WCPA-Marine & WWF
Marine Protected Area Management Effectiveness Initiative

Application of the WCPA-Marine/WWF Guidebook on Evaluating Effective Management in MPAs

GALAPAGOS

A Demonstration Case

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September 2003

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Introduction

Why perform MPA management effectiveness evaluations?

Marine protected areas (MPAs) are recognized as management instruments to protect marine biodiversity, to maintain/restore ecosystem health, and to provide coastal communities with a sustainable source for economic growth. However, most MPAs around the world face multiple issues, such as insufficient financial and technical resources, lack of trained staff, and lack of natural and social sciences research support. These issues severely challenge MPA managers and practitioners in the pursuit of the goals and objectives of their MPAs.

Measuring the performance of MPAs and their impact on natural environments and society is becoming a priority for many national governments, international organizations, and donors. Evaluating the effectiveness of an MPA provides information on the successes or failures in reaching the goals and objectives of the MPA, and these results allow MPA managers and practitioners to:

- Adapt management strategies to improve the MPA's performance
- Set priorities for new projects and strategies
- Improve accountability
- Implement measures to maximize the MPA's benefits to the society

The WCPA-Marine & WWF MPA Management Effectiveness Initiative

In 2000, the World Commission on Protected Areas-Marine (WCPA-Marine) and the World Wide Fund for Nature (WWF) initiated the MPA Management Effectiveness Initiative (MEI) to provide MPA managers and practitioners with a simple instrument to conduct an evaluation. This four-year program aimed to increase international awareness of the value of performing monitoring and evaluation in MPAs, and it was developed in collaboration with MPA managers and experts worldwide. A major product of this initiative is the guidebook *How is your MPA Doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness*. It gives a step-by-step description of how to perform an MPA effectiveness evaluation, how to select and measure the most appropriate indicators, and how to use the results of the evaluation. The guidebook contains a set of biophysical, socioeconomic, and governance indicators, which are designed to measure management effectiveness in a wide range of MPAs.

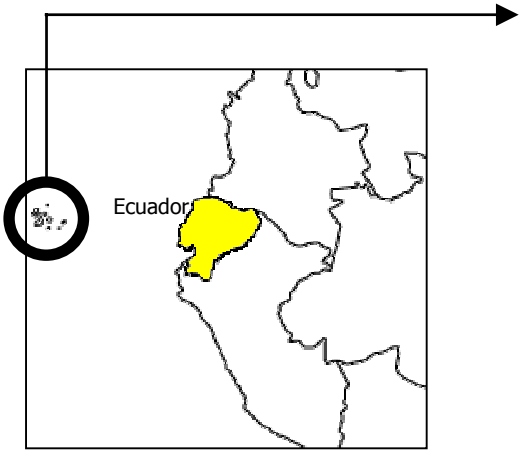
Demonstration case report

Eighteen pilot MPAs, with diverse management objectives and environments, were selected to field test a draft of the guidebook in order to develop a flexible tool that could be used in many types of MPAs. Over a six-month period, representatives from these MPAs participated in two activities: (1) a training workshop to learn how to use and apply the guidebook, provide feedback, and select the most appropriate indicators for each site; and (2) measure the selected indicators in their MPAs and submitted their results and recommendations to improve the guidebook. Four of these pilot sites, with different environments and management systems, reported more extensively on their experiences to illustrate how the guidebook can be implemented.

