan a list of management options can be presented in this section and a choice made between them in the final version of the plan.

5. Surveillance

This section should describe any programmes proposed to assess movement of people, vessels and aircraft within and through the area and the use made of the area.

6. Monitoring

This section should describe any biological, environmental and usage-monitoring programmes proposed for the area, when these programmes will be completed and how they are to be used in reviewing the management plan. It may also identify other monitoring programmes to be initiated during the first stage of the plan and who could carry them out. Some of the results from monitoring may eventually be included in the appendices.

7. Education and Interpretation

This section should describe programmes and co-operative arrangements with educational institutions, public associations and community groups to promote protection, wise use, public understanding and enjoyment of the MPA.

8. Enforcement

This section should outline the arrangements which will need to be made to detect apparent offences and to apprehend and prosecute offenders in order to achieve an acceptable level of adherence to MPA regulations. No nation could afford to manage primarily on the basis of enforcement in the face of general public hostility or to apprehend every breach of regulation. Education is therefore the primary management tool.

9. Maintenance/ and Administration

A section will be required to address the subjects of budget, staffing, etc.

9.1 Budget

Anticipated costs should be identified so that adequate funding may be arranged.

9.2 Staffing

The management plan should indicate staffing needs and identify major functions. Volunteers, consultants and head office staff involved in the planning process should also be identified, as this will provide a more accurate indication of staffing levels. Staffing deficiencies can be predicted and recommendations suggested. Section 9 should be updated and released as part of an annual report.

10. Information Sources

Information regarding the area will come from sources outside the manager's regular information base. These should be identified and listed wherever possible, and include those other government agencies, non-government organisations, individuals, consultants, overseas sources etc that were consulted. A bibliography should be appended.

11. Appendices

Appendix 1: Boundary and Area Description

This should provide the legal description of the area including any outstanding legal tenure or matters of existing interest which might have become clear during the development of the management plan. In most federal systems of government, there are complex and sometimes unresolved questions of jurisdiction between levels of government especially in the intertidal environment. These problems should be highlighted and, if appropriate, solutions suggested. One solution is to have complementary legislative, planning and management provisions on each side of that jurisdictional boundary. Examples of this include adjacent Federal and State Marine Protected Areas at Florida Keys and the Californian Channel Islands in the United States of America and the Great Barrier Reef Marine Park and adjacent Queensland Marine Parks in Australia.

Appendix 2: Legislation

All legislation and regulations relating to the area and their interactions, should be noted and explained. Where feasible, the legislation that prevails in the event of conflict between the provisions of different enactments should be identified. Implications for the protective status of the area should be identified.

Appendix 3: Plant Species

A comprehensive list of plant species should be attempted for the first management plan. As the process continues over the years, it is very likely that new plant species will be discovered in the area. Plant names should be listed in broad taxonomic groups, with botanical and common names where possible.

Appendix 4: Animal Species

Animal species should be listed in broad taxonomic groups: e.g. Mammals, Reptiles, Amphibians, Fish, Birds and Invertebrates and common names provided where possible.

Appendix 5: Special Features

This section could describe unusual or outstanding features of the area and could range from whale strandings, waterspouts, oil slicks to spiritual revelations and cultural beliefs.

Appendix 6: Past, Present and Proposed use

This section should attempt to provide ‘more detail on uses, identify key user groups and assess the social and economic significance of areas.

Maps

The following are suggested as a minimum number of maps required.

- Map 1 - Location
- Map 2 - Land/water tenure and jurisdiction
- Map 3 - Land topography and seabed bathymetry
- Map 4 - Geology
- Map 5/6 - Dominant plant and animal communities
- Map 7/8 - Major uses
- Map 9 - Major use conflicts and threatened resources
- Map 10 - Zoning

Where practicable the use of overlay presentation is recommended in order to illustrate the associations between such factors as topography, biological communities and uses.

