EVALUATION REPORT
SEAFLOWER BIOSPHERE RESERVE IMPLEMENTATION:
THE FIRST FIVE YEARS
2000 – 2005

ARCHIPELAGO OF
SAN ANDRES, OLD PROVIDENCE & SANTA CATALINA
COLOMBIA

BY

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JUNE 2006

Completed for:

The Corporation for the Sustainable Development
of the Archipelago of San Andres, Old Providence and Santa Catalina
CORALINA

Funded by:

UNESCO Man and the Biosphere Program- MAB
& Coastal and Small Islands Network- CSI

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LIST OF ACRONYMS AND ABBREVIATIONS

CARICOMP	Caribbean Coastal Marine Productivity project (UNESCO)
CORALINA	Corporation for the Sustainable Development of the Archipelago of San Andres, Old Providence and Santa Catalina
COSALC	Coast and Beach Stability in the Caribbean project (UNESCO)
DANE	Departamento Administrativo Nacional de Estadística (Colombia)
DFID	Department for International Development (UK)
GDP	Gross domestic product
GEF	Global Environment Facility
GIS	Geographic information system
IAB	International Advisory Board (Seaflower MPA)
IDB	InterAmerican Development Bank
ICM	Integrated coastal management
IIC	Inter-Institutional Committee (Seaflower MPA)
INAP	Integrated National Adaptation Program
INVEMAR	Instituto de Investigaciones Marinas (Colombia)
IUCN	World Conservation Union
km^2	Square kilometer
MAB	Man and the Biosphere program (UNESCO)
MDG	Millennium Development Goal
MPA	Marine protected area
NGO	Non-governmental organization
NOAA	National Oceanic and Atmospheric Administration (USA)
OCCRE	Office of Control of Residence and Circulation (San Andres Archipelago)
PFE	Partnership for the Environment
REEF	Reef Environmental Education Foundation
SAC	Stakeholder Advisory Committee (Seaflower MPA)
SINA	Sistema Nacional Ambiental (Colombia)
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization

Executive Summary

The Seaflower Biosphere Reserve has been a member of UNESCO's World Network of Biosphere Reserves since 2000. Supported by funding from UNESCO, the management agency, CORALINA, wanted a formative evaluation of the biosphere reserve's first five years, 2000-2005. An evaluator who both works with CORALINA (internal) and is professionally trained in evaluation (external) was chosen to lead the evaluation. The goal of the evaluation is to improve effectiveness of future implementation by examining implementation to date. To achieve this goal, progress was examined in relation to the Seaflower Management Plan and the implementation indicators for individual biosphere reserves, as defined in the Man and the Biosphere (MAB) Program's Seville Strategy for Biosphere Reserves.

The Archipelago of San Andres, Old Providence, and Santa Catalina is in the southwest Caribbean. It has a land area of 57 km^2 and a marine area of about 300,000 km^2. The islands are ringed by corals, mangroves, and seagrass beds. The largest island is San Andres. Smaller inhabited islands are Old Providence and Santa Catalina, which were damaged extensively by Hurricane Beta in 2005. Outlying reefs, banks, and atolls are found in the open ocean. Growth has brought environmental, social, and economic problems. San Andres Island is very densely populated. The majority of residents are national migrants. Native islanders, who descend from early settlers, are protected by the Constitution as an ethnic minority. In 2001, unemployment was 53%. Poverty was widespread: 32% of households reported no regular source of income and 48% subsisted on US $1 per person per day or less. Economic activities are tourism, tourism-related commerce, government employment, fishing, and small-scale farming.

Colombia's framework environment law established the National Environment System (SINA) and declared the archipelago a biosphere reserve. This law also created CORALINA, the archipelago's environment authority, and made this agency responsible for biosphere reserve planning and implementation. The Seaflower is not a protected area in the traditional sense -- rather it includes all of the archipelago's cities, villages, farmlands, ecosystems, and parklands and all the archipelago's residents live and work in the biosphere reserve. Furthermore, the biosphere reserve is at the heart of the community's vision of its future and is used as a development tool to alleviate the archipelago's problems and to support achievement of the Millennium Development Goals (MDGs).

The centrality of the biosphere reserve in the local development model creates an opportunity and challenge, as does CORALINA's dual role. These factors have made it difficult for stakeholders to understand the relationship between biosphere reserve implementation and CORALINA's projects and daily operations. Practically speaking, they are virtually identical but how they fit together is not articulated. The evaluation looked at actions, projects, and programs carried out from 2000-2005. It is not possible to differentiate CORALINA's work as regional environmental authority from its work as biosphere reserve manager, nor would a division be realistic. In the five years since the declaration, CORALINA has completed thousands of activities to advance the biosphere reserve; many in collaboration with the community, private sector, institutions, and national and international partners.

The Seaflower Biosphere Reserve Management Plan identifies the archipelago's principal environmental problems as over-population; poor solid waste management; lack of freshwater; inadequate liquid waste management; vulnerability of human settlements; poor maintenance of soil; and degradation of strategic ecosystems. During biosphere reserve implementation, many projects and actions were carried out to address these problems. Some of the most significant advances were establishing the Seaflower Marine Protected Area (MPA); implementing the Integrated Groundwater Management Plan; carrying out projects to recover corals, manage solid waste, protect species, and promote sustainable agriculture and tourism; and developing an integrated environment systems model.

The management plan also outlines six components for managing the biosphere reserve – implementation strategies of zoning, participation, environmental education, and institutional strengthening; governing structure; infrastructure and personnel; financial sustainability; participation in the World Network; and monitoring and evaluation. Again, many activities were accomplished in each component. Especially important were strengthening core zones by establishing the MPA and two regional parks, promoting participation in all projects and in volunteer programs, carrying out formal and informal environmental education targeting all ages and many sectors, building national and international ties, raising financial and technical support from grants and project development, certifying the laboratory and expanding the GIS and document center, and implementing technical and community-based monitoring.

Current status of the 24 implementation indicators at the individual reserve level identified in the Seville Strategy for Biosphere Reserves was also looked at. These indicators act as recommendations for developing effective biosphere reserves and as a check list to help individual reserves assess their progress. All of these indicators were either fully or partially achieved.

Along with the many advances, key areas for improvement were identified. Most implementation problems stem from a lack of organization and clearly articulated frameworks. First, as mentioned earlier, many community members and even some CORALINA personnel do not understand how CORALINA's work links to the Seaflower. It is important to articulate this relationship in all work with the community. Training staff in biosphere reserve functions, management, and zoning will help them understand the role of their work.

A lack of visibility adds to the community's confusion about biosphere reserve progress. This can be improved by giving the Seaflower a small staff and a visible, accessible office. Educating residents about zoning and publicizing activities more widely will increase local awareness of biosphere reserve implementation and the ways it is improving their lives. Another factor contributing to the lack of clarity is the number of management plans, participatory committees, volunteer programs, research and monitoring programs, and education activities. All of these are important; the solution is not to eliminate them but rather to unify and link them in "umbrella" frameworks. Not only would this make it obvious how they relate to one another and to the biosphere reserve, but it would also open communication channels, improve consistency, and make work more visible.

Based on findings, conclusions, and lessons learned, recommendations to improve implementation are organized in an Action Plan. In addition to the issues discussed above, actions to implement in 1-2 years include updating the biosphere reserve profile by adding the MPA, reestablishing community commissions on both islands, doing research assessments of the watersheds, working with stakeholders to revise buffer and cooperative zones, and gathering new information about community concerns in relation to each of the three biosphere reserves functions. Recommendations for the medium term include implementing actions to solve the population problem and monitor population growth, promoting waste management alternatives that integrate conservation and economic development, implementing financial strategies to achieve self-sustainability, and working with the private sector, NGOs, and institutions to develop incentives and initiatives to spur sustainable economic growth that will alleviate poverty.

In conclusion, improving implementation of the Seaflower Biosphere Reserve in the next five years does not require major changes. Excellent activities, projects, and programs have been completed or are on-going that have successfully advanced implementation during these years. Furthermore, the biosphere reserve is proving to be an effective approach to sustainable development. Continuing and expanding existing programs and putting in place new programs will continue to result in effective implementation. Simple restructuring and articulation of roles, improved communication and dissemination of information, wider participation, and financial sustainability are the keys to making implementation even more effective in the future.

Profile of the Evaluation

The Seaflower Biosphere Reserve has been a member of UNESCO's Man and the Biosphere (MAB) program's World Network of Biosphere Reserves since 2000. With funding support from UNESCO, the Seaflower management agency, CORALINA, requested a formative evaluation of the biosphere reserve's first five years, November 2000 through December 2005. Formative evaluations focus on program improvement. Therefore, the goal of this evaluation is to improve effectiveness of future implementation by examining implementation to date. The report of the evaluation summarizes the findings and, based on these, recommends actions that will benefit both the management agency, CORALINA, and the community living in the biosphere reserve.

To achieve the evaluation's development goal, progress was examined in three sections (see Methods, figure 2): 1) Relative to the principal environmental problems identified in the Seaflower Management Plan; 2) Relative to the implementation components identified in the Seaflower Management Plan; and 3) Relative to the implementation indicators for biosphere reserves at the individual level defined in MAB's Seville Strategy for Biosphere Reserves. The evaluation report also includes background on the site and governing institution. Methods of gathering and structuring the information are summarized. Based on the findings, conclusions are given with lessons learned. The report ends with an Action Plan recommending short (1-2 years) and medium (3-5 years) term activities and programs for 2006-2010.

In regard to process, evaluations are done by either an external evaluator or an internal evaluator; each bringing certain strengths to the process. Internal evaluators are considered to have an advantage in formative evaluations and are often used. Based on factors like the complexity of the biosphere reserve being implemented in the San Andres Archipelago, the traditional reticence of islanders with outsiders, and the limited funds available for the evaluation; CORALINA selected an evaluator who both works with CORALINA as an advisor and was actively involved in establishing the biosphere reserve (internal) and who also has been professionally trained in evaluation and is on the faculty of a prominent North American university program in social policy and international development (external). By attempting to bridge the gap between the two types of evaluators, CORALINA hopes for an evaluation that combines the objectivity of the external evaluator with the program knowledge and rapport of the internal evaluator.

Introduction

Colombia's framework environment law, law 99 of 1993 from the Congress, established the National Environment System (SINA) and also declared the Archipelago of San Andres, Old Providence, and Santa Catalina a biosphere reserve. This law also named the Corporation for the Sustainable Development of the Archipelago of San Andres, Old Providence, and Santa Catalina - CORALINA the agency responsible for taking the steps to implement the biosphere reserve designation locally, nationally, and internationally.

From 1997 to 2000, CORALINA completed the actions to establish the biosphere reserve, including submitting the nomination to UNESCO and drafting the management plan. This work was financed initially by the Ministry of Education with funds from UNESCO and then by the Ministry of Environment with funds from the InterAmerican Development Bank (IDB). The work was carried out by a team of about 15 people including a coordinator, advisor, natural and social scientists, technicians, economists, educators, publicists, and community promoters; supervised by the Chief of CORALINA's Planning Department and the General Director. UNESCO's MAB program declared the Seaflower Biosphere Reserve in November 2000. CORALINA is responsible for ensuring that the archipelago's inhabitants and environment receive continuing benefit from the biosphere reserve. Therefore, to date, this agency

has acted as management authority, coordinating programs and projects with the community to achieve MAB program functions and goals and to implement the management plan.

