



MESOAMERICAN BARRIER REEF SYSTEMS PROJECT (MBRS)

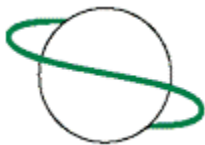


ANNUAL WORK PLAN

Period: July 2001 – June 2002
(Revised for Web Publishing)



August 22, 2001



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1. Executive Summary

The concept for the Mesoamerican Barrier Reef Systems Project (MBRS) was born with the signing of the Tulum Declaration in June of 1997. Since then, and under the auspices of the Central American Commission for Environment and Development (CCAD) and the World Bank, the four MBRS countries and other interest groups throughout the region have cooperated with each other in the design and preparation of the Project, leading up to its Official Launching on June 20th, 2001.

To ensure the proper implementation of the Project, funds will be disbursed against an approved Work Plan. A Draft MBRS Work Plan for the period 2001 – 2002 has been prepared by the PCU, and will be presented to the Project's Technical Working Groups (TWGs) for their inputs during the first round of meetings to be held in Tegucigalpa, Honduras, from August 20-21, 2001. The draft plan describes the activities to be conducted under the four technical components of the Project, as well as activities related to Project Management.

During Project Year 1 (PY1), activities under the Marine Protected Areas Component will focus primarily at establishing a monitoring baseline for Marine Protected Areas, as well as training to park staff in the development of management plans for MPAs. In addition, two Transboundary Park Commissions will be established in PY1. These activities have an estimated budget of \$111,925. Activities under the Regional Environmental Information System Component/(REIS), will focus on developing a baseline for synoptic monitoring of ecosystems health, at defining the scope of the REIS, and preparations for establishing its national nodes. The estimated budget for this component is \$394,940.

The Sustainable Use Component focuses at two sectors: Fisheries and Tourism. In PY1 this component will include the determination of spawning aggregation sites for selected species along the MBRS and the production of a digitized map to illustrate the results. A Regional Marine Tourism Fora will be implemented and a Regional Environmental Certification Program will be developed in conjunction with CCAD. The estimated budget for this component is \$143,290. In PY1 the Public Awareness and Environmental Education Component will focus on the development and Implementation of the Environmental Campaign Strategy. The estimated budget for this component is \$69,750.

Project Management in this initial start-up phase is focused primarily at establishing the PCU, staff recruitment and fees, procurement of project equipment, regional coordination and day-to-day project implementation. Details of this are described in the section on Project Management on page 36. This has been budgeted at \$777,780, but includes cost estimates for six quarters, as opposed to four. This is to account for the first two quarters of 2001 that have transpired. The real estimate for Project Management for the next four quarters is \$546,901 and the total estimated budget for PY1 is \$1,497,685.

The activities proposed for PY1 are consistent with the goals and objectives of the Project and will provide the necessary base upon which future project activities can be conducted. The budget estimates are conservative and agreed counterpart contribution will be crucial for successful project implementation.

2. Introduction

The Mesoamerican Barrier Reef System (MBRS) includes the second longest barrier reef in the world. The MBRS is unique in the Western hemisphere on account of its size, its array of reef types, and the luxuriance of corals it contains. The MBRS stabilizes and protects coastal landscapes; maintains coastal water quality; sustains species of commercial importance; serves as breeding and feeding grounds for marine mammals, reptiles, fish and invertebrates; and offers employment alternatives and incomes to approximately one million people living in coastal zones adjacent to the reefs. Associated with the coral reefs of the MBRS are extensive areas of relatively pristine coastal wetlands, lagoons, seagrass beds and mangrove forests; these sustain exceptionally high biodiversity and provide critical habitat for threatened species. The outstanding ecological and cultural significance of the MBRS has resulted in its designation as a World Heritage site.

Recognizing the importance of the MBRS to the economy of the region and to the natural and cultural heritage of its people, and conscious of the increasing threats to its overall health, the leaders of the four countries bordering the MBRS convened in Tulum, Mexico in June 1997 to pledge their commitment to protecting this outstanding resource. The Tulum Declaration called on the four littoral states of the MBRS and its partners in the region to join in developing an Action Plan for its Conservation and Sustainable Use. The Central American Commission on Environment and Development (CCAD), comprised of the Ministers of Environment of the seven Central American countries and Mexico (as an observer), approached the GEF through the World Bank to request support for the design of the Plan and a strategy for its implementation. With PDF Block A and Block B funds from the GEF and technical support from the World Bank, IUCN, and WWF, CCAD convened a multi-stakeholder workshop and subsequent working groups of scientists, managers, governmental and non-governmental representatives from the four participating countries to draft an Action Plan for management of the MBRS.

The MBRS Project is the first phase of a 15-year conceptualized program, and was designed based on the regional components of the Action Plan and included an exhaustive process of broad stakeholder consultation and participation throughout the MBRS region.

The consultative process was complemented by a series of technical reports developed specifically for this purpose. Of particular interest is the 'Threat and Root Cause Analysis', which clearly defines major threats to the MBRS and highlights 'hot-topics', with a special emphasis on transboundary areas.