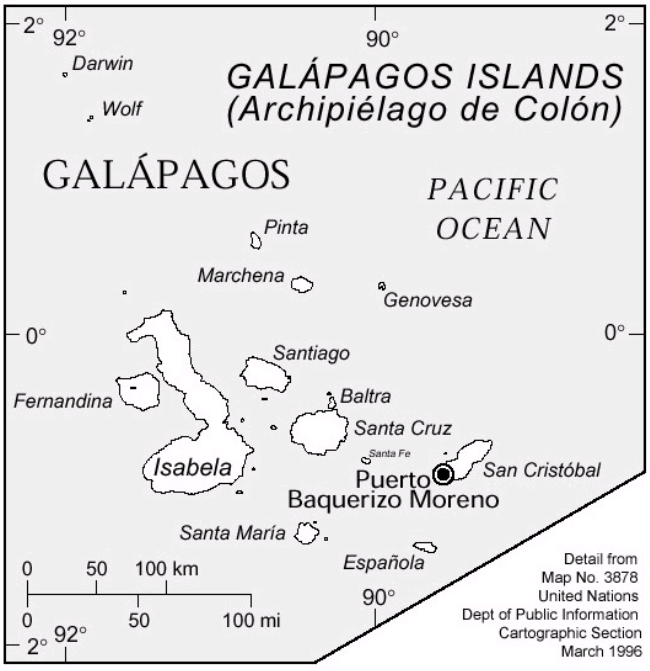
This report is the case of **Galapagos Marine Reserve**, Ecuador. This case study will provide MPA managers and practitioners working in similar MPAs an example of how the guidebook can be applied and adapted to conduct management effectiveness evaluations.

Descriptive Information

Name:	**Galapagos Marine Reserve**
Country:	**Ecuador**
Location:	**2° N - 2° S; 89°-92° W**
Area:	**135,000 Km^2**
Objective:	**Multiple use**
Near City:	**Guayaquil**



The Galapagos are an extensive and very complex archipelago, made up of 13 major islands, the smallest having an area of 14.1 km^2, and the largest 4,588 km^2, plus over 115 islets and rocks, most of which have vegetation. Its total terrestrial area is 8,000 km^2, and the islands straddle the equator, 1,100 km to the west of the coast of mainland Ecuador, at 3 degrees longitude East-West, and 4 degrees latitude North-South. Its Marine Reserve covers an area of 135,000 km^2, and it has a total of 1,500 km of coastline, making it the second largest protected marine area in the world, and making it all the more important biologically considering its vast area.



Ecological Characteristics

In Galapagos, the terrestrial and marine ecosystems are very closely related. In order to survive, practically all the species that live in and around the islands depend on the sea. Even the plant and animal that inhabit the high parts use the nutrients dropped by the marine birds returning to their nests.

The highly productive coastal waters sustain a very extensive food chain made up not only of plankton, sharks, and whales, but also terrestrial plants, insects, and birds.

A number of hot and cold currents come together in the archipelago, dividing the islands into different biogeographic zones. Here one can see corals, manta rays, and other plants and animals particular to tropical seas sharing space with penguins, sea lions, and other species characteristic of more temperate waters.

The different systems of currents combine with a wide variety of underwater landscapes that include the underwater volcanoes that approach the surface, providing an environmental in which a wide variety of species thrive, including sponges, corals, anemones, gorgonia, shrimp, bivalves, and starfish.

A large number of species are endemic to Galapagos, such as, for example, the marine iguana, the only reptile in the world adapted to live in the sea. The marine iguanas live along the rocky coasts, feeding from marine alga, and can remain underwater for up to 45 minutes.

Along the coast of many of the islands one can find four different species of mangrove: red (*Rizhophora spp.*), black (*Avicennia germinans*), white (*Laguncularia racemosa*), and button (*Conocarpus erectus*). The rich and high concentration of nutrients and plankton that come and go with the tides make the mangroves preferred nesting sites for birds and an important place for the breeding of many fish and invertebrate species.

The beaches of the Galapagos are also used by any number of species ranging from microscopic plants to the large sea lions. They are also preferred sites for sea turtles to nest.

Certain areas of outcropping are very important feeding sites for marine mammals. Dolphins, killer whales (*Orcinus orca*), blue whales (*Balaenoptera musculus*), and hunchback whales (*Megaptera novaengliae*) are among the 24 different species of cetaceans that visit the GMR in search of refuge, food, or a better place to mate.

Socioeconomic Environment

Approximately 20,000 people live on the five populated islands (Santa Cruz, San Cristóbal, Isabela, Floreana, and Baltra). In Galapagos, in addition to a wave of immigration, recent years have seen a considerable mixing of cultures, both Ecuadoran and foreign, which explains why there is not yet a cultural tradition solidly rooted in the islands. The main sources of income for the population are tourism, fishing, and commerce. Two extremely important activities that have developed historically in the area of the GMR are tourism and artisanal fishing. Both, in their way, depend directly on keeping the marine ecosystems healthy, and both bring pressure to bear on the islands' natural environment.