APPENDIX 6.14: Model of Management Plan cf. Salm and Clark

Model Outline for Protected Area Management Plan

I. Executive Summary

II. Introduction

- A. Purpose and scope of plan
- B. Legislative authority for the action

III. Management Content

- A. Regional setting: location and access
- B. Resources (only facts pertinent to management, with other data in an appendix or separate document)
 - 1. Physical
 - 2. Biological
 - 3. Cultural
- C. Existing uses (economics, description, facilities, etc.)
 - 1. Recreational
 - 2. Commercial
 - 3. Research and education
 - 4. Traditional
- D. Existing legal and management framework
- E. Existing and potential threats and implications for management (i.e., analysis of compatible or incompatible uses, solutions)
- F. The plan
 - 1. Goals and objectives
 - 2. Management tactics
 - a. Advisory committees
 - b. interagency agreements (or agreements with private organizations, institutions or individuals)
 - c. Boundary and zoning
 - d. New regulations
 - e. Resource studies plan
 - f. Resource management plan
 - g. Interpretive plan
 - 3. Administration (phased over 3- to 5-year plan)
 - a. Staffing
 - b. Training
 - c. Facilities and equipment

- d. Budget
 - 4. Surveillance and enforcement
 - 5. Evaluation of plan effectiveness (monitoring uses, impacts, etc.) and revision
- G. References
- H. Appendices

APPENDIX 6.15: Jamaican Model (Montego Bay Marine Park, Draft Management Plan 1192)

The MBMP was enacted in 1974 and was essentially a paper park” for 15 years. Actual development and management of the park did not start until 1989 as part of the GOJ/USAID funded Protected Areas Resource Conservation Project. Implementation of management was hampered to some extent by a complex institutional structure and dependence (both in decision making and financial) of local authorities on bureaucratic Government agencies in the capital.

Organization of the management plan:

INTRODUCTION AND OVERVIEW

- ◆ Institutional context
- ◆ History of MBMP
- ◆ Goals of MBMP
- ◆ Goals and definition of the management plan

RESOURCES AND ISSUES

- ◆ Natural resources of Montego Bay
- ◆ Human resources
- ◆ Threats and issues

DEVELOPMENT AND MANAGEMENT

- ◆ Organization and institutional structure
- ◆ Zoning as a management tool
- ◆ Science and environmental monitoring
- ◆ Public education and outreach
- ◆ Enforcement

FINANCIAL MANAGEMENT

- ◆ Financial policy and goals
- ◆ Capital and recurrent costs
- ◆ Revenues and estimated income

Comments: The (1992) draft plan was poorly organized. Goals and objectives are not used consistently in various sections of the plan. Headings are sometimes misleading (e.g. section on “Human Resources” deals with impact from large urban population). Visitor facilities, infrastructure and equipment are insufficiently covered. These shortcomings stem from various individuals contributing to the writing without proper coordination.

APPENDIX 6.16: Indonesia Model (Bali Barat National Park)

This is a rather old management plan (1980) prepared under the WWF Indonesia Programme and the UNDP/FAO National Parks Development Project. Follow-up and implementation of the plan is unknown. The original park did not have a marine component and the management plan was prepared in response to the Government's decision to extend the park with 6,220 ha of marine area in the early eighties.

Organization of the plan:

INTRODUCTION

- ◆ The status of planning
- ◆ Management objectives
- ◆ Marine tourism potential in Bali Barat

MARINE RESOURCES AND PROBLEMS

- ◆ Marine resources
- ◆ Human impacts on the marine habitats
- ◆ Conclusions

MANAGEMENT AND DEVELOPMENT PROPOSALS

- ◆ Conservation values and options
- ◆ Regulations, boundaries and zoning (also including permits and enforcement)
- ◆ Staffing, administration, resource management and guarding.
- ◆ Visitor use and facilities
- ◆ Summary of facilities, equipment, costs and scheduling

APPENDIX

Description of the major marine ecosystems of proposed marine extension.

Comments: This is a fairly traditional model of a management plan. The management and development section is quite detailed, although the management plan would gain in clarity by a more elaborate division into sections and subsections of the different chapters.

APPENDIX 6.17: Netherlands Antilles Model (Curacao Underwater Park)

This plan is called a management guide, perhaps to reflect its primary purpose to serve as a guide for management of an already established park. The park was *de facto* established in 1983, but was never formally enacted by government. This has hampered the implementation of management, which has been solely based on an existing but inadequate reef management ordinance. For these reasons the plan has had little, if any, effect on actual management practice.