The activities to be addressed under the Project are an accurate reflection of priorities identified and agreed to by the four participating countries and are primarily focused at issues in the two transboundary areas, consistent with the 'Threat and Root Cause Analysis'. These are distributed across five project components: Marine Protected Areas; Regional Environmental Information System; Sustainable Use of the MBRS; Public Awareness and Environmental Education; and Project Management. In all cases, the outputs of activities to be conducted will support the formulation of national and regional policies necessary for the conservation and sustainable use of the MBRS, with special consideration for the livelihood of primary interest groups.

This Work Plan describes the activities to be conducted during the Implementation Period 2001 – 2002 and is very much characterized by actions focused at establishing the Project Coordinating Unit and at developing the momentum and dynamism that the implementation of this Project demands.

3. Component 1: Marine Protected Areas

Sub-component A: Planning, Management and Monitoring of Protected Areas

At present, there is a large number of Marine Protected Areas (MPAs) in the MBRS region. Unfortunately, many of them exist only on paper and have little or no on-site management. Even where management plans are in place, rarely are there monitoring programs to detect changes in biodiversity status and other indicators of the effectiveness of protected area management. There is also an absence of sound social and economic analysis, financial strategies and fundamental skills required from the staff to carry out their work and responsibilities at the level required. In some countries in the MBRS region, government authorities have delegated the primary responsibility for management of the MPAs to NGOs.

Given the above, the present project sub-component intends to improve the capacity of those organizations, both governmental and non-governmental, responsible for marine protected area management. It envisages doing this through the provision of training and technical assistance in the development of MPA management plans. It also intends to assess the effectiveness of such assistance through an MPA monitoring program. The MBRS MPA monitoring program will include the assessment of biophysical indicators associated with the health and conservation of the environment as well as the evaluation of socio-economic objectives of MPA management in line with improving the quality of life of surrounding communities.

Within this sub-component, the priority is to initiate the design of the methodology to establish a baseline, a task that will be contracted out to a suitably qualified international consultant. The methodology will be subsequently reviewed and assessed during a meeting of regional experts.

To accomplish these objectives, the following activities will be performed: a) definition of terms of reference for the international consultant who will define the methodology for the establishment of the baseline for each of the existing MPAs; b) supervision of the consultant's activities to ensure the best quality of products; c) identification of experts in the field of marine protected area management; and d) hosting an Expert Meeting to validate the proposed methodology. An additional activity for this sub-component during the first year would be to embark on the establishment of the Transboundary Park Commissions and the development of their operational by-laws.

The topics that the commission will discuss relate to the management policies regarding Marine Protected Areas, fisheries, tourism, and monitoring of biophysical environmental parameters and socioeconomic aspects.

Sub-component B: Institutional Strengthening

This component will provide support in planning and training to a total of 15 previously selected MPAs. The criteria for selection of these MPAs were based on the significance of the protected area with respect to their contribution to the ecological values, diversity and processes within the Mesoamerican Barrier Reef System (MBRS); and on their potential to be used as demonstration models for effective protected area management and transboundary cooperation.

Of the fifteen selected MPAs, eleven already enjoy some form of legal protection and the remaining four are at different stages of being legally declared as protected areas. Nine of the MPAs are located in the two transboundary areas within the MBRS: the first being the Bay of Chetumal, between Belize and Mexico, and the second being the Gulf of Honduras, between Belize, Guatemala and Honduras. Several of the MPAs in the transboundary areas are defined by national boundaries and are being managed as separate units. Two of these bi-national MPAs (Xcalak/Bacalar Chico and Sarstoon-Temash/Sarstún) will be assisted through the project with the added objective of promoting a bi-national approach to their management.

In the first year, this sub-component will focus on training MPA staff in the development of management plans. The focus of the training program will be the nine MPAs that are located in the two transboundary areas of the MBRS region. This training will be conducted by an international consultant. The consultant will develop a training manual on the formulation of management plans to be used in the actual training. Management planning, and staff training in this subject, have been prioritized because a significant number of MPAs currently have neither master nor operational plans, much less have they established management plans and a baseline, which would allow them to monitor conservation actions.

Existing manuals and management plans will be reviewed to inform the development of the training manual. This will add value to the proposed manual, which will be evaluated subsequently by the technical team of the MBRS.

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4. Component 2: Regional Environmental Monitoring and Information System

Sub-component A: Creation and Implementation of a Distributed Regional Information System (REIS)

Background

The primary task of this sub-component is to design and implement an electronic information system, which will manage, and make accessible to the project's clients, the information relevant to the management of the MBRS and related ecosystems and to the human communities that depend on it for their livelihood. The work of this sub-component, therefore, is intricately tied to the processes and results of the other project components and specifically to the Synoptic Monitoring Program. These other components would determine the overall scope and collection methods for the data to be managed by the REIS.

The design of an electronic information system involves a full understanding of the requirements of its intended users. In the case of the REIS, the intended users are understood to be twofold: firstly, the counterpart agencies and other management bodies or entities who work directly with information relevant to the management of the MBRS; and secondly, the general public. These two groups of users would have different levels of access to the information in the REIS, as appropriate for their needs.