MPA Establishment

The Galapagos Marine Reserve (GMR) is a multiple-use protected marine area, created by the Government of Ecuador in 1998 with the issuance of the Organic Law on the Special Regime for the Conservation and Sustainable Development of the Province of Galapagos.[1] Also created at its inception was the Participatory Management System (PMS) of the GMR. Some additional and much more specific rules for the sound functioning of this system were implemented with the issuance of two additional bodies of law: (i) The General Regulation for Enforcement of the Law; and (ii) the Management Plan of the GMR.[2]

The creation of the GMR and the PMS was possible due to the local partnership among fishermen, tourism operators, nature guides, environmentalists, and the administrators of the Galapagos National Park Service (GNPS), who from the outset enjoyed major local political support and assistance from Ecuadorian and international NGOs.

In late 1996, a conflict analysis identified the common interest of the users in participating in the decision-making process.

In June 1997, the GNPS and the Charles Darwin Research Station began a participatory process to review the Marine Resources Reserve Management Plan,[3] in order to set up a Core Group made up of representatives from a broad array of users. The Core Group came up with a new category of management (the Galapagos Marine Reserve), and with a new administrative regime – the system of co-management, in which the local sectors are not merely consulted, but rather would play an active role in the decision-making process, to ensure fair decisions adapted to the local context, in which the users would be responsible for seeking consensus and in which they should carry out their commitments responsibly.

In 1998, with significant national and international support, this system became a reality with the new legal and institutional framework for the GMR.

Legal Framework

The legal framework for the GMR is established in the Special Law on Galapagos, the Forestry Law, and the regulations that apply to these two codes; the Maritime Police Code; special regulations, in particular on artisanal fishing and on tourism in protected areas; and the Galapagos Marine Reserve Management Plan.

The Fisheries Law and its regulation will be applied on a supplementary basis, i.e. to regulate any matter not considered in any of the above-listed bodies of law.

The Special Law for Galapagos established the system of co-administration and co-management of the Galapagos Marine Reserve, based on two fundamental principles, adaptive management and participatory management.

By law, the PMS includes the participation of the following:

[1] Official Register No. 278, March 18, 1998.
[2] Official Register No. 173, April 20, 1999.
[3] Category created in 1986; according to some experts, neither this category or the plan actually helped ensure the real management or sustainable development of the marine resources of the Galapagos Islands.

The Participatory Management Board (PMB) is the council of local users. The PMB is the entity for the participation of the users of the GMR, and is made up of: (i) a representative of the GNPS, (ii) a representative of the artisanal fishing sector, (iii) a representative of the Provincial Chamber of Tourism of Galapagos, (iv) a representative of the Charles Darwin Foundation, and (v) a representative of the nature guides. In the PMB, users present and discuss different types of proposals for projects or regulations, analyze them, and try to reach consensus. It is important to note that all resolutions by the PMB must be reached by consensus. This is intended to minimize efforts at marginalizing any group, and instead encourage the members to invest their best efforts in trying to understand the position of others with the goal of reaching mutually beneficial solutions. The model is considered the basis for a long-term dispute management process. The meetings are always guided with a view to seeking consensus; this is why they are moderated by a facilitator, who does not participate in the debate or decisions, but does follow the discussion closely (Bravo & Heylings, *forthcoming*).

The Inter-institutional Management Authority (IMA) of the Galapagos Marine Reserve is the highest-level decision-making body in the GMR's Participatory Management System. The IMA is made up of official delegates from government ministries, but also by representatives of the users of the Marine Reserve and delegates from the environmental sector. The members of the IMA are:

- The minister of environment, who serves as its chairperson;
- The minister of defense or a delegate;
- The minister of trade and fisheries or a delegate;
- The minister of tourism or a delegate;
- The president of the Union of Fishing Cooperatives of Galapagos;
- The president of the Chamber of Tourism of Galapagos;
- The president of the Ecuadorian Committee for the Defense of Nature and the Environment.