Organization of the plan:

PART I: DESCRIPTION

GENERAL INFORMATION

Includes location, tenure and map coverage

SITE INFORMATION

- ◆ Physical
- ◆ Biological
- ◆ Cultural
- ◆ Ecological relationships

PART II: PRESENT SITUATION

REASONS FOR ESTABLISHMENT

EVALUATION OF FEATURES AND SITE POTENTIAL

OBJECTIVES

RESOURCE USERS AND AVAILABLE FACILITIES

IMPACT OF RESOURCE USERS

PAST MANAGEMENT

PART III: MANAGEMENT ISSUES/MANAGEMENT ACTIONS

LEGAL AND MANAGERIAL CONSTRAINTS

FINANCIAL REQUIREMENTS

ADMINISTRATIVE ARRANGEMENTS

MAN INDUCED TRENDS

Includes impacts of uses, artificial beaches and mariculture

NATURAL TRENDS

Includes impact of coral diseases, bleaching, sea urchin die off, and storms

IMPACT ASSESSMENT

MANAGEMENT ACTIONS

Includes both on-site and off-site management programs

PART IV: BIBLIOGRAPHY AND RESEARCH REGISTER

Comments: The plan is well organized and very detailed, but is heavy on the descriptive/background information and light on management actions. As such it will not constitute a good model for a management planning exercise. The management plan has since been replaced by a management plan for the entire nearshore marine environment.

APPENDIX 6.18: Parks Canada Model (Sageney-St. Lawrence Marine Park)

The management plan reflects the decision of the Federal and Provincial Governments to jointly establish a marine park, the first in Quebec. The two governments signed an agreement to enact legislation and regulations for the park, in keeping with their respective jurisdictions. Establishment of the park and development of the management plan is the result of extensive public consultation.

Organization of the plan:

MARINE PARK MANAGEMENT FRAMEWORK

Includes description of the boundaries and the institutional framework for management (coordination zone, coordinating committee, partnerships with bordering municipalities and communities).

NATURAL AND CULTURAL FEATURES

Summary of the main physical, biological and cultural features.

OBJECTIVES

- ◆ Conservation
- ◆ Education and interpretation
- ◆ Research
- ◆ Land use
- ◆ Integration into the regional community

MANAGEMENT ISSUES

Mostly a description of current uses/activities and their impacts. Also addresses public safety.

ZONING

Criteria, management framework and compatible activities for 4 types of zones.

DEVELOPMENT CONCEPT

This section is comparable to an implementation plan. The development concept is based on the idea that the park, and exploration activities therein, are organized around themes illustrating the major park features.

Comments: The organization of the plan is simple and transparent. The user of the plan is not burdened with excessive or redundant information. As a model, it will be particularly applicable to the to MPAs where the management planning process was an integral part of the overall planning and consultation process for the establishment of the park.

APPENDIX 6.19: Turks and Caicos Marine Parks Model

The management plan relates to two almost adjacent MPAs, which will be managed from a single operational base. The parks have been in existence for quite some time, but were not under active management. The management plan intends to change this. The management activities for both areas are very similar in nature.

Organization of the plan:

SECTION I: BACKGROUND

- ◆ Introduction
- ◆ Objectives of the plan
- ◆ Review of existing legislation
- ◆ Resource description
- ◆ Uses and impacts

SECTION II: MANAGEMENT

- ◆ Objectives for management
- ◆ Legal framework for management
- ◆ Zoning
- ◆ Institutional framework for management
- ◆ Park equipment, infrastructure and facilities
- ◆ Public outreach, education and interpretation
- ◆ Research and monitoring
- ◆ Carrying capacity and visitor management
- ◆ Licensing procedures
- ◆ Enforcement
- ◆ Staffing and training
- ◆ Revenue generation and budget
- ◆ Timetable for implementation

SECTION III: ANNEXES

- I. Information sources/bibliography
- II. Legal texts
- III. Job descriptions park staff
- IV Visitor survey

APPENDIX 6.20:

Conclusions of Evaluation of Existing Management Plans

- ◆ Management plans are being prepared by scientists, managers, consultants, or teams of experts from several agencies.
- ◆ Each author or team appears to have its own preferred model for a management plan
- ◆ All management plans follow a general pattern, including a descriptive part and a management issues/activities part.
- ◆ some management plans follow a strict pattern of policy, goals and objectives, strategy and actions
- ◆ Management plans which have been prepared on the basis of extensive public consultation and review seem to be the most valuable and may have the best chances of implementation.
- ◆ Some management plans were prepared prior to implementation of management, others after IUCN has prepared a generic management plan outline¹ which constitutes a useful basis for any organization involved in management planning²
- ◆ There is no single model that MPAs can adopt for its management planning without modifications.
- ◆ MPAs should develop its own model, based on the comprehensive outline proposed by IUCN, and using formulas and approaches of existing management plans as appropriate

¹ See Kelleher G. & Kenchington, R 1992. *Guidelines for Establishing Marine Protected Areas*. A Marine Conservation and Development Report. IUCN, Gland, Switzerland.

