



The National Integrated Coastal Zone Management Strategy for Belize



The Coastal Zone Management Strategy for Belize



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The Coastal Zone Management Strategy for Belize

A Summary

Strategic Context and Goal

The wider purpose of this strategy is to facilitate improved management of coastal resources at a national level in Belize, to ensure economic growth is balanced with sound environmental management. The activities required to achieve this are contributing to Belize's regional commitments in biodiversity and natural resources management, including the Barrier Reef System that it shares with Mexico, Honduras and Guatemala.

The Strategy has four main functions. These are:

- Helping to link the economic potential of the coastal zone with equitable allocation and sustainable use of its resources, while improving the decision-process over the use of these resources.
- Facilitating further appreciation by stakeholders and interest groups of the interdependence between all natural resources and processes, and human interventions in the coastal area of Belize.
- Promoting the scientific understanding that is essential to the setting and maintenance of targets and standards for environmental and natural resources management in the coastal area of Belize.
- Fostering even greater collaboration between all involved parties in the development and management of this complex yet vital national asset.

To achieve this, an over-arching goal has been defined, towards which it is anticipated all participants in management and development of the coastal zone will be able to work. This goal is:

“To support the allocation, sustainable use and planned development of Belize’s coastal resources through increased knowledge and building of alliances, for the benefit of all Belizeans and the global community”

Enhancement of existing laws, regulations, ‘policies’ and guidelines relating to conservation, resource management and development control in the coastal zone are an important part of this Strategy. These will support a coastal area management framework that addresses (a) the need for improved management approaches in locations between, as well as within, Coastal and Marine Protected Areas, and (b) the special requirements for managed development and conservation in the barrier reef region, particularly the cayes.

Approach

In the coastal area, natural or man-made events and activities are intimately linked over large spatial scales by ocean processes. In this complex and dynamic setting, an integrated approach to development

planning, conservation and natural resources management is required. This approach takes account of:

- Environmental characteristics of coastal ecosystems and the pre-requisite for maintaining ecosystem integrity.
- Pressures and impacts associated with national and international land and marine-based development.
- Factors that may change or otherwise impact the coastal system, including climate change.

Integrated Coastal Management requires a hybrid of approaches traditionally used in marine and land-based planning, and the forging of linkages between them, supported by scientific research. It requires both pro-active planning measures, as well as response systems after problems have been identified. This is an evolving and essential element of the planning and environmental management process for Belize. To deliver it, enhanced and sustained collaboration is needed between various agencies of Government, the non-governmental and private sectors, and the wider public.

By Law, the Strategy and detailed plans that will follow it require review and, if necessary, revision every four years. This review can take account of the relative success of various components, lessons learned, and data and information from ongoing scientific research and monitoring on the condition of the coastal and marine environment.

Principles for Achieving Integrated Coastal Area Management

The delivery of integrated management in coastal Belize is based on the following realities:

- It must provide for a balance between the requirements for conservation and development.
- Cross-sectoral, interdisciplinary debate and decision-making are key to success.
- High quality research and data management must support the process.
- Environmental best practice is, and will be applied to all advice provided to decision-makers on economic development and conservation issues in the coastal zone.
- Where elements of uncertainty exist in the decision-process for coastal resources management, the 'precautionary principle' will be applied to professional recommendations.
- Decisions on coastal resource use and conservation must take full account of the knowledge base, aspirations and requirements of local communities.
- The process will take account of all national, regional, and international activities and initiatives to manage natural resources and the environment.

The Coastal Zone Management Authority and Institute is the focal point for these activities, and has the legislation and professional staff composition needed to implement this mandate. However, decision-making responsibility on development and natural resources management is vested in other agencies of Government.

The Authority and Institute have been successful in motivating the participation of a wide range of stakeholders in this difficult yet vital task. Due to the representation by sister agencies and members of the private and non-governmental sectors on committees of the Authority and Institute, and also, by the Authority and Institute in other national advisory groups, many of the objectives for successful coastal zone management are broadly understood. Continued dissemination of the basic message, is however, a key component of the Strategy, along with a degree of rationalization of the committee system where discussion of these issues takes place.

While public participation in coastal management on the basis of shared goals and objectives is an ideal scenario, there is also a substantial legislative framework for coastal management in Belize. Efficient implementation and monitoring is critical, but is difficult given financial, technical and logistical limitations of budgets. This problem is addressed in the Strategy by exploring further linkages in the use of available resources for regulation and monitoring.

Actions

In order to progress the Integrated Coastal Area Management process for Belize, various actions are proposed. While some are new, others re-emphasize or build on previous recommendations or ongoing activities at national or international level, including the Biodiversity Strategy, the National Parks and Protected Areas System Plan, and the Medium Term Economic Strategy Paper 2000 - 2002. The main elements of these activities, the agencies responsible for them and the time frame for conducting them are included in the following table. Topics addressed by the Strategy are grouped together under three strategic objectives. Each of these is linked to the goal.

Detailed requirements for each topic are tabulated through the main text, in boxes with a blue background color.

The implementation framework has been constructed around the existing workplans of institutions involved in ICZM. To do otherwise would invite unrealistic expectations for delivery of results.

Financing the Strategy

Implementation costs for the Strategy are built in to budgets for the Coastal Zone Management Authority and Institute until the year 2004. Part of the funding is provided through a grant to the Government of Belize from the Global Environment Facility and United Nations Development Program, and the European Union, while Government provides the remainder.

The work of integrated coastal zone management will progress indefinitely, and the issue of financing to support these essential efforts for the future is being investigated during a consultancy for the Authority and Institute during 2001.

Figure 1: Summary of Key Strategic Activities for Integrated Coastal Zone Management in Belize

SUMMARY: KEY STRATEGIC ACTIVITIES FOR INTEGRATED COASTAL MANAGEMENT IN BELIZE (details contained in Action tables under text-referenced topic)			
TOPIC	ACTIONS	LEAD AGENCIES	TIME-FRAME
Coastal Strategy: Adoption, Review, Revision	House of Representatives approval, gazetting and statutory adoption of the Strategy	Cabinet, with Ministry of Agriculture, Fisheries and Cooperatives, and Coastal Zone Management Authority	3 rd Quarter 2001
	Preparation of annual State of Coast Reports, to analyze trends and changes in the coastal area	Coastal Zone Management Institute	Annual
	Review implementation of Strategic Actions, revise the Strategy document	Coastal Zone Management Institute	2004
	Adopt revised Strategy, implement recommendations for further 4-year period	Coastal Zone Management Authority and Institute	(a) 2005, adoption (b) 2005-2009, implementation
STRATEGIC OBJECTIVE: “Knowledge and Sustainable Coastal Resources Use”			
Coastal Research and Monitoring (4.2.2)	Prioritize proposals from review undertaken on research, identify funding and management mechanisms	Coastal Zone Management Institute, after consultation with Heads of Government Departments	Last quarter, 2001
Protected Areas Management (4.2.3)	Policy framework to be developed for country Protected Areas System management	National Protected Areas Policy Committee	By mid-2001
	Develop marine protected areas (MPA) system Framework, and over-arching management structures	Department of Fisheries, with Coastal Zone Management Authority and Institute, Forest Department, and fishing cooperatives	By mid-2001
	Establish advisory committees and revise management plans, let facilities contracts, hire and train staff for MPA’s at Caye Caulker, Laughing Bird Caye, Sapodilla Cayes and South Water Caye	Coastal Zone Management Authority and Institute, with Department of Fisheries and Forest Department, Non Governmental Organizations, and fishing cooperatives	By end, 2001, and ongoing

SUMMARY: KEY STRATEGIC ACTIVITIES FOR INTEGRATED COASTAL MANAGEMENT IN BELIZE (details contained in Action tables under text-referenced topic)

TOPIC	ACTIONS	LEAD AGENCIES	TIME-FRAME
STRATEGIC OBJECTIVE: “Knowledge and Sustainable Coastal Resources Use”			
Protected Areas Management (4.2.3)	Revise regulations, taking into account statutory requirements of policy guidance	Same	Mid-2002
Coastal Habitat Restoration (4.2.5)	Create inventory of damaged sites; and mechanisms for remediation	Departments of Forest and Fisheries and the Physical Planning Section of the Lands and Surveys Department	Through 2002
	Prepare legislative requirement for restoration, should damage occur in association with breach of planning approval, or for illegal development where mangroves or other habitats are damaged	Same, with Attorney General	End, 2001
	Review schedule of fines for breaches of regulations	Same, with Attorney General	End, 2001
Coastal Wildlife Conservation (4.2.6)	Sustain manatee program; promote ownership and implementation for turtle recovery program, and support plan development for coastal avian wildlife	Coastal Zone Management Institute, in consultation with Non-Governmental Organizations	Ongoing, new activities in 2002
Fisheries (4.2.7)	Support fisheries research eg. Nassau Grouper	Fisheries Department, and the fishing cooperatives with the Coastal Zone Management Institute	Ongoing
	Enhanced training for fisheries staff in coastal area management	Coastal Zone Management Institute and Fisheries Department	2001-2002
	Implementation of Fishery Management Plans	Fisheries Department	Ongoing
	Revitalize mooring buoy program	Fisheries Department	During 2001

SUMMARY: KEY STRATEGIC ACTIVITIES FOR INTEGRATED COASTAL MANAGEMENT IN BELIZE (details contained in Action tables under text-referenced topic)			
TOPIC	ACTIONS	LEAD AGENCIES	TIME-FRAME
STRATEGIC OBJECTIVE: “Knowledge and Sustainable Coastal Resources Use”			
Aquaculture (4.2.8)	Zoning plan to be developed and implemented for aquaculture and mariculture	Fisheries Department, with the Lands and Surveys Department, Department of Environment, Forest Department, Geology and Petroleum Department, Belize Trade and Investment Development Service, Aquaculture Industry Association, and the fishing cooperatives, with technical support from the Coastal Zone Management Institute	Complete planning by mid-2002
	Modify regulations to allow for remediation in the event that an aquaculture facility should fail	Department of Environment and Fisheries Department	Open
STRATEGIC OBJECTIVE: “Supporting Planned Development”			
Cayes Development Policy (4.3.3)	Revision, clarification and expansion of the draft policy, and incorporation under the Coastal Zone Management Strategy	Coastal Zone Management Institute	Draft completion, mid-2001. Adoption, end 2001
Coastal Area Planning (4.3.4)	Establishing Coastal Area Committees as a basis for regional Coastal Management Planning	Coastal Zone Management Institute, in liaison with other planning agencies and fishing cooperatives	2000-2001
	Develop demonstration plans at Caye Caulker and Turneffe Atoll	Same	2000-2001
	Undertake all additional six regional level plans	Same	2001-2004

SUMMARY: KEY STRATEGIC ACTIVITIES FOR INTEGRATED COASTAL MANAGEMENT IN BELIZE (details contained in Action tables under text-referenced topic)

TOPIC	ACTIONS	LEAD AGENCIES	TIME-FRAME
STRATEGIC OBJECTIVE: “Supporting Planned Development”			
Beach, Shoreline Management, Safety, Recreation (4.3.5)	Prepare guidelines for construction on beaches, incorporating revised pier guidelines, and including seawalls, groynes, jetties and harbor arms	Coastal Zone Management Institute and Physical Planning Section, Lands and Surveys Department	2001-2002
	Beach management to form part of Master Plan for area development	Same, plus Department of Environment during assessment of planning applications	Ongoing
	Classify beaches according to high, medium, low usage and potential usage, as tool to limit impacts. Apply the guidelines in Strategy for allowable use on each category.	Same, plus, Belize Tourism Board, Belize Tourism Industry Association	2002 and ongoing
	Implement ‘adopt-a-beach’ program for beach maintenance and management	Coastal Zone Management Institute, Non-Governmental Organizations, Private Sector	2001 and ongoing
Marine Pollution Control (4.3.6)	Implement national water quality monitoring program	Department of Environment, with other agencies	Ongoing
	Establish laboratory with Quality Control/Quality Assurance to allow prosecution of polluters	Same	Ongoing

SUMMARY: KEY STRATEGIC ACTIVITIES FOR INTEGRATED COASTAL MANAGEMENT IN BELIZE (details contained in Action tables under text-referenced topic)			
TOPIC	ACTIONS	LEAD AGENCIES	TIME-FRAME
STRATEGIC OBJECTIVE: “Supporting Planned Development”			
Marine Pollution Control (4.3.6)	Preparation of a National Emergency Preparation Plan for Oil Spills, National Waste Oil Management Plan, Guidelines for (a) waste management for hotels, (b) for management, treatment, re-cycling and disposal of wastewater, and (c) the aquaculture sector, and review of the penalties for pollution infringements.	Department of Environment	2001 and ongoing
	Project for capture and treatment of sewage and wastewater, Caye Caulker – expansion to other Cayes	Department of Environment	2001 – possible extension
Setbacks (4.3.7)	Strengthen regulatory requirements to include all lands. Allow for variable setback widths dependent on locality	Housing and Planning Department, Lands and Survey Department, with Coastal Zone Management Institute	2001-2
	Provision in regulations to limit activities within setbacks, including sea-walls, enclosures and other hard structures, plus vegetation clearance	Same	2001-2
	Require footprint of property to be retreated during re-development if necessary	Same	2001-2

SUMMARY: KEY STRATEGIC ACTIVITIES FOR INTEGRATED COASTAL MANAGEMENT IN BELIZE (details contained in Action tables under text-referenced topic)

TOPIC	ACTIONS	LEAD AGENCIES	TIME-FRAME
Cruise Ship Policy (4.3.8)	Require site condition surveys for proposed visitor use	Department of Environment, Coastal Zone Management Institute, Belize Tourism Board	2002
	Devise procedure for reviewing efficiency of plans in mitigating environmental damage	Same	Ongoing
Draft Marine Dredging Policy (4.3.9)	Modify, requiring proponent to specify options and clarifying roles of Government agencies	Geology and Petroleum Department	2001-2
	Feasibility study to identify 'take-zones' for aggregate	Geology and Petroleum Department, Fisheries Department and Coastal Zone Management Authority and Institute	2002-3
	Consider regulation for payment of 'environmental compensation' for damage to marine and coastal habitats	Same	2002-3
Temporary Pier Guidelines (4.3.10)	Fully revise	Physical Planning Section of Lands and Survey Department, with Coastal Zone Management Institute	2001-2
Coastal Vulnerability (4.3.11)	Sustain inputs to the regional Climate Change Projects and related Planning	National Meteorological Service and Coastal Zone Management Institute	Ongoing

SUMMARY: KEY STRATEGIC ACTIVITIES FOR INTEGRATED COASTAL MANAGEMENT IN BELIZE (details contained in Action tables under text-referenced topic)			
TOPIC	ACTIONS	LEAD AGENCIES	TIME-FRAME
STRATEGIC OBJECTIVE: “Building Alliances to Benefit Belizeans”			
Education, Awareness and Communication (4.4.2)	Sustain aggressive public education campaign, extend to politicians, senior civil servants and other Government staff	Coastal Zone Management Institute	Ongoing
Collaboration in Enforcement and Monitoring (4.4.3)	Review capacity in Government and Non-Governmental organizations; provide options for optimal resource use	Coastal Zone Management Authority	2001-2
Coastal Advisory Committees and the Coastal Planning Process (4.4.4)	Establish Coastal Advisory Committees as precursor to regional coastal zone management planning	Coastal Zone Management Institute	2001-2
	Seek formal means for all applications impacting the coastal area to be submitted to the Coastal Zone Advisory Council by the relevant permitting agencies	Coastal Zone Management Authority and Institute	2001-ongoing
Investment Agencies and Coastal Management (4.4.5)	Establish direct liaison with Belize Trade and Investment Development Service to streamline development applications – extend to other investment agencies as appropriate	Coastal Zone Management Institute and Belize Trade and Investment Development Service	2001-ongoing
Streamline Committee Functions (4.4.6)	Review and recommend consolidation of present committee system for analysis of coastal issues	Coastal Zone Management Authority Non-government Organizations	2001-2
Civil Society Movement (4.4.7)	Have regard to, and consultation on Land Alliance for National Development activities, and seek participation in Land Policy Committee	Coastal Zone Management Institute Non-government Organizations	Ongoing

1 BACKGROUND, GOAL AND OBJECTIVES

1.1 Circumstances and Needs

The coastal area of Belize is a major factor in national development, contributing an estimated Bz\$250-300 million directly to economic activity in 1999. Government desires further expansion of economic development in this area.

Coastal development is moving rapidly in certain sectors, for example, tourism, aquaculture and residential subdivision. Sectoral planning and management are still essential, but the coastal zone is a highly dynamic area where decisions made for one location can have significant impacts on the condition of the natural environment elsewhere. This is because water connects all components of the coastal area, resulting in complex physical, chemical and biological interactions and interdependency over large spatial scales.

Integrated Coastal Zone Management is providing the consultative and decision-making framework within which the interests of all sectors can be balanced with the requirements of coastal conservation and environmental management. Further enhancement of this process is required. The focus of this effort is to maintain the coastal resource base and biodiversity, while guiding development of the various sectors through co-operative management and inter-sectoral coordination.