To determine the requirements of the REIS, it is first necessary to assess the quantity and quality of information already extant in the region, the format of this information, and the information gaps. Most likely, it will be necessary to focus the monitoring and data collection efforts into a subset of the overall need, which reflects the information identified as priorities for management. This sharpening of the focus will be accomplished through a series of consultancies and expert meetings undertaken through other project components and their results will feed directly into this sub-component. Once these results are available, a design of the first module(s) of the REIS can be produced.

It is expected that the full scope of the REIS will be very broad. It will therefore be more feasible to approach its design and implementation modularly. This will allow useable products, in the form of database modules, to be produced early on in the project life since the first module(s) can be fully functional before time is spent on designing the subsequent modules.

Given the interdependence between this and other project components, the intention is to analyze the requirements of all components in parallel rather than to await outputs from the other activities before embarking on REIS design.

This sub-component has a second and related responsibility to launch a project website and keep it updated with current project news. The website will provide general project information to the public and it will feature an information clearinghouse comprised of links to technical documents and related project sites. This website will also provide access to the REIS, once it is implemented.

The specific tasks envisioned for the first year can be described as follows:

Technical Working Group Meetings

At the first meeting, the technical team will meet with counterparts from the four participating countries to determine the scope of the REIS, the status of information management in each country, the data sharing potential, the technical capacity of each country, and to identify agencies in each country that could host database nodes.

By the time of the second meeting, planned for the latter part of the first project year, the environmental monitoring requirements will have been defined to an extent that would allow design of the first module(s) of the REIS. An implementation plan can then be drafted for approval, detailing when equipment should be purchased and which nodes are ready for implementation. Also, by this time, the hardware and software requirements for the first database nodes could be drafted and the procurement process begun. Depending on the specific requirements, the procurement phase may not be completed prior to year-end. An amount for system purchase is therefore **provisionally** included in this year's budget.

Since it is the intention to establish at least one database node in each of the participating countries, commitment from the candidate node agencies to participate fully and actively in maintenance of the information and related hardware will be a necessary pre-cursor to the actual implementation of any node. A set of qualifying requirements for node agencies will therefore need to be drafted.

Establish Metadatabase

The REIS is visualized as a two-tiered system. One tier would be an information clearinghouse. The information clearinghouse will be accessible to the general public. Within this clearinghouse, there will be various types of information, including, *inter alia*, the following:

- General information about the MBRS project
- A bibliography of publications related to the MBRS
- Technical reports
- A directory of the principal actors in the management and conservation of the Mesoamerican Barrier Reef
- Links to Web sites of related projects and agencies
- National legislation
- Marine and Coastal protected areas in the MBRS project area
- Other environmental policy instruments
- A database of metadata describing the electronic information available for the region
- Geographic Information System
- Environmentally-friendly tour operations
- Other projects operating in the MBRS project area

The second tier of the REIS would be a database that manages the information collected by the project itself, for example, the data collected under the following components:

- Synoptic Monitoring Program
- Marine and Coastal protected areas
- Sustainable Use
 - Tourism
 - Fisheries research
- Environmental education
- International legislation

This project database would be accessible only to authorized users who have passwords.

Central database. This will involve: (i) identifying the scope of the database for the 5-year project period, (ii) identifying data collection, processing and output requirements for each component, (iii) drafting systems analysis and design documents for the first modules to be implemented, (iv) determining hardware and software requirements, and (v) drafting an implementation plan.

Expert meeting. Inputs from the expert meeting and consultancies will feed into the systems analysis and design process. Two different groups of professionals would be needed for the expert meeting – the first would have specific expertise in environmental information systems whereas the second would have expertise in web-based database technology. It may be advantageous to have these two groups meet at different times since the first group is needed during the design phase whereas the second would be more useful once the system requirements have been well-defined. Data collection protocols will be designed simultaneously and in conjunction with the Synoptic MBRS Monitoring Program and the Marine Protected Areas Component.

Node agencies. It is intended that the REIS be a distributed database with at least one database node in each of the four participating countries. After the central database has been implemented, nodes will progressively be established in each of the four countries.

The envisioned network design would have a central node located in the office of the Project Coordinating Unit with four server nodes located in selected agencies in the four countries, all connected via the Internet. The nodes in each country can have workstations connected via an Intranet.

To be a node, an agency must comply with certain criteria and must commit itself to contributing certain in-kind resources. The desired characteristics of a node agency are:

- The permanence of the institution
- Stability
- Experience in database management
- Confidentiality in the management of the information
- Involvement in the management or conservation of marine and/or coastal ecosystems.

The counterpart contributions required from the node agencies are:

- Full participation and collaboration with the project consultants and technical team
- Commitment to share data
- Timely input of information according to agreed commitments
- Access to existing data and computing infrastructure
- Physical space and infrastructure to house the nodes
- Personnel to attend the training programs
- Commitments from each country to maintain its node
- Provision of electronic versions of reports to be included in the information clearinghouse on the project Website.

The Technical Working Group (TWG) of this sub-component will recommend candidate node agencies. From amongst these candidates, the National Barrier Reef Committees, in coordination with the Information Systems Specialist of the MBRS Project, will select those that best fulfill the established criteria. The TWG has already offered a preliminary list of agencies that could serve as nodes in each country. These are:

Belize: CZMAI, BAS

Guatemala: Center for Conservation Studies – USAC, CONAP

Honduras: SINIA, PMAIB, REDHES, DIGEPESCA, AFE_COHDEFOR, CURLA,
Cayos Cochinos Foundation

Mexico: ASK, UQROO, CINVESTAV, CONANP

Each node will have the responsibility of entering the data for its country into the information clearinghouse. The project data will be entered by whoever collects the data. The project, in coordination with its counterparts, will develop a manual of norms and procedures for the management and use of the MBRS information system.