The World Network of Biosphere Reserves is the cornerstone of the MAB program. The goal of this program is to achieve a sustainable balance between biodiversity conservation, economic development, and cultural survival. In order to achieve this goal, biosphere reserves are designed to reconcile the conservation of biodiversity, the quest for economic and social development, and the maintenance of associated cultural values by fulfilling three complementary functions:

- Conservation. Preserve genetic resources, species, ecosystems, and landscapes.
- Development. Foster sustainable economic and human development.
- Logistic support. Support demonstration projects, environmental education and training, research and monitoring related to local, national, and global issues of conservation and sustainable development.

Integrating conservation, economic development, and social development/cultural survival make biosphere reserves distinct from most other types of protected areas. Biosphere reserves demand the implementation of new and flexible approaches to management, and each reserve must implement its own framework and programs suitable for its site. Ideally, biosphere reserves are locations where methods to realize sustainable development are envisioned, tested, revised, practiced, and shared. In other words, they are places where all sectors of the community work together to realize a practical model of how to live and work in a balanced relationship with the natural world that points the way to a sustainable future.

The biosphere reserve concept is at the center of the San Andres Archipelago community's vision of its own future. The Seaflower Biosphere Reserve is a tool to help alleviate many of the archipelago's problems. By carrying out sustainable development projects, community-based initiatives, and training programs; effective biosphere reserve implementation can fight natural resource and ecosystem degradation, unemployment, poverty, and lack of human development. Demonstration projects can build the people's capacity to conserve their islands' natural resources and promote alternative technologies and economic diversification, improving the biosphere reserve's long-term sustainability and supporting international environmental agreements, especially the Convention on Biodiversity, and the Millennium Development Goals (MDGs), especially MDG 7.

Initially biosphere reserves tended to be superimposed over or centered on existing protected areas. Although the Seaflower Biosphere Reserve included several parks at the time of the declaration and now includes more, establishing and implementing protected areas is only one of many methods used to realize the three functions. The Seaflower encompasses a wide range of environmental, economic, and cultural situations -- varying from healthy, productive coral reefs to severely impoverished human settlements – and the biosphere reserve concept is intrinsic to the development model chosen by the archipelago's institutions and community.

This is both the promise and challenge of this unusual biosphere reserve. Because the Seaflower includes a mosaic of circumstances – indeed, the archipelago is a microcosm of most present-day development problems -- exceptional opportunities exist to create and demonstrate new, replicable, working examples of sustainable development to achieve MAB program goals. On the other hand, the wide-range of circumstances and lack of pre-existing protected structure with identifiable boundaries mean that the amount of work to be done every day is overwhelming. Furthermore, the centrality of the biosphere reserve concept to regional planning and day-to-day management means that developing effective governance and coherent implementation calls for enormous ingenuity, organizational ability, efficiency, and cooperation from all institutions and sectors of the community.

Background

Location

The San Andres Archipelago is in the southwestern Caribbean (figure 1). It has a terrestrial area of 57 km^2, including three small inhabited islands and a number of uninhabited cays and atolls. The territorial waters are about 300,000 km^2, nearly 10% of the Caribbean Sea. The largest island, San Andres, is 800 km northwest of Colombia and 150 km east of Nicaragua. Old Providence and Santa Catalina are 80 km north of San Andres. Corals, mangroves, and seagrass beds surround these islands. The coral reef ecosystems are among the largest in the Americas and include two barrier reefs, five atolls, reef lagoons, and less well defined coral banks extending more than 500 km along the Nicaraguan rise, with links to the Meso-American Corridor.

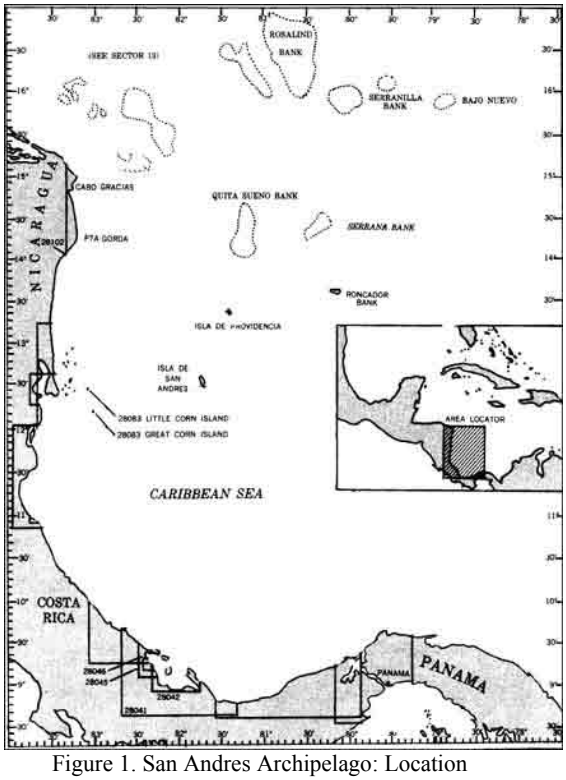


Figure 1. San Andres Archipelago: Location
(Source: Howard, et al. 2003)

Site

In national law the entire archipelago makes up the Seaflower Biosphere Reserve, whereas the UNESCO declaration does not yet include the entire area. Since the declaration in 2000, CORALINA has established a marine protected area (MPA) to implement the biosphere reserve in the vast ocean area. The Seaflower MPA, which is divided into three management units (Northern, Central, and Southern Sections), protects 65,000 km^2 of marine area and was declared by the Minister of Environment, Housing, and Territorial Development in January 2005 (Resolution 107). It is the first protected area of its type in Colombia, the largest MPA in the wider Caribbean, and among the largest in the world. The objectives of the Seaflower MPA are preservation, recovery, and long-term maintenance of species, biodiversity, ecosystems, and other natural values including special habitats; promotion of sound management practices to ensure long-term sustainable use of coastal and marine resources; equitable distribution of economic, and social benefits to enhance local development; protection of rights pertaining to historical use; and education to promote stewardship and community involvement in management.

Ecologically, the San Andres Archipelago is of both regional and global significance. It is part of the Caribbean Terrestrial Biodiversity Hotspot and also the Western Caribbean Coral Reef Hotspot, identified as one of the world's top ten regions exceptionally rich in marine species and facing extreme threat. The archipelago has high or very high levels of marine endemism and was declared an Important Bird Area by BirdLife International in 2004. The archipelago is also one of eight sites on the Latin America/Caribbean A List of priority areas recommended for marine World Heritage Site status by an expert committee in 2002. The Seaflower MPA was added to Colombia's tentative list and submitted to the World Heritage Committee.

Socio-economically, the archipelago has experienced many changes in the past decades. Native islanders, descendants of the early English-speaking settlers, traditionally lived off of artisanal fishing and small-scale farming. In 1953, San Andres was declared a free port. The most significant impact of the free-port designation was the development of a commercial tourism model that targeted mainlanders, attracting them to San Andres to buy foreign goods. After that, tourism-related development proceeded unplanned and unregulated at an increasing rate for about 40 years. By the 1990s the tourist industry accounted directly for more than 40% of local GDP. A level of population growth unprecedented in the Caribbean, almost entirely from internal migration that continues today, accompanied this development. According to DANE, population was about 78,000 in 2003; yielding a density of about 2,900 people per km^2 and making San Andres the most densely populated oceanic island in the Western Hemisphere and one of the most crowded in the world. Estimates of unregistered population increase the number to over 100,000.

Culturally, the archipelago has a traditional or "indigenous" culture that is often in conflict with newer externally introduced systems. The native islander population is defined by its Anglo-puritan/African heritage, Protestant religious tradition, and English mother tongue and now has the legal protection granted to ethnic minorities by Colombia's Constitution of 1991. Besides being a national minority, islanders are now a minority in the archipelago and have been marginalized politically and economically. Uncontrolled growth has brought many problems—environmental, social, and economic—to an island unprepared to deal with them because of the fragility of its ecosystems, traditional nature of its indigenous culture, narrow economic base, and lack of human capital. In 2001, unemployment was 53%. Poverty was widespread, with 32% of households reporting no regular source of income and 48% subsisting on US $1 per person per day or less (van't Hof and Connolly 2001). Present economic activities are tourism, tourism-related commerce, government employment, fishing, and small-scale farming.

In October 2005, Old Providence and Santa Catalina were hit directly by Hurricane Beta. The storm hovered over the islands gaining strength for about 15 hours. Fortunately there was no loss of human life but structures, woodlands, and farmlands were devastated. Damage to marine ecosystems and fisheries was also severe. Since that time, most of the work being done in these islands is hurricane-related. This natural disaster resulted in major setbacks for biosphere reserve and MPA implementation and advances in conservation, sustainable use, and economic development. CORALINA is still doing extensive research and monitoring to determine the extent of the damage and initiate programs to restore ecosystems and promote recovery of natural resources and the economy.

Governing body

The Corporation for the Sustainable Development of the Archipelago of San Andres, Old Providence, and Santa Catalina - CORALINA is a public corporate body created by article 37 of law 99, which was passed by the legislature in December 1993. This government agency is the autonomous regional representative of SINA in the archipelago and began functioning in 1995. As defined by law 99, CORALINA is responsible for managing the environment and natural resources to promote sustainable development in accord with policies and regulations of the Ministry of Environment and international instruments to which Colombia is a party. Its jurisdiction is Colombia's only oceanic department, the San Andres Archipelago -- including insular area (approximately 57 km^2) and sovereign seas (about 300,000 km^2 in the territorial waters and exclusive economic zone). In accord with law 99, CORALINA developed and manages the Seaflower Biosphere Reserve.

Because of the significance and fragility of the ecosystems in its jurisdiction, CORALINA is one of only seven regional sustainable development corporations in Colombia. Its mission is to manage, protect, and recover the environment by using appropriate technologies to regulate supply and demand of renewable resources and by promoting sustainable human development in consultation with the community, in order

to better quality of life through participation and agreement. Its functions are to manage natural resource conservation and sustainable use, direct environmental planning and zoning processes for land and sea, enforce environmental norms, involve the community in sustainable management of natural resources, ensure equitable resource benefit for all classes of the local community, enact policies and regulations to protect flora and fauna, and develop national and international projects of research, conservation, recovery, and sustainable use in conjunction with the State, community, NGOs, and private sector.

At any given time, CORALINA employs about 100 people with about 30 permanent staff and the rest on contract. There are three departments (environmental management, planning, and legal), two coordination offices (education/community participation and the Old Providence/Santa Catalina branch office), and the administrative department managed by the General Secretary. This department includes personnel, financial management and accounting, treasury, procurement, supply, and internal control. CORALINA also has a full laboratory, a GIS section, and a public document center and reading room.

CORALINA's current three-year action plan focuses on four policy areas based on the Seaflower Biosphere Reserve Management Plan: improving natural resource management, controlling pollution, strengthening territorial development, and building human capital. The fact that CORALINA is both the archipelago's environmental authority and also the Seaflower Biosphere Reserve and MPA governing body poses an opportunity and a challenge. For the region, CORALINA is a relatively strong institution with a well-developed infrastructure. On the other hand, its mandate and responsibilities are extremely large and, like most developing country institutions, it is seriously under-funded. The large mandate, lack of funding, and similarity between CORALINA's mission and MAB's vision have made it difficult for stakeholders and even some CORALINA personnel to understand the relationship between biosphere reserve implementation and CORALINA's projects and daily operations. Practically speaking, they are virtually identical but how they fit together is not articulated.