The spine of national efforts at sustainable coastal resource management is a substantial Marine Protected Areas network, management arrangements for which are currently being enhanced, with further strengthening planned. In the last decade, important advances have been made to extend and integrate other coastal area management issues in the planning process, taking account of wider development requirements. Two key components have been the establishment of the Coastal Zone Management Authority and Institute, and the environmental appraisal process managed by the Department of Environment through the National Environmental Appraisal Committee.

For these initiatives to be successful it is essential that the attributes and processes of the coastal ocean and the ecosystems it supports are understood. Two sets of activities underpin this effort:

- The collection, analysis and dissemination of quality scientific data, through research and analysis. This drives the professional advice, based on sound observation, that is required on many matters. These include the capacity of coastal systems to support various developments; measures that may be necessary to minimize potential development or naturally occurring impacts, and on whether measures have been successful or need adjustment. Further, Belize should be in a position to measure and monitor the overall condition of its coastal and marine environment, and natural resources base, to make informed decisions on development and conservation issues.
- Widespread information dissemination, and public education. This must target the traditional recipients such as the public, coastal resource user-groups and schools, and also, senior Government officials, politicians and public sector agencies involved with enforcement of regulations, including the Police and Maritime Wing of the Belize Defence Force.

1.2 Statutory Responsibilities

Responsibility for undertaking functions related to economic development, resource and environmental management in the coastal area of Belize is divided among numerous agencies, with equally diverse legislation. Many non-governmental organizations participate as well. Such fragmentation of management responsibility is a recipe for *ad hoc* decision making by various sectors and interests, with the attendant risks of poor planning that can and will lead to natural resource degradation. This in turn will undermine the economic development and potential of the coastal area. Appendix 1 summarizes the role of these organizations.

To address this issue, the Coastal Zone Management Act of 1999 established within the public service, the Coastal Zone Management Authority and Institute.

- The Act mandates the Authority, with technical support of the Institute, to address cross-sectoral sustainable development of coastal resources.
- The Authority is charged with a broad consultative and advisory role with public and private sector agencies, and of advising the Minister on policies relating to coastal development and resource use.
- It is the responsibility of the Authority to take the lead in improving functional integration for decision-making for the development and management of the coastal area. Final decision-making responsibility, however, rests with other bodies of Government.
- The Institute is required to undertake research, monitoring, training and public awareness activities on all aspects of marine and related resources.

The research and educational activities of the Institute are wide ranging, and are published in annual State of the Coast Reports and information packages. The Institute, with its core of professional scientific staff, is responsible for leading the scientific research and data management effort that is essential to informed decision-making in the coastal zone, in collaboration with other national and non-national institutions.

The Authority and Institute have the mandate and potential to become a leading regional center of excellence for research, advocacy and policy-making in coastal area management, in addition to their role in coordinating national efforts in these areas.

1.3 Coastal Zone Management Strategy and Plan

The Coastal Zone Management Act requires the Chief Executive Officer of the Coastal Zone Management Authority to prepare a Coastal Zone Management Plan. Production of a Plan with sufficient detail to satisfy regional and local requirements is a task that will take several years.

Consequently, the Plan is being developed in phases. This Strategy is the first element, providing overarching national objectives towards which stakeholders can work, and guidance on how these objectives can be met. The Strategy integrates the legislative requirements, regulations, plans and policies that already exist for the coastal zone of Belize with new elements defined during the consultative phase for Strategy formulation.

The Strategy has four primary functions. These are:

- Helping to link the economic potential of the coastal zone with equitable allocation and sustainable use of its resources, while improving the decision-process over use of these resources.
- Facilitating further appreciation by stakeholders and interest groups of the interdependence between all natural resources and processes, and human interventions in the coastal area of Belize
- Promoting the scientific understanding that is essential to the setting and maintenance of targets and standards for environmental and natural resources management in the coastal area of Belize.
- Fostering even greater collaboration between all involved parties in the development and management of this complex yet vital national asset.

The Strategy builds on activities and publications of the Coastal Zone Authority and Institute. It was developed during October and November 2000 by the Authority and Institute. The process involved:

- document review,
- interviews and stakeholder consultations held at locations in Corozal, Independence and Belize City,
- a public awareness campaign,
- the publication of two interim reports summarizing findings and analysis from these activities,
- preparation and review by stakeholders of a draft Strategy, and
- finalization of the Strategy document.

1.4 The Goal and Objectives for Integrated Coastal Area Management in Belize

Implementing integrated management is much harder than planning for it. To do so requires a combination of skills, commitment and aspirations of the people involved.

This can only be achieved through a collaborative decision-making process, joining the interests, knowledge and experience of all stakeholders from civil society, the private and public sectors. This is the core function of integrated coastal area management, and mechanisms are discussed in this



Meeting with stakeholders at the ICZM strategy consultations (CZMAI)

Strategy to sustain and enhance this process.

Taking these factors into account during the consultation process for the Strategy, the Goal of coastal

“To support the allocation, sustainable use and planned development of Belize’s coastal resources through increased knowledge and building of alliances, for the benefit of all Belizeans and the global community”

area management in Belize has been defined:

The Strategy is developed through discussion of the economic and resource attributes of the coastal zone (Part 2), and environmental characteristics (Part 3), to the presentation of three Objectives (Part 4), drawn from the Strategic Goal. These objectives provide thematic areas within which more detailed topical issues are addressed. These objectives are:

Objective I - “Knowledge and Sustainable Coastal Resources Use”. Here, the Strategy advances the need for improvements in the coastal and marine Protected Areas System, and identifies areas for improved or new intervention in the maintenance of natural habitats, and wildlife management. Scientific research and monitoring is central to the process.

Objective II - “Supporting Planned Development” addresses critical issues related to resource use and development control, both on land and in the sea. The Strategy proposes considerable tightening of control, through improved planning, co-ordination, legislation and regulations, to reduce the impact of both marine and terrestrial development in coastal Belize.

Objective III - “Building Alliances to Benefit Belizeans”. Essential to a program that seeks to build bridges between various interest groups, this element focuses on mechanisms that can improve public education, and functional linkages between organizations involved in coastal area management. Such linkages will strengthen capacity for monitoring and enforcement, for a large coastal area where institutional resources are stretched to achieve their mandates.

1.5 ‘Coastal Area’ and ‘Coastal Zone’ Boundaries

What is ‘coastal’, and why is an understanding of this necessary for the purposes of integrated management?

The Coastal Zone Management Act defines the Coastal Zone as those areas of the seabed up to Mean High Water. However, in practice, nature does not recognize these boundaries. Natural processes, human activities, and interactions between them operate in a continuous three-dimensional system between the land and the sea.

Following international convention and practice, it is wise to take account of activities of a ‘terrestrial’ nature in considering matters that are ‘coastal’. This has been acknowledged in Belize, an example being advice provided to other agencies of Government by the Coastal Zone Management Authority and Institute on various land-based as well as marine development proposals, through forums such as

the National Environmental Appraisal Committee.

This situation is recognized in the Strategy by use of broader terminology, allowing interpretation of a 'Coastal Area' that embraces the more specific connotation implied by the term 'Coastal Zone'.

Terrestrial Boundaries

Criteria here include the distribution of natural resources found in marine and coastal systems where water levels (a) are influenced by tidal action (b) are contiguous with sea-level, (c) have a saline influence, or (d) facilitate migration of fauna between fresh and saline water. This takes account of the extensive riverine, estuary and wetland systems of the coastal area. In practice, greater flexibility is desirable, depending on the relationship of watersheds to coastal ecosystems where effluent disposal or soil run-off can impact the coastal system.

Marine Boundaries

Providing these for a 'coastal zone' is inherently complex, given the diverse character of the seafloor and coastal ocean in Belize. The extent of the Exclusive Economic Zone is a useful first order limit. Again, in practice, ocean dynamics link processes across this legal boundary. Belize also shares the ocean with its neighbours in Central America and the Caribbean. Flexibility in boundary definition should be retained, except where specific jurisdiction or regulatory control is required over resources of the ocean or sea-bed, or on development or conservation issues. As with marine protected areas, different levels of boundary can be defined, depending on the purpose for which they need to be declared.

Taking into account regional coastal characteristics, 'boundaries' will be further defined during the detailed regional coastal area planning process that will follow this Strategic level plan.

Synthesis: Integrated Coastal Area Management in Belize

Coastal area management requires:

- pro-active implementation of sound resource development and environmental management approaches,
- responses to the impacts of natural events such as storms, or inappropriate development or resource use practices
- the decision-process for the coastal area to be as informed as data and information allow.
- 'best-practise' approaches that apply the precautionary principle to analysis and consequent provision of recommendations to decision-makers.

Therefore, consultation and participatory implementation are essential. The process involves many agencies of Government, supported by Non-Governmental Organizations and the private sector. Coordination of function is the central and critical element in this process, supported by high quality research and monitoring of coastal environments and resources.

Many countries have recognized the necessity for such a process. Since 1989 when this commenced at a workshop in San Pedro, Belize has:

- enacted legislation to integrate the numerous functions related to coastal area management and created an institution to coordinate programs and planning;
- acted on almost 50% of the 175 recommendations for improving coastal management contained in the 1995 'State of the Coastal Zone Report';
- attracted significant external funding and support to promote these coordination efforts from organizations such as the Global Environmental Facility, the European Union, United Nations Development Program, and Inter-American Development Bank;
- successfully fostered national level cross-sectoral approaches to planning and management of coastal area resources.

The process is continuous. After plan completion, the legislation requires that a revision be made every four years. This allows for evaluation of the effectiveness of the proposed measures, and adjustment and addition as new information, approaches and ideas come to light.

2 THE COASTAL AREA ECONOMY

2.1 Resources of the Coastal Area

Belize's coastal area contains abundant natural resources, providing the base for several productive sectors including tourism and fisheries. This area plays host to over 45% of the nation's population, its ports, and locations that have been developed for industry, agriculture and aquaculture.

Not all the population has benefited from improvement in living standards in recent years. Subsistence conditions or outright poverty are the plight of over 45% of the country's population. Continued investment in, and development of, coastal area resources are necessary to attain higher levels of economic and social well being.

Components of the coastal area that contribute to this resource base can be illustrated by considering them as living, non-living and environmental resources.

The 'Environment' as a Resource. The term 'environment' covers the wider character of the coastal area. This can be identified with the ambience of coastal lagoons, or the aesthetic and therapeutic pleasure of reefs, beaches, cayes and atolls. The coastal 'Environment' is the major attraction for the thriving tourism industry. Its health is intimately linked with the function, productivity and condition of its component parts, and to the economic benefits that can be derived from them.

'Living Resources'. These are the plants and animals of the coastal zone, occurring both above and in the water. They include numerous species occurring in coastal forests, mangroves, seagrass beds and coral reefs, as well as in open water or on sandy cayes. Together with terrestrial fauna and flora, they constitute the biodiversity for which Belize is internationally renowned. They also form the basis for important extractive industries, including the capture fishery, and present attractive targets for industries related to bioprospecting.

'Non-Living Resources':

- Land and seabed surfaces are modified to facilitate development. New land is often created in coastal areas by filling on mangroves, coastal lagoons and seagrass areas. Coastal land is a prime target for aquaculture, which transforms large areas into artificial productive systems.
- Oil and gas. Contained underground, there is optimism that renewed exploration activity onshore and offshore in the south of the country may identify exploitable reserves. Exploration concessions are currently being agreed through the Geology and Petroleum Department.
- Aggregates. Primarily used for landfill on cayes and wetland areas, as well as for construction, the seabed provides materials, the removal and placement of which can seriously affect the health of living resources under which they are located, or on top of which they are placed.

2.2 Productive Capacity in the Coastal Zone

It is estimated that \$Bz250 to \$Bz300 million is generated directly through resource-based economic activity in the coastal zone. Perhaps a further \$Bz300 to \$Bz400 million are transported through the area in exports (sugar, citrus, bananas, timber, other agricultural products). Approximately \$Bz745 million worth of imports entered the country in 1999, more than half of this through the seaports. The

following sections provide a brief overview of the contributing sectors.

Tourism

Tourism, identified as the single largest contributor to the country's economic growth, is primarily focused on the coastal zone. Approximately three-quarters of the country's hotels are found here and the cayes, including Ambergris Caye, Caye Caulker and the Atolls attracted approximately 60% of the estimated 172,300 tourism arrivals in 1999. Mainland coastal destinations include Belize City, Placencia and Punta Gorda, though resorts, guest houses and hotels can be found in smaller locations in several other coastal locations.



Tourists out on a manatee tour (CZMAI)

Employment in tourism is estimated to have grown from 4,000 in 1993 to approximately 7,000 nationwide in 2000, the fifth largest employment sector in Belize. Further growth is anticipated, using a model that could see

industry income after 5 years grow by Bz\$30 million annually, with a total of 3,000 new positions, plus a 20% increase in foreign exchange. Much of this growth is focused on coastal areas.

The Tourism Strategy Plan for Belize prepared by the Belize Tourism Board has been adopted as the blueprint for additional investment and development. The report is the basis for the Inter-American Development Bank funded Tourism Development Project which proposes actions on eco-tourism training, archaeological site development and improved access. Importantly, the Strategy harmonizes development prospects with the environmental attributes and infrastructure capacity of coastal areas.

Fishing

The more traditional sectors such as fishing are estimated to have directly employed between 2,000 to 3,000 persons per year over the last six years, taken from persons with fishing licences. Indirect employment through processing, sales and maintenance increases the importance of this sector in the job market. The total financial value of this sector was \$Bz19.4 million in 1999. Large changes in income from this sector are not anticipated.



Fisherman gathering his lobster catch (Eugene Ariola)

Aquaculture

Aquaculture, mainly shrimp farming, is increasing in economic importance and physical impact on the coastal zone. Currently there are eight farms in operation collectively covering 3,000 to 4,000 acres, mostly sited on pine ridge coastal lands. It is estimated that the industry generates approximately \$Bz43 million with a projected rise to \$Bz62.5 million by 2003.

Although there is a current preponderance in the south new farms are proposed in the north of the country where the soils are not immediately appropriate. No policy guides the industry's growth and

the habitual siting of farms on pine ridge soils, giving by default an indication of how the industry may physically expand, may be transformed by pond lining technology which could open up new areas to development. Employment levels are generally low though are boosted periodically in the processing plants at Ladyville and Independence.

Agriculture

Agriculture extends into the immediate coastal area only where soils and access allow, generally on riparian lands, coastal bars and the few areas where fertile plains extend to the coast. In most of these cases cultivation consists of small scale, and relatively low impact, plantations of crops like coconut and cassava. These meet important local needs yet have minimal influence on national economic income generation.

Larger more capital intensive enterprises are generally located further inland; extensive sugar in the hinterland of Corozal, estimated as generating approximately \$Bz84.5 million in 2000; citrus extending from Mullins River to South Stann Creek and in more isolated areas further south, valued at Bz\$76 million in 2000, and substantial banana plantations along the Sittee, South Stann Creek, Swasey and Bladen rivers, currently generating Bz\$65 million. The coastal communities of Corozal, Dangriga and Independence are heavily reliant on these sectors.

Opportunities for further expansion and/or intensification of agriculture in the coastal area are largely contingent on means of utilizing marginal lands: pine ridge and savannah and mangrove wetland. The principle problems with the pine ridge and savannah are the high requirement for fertilizer and irrigation, both having the potential for run-off into the sea. For mangrove areas the high degree of salinity and the necessity of extensive drainage is a major concern.

Residential development

Out of the ten major residential centers in Belize, six are located on the coast. In spite of a stated policy to relocate housing inland due to sea level rise and hurricane vulnerability, all coastal centers are experiencing growth to varying degrees, and frequently into flood-prone areas. Development is undertaken by both the public and private sectors, with the latter involved primarily in sub-divisions in several coastal locations, often targeting foreign markets and retirees.



The continuously expanding town of San Pedro Ambergris Caye (CZMAI)

Industry and Commerce

Belize currently has a small industrial base, employing a national total of approximately 5,600, yet much of that is located in close proximity to the coast. Main centers are around Independence - plastics, processing, storage; Belize City - garments, processing, distilling, storage, assembly; Ladyville - garments, distilling, processing; and the growing Corozal Commercial Free Zone - mostly storage and bulk sales. The garment industry is estimated as generating approximately \$Bz40 million in 2000.

Infrastructure

Of the three main ports Belize City acts as a main entry point and is currently upgrading facilities to recover and expand on losses in traffic experienced in recent years: 177 container ships visited the port in 1999, a reduction on the 390 in 1994. There are proposals, due to increasing land and infrastructure pressures, to relocate much of the activity to Commerce Bight, which is presently used mainly for the export of citrus products from the juicing plants in the Stann Creek Valley. Big Creek port deals primarily in the export of the banana crop. A smaller port is located at Punta Gorda, and development of facilities at Riversdale is proposed.

Only two marinas have been developed, at Belize City and Punta Gorda. Docking facilities are also found at San Pedro, Caye Caulker, Belize City, Placencia, New Haven, Punta Gorda and Corozal.

All the airstrips with regular scheduled flights lie within the coastal area: Corozal, San Pedro, Caye Caulker, Belize City, Dangriga, Placencia and Punta Gorda. The International Airport is also in a near coastal location.

Road access to the coast is patchy. Each of the coastal towns are accessed by the highway network, otherwise roads, many of them in seasonally defective states, lead often only to isolated seaside villages. Much of the coast, particularly areas in private ownership, remains un-accessed. Culverts under these roads allow a degree of water exchange in wetland areas, but their capacity is overwhelmed during heavy rainfall.