² The authors remark that ...”It should be viewed as an ideal since it involves a planning situation where there is a high level of description and understanding of the area under investigation. The precise format adopted will depend upon the provisions of the legislation establishing the MPA and the government processes required for putting a management plan into effect”.

APPENDIX 6.21: Annotated Management Plan Outline

PART I: DESCRIPTION AND BACKGROUND OF THE MPA

1. Summary

This section summarizes the reasons why the plan was prepared, the period for which it applies, the conditions which controlled its preparation including the legislative basis and authority for plan development (where applicable).

2. Acknowledgment

This section will acknowledge all persons who have contributed to the development of the plan, as well as the organization(s), which provided financial support to the plan development.

3. Introduction

This section will briefly introduce the purpose and subject matter of Part I. It may furthermore address the mission statement of the management agency and a brief history of the agency.

4. History of the protected area, gazettelement and boundaries

Includes the criteria on which selection of area was based, date of designation, boundaries, reference to gazette notices, and boundary plans.

5. Physical characteristics

5.1 Climate

5.2 Oceanography

5.3 Geology

This will include information available from published literature and unpublished reports. It is not the intention that new data be collected. Geological information will only be included insofar it is relevant to the marine protected areas. Most emphasis will be on temperature, precipitation, sea surface temperature, salinity, and currents. Water quality may be addressed under oceanography or as part of a separate heading.

6. Coastal ecosystems

- 6.1 Coral reef communities
- 6.2 Mangroves
- 6.3 Seagrass beds
- 6.4 Fish stocks
- 6.5 Inter-tidal mud/sand flats; beaches
- 6.6 Endangered species and critical habitats
- 6.7 Islands/offshore cays

This section will be a compilation of information available and unpublished reports. It is not the intention that new data should give a clear picture of the biodiversity of the area.

7. Cultural characteristics

This section will describe any cultural features of the area.

8. Resources uses

- 8.1 Artisanal fishermen
- 8.2 Sport fishing, deep-sea fishing
- 8.3 Trawling
- 8.4 Mangrove cutting
- 8.5 Scuba diving and snorkelling
- 8.6 Other water sport activities
- 8.7 Beach recreation

9. Bibliography

10. Appendix: Gazette notices and boundary plans of protected areas

PART II: MANAGEMENT ISSUES AND ACTIONS

1. Summary

2. Mission statement and goals for marine protected areas

A mission statement will be given for each park and reserve. A possible mission statement for a marine park could be: “The mission of the marine park is to strictly conserve all biodiversity in the park, while providing for enjoyment of this biodiversity in ways compatible with the primary conservation objective”.

Goals will further elaborate on this mission. For example, goals can include “To enhance fish stocks in the park”; “To allow natural regeneration of damaged ecosystems”; “To promote sustainable tourism”; “To provide opportunities for public education and conservation awareness”; etc. The group will have to determine the appropriate mission and goals for each MPA.

3 Objectives for management

The emphasis here is on *management*. Examples of objectives for management include: “To facilitate access for visitors”; “To ensure safety of visitors”; “To increase public conservation awareness through printed material, graphic material, visitor information centers, lectures and workshops”; “To enforce regulations”; “To carry out research and monitoring in support of management”; etc.

4. Review of current management framework

This section intends to establish a baseline of the current arrangements for management in terms of the legal framework, institutional arrangements, infrastructure, equipment and human resources available for management. Paragraph 4.4 gives an evaluation of the current framework and identifies its constraints. The section gives an answer to the question: “What framework is in place today, and how effective is it?” This forms the basis for Section 5, which identifies management issues. 1

- 4.1 Current legal framework for management
- 4.2 Current institutional arrangements for management
- 4.3 Infrastructure, equipment and human resources available for management (including organogram)
- 4.4 Summary of constraints for management

5. Management issues: tenure, resource uses, impacts, and user conflicts

This section addresses the various management *issues* in the park and reserve. What are the activities (legal or illegal) that take place in the area, what are their impacts, what are the conflicts between user groups, and what management problems are associated with these activities?