Before establishing a node, the candidate host agency must meet these requirements and must commit to investing the necessary resources into maintaining the node. Once a suitable agency is identified, procurement of the appropriate software and hardware may begin. Ideally, it will be possible to embark on the procurement of a system for *at least one*, (and preferably more than one) node agency within the first year. Although it may not be possible to complete procurement within this time, allowance is made in the budget for procurement of all four systems.

It is not advisable to embark on system purchase before completion of the design phase and subsequent drafting of system requirements. Given the rapid rate at which computer technology becomes obsolete, it is best to wait until requirements are better understood, and a particular node agency identified, before purchasing the system for that agency.

Information dissemination. Processed information and reports produced by the project will be made available on the MBRS project website. Technical reports produced by counterparts and natural resource management agencies can also be made available on the website, providing that information sharing agreements can be reached.

Website Management

Launching and maintenance of the website is an on-going activity requiring monthly website housing fees. The website will provide updated information on current project activities, consultancies being offered, and achievements. As such, the content will need to be updated at least on a quarterly basis. Once the REIS is implemented, it will also be made accessible through the website.

Establishment of Office Network

In the first months of the project, an office network will be established linking all office computers at the Project Coordinating Unit. This network will allow office staff to share working documents as well as computing resources such as printers, disk drives, Internet connections, etc.

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Sub-component B: Establishment of a Synoptic MBRS Monitoring Program

Objective of the SMP

The main objective of the **Synoptic MBRS Monitoring Program (SMP)** sub-component is to establish a regional and issue-specific program that will generate reliable information to form a solid baseline for data management and decision support to aid in the conservation and sustainable use of the MBRS. It is therefore important that the SMP is designed with sufficient flexibility to allow it to accommodate future developments and/or data acquisition. Ideally, the SMP should be a comprehensive program covering as many biological, physical and ecological parameters as possible. However, because of budgetary and time restrictions, it is likely that only those monitoring activities with a high level of priority will be carried out. The reports produced by the SMP will be accessible publicly through the MBRS Project web site.

Regional Issues Influencing the SMP

The project area is a mosaic of inter-linked ecosystems surrounded by water. Most ecological processes and linkages between the reefs, mangroves, seagrass beds and other coastal ecosystems, are thus influenced greatly by water currents, which account for the dispersal of nutrients and reproductive products across ecosystems. Unfortunately, they are also responsible for transporting pollutants and debris, affecting the water quality of their surroundings. Despite this, little is known of the region's oceanographic patterns and water quality regimes and their influence on the processes and ecosystems in the MBRS region. Additionally, data are also needed on complex reproduction patterns, larval dispersal and recruitment for key groups of species.

It is therefore envisaged that the SMP will generate information on the region's oceanographic current regime and its influence on the status and processes of MBRS reefs and other critical ecosystems. It is hoped that data will be collected on reproduction, larval dispersal, and recruitment of corals, fish and other important reef components to further our understanding of ecological linkages between reefs and other marine environments, and processes, which influence reef integrity.

Focus of the SMP

To maximize resources, the geographic focus of the SMP in its initial phase will be in the two transboundary areas of the MBRS: a) between Mexico and Belize (i.e.: Río Hondo and New River) and b) between Belize, Guatemala and Honduras (i.e.: Motagua, Chamelecón, Ulúa and Sarstoon Rivers). Ideally, the SMP will include up to 23 areas in total: the 15 priority protected areas and eight additional sites, located strategically between the transboundary areas of the north and south. These monitoring sites will contribute to a more complete understanding of the ecological processes that characterize the MBRS (See Table 1). Selection criteria for monitoring sites will most likely include: the presence of biodiversity-rich ecosystems; importance of the areas as sources or sinks for recruitment of corals, fish and other important community components, and presence and degree of threat associated with pollution stemming from onshore activities

The SMP proposes to standardize monitoring methodology for the region in such a way that comparisons can be made between monitoring sites, countries and region. Table 2 presents the potential monitoring methods that could be utilized in the SMP. Similarly, there should be training of monitoring personnel at various levels: methods, collection and analyses of data, etc. The establishment of partnerships between existing government and non-government agencies in the region will allow the exchange of experiences between the participating groups in the SMP. Additionally, it will be necessary to prepare a habitat map for the MBRS region that will permit monitoring results to be incorporated.

The SMP will be designed to address management concerns for the MBRS and will focus on those anthropogenic activities that are currently giving serious cause for concern for the long-term health of the reef and adjacent coastal ecosystems. Such activities represent complex cultural and socio-economic issues, which will need to be addressed if the long-term sustainability of the MBRS region as a whole is to be ensured. However, most of these may be outside the scope of the present project. The immediate objective of the SMP is therefore to provide high quality information for the improved management of the reef system. As such, it will aim to have a parallel ecological and anthropogenic emphasis.