Dredging and Petroleum



Dredger pumping sand on land for Caye Caulker beach replenishment (CZMAI)

Development of low-lying coastal areas requires considerable dredging and filling: much, if not all, of Belize City was developed in this manner. Increasing residential and commercial use on the cayes and elsewhere is intensifying this practice. Moreover extensive beach replenishment, a perceived necessity of the tourism industry, has taken place at San Pedro and Caye Caulker as a result of hurricane related erosion. Recently, large scale dredging, approximately 217,000 cubic yards, and landfill accompanied the private development of Caye Chapel. Several companies and numerous private individuals are involved in this business, primarily based around Belize City.

Proposals have been made for petroleum exploration in the southern waters of Belize. Target sites underlying the Port Honduras area have been identified, although work has yet to commence. If promising reserves are found it is likely that production will require large associated marine and shoreline developments.

The Future

In 1999 the coastal area of Belize contributed approximately Bz\$250 - 300 million to overall economic activity. Government plans for expansion in many sectors will increase development pressures. Inappropriate land-use, pollution, and resource use conflicts coupled with incremental but cumulative effects on the production functions in this area are of obvious concern. This factor obviates the requirement for a comprehensive planning and development program to ensure the rational and

Alleviating Poverty

With reference to the policies of the National Human Development Advisory Committee, the results of which were published in the National Poverty Elimination Strategy and Action Plan in 1998, integrated coastal management provides central inputs to two of its six main measures for poverty alleviation. These are in the compatible areas of:

- Employment and Sustainable Livelihoods, and
- Environmental Protection and Conservation.

In addition, initiatives in coastal areas can also be linked directly to other program areas in the Plan. These include:

- Education, and its related benefits for sustainable coastal resources use and income generation
- Housing, shelter and human settlement, through identification of appropriate areas for settlement, of risks associated with this, and building guidance that can alleviate such risk.

Finally, by focusing effort on water supply and sanitation requirements, plus pollution control, coastal area management will make a major input to health improvements for coastal area residents.

integrated use of coastal area resources.

2.3 Balancing ‘Supply and Demand’ in the Coastal Area

If more resources are removed or damaged than can be naturally replaced by the coastal system, then the system’s capacity to supply the products that drive economic development on a ‘sustainable’ basis will be undermined. There are numerous examples within the region, and globally, where the balance between these factors has not been met, resulting in severe coastal resource degradation. These examples can be found in the coastal fisheries, water, coral reefs, seagrasses and wetland systems that characterize coastal tropical environments across the globe.

For example, the United Nations Educational, Scientific and Cultural Organization have stated that 50% of the world’s wetlands have been destroyed in the last 100 years due to development pressures (<http://www.unesco.org/mab/ramsarmab.htm>). Only 10% of the remaining wetlands are protected, and it is feared that flood-related disasters and water shortages will increase in 60 countries by the year 2050 unless the remaining wetlands are preserved. Belize, with substantial wetland areas, can still set

an example to the regional and global community.

Different sectors may have varying views on the way in which these coastal resources can be used. There is often competition for these resources, and inevitably, the demands of various productive sectors for utilization of these resources cause conflicts between user groups. It is essential that the capacity or the 'supply' within the system is understood before decisions are made on how, or even whether, these resources are put to one use or another.

In order to understand the capacity of the system, various scientific 'tools' are used. For example, the Fisheries Department collects fishing statistics at various locations throughout the country. This helps them to assess whether, in relation to the number of persons fishing, the type and size of fish, and amount caught, is going up or down with time. If it is going down, this suggests over-fishing may be taking place in some or all species being caught.

However, more information than this is required for the wider coastal area. To make decisions on, for example, how many tourists should be taken to a caye by a tour guide or cruise ship, an understanding of the environmental attributes and condition of the system must be gained. Does the area contain endangered species, or habitats that if damaged, reduce the biological 'stock' or the capacity of related systems to survive?

Similarly, how much effluent from households, agriculture and industry can coastal waters absorb, or be expected to absorb? Are discharges quickly mixed and 'lost' in the background coastal water, or do they exceed tolerance levels of coastal water and organisms for pollution, causing environmental and public health problems? Should a location be transformed for aquaculture, when alternative sites may exist that have a lower direct and indirect impact profile on the location and the other productive functions it supports?

These questions can be answered by ongoing, coordinated and focussed scientific research and monitoring, discussed in Part 4 of the Strategy.

Resource allocation requires a linked land use/resource use policy and plan, though none currently exists for Belize. An integrated coastal area management plan will fulfill many of the requirements for resource allocation. This level of planning is the next step in the coastal planning process.

3 THE NATURAL ENVIRONMENT OF COASTAL BELIZE

3.1 Describing the Coastal System

Why is the coastal area of Belize unique, and why does it require a special ‘integrated’ management approach? The following sections introduce the coastal area of Belize, and discuss elements of our interaction with the ‘natural’ coastal system. Readers are referred to the Belize Biodiversity Strategy, 1998, and the State of the Coastal Zone Report, 1995, for detailed descriptions of the natural environment of the coastal area.

Water that Binds – The Critical Link between Land and Ocean

The coastal area is naturally dynamic, involving continual interplay between the living and non-living components of its many ecological units.

- The dynamism of the coastal area is due to its unique relationship with coastal water. The water itself comes from two main sources, the saline water of the Caribbean Sea and fresh water from rainfall flowing through rivers and underground. These water bodies mix along the coastline, determining the distribution of systems such as reefs, seagrasses, and mangroves that have different tolerances to salinity levels and sediments. They also cross national and local boundaries, transporting plankton, sediments and other dissolved and suspended materials, including pollutants that may travel considerable distances in the coastal ocean.
- Waves and currents act on the seabed and shoreline, helping to create changes in shoreline position. Coastal water is the home medium for many animals and plants that are essential to day-to-day community existence and culture. Fish, shellfish, turtles, crocodiles and manatees are among the creatures that depend on it for their existence.
- Changes in the level of coastal water are equally important. Whether by tidal action, storm surge or longer-term sea level changes linked to climate-change; human proximity to the ocean is an everyday and critical element of Belizean existence. We travel on and in the water, use it for recreation, fish in it for livelihoods, and dump liquid and solid wastes within it, causing damage throughout the coastal area.
- Large demands are made on freshwater from rivers for public water supply, irrigation, hydropower, and increasingly, for aquaculture. There are documented concerns on impacts from development on this resource. For example:
 - Reduced river flow by damming and water extraction is limiting supply of sediment to the coast, causing erosion that is threatening homes at Monkey River.
 - Friends of Placencia Lagoon, a local Non-Governmental Organization, are greatly concerned about the quality of coastal water due to effluent disposal from shrimp farms located nearby.
 - Citizens of Dangriga have repeatedly had their water supply contaminated by overflow of waste from the citrus industry into the North Stann Creek, contamination which also affects the coastal environment and can impact the food chain.

Understanding this vast body of coastal water is at the very center of efforts to manage the coastal

area. Its origins and movement within and beyond national boundaries, and the effects people have on it – and it on us - require multi-stakeholder inputs for both its assessment and management.

Blue Water – Atolls, Barrier Reef and Cayes: The “ABC’s”

The underwater shelf – the submarine extension of the land – is 275 kilometers long and between 15-40 kilometers wide. It is shallow, and covered in islands. Some of these are located on portions of the seabed separated from the remainder of the shelf. These are the atolls of Glovers Reef, Turneffe Islands and Lighthouse Reef.

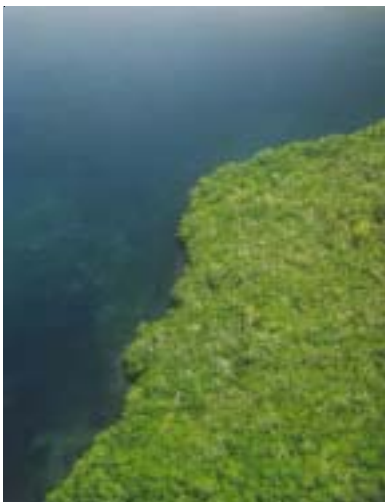
Along the edge of the continental shelf within territorial waters is found a large portion – almost 80% - of the world’s second longest Barrier Reef. It is a location exposed to wave and current action and where sediments generated by reef processes - but with the potential to harm the reef - can shed naturally to deeper water. Because it is distant from the continental coastline, this Blue Water area is also relatively nutrient-poor, an environment necessary for healthy coral reef growth. The United Nations Scientific, Educational and Cultural Organization, in recognition of its status and importance at a global level have declared the Barrier Reef a World Heritage Site.



A portion of Belize's 220km long barrier reef, the second largest in the world. (CZMAI)

Recent coral bleaching events, linked to climatic phenomena, and damage from Hurricanes Mitch and Keith, have reduced the proportion of live coral cover on the reef systems of the shelf edge and atolls. There are fears too, that deforestation and use of fertilizers for agriculture will result in increased nutrient and sediment loads reaching the reef systems in river outflow following heavy rainfall events.

The Continental Shoreline



Mangrove patch (CZMA)

Twenty main river catchment areas drain into the continental coast of Belize. Sediment carried by these rivers has been redistributed by wave and current action along the shoreline for millions of years, forming numerous depositional features including beach ridges, sand bars and deltas. They enclose lagoons and estuaries, and where fresh and salt water mingle, our extensive wetland systems have developed.

Whether freshwater, or brackish and salty such as mangroves, these wetlands perform a range of essential functions. Like the offshore islands, habitats of the continental coastline are permanent or over-wintering homes for various bird species. Some have reduced numbers and appear on the threatened list of the International Union for the Conservation of Nature. The wetlands, rivers and lagoons are home to manatees and crocodiles, and many species of juvenile and adult fish.

The wetlands are efficient buffers against storm surge, are important in

flood control, and can adapt to changing sea levels. They also thrive on nutrients and sediments derived from the land, and in so doing, help to trap them and limit transport to the sediment-sensitive reef systems of our Blue Water region.

The Inner Shelf

The shallow shelf between the “ABC’s” and continental shoreline plays host to many forms of ecosystem. It is this area over which ocean and river-derived waters mix. Organisms living here are tolerant to some extent of changes in salinity during the rainy season, and to changes in sediment loads from the land.

Seagrass beds are widespread; they accommodate among many other organisms including seaweeds, crustaceans, mollusks, shoals of grass and algal-eating fish, and provide the forage for turtles and manatees. They trap sediment and nutrients, and stabilize the sea floor.

At various places on the shelf are patch reefs. These are smaller assemblages of coral and associated organisms than on the main Barrier Reef or Atolls, but ecologically and environmentally sensitive and valuable.



Fringe reef at Southwater Caye (Tony Rath)

The sediment that forms much of the seafloor is partially derived from the land, and from skeletal remains of dead marine plants and animals including corals, mollusks and some algae. Ship channels must be created, and aggregates are needed for construction along shorelines. Consequently, dredging is widespread. It may directly impact seagrass beds and coral reefs, and the fine sediments released to the water can unless intercepted, cause siltation problems on other, sensitive habitats including coral reefs.

3.2 The Relationship between Natural Coastal Change and Human Impacts

Coastlines are among the most naturally dynamic parts of the Earth’s surface. Changes in shoreline position, and in the types and location of coastal features such as river deltas, wetlands, mangrove forests, sandbars and cayes have occurred for millions of years. They have done so in Belize in response to naturally occurring processes such as falling or rising sea-level, changes in precipitation, variable sediment loads and the influence of storms.

Many changes have been introduced to coastal areas as a result of human activity.

- Acceleration in rates of natural change such as the frequency and intensity of storms, and sea-level movement. These ‘climate-change’ phenomena are related to changes in composition of the atmosphere, brought about by our burning of coal, oil and gas, and release of other substances that deplete the Earth’s protective ozone layer. These are the

so-called 'greenhouse gases'.

- Local and regional impacts that are a direct consequence of the types of development we undertake in coastal areas. Examples include:
 - reduced coastal water quality from untreated effluent and sewage disposal to rivers and sea, and from increased rates of sediment run-off from deforested hillsides. Such changes are iniquitous to the health of marine organisms including coral reefs.
 - construction, landfill or dredging at or near shorelines. These directly influence natural processes, and create shoreline instability and loss of productive function in coastal systems.
- All these changes seriously impact the ability of coastal areas to naturally 'buffer' the effects of climate change, storm surge and sea-level rise. Over-extraction, such as excessive fishing, or aggregate removal from rivers, can also effect the function of the ecosystems in which various organisms, including corals, live.

Some interventions in coastal areas may indeed be beneficial, but their impacts require evaluation before they are implemented.

The key is finding a balance between the extent of our influence and the ability of the natural system to absorb such change. The evidence from Belize, other parts of Central America and the Caribbean, and globally, is that with a few exceptions, we are failing.

This is why the Government of Belize, and its partners in the non-governmental organizations and civil society, have developed and are implementing legislation and regulations, programs and policies at national and international level to manage our impacts on the natural environment. This Strategy, which links all these activities for the coastal area, is an essential part of this effort, and describes these initiatives and actions.

4 STRATEGIC OBJECTIVES FOR ACHIEVING INTEGRATED COASTAL AREA MANAGEMENT

4.1 Introduction

In this section, the strategy discusses background issues, and provides strategic guidance for topic areas that are central to coastal management in Belize. All topics covered require further detailed planning and implementation, though in some cases, work on this has commenced. Proposed actions are identified in text boxes.

Topic areas are grouped under the three thematic Strategic Objectives, which themselves are derived from the Goal. This provides clear links between the components of the strategy, and the goal to which they contribute.

4.2 *First Strategic Objective: “Knowledge and Sustainable Coastal Resources Use*

4.2.1 Introduction

The State of the Coastal Zone Report produced by the Coastal Zone Management Project in 1995, and the Belize Biodiversity Strategy of the National Biodiversity Committee, in 1998, implicated wide-ranging threats to the integrity of the coastal and marine resources and natural environment of Belize.

Central to the discussion now, as then, is the identification of specific interventions that can be implemented to:

- sustain the capacity of the resource base to deliver economic benefits, while
- maintaining overall ecosystem function.

All areas of intervention discussed in this Strategy address these two fundamental requirements. This is a continual process, taking account of past and ongoing actions and recommendations, as well as new information, ideas and approaches. This section of the Strategy builds on previous documented strategies and associated activities for conservation-based approaches to resource management in the coastal zone, commencing with the collection of scientific information that forms the underpinning for decisions on coastal resources management.

4.2.2 Coastal Research and Monitoring

Science has a pivotal role in coastal zone management. It provides fundamental understanding of the environmental attributes of coastal ecosystems, and the social and economic circumstances and requirements of communities who live within them. Applied over longer time frames, it can track changes

in ecosystem and community characteristics, and provide answers as to why these changes have occurred.

There are many ways that research, allied to ongoing monitoring, can work for us in the coastal zone:

- Understanding the needs, aspirations, knowledge and cultural circumstances of communities. ‘Top-down’ solutions to community issues, including provision of opportunities in coastal areas, rarely work.
- Characterizing the quantity and quality of coastal resources, and functional relationships between components of coastal ecosystems.
- Assisting determination of the capacity of natural systems to absorb artificial changes such as introduction of waste products, clearance of vegetation, and extraction of living and non-living resources.
- Monitoring change in the resource base and ecosystem over time, and the identification of factors both ‘natural’ and ‘man-made’ which may be influencing this change.
- Ensuring there is compliance with legislative and permit requirements by coastal resource ‘user-groups’.

Many levels of detail and sophistication can be applied to these activities. The choice of approach depends on the specific questions being asked, and the availability of trained professionals, equipment, financing, and institutional resources to undertake the work.

Belize has numerous programs and projects set up to undertake environmental research and monitoring. Many are government or non-governmental efforts, some are driven by external research interest. A study undertaken for the Coastal Zone Management Institute and Authority in 2000 on marine research and monitoring identified:

- A substantial portion of the information available represents background baseline against which future observations could be compared, but
- Poor coordination between various initiatives and
- Much collection of field data without an apparent framework within which the data would be evaluated.

There were:

- Over 55 programs, examining 2,000 field sites and 75 types of survey;
- Studies were linked to (a) Marine Protected Areas, (b) biological surveys, and (c) physical and chemical surveys;
- A variety of national and international organizations and institutions are responsible for them.

The review pointed out the differentiation between three types of studies:

- Baseline Surveys, to provide an initial evaluation of environmental conditions at a location, which could be used for comparative purposes or longer-term study.
- Research Studies, which look in detail at ecological, physiological and process-response relationships.
- Change-Detection Monitoring, which provides a time-series of observations for observing and accounting for change over time.

In addition, there is the need for compliance monitoring, to ensure that conditions attached to any form of development in the coastal area are adhered to by the developer and his contractors. A key element that is missing in this form of monitoring is the availability of a laboratory to provide Quality Assurance and Quality Control to marine water quality and bacteriological analysis in Belize. This limits capacity to prove scientific results, including situations where Government may wish to prosecute polluters.

Within country, cooperative research programs exist, for example in the reef video surveys undertaken by the Fisheries Department, from which monitoring type data are analyzed by the Marine Biologist at the Coastal Zone Management Authority and Institute. These data are then sent to Jamaica, where the Caribbean Planning for Adaptation to Climate Change Program has established a regional data center, at which results from several countries are stored.