The technical secretary is the Director of the GNPS, and the Charles Darwin Foundation attends in its capacity as scientific adviser. Here, decisions are by vote, which means that all the members of the Authority have the opportunity to express their views; when the chairperson of the IMA considers that there has been sufficient discussion, he or she calls a vote.

A large percentage of the management decisions of the GMR are decided by a simple majority of votes of the IMA.

The Galapagos National Park Service (GNPS) is an autonomous public institution with decentralized economic management, which, under the Special Law for Galapagos, is in charge of administering the Marine Reserve in the context of participatory management, discussed above. The GNPS is responsible for carrying out the resolutions and decisions of the co-management system. Nonetheless, the Park also has authority to decide directly, in keeping with the powers conferred on it by the Law and the Management Plan. In emergencies, the Law allows the Park to make management decisions directly. Then these decisions must necessarily be reported to the IMA, which may ratify or annul them.

Management Plan

The goal of the Management Plan for the GMR is to protect and conserve the coastal marine ecosystems of the archipelago and its biodiversity for the benefit of humankind, the local population, science, and education.

Its main characteristics are:

- It contains various management principles, the main ones being participation, adaptation, and the precautionary principle.
- It defines the various human uses.
- It defines the responsibilities of the Reserve's administration.
- It considers a zoning system to define uses.
- It establishes regulations.
- It describes programs for the management and administration of the protected area

Staff and its Work

Approximately 230 park rangers work in the GNPS. They are in charge of protecting and conserving two protected areas, the land park, and the Marine Reserve.

According to the administrative scheme of the GNPS, the Marine Resources Unit is tasked with carrying out these conservation actions of the reserve, and 51 biologists, fishing technologists, captains, sailors, machinists, and administrative support staff work to this end. (Table 1). All the staff is distributed in the four technical offices located on the populated islands (Santa Cruz, San Cristóbal, Isabela, and Floreana) and in the two operational bases located at a distance (Canal Bolívar base on Isabela, and Tiburón Martillo in the Canal de Itabaca between Santa Cruz and Baltra).

The park rangers' main activities are monitoring and surveillance of the GMR, fisheries monitoring during the main fishing seasons, and coordinating support for all the other conservation activities undertaken by the institution's other units.

Tabla 1. Staff who work in the Galapagos Marine Reserve

STAFF	SANTA CRUZ	SAN CRISTOBAL	ISABELA	FLOREANA
Marine Biologists	2	0	1	0
Fishing Technologists	1	1	0	0
Captains	5	2	1	1
Sailors	15	6	3	1
Machinists	3	1	0	0
Administrative Assisstants	1	1	1	0
Technical Staff	3	1	1	0
TOTAL	**30**	**12**	**7**	**2**

Outreach and Training Activities

The GNPS is the most important institution in Galapagos, as it administers the resources generated by the entry fee levied from tourists going to the protected areas and distributes them to other institutions and agencies on the islands. The effectiveness of the management and administration of the archipelago's natural resources will depend on activities such as tourism, fishing, and even commerce. The tourist draw of Galapagos depends on sound conservation of the ecosystems. Losing this draw would result in social and economic problems for the population of Galapagos.

This is why the Park seeks to become involved in the community, carrying out environmental education and supporting the people and institutions of the islands. The Park tries to put forth proposals to garner the resources and funds needed to carry out conservation and sustainable development projects that benefit the population.

The Park enjoys considerable credibility and acceptance by the local population, because of its work.

The GNPS works with cooperation agencies, donors, NGOs, and friendly governments to support initiatives to train members of the community, students, and local users of the GMR. One can mention training courses in the area of fisheries, as well as cooperatives, and starting-up and running microenterprises, geared especially to artisanal fishermen and their families.

Stakeholder Participation

Co-management is the administrative system carried out in the GMR, by mandate of the Special Law. It is relatively young, as it just began to be implemented in 1999. With this system, the users play a vital role in management, and therefore are closely involved in all the activities having to do with the Reserve.