General Approach for Implementation of the SMP

It is proposed that the SMP, similarly to the REIS, should have national nodes that will feed a regional node. National nodes will be agencies with experience in monitoring activities, with a high level of technical capacity and that can take the lead in their respective countries. Experience personnel in such nodes will have the responsibility of training staff in other agencies or countries and to supervise monitoring activities in their countries or the region. Table 3 shows potential executing agencies for the SMP in each participating country in the MBRS Project.

The development of the SMP could be envisaged as follows:

- Design of the monitoring program
- Standardization of methodology
- Manual preparation
- Selection of national nodes
- Selection of data collectors by topic and areas (among existing entities and communities)
- Training of national nodes
- Training of collectors
- Data collection
- Inclusion in national nodes
- Inclusion in regional nodes

Technical Working Groups

Setting up the priorities for the monitoring activities is high on the agenda during this workshop and will be the joint responsibility of the Technical Working Groups (TWG) and the Project Coordinating Unit. The collaboration of the members of the TWGs at all stages of design, implementation and sustainability of the monitoring program is consequently considered crucial to the successful development and long-term operation of the SMP.

Monitoring Frequency

It is envisaged that there will be experimental monthly sampling in the two transboundary areas for one year. Such sampling needs to include physico-chemical parameters, algae and fish, among others. From these results, the most important events in the year will be identified to modify the future focus of the program.

Consultancies for Baseline Determination

Some of the key activities that will be undertaken as soon as possible will be the national and international consultancies that will provide crucial information on coral reef ecology, land-based sources of pollution and the region's oceanography for the determination of a solid monitoring baseline. Consultants will make preliminary recommendations, particularly regarding the priorities of the SMP, which will be in function of the human and financial resources available.

Expert Meeting: Baseline Determination Workshop

Information and data, together with the recommendations from the above consultancies will form the basic material for discussion at a *Baseline Determination Workshop*, which will occur shortly after receiving the consultants' recommendations. During this workshop, the activities of the SMP will be clearly defined for the duration of this first five-year project phase.

Aware of the high quality work carried out by several international programs, such as the *Long Term Monitoring Program*, *Science for Management* and the *Global Coral Reef Monitoring Network*, all part of the Australian Institute of Marine Sciences; other monitoring programs in the USA, Caribbean and elsewhere, the MBRS SMP will be developed with these successful models in mind. It will be designed to incorporate key features most relevant to the Mesoamerican Region and will have as a high priority, to standardize and harmonize methodologies and data analyses for their rapid incorporation into national strategies.

Ideally, the MBRS SMP should be a robust program able to incorporate data on selected groups of species, habitats and events that are most likely to provide us with a rapid and reliable indication of changes to the health of the key MBRS environments. As data continues to be fed into the Program, the complexity of the analyses will increase but so will our ability to assess and measure change to the reef and adjacent ecosystems.

Information Dissemination

A Baseline Determination Report, a preliminary design for the SMP and a monitoring manual will be produced by the end of the first year. As an aid to future monitoring activities in the region, the manual will include the latest concepts and knowledge available on monitoring protocols and methodologies for several taxonomic groups and parameters.

Table 1. Synoptic Monitoring Program of the Mesoamerican Barrier Reef System Project Selected Sites for the SMP and List of Potential Monitoring Parameters

Sites	Parameters	Physico-Chemical	Water Quality	Mangrove	Pollution	Currents	Fish	Corals	Other Invertebrates	Algae and Seagrass	Birds	Aquatic Mammals	Reptiles
Santuario del Manatí		*	*	*	*	*					*	*	*
Banco Chinchorro		*	*	*	?	*	*	*	*	*	*		*
Arrecife de Xcalak		*	*	*	*	*	*	*	*	*	?		*
Bacalar Chico		*	*	*	*	*	*	*	*	*	?		
Corozal Bay		*	*	*	*	*					*	*	
South Water Caye		*	*	*	*	*	*	*	*	*	?		
Glover's Reef		*	*	*	?		*	*	*	*	*	*	
Gladden Spit		*	*		*	*	**	*	*	*			
Sapodilla Caye		*	*		*	*	*	*	*	*			
Port Honduras		*	*	*	*	*	*	*	*	*	*	*	
Sarstoon-Temash		*	*	*	*	*	*	*	*	*	*	*	
Río Sarstún		*	*	*	*	*	*	*	*	*	*	*	
Punta de Manabique		*	*	*	*	*	*	*	*	*	*	*	*
Omoa-Baracoa		*	*	*	*	*	*	*	*	*	*	*	*
Turtle Harbor		*	*	*	*	*	*	*	*	*	*	*	*
Beize River		*	**	*	**	**	*	*	*	*	*	*	*
Hoj Chan		*	*	*	*	*	*	*	*	*	*	*	*
Caye Caulker		*	*	*	*	*	*	*	*	*	*	*	*
Río Dulce		*	*	*	*	*	*	*	*	*	*	*	*
Bahía Santo Tomás		*	*	*	*	*	*	*	*	*	*	*	*
Puerto Cortés		*	*	*	**	*	*	*	*	*	*	*	*
Tela		*	*	*	**	*	*	*	*	*	*	*	*
La Ceiba		*	*	*	**	*	*	*	*	*	*	*	*