A number of other national and local institutions share authority in aspects that affect biosphere reserve governance and implementation. These include the environment ministry, national park office, naval maritime authority (DIMAR), coast guard, national police, national fisheries institute (INCODER), departmental fishing board, and departmental government. There are also a number of educational institutions. In addition to primary and secondary schools, some of the most active are the National University, SENA, INFOTEP, and Christian University. CORALINA partners with all these institutions on some activities and, when appropriate as in enforcement, works together on daily operations. No international or national NGOs are based in the archipelago and, indeed, rarely work in the biosphere reserve unless affiliated with a CORALINA-led project.

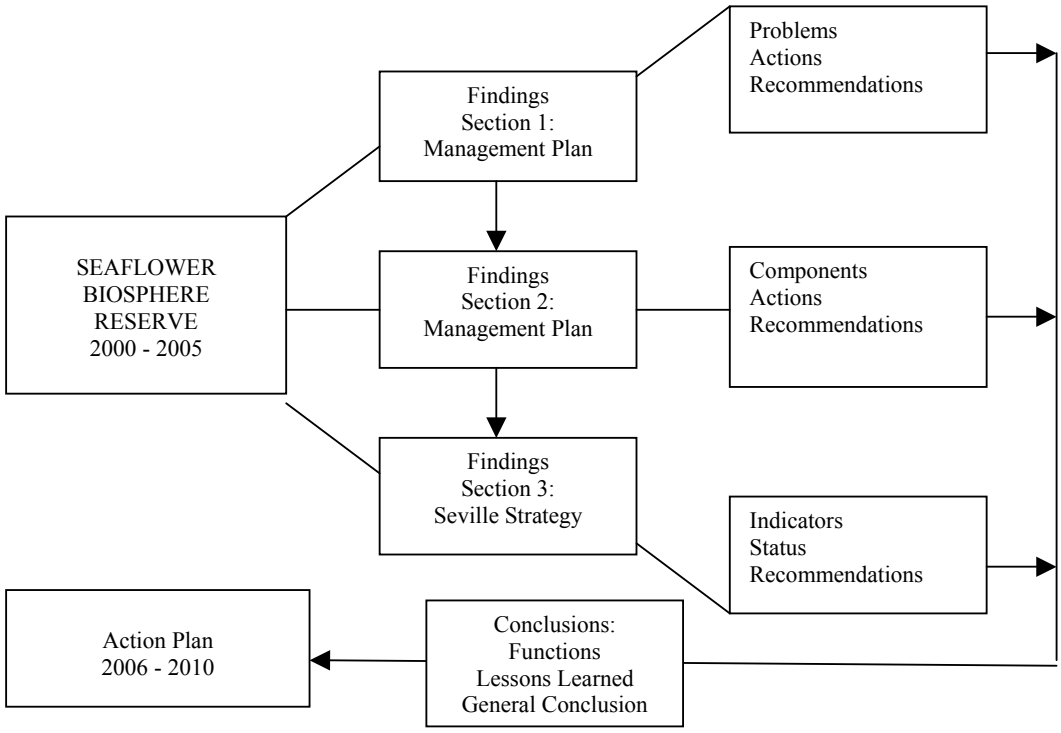
Methods

To do the evaluation, information was collected from CORALINA through interviews and discussions with personnel including the executive director, general secretary, sub-directors of environmental management and planning, and coordinator of the Old Providence Office. Project coordinators were consulted, as was the coordinator of environmental education and community participation. Projects were discussed with specific project staff and interns. Much of the information also comes from desk studies of CORALINA's databases, progress reports, and project documents. Some of the information is from research assessments and natural science projects, while other information is derived from social science research, community surveys, stakeholder workshops, focus groups, and other participatory activities.

Stakeholders were also interviewed; including representatives of the health and education sectors, NGOs, churches, media, fishing cooperative, tourist industry (hotels and travel agencies), and several other government offices. These interviews were conducted by the evaluator in January and April 2006 in

person or by telephone. Originally the evaluation was designed to include random household surveys on both islands; however, after conducting several surveys in August and September 2005, this methodology was reconsidered. The general community was unfamiliar with questionnaires and had trouble completing a survey instrument. Furthermore, trained and/or objective surveyors were hard to find, given the lack of human capital and the tightly-knit, interrelated nature of the islands' communities. Therefore, the decision was reached by CORALINA's executive director and the evaluator that carrying out in-depth individual interviews with sector representatives would be more productive and would result in more valid information. Nonetheless, the evaluation was still informed by input from the wider community. The evaluator interacted extensively with the community during the first five years of implementation and, even more importantly for the evaluation, from March to July 2005 especially observing attitudes towards the biosphere reserve. Discussions with indigenous islanders, residents, and visitors to the islands substantially informed the evaluation, and their observations are reflected in the report.

Figure 2. Framework of Analysis for Seaflower Biosphere Reserve Evaluation



Keeping in mind that CORALINA wanted a formative evaluation to improve future work, a framework of analysis was developed, as shown in Figure 2. Formative evaluations are focused on program improvement. This framework allowed information gathered during the research period to be organized in ways that facilitated structuring findings and forming recommendations, leading to creation of an Action Plan.

The evaluation examined actions, projects, and programs carried out from 2000-2005. The findings are presented in this report in three sections. The first and second sections focus on advances made within the framework of the Seaflower Biosphere Reserve Management Plan. The management plan identifies the archipelago's principal environmental problems as over-population; poor solid waste management; lack of freshwater resources; inadequate liquid waste collection, treatment, and disposal; vulnerability of human settlements; poor maintenance of soil; and degradation of strategic ecosystems. The report's first section summarizes findings on how the principal problems were addressed during the past five years.

The Seaflower Management Plan also outlines six components for managing the biosphere reserve – implementation strategies of zoning, participation, environmental education, and institutional strengthening; governing structure; infrastructure and personnel; financial sustainability; participation in the World Network of Biosphere Reserves; and monitoring and evaluation. The second section of the report looks at the findings relative to the status of each of the six management components.

The third section on findings summarizes the current status of the 24 implementation indicators at the individual reserve level identified in the Seville Strategy for Biosphere Reserves. These indicators act both as recommendations for developing effective biosphere reserves and also as a check list to help individual reserves assess whether they are moving towards the Seville Strategy's four goals for the World Network of Biosphere Reserves. These four goals -- use biosphere reserves to conserve natural and cultural diversity; utilize biosphere reserves as models of land management and of approaches to sustainable development; use biosphere reserves for research monitoring, education, and training; and implement the biosphere reserve concept -- link with the three functions of biosphere reserves.

The report then presents conclusions, with the purpose of improving implementation in the future. First, pluses and minuses of biosphere reserve implementation to date are summarized in relation to the three functions of conservation, development, and logistical support. These are classified in a matrix based on a simplified SWOT Analysis. Lessons learned follow, along with the general conclusion. An Action Plan for the second five years ends the report. The plan is rooted in the findings; reflecting the recommendations and conclusions about functions and lessons learned.

As mentioned in the background section, at this time it is not possible to differentiate CORALINA's work as regional environmental authority from its work as biosphere reserve manager, nor would such a division be realistic considering that the biosphere reserve vision is at the center of the local development model. In the five years since the declaration, CORALINA has completed literally thousands of activities in many program areas; all related to biosphere reserve functions. The evaluation report cannot begin to discuss or acknowledge all of them. Therefore, selected projects -- either priorities or representative of the type and quality of work being done -- that are especially pertinent to implementation of the Seaflower Biosphere Reserve Management Plan are mentioned in the sections on findings.

Findings
Section 1: Seaflower Biosphere Reserve Management Plan

Problems

The objectives of the Seaflower Biosphere Reserve Management Plan are conservation of strategic areas to protect the archipelago's biological and cultural diversity; creation of a model of territorial development and a site for testing methods of sustainable development; set aside areas for research, observation, education and building capacity of residents and visitors; and apply the concepts of the World Network of Biosphere Reserves. In this section, representative and/or priority projects and actions that have been carried out to address the problems discussed in the management plan are identified. Recommendations to strengthen implementation are included in the text and reflected in the Action Plan.

The Seaflower Management Plan identifies seven environmental problems as the main threats to the biosphere reserve: over-population; poor solid waste management; lack of freshwater resources; inadequate liquid waste collection, treatment, and disposal; vulnerability of human settlements; poor soil

maintenance; and degradation of strategic ecosystems. During biosphere reserve implementation, many actions have been carried out to address these problems, some of which are highlighted below.

Population

The management plan identifies pressure on ecosystems and natural resources, excessive demand on goods and services, worsening social problems, and increasing anti-social behavior as negative impacts of over-population, particularly in San Andres. Lack of funding, technical assistance, local capacity, and national institutional support mean that little has been done in the past five years to address this problem.

In 1999 and 2000 stakeholders of all ages and from all walks of life attended a series of biosphere reserve workshops. To support planning, participants broke into groups and, working together to reach consensus, ranked natural resources (8 items), threats to natural resources (14 items), and problems (16 items) in order of importance, with one being most important. In the problem category, "over-population" was ranked either first or second by every group at every workshop,

At the request of the departmental government, CORALINA produced a document that recommended developing local population policies in the thematic areas of population and sustainable development, population and environment, population and health, population and the family, population and education, population and the native people. Following a meeting with a high-level national commission who visited San Andres in 2005 at the request of the community, working groups were set up in each of these policy areas. The groups are composed of representatives of the community and institutions with expertise in each particular area. The community selected CORALINA to lead this process and train the groups. An initial training session took place and the working groups began meeting. However, the process has been progressing very slowly and sporadically due to lack of funds, technical support, and a coordinator.

A case study of population in San Andres was completed by a graduate student at Brandeis University at the request of community members. The case study did a demographic profile, looked at selected impacts of population on the environment, and analyzed the existing population policy and effectiveness of implementation (OCCRE). The case study concluded with a number of specific recommendations to improve the situation in San Andres by gathering information, controlling immigration, encouraging emigration, and improving environmental management. Financial and technical support has been unavailable to implement any of the recommendations.

**Recommendation: Considering that "over-population" was ranked first or second by every group at every workshop in the problem category, tackling this issue should be a priority of biosphere reserve implementation during the next five years. Although the problem is not recognized as serious at the national level, it is the issue that most concerns the biosphere reserve's residents so an on-going, informed, and constructive dialogue is needed, with the goal of agreeing on an integrated plan of action for all levels of government.*

Poor solid waste management

Consequences of poor solid waste management mentioned in the management plan are contamination of air, water (fresh and marine), and soil; spread of plagues and diseases; loss of income for the community and institutions; and high management costs. A substantial amount has been accomplished in regard to this problem during the first five years, particularly at the institutional level, paving the way for the development of future actions led by the private sector, NGOs, and the general community.

In 2001 a project was developed to deal with solid waste issues in collaboration with the departmental government, the agency responsible for solid waste management. Funded by the European Union's URB-AL program, partners include experts and municipalities in Germany and the municipality of Santa Cruz in the Galapagos Islands, Ecuador. This project has had three phases – Phases I and II have been completed and Phase III will begin in 2006. Significant results have been substantial improvement in the management of the landfill in San Andres; identification, quantification, and classification of sources of solid waste; pilot recycling of certain materials; and island-wide education programs including the production of education material.