Resources for research and monitoring are limited within Belize, and could be shared more efficiently, especially if the number of programs undertaken by national institutions were prioritized and implemented using common methods and protocols.

The review identified the need for a Monitoring Coordination Unit, whose responsibility it would be to assist in planning, coordination, tracking and data storage of all marine research surveys in Belize. Where external institutions were involved, there would be liaison to ensure a degree of understanding between country and researcher over data needs, of previous and ongoing activities and of potential links in the sampling methodologies between previous and new studies.

The study recommended nine types of program that could be conducted, and costed them. The programs covered coastal lagoons and wetland macro-fauna; seagrass and plankton; coral reef monitoring; reef-associated organisms; higher marine invertebrates – including turtles, crocodiles and birds; meteorological and oceanographic measurements; shoreline stability, and chemical pollution.

Total costs for these studies over five years were estimated at US\$8.7 million. Industry and government were identified as major stakeholders who would wish to invest in this work, but numerous other potential sources were also identified.

To implement the program in one go would not be realistic. Hence, there would need to be careful selection of those options that are regarded as priority, and a mechanism established to raise the funds and identify resources for the chosen elements. Potential to expand into a wider program, and to enhance coordination, is provided by the forthcoming Meso-American Barrier Reef System Project, discussed in section 4.2.3 of the Strategy.

Other forms of research may also be necessary, for example, during the conduct of an Environmental Impact Assessment. These activities are typically conducted by consultants on behalf of the project proponent. However, Government scientists will guide them. More efficient and less time consuming studies, which do not unnecessarily delay the project appraisal process, can be undertaken if Government staff have sufficient practical experience of the natural environment, and of what may or may not be important in defining the terms of reference for a study. Similarly, quality databases and information systems greatly improve the turn-around time on projects, and the decision-process on success or otherwise of regulations or standards in managing marine resources. They provide baseline input to decision-making on resource use alternatives.

Technically, financially and logistically, the development, implementation and maintenance of a high quality research and monitoring program is amongst the most demanding endeavors in coastal area

management. There is a need for rationalizing existing programs that are run by Government, while tying more closely the activities of external research organizations into national requirements.

Enforcement and compliance monitoring is a specific task requiring resources, methods and materials, across a large legislative, as well as geographical range in coastal Belize. This difficult yet important issue is discussed further in section 4.4.3.

The Coastal Zone Management Institute has a legal mandate to undertake research in the coastal zone, and the provision of research data is one of the primary activities undertaken. Specialist staff at the institute undertake research on oceanography, marine biology and wildlife, and there is a dedicated information manager for a Geographical Information System.

The Institute is heavily involved with ensuring that data information generated for the coastal area can be integrated into a Geographical Information System. This system has provided an important syntheses of data in several areas, accessible in map-base, as well as database formats. These include the National Marine Habitat map; mapping of the coastal, as well as Marine Protected Areas; the Manatee Distribution Map, and a variety of products linked to the Caye Caulker coastal planning initiative.

A major shortcoming in Belize is the absence of a standard for database development, which researchers could apply to collection and storage of data and information. Therefore, the Institute is working toward the establishment of a standardized data reporting and management. This will allow for easier assimilation of diverse research products into the national coastal database.

The Institute will lead the national research effort and database management for the coastal zone, and will ensure coordination among and between other agencies.



Reef biologist performing periodical monitoring for CZMAI reef monitoring programme (CZMAI)

Actions

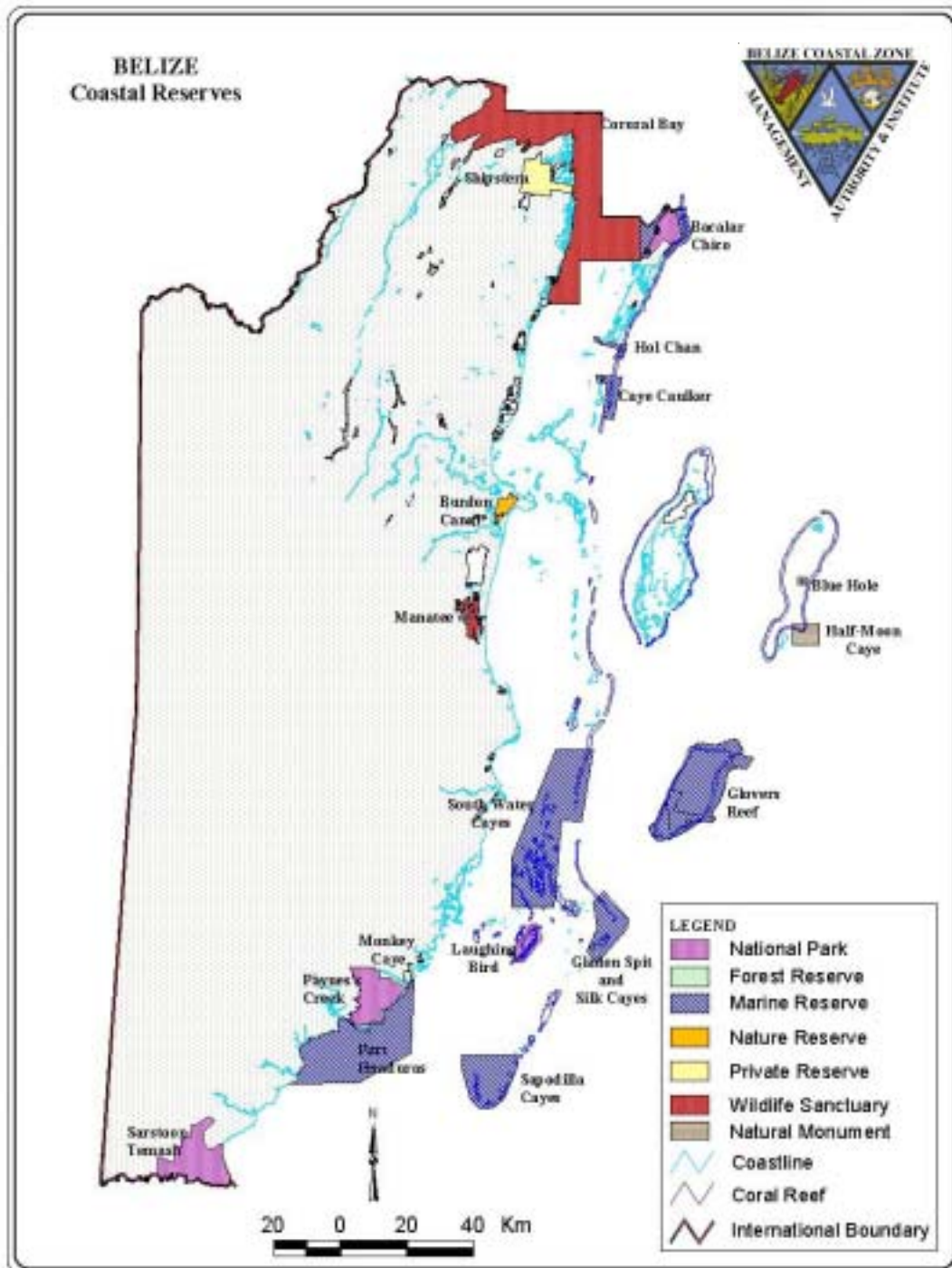
- The Coastal Zone Management Authority and Institute, using the year 2000 survey of coastal area research and monitoring as a basis, will prioritize options for the implementation of an enhanced coastal research and monitoring program.
- A key component will be the establishment of a Monitoring Coordination Unit whose responsibility it would be to assist in planning, coordination, tracking and data storage of all marine research surveys in Belize
- The Unit will prioritize questions that need to be asked in undertaking this work; will systematize and consolidate the methods, analysis, reporting and database management, and organize and define research and monitoring programs that make best use of resources and available capacity.
- In the consultancy to be undertaken in 2001 for financial support to ongoing Coastal Management in Belize, consideration will be given to mechanisms for funding the Unit, and also, selected elements of the options presented by the study.
- Close collaboration will be required with all other agencies that have requirements to collect coastal data and to undertake monitoring, including but not limited to the Fisheries Department, Department of Environment, National Meteorological Service, and University of Belize, local Non-Governmental Organizations such as the Belize Audubon Society, and international organizations such as Oceanic Society Expeditions.
- In reviewing options, the Authority and Institute, in association with other organizations, should consider the opportunities for enhancing coastal and marine research and monitoring capability under the Meso-American Barrier Reef System Project, due to commence in the second quarter of 2001.
- Regard must be made to the 1995 plan for a national water quality monitoring program, devised but not yet implemented by the Department of the Environment.
- The Institute will continue development of a standardized reporting and data management framework, for use by researchers in Belize, allowing for easier assimilation within the coastal Geographical Information System.
- Particular emphasis must be placed on how the data, and information generated, can be used efficiently and reliably by Government and its partners.
- Continued staff training, and dissemination of information must be regarded as high priorities in such a program.
- The Coastal Zone Management Authority and Institute will support efforts made by the Department of Environment to establish a laboratory facility capable of providing quality control to sufficient levels that standards for water quality can be legally verified, thereby improving capacity to prosecute polluters.

4.2.3 Coastal and Marine Protected Areas Management

Protected Areas form the 'spine' of the sustainable marine resources management effort in Belize. Multi-country initiatives to better manage shared marine resources, presently in the pipeline with Mexico, Honduras and Guatemala, will get under way in 2001. National protected areas legislation allows for preparation of management plans, which form the guidelines under which activities within Protected Areas will be conducted.

According to the paper prepared for the Coastal Zone Management Institute on environmental monitoring, Belize has 11.8% of its mainland coastline area under some form of protection. For the 1999 situation, about 1% of the total marine area, to the 12-mile limit, was designated as “no take”. About 8% of the total marine area within marine protected areas, not including cayes, was zoned as “no take”. Figure 2 shows the location of these areas, and Appendix 3 describes their status.

Figure 2: Map of Belize’s Coastal Reserves (2000)



As the table indicates, there are a variety of arrangements presently in place for managing these areas, with an increasing tendency being to contract these out to a Non-Governmental Organization, with government agencies playing the oversight role. This strategy recognizes the limited resource base with which government is able to pursue 'hands-on' Protected Areas management, as well as alternate funding opportunities that are open to other organizations.

Community Groups, including fisherfolk, expressed concerns during Strategy consultations that Protected Areas:

- Restricted access to fishing grounds, limiting their capacity to catch fish.
- Had not yet proven their full value, especially where other fisherfolk, including non-nationals, were able to enter these areas and were seen to be breaking the rules.
- Needed to provide for improved recreational access by the general public.



*The Blue Hole Natural Monument, located on Lighthouse Reef Atoll, is managed by the Belize Audubon Society (**Belize Audubon Society**)*

With regard to exclusion, only 8% of marine protected areas have been designated as “no-take” zones for fisheries and other natural resources. There is a need here for sustained dialogue and public education with resource users on the benefit of these systems. On policing and enforcement, however, there is still a desire to see concerted action by government and its agencies. Access issues need to be re-evaluated in the upcoming re-drafting of a number of management plans.

There have been several major efforts at providing an integrated framework for Protected Areas Management. The basis for this is the National Parks and Protected Areas System Plan of 1995. The Belize Biodiversity Strategy of 1998 endorsed this Plan, yet a comprehensive management framework that links the administrative, technical and financial management of this system for the marine and coastal area has yet to be implemented.

Several initiatives are being undertaken on these issues during 2000-2001.

- A National Protected Areas Policy Committee was established in 1999, and at the time of preparation of this Strategy, was close to finalizing its policy framework. This policy will incorporate the marine protected areas.
- An evaluation of the management effectiveness in the Marine Protected Areas System has been conducted by the Coastal Zone Management Institute and Authority.
- The Fisheries Department has begun consultation on a proposed management framework for the Marine Protected System.
- Projects to identify revenue generation schemes for coastal management and protected areas financing are currently under way through the Authority and Institute, and Programme for Belize, respectively.

The evaluation, using World Wide Fund for Nature methods, identified weaknesses in administration of several parks, although the legislation appeared to be sound. At a time when much focus is being placed on the system, questions are being asked about the larger objectives of such a system, and

especially, the objectives for management and whether these have been met by existing management arrangements. Parks with management arrangements led by non-Governmental organizations were performing better than those run by Government.

Moreover, a number of the management plans prepared for coastal and marine areas have yet to be formally adopted. The plans are used informally for guidance by operating organizations, but there is clearly potential for variation in application, and for inadequate monitoring of plan implementation in the present arrangements. In the present situation, there is sub-optimal use of human and technical resources of government departments in the oversight and monitoring of management plan implementation. It is recognized that institutional capacity for managing the wider marine protected areas system needs enhancement.

Equally important, is the management for those coastal and marine areas that are not covered by Protected Area status. These include vast tracts of the barrier reef, inner shelf and continental coastline, plus 'Blue Water' that lies within the nation's Exclusive Economic Zone. Regulations, planning and permitting requirements for the coastal and marine area are described in the next section of the Strategy, where recommendations are made for more comprehensive legislation and, under the third objective, for enhanced institutional arrangements for protection, management and monitoring in these systems.



Carrie Bow Caye, one of the cayes of South Water Cayes Marine Reserve (Sue Wells)

There are two larger levels in which Protected Area System planners foresee potential improvements. One, the Mesoamerican Biological Corridors Project, is the linking of Protected Areas within Belize across the terrestrial and marine interface. The Maya Mountains Marine Transect project, which is being progressed by the Toledo Institute for Development and Environment, is at the forefront of this effort. Still in its planning stages, this valuable concept recognizes the integral linkage between processes and function on land and sea, and the need to harmonize management among these areas, as well as in-between areas that are not under specific management status.

The Meso-American Barrier Reef Project will provide continuity between the present national program under which this Strategy has been prepared, and the wider regional requirements for managing shared coastal and marine resources. An outline of the project, which is expected to commence in 2001, is provided in the accompanying text box.

The Meso-American Barrier Reef System Project

The Global Environment Facility of the World Bank is providing financial support to Belize, Mexico, Guatemala and Honduras to implement a cross-border, international project that seeks to improve regional management of critical biodiversity resources associated with the reef system that is shared by all four countries.

A Threat and Root Cause Analysis for this project identified several regional concerns that are thought to be cumulative:

- Coastal and island development and rapidly expanding tourism.
- Inappropriate upstream land and resource use, and industrial development.
- Overfishing and unregulated aquaculture development.
- Uncontrolled port, shipping and navigation practices.
- Climatic-meteorological phenomena associated with changes in ocean currents, sea surface temperatures, storm intensity, precipitation, and vulnerability to disease, in all probability linked to climate change.

The transboundary nature of processes and factors influencing habitats and resources, require regional cooperation for development of effective responses, through the Meso-American Barrier Reef System Project.

The project will provide facilities to link between a range of existing activities in these countries. One of these is the World Bank funded project under which this National Coastal Management Strategy for Belize is being developed – the Conservation and Sustainable Use of the Belize Barrier Reef Complex. Among provisions for the new project are:

- Strengthening existing Marine Protected Areas and establish new protected areas in transboundary locations.
- Develop and implement a standardized regional environmental monitoring and environmental information system.
- Promote measures to reduce non-sustainable patterns of resource use, focussing initially on the tourism and fisheries sectors.
- Increase local and national capacity for environmental management through education, information sharing and training.
- Strengthen and coordinate national policies, regulations, and institutional arrangements for marine ecosystem conservation and sustainable use.

Actions

The Department of Fisheries, the Forest Department, the Coastal Zone Management Authority and Institute, and the fishing cooperatives will continue to be the lead agencies in development of the Marine Protected Areas System.

As a matter of priority, in accordance with the recommendations of the National Biodiversity Strategy, these organizations should agree on an appropriate management structure and framework for all marine reserves. This should have regard to:

- The Policy Framework under preparation by the National Protected Areas Policy Committee.
- An ‘objectives’ based structure that reviews the wider national objectives for this system, and adoption of the best model for both system management, and park management.
- Management arrangements that formalize the participation of Non-Governmental Organizations and community groups in the implementation of management plans.
- Funding arrangements, taking account of ongoing studies on Marine Park financing by the Programme for Belize, and the wider financial evaluation for coastal management underway through consultancy at the Coastal Zone Management Institute.

Actions for advancing the Belize Barrier Reef Marine Protected Areas Network which are scheduled under the workplan for the present coastal management project administered by the Coastal Management Authority and Institute through to 2004 include:

- Establishing protected areas advisory committees for Caye Caulker, Laughing Bird Caye and South Water Caye
- Ongoing advisory meetings for Bacalar Chico, Sapodilla Cayes, and Glovers Reef
- Revision of management plans, plus facilities contracts, staff hiring and equipment purchase for Sapodilla Cayes, Laughing Bird Caye, Caye Caulker and South Water Caye.

In addition, it is essential that the lead agencies in developing and implementing these plans:

- Undertake a sustained dialogue and public education program with resource users on the benefit of these systems

During the revision of management plans, consideration will be given to the issue of visitor rights. The lead agencies will also ensure that all plans prepared for management are officially adopted after appropriate revision, with post approval monitoring fully addressed through inter-agency collaboration. The research component for monitoring can be led by the Coastal Zone Management Institute.