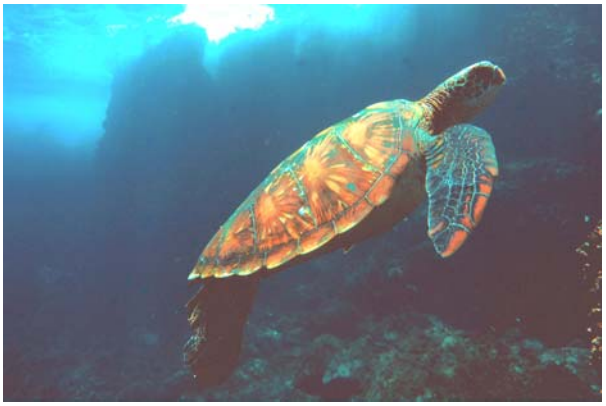
This point was an indicator in the evaluation of management effectiveness.

Relevant Matters

Since the establishment of the GMR, there have been several successes, including, among the main ones:

- Exclusion of industrial fishing from the area of the reserve;
- Establishing consensus-based provisional coastal zoning;
- Design of a five-year fisheries calendar with clear inter-sectoral commitments;
- The creation of a registry of fishermen and of fishing boats legally authorized to operate; and,
- The creation of a participatory management process that is increasingly well-understood with each passing day.

In order for the conservation of Galapagos to be maintained and in order for the local population to be able to develop its activities sustainably, the Ecuadorian government must continue to uphold its political commitment to protect the archipelago.



Conditions of the Evaluation

The GMR Management Plan includes a sub-program for evaluation and monitoring its implementation whose objectives are to lay the bases for analyzing how effectively the Plan has been implemented.

In 2001, a team of outside expert evaluators together with representatives of the sectors of the PMB evaluated the Participatory Management System, including three main components: situation analysis, analysis of goals, and analysis of activities (Heylings & Bravo, 2002).

Due to economic and technical factors, and also the short time since the creation of the Marine Reserve, the GNPS has not been able to implement the evaluation sub-program with periodic monitoring, to evaluate all the activities undertaken and to verify whether they have been brought into line with the conservation objectives proposed with the establishment of the protected marine area. This is similar to a problem observed in the land Park, since the same limiting factors impede the establishment of a permanent integrated monitoring system and periodic evaluations of management efficiency.[4]

The main aspects of the activities carried out within the GMR and which merit evaluation are as follows: the extent of participation of the users in the decision-making process, since good governance largely depends on this; the effort and level of catch of the main species of commercial interest, as a considerable number of families who make a living from fishing depend on their sound management; and finally, the level of knowledge of the local inhabitants regarding the most relevant aspects of the natural history of the protected marine area, since this, in due course, will guarantee support for management decisions that may be adopted.

The GMR Management Plan is a flexible and adaptive document that makes it possible, occasionally, to make adjustments in mid-stream when it is noted that the activities being carried out are not meeting the conservation objectives initially proposed. According to the management scheme established, the evaluations should be put to the consideration of the users in PMB, so that they, by consensus, can recommend modifications to the plan to the IMA. The concept of adaptive management could be implemented following this legal procedure.

It is very important to perform periodic evaluations of management effectiveness in the protected marine areas, since they enable the authorities, administrators, users, and the population in general to learn the level of management being attained, and to evaluate whether the objectives originally outlined when the reserve was established are being met.

The results of an evaluation may at a given moment help bring about important changes to correct mistakes in certain programs and/or conservation activities already under way that are not producing adequate results, in light of the original expectations.

In the case of the GMR, the target audiences for disseminating the results are the PMB and the IMA, the legally-established entities directly involved in managing the Marine Reserve, and, moreover, vested with the legal authority to make the changes they deem necessary to the management plan.

Using the draft guidebook for evaluating management effectiveness was vital, since it was the main tool that guided the work of the technical personnel of the GNPS involved in the project. The GNPS staff has some experience in evaluating management effectiveness, but limited to the land area.

[4] The latest evaluation of management effectiveness of the land Park was done in 1996 (Cayot & Cruz, 1996).