**Recommendation: Creative solid waste management alternatives are among the most promising ways to integrate conservation with economic development. Besides reducing threats to environmental and human health, introducing new technologies for managing solid waste can create many jobs and generate new income sources in developing countries for both residents and institutions. Given the volume of solid waste produced daily in the biosphere reserve, developing low-tech pilot programs managed by the local private sector, NGOs, and community to deal with solid waste -- particularly focused on recycling and reusing existing and newly generated waste and reducing future volume -- is seen as an especially effective way to promote the three functions, advance sustainable development goals, and demonstrate replicable methods in the Seaflower.*

Scarcity of freshwater resources

Results of the scarcity and poor use of freshwater resources, as summarized in the management plan, include reduced quantity, inequitable access to and benefit from potable water, loss of income from service, and worsening quality of life. Although demand on water resources continues to grow along with the population, actions led by CORALINA with collaboration from the water authority, owners of commercial and private wells, and the general community during the past five years have greatly improved freshwater management; both maintaining quantity and also improving quality.

Developed during the biosphere reserve planning process (funded by DFID), the Integrated Groundwater Management Plan for San Andres was approved in December 2000. This is a 10-year plan of watershed management that includes five program areas: research, monitoring, environmental education, community participation, and legal procedures. Since then, the plan has been consistently implemented. Actions include water quality testing; monitoring wells and shallow aquifers for groundwater quantity and quality parameters, including tracking the increasing threat of saline intrusion; issuing permits for extraction from commercial wells, subject to constant monitoring and regulation; training farmers and watershed residents, resulting in substantial participation; and on-going education of the general public.

The major watershed in San Andres, Cove Valley, is a core zone although implementation has been difficult because of growing deforestation and alteration of the natural landscape for housing and agriculture. Threats persist. For example, in 2005, the departmental government announced that a paved road would be built through the valley, opening it to major development. The community joined with CORALINA in stopping the road. The resulting participatory process of consultation and planning for the future of the Cove Valley is continuing and, as would be expected, is not without conflict.

**Recommendation: Carry out research assessments of the Cove Valley watershed in San Andres and the major watersheds in Old Providence to map the current situation. Based on results, revise and implement strategies to improve protection of these crucial core zones.*

To increase freshwater supply, a pilot project of rainwater harvesting began in 2005. This project will be expanded as a key component of the national climate change project, Integrated National Adaptation Program (INAP), in which CORALINA is a partner. This full-sized project funded by the Global Environment Facility (GEF) started in 2006.

Inadequate liquid waste collection, treatment, and disposal

As identified in the management plan, the consequences of poor liquid waste management are deteriorating quality of life, threatening public health (spread of epidemics and disease), and degrading landscapes with negative impacts on tourism. Given that CORALINA is not the agency responsible for liquid waste management, the amount that this agency can do as both biosphere reserve and environmental authority is limited. Nonetheless, CORALINA has made substantial effort and real contributions to better this problem in the past five years.

Waste management experts from Germany visited the islands at CORALINA's request and did a comprehensive analysis of the wastewater treatment situation and existing facilities. CORALINA organized this work in cooperation with the responsible local government offices. Sanitary engineers from relevant authorities participated and were both trained and consulted.

Following this assessment, as an activity in the Coral Recovery (funded by Ministry of Environment with monies from IDB) and MPA (funded by the GEF) projects, water quality experts from the USA visited the islands to support CORALINA staff in completing a Water Quality Action Plan. The plan is comprehensive and practical. It looks at links between fresh and coastal water quality (downstream effects) and identifies threats, priorities, and management solutions. It also includes a time line. These experts also followed up with local government and the archipelago's sanitary engineers, adding their evaluation and recommendations to those of the European experts. Lack of funding and technical capability has limited implementation but action is gradually being taken, when possible.

**Recommendation: Given the highly qualified technical level of the research, plans, and recommendations made during the last five years, sufficient information is now available to solve or at least to substantially improve this situation. It is recommended that an integrated working committee of local technical experts be set up, a comprehensive review of all available information be made, and that acquiring funds and expertise to implement the necessary actions become a priority.*

Wastewater monitoring is on-going. Businesses and hotels are carefully regulated and fined if for failure to meet acceptable standards. Point-source pollution sites like the municipal sewage outfall and household outfalls are regularly monitored. Work has also begun to improve the situation of some shantytowns, which have no fecal waste management facilities, with the result that wastewaters flow into the streets.

Vulnerability of human settlements

Coastal development, inferior construction, spreading shantytowns and slums, and lack of regulation and control over urbanization contribute to the vulnerability of human settlements. The major advance in this problem area in the Seaflower's first five years was the completion and approval of the Territorial Ordering Plan for the archipelago. This work was led by the Departmental Government with technical support from CORALINA. The process took several years and was very participatory. It is important to note that there are conflicts over implementation of different aspects of the plan involving many actors – varying from village communities to private land owners to the national government.

Recently pilot projects have been implemented in slum areas and shantytowns to improve sanitation, waste disposal, and construction practices in these highly vulnerable areas. CORALINA has also been working with businesses, hotels, and residences adjacent to the sea to reduce the threats to strategic ecosystems and the human community posed by these constructions. The INAP project allows work in this area to be expanded.

Poor soil maintenance

According to the management plan, poor maintenance of soil results in erosion and soil loss, deterioration of quality of life, and lack of public space with associated infrastructure. During the past five years, on-going work has been done to address this problem -- particularly with farmers and animal raisers -- and promising programs are underway.

The regulation to control agricultural burning was in effect before the Seaflower was established. However, permitting procedures, enforcement, education, and capacity building have become more wide-spread since biosphere reserve implementation. The community is well informed about the law and compliance has become the norm. Farmers have been targeted and continue to be educated about the law and the impacts of burning. A certain number of permits for controlled agricultural burning supervised by CORALINA technicians are given annually upon request.

Permitting procedures, enforcement, and capacity building in regard to cutting down or substantially trimming trees also have been on-going, aimed to maintain soil by reducing deforestation. Although illegal burning is now rare, farmers and villagers report that deforestation continues at a disturbing rate.

Several sustainable agriculture projects have been completed or are continuing. Farmers have been trained in alternative methods of soil and land use, including encouraging composting. Pig farmers have been worked with extensively as have cattle raisers, particularly in Old Providence where the steep hillsides are very vulnerable to erosion from grazing. A promising new project to promote biosphere reserve functions and sustainable development values is the work being done to establish green markets (funded nationally). Focusing on farmers and small business people, sustainable farming methods, products, and marketing systems that maximize equitable distribution of benefits are investigated. Methods to “green” tourism as well as gain access to and promote green tourist markets are also examined.

Degradation of strategic ecosystems

The management plan pinpoints several results of the degradation of strategic ecosystems including loss of natural resources and biodiversity, over-exploitation of fisheries, and decline in economic benefits and tourism. Many programs and projects that targeted a wide range of conservation and sustainable development issues were accomplished in regard to this problem during the last five years.

The largest and most challenging of these was establishing the Seaflower MPA to implement the biosphere reserve in the vast marine area. Since the law 99 defined the biosphere reserve as including the whole archipelago - both land and sea - the marine area also needed to be zoned. During biosphere reserve planning, zoning was completed for the three inhabited islands but given the size, complexity, and cost of developing the biosphere reserve in the sea, marine zoning and management planning had not begun at the time of the declaration. Following the declaration, as its first priority CORALINA carried out the MPA project, with community support and very active participation. The draft MPA management plan is grounded in the functions of conservation, development, and logistical support.

To support MPA and biosphere reserve goals in the marine area another major project, the Coral Recovery Project, was developed and executed. This project was funded by the Ministry of Environment with special project funds from the InterAmerican Development Bank (IDB) and was done in partnership with INVEMAR and the National Park Office. Much was accomplished. Especially significant were identification of natural and human threats to coral health, vulnerability assessments, research to quantify impacts of anthropogenic activities, improving water quality to promote natural recovery of corals, evaluating and strengthening monitoring, and education to raise awareness and encourage stewardship.

At the same time, smaller regional protected areas were created and improved. A pilot program that included monitoring, enforcement, community-based management, and education was implemented to strengthen the pre-existing San Andres Bay Reserve. Johnny Cay Regional Park and Old Point Regional Mangrove Park were delimited and declared in 2001 and 2002, respectively. The first has been actively managed since declaration and, while not without problems, is fully implemented on a daily basis. The latter has not yet been implemented due to lack of funds and technical support.

Advances were also made to protect key species. A project to conserve black crabs was completed in partnership with Heriot-Watt University, Edinburgh, with funds from the Darwin Initiative. The project gathered information to conserve, recover and ensure future sustainable exploitation of the black land crab; produced a management plan; strengthened the policy and regulatory framework; and established a Black Crab Conservation Unit. Educational materials were produced and monitoring is on-going. In 2004 the Seaflower Biosphere Reserve was declared an Important Bird Habitat by BirdLife International, and an action plan for sea and shore birds was completed in 2005. Being accepted into the international WIDECAST network in 2004 will improve conservation and monitoring of endangered sea turtles.

Also during the first five years, CORALINA and other local institutions, with technical and financial support from Partnership for the Environment (PFE), developed an integrated environment systems model to support sustainable development. Based on the results of the first phase of the modeling, the conclusion was reached that deterioration of coral reefs, saltwater intrusion into the aquifer, and the volume of solid waste produced are quantifiable indicators showing that the island's existing development model and population are straining the biosphere reserve's natural limits.

**Recommendation: Update the Seaflower Biosphere Reserve Management Plan in accord with the results of modeling done with PFE. Then ensure consistency of all existing management plans.*

Also deserving mention is the GEF Block B to design the INAP project, which will address ecological, physical, social, economic, and cultural impacts of climate change. Besides producing the full-size project, pilot adaptation activities were carried out. The full-size INAP project was submitted to the World Bank in 2005, approved, and began in 2006. Adaptation measures appropriate for small islands will be implemented in key environmental areas predicted to be negatively impacted by climate change: fresh water resources, marine protected area (MPA), and integrated coastal management (ICM).

Findings
Section 2: Seaflower Biosphere Reserve Management Plan

Management components

In addition to identifying problems, the Seaflower Management Plan outlines six components for managing the biosphere reserve – implementation strategies of zoning, participation, environmental

education, and institutional strengthening; governing structure; infrastructure and personnel; financial sustainability; participation in the World Network of Biosphere Reserves; and monitoring and evaluation. This section looks at the evaluation's findings about the status of each component after five years of implementation. As in Section 1, only selected actions are mentioned, and recommendations to improve implementation are inserted in the text and reiterated in the Action Plan.

Implementation strategies

- Zoning

Much has been accomplished from 2000-2005 to improve implementation of zoning. Of particular importance were establishing the Seaflower MPA and improving management, legal protection, and monitoring of the majority of core zones by declaring the Old Point Regional Mangrove Park to protect the largest and most productive mangrove forest in San Andres; setting up and implementing the Johnny Cay Regional Park; actively managing the San Andres Bay Reserve and Cove Valley watershed; and strengthening the partnership with the Old Providence McBean Lagoon National Park.