- 5.1 Tenure
- 5.2 Fishing
- 5.3 SCUBA diving and snorkeling

-
- 5.4 Glass bottom boating
 - 5.5 Other water sport activities
 - 5.6 Sport fishing/deep sea fishing
 - 5.7 Beach recreation
 - 5.8 Security
 - 5.9 Land-based activities with impact on the marine environment
 - 5.10 Existing and potential conflicts between resource users

6 Management actions

This step will translate the management issues and problems as identified under 5 into management action. What management actions do we need to implement to adequately address these issues and problems?

- 6.1 Additional legislation required for management
- 6.2 New/additional institutional arrangements required for management
- 6.3 Land tenure
- 6.4 Zoning plans and regulations
- 6.5 Control of land-based activities
- 6.6 Licensing procedures
- 6.7 Liaison with other agencies and organizations
- 6.8 Infrastructure and equipment needs
- 6.9 Human resources and training needs
- 6.10 Community relations
- 6.11 Public awareness, education and interpretation
- 6.12 Research and monitoring
- 6.13 Surveillance and enforcement

7 Time schedule for actions (based on priority ranking)

It is proposed to conduct a priority ranking exercise for the actions under 6, and prepare an implementation schedule for the j-year life of the plan.

8 Budget, revenue generation and “creative financing”

The budget should be divided in capital and recurrent costs. Protected area managers should seriously look into creative financing mechanisms to increase direct revenue. Such mechanisms include, but are not limited to, the establishment of supporting NGOs and Friends groups that can raise funds for the park locally or apply to donor agencies for special projects.

9 Evaluation and review

A management plan needs to be dynamic in order to respond to changing circumstances. This section will describe the procedures for evaluation and review of the management plan. It is proposed that the lifetime of the plan will be five years and that a complete review takes place at the end of the S-year period. However, depending on unforeseen developments and circumstances, interim reviews may be proposed.

PART III: DAY-TO-DAY MANAGEMENT HANDBOOK

The management handbook will be a practical guide to all day-to-day management activities that can be consulted by all park and reserve staff. It will also be extremely useful to new staff transferred from other areas and reduce the time needed for familiarization.

Following is a very rough listing of the most obvious elements that should be addressed in the management handbook. It needs to be revised and completed by the managers on the ground. Once completed and in use, the handbook should be updated periodically to incorporate new procedures or other changes.

We propose a two-part structure, whereby part one describes the day-to-day management procedures, and part two gives a schedule by day, week, month, quarter, etc. of all the management activities. The schedule can best be presented as a series of tables.

Part I. Procedures.

1. Administrative procedures (work plans, reporting, meetings)
2. Financial procedures (revenue collection, bank deposits, budgeting, reporting)
3. Personnel management
4. Patrolling
5. Law enforcement
6. Research and monitoring
7. Community outreach, education and information
8. Maintenance

Part II. Schedule.

APPENDIX 22: Limits of Acceptable Change

Managing Recreation Use of Marine Resources Through the Limits of Acceptable Change Planning System

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Introduction

Clearly, the world has undergone significant social change in the last few years: the iron curtain has disappeared, terrorism has declined, an outbreak of peace is appearing, and the number of freely elected democracies has increased dramatically. Such momentous global changes in basic social and institutional structures are important factors influencing how nations will deal with pressing population, quality of life and environmental issues. At the same time that these fundamental changes have occurred, tourism has come to be the most significant industry, worldwide, measured in employment. D'Amore, for example, reports that 400 million international tourist arrivals in 1988 resulted in about 25% of the international trade in services, and 1042% of the world's gross product. Industry expectations are that the industry will continue to grow as long as political stability occurs on a global level.

Yet, as these important and fundamental changes have occurred, the world's population, particularly in third world countries, has raised its expectations in sharing in the economic well-being held by western Europe, North America and the Pacific Rim. The debate over whether the "South" can attain the same standard of living as the "North" has developed into a fundamental split in how economic growth is defined and who will pay the costs of conservation actions. Never-the-less, rising expectations suggest that third world nations will turn to the economic development tools that will gain them faster access to the material goods and services demanded by their citizens.

The global community is also keenly aware of the crucial need to maintain biological diversity and protect the integrity of ecosystems, particularly highly productive tropical forests and marine communities. One of the fundamental principles of "Caring for the Earth:

A Strategy for Sustainable Living” (IUCN 1991) is to Conserve the Earth’s Vitality and Diversity, through establishing protected areas and strategies that combine economic use and conservation over broad areas.