Applying the Guidebook

Selecting Indicators and Pre-Evaluation Activities

The indicators were selected for having a direct relationship with the objectives of the management plan (See annex 1 for a detailed list of indicators). Accordingly:

- The biophysical indicator of type and level of fishing effort in the GMR was measured (B8), as it is directly tied to the objective of maintaining and preserving the populations of fish species that are important for fishing, in keeping with the provisions of the plan.

- The indicator of governance, looking at the existence of a fully-established management system for decision-making (G3), was chosen because of the direct relationship with the objective contained in the management plan that speaks of implementing a participatory management system in the GMR.

- And finally, work was done with the socioeconomic indicator, regarding the community's degree of awareness of the natural history (S14), since the management plan speaks of providing for and promoting scientific activity so as to increase the knowledge and understanding of the marine biodiversity, of the sites and species exploited, and of the ecological impacts of human activity.

After the training workshop, which was offered in Honolulu, Hawaii, an internal workshop was held with the group of GNPS technical staff who were to do the evaluation work. That workshop lasted two days, during which the selected indicators were presented, an explanation was offered as to how they were chosen, the technical personnel were training in the use of the guidebook, and a timetable implementing the project was outlined in general terms.

The draft guidebook recommended that monitoring programs be implemented to measure the physical and governance indicators. According to the results of the internal workshop of technical staff (GNPS), this was not necessary since there was already enough information in Galapagos about the indicators chosen from the already-existing monitoring programs. Only in the case of measuring the socioeconomic indicator was it necessary to do a survey to strengthen the technical reports already available on the topic.

The technical team was selected based on their experience in the different areas in which the evaluation was to be done.

The work plan was designed in a participatory manner by all the technical staff on the team. Each specialist took responsibility for doing the measurement work for his or her indicator; the Coordinator of the Participatory Management Process and the Director of the GNPS were in charge of working with the governance indicator, the scientific adviser to the GMR measured the biophysical indicator, and the Coordinator of research projects along with the chief of the Marine Resources Unit measured the socioeconomic indicator.

In addition, three workshops were held on each of the main populated islands (Santa Cruz, San Cristóbal, and Isabela) with representative members of the PMB in order to present the indicators and work plan for the Park's technical team. The objectives of these workshops were to validate the methodology and to obtain the feedback needed to enable the team to better develop the project.

One of the advantages of having done this work in the Galapagos is that there was enough information on the indicators selected. Thanks to a permanent fishing monitoring program, there was already information on catch and levels of effort for the biophysical indicator selected; as a result of complete monitoring of the activities of the participatory management process by its Coordinator, there was abundant information on the levels of participation of the users in the decision-making process, and, finally, thanks to the existence of recent studies on perceptions of the GMR, there was a good base of information that supplemented the survey work done to measure the socioeconomic indicator.

Of the valuable information used in this evaluation, special mention should be made of:

- The fishing data base of the fishing monitoring program;
- The data base of the office of coordination of the participatory management program;

- Technical reports by consultants from the Inter-American Development Bank on perceptions of the GMR, and surveys designed to determine the extent of the community's knowledge of the natural history of the protected area.

In addition to the five technical staff in charge, four technical staff and 15 volunteers did the necessary work of collecting and systematically organizing the information. The technical personnel took charge of systematizing and analyzing the information in order to present the final report.

The results of the evaluation work were presented and validated in a final workshop with members of the PMB.

In regards to the biophysical indicator, it is recommended that more fisheries research be done in the area of population and biological dynamics of the economically important species (levels of recruitment, spawning periods, biomass of the species, biomass of the reproductive stock), since at present the lack of such information has a major impact when it comes to decision-making in the context of participatory management. Each year there is great concern and distrust on the part of the fishermen due to the lack of reliable scientific information. The indicator has been strengthened by the existence of the participatory fishing monitoring program (GNPS-CDF) since 1997.