To better implement the biosphere reserve in the sea, the Seaflower MPA is divided into three administrative sections: Northern 37,522 km^2, Central 12,716 km^2, and Southern 14,780 km^2. Each section is zoned for in-situ conservation and sustainable use. There are five zone types: 1) no-entry, with use restricted to research and monitoring (116 km^2); 2) no-take, allowing a variety of non-extractive uses (2,214 km^2); 3) artisanal fishing, for use by traditional fishers only (2,015 km^2); 4) special use, for specific uses like shipping lanes, large-vessel anchorage, ports, and marinas or uses with the potential to generate conflict like heavily used water sports areas (68 km^2); and 5) general use, where minimal restrictions apply to preserve MPA integrity and promote conservation (the remainder). These zones are consistent with biosphere reserve zoning. No-entry and no-take zones are core areas; artisanal fishing and special-use zones allow controlled use as do buffer areas; and general use zones are like cooperation zones in allowing a variety of sustainable uses while protecting the integrity of core areas. Note that in the Seaflower Biosphere Reserve, transition zones are referred to as zones of cooperation, to emphasize their function as sites of multiple sustainable uses; ideally managed cooperatively by the users themselves.

From the beginning, the zoning process was rooted in participation by all stakeholders, who had decision-making power. Participatory planning resulted in MPA objectives, external boundaries, zoning, and the creation of a management structure. Following the national-level declaration of the MPA in January 2005, the three administrative sections were legally defined in April 2005. The participatory management structure began working in June 2005. Zoning plans for all three sections and the "umbrella" regulation stating what can and cannot be done in the MPA were formally approved in July 2005.

Strengthening the partnership with Old Providence McBean Lagoon National Park has also strengthened protection of a core area. To improve management of critical ecosystems, the marine component of the only national park in the archipelago, Old Providence McBean Lagoon, is encircled by the Seaflower MPA Central Section. The park covers 995 hectares; 905 of which are marine. The most productive and well-preserved mangrove forest in the archipelago, Oyster Creek, is in the park, as is about 20 kilometers of the barrier reef. The National Park Office, a branch of the Ministry of Environment, manages this area, which is zoned entirely for conservation (no-take). CORALINA and the Park Office collaborate on activities including research, monitoring, education, and research. Communication is good between the two agencies and the partnership is strong.

To further strengthen coral reef conservation (all coral reefs are core zones), in 2005 CORALINA brokered a formal agreement with DIMAR to collaborate for the first time on conservation work. As part

of this agreement, CORALINA trained navy personnel in seabird biology and conservation and the maritime authority transported researchers to the Northern Cays and facilitated their research. The establishment of the MPA and the formal agreement between the maritime authority and the environmental authority provide a mandate and strong legal basis for conserving and managing most of the archipelago's remote cays and banks.

Management of other core areas has also been strengthened. Legal protection of additional core areas was achieved by declaring the Old Point Regional Mangrove Park that protects the largest and most productive mangrove forests, Hooker Bight and Honda Bay, in San Andres (all mangroves are core areas) and setting up and implementing the Johnny Cay Regional Park. The pilot program in the San Andres Bay Reserve has resulted in active management including enforcement and monitoring. The Cove Valley watershed is the most threatened core zone in the Seaflower at the present time. As mentioned earlier, an active process began with the resident community in 2005 to seek agreement on how to resolve the conflicting demands for conservation and development in this area.

In spite of all the significant work accomplished during implementation that has strengthened zoning, much of the community is still unaware of actual zone boundaries, zone types, and what kinds of activities are allowed in each zone. Also, as would be expected, during the first five years more has been accomplished in regard to core areas than other zones because of their importance to conservation.

**Recommendation: Work with stakeholders on each island to revise zoning of buffer and cooperation zones in the biosphere reserve's terrestrial area. Carry out mass education campaigns to educate the general public, institutions, private sector, and land-owners about terrestrial and marine zoning and management to raise awareness so that future planning is unified, consistent, and supports zoning.*

– Participation

All CORALINA projects, programs, and activities emphasize community participation at the level of active involvement or decision-making. This helps resolve resource use conflicts, empower the community, integrate local knowledge into management, and achieve a more equitable distribution of benefits from project activities. Part of CORALINA's daily work is responding to complaints and enforcing regulations. As biosphere reserve implementation progresses, more people from the community have been reporting environmental infractions or lodging complaints, indicating that stakeholders are taking more responsibility for conservation and becoming stewards. These are examples of some of the ways in which stakeholders have been involved in biosphere reserve implementation from 2000-2005 but, as mentioned earlier; they do not always understand that CORALINA work is biosphere reserve work.

Volunteerism has been promoted to support biosphere reserve implementation. Volunteers are involved in many ways. One of the most important is the MPA Stakeholder Advisory Committee (SAC), which is made up of volunteers (by invitation) from primary user groups -- artisanal fishers, professional divers, other water sports, marinas, the tourist sector, and traditional users (indigenous community). The SAC is consulted about all aspects of MPA management. A memorandum of understanding (MoU) was signed with members and a meeting schedule was agreed upon. Another major program is volunteer inspectors, who do surveillance and "soft" enforcement. The inspectors take an intensive training course (with follow-up) and are issued ID cards. The mooring buoy program is another volunteer program. The buoys were sited and installed by volunteers (divers and artisanal fishers), and CORALINA has formal agreements with dive shops that have volunteered to maintain them.

Community-based monitoring is another participatory program. These monitoring programs use international community-based protocols – REEF and ReefCheck (fish), RECON (coral health),

COSALC (beaches), and WIDECAST (marine turtles). Volunteers also support research; for example, working with scientists on baseline ecological studies. Community-wide events like the annual international coastal clean-up also rely on volunteers. For young people there are marine scouts (youth) and marine clubs (children) that focus on raising awareness about the biosphere reserve and MPA. An "adopt-a-beach" program has been implemented with interested businesses, schools, and church groups.

On the other hand, community participation in actual biosphere reserve governance is limited to the stakeholder representatives on CORALINA's board of directors. These include elected representatives of the private sector, cooperatives (fishers and farmers), local NGOs, and native community. As mentioned, a Stakeholder Advisory Committee (SAC) for the MPA began meeting in 2005. Community involvement in governance is discussed in more detail later in the report in the section on governing structure.

Independent initiatives to support the biosphere reserve by the private sector, institutions, or individuals are rare; except in instances of publicity. Everyone knows that the archipelago is a biosphere reserve and the term has become a household word so the private sector often includes the Seaflower name or logo on advertising, plastic bags, calendars, etc. Even tourists are widely aware of the biosphere reserve status. In a tourist survey in 2000, following the international designation, when asked if they were aware that the archipelago was a UNESCO Biosphere Reserve, 80% said yes. On the other hand, although people are aware that they live in or are visiting a biosphere reserve, there is a lack of publicity about activities and information about project advances is not well disseminated or always visible to the general public.

**Recommendation: Work with the private sector, local NGOs, and other institutions to develop incentives and promote initiatives, particularly in buffer and cooperation zones, that spur sustainable economic and human development. Integrate these with CORALINA's work, creating a community-wide network of involvement and response to biosphere reserve implementation.*

– Environmental education

During the Seaflower's first five years, environmental education has been on-going. A vast number of programs – formal and informal – for all ages and classes of individuals and institutions have been carried out and continue. CORALINA is well-known for the quality of its work in environmental education.

One of the most outstanding programs was a technical degree in tropical coastal and marine resource management in collaboration with the Christian University of San Andres. This program was funded by the GEF as part of the MPA project. The purpose was to prepare islanders to manage the Seaflower Biosphere Reserve and MPA and also be trained generally for careers in the field of conservation. The program was accredited by ICFES, the accreditation association for higher education, in 2001 and began in 2002 with 38 students. The first class of 18 students graduated in December 2005. Of the graduates, one has been accepted internationally for post-graduate study, five are working at CORALINA, and others are working with other organizations in the biosphere reserve.

Also to improve formal education, CORALINA's environmental education group designed programs to incorporate biosphere reserve education into curricula, including a bilingual marine resources curriculum that has been introduced in some schools. Collaboration with the Mangrove Action Project (MAP) resulted in a Spanish mangrove curriculum for primary schools and an adaptation of the English version, first introduced in the Cayman Islands, for use in Old Providence. MAP's global education coordinator also gave a teacher-training course on curriculum implementation that awarded continuing education credits to participating teachers. Other courses have targeted interest groups including introducing sustainable tourism, improving dive operations, greening hotels and businesses, and training-of-trainers in

community-based monitoring and MPA management. Artisanal fishers and students have also received scuba training, with several advancing to the instructor level.

An important program is the active involvement in CSI's Small Islands Voice (SIV) global forum. Two school radio stations have been set up, and weekly radio broadcasts have been held. Both students and adults have been trained to take part in SIV activities. Some schools are producing newsletters, and solid waste management alternatives like reducing water use and making recycled paper and crafts from waste materials is on-going in several schools. Most recently, an inter-generational exchange involving youth and older community members gathered information on traditional practices and lifestyles in the biosphere reserve.

In the past five years, many educational materials have been produced that were distributed to schools, tourists, and adults at educational activities and events. For example, bilingual coloring books on sea turtles and coral reefs strengthen primary school programs on these subjects. A video, flyers, booklets, coloring books, a jigsaw puzzle, and information sheets have been produced on the biosphere reserve. Materials have also been designed and distributed that deal with specific subjects like corals, mangroves, groundwater, waste management, and the MPA. Spanish and English are legal languages in the archipelago, so many materials are bilingual. As funds allow, materials are reprinted and new materials are developed.

A number of special events have also been held. The annual "Expo BR" celebrates the Seaflower's environment and native culture. Stakeholder study tours were carried out in the MPA project to promote information exchange and empower those who live off marine resources. The artisanal fishers' trip to Jamaica gave the archipelago's fishers the opportunity to compare the degradation of sea resources in Jamaica to their own relatively pristine environment and to become more committed to biosphere reserve and MPA implementation. Dive operators visited Bonaire Marine Park, where they were trained in sustainable ways to improve dive tourism. MPA project team members visited Florida Keys National Marine Sanctuary, Bonaire Marine Park, and Saba Marine Park to learn about all aspects of MPA management. Christian University students tagged marine turtles at a national park in Costa Rica and surveyed bird populations in the Northern Cays in expeditions facilitated by DIMAR.

During the first years of implementation, CORALINA's document center was strengthened with books, periodicals, and trained staff. Installing computer equipment at the document center made databases accessible to teachers, students, and the general public. Finally, the inter-sectoral, inter-disciplinary environmental education committee set up during biosphere reserve planning continues to meet. Members represent more than 20 local educational institutions, organizations, and private sector businesses like the company that handles waste management. This committee promotes a wide range of collaborative environmental education activities.

**Recommendation: Use the many excellent existing environmental education programs and materials to clearly and explicitly link the Seaflower Biosphere Reserve and MPA with all conservation and development actions, mainstreaming biosphere reserve implementation into archipelago development in the public consciousness. Improve publicity and use the media to disseminate information about activities to raise community awareness about biosphere reserve implementation.*

– Institutional strengthening

CORALINA's role as governing authority of the Seaflower Biosphere Reserve and MPA is legally recognized and respected nationally and internationally. The agency also enjoys a high level of popular support that contributes to its institutional stability. Activities during the first five years of implementation

that have helped strengthen CORALINA and other institutions in the biosphere reserve have included creating international bonds; improving local and national inter-institutional ties, especially since 2004 as this has been a priority of CORALINA's new administration; developing partnership projects and joint initiatives with local institutions; pursuing advanced training for islander resource managers; involving the community in decisions and programs that affect them; and supporting programs of local institutional and community empowerment.