Actions (continued)

Policies whose implementation through the lead agencies will result in improved coastal and marine management in the barrier reef region are contained elsewhere within this Strategy. They include among others:

- The Cayes Development Policy;
- Improvements in various standards and guidelines including beach and shoreline management, and
- Enhanced monitoring and enforcement through deployment of shared institutional resources.

In addition, through a consultancy to be conducted in 2001 at the Authority and Institute, it is suggested there should be a comprehensive review of legislation to improve the policy and legal framework necessary for the management of coastal and marine biodiversity. This could possibly include a review of the status of those protected areas along the coastline presently regulated under Forest Act Legislation, allowing Fisheries Department with the Coastal Management Authority the legal provision for declaring and managing these areas, with the support of the Forest Department.

Government is fully committed to implementation of the Meso-American Barrier Reef System project. This will strengthen many major aspects of coastal management within Belize, but also, will address wider cross-boundary management requirements.

4.2.4 Mangrove Protection

The regulations are provided under the Forest Act, 1980, and are administered by the Forest Department. Only forest officers may undertake enforcement, though other statutory permitting agencies are supposed to refer applications that may entail mangrove clearance to the Department. They prohibit any alteration, including cutting and defoliation, but allow selective trimming on any land with a permit. Dredging or filling, licensed through the Geology and Petroleum Department, can only be authorised in exceptional circumstances. Important provisions on approval relate to proximity of coastal and reef areas known to be of high ecological value, and also, existing or proposed plans such as barrier reef regional management and development plans.



Mangrove cleared to allow for pier construction (CZMAI)

The widespread clearance of coastal vegetation, including pine ridge savannah for aquaculture, and filling for residential development and roads, is a major concern highlighted in the 1995 State of the Coastal Zone Report and other papers. It is ongoing, and clearly requires a substantial response.

Actions

The Coastal Zone Management Authority and Institute should assist the Forest Department in:

- Providing clear statement of policy on mangroves that can be applied and understood by developers through the National Environmental Appraisal Committee and National Planning System that is currently being proposed under the Land Management Project.
- Linking this policy with revised setback requirements (see section 4.3.7)
- Prepare zoning guidelines for mangroves of Belize, either as an individual policy guideline, and/or linked within the proposed National Land Use plan and policy.
- Revising the regulations, to take account of statutory requirements that derive from the proposed mangrove policy guideline.

In addition, consideration must be given to

- Strengthening, through the proposed formalization of inter-agency monitoring and collaboration, the capacity to anticipate, detect, report and act on infringements of the mangrove regulations.
- Increasing fines for infringement of regulations.

4.2.5 Coastal Habitat Restoration

Development pressures and natural events have resulted in loss or damage to habitats over large areas in coastal Belize. While the emphasis in this Strategy is on continued development and implementation of pro-active measures to safeguard the coastal area, it is also necessary to consider the implementation of habitat restoration measures.

Management guidance for habitat restoration depend on the specific ecosystem, but may include for example:

- Replanting in mangroves, seagrasses or areas of lost beach vegetation.
- Modification of drainage schemes in wetland areas.
- Diverting of access routes away from damaged sites.
- Further establishment of protected areas to allow recovery and enhance fish stocks.

Central to this activity is the identification of problems, whether these are caused by non-compliance with provisions of development approval, illegal coastal development or natural events. Along with our understanding of 'supply and demand' this element of the Strategy requires scientific research and monitoring, and database management.

Actions

The Coastal Zone Management Authority and Institute will, with Forest and Fisheries Departments as appropriate:

- Inventory areas of damage and potential for restoration programs.
- Evaluate mechanisms such as transplanting and re-planting that can be used to restore these systems, and create an inventory of native and naturalized plants that are suitable for replanting.
- With the Departments of Forest and Fisheries and the Physical Planning Section of the Lands and Surveys Department:
 - Develop legal provision for habitat restoration, linking this to planning permission for new development or re-development, and licensed operations, where habitat damage occurs.
 - Provide for the removal or relocation of structures or buildings where these are damaging to the overall processes and stability of the beach and coastal area.
- With the Attorney General, review provision for fines or bonds as these relate to breaches of legislation or regulations that require adherence to habitat conservation.
- Work closely with the Belize Tourist Board, Tourist Guides and Fisheries and Forest Departments to provide alternative visitor sites that can be rotated or relocated, where recovery or rehabilitation at existing sites is identified as a requirement.

4.2.6 Coastal Wildlife Conservation

In Belize, coastal management has focused primarily on the endangered coastal species as well as the commercially utilized species. These include marine turtles, crocodiles, manatees, coastal birds, as well as reef fish, mollusks, crustaceans, and invertebrates. Wildlife, including endangered species, are protected under the Wildlife Protection Act of 1981, which is administrated by the Forest Department.

Management and data collection of the fisheries resources is carried out by the Fisheries Department, while conservation and census of resident and migratory birds are primarily undertaken by the Belize Audubon Society. Counts of the red-footed boobie nests are done at the Half Moon Cay Natural Monument, and an important jabiru nesting site is managed under the Crooked Tree Wildlife Sanctuary, both under Audubon Society management. A few researchers and students carry out site-specific research on endangered species.



Booby colony at Halfmoon Caye Natural Monument (Sue Wells)

Of these a nationwide research project exists only for the manatee, carried out by the Coastal Zone Management Institute. This project has a high degree of visibility, due to an aggressive public

education campaign, and has a good response rate from fishers and boat users who report accidents and other information to the Institute.

These species are important for a variety of reasons. Direct economic benefits come through the eco-tourism industry, while there are uninvestigated opportunities in medical science and other fields. The role individual species play is also essential to coastal ecosystem 'health'. Some species indicate changes in the natural habitat. This in turn leads to identification of causative factors in habitat loss and ultimately, to remediation of the problem. The leading cause of destruction to wildlife is increasing development, as people compete with wildlife for space.

Recovery plans have been compiled for the threatened manatee and the endangered marine turtles in Belize. Also, the Status and Life History of the American Crocodile in Belize includes recommendations to enhance recovery of this endangered species. All documents emphasize the need to protect the habitats of these flagship species, including the few nesting beaches and the seagrass beds.

Wildlife Recovery Plans

Manatees. Manatees are listed as threatened by the International Union for the Conservation of Nature. They are protected by the 1981 Wildlife Act. The conservation project at the Coastal Zone Management Institute began with research of the West Indian manatee in Belize and included interviews at coastal communities, boat and aerial surveys, and preliminary examination and recording of strandings. Education is a major part of the project and is done in schools and at the communities in which interviews were carried out. All of the research material gathered was used to compile the *Belize Manatee Recovery Plan*. In this comprehensive document, a four-year schedule of conservation activities was drafted. The two goals are 1) to prevent extinction or irreversible decline of the species in the foreseeable future, and 2) to prevent decline of the quality of their habitat. The aerial surveys and the education activities continue, but implementing management goals is the current priority.



Manatee at Drowned Cayes (Caryn Sullivan)

Wildlife Recovery Plans

Turtles. The Sea Turtle Recovery Action Plan for Belize was produced in 1992 by the Belize Audubon Society and WIDECAS (Smith *et al.* 1992). Research was conducted prior to this report, primarily in the Gales Point area. Estimates of nest numbers of the marine turtles in Belize were made. Since then, the Bacalar Chico Marine Reserve and the Half Moon Caye Natural Monument have been doing nest counts within their specific reserves. In Gales Point, the most important Hawksbill (*E. imbricata*) nesting beach in Belize, and a very important nesting area for the region, a private researcher is collecting the data on the nesting turtles and their nests. The National Sea Turtle Working Group, comprising the Fisheries Department, Coastal Zone Management Authority and Institute, Belize Audubon Society, Belize Zoo, Bacalar Chico Marine Reserve, and Gales Point Co-operative has undertaken activities focused primarily on of the Regional Network. The Institute has assisted with the lobby for Belize to ratify international treaties and amend local legislation, and conducts aerial counts during the manatee surveys. Some education from various organizations has also been done. The activities of the Recovery Plan, however, have not been formally carried out as no agency has taken on complete responsibility.



Hawksbill turtle being tagged as a part of the National Sea Turtle Working Group tagging and tracking program (Nicole Auil)

Actions

Numerous recommendations are made in the Manatee and Sea Turtle Recovery Plans, as well as the Life History Report on the American Crocodile. Some of the primary and common activities are:

- Preservation/protection of critical sites such as known nesting and foraging areas.
- Amend existing protected areas management plans to include the protection of the critical coastal species.
- Long-term monitoring; identifying critical areas.
- Review and amend laws protecting species.
- Explore alternative for poachers and provide economic incentives such as sustainable tourism of species.
- Increase education at all levels, from enforcement officers to school children.
- Enforcement of existing laws.

These will continue to be carried out for the manatee research project. In addition, it is recommended that the Coastal Zone Management Authority and Institute take a lead role in implementing the Sea Turtle Recovery Plan, in association with its agency partners on the National Working Group.

There is no recovery plan for the coastal birds in Belize. Sustained collaboration between regulating agencies, conservation non-governmental organizations, and researchers is necessary to carry out the existing recommendations, as well as the recommendations made in management plans of protected areas. This will allow these species to be utilized wisely for economical and ecological benefits now and in the future. A lead agency must be identified for this role, and the Coastal Management Institute should assist in the identification of an appropriate organization.

4.2.7 Fisheries

The Fisheries Department has wide ranging powers of permitting, licensing, inspection and enforcement, for fishery resources, including the licensing of bio prospecting and aquaculture, which due to its growing importance is dealt with separately in the next section of the strategy. These powers are embedded within the Fisheries Act and Regulations, which are currently being revised. Fisheries Management Plans have been prepared, and are to be implemented.

Fisheries legislation covers all aquatic plant and animal life. This includes, among others, corals, seagrass, crustaceans and aquatic reptiles and mammals. Among the provisions of the legislation and regulations are:

- A research permit is required, and a plan for the research must be submitted to the fisheries administrator.
- A separate permit is required for bio-research and bio-prospecting, and bio-prospecting must have no negative environmental impacts.
- Fines are described for infringements including breach of laws relating to size, season and type of fish catch.

- Various provisions are made for turtles, including a complete ban on catching or selling the hawksbill turtle, and size limitations are placed on capture of the green and loggerhead turtles.
- The most stringent provisions covering all elements of marine life are those for a marine reserve, where specific exceptions must be, and are in some cases, made in the reserve management plan for fishing, damage to any species of fauna and flora (including corals and seagrass); and scientific research.

Since 1993, the Fisheries department has undertaken a data collection program on fish stock assessment, supported by the Caribbean Fisheries Resource Assessment and Management Program. This effort is essential to understanding the character and quality of the living resources base within the coastal area, and of the effects of fishing and fish gear on fish stocks, and must be sustained



Fishermen hauling in the day's catch, Bacalar Chico (CZMAI)

The requirements of the draft fisheries legislation include provision for preparation and implementation of fisheries management plans, and responsibility for conducting and co-ordinating fisheries research.

Fisheries staff have contact with key stakeholders in the coastal zone. This contact occurs through acquisition of fisheries catch data, outreach programs, inspection and enforcement activities, liaison activities with the fisheries co-operatives, and in the management arrangements between themselves and non-governmental organisations including those who are proposing to run marine reserves under contract with the Department. This level of contact is potentially of even greater significance in the requirements for stakeholder participation in the broader aspects of integrated coastal zone management.

The Fisheries Department is jointly involved with the Coastal Zone Management Institute in coral reef monitoring.

The Fisheries Administrator has powers to co-opt additional staff to act as fisheries inspectors, though inspection can be difficult at times due to equipment and logistical issues. The main concern expressed by stakeholders during consultations for this strategy revolved around access to fishing grounds in Marine Reserves, and the ingression of non-national fishermen into Belizean waters. Field time and presence of inspectors is also an issue, given the financial limitations of departmental budgets. The poaching issue is complex, and is being addressed at the national level.

Actions

The Fisheries Department is identified throughout this Strategy through its involvement in mechanisms required to develop, implement and regulate aspects of coastal zone management. In addition:

- The Coastal Zone Management Institute can provide for enhanced training for fisheries staff in broader aspects of integrated coastal management. This will improve delivery of coastal management objectives during routine outreach and inspection functions conducted by Fisheries staff.
- In the first Strategic Objective, under research, the requirement and mechanism for rationalization of coastal research and monitoring programs was discussed. Close collaboration between the two institutions is essential, and must be sustained, including the existing coral reef monitoring program under the Caribbean Planning for Adaptation to Climate Change Project.
- The workplan for the coastal management project provides for joint interventions in fisheries and marine resource management between the Fisheries Department and the Coastal Zone Management Authority and Institute, funded through the present Global Environment Facility Grant to the Institute. Initiatives include:
 - Fisheries research on spawning aggregations, for example, the Nassau Grouper.
 - Establishment of Advisory Committees for Marine Protected Areas.
 - Hiring of staff, purchase of equipment, plus development of management plans for marine reserves, including Sapodilla Cayes, Laughing Bird Caye, Caye Caulker and South Water Caye.
 - Holding of fisheries symposia and development of promotional and educational materials for marine protected areas.
- The Fisheries Department has a mooring buoy program, which commenced at the Hol Chan Marine Reserve in 1988. This initiative is important to prevent damage to reef and other marine communities, and must be sustained.

4.2.8 Aquaculture

A growing industry with significant economic benefits, the predominantly shrimp based aquaculture industry is licensed through the Fisheries Department. The root cause and threat analysis undertaken for the forthcoming Meso-American Barrier Reef project recognizes the rapid development of coastal aquaculture as a serious threat to the long-term sustainable use and stability of the coastal zone in Central America. The analysis provided under section two of this Strategy strongly suggests that additional large areas of coastal land will be transformed. There are genuine concerns that a landscape similar to that in other coastal areas including Ecuador and Thailand may result, with similar problems of loss of coastal ecosystem function, introduction of strong alkali components to the coastal soil, and pollution entering coastal water causing further damage to marine ecosystems and food chains. In 1997, a paper was produced for Belize on 'Environmental Impact of Aquaculture in Belize and Guidelines for Sustainable Development'. The paper addressed concerns over the rapidly growing aquaculture industry, and identified specific requirements to minimise degradation of natural resources and the environment. Recommendations for licensing, mitigation, and remediation are extensive, and include among others, land and resource use, and waste management, as well as socio-economic issues. The National Environmental Appraisal Committee in its review process extensively applies the assessment methods for aquaculture developments provided in this document.

However, it is recognised that a clear policy on the location and extent of aquaculture development is lacking. The tourism sector has adopted an ad hoc 'Tourism Land Use Policy', in the absence of a national framework, because it recognises the importance of such a system in sustainable resources

use. No such plan exists for aquaculture or indeed other sectors. The recent formation of an industry association provides opportunity for consultation in drafting such a policy.

Land-use zoning is required for aquaculture as a component for a comprehensive national land use planning system to delineate the most suitable areas, taking a full range of environmental, resource use and user-group issues into account. Guidelines and initial evaluation of options are provided in the 1997 report, and provide a strong platform for taking this issue forward. Coastal and marine issues are essential components of this evaluation.

Even in the absence of a National Land Use policy and strategy, zoning issue related to aquaculture must be seen as a priority issue for the coastal zone of Belize.

Additional problems that will have to be addressed are:

- What will be the fate of these transformed lands should the companies cease to operate the facilities?
- Who will take responsibility, and pay, for remediation of this land?



Aquaculture farm in Southern Belize (Eugene Ariola)

Actions

- There is an urgent requirement for Government to develop and implement a zoning policy for coastal land use for aquaculture. Even in the absence of a national land use policy, which would be preferred to allow for trade-offs with other land use and preservation of ecological function, aquaculture must be provided with a zoning plan. The basis for generating this plan has been provided in the 1997 aquaculture review paper. This policy must include mariculture, recently proposed for waters off Placencia.
- The responsibility for this will be shared by numerous agencies of Government. It is proposed that a multisector Task Team be established by the Fisheries Department, who are the lead agency for Aquaculture development and regulation, with the Lands and Surveys Department, Department of Environment, Forest Department, Geology and Petroleum Unit and Belize Trade and Investment Development Service and the newly formed industry association, with technical support from the Coastal Zone Management Institute. It is recommended that the Belize Tourism Board also be a member of the Task Team. The task team should report to cabinet, who will make a decision on this policy.
- The Department of Environment should modify its regulations to allow for remediation in the event that an aquaculture facility should fail. Consideration should be given to creation of a reserve fund from the investment and income of each facility to defray the expenses associated with remediation. Liability, as at present, must be the responsibility of the owner/operator of the facility.

4.3 Second Strategic Objective: “Supporting Planned Development”

4.3.1 Introduction

Essential to the national effort at managing the natural resource base are the legislation, regulations, standards and guidelines which are applied to planning and development control in the coastal area of Belize. These provisions, and requirements to enhance them are presented in the following sections.

4.3.2 Cross-Sectoral Coastal Area Planning and Development

Historically, decisions have tended to be made on resource allocation and management in the coastal zone in a fragmented fashion, according to the perceived needs of various sectors. The large number of Government agencies has made this situation more complex. There are of course exceptions, such as the marine protected areas system, where debate has resulted in a network of areas with plans and management systems in place. And the introduction of environmental legislation in the 1990's, has provided for an Environmental Assessment process, managed through the National Environmental Appraisal Committee by the Department of Environment, involving the inputs of numerous stakeholders.