The governance indicator clearly shows that the participatory management process, though young, is beginning to consolidate, due to the increase in the participation by the users since its inception. There is greater interest, on the part of the users and authorities, at their respective levels, in participating in the decision-making process. One problem, looking to the future, and which may impact on the arrangements for administering the reserve, is the country's political instability, which results in the government authorities who are members of the IMA being replaced on a more or less regular basis, imposing delays on the process, due to the need for a period of induction of the new authorities until they grasp the workings of the administration of the Reserve.

For its part, the socioeconomic indicator measured shows that the local population's knowledge of issues such as the life cycle of commercially important species (sea cucumbers and lobster), and the life cycle of emblematic species (sea lions and sharks) is extremely limited, which itself is a serious threat. This is explained by various reasons:

- Traditionally, environmental education in the islands has been more focused on the conservation of the land-based ecosystems, given their long history as a protected area
- The short time since the reserve was established has not allowed the institutions engaged in conservation efforts to be strengthened by hiring specialists whose work is focused on the GMR area.

As with the two previous indicators, certain information was already available that served as the basis for the work to be done. The more information the population has, the better their understanding of the issues. Understanding, in turn, generates attitudes and practices consistent with the conservation and sustainable use of the GMR. Therefore, it is important to gear efforts to better educating the users of the Reserve.

Lessons Learned

The pilot project carried out in the Galapagos Marine Reserve was very important, as it enabled the administrators to perform an initial evaluation – long postponed due economic and technical limitations – in this recently created marine protected area. This exercise was limited, as only three indicators were measured, but it made it possible to determine that some of the management objectives of the GMR Management Plan are not being fully met. This initial experience of evaluating the effectiveness of the management of GMR provided valuable lessons to the technical personnel who participated in it. The results acquired could easily be implemented in the future, not only in the archipelago, but also in any other protected marine site.

Channeled adequately, the results obtained are very useful, as they will enable those in charge of running the GMR (PMB - IMA) to carefully consider the situation and make the most appropriate management decisions, making it possible to amend errors and correct the path so as to attain the objectives proposed initially in planning.

The administrators must give close consideration to measurement of the biophysical indicator, according to which the CPUE of the different species has dropped somewhat. They have also determined that it is necessary to begin biological and specialized research on fishing resources of commercial interest.

The results of the governance indicator reflect the need to continue strengthening the system for participatory management of the Reserve, since this innovative management system has made it possible to diminish conflicts among users considerably in recent years. Currently, it is possible to observe a change in stakeholder strategies to achieve sectoral interests. Stakeholders have realized that they can get more out of a negotiating table than unauthorized acts, and this is reflected in the users' levels of participation. Political instability in the IMA is still a latent threat.

Regarding the socioeconomic indicator, it is vitally important to change the current education and communication strategy of both the GNPS and the CDF, since the results show that there are troubling gaps in knowledge with respect to the importance of the marine protected area. It would be good if these two institutions could improve their communication and public outreach programs, focusing more on the value and benefits of the GMR to the local community.

The results of this exercise helped concretely document what many in the GMR's senior management and supporters of conservation in Galapagos suspected were key issues related to effective management. Subsequently, one government aid agency has developed a funding strategy targeting the specific governance, fisheries, and community-perception issues highlighted in the management effectiveness analysis. Clearly, this is one of the key benefits of investing in monitoring and evaluation.

It is now up to the new senior management of the GMR (and JMP and AIM) to respond to the results of the evaluation by redirecting resources and adjusting management strategies in a timely manner while allowing the participatory management process to mature and become institutionalized.

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Official Register No 278, March 18th, 1999

Official Register No 173, April 20, 1999

Annex 1

List of Indicators (A) contained in the Draft Guidebook and used by pilot sites to field-test the indicators, and (B) contained in the final version of the Guidebook