At an international level, since 2000, the biosphere reserve declaration has greatly enhanced regional and international ties, resulting in partnerships and activities with a number of collaborating organizations. CORALINA now has partnerships with international and Caribbean-regional NGOs, governments, and programs; many have contributed to implementation and long-term biosphere reserve and MPA functioning. In addition to UNESCO's CSI and MAB programs, such international organizations (both non-governmental and governmental) included the Ocean Conservancy, Island Resources Foundation, CORAL, the CARIBWA chapter of the National Marine Educators Association, the United Nations Environment Program (UNEP), Mangrove Action Project, Reef Environmental Education Foundation (REEF), Barbados Coastal Zone Management Unit, and Caribbean Fishery Council. A four-part training program was sponsored by the US National Ocean Service that included training most of the MPA project team in the Florida Keys National Marine Sanctuary (a global model for MPAs) and training CORALINA economists and GIS specialists at NOAA headquarters in Silver Spring, Maryland.

In addition to a recent increase in funding received from national programs, project funds that have strengthened CORALINA institutionally and advanced biosphere reserve implementation have been awarded from the GEF-World Bank, UNESCO, UNEP, European Union, Darwin Foundation, National Fish and Wildlife Foundation, Partnership for the Environment, Island Resources Foundation, and Lighthouse Foundation; among others. The GEF-INAP project, approved in 2005, will also promote institutional strengthening, by supporting a number of activities to advance implementation and measure biosphere reserve and MPA impact on conservation of ecosystems and essential resources like fresh water.

At CORALINA's request, when the MPA project began, the World Bank sent experts to San Andres to train staff in administrative aspects of project management like recruitment, procurement, contract design, and accounting. Administrative personnel were also sent to training programs nationally and internationally. This training substantially strengthened CORALINA as an institution, which will show itself in long-term biosphere reserve implementation. CORALINA project staff also benefited from many technical training programs, both nationally and internationally. How much is evident in that CORALINA personnel have become trainers themselves -- notably with the Mangrove Action Project, UNESCO's COSALC program, and RECON -- all of which took them as trainers to international sites.

Another major advance was getting the laboratory certified in 2005. Technical support from Cuban experts helped build the lab's professional reputation and the Ocean Conservancy donated equipment. CORALINA's GIS also received acclaim -- the president of Island Resources Foundation praised it as one of the best in the Caribbean. From 2000-2004, the GIS technicians were trained and worked in the USA, Netherlands, and the UK. As mentioned earlier, the document center has also been strengthened and has moved into its own space, where it is more accessible to schools and the general public. This center is widely used, particularly by teachers and students, as there are no public libraries in the archipelago.

To strengthen the private sector, a project to improve ecotourism was completed in partnership with Conservation International. The project focused mainly on Old Providence and Santa Catalina and produced an ecotourism action plan for those islands, which was approved in 2003. Activities built decision-making capacity about tourism development in the tourist sector, local institutions/government,

and community; increased understanding of the benefits and risks associated with tourism development; and raised awareness about ecotourism issues and actions. A series of community workshops and seminars were held to support planning and implementation and realize training.

CORALINA also focused on building capacity of local institutions with cooperative programs, by including them in international partnership projects and training activities. Working cooperatively with organizations like the national police and coast guard has strengthened daily operations of surveillance and enforcement. However, given the political nature and volubility of many local institutions, which leads to constant changing of staff and program priorities, it is difficult to advance institutional sustainability. However, many individuals trained do remain in the archipelago, hopefully benefiting other organizations with which they work and ultimately the biosphere reserve.

Governing structure

The management plan outlines a governing structure that is an autonomous body with its own legal identity, which would ultimately be financially independent, although still associated with CORALINA. The separate units within the structure would be: a Biosphere Reserve Directive Council of the established CORALINA Directive Board plus four additional community representatives, a Scientific-Technical Committee; and a Community Commission (subdivided into two commissions: one for Old Providence/Santa Catalina and another for San Andres). Members would include representatives of the tourism, commercial, water sports, agricultural, and fisheries sectors as well as representatives of the environmental NGOs, native islander groups, residents and land-owners in the mangrove and watershed zones, churches, educational institutions, community action groups, and cooperatives.

The management plan also states that until such time as this semi-independent structure affiliated with CORALINA can be established, CORALINA will continue to administrate the biosphere reserve. For the first five years, CORALINA has managed the biosphere reserve as part of its on-going functions, both operationally and in regard to projects. Setting up the autonomous management structure requires human and financial resources that have not been available. This has led to some confusion on the part of the community about the level to which the biosphere reserve is being implemented.

The Seaflower MPA will also ultimately have a semi-autonomous co-management structure similar, and somehow linked to, that of the biosphere reserve. Presently, CORALINA's board of directors and the MPA project team are advised by three active committees – the Stakeholder Advisory Committee (SAC), Inter-Institutional Committee (IIC), and International Advisory Board (IAB).

Prior to the Seaflower Biosphere Reserve declaration in 2000, the community was extensively consulted during planning and a preliminary community consultative committee was functioning on each island. However, after the declaration these groups became inactive, presumably because of lack of funding combined with the burden of CORALINA's work load as environmental authority. Past committee members and CORALINA staff also made the point during evaluation that the committees set up during the planning process were too large to take practical action, make effective decisions, or offer all members the opportunity to express themselves. Furthermore, members lacked capacity.

CORALINA's new administration, which took office in 2004, is aware of the importance of re-establishing the community commissions but made a decision not to reactivate them until the MPA management structure had been agreed upon by the community and was functioning. This was because the biosphere reserve committees might need to be revised or, at least, linked with the structure the community preferred for MPA management. In the meantime, all CORALINA projects have been highly participatory and local stakeholders had decision-making power in designing the Seaflower MPA, but the community has not played a day-to-day role specifically in biosphere reserve management.

**Recommendation: Now that the Seaflower MPA management structure with advisory committees is functioning, community commissions for the biosphere reserve should be reestablished on both islands. Because management of CORALINA itself, the MPA, and other protected areas and institutions with jurisdiction in the biosphere reserve must be carefully linked, committee structure should be redesigned, as required to integrate properly with other management boards and institutions. Although members' capability may not be high initially, participating in a consultative board of this type is an important tool of human development and will help prepare stakeholders to gradually assume more active and responsible roles in Seaflower operations, both empowering biosphere reserve residents and helping relieve CORALINA of some of the burden of management.*

Infrastructure and personnel

The management plan states that initially the biosphere reserve will be run from CORALINA offices, which has been the case during the last five years. Although the Seaflower will always be governed by CORALINA, as participatory co-management becomes the reality, semi-independent offices (one in San Andes and another in Old Providence) linked with CORALINA should be set up to handle daily operations. The management plan proposes that the offices be staffed with a reserve manager, biologist, lawyer, social worker/educator, natural resource management technician, and four inspectors (rangers).

Since implementation, CORALINA has been renting two buildings – one in San Andres and another in Old Providence. Rent must be paid primarily from project funds, as CORALINA does not receive much money from other sources to cover operational costs. Most personnel are also contracted on a temporary basis through projects. Therefore, office space cannot be available for programs that are not funded nor can staff be hired. The biosphere reserve has not had specified office space since 2000 and only had its own personnel for a little over a year in 2001-2002, when a project with a grant from UNESCO allowed a few people to be contracted solely or partially by the biosphere reserve.

CORALINA has been successful at raising funds to buy office, laboratory, and field equipment during the first five years. Educational equipment including audiovisual aids and cameras has also been acquired, along with books and equipment for the document center. Significant additions have been two completely outfitted vessels for the MPA, diving gear, and underwater cameras. A project to support the laboratory resulted in new equipment being sent from the United States while a great deal of computer equipment has strengthened the capability of the offices.

As discussed in other sections of the evaluation report, it is important to understand that the lack of biosphere reserve autonomy within CORALINA including its own staff, office space, or specific projects does not mean that the Seaflower is not being implemented. All CORALINA's work is rooted in the biosphere reserve vision, which is genuinely mainstreamed throughout CORALINA's approach. All CORALINA's projects and daily operations are synonymous with the Seaflower, and most personnel are aware that they are implementing the biosphere reserve in their work. Similarly, all CORALINA's facilities -- including the laboratory, document center, and GIS -- and equipment are used for biosphere reserve implementation. However, as mentioned in the background and sections on participation and governing structure, this relationship is tacit rather than explicit. Therefore, other institutions, the community, and visitors do not always grasp that the biosphere reserve is being actively implemented and making a real difference in the development of the archipelago and their lives.

At the present time, one of CORALINA's priorities is acquiring its own building. As proposed by the Executive Director, the building could be donated by the government (the Colombian government

confiscates assets from the drug trade and there are several such buildings in San Andres). Then funds to renovate the building would need to be raised. Being free of the burden of rent would reduce the donor-driven aspect to the allocation of space, as well as allowing the substantial funds needed for rent to go to activities or cover other operational costs.

**Recommendation: The lack of clearly articulated organization, differentiation, and linkages between CORALINA and the Seaflower is one of the most important issues facing biosphere reserve implementation. Putting in place and maintaining permanent office space and, at least, minimal staff for the biosphere reserve would go a long way to resolving this confusion. An office would give the community channels of communication and a visible center of Seaflower operations and activities. Moving into a new building would facilitate setting up an office that is easily accessible to the community and tourists and also closely linked with CORALINA projects and staff.*

Organizing special biosphere reserve programs, not just daily operations and management, are also constrained by inadequate facilities. From the time of biosphere reserve planning, CORALINA has dreamed of creating a Seaflower Biosphere Reserve Environmental Education Center -- a multi-purpose facility to provide space for community and visitor programs. Although this is an ambitious, expensive project, since the declaration CORALINA has sought funds for a center without success. Nonetheless, it is an important idea that is worth mentioning in this report. A single facility could serve as a visitor center; house an auditorium, meeting rooms, cafeteria, gift shop, administrative offices, and exhibition space; and be the locus for environmental programs, demonstrations, and training activities. Such a center would create jobs and support financial sustainability by providing a collection point for fees and the opportunity to generate revenue through a cafeteria, gift shop, and events with admission charges.

Financial sustainability

From 2000-2005, CORALINA received a number of grants or special project funds to pay for salaries and activities to support biosphere reserve implementation. In addition to national project funds for diverse programs like green markets, institutional strengthening, and coral recovery; grants were received from UNESCO (biosphere reserve implementation), UNEP (MPA education), GEF-World Bank (biodiversity and climate change), European Union (URB-AL and INCO-DC programs), Embassy of the Netherlands (environmental education), The Ocean Conservancy (marine conservation), National Fish and Wildlife Foundation (coral conservation), NOAA (marine conservation), Lighthouse Foundation, Island Resources Foundation (small island development), PFE (sustainable agriculture, development modeling), and the Mangrove Action Project (mangrove education). A number of national and international partners provided technical support including NOAA, IUCN, The Ocean Conservancy, Wildlife Conservation Society, Conservation International, CORAL, INVEMAR, and the National Park Office; to name a few.