This system, while essential in the process of development control, is nonetheless reactive to proposals for development. Various sectors in addressing their own development needs, continue to report on inadequate integration in the planning process. These concerns are mirrored in, for example, the National Environmental Action Plan, the Tourism Strategy for Belize, and the National Biodiversity Strategy. These documents widely embrace sustainable environmental management principals in defining their sectoral needs. In consultations for the coastal area Strategy, community organizations also expressed concern that local knowledge, capability and socio-economic circumstances were not sufficiently taken into account in decision-making.

How does this situation affect the natural resources base and economic development in coastal areas?

- It can result in *ad hoc* decision-making on the location and type of development. The chosen development may or may not be best suited to the natural functions, attributes and capability of an area and its inhabitants.
- Negative local and sub-regional impacts on the quality and productivity of the natural resources base may result.
- In the long run, these local and regional impacts accumulate and coalesce to create more widespread, systemic damage in natural systems. At this point, ‘sustainable development’ may no longer be possible.

The ensuing topic areas under this objective address a range of areas that are critical to effective coastal area management for Belize.

4.3.3 Cayes Development Policy

Prepared by the Coastal Zone Management Technical Committee in 1995, this paper represents a major effort to consolidate all existing legislation, regulations, policies and guidelines relating to development and sustainable environmental management for the cayes. This approach recognises the special bio-geographic characteristics of the “ABC” – Atolls, Barrier Reef and Cayes – region of Belize, and the need to match this with appropriately tailored provisions for managing development.

Although in its present form the paper has no statutory power, the authority behind the various policies is linked to those in the legislation and regulations of the various agencies responsible for each component. Overall responsibility for ensuring implementation of the policy is not stated in the document.

The paper contains performance standards covering the following sectors:

- ownership
- protected areas
- land use, planning and development control
- clearance, extraction and infrastructure
- shipping and the use of vessels
- freshwater, waste disposal and fuel storage
- recreation and tourism
- fishing and wildlife exploitation
- cultural heritage
- commerce and economic development.

As presented the paper will be difficult to implement. It lacks sign-posting of responsibility for implementation, and many of the recommendations lack clear definition, leading to potential lack of understanding of intent by regulators, developers and residents, and to inconsistency of application of policies.

Throughout, policies form a part of the recommendations. Many of the requirements in each section are already covered by legislation or regulations, or are part of established practice. Distinction therefore needs to be drawn between policy as it is applied, and proposals for changing and improving current practice.

In addition, the relationship between this paper and the individual development guidelines for various coastal regions, eg. Turneffe Atoll, Caye Caulker, Belize City Cayes and Ambergris Caye, and the numerous marine reserve management plans is not defined. This has potential to cause confusion over which document represents actual Government policy for development control - not however, development in the planning sense - in these areas.

Actions

The Coastal Zone Management Authority and Institute will:

- Revise the Cayes Development policy as a component Coastal Zone Management Strategy before passage through the House of Representatives. This will involve the following:
 - Clarify recommendations that are not specific enough to allow for unequivocal interpretation of intent and application.
 - Make a distinction between actual regulations, policies and guidelines in use at the present, and those activities for which the recommendations suggest change or improvement
 - Make a clear identification of institutional responsibilities for taking the recommendations further.
 - Develop and publish a manual or developer's guide, based on the clarified recommendations, for distribution to the public and concerned Government agencies.

This should set out recommended standards and required procedures in an accessible manner.

- Take fully into account circumstances of, and management requirements for, marine areas including the barrier reef in re-formulating the policy.
- There should be close liaison with the Department of the Environment, the Physical Planning Section and the Housing and Planning Department in the review of this policy.
- Should the document be accepted as part of the Coastal Zone Management Strategy, then the Coastal Zone Management Act would allow for recognition of the Authority and Institute to ensure overall integrated implementation. Without such recognition the Coastal Zone Advisory Council should be mandated to ensure consistent implementation.
- Policies in the document should be clearly linked with the regional coastal planning program. In turn, the existing development guidelines should be reviewed to ensure compatibility with the document's re-articulated recommendations.

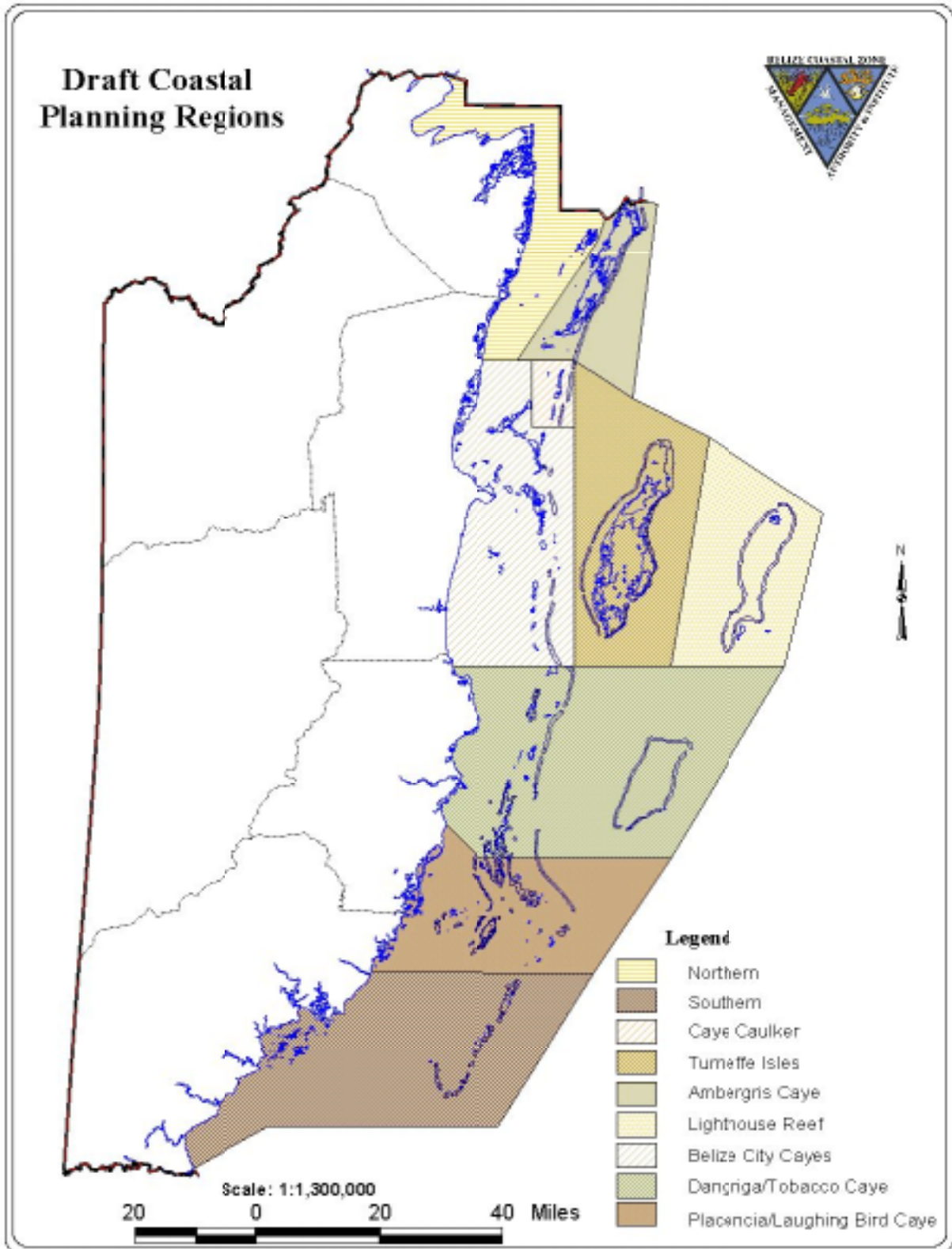
4.3.4 Coastal Planning Program

This Strategy is the initial component in preparation of a Coastal Zone Management Plan for Belize. Prior to the passing of the Act the Coastal Zone Management Project commenced a coastal planning exercise. This was largely founded on the draft Cayes Development Policy and entailed a rolling program approach to the preparation of development guidelines for the nine coastal planning regions (see Figure 3).

These regions are based on groupings with shared social, economic, geographic and administrative factors. They are also intended to complement the mainland Special Development Area land use planning program undertaken by the Physical Planning Section of the Lands and Survey Department. Both these programs have almost parallel regional approaches, objectives, methodologies, and advisory local committee mechanisms.

However, an important and essential distinction is made in the further generation of the coastal management-planning program. While it must complement the other planning initiatives, coastal management plans must also link the resources, attributes and processes of the marine and coastal area with the traditional considerations taken into land use and development planning. Consequently,

Figure 2: Draft Coastal Planning Regions



the detailed coastal zone management plans will incorporate these characteristics, following on at a regional scale from the guidance provided in this National Coastal Strategy document.

Currently two sets of 'development guidelines' have been drafted, the Turneffe Islands and the Belize City Cayes, and work has commenced on Caye Caulker. The Ambergris Caye region is considered as covered by the Ambergris Caye Master Plan drafted through the Central Housing and Planning Authority in the early 1990s. These 'guidelines' will need to be re-drafted, taking this National Strategy into account.

The passing of the Act and the preparation of this Strategy, along with a revised Cayes Development Policy, now enable greater consideration to be given to the potential scope of the program. Indicative is the ability to change from the concept of 'guidelines', implying voluntary implementation, to a more formalized 'plan'.

- Clear methodology and objectives need to be established to ensure that they meet public and stakeholder expectations, complement the planning programs of other agencies, and have viable means of implementation. Consideration, for example, should be given to how the program could complement the more established land use planning powers of the Land Utilization Authority and the Housing and Planning Authority.
- Stakeholder participation is essential in the planning process. Mechanisms to ensure this takes place are discussed under the third Strategic Objective.

The Coastal Zone Management Authority and Institute are unable to make decisions and directly implement planning and development control recommendations. Recommendation on coastal issues through the Coastal Zone Advisory Council can only be subject to discussion and subsequent recommendation. However an authority with similar coordination powers is currently being established in the south of the country, the Toledo Development Corporation. This body is intended to manage multi sector activity through the implementation of a development plan in much the same manner as the Coastal Zone Authority and Institute, and there are considerable opportunities for liaison and cooperation.

The second element of this process is the strengthening of the participatory process for coastal planning and resource allocation through the Coastal Advisory Committees, and the preparation of a demonstration-planning project based on Caye Caulker. This will take place between 2000-2001. The final element will require coastal zone planning in the other regions identified, work will commence in 2001, though additional financial resources will be needed to further this work.

Actions

Through the legal review to be undertaken in 2001, the Coastal Zone Management Authority and Institute will:

- Clarify the expectations and responsibilities for delivery of the Coastal Zone Management Plan, recognizing that at present, the Authority has no specific responsibility for decisions relating to the sectoral elements required to deliver the plan. Specific attention will be paid to mechanisms that will ensure implementation of plan requirements.
- Implement, through its already agreed workplan, programs for:
 - Establishing Coastal Advisory Committees as a basis for regional Coastal Management Planning
 - Continuing a demonstration project on integrated coastal planning for Caye Caulker, using the Strategy as guidance for inputs.
- Identify external financial assistance to undertake the regional level Integrated Coastal Management Planning process.
- Ensure that the detailed coastal planning activity:
 - Incorporates traditional land use planning requirements with the special requirements of coastal and marine resources management and planning
 - Is compatible with the Special Development Area land use planning program of the Physical Planning section of the Lands and Surveys Department
 - Fully involves the stakeholders through the Coastal Advisory Committees and other partners as identified
 - Embraces the Goal, Objectives and actions defined in the Strategy.
- Detailed planning should assist in the identification of appropriate investment opportunities in each regions, as well as differentiating areas of conservation and environmental values.

4.3.5 Beach and Shoreline Management, Safety and Recreation

Beaches are an essential ingredient in national recreational activities, and for the tourism industry. Pursuits undertaken at beaches are a combination of 'passive', for example, sunbathing and swimming, and 'active' involving wind or motor powered craft. Providing access to, or facilities on a beach, can damage vegetation and ecological function, while solid waste disposal can reduce aesthetic as well as health and safety value.

Swimmers can be injured by water craft, and also, need to be wary of rip tides, though these may be less common in Belize than on more exposed beach areas.



Pier providing access to beach via boat traffic (CZMAI)

Rip currents are known in reef areas, for example in the tidal channel at Hol Chan. Construction on or near beach areas can, and frequently does, interfere with normal sediment transport processes, causing loss of property and commonly, ad hoc and ineffective hard engineering responses to reduce erosion. Similarly, turtle nesting is severely disrupted by construction on or near beaches.

Actions

The Coastal Zone Management Authority will undertake the following:

- Develop with the Physical Planning Section of the Lands and Survey Department, comprehensive guidelines for construction on beaches, incorporating a revision of the pier guidelines, but taking into account seawalls, groynes, jetties and harbor arms. A review of the setback regulations, discussed in this Strategy, will form a part of this comprehensive review.

- Beach development must form part of the overall Master Plan for an area, and must ensure:
 - simplicity, and culturally and environmentally compatible design of buildings or structures plans that are ecologically sound
 - provision of safety features for swimmers taking into account rip tides and ‘active’ uses.

- Classify beach areas according to their present levels of usage. For convenience, these will be identified as high, moderate, or low plus no-use beaches. Implement, with the Physical Planning Section of the Lands and Surveys Department, Tourism Board, Belize Tourism Industry Association, and relevant municipalities and owners or managers of shore areas, the following programs:

- For high use beaches, the emphasis will be on improving facilities, and focussing activities. This may be achieved by making improved use of surrounding areas for parking, barbecue and picnic areas and ensuring adequate solid waste disposal; provision of change facilities and water collection and sanitation that allows no impact on ground or coastal water; and interventions to rehabilitate damaged vegetation, or restrict access to vegetated areas and construction of raised boardwalks.
- For moderate use beaches, avoid commercial developments, and implement measures for high use beach management.
- For beaches with low or no-usage, the presumption should be made to limit their future development or to prevent this. Any development must take into account restrictions on vehicular access, visitor numbers, minimal ‘active’ use, and requirements for ecological maintenance and the provision of appropriate but limited facilities to cater for low-use access.
- Encourage community participation and corporate sponsorship for programs such as ‘adopt-a-beach’, where schools and members of society undertake voluntary clean up and advocacy for improved beach management.

Where beaches are located within Protected Areas, they will be subject in the first instance to the provisions under the designation of the area and existing management plans. Existing management plans and those developed in future will have regard, through the management authority, to the beach management guidelines.

This guidance forms part of the Coastal Zone Management Plan, and should be extended to similar construction on other shorelines, including wetlands.

A National Land Use Planning Strategy – Coastal Area Implications

The absence of a comprehensive land use planning strategy has been identified in numerous documents ranging from the National Environmental Action Plan, National Biodiversity Strategy, through the Tourism Strategy plan for Belize, to the Southern Regional Development Plan, as a major hindrance to coordinated national development. Absence of this strategy has major implications for resource allocation and utilization, and for sustainable management in the coastal area of the country. This Strategy, and the particular requirements for managing the coastal zone, are an essential complement to the larger requirements for national land use planning.

A variety of development plans and initiatives are drafted by both the public and private sectors. These address issues ranging from poor infrastructure and amenities, inappropriate resource use, investment opportunity, housing development, or recreational improvement. Few of these, however, manage to reach meaningful levels of implementation due to not being placed within an effective implementation framework. A mismatch in the remits of the agencies that have statutory planning powers has had the effect of discouraging the establishment of an efficient planning system.

It is suggested that a system based on an enabling National Physical Planning Act would allow the drafting and implementation of development plans to meet national, regional and community needs. Particular performance standards, zoning and specifications could be contained in regional and community plans drafted in conformity with national and regional policies. Implementation could be based on three levels:

- National Planning Forum charged with formulating and integrating national policy, and supervising the national system;
- regional, *including the coastal planning regions*, or district level planning authorities accountable for actual development planning; and
- village level participation in community planning.

The goal would be to establish a system that allows policy to flow freely from the national level to the community level and *vice versa*.

Such a model would allow a meaningful level of decentralization of land use planning and development control, particularly through the establishment of Coastal Advisory Committees. Where possible the system could utilize existing or already proposed structures, such as the proposed Toledo Development Corporation and a re-invigorated Belize City Cayes Advisory Committee.

4.3.6 Marine Pollution Control

The responsibility for control of pollution in Belize rests with the Department of the Environment and, to some extent, with municipalities. It is an essential and integral part of coastal zone management. The importance of pollution control is defined by the numerous pathways in which substances that are iniquitous both to environmental and public health can be brought to, and transported within, the watery environment of the coastal zone. This is a direct consequence of the highly dynamic nature of the coastal system, and multiple potential sources. Both point sources, such as discharges from pipelines, and non-point, such as surface water run-off, can deliver such pollutants to the coastal ocean.



Garbage at Alligator Creek, South Water Cayes (CZMAI)

There is 'background' variability in the levels of naturally occurring substances that occur in coastal water. Naturally occurring events can spike increases in these substances over short intervals of time. Organisms and ecosystems are used to such changes, and are adapted to them. For example, coastal areas with rivers are subject to changes in sediment loading, salinity and temperature as a consequence of rainfall events.