These major global trends are also coupled with a greater desire for local participation in natural resource decision-making processes. Old, top-down, centralized planning paradigms frequently ignored the wishes of local communities. Many projects didn’t adequately account for the costs of development and conservation that frequently benefited the international community but had few local payoffs. Development and conservation projects with little local public involvement and participation do not result in much “ownership” in the project, and thus may fail to be adequately implemented or create antagonism.

The result of these trends is that governments are expected, as they never have been before, to develop trackable and defensible decisions about ecological protection, where the judgments and social values used are explicit and subject to scrutiny as well as debate. This is particularly true when the enormous pressures for short run (and non-sustainable) development leads to significant economic benefits, but at the expense of irreversible impacts to natural environments. The zero-sum nature of many development projects points to increased polarization over the effects, costs and benefits of development: often environmental protection and economic development are described in “win-lose” terminology. While the choices are difficult, projects can frequently be modified to incorporate both concerns.

In summary, people want to know how decisions are made, who will benefit (and why) and who will pay the variety of economic and social costs that will eventually accrue from the project. In the politicized environments that often surround proposed conservation and development projects, planners have found that current paradigms of planning--where technicians plan for people--frequently result in plan failure, frustration by both planners and their clients, and increased polarization of the contending groups affected by the proposals.

These conclusions apply to tourism development as well as other tools of economic movement. The global growth in tourism, the increased interest in using natural environments for special type of tourist activity (termed eco-tourism), and the principle of local involvement have all combined to develop a greater need for planning systems that competently address environmental protection, local participation, and development in a way that makes the social judgments involved explicit and subject to review.

The need to respond to increased interest in eco-tourism through development of more and different opportunities combined with greater recognition of the importance of protecting biological diversity has forced planners and managers to turn to the carrying capacity paradigm as a method of addressing these needs. The carrying capacity paradigm would

seem to be particularly appropriate within the context of small islands, where resources are obviously limited. Unfortunately, as we have noted before (McCool and Stankey 1992) the rise in interest in applying carrying capacity in tropical regions comes just at the time when research and management experience in temperate zones has demonstrated its severe structural weaknesses.

Some Principles to Guide' Planning Processes

With this context in mind, we suggest that planning for tourism development be guided by the following principles.

1. "Good plans", ones that identify specific management actions or policies frequently create more disagreement about proposed courses of action than agreement. This is because such plans will negatively impact certain values that have been expressed socially and which are held by groups with the political power to veto proposed actions. Therefore, the traditional rational-comprehensive paradigm of planning (containing superficial 'public participation) is no longer adequate to deal with issues of tourism development and environmental protection (Friedmann 1973).
2. Because good plans create disagreement about the future among the affected groups, planning must encompass processes beyond the traditional technocratic methodology typically used. Planners must attempt to gain consensus from the affected groups as an essential and integral component of all phases of planning. Therefore, the public participation process must proceed with integrity and with objectives of creating dialogue, mutual learning, and societal guidance. The end result is consensus about a proposed future and agreement about how to get there.
3. The traditional rational-comprehensive planning offers the strength of a systematic process that explicitly considers alternatives. In order to be effective, consensus building processes must be coupled with technical planning methods.
4. Research clearly demonstrates several major problems with the carrying capacity paradigm. These problems illuminate the intrinsic complexity and difficulty involved in establishing numerical limits to human recreational use of natural environments. Plans dealing with tourism development and recreation use should focus on desired resource and social conditions and the level of change in the social and natural environment deemed acceptable.

Limits of Acceptable Change

Carrying capacity is often defined as the amount of use that can be accommodated in an area without significantly affecting the long-term ability of an area to maintain the biological and sociological attributes that gave rise to its recreational value. Within the context of small islands, we might tentatively define carrying capacity as the number of people that can be accommodated at one time within existing resource capabilities. However, research and *management experience in North America and elsewhere has frequently failed to establish the numerical capacities implied in this definition.*

A number of authors have pointed to the complex relationships between impact and use, the effects of bio-physical variables in mitigating these relationships, the influence of individual human behavior on this relationship, and the confusion of prescriptive judgments with descriptive information in establishing capacity (Graefe and others 1984; Stankey and McCoot 1984; McCool and Stankey 1990). McCool and Stankey (1992) most recently identified nine ' conditions required before a numerical capacity could be established. They concluded that few places would be able to satisfy all nine conditions.