CORALINA did an excellent job leveraging funds during this period. For example, the GEF grant to set up the Seaflower MPA was one million dollars with another $3,278,000 originally committed from partners. According to the World Bank project completion report (PCR), during the course of the project CORALINA leveraged an additional $1,663,500, bringing the project total to $5,941,600 including the GEF contribution.

In spite of CORALINA's success at raising funds nationally and internationally, the financial state of the Seaflower Biosphere Reserve and MPA is very precarious. Programs are limited by the lack of secure, on-going funding. Relying on grants means that activities have been donor-driven, resulting in a lack of organization, continuity, and follow-through in programming. Work also becomes project-driven, meaning that funding for day-to-day biosphere reserve operations is usually insufficient. To be truly

sustainable, the Seaflower must become self-sufficient, developing a realistic financial plan and implementing mechanisms to generate enough revenue to cover the recurring costs of staff, management, education, and daily operations.

**Recommendation: Financial autonomy is a priority. Seek interim-funding to revise the financial plan and then carry out pilot programs to test the feasibility of a range of financial strategies to generate sufficient funds to cover management and operational costs of the biosphere reserve and MPA.*

The management plan identifies a number of financial strategies. Revenue-generating mechanisms that could be implemented include: conservation levies from development projects that negatively impact ecosystems or biodiversity, coastal development, the tourist card, or enterprises that benefit from the biosphere reserve; a trust fund; fees of which there are several types such as entrance, use of specific object, and/or admission to a certain facility or site; licenses and permits; sale of souvenirs, educational materials, etc. by local stores and/or special biosphere reserve gift shops; concessions to conduct activities in the area or to use resources; donations and memberships like Friends of the Seaflower Biosphere Reserve (local, national, and/or international); sponsoring special activities, events, and fund-raisers; and promoting tourism and research opportunities.

Participation in the World Network of Biosphere Reserves

In addition to being part of the World Network of Biosphere Reserves, the Seaflower is a member of the IberoMAB network and was represented by biosphere reserve personnel from the planning or education departments at international conferences in 2001, 2002, and 2005. Grants were received from UNESCO in 2000 and 2005 to advance biosphere reserve implementation. The Seaflower also participates actively in CSI activities including Small Islands Voice and the CARICOMP and COSALC programs.

A profile of the Seaflower Biosphere Reserve is posted on the UNESCO MAB World Network of Biosphere Reserves website but the description is out of date; particularly so because the Seaflower MPA has not been incorporated into the biosphere reserve at the international level.

**Recommendation: Send the information about the Seaflower MPA declaration, boundaries, and zoning to MAB so that the marine area can be incorporated into the biosphere reserve. Update the Seaflower Biosphere Reserve profile in the World Network of Biosphere Reserves accordingly. Then actively seek ways to be more involved in the World Network, including establishing communication and partnerships with regional reserves and other reserves in small islands.*

To raise awareness about biosphere reserves, CORALINA personnel have given presentations on the biosphere reserve and its significance to small island sustainable development at a number of local, national, and international conferences. CORALINA has also been actively involved in the process to establish MPA systems and marine World Heritage Sites since 2005. In 2006 the Seaflower MPA was added to Colombia's tentative list and submitted to UNESCO's World Heritage Committee.

Monitoring and evaluation

A number of monitoring programs are new since 2000, while existing programs have been expanded or strengthened during biosphere reserve implementation. At this time, new ecological and socioeconomic indicators are being developed to monitor effectiveness of the Seaflower MPA's management and zoning.

The following technical and community-based volunteer monitoring programs are on-going in the Seaflower Biosphere Reserve and MPA:

- Beach monitoring and characterization: UNESCO and Sea Grant COSALC (Regional network: Coast and Beach Stability in the Caribbean)

- Reef condition: SIMAC (National network: Colombian System of Reef Monitoring), CARICOMP (Regional network: Caribbean Coastal Marine Productivity), ReefCheck (Global network: volunteer reef monitoring), RECON (Global network: volunteer coral monitoring)

- Mangrove condition (National network: System of Mangrove Zone Monitoring)

- Seagrass condition: CARICOMP (Regional network: Caribbean Coastal Marine Productivity)

- Coastal zone: Control and monitoring of the coastal zone (Local network: CORALINA)

- Groundwater: Control and monitoring of the San Andres groundwater (Local network: CORALINA)

- Species: WIDECAST – sea turtles (Global network: marine turtle monitoring), ReefCheck – fish (World network: volunteer fish monitoring), REEF - fish (Global network: Reef Environmental Education Foundation), black land crabs (Local network: CORALINA), AICAS - birds (national network: population distribution and species counts)

**Recommendation: Integrate monitoring into a coherent program for the entire biosphere reserve. Ecological and socioeconomic indicators should also be developed to measure effectiveness of the Seaflower's terrestrial management and zoning with regular technical and community-based monitoring systems put in place.*

Process evaluation is an on-going part of all CORALINA projects and, of course, donors often require outcome evaluations at the conclusion of projects. These evaluations are done both internally and externally. Nonetheless, since implementing the biosphere reserve is not a project, per se; this is the first formative evaluation that has concentrated on biosphere reserve implementation.

**Recommendation: To improve biosphere reserve planning and implementation, carry out regular process and outcome evaluations of biosphere reserve advance; for example, do a process evaluation every 2-3 years and an outcome evaluation every 5 years.*

Findings
Section 3: Seville Strategy Implementation Indicators

The Seville Strategy for Biosphere Reserves -- based on conclusions reached at UNESCO's International Conference of Biosphere Reserves held in 1995 in Seville, Spain – includes implementation indicators to help evaluate progress at the levels of international, national, and local reserves. This section summarizes the status of each indicator for local reserves after the first five years of implementation. All of the indicators are either fully or partially realized. Findings are presented in Table 1. Recommendations for the second five years are also included.

Table 1. Seaflower Biosphere Reserve 2000 – 2005: Indicators at the individual reserve level

Indicator: Seville Strategy	*Status: 2005 (yes, no, on-going, in process, etc.)*	*Recommendations: 2006-2010*
Survey made of stakeholder interests	Yes	Update with new information
Factors leading to environmental degradation and unsustainable use identified	Yes	Revise to reflect new knowledge and current situation
Survey made of natural products and services of the biosphere reserve	Yes	Revise to reflect new knowledge and current situation
Incentives identified for sustainable use by local populations	Yes, for certain projects	Expand with stakeholder input to help identify an integrated incentive program
Plan prepared for equitable sharing of benefits	Yes, for certain projects	Continue at individual project and program level; develop a structure to integrate projects and programs into overall implementation
Mechanisms developed to manage, coordinate, and integrate the Biosphere Reserve's programs and activities	Partially achieved – biosphere reserve implementation mainstreamed in CORALINA's work but this is tacit rather than explicit	Clarify and articulate linkages between CORALINA's on-going work and Seaflower Biosphere Reserve and MPA objectives; ensure consistency of management plans
Local consultative framework implemented	Yes, for MPA No, for terrestrial area	Redesign and implement for terrestrial area; develop communication channels to link consultative committees of biosphere reserve, MPA, daily operations, and other programs
Regional demonstration sites developed	Yes, in certain projects	Expand into more program areas; promote involvement of the private sector and general community
Coordinated research and monitoring plan implemented	Yes, on-going but not unified	Improve by integrating distinct programs into an over-arching plan
Functional data management system implemented	Yes, every program has a database but there is not a unified information management system	Improve by incorporating databases into an easily managed and accessible information system
Biosphere Reserve is used for developing and testing of monitoring methods	Yes, on-going	Improve links and communication between monitoring programs
Biosphere Reserve is used for developing indicators of sustainability relevant to local populations	Yes, ecological and socioeconomic indicators being identified with some implemented	Complete process of identification; incorporate into monitoring and evaluation to inform management and improve effectiveness

Local stakeholders are included in education, training, research, and monitoring programs	Yes, on-going	Continue existing and introduce new programs; improve program visibility
Information for visitors to the Biosphere Reserve developed	Yes	Update, reprint, identify distribution points, and distribute regularly
Ecology field center developed at the biosphere reserve	Partially achieved – CORALINA offices, lab, GIS, and document center also serve the biosphere reserve	Set aside a permanent space for a biosphere reserve office and maintain staff to create a focal point for reserve activities and for the community and visitors
Biosphere Reserve is used for on-site training activities	Yes, on-going	Continue and expand programs and visibility
Local educational and training program in place	Yes, on-going	Continue and expand programs and visibility
Different zones of Biosphere Reserve identified and mapped	Yes	Produce user-friendly maps and signage; educate the general public and institutions about zoning
Buffer and cooperation zones replanned to promote sustainable development and protect the core areas	Yes, zoning in effect for terrestrial and marine areas that is compatible with core, buffer, and cooperation zones	Review terrestrial zoning in consultation with stakeholders and re-plan buffer and cooperation zones if required to improve effectiveness
Local community involvement in planning and managing the Biosphere Reserve	Yes, on-going in projects and programs but lacking in management	Improve stakeholder involvement in daily operations and management
Private sector initiatives to establish and maintain environmentally and socially sustainable activities are encouraged	Yes, on-going in selected fields	Promote and expand private sector involvement into more areas; develop a framework to unify initiatives and promote communication between sectors
Information and promotional programs developed	Yes, on-going	Continue, with expanded use of local media to improve visibility
Strategies developed for mobilizing funds from businesses, NGOs and foundations	Yes, on-going in relation to projects and grants	Expand and implement financial strategies beyond grants, to achieve self-sustainability
Mechanisms developed for monitoring and assessing the implementation of the Seville Strategy	Yes, in outcome evaluation	Develop on-going monitoring of biosphere reserve advance in relation to the management plan and Seville Strategy; initiate regular process evaluation every 2-3 years in addition to outcome evaluation every 5 years

Conclusions

Based on the findings for work accomplished from 2000-2005, conclusions are presented. First, positive and negative findings are summarized in relation to the three functions. Second, lessons learned that will improve future biosphere reserve implementation are discussed. Finally a general conclusion is given.

Functions – pluses and minuses

Implementation pluses and minuses are summarized for each of the three functions of biosphere reserves:

- Conservation: preserve genetic resources, species, ecosystems, and landscapes.
- Development: foster sustainable economic and human development.
- Logistic support: support demonstration projects, environmental education and training, research and monitoring related to local, national, and global issues of conservation and sustainable development.

To make results easily accessible, the conclusions are structured in a simple matrix rooted in a modified SWOT Analysis framework. Positive aspects -- strengths and opportunities -- are listed for each function on the left side of the matrix while negative aspects -- weaknesses and threats -- are listed for each function on the right side of the matrix, as presented in Table 2.

Many of the activities of capacity development like formal education and training are listed under function 2 as human development, but it is important to note that they could just as appropriately be listed under function 3. These activities also contribute to function 1, conservation. In reality, many of the pluses and minuses could be repeated under each function, illustrating the integrated nature of the biosphere reserve approach to development.