The essence of pollution control, however, is to eliminate or reduce to levels that can be tolerated by the natural system the amount of additional pollutant entering the system as a consequence of human activity. Not only must the absolute level of pollutant entering the system be taken into account, but also, its residence time. This is a very complicated issue, requiring understanding of the chemical life-cycle of different substances and the way these may be taken up or transformed in coastal areas, as well as the extent to which such substances may be dispersed and diluted.

Different control methods are used. Source control is the most efficient. This approach seeks to limit the discharge from industrial, sewage or wastewater pipes and channels into open systems such as rivers or coastal water, and in agricultural areas, to limit the application of pesticides and fertilizers, and control run off from slopes. Commonly, for pipe discharges, 'end-of-pipe' water quality is used to limit pollution. This requires the specification of standards which owners of pipes must ensure are met in the treatment of discharge sent through the pipe.

Extensive legislation is available for control of pollution in Belize. These include standards for emissions, discharge, littering and dumping. It also includes specifications for Environmental Impact Assessment, which, through the National Environmental Appraisal Committee, looks at potential pollution among wider environmental issues in the development control process. The emphasis therefore is to prevent pollution, although provision is made for clean-up in the event that pollution occurs. Revision of

environmental legislation is currently underway.

The Policy and Strategy of the Department of Environment, identifies a number of areas that make a significant impact on environmental management in general, including pollution control. With regard to the coastal zone, these include:

- Production of a comprehensive water resources policy, to ensure maintenance of appropriate quality. This is centered on effluent treatment control.
- The requirement for a comprehensive National Plan on land use and zonation. This is not surprising as nearly all sectors have identified this weakness.
- Understanding the 'natural capital' of the environment, and monitoring its condition. It is generally recognized that this is inadequate, and is addressed in the first strategic objective of this strategy under research and monitoring.
- Sensitizing decision-makers to issues and management requirements. This is an essential part of all aspects of managed development, and is addressed here in the third strategic objective.
- Promoting the proper use of wetlands.

Actions

The Department of Environment works with all other agencies of Government and other stakeholders, to improve the management of environmental quality in Belize. The working relationship with the Coastal Zone Management Authority and Institute is mirrored in various activities, including participation on the National Environmental Appraisal Committee. Further strengthening in pollution control and related matters in the coastal zone requires:

- Participation by the Department of Environment in the development of Integrated Coastal Management Plans at the regional level.
- Implementation of the national water quality-monitoring program devised in 1995 by the Department of Environment. Limitations in resources have hampered implementation. The consolidation project proposed in the first Strategic Objective for coastal research and monitoring will provide a vehicle for implementation of the coastal and marine element of this strategy.
- Similarly, the proposed consolidation of arrangements to share logistical and human resources for monitoring and compliance under the third strategic objective will improve the capacity of the Department of Environment to undertake essential site surveys and checks.
- Establishing a policy for managing the extent of run-off from hillslopes thereby limiting potential pesticide or fertilized contamination in coastal waters.
- The establishment of a central laboratory with international Quality Assurance and Quality Control accreditation is essential to ensure that Government can establish baseline conditions, and prosecute offenders for breach of pollution regulations. The possibility of using the Belize Agricultural Health Association facility is being discussed, though the demands made on this facility, and the requirements for coastal and marine water quality analysis, will have to be carefully assessed.
- The workplan for the Department of Environment includes interventions in areas critical to the coastal zone. This includes:
 - Preparation of a National Emergency Preparation Plan for Oil Spills.
 - Preparation of a National Waste Oil Management Plan.
 - Guidelines for (a) waste management for hotels, (b) for management, treatment, recycling and disposal of wastewater, and (c) the aquaculture sector.
 - A review of the penalties for pollution infringements.
- A project is in progress for capture and treatment of sewage and wastewater that could otherwise cause pollution on nearby reefs at Caye Caulker. This approach has potential to be extended to developments on other Cayes, and if successful, should be actively promoted by the Coastal Zone Management Institute and Authority on other Cayes

4.3.7 Setbacks

The area where water meets land is a transition zone characterised by complex physical and biological processes. Interfering with this zone through clearance or construction can have significant negative consequences on shoreline stability, and on the integrity and value of investments that have been

made.

A comprehensive setback policy is amongst the most essential and effective methods of limiting these problems. It will also support landscape conservation and will facilitate access of the wider public along coastal and river banks.

The National Lands Act requires that where national land is located outside a city, town or village is leased and adjoins any running stream, river or open water, a 66 foot wide strip of land should be left in its natural state, unless the Minister gives approval for it to be used in a specified manner. The provision is also considered by the Physical Planning Section of the Lands and Surveys Department during subdivision applications involving private land, through the Land Utilization Act.

The widespread clearance of riverine and coastal areas, plus construction activities within the 66 foot reserve suggest that the policy is being applied unevenly, or that provisions for approval of construction are being flouted by developers. Indeed the rule is occasionally varied in relation to the cayes whereby the reserve can be reduced to 20 feet when there are severe limitations on land availability.



Post-Hurricane Mitch: Damaged home and seawall reaffirm the fact that development guidelines, such as setbacks are important for property protection.

Actions

The Lands and Survey Department and the Housing and Planning Department, with advice from the Coastal Zone Management Authority and Institute, should undertake a thorough revision of the legislative provision for setbacks. This review should include, *inter alia*, the following:

- Strengthening of the requirements to include all lands, whether public or private
- Providing setback limits that may be greater, but not less than 66 feet, and which can vary depending on the types of river or coastline and the physical processes along defined specific sections or ‘reaches’ of rivers and coasts. A survey will be required to establish appropriate setbacks for different coastal types in the country. Sea-level change and shoreline erosion trends should be taken into account in this analysis.
- Specific provisions to limit certain forms of activities within the approved setback, such as sea-walls, enclosures and other hard structures, plus vegetation clearance.
- During re-development of a site, where existing setbacks are inadequate for the section of coastline, the developer should be required to retire building footprints by a distance that may be part or all of the required setback for that coastal reach.
- Remove the Ministerial over-ride of technical departments of government.

4.3.8 Cruise Ship Policy

This policy seeks to balance the number of cruise ship and cruise visitor arrivals, plus the revenue and employment opportunities these create, with environmental concerns, provision of appropriate services and facilities, and the broader tourism development effort. The lead agencies are the Belize Port Authority, Public Health Bureau, Department of Environment, in conjunction with the Fisheries Department and Belize Tourism Board, who will agree the Environmental Compliance and Monitoring Plan. Compliance is the responsibility of the owner, master and port agent of the cruise ship. The lead agencies will carry out monitoring.

The policy allows for controls through:

- Provision by the cruise operators of an Environmental Compliance and Monitoring Plan. This covers, among other items, agreements on anchoring locations, controls on recreational activities, requirements for diving and snorkelling activities, prohibition of on-board use of out-of-season marine products, or hazardous chemicals, use of phosphate-free detergents, and no at-sea waste disposal of any type.
- Schedules of site visits and activities, numbers of passengers, names of tour operators, and ship discharge outlet plans, must also accompany the Plan.

The policy would benefit from a mechanism for site evaluation. A preliminary assessment was conducted by the Belize Tourist Board, which identified certain attributes, and suggested visitor numbers. However, condition surveys and analysis of ecological attributes would greatly enhance the decision-process, and support the primary objective of the policy with regard to environmental impact. This policy provides an important example of where science is essential to underpin the decision-process on the capacity of coastal areas to sustain particular forms of resource utilisation.

The policy does not mention specific provisions for fines or other sanctions in the event of non-compliance with the Environmental Compliance Plan, nor the mechanics of monitoring. While the policy discusses review in the context of environmental mitigation, the methods to be applied in undertaking the effectiveness of the policy are not described.

Actions

To address potential loopholes in implementation, it is proposed that the Coastal Zone Management Authority and Institute discuss with Fisheries Department, Belize Tourism Board, and Department of Environment, the following:

- The inclusion of condition surveys for possible visitor use. This could include (a) pre-screening by Government of sites that may, or may not be suitable for use by cruise ship visitors for day trips, snorkelling or other activities, or (b) provision of environmental assessment reports by cruise operators of target sites. Cruise ship companies may regard option (b) as too onerous, although environmental impact assessment should be required for major site development for the cruise industry, through the National Environmental Appraisal Committee. Pre-screening would limit the choice of sites, and allow for more detailed baseline surveys to be conducted as a basis for compliance evaluation.
- Taking account of limitations in resources, some surveys should be conducted by consultants, paid for by project proponents, under Terms of Reference devised by regulatory bodies.
- Where these are already enshrined in regulations, the policy should stipulate the levels of fines or other sanction that may be applied in the event of non-compliance with the Plan.
- Where fines at present do not exist, the lead agencies should develop guidelines and have these agreed by the agencies responsible for the appropriate legislation.
- Consideration should be given to the actual monitoring procedures to be applied – for example, reports from the master or port agent, inspections by government officials, site surveys and so on.
- The lead agencies should determine a procedure for reviewing the efficiency of the various plans in mitigating environmental damage.

4.3.9 Draft Marine Dredging Management Policy

Dredging for aggregates, and provision of ship channels, was identified by many persons during Strategy consultations as a primary development-related threat to the integrity of habitats on the continental shelf and barrier reef system.

A new policy has been developed to deal with this widespread problem. The policy details specific requirements that must be met by a dredging proponent, before issuance of a license to dredge. These requirements may include a full environmental impact assessment. The authorisation for dredging is issued by the Minister of Natural Resources, Environment and Industry, on advice of the Inspector of Mines, Geology and Petroleum Department.



Dredging scar near one of the Sapodilla Cayes (Wil Heyman)

The policy addresses the need for a consistent response to all dredging applications. However, no mention is made of a priori limitations that may automatically apply with regard to the location of proposed dredging. A number of recommendations are made here to strengthen this policy.

Actions

The Geology and Petroleum Department may consider strengthening this policy by inclusion of clauses which:

- Specify that the proponent may be required to provide an assessment of two or more options for the source of dredge material; or, if the application is to dredge for access or other water-deepening requirements, that alternative access or dredging design configurations may be required.
- State more clearly the roles and linkages between the Geology and Petroleum Department and the National Environmental Appraisal Committee on the decision-process by which an Environmental Impact Assessment may be required.

In addition, the Geology and Petroleum Department, Fisheries Department and Coastal Zone Management Authority and Institute should consider the following activities:

- Promoting the development of designated marine aggregate-take areas. A feasibility study will be needed on the geotechnical, environmental and financial viability of a number of sites that could service likely requirements at various locations along the length of the continental shelf.
- Resources to undertake such a study will need to be identified, possibly with finance coming from external sources, preferably a grant.

Additionally, consideration should be provided by these agencies and the Department of Environment to 'environmental compensation' as a mitigation measure for loss of important marine habitat. Where an environmental assessment has been completed for a large dredging or landfill project such as a port access, and there is no alternative to loss of large areas of, for example seagrass, a requirement of planning approval may be the creation or restoration of habitats elsewhere, or the provision of financial resources to undertake such or similar environmental works. This compensation approach is used in association with habitats regulations in Europe and could be developed for application in Belize. It would apply to all coastal and marine habitats, including mangroves, seagrasses and coral reefs.

4.3.10 Temporary Pier Guidelines

The Physical Planning Section of the Lands and Survey Department produced a recent set of guidelines in 1999, following the spate of requests for construction or re-construction after Hurricane Mitch. They seek to promote consistent design criteria for piers.

Provisions of the guidelines include:

- Length limited to 350 feet.
- Proper illumination.
- Minimum recommended separation of 1000 feet between piers in rural settings.
- 'Proper' architectural design, and use of 'safe' construction materials.
- No enclosures.
- Public access to be allowed.



Many piers house tourism-oriented businesses such as dive shops. (CZMAI)

Approval for associated dredging is needed from the Geology and Petroleum Department.

Emphasis in the guidelines is placed on aesthetic appearance and function. Other than spacing and dredging, design features and location controls are limited. Whether or not all applications are reviewed by the National Environmental Appraisal Committee, there is room for strengthening the guidelines taking into account potential impacts on coastal processes and the marine environment.

Actions

The Coastal Zone Management Institute, in consultation with the Physical Planning Section of the Lands and Surveys Department, should seek to strengthen the guidelines, through additions as follows:

- After review for more general applicability, application of an appropriate spacing to urban as well as rural settings. The review should take account of criterion on length of groynes.
- Require permeable vertical construction using piles, unless there is compelling reason for an impermeable structure.
- Should an impermeable design be proposed, an environmental impact assessment should be undertaken to ascertain impacts on longshore sediment transport and shoreline erosion and accretion.
- Clarification of what may be regarded as 'safe' materials.
- The guidelines should request details of proposed construction methods from the proponent. Dredging would be subject to the provisions of the dredging policy.

In restructuring these guidelines, it would be advisable to consider:

- Having them formally adopted as policy, and
- Including comprehensive provision for all forms of coastal structure, including sea walls and sea-defences, as discussed in the Strategy under beach and shoreline management.

4.3.11 Confronting Coastal Vulnerability

Populations tend to live in locations that are either (a) close to the resource base for employment generation, and/or (b) accessible. These factors have resulted in nearly half of the Belizean population living in the coastal area, in locations that are known to be at high risk from flooding during storm surge or heavy rainfall events, and from strong wave and wind action associated with tropical storms and hurricanes. Hurricane Keith provided a frightening reminder that Belize is, and will remain vulnerable to, climatic extremes.

The relocation of Government's main administrative center to Belmopan after Hurricane Hattie in 1961; the threat from Hurricane Mitch in 1998, which resulted in the development of plans for a satellite city at Mile 31 to relocate coastal residents; and the impacts of Hurricane Keith in 2000 are salient reminders of this vulnerability.

Unfortunately, these problems will be amplified in the future. Further development in coastal areas will increase the numbers of people and the extent of infrastructure that will be exposed. In addition, in an area where most development is at or within a few centimeters of water level, rising sea-level is potentially of major consequence for Belize. Scenarios in use up to 2000 for future change in mean sea level are 4 centimeters in 25 years, 30 centimeters in 25 years, and 50 centimeters in 100 years. These numbers do not take account of ground subsidence.

So too, is the projected increase in frequency and intensity of hurricanes with accelerated climate change. Permanent coastal inundation, inadequate drainage, salt-water intrusion and shoreline retreat are all consequences of steadily rising mean sea-level.



Flooding in Caye Caulker following the near hit by Hurricane Mitch (Anne Heredia)



Destroyed and damaged infrastructure on Caye Caulker following Hurricane Keith. (CZMAI)

A paper prepared through the National Meteorological Service for the regional Planning for Adaptation to Climate Change Project recommends an adaptive response strategy, and makes recommendations that are a mix of pro-active planning and on-going adaptive response. While responses to potential problems are at a preliminary stage of discussion, proposals include the following:

- Appropriate set-backs are developed and applied on undeveloped coastal areas.
- Relocation of vulnerable coastal communities and provision of shoreline protection to developed areas.
- Construction of new townships in coastal areas, and new residences within inland coastal plains are discouraged, while creation of new economic activities away from coastal areas is proposed.
- Reconstruction on damaged coastal properties should be discouraged.

- Adoption of the National Parks and Protected Areas System Plan will provide some assurance of continuity in the capacity of the natural coastal ecosystem to respond to future changes and events.

The extent of vulnerability and risk associated with occupation and natural resource use of the coastal zone will be a significant factor in the demographic, economic and development future of Belize, and a complex mix of market forces and policy-making will determine the response to this problem.

Assessment of risk by lending agencies, mortgage and insurance companies may act to dampen investment in the coastal zone as storms and sea-level rise become more of a threat. In addition, public and corporate perception of the risks will sharpen should Belize suffer with increasing frequency from the effects of climate change. Moreover, continual improvement of the capacity of Government to manage crisis situations will be required, through enhanced facilities at the National Meteorological Service, and in the National Emergency Management Organization and the use of Special Vulnerable Areas.

Actions

The National Meteorological Service is the Focal Point for all climate-change-related activities in Belize, and utilizes the technical capacity of various Government services in its activities. The Service is presently involved in the United Nations Framework Convention on Climate Change, for whom it has produced various papers on vulnerability and possible response mechanisms. It also works on the regional project on Caribbean Planning for Adaptation to Climate Change, soon to be followed by a successor project called Implementation of Adaptation to Climate Change.

The Coastal Zone Management Authority and Institute, working with the National Focal point, will assist planning agencies in developing adaptation response strategies to the threats posed by climate change and sea-level rise.

4.4 Third Strategic Objective: “Building Alliances to Benefit Belizeans”

4.4.1 Introduction

Central to the entire coastal management process are mechanisms that facilitate broad participation of stakeholders in identifying solutions to resource allocation, environmental management and conservation issues. These requirements need to be met through various mechanisms, including committee work, but also, education and awareness.

Think Nationally, Act Locally

The benefits Belize can derive from sound stewardship of coastal area resources are proportionate to the sum of collective contributions. No matter which economic sector in which citizens and residents operate, their contribution played out through application of the principals and guidelines in this Strategy, will help to secure a sustainable future for a nation which depends heavily on the coastal area for its development.

Stakeholders should be able to conceptualize the importance of their individual and collective roles and responsibilities within the wider coastal environment of Belize, and of the region.