* = Suggested parameter

** = Parameter of particular importance

? = Importance unknown

Table 3. Synoptic Monitoring Program of the Mesoamerican Barrier Reef System Project					
Potential Executing Agencies for the SMP by Country					
HONDURAS NODE	GUATEMALA NODE	BELIZE NODE	MEXICO NODE	EXTERNAL NODES	
UNAH*	Shell	CZMA&I*	SEMARNAT	NASA	
PROLANSATE	Ministry of Energy and Mining	Fisheries Department	Mexican Army	NOAA	
BICA	Empornac	UB	CONANP*	U Miami	
FUCSA	UNICPESCA	DOE	ECOSUR*	U Florida	
FHRPF	CONAP*	Collabon	UQROO*	Texas A&M	
PMAIB*	CECON	NGOs	UNAM	Cornell	
RIMS	CEMA	TIDE	ASK*	U Louisiana	
City Council of Puerto Cortés/UGA	FUNDARY	BAS	SEDUMA	U Windsor	
CESCO	FUNDAECO/COSTAS*	Green Reef	CET MAR	TNC	
DIGEPESCA	INAB*	Public Health	AMAC	Environmental Defence	
DIBIO	NAVY	Forest Department	CAN	JICA	
Ministry of Health	Ministry of Health	LIC*	SAGARPA	IRS	
ENP	City Council		CAPA	CARICOM	
IGN*			CINVESTAV*	AGRRA	
ESNACIFOR*			CICESE		
UNITEC*					
AFE-COHDEFOR*					
Bold = possible executing agencies					
* = Agencies with GIS. This does not apply to external agencies.					

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5. Component 3: Promotion of Sustainable Use of the Mesoamerican Barrier Reef System (MBRS)

Sub-component A: Promotion of Sustainable Fisheries Management

Fishing is one of the most important economic activities in the MBRS region. In addition to their economic role, many fish species play key roles in the health of the reef ecosystem. A critical stage in the reproductive cycle of various reef-based fish species in the MBRS, including several with commercial value, is the periodic aggregation of spawning populations in geographically specific areas. Unfortunately, in the majority of these areas, such aggregations are taken advantage of to catch these fish. This type of fishing has taken place for some time without restriction.

In light of this, the objective of this sub-component in the first project year is to support the collection and analysis of scientific and anecdotal information documenting the location of spawning aggregation sites of commercially important fish species that are found in the MBRS region. This task will be contracted out to an international consultant.

A key product of this consultancy will be the preliminary evaluation of the status of fish spawning aggregation sites, which will be monitored in the following three years. This activity therefore constitutes the first step in the development of a Draft Regional Policy to regulate overfishing in these sites. The following species will be evaluated during the second year of the project: grouper, snapper, snook, hogfish, and anchovy. For these species, ecological relationships, such as sex ratio, age structure, companion species, duration of the aggregation and distance traveled, will be determined.

Furthermore, a digital map will be produced at different scales, showing the geographic distribution of the areas studied. This map will comprise various information layers, by species, showing depth and other factors, which illustrate the connectivity between aggregations.

The above-mentioned study is being undertaken since little data currently exists from which to determine the consequences of the practice of overfishing in these sites and within the fish populations of the MBRS in the long term. Furthermore, consistent policies to regulate these practices do not exist at the national and regional levels.

Sub-component B: Facilitate Sustainable Coastal Marine Tourism

Tourism represents one of the most important income streams for Central America, and one which has been growing in recent years. A good percentage of this tourism focuses on natural attractions, among them the various reef formations of the Caribbean Basin. In the absence of adequate environmental management guidelines or regulatory regimes, the proliferation of traditional sea and sun tourism continues in the region, putting at risk the ecological values of the reef system.

Consequently, during the first year, the emphasis of this sub-component will be on the design and implementation of a Regional Forum on Tourism. This activity will be conducted by international and national consultants who will have the responsibility of training regional personnel. The consultants will also develop a training manual, which will be used in the actual training, and which will subsequently be published and disseminated.

The MBRS countries will establish agreements that guarantee their participation in the tourism fora. A framework and regulations for these fora will be designed to facilitate their implementation. Furthermore, an analysis of existing local initiatives will be undertaken to ensure that there is no duplication of effort.

Additionally, this sub-component, in collaboration with the Central American Commission on Environment and Development (CCAD), will promote the formulation and adoption of a certification system for best-practices in tourism operations.

The concept of a five-star hotel in the MBRS region will also be revised, incorporating new models of hotel accommodation and establishing the carrying capacity for tourism in the region.

There is an urgent need to promote dialogue on regional policies and to take concrete steps to ensure the implementation of the principles of environmentally sustainable tourism, which will result in the development of best practice models for sustainable coastal and marine tourism in the four countries comprising the MBRS.