Table 2. Seaflower Biosphere Reserve 2000 – 2005: Summary of implementation of functions

	Conservation	
	+ Strengths and opportunities	*- Weaknesses and threats*
1	- Core zones strengthened with protected area declarations and legislation - Seaflower MPA developed (declaration; zoning; ecosystems, fisheries and species management) - Coral recovery project completed - Johnny Cay Regional Park declared and implemented - Old Point Mangrove Park declared - Cove Valley watershed participatory process underway - Management of freshwater resources, including freshwater harvesting pilot project - Water Quality Action Plan developed - Population research and policy document produced - Solid waste management projects continuing - Pilot project in slums underway - Coral recovery project completed - Black crab project completed - Climate change project approved by GEF - Integrated environment systems model developed	- Community uninformed about core zoning and regulations - Community unaware of biosphere reserve advances - Financial support not secure - Projects donor-driven and operations project-driven - Population still increasing and pressuring resources - Policies and feasible solutions for population issues not defined, identified, or implemented - Increasing poverty pressuring natural resources - Growing threats to watersheds (deforestation, urbanization, agriculture, etc.) - Ecological devastation from Hurricane Beta (corals, woodlands, mangroves)

	Economic and Human Development	
	+ Strengths and opportunities	*- Weaknesses and threats*
2	- Seaflower MPA developed (fisheries, livelihoods, economic alternatives and job creation) - Seaflower MPA Stakeholder Advisory Committee functioning - Solid waste management alternatives (pilot projects of recycling, reuse) implemented - Green market project underway - Sustainable agriculture projects on-going - Ecotourism project and Action Plan completed - Jobs created with CORALINA and through projects - Wealth of special training programs, seminars, conferences, etc. targeting many sectors and on-going - Stakeholder off-island training programs completed - Technical training and advanced education for CORALINA personnel on-going - International training of laboratory and GIS personnel carried out - CSI SIV actively implemented and on-going - Formal education program with CU (technical degree) accredited with first class graduated - Teacher continuing education courses completed - Annual and one-time special events with active community participation and support on-going	- Community uninformed about buffer and cooperation zones and opportunities - MPA consultative committee functioning but not biosphere reserve consultative committee - Community participation limited to individual projects and not integrated into overall governing structure - Financial support not secure - Projects donor-driven and operations project-driven - Population still increasing and pressuring economy, social services, and infrastructure - Poverty and unemployment still major problems - Lack of human capital - Private sector initiatives not adequately promoted - Economic devastation from Hurricane Beta (tourism, fishing, agriculture)
	Logistical Support	
	+ Strengths and opportunities	*- Weaknesses and threats*
3	- Training in administration carried out (recruitment, procurement, contracts, accounting, etc.) - Infrastructure expanded including office and field equipment (computers, diving gear, boats, etc.) - Negotiation for new building underway - Expansion of laboratory, GIS and document center - Laboratory certified - Environmental education programs – formal and informal – on-going at all levels - Ecologically and culturally appropriate bilingual education materials produced for all ages - Environmental Education Committee functioning - Volunteer programs on-going with volunteerism increasing - Monitoring programs (technical and community-based) on-going - Biological indicators identified; socioeconomic indicators in process - Partnership projects and MoUs with many national and international partners - Strong community support and inter-institutional relationships - National and international network affiliations - Daily operations (surveillance, enforcement, permitting) strengthened	- Integrated, participatory governing structure not fully realized - Lack of specific biosphere reserve office and personnel - Financial support not secure; financial sustainability measures not implemented - Lack of funds for general biosphere reserve operations - Lack of publicity; information about advances inadequately disseminated to the general public - Seaflower profile with UNESCO out-of-date; MPA not included in the biosphere reserve - Management plans, monitoring, research, information systems (databases), and consultative structures not structured or organized in coherent programs, lacking overarching frameworks, channels of communication, and consistency

Lessons learned

A number of lessons were learned during the evaluation that can improve future biosphere reserve implementation. The most important are:

- When the biosphere reserve includes an entire territory and is managed by a pre-existing agency with a distinct mandate, failing to clearly articulate the relationship between the work of the agency and the implementation of the biosphere reserve contributes to a lack of understanding about the role of the biosphere reserve in local development. This can lead to the perception that the biosphere reserve is not being implemented.

  Therefore, in the case of the Seaflower, the most important challenge for the second five years is to make clear to the community that most, if not all, of the work done by CORALINA implements the biosphere reserve. This should be easy to get across by improving communication, articulating the relationship between CORALINA and the Seaflower, and organizing over-arching frameworks to integrate programs and ensure consistency. The following four lessons learned follow from this first lesson.

  - Because the entire community knows they live in a biosphere reserve, does not imply that they understand what that means. On-going education and media campaigns that are specific and explicit about how to live in a biosphere reserve and about biosphere reserve concepts; dissemination of information about biosphere reserve implementation, programs, and projects; and training in zoning and regulations, including permanent access to materials that illustrate zoning; will go a long way to ensuring achievement of and clarity about this new vision of development.

  - Newcomers to the management agency may not understand the biosphere reserve concept themselves or grasp how it links to their work. Therefore, all CORALINA personnel, especially new ones, should be trained in the biosphere reserve model of development and understand how it pertains to what they are doing. They should also be able to communicate this to stakeholders and should understand that articulating these linkages is a priority.

  - Biosphere reserves are both physical places and concepts (alternative models of development). In the case of biosphere reserves that do not have easily identifiable external boundaries that the community can see or comprehend, like the Seaflower, having a biosphere reserve office and personnel, however limited, are essential to successful implementation. There needs to be a physical place explicitly associated with the biosphere reserve (for example, with a large sign saying Seaflower Biosphere Reserve Center) to make it visible. A staffed office also provides an obvious place for the community to visit when they want to talk, learn about, or work with the biosphere reserve.

  - When the biosphere reserve encompasses an entire community and its territory -- as is the case with the Seaflower -- rather than being a discrete park; original and site-specific alternative systems of management, monitoring, communication, information management, participation, etc. must be developed and implemented. Many separate, independent actions can be going on at any given time, but they all need to be integrated under the “umbrella” of the biosphere reserve, have clearly established channels of communication and be visible, and articulate where and how they fit into or link with broader biosphere reserve functions and programming. For example, all monitoring programs should fit into an over-arching, unified program; stakeholder committees should be part of a larger framework; and management plans should be consistent.

- Implementing a financial sustainability plan is central to long-term successful implementation of the biosphere reserve. Without an adequate level of financial autonomy, biosphere reserve activities and management become donor- and project-driven, which can compromise effectiveness, continuity, and the ability to carry out daily operations.

- Governance is challenged by a lack of capacity and funding. In sites lacking human and financial capital, promoting community involvement in management and development of stakeholder initiatives -- within a larger program supervised by the biosphere reserve authority if capability is low -- builds local capacity, opens more paths for human and economic development, strengthens conservation, and empowers stakeholders.

- Integrating the three functions -- which promote conservation, cultural and socioeconomic concerns, capacity building, and equity -- results in sites that offer a model of sustainable development. From the beginning the Seaflower Biosphere Reserve and MPA were developed with an integrated sustainable development mission. A key objective is the generation of local benefits. Since the native people depend on the islands, the sea, and their resources for their economic and cultural survival, community-based conservation rooted in respect for traditional tenure, values, rights, and livelihoods is essential for long-term conservation and sustainable use of resources.

General conclusion

Improving implementation of the Seaflower Biosphere Reserve and MPA in the next five years does not require major organizational changes by CORALINA. A wealth of excellent work -- activities, projects, and programs -- has been completed, is underway, or is on-going that has successfully advanced biosphere reserve implementation since 2000. The biosphere reserve is proving to be an effective approach to sustainable development. Continuing and expanding existing programs and putting in place new programs rooted in the development vision chosen by the community – a model based on the biosphere reserve's integrated functions and goals – will continue to result in effective implementation. Simple restructuring and articulation of roles, improved communication and dissemination of information, wider participation, and financial sustainability are the keys to making implementation even more successful, productive, organized, visible, and effective in the future.

Action Plan
The Seaflower Biosphere Reserve: The second five years
2006-2010

To conclude the evaluation of the Seaflower Biosphere Reserve's first five years, a summary of next steps to improve implementation based on the recommendations is given in two time frames: short to medium term and medium to long term. As the actions listed here focus on improvement, the excellent work that has substantially advanced implementation is not included in this plan but should definitely be continued.

1. Short to medium term

This time frame is considered to be 1-2 years. It includes the following actions (actions that should be carried out permanently after implementation are designated with an asterisk):

- Clearly articulate the relationship between the Seaflower Biosphere Reserve and MPA, CORALINA work, and any other conservation and development programs in all management plans and governing structures; environmental education, publicity, and media activities; special events; committee meetings; volunteer programs; research and monitoring; etc.*

- Ensure that the biosphere reserve has its own office space and minimal staff, and train all CORALINA personnel in biosphere reserve functions and concepts and how their work relates to these.*

- Reestablish community commissions for the biosphere reserve on both islands and reexamine the management structure to properly link with other management committees (for example, MPA SAC and IIC) and institutions.*

- Send information about the Seaflower MPA declaration, boundaries, and zoning to UNESCO-MAB so that the marine area can be incorporated into the biosphere reserve, and update the Seaflower Biosphere Reserve profile in the World Network of Biosphere Reserves accordingly.

- Update the section on problems in the Seaflower Biosphere Reserve Management Plan to include and be in accord with the results of the research and modeling done with PFE and ensure consistency of all management plans (for example, MPA and Integrated Groundwater Management Plan).

- Carry out research assessments of the Cove Valley and Old Providence watersheds to map the current situation; then review strategies to adequately protect these critical core zones.

- Work with stakeholders on each island to revise zoning of buffer and cooperation areas in land sites.

- Develop user friendly zoning maps and signage, and educate all stakeholders about biosphere reserve and MPA zoning.

- Explore financial strategies and revenue generation options to improve biosphere reserve autonomy and develop a project to get interim-funding.

- Launch a dialogue with stakeholders and all levels of government with the goal of agreeing on an integrated plan of action to solve the population problem in San Andres.

- Gather new information from the community about their concerns and interests in relation to each of the three functions.

2. Medium to long term

The time frame in this case is envisioned to be 3-5 years. The following actions -- all of which should be on-going once they are put in place -- should be accomplished or advanced during this period:

- Implement actions to solve the population problem in San Andres and monitor population growth in Old Providence and Santa Catalina.

- Seek and promote creative solid waste management alternatives that integrate conservation with economic development.

- Implement actions to strengthen protection of the Cove Valley and Old Providence watersheds.

- Set up an integrated working committee of local technical experts in liquid waste management issues, do a comprehensive review of all available information, and acquire funds and expertise to implement the necessary actions to solve this problem.

- Work with the private sector, local NGOs, and other institutions to develop incentives, initiatives, and demonstration projects to spur sustainable economic alternatives and create jobs to help alleviate poverty; then integrate these with CORALINA's work, creating a community-wide network of involvement and response to biosphere reserve implementation.

- Implement financial strategies and revenue-generating options to support the biosphere reserve and MPA.

- Examine and strengthen methods to ensure equitable access to the biosphere reserve's natural products and services and equitable distribution of benefits.

- Actively seek way to be more involved in the World Network, including establishing communication and partnerships with regional reserves and small island reserves.

- Integrate research, monitoring, information systems, management, governance, etc. into coherent programs for the entire biosphere reserve and MPA.

- Carry out regular process and outcome evaluations of biosphere reserve advance (process evaluation every 2-3 years, outcome evaluation every 5 years) to improve biosphere reserve planning and implementation.