Our suspicions are that marine environments, including small islands, cayes, atolls, beaches, and reefs are no different. While these places and their biota are very sensitive to development and human activity, small in physical size with some resources such as freshwater extremely scarce, identifying a single numerical capacity still involves assumptions about values, experiences, availability and cost of technology and appropriate recreation activities. Our tentative definition of carrying capacity included a reference to "existing resource capabilities". Nearly any development of small islands for tourism will require external inputs in terms of construction materials, labor, energy, sewage treatment and water supply. Thus, limiting carrying capacity to existing resource capabilities is not only unrealistic and impractical, but it does not help resolve more fundamental issues of scale and appropriateness of development that are often the center of debate. Reduction of complex issues of development, quality of life, environmental impact, and economic well-being to a numerical capacity over simplifies the frequently intricate and multi-faceted question of tourism development.

Recreational carrying capacity originally was, we feel, developed as a way of conceptualizing or framing real-world problems. However, the continual drive to use it in the sense of a "magical number" has made the concept one that is all but worthless in terms of utility to planning and management.

Wagar (1964), one of the original researchers testing the concept of recreational carrying capacity, felt that it was a method of looking at desired conditions. Indeed, most definitions of the term relate capacity to the objectives established for an area (see for example Lime and

' Stankey 1971). We feel we should return to this idea and focus our efforts on identifying the social and resource conditions for small island tourism development, and then determine how restore or enhance them. This is the central definition of the Limits of Acceptable planning system.

As originally conceived, LAC had both the intrinsic strengths and weaknesses of typical rational-comprehensive planning processes. LAC is a rational, systematic process that attempts to fit means to desired ends. Combining it with transactive planning concepts (dialogue, mutual learning and societal guidance) leads to a process that includes the power of intimate and authentic public participation in the planning process (Friedmann 1973).

The LAC process is built upon three major premises. First, any human-use of a natural environment results in some change to that environment. Therefore, the focus of planning and management is on identifying how much human-induced change is acceptable for a given setting. Second, diversity in resource and social conditions is both inevitable and desirable. Third, management actions should focus on attaining certain outputs of the process (resource and social conditions) through appropriate management actions.

The IAC process consists of nine steps that are briefly described below. The nine steps can be modified to fit the local planning environment.

1. *Identify area special values, issues and concerns.* Citizens and managers meet to identify what special features or qualities within the area require attention, what management problems or concerns have to be dealt with, what issues the public considers important in the area's management, and what role the area plays in both a regional and national context. This step encourages a better understanding of the natural resource base, such as the sensitivity of marine environments to recreation use and tourism development, a general concept of how the resource could be managed and a focus on principal management issues. LAC is very much an issue driven process; issues identified here will be addressed later.
2. *Identify and describe recreation opportunity classes or zones.* Most marine settings of sufficient size contain a diversity of bio-physical features, such as reefs, underwater cliffs, corals, and evidence of human occupation and use. Likewise, social conditions, such as level and type of use, amount, density and type of development, and types of recreation experiences vary from place to place. The type of management needed may vary throughout the area. Opportunity classes describe subdivisions or zones of the natural resource where different social, resource or managerial conditions will be maintained. For example, deeper reef settings will require SCUBA gear while in shallower areas snorkels may be adequate. The shallower areas may also show more impact from human use, such as effects on coral, than deeper areas. The classes that