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Component 4: Public Awareness and Environmental Education

Objective:

A critical element in developing the political will and policies required to manage the MBRS sustainably will be to build the necessary public support to catalyze change. The objective of this component, therefore, will be to create public awareness in the region of the need to conserve the MBRS. This will be done by increasing public knowledge about the value of the reef and fostering an understanding within the general public about the impacts of development on this ecosystem. Through networking, information sharing, and discussion fora, the project will seek to introduce environmental and social sustainability criteria into decision-making. Activities under this component include: the establishment of an MBRS database and information clearinghouse (linked to Components 2 and 3), the production and dissemination of education materials, and regional workshops and conferences for professionals in the industrial and tourism sectors that directly affect MBRS resources. This component will also provide training for community leaders who exert a strong influence on MBRS stakeholders.

This component contains two sub-components: (A) Development of an Environmental Awareness Campaign, and (B) Formal and Informal Education. The latter sub-component will not be embarked upon in the current project year but rather in the second year, during the period 2002-2003. A work plan for the latter sub-component is therefore not included here.

Sub-component A: Development of an Environmental Awareness Campaign

Under this sub-component, general public awareness of the importance of the MBRS as a world-class resource and the need to promote its conservation and sustainable use will be increased. This will be carried out through the development of a public awareness campaign based on the use of printed and audio-visual material.

Specific activities

The specific activities of this Work Plan include:

1. Design of a Public Awareness Campaign Strategy

This will be developed through a series of meetings and interviews with key players in the four MBRS countries. It will be implemented on a regional basis and will focus on the value and need for conservation of the shared resources of the MBRS. The performance indicator for this activity will be the completion of the related consultancy and the presentation of the campaign strategy. (See table 4.)

To this end, it will be necessary to define terms of reference for:

- a) An international or regional multidisciplinary consultancy firm with experience in the region, who would contract a local counterpart. This may also be undertaken by an independent consultant.
- b) A regional research institute, consultants, or independent regional or international specialist supported by a research or academic institute who will establish the Public Awareness Campaign Strategy and who will design of base methodology for the collection of data which would allow the measurement of changes and of public behavior regarding their receptiveness to the sensitization and consciousness-raising process.

It is suggested that the consultant consider the following list of priority targets:

1. Service providers
2. Fishermen
3. Tourists
4. Local and national decision makers
5. The industrial sector
6. The informal sector
7. Sea transport

This list of priorities has been defined with the aim of evaluating the socio-cultural particulars of each group and focusing greater or special efforts on them. Furthermore, it is intended that the consultancy produce recommendations to make the campaign self-sufficient.

The strategy will include the following elements:

- a) A diagnosis of the public awareness needs with specific recommendations about the most feasible ways to reach the previously described population sectors. The recommendations should include names of contacts (formal and informal organizations and individuals,) networks, discussion fora, broadcasting costs, and names of organizations with which the counterparts can realize synergies to achieve greater impact.
- b) Establishment of a system to evaluate the effectiveness of the campaign, accompanied by a statistical database of this information.
- c) Development of a manual of graphic templates (basing its design on information regarding the characteristics of the target populations and providing specifications for the design of educational materials.) This supposes that the graphic design of the campaign, depicted within the budget as an independent activity to be undertaken by a consultant, feeds into the design of the campaign strategy. (*See the Work Plan for this component.*)

The project will also undertake the following complementary activities:

- a) Development of a catalogue of MBRS reference materials, which will include all printed and audio-visual materials produced by the various MBRS project components. These materials will be compiled and made available to the public.
- b) Development and dissemination of promotional materials.
- c) Conducting seminars for the National Barrier Reef-Committees and mass media representatives in each of the four countries to promote the public awareness campaign and to disseminate printed and audio-visual materials. These seminars will be scheduled to capitalize on the meetings held by other project components.

2. Graphic Design of a Project Logo

This will be achieved through a regional competition opened to the general public. In coordination with the National Barrier Reef Committees, the project will prepare and disseminate the competition rules.

The logo should have the following basic characteristics:

- Reflect the concept of regional unity among the four countries
- Reflect the characteristics of the coral reef
- Make reference to the biological resources of the ecosystem
- Reflect the character of the people of the area.

The National Barrier Reef Committees will be a filter for the receipt and the pre-selection of the entries and will each forward three finalists to the PCU. The PCU will nominate a Regional Technical Selection Committee to choose the best from among the finalists and will prepare diplomas for the twelve regional finalists. Prizes of US\$100.00 dollars will be awarded to each of the twelve finalists and a prize of US\$500 dollars to the winner. The PCU will publish the name of the winner and make the necessary arrangements for an award ceremony, scheduled to coincide with some other regional event.

The selected logo will be subject to the technical specifications of the graphic designer hired for the public awareness campaign.

3. Publications

In support of the campaign, the project will be producing and distributing printed and audio-visual materials including promotional brochures, informative bulletins, information on MBRS cultures, maps, and manuals on environmental monitoring, regional tourism fora, and protected areas management. All materials will be produced in English, Spanish and, in some cases, Garífuna. The countries' in-kind contribution will be to provide information and to guarantee the appropriate use of published materials and their access by the target population.

4. Policy Harmonization

A member of the Central American Commission on Development and Environment of the System for Central American Integration (CCAD/SICA) will develop and coordinate the Work Plan for this activity area.

TABLE 4.