	A. Indicators used by the Pilot Sites Draft Version of the Guidebook (September 2002)	B. Revised list of Indicators Final Version of the Guidebook (September 2003) (*)
BIOPHYSICAL	B1. Focal Species Abundance B2. Focal Species Population Structure B3. Composition and Structure of the Community B4. Recruitment Success within the Community B5. Habitat Distribution and Complexity B6. Food Web Integrity B7. Water Quality B8. Type, Level, and Return on Fishing Effort B9. Area Restored B10. Area Under Reduced Human Use/Impacts B11. Area Free from Extraction	B1. Focal Species Abundance B2. Focal Species population Structure B3. Habitat Distribution Complexity B4. Composition and Structure of the Community B5. Recruitment Success within the Community B6. Food Web Integrity B7. Type, level and Return on Fishing Effort B8. Water Quality B9. Area Showing Signs of Recovery B10. Area Under No or Reduced Human Impact
SOCIOECONOMIC	S1. Household Perceptions of Availability of Seafood S2. Local Fisher Perceptions of Harvest S3. Material Style of Life of Households S4. Community Infrastructure S5. Household Occupational Structure S6. Number and Nature of Markets S7. Infant Mortality Rate S8/9. Perceptions of Non-Market and Non-Use Value of the MPA S10. Percentage of a Particular Group in Leadership Positions S11. Local Marine Resource Use Patterns S12. Local Values and Beliefs Regarding the Marine Resources S13. Changes in Conditions of Ancestral and Historical Sites, Features, and/or Monuments S14. Stakeholder Knowledge of Natural History S15. Level of Understanding of Human Impacts (Including Population) on Resource S16. Distribution of Formal Knowledge to Community S17. Income Distribution by Source by Household	S1. Local Marine Resource Use Patterns S2. Local Values and Beliefs Regarding the Marine resources S3. Level of Understanding of Human Impacts on Resources S4. Perception of Seafood Availability S5. Perception of Local Resource Harvest S6. Perception of Non-Market and Non-Use Value S7. Material Style of Life S8. Quality of Human Health S9. Household Income Distribution by Source S10. Occupational Structure S11. Community Infrastructure and Business S12. Number and Nature of Markets S13. Stakeholder Knowledge of Natural History S14. Distribution of Formal Knowledge to community S15. Percentage of Stakeholder Group in Leadership S16. Changes in Conditions of Ancestral and Historical Sites, Features, and/or Monuments
GOVERNANCE	G1. Existence of a management plan and adoption of plan G2. Understanding of MPA rules and regulations by the community G3. Existence of a decision-making and management body G4. Existence and adequacy of legislation to enable the MPA to accomplish its goals and objectives G5. Degree of stakeholder participation in management of the MPA G6. Level of satisfaction of stakeholders with participation G7. The amount and quality of training provided to resource users to participate in MPA management G8. The amount and quality of training provided to community organization to participate in MPA management G9. Community organization formed and active G10. Available human resources and equipment for surveillance and monitoring G11. Clearly defined enforcement procedures G12. Number and variety of patrols per time period per unit area G13. Effective information dissemination to enhance and support compliance of stakeholders G14. Regular meeting of MPA staff with stakeholders G15. Proportion of stakeholder trained in sustainable resource use G16. Number of stakeholders involved in surveillance, monitoring and enforcement	G1. Level of Resource Conflict G2. Existence of a Decision-Making and Management Body G3. Existence and Adoption of a Management Plan G4. Local Understanding of MPA Rules and Regulations G5. Existence and Adequacy of Enabling Legislation G6. Availability and Allocation of Resources G7. Existence and Application of Scientific Research and Input G8. Existence and Activity Level of Community Organization(s) G9. Degree of interaction between managers and Stakeholders G10. Proportion of Stakeholder Trained in Sustainable Use G11. Level of Training Provided to Stakeholders in Participation G12. Level of Stakeholder Participation and Satisfaction in Management Process and Activities G13. Level of Stakeholder Involvement in Surveillance, Monitoring and Enforcement G14. Clearly Defined Enforcement Procedures G15. Number and Variety of Patrols Per Time Period per Unit Area G16. Degree of Information Dissemination to Encourage Stakeholder Compliance

(*) Note: Some of the indicators contained in the Draft Guidebook (September 2002) and used by the pilot MPAs during the field-testing phase were altered for the final version of the Guidebook (September 2003). The indicators of the final version were revised, regrouped, merged, and/or renamed based on the comments and recommendations from the pilot sites and external peer reviewers.

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