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- are developed represent a way of defining a range of diverse conditions within the marine setting. And, while diversity is the objective here, it is important to point out that the conditions found in all cases must be consistent with the objectives laid out in the area's organic legislation or decree. In this step, the number of classes are also defined as well as their general resource, social and managerial conditions.
3. *Select indicators of resource and social conditions.* Indicators are specific elements of the resource or social setting selected to represent (or be “indicative of”) the conditions deemed appropriate and acceptable in each opportunity class. Because it is impossible to measure the condition of and change in every resource or social feature within a protected marine setting, a few indicators are selected as measures of overall health, just as we relatively frequently monitor our blood pressure rather than more complete tests of blood chemistry. Indicators should be easy to measure quantitatively and relate to the conditions specified by the opportunity classes and reflect changes in recreational use. Indicators are an essential part of the LAC framework because their condition reflects the overall condition found throughout an ‘opportunity class. It is important to understand that an individual indicator not adequately depict the condition of a particular area. It is the bundle of indicators that is used to monitor conditions.
 4. *Inventory existing resource and social conditions.* Inventories can be time consuming and expensive component of planning, indeed they usually are. In the LAC process, the inventory is guided by the indicators selected in step 3. For example, level and type of development, use density, and human-induced impacts on coral might be measured. Other variables, such as location of different corals, shipwrecks, docks and mooring spots, can also be inventoried to develop a better understanding of area constraints and opportunities. And, inventory information will be helpful later when evaluating the consequences of alternatives. Inventory data are mapped so both the condition and location of the indicators are known. The inventory also helps managers establish realistic and attainable standards. By placing the inventory as step 4, planners avoid unnecessary data collection.
 5. *Specify standards for resource and social conditions in each opportunity class.* In this step, we identify the range of conditions for each indicator considered appropriate and acceptable for each opportunity class. By defining those conditions in measurable terms, we provide the basis for establishing a distinctive and diverse range of marine settings. Standards serve to define the “limits of acceptable change”. They are the maximum permissible conditions that will be allowed in a specific opportunity class. They are not necessarily objectives to be attained. The inventory data collected in step 4 play an important role in setting standards. We want the standards defining the

- range of acceptable conditions in each opportunity class to be realistic and attainable; we also want them to do more than mimic existing (unacceptable) conditions.
6. *Identify alternative opportunity class allocations.* Most attractive marine settings could be managed in several different ways. Indeed, here in Belize Ambergris Caye, Caye Caulker and Caye Chapel differ significantly in the amount of development, human density (both residents and visitors) and recreational opportunities available. In this step, we begin to identify some different types of alternatives. Using information from step 1 (area issues and concerns) and step 4 (inventory of existing conditions), managers and citizens can begin to jointly explore how well different opportunity class allocations meet the various contending interests, concerns and values. For example, one alternative scenario for Caye Caulker might allocate the north side of the “cut” to an undeveloped class where human impact is least desirable or acceptable. On the other hand, this area could be viewed as an ideal location for expansion of the high end tourism industry and classed accordingly.
 7. *Identify management actions for each alternative.* The alternative allocations proposed in step 6 are only the first step in the process of developing a preferred alternative. In addition to the kinds of conditions that would be achieved, both managers and citizens need to know what management actions will be needed to achieve the desired conditions. For example, if the north end of Caye Caulker is to be kept pristine, a large acquisition by the Belize Department of Conservation may be needed. Conversely, if an upscale tourism experience is desired, land use zoning would be used to prescribe minimum lot sizes, etc. In a sense, step 7 requires an analysis of the costs, broadly defined, that will be imposed by each alternative. For example, many people may find attractive the alternative to protect the north end from any development, and restore to pristine condition any impacts that might exist. However, this alternative might require such a huge commitment of funds for acquisition and enforcement that the alternative might not seem as attractive.
 8. *Evaluation and selection of a preferred alternative.* With the various costs and benefits of the various alternatives before them, managers and citizens can proceed to evaluate them, and the managing authority, based on guidance from the public, can select a preferred alternative. Evaluation must take into consideration many factors, but examples would include the responsiveness of each alternative to the issues identified in step 1, management requirements from step 7, and public preferences. It is important that the factors figuring into the evaluation process and their relative weight be made explicit and available for public review.
 9. *Implement actions and monitor conditions.* With an alternative finally selected, and articulated as policy by decision-makers, the necessary management actions (if any)

are put into effect and a monitoring program instituted. Plans with significant ownership by those affected have the greatest chances of implementation; therefore, public participation throughout the LAC process is imperative.

Often, an implementation plan, detailing actions, costs, timetable, and responsibilities will be needed to ensure timely implementation. The monitoring program focuses on the indicators selected in step 3, and compares their condition with those identified in the standards. This information can be used to evaluate the success of actions. If conditions are not improving, the intensity of the management effort might need to be increased or new actions implemented.

The LAC process, in summary, provides a framework for thinking about issues of tourism development and management. It is a framework, we believe, that recognizes the intrinsic complexity of development issues, yet provides the process to competently deal with this complexity without being excessively reductionistic. By combining the technical expertise of planners and scientists with valuable personal-knowledge held by the local public, LAC can result in more defensible decisions that have greater chances of implementation.

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