Activities	Actions to improve the activities	Regionally-agreed country commitments	Potential contacts in the countries
Logo Definition	Define and publish the competition rules Prepare diplomas for the award ceremony Capitalize on another regional event to make the award Request free entry for the winner to an eco-archaeological site	Promote the competition Pre-select finalists (National Barrier Reef committee) Organize the national award ceremony Provide visitor facilities to the winner	Amigos del Manatí MEXICO
Design the campaign strategy	Definition of the TORs	Facilitate the work of the consultants by providing information sources	SEE THE NEXT TABLE
Graphic design of the public awareness campaign	Ask each country to designate someone to be responsible for approval of the graphic design	Provide skilled professionals	Belize: Dept. of Environment Mexico: SEMARNAT Guatemala: MARN, CONAP Honduras: Dept of Environment Unit, UGA
Printing of publications	Establish dates and formats for information requests	Provide the information on time and in the correct format	

TABLE 5.
Contacts to consider for access to databases, coordination of the awareness campaign, and as the counterpart agencies in the countries:

Belize	Mexico	Honduras	Guatemala
Forestry Dept. Fisheries Dept. Dept. of the Environment Belize City Council National Garífuna Council Belize Audubon Society PACT Project	University. Quintana Roo Colegio de la Frontera Sur Instituto de Limnología Inst Nacional de Investigación Agropecuaria Amigos de Sian Ka'an AKUMAL	SERNA Digepesca UGA P.C. Navy ODECO UNAH OFRANEH PMAIB Pico Bonito Foundation Prolanzate	MARN RECOSMO ASIES FUNDAECO CONAP FUNDARY FLACSO Municipalities

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7. Project Management

The nature and complexity of the MBRS Project demand a rather advanced institutional structure to ensure successful implementation. The need for aggressive and constructive coordination with primary project beneficiaries, political leaders, stakeholders and the wider public is probably the most important factor in the overall institutional arrangement of the Project.

In order to maintain ownership by project beneficiaries and to achieve the extremely high level of coordination required, participation of all stakeholders must be maximized at all levels of project management. Evidence of this participation is presented throughout this Work Plan, both within and across project components. The most obvious are the National Barrier Reef Committees and the Technical Working Group Meetings, where participation is secured from a wide cross section of sectors and disciplines from all four MBRS countries. The TWGs have a crucial role to play in the development of the MBRS Work Plan and in defining mechanisms for the implementation of said plan. The TWGs will be meeting twice in PY1. Specialized support is also being sought through a series of Expert Meetings and Baseline Determination Workshops. The baseline determination in Project Year 1 (PY1) is particularly important for setting the structure upon which future activities may be carried out during the remainder of project life. Even though these meetings are costly, this level of involvement from such a broad spectrum of actors is crucial for ensuring that the activities conducted during project implementation are technically sound, are consistent with contemporary knowledge on the topics in question, and are representative of the issues of primary concern to the MBRS.

Adding to this matrix are two 'virtual' advisory bodies: the *Technical Advisory Committee* (TAC) and the *Consultative Group* (CG). Even though a specific budget does not exist for these committees, they play a pivotal role in Project Management. The TAC consists of regional and international experts that will provide objective criticism on issues of a technical nature, based on their expertise acquired in other parts of the world. Inputs from the TAC will be continuously sought for activities under all project components, and in particular, on the Baseline Methodologies being developed in PY1 and in defining the scope of the Regional Environmental Information System. The CG is a 'donors forum' that will be consulted on an as needed basis, with the primary purpose of identifying synergies, overlaps and gaps in regional Work Plans.

This will be useful to avoid duplication of effort and to optimize the use of human and financial resources available to the MBRS region. The CG is expected to meet at least once during PY1 and participants will be required to fund their own participation.

The most senior decision-making body in the MBRS institutional framework is the **Regional Steering Committee (RSC)**. The RSC is expected to meet three times during PY1 and the Project will be covering all costs associated with those meetings. During its First Ordinary Meeting, the RSC will be discussing and approving the Draft MBRS Work Plan for Period 2001 – 2002. The Terms of Reference and membership of the TAC, the CG and the Policy Working Group will also be discussed and approved by the RSC during its First Ordinary Meeting to be held in Tegucigalpa, Honduras on the 22nd August, 2001.

The Project Coordinating Unit (PCU) is the nucleus of the MBRS Project, and is responsible for the day-to-day implementation of project activities. For the PCU to effectively perform its technical, administrative and management functions, it is necessary to secure the services of some of the best persons in the MBRS region. The staff selection process has been long, exhausting and expensive, but was worth it. The cost of securing (nine + 1) project personnel is consistent with the quantity and quality of services required, and as such, is the larger part of Project Management Costs. Communication and coordination costs between the four countries, CCAD, UNDP, the World Bank, and other regional partners is not cheap and represents an important part of the budget. This is compounded by logistical costs incurred during the preparation and execution of regional meetings.

The United Nations Development Programme (UNDP) has been contracted by the Project to assist the PCU in specific procurement and disbursement services. These services are reimbursed at a rate of 3.2 % of funds disbursed by UNDP on behalf of the MBRS Project. Annual audits of project funds, as is required by the World Bank, also represent an important part of Project Management Costs.

Project Management Costs for PY1 are representative of the services required to implement a regional project such as the MBRS. The budget to implement technical activities across the four project components are conservative and will require exceptional team work and compliance with counterpart contributions on the part of the four MBRS countries.