4.4.2 Education, Awareness and Communication

Environmental education and public awareness are amongst the most critical functions of the Coastal Zone Management Institute and Authority, who have a full-time member of staff dedicated to this work. The Institute undertakes its own programs and campaigns, and supports the efforts of other organizations to promote conservation and sustainable management of coastal resources.

Presently, several community-based non-governmental organizations are carrying out environmental education and public awareness initiatives throughout Belize. Due to the proximity of many communities to coastal areas and their dependency on coastal resources, these initiatives usually include a marine component. These initiatives are also enhanced by similar activities by other nationally or regionally established organizations, including for example, the Belize Audubon Society, Toledo Institute for Environment and Development, the Belize Tourism Board, and on the cross-boundary issues, The Trinational Alliance for the Gulf of Honduras, and the Belize/Mexico Alliance for Management of Common Coastal Resources. Appendix 1 contains a wider list of Non-Governmental Organizations who work in the community on natural resources issues.

The primary objective of these coastal programs is to increase and improve the knowledge and understanding of issues affecting the coastal zone, and therefore better prepare communities to make informed decisions on the use of coastal resources to ensure the sustainability of their livelihood.

From 1999-onwards, the focus within the Coastal Zone Management Authority and Institute has largely

been on public awareness and communication with environmental education largely being school-based activities, and community presentations. The initial focus has been on gaining public awareness for the coastal management process. This has allowed for public recognition and therefore interest, when an educational campaign is implemented. While this continues, it is recognized that there needs to be a shift from general public awareness and education to community-based environmental education programmes that would address issues and concerns specific to that community.



Speaking with members of the Placencia chapter of the Belize Tourism Industry Association Product Development Committee about CZMAI and environmental community issues. (CZMAI)

In addition, during Strategy consultations, the need was identified to target other groups. These include senior Government officials, including top civil servants, politicians, and members of various authorities involved with implementation and

enforcement of laws and regulations that govern coastal zone management. These included the police, the marine wing of the Belize Defence Force, and staff of agencies including forestry, fisheries and planning

Actions

The workplan and budgets for the Coastal Zone Management Authority and Institute for 2000-2004 allow for sustained interventions in the public arena in creating awareness, and undertaking educational campaigns. The Institute will:

- Sustain its highly successful campaign related to Manatee conservation.
- Undertake a public awareness program targeted at the dive industry.
- Establish a web-site.
- Assist development of educational material on the new Fisheries legislation.
- Expand the dialogue with fishermen and fisheries cooperatives on coastal management issues, to include the purpose and value of marine protected areas, and promotion of sustainable fisheries.
- Provide displays at various shows, for example the Agricultural Show, and Tourism Week.
- Make presentations at various stakeholder meetings including Village Councils and the Belize Tourism Industry Association.
- Further development of brochures for Marine Protected Areas including Sapodilla Cayes, Laughing Bird Caye, Glover's Reef, and Caye Caulker.
- Preparation and dissemination of the Annual 'State of the Coastal Zone' Report.
- Plan and deliver short programs on coastal management to agencies such as the Marine Wing and Police.
- Identify opportunities at which senior civil servants, and politicians, can be briefed and advised on key coastal management issues.

The Institute will take every opportunity linked to planned events, issues of public concern, consultancies undertaken on behalf of the Institute and natural climatic events such as storms or coral bleaching, to provide information and perspective to the public.

4.4.3 Collaboration in Enforcement and Monitoring

The extensive coastal area of Belize, with its numerous estuaries, over 1,000 cayes, and extensive fishing banks, requires monitoring and policing to enforce the many laws and regulations relating to the coastal zone. This is a huge task, for which there are limited financial, human and physical resources to accomplish. It is generally recognized that there is a need for enhancement of these activities.

Government Departments have developed a close informal collaboration for sharing equipment, people and resources for a wide range of inspection and monitoring activities. Some legal backstopping for resourcing these tasks is available. For example, the Environmental Protection Act, and Fisheries Act, allow the Minister, on advice of the Chief Environmental Officer and Fisheries Administrator, to appoint various persons from within, and in instances outside of Government, to assist in these tasks.

Within Marine Protected Areas, legislation allows the appointment of rangers, who receive training and are placed *in situ* in remote areas that would otherwise be difficult to monitor.

There are many other agencies with responsibilities for various forms of inspection and monitoring in coastal areas, including the Forest Department, Geology and Petroleum Department, Lands and Surveys Department, Customs Department, Police Department and Marine Wing of the Belize Defence Force. There is considerable merit in considering the roles and responsibilities of these organizations, the resources that are available to them for their work, and additional mechanisms by which collaboration can be pursued.

Actions

- The Coastal Zone Management Authority will initiate a review of existing arrangements for monitoring and enforcement of laws and regulations in the coastal zone of Belize.
- The review will take account of existing legislative and regulatory requirements; the resources that are available to undertake this work, and identify the activities and mechanisms currently in place to fulfill these requirements.
- From this, a gap analysis will identify the weaknesses in present arrangements.
- Proposals will be developed that optimise use of all available resources both in Government, the Non-Governmental and private sectors, to deliver the best possible cover for the range of activities identified. Coordinating bodies and mechanisms will be identified.
- These reports, and proposals, should be submitted to Cabinet for endorsement.

4.4.4 Coastal Advisory Committees and the Coastal Planning Process

The practice of bringing together a stakeholder or community committee to oversee the drafting of regional coastal management plans required by the Strategy is to be facilitated by establishing formal Coastal Advisory Committees for each coastal planning region (see figure 5). These committees should be fully informed on the planning process throughout its drafting phase by regular meetings with the planners, and they should formally approve the draft plans before they are sent to the Coastal Zone Advisory

Council for assessment and approval. The first of these was established for the Turneffe Islands Atoll in 1995, the most recent for Caye Caulker in 2000.

Membership as proposed consists of elected community representatives from city, town and village councils, with further membership from local non-government and community based organizations, local institutions, major employers and fishing cooperatives. It is suggested that the initial invitation is considered a 'first draft' and that membership could be altered after the first or subsequent meetings. The Physical Planning Section, through the Land Utilization Authority, has habitually published the declaration of a Special Development Area as a statutory instrument in the gazette, together with formal appointment of advisory committees. The Authority and Institute should also consider this option as it both notifies the public and lends authority to the process.

Other questions remain:

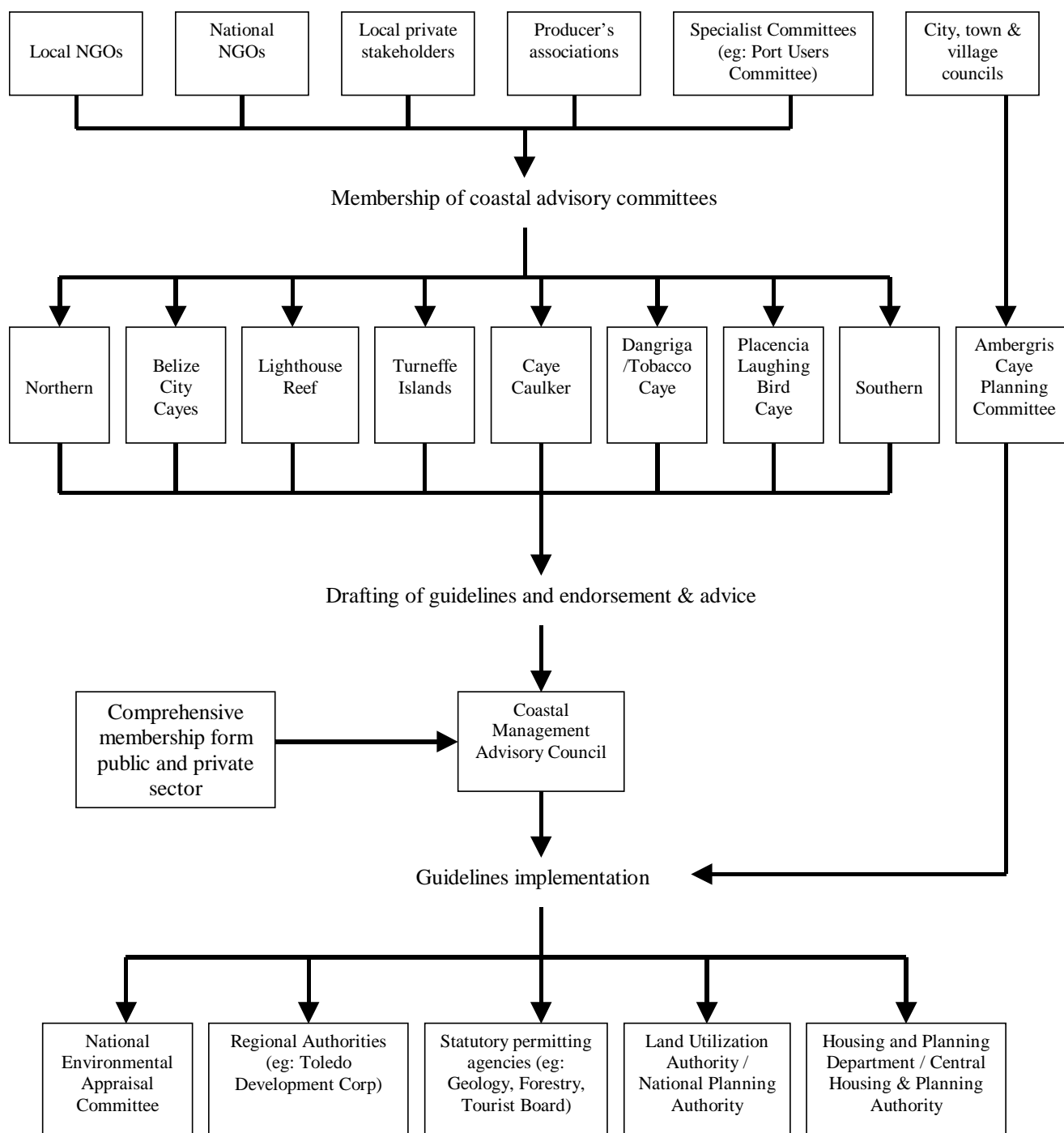
- How should coastal advisory committees be financed, or reimbursed for expenses, and
- What degree of permanence should they be given in order to monitor the implementation and impact of the management plans?

It is unlikely they could be viably financed through any tax or permit revenue, hence participation may be voluntary. This, however, may allow for special interests, exclusivity and unaccountability. In this case the Authority and Institute should maintain the right to alter membership as necessity dictates. Opportunity does exist, through the Village Councils Act and possibly the Town Councils Act, to enable the councils to take responsibility for sections of any coastal management plans that may fall within their boundaries.

The Authority and Institute are limited in their ability to directly implement planning policies and recommendations. It is possible that clearer means of delegation and coordination are established with partner agencies. Considerable liaison and negotiation with these agencies will be required and it is recommended that resulting means are included in regulations to the Coastal Zone Management Act.

The Authority and Institute currently employs one coastal planner. This is not sufficient to launch a comprehensive regional planning program, and it is recommended that a similar approach is taken to that currently being recommended for the Physical Planning Section. This entails the retention of a central planning capacity within the Institute to oversee the program, give technical and policy guidance and ensure that the scheduling of the program is undertaken within an accepted framework. Actual drafting of detailed coastal management plan should be undertaken through tender in much the same manner as is used in the drafting of management plans for protected areas.

Figure 5: The Role of Coastal Advisory Committees in the Coastal Planning Process



Actions

The Coastal Zone Management Authority and Institute will:

- As part of their workplan for 2000-2001, establish the first Coastal Advisory Committee and undertake the demonstration project for Caye Caulker, establishing terms of reference and operating procedures for this and other Committees who will be involved with the coastal planning process.
- Assess financial requirements for maintaining committee functions, and the necessity for having their role recognized through the Coastal Management Act.
- Take an active interest in the scheduled Land Management Project which has a particular focus on augmenting the land use planning remit and capabilities of the Physical Planning Section.
- Consider a combined public information exercise on development planning issues with the Physical Planning Section of the Lands and Survey Department and, if appropriate, the Housing and Planning Department.
- Seek formal means for all applications impacting on the coastal area to be referred to the Coastal Zone Advisory Council by the relevant permitting agencies.
- Seek formal representation on the Land Utilization Authority, the Central Housing and Planning Authority and the proposed Toledo Development Corporation.
- Allow drafting of coastal management plans to be undertaken through consultants in similar manner used in the drafting of management plans for protected areas.

4.4.5 Investment Agencies and Coastal Management Issues

At the core of service delivery by Government Agencies is the need to facilitate, through the strategic objectives of this plan, appropriate forms of economic development in the coastal area of Belize. The procedures for approving development are cumbersome, and require many steps and many agencies.

The establishment of the Belize Trade and Investment Development Service as a 'one-stop' center for national and foreign investors offering information on investment procedures and requirements represents a major intervention in streamlining. Assistance consists of advice on the development of industries, pre-feasibility studies, and the expedition of the granting of government approvals. Emphasis is focused on the primary investment sectors of agriculture (including aquaculture), tourism, manufacture and processing.

The mechanism devised in the environmental impact assessment process by the Department of Environment involved several tiers. The first of these was a link between regulatory agencies and development agencies, at the time of proposal or project development. Early participation can assist the developer in:

- understanding the full requirements for investment,
- streamlining of the approvals process through better understanding of requirements and regulations, and

- may add value to the project by assisting at an early stage of opportunities for enhancement of the overall resource management and environmental profile of the project.

This stage is not always employed, although the next stage or tier is. This is when the Department of Environment is consulted on potential environmental impacts, after the project profile has been developed. The Coastal Zone Management Authority and Institute are in a good technical position to advise on the implications of projects at an early stage of their development. There are resourcing implications for being further involved in terms of staff commitments, which would require evaluation. However, the benefits in terms of service delivery on the investment situation may be beneficial. Such activities are not a substitute for the formal environmental assessment process, but a support to them, and the Department of Environment foresaw such involvement when it crafted the legislation for environmental assessment. Early intervention can identify at a coarse level, areas of concern or constraint in the proposals being developed.

Actions

It is proposed that the Coastal Zone Management Authority and Institute should establish direct liaison in the first instance with the Belize Trade and Investment Development Service to facilitate early intervention. Formal links with the Belize Tourist Board and other agencies as appropriate should be considered.

4.4.6 Streamlining of Committee Functions

Currently there are five principal statutory committee structures overseeing a range of management issues specifically relevant to the coastal area:

- The Coastal Advisory Council: has representation from a wide variety of private, public and voluntary sector interests and is responsible for overseeing general, multi sector management issues, and authorizing the coastal regional development planning program.
- The National Environmental Appraisal Committee: consists mainly of representation from government departments though with some private and voluntary participation, and is charged with assessing the requirement for environmental screening of developments, any subsequent environmental impact assessments, and their compliance.
- The Belize National Tourism Council: has representation from the tourism industry and government, and oversees general tourism policy and development of the industry.
- The Land Utilization Authority: has membership limited to a few government officers and appointed members of the private sector, and regulates the sub-division of property and authorizing the Special Development Area planning program.
- The Central Housing and Planning Authority: has representation from a limited range of government departments with minimal private sector participation, and oversees mainly urban development schemes and development plans.

There is considerable duplication in the remit and membership in the first three of these committees, all of which have been established within the last ten or less years. The latter two are considerably older and do not adequately reflect the public and private sector interests that have grown in the interim, though the Land Utilization Authority in particular has an important influence and authority on coastal issues. A concern expressed during Strategy preparation is that the same agencies and organizations tend to be represented in each of these communities, and that community groups and non-governmental organizations should be able to participate more fully. Other committees also exist, such as the Fisheries Advisory Board, the Belize Alliance of Conservation Non Government Organizations, The Port User's Committee, and the Ambergris Caye Planning Committee to focus on specialized sectors and specific locations.

While most of these committees have an impact on policy formulation, either through declaration or recommendation, only the National Environmental Appraisal Committee and the Land Utilization Authority have any direct permitting powers on actual development proposals. Moreover much of the decision-making that heavily impacts the coastal area is subject to limited or negligible participation from either the public or private sectors.

- Mining, prospecting and dredging is subject only to public notification.
- Hotel registration is done entirely within the Belize Tourism Board.
- Applications for mangrove permits and logging licenses are not publicized.
- Leases of National land are not advertised.
- Applications for coastal structures are assessed without formal participation by the concerned community or other interests.
- Applications for the subdivision of private lands are decided upon *in camera* by the Land Utilization Authority.

While the committees facilitate representation on a wide range of concerns over the coastal area, they also allow for a high degree of duplication, and potential misunderstanding among the various interested parties. The public perception of 'inefficiency' in these procedures may also represent a potential hindrance to effective development management, and can encourage the circumvention of the requirements of one agency's procedures by seeking approval through another. Moreover the widespread absence of public notification does not enable communities or other stakeholders to identify or express their interests or concerns.

Actions

The Coastal Zone Management Authority and Institute will:

- Undertake a consultation process with organizations who are responsible for running these committees to determine ways in which wide participation and action-oriented decision-making can be achieved, while reducing the overlap and duplication of meetings. The Chief Executive Officer of the Authority should develop this intervention, through correct channels after discussion with the Coastal Zone Management Board, and allow for the results to be presented to the Ministries under whose responsibility these committees are convened. To ensure cross-departmental action is taken, it may be necessary for this initiative to be approved through Cabinet.
- The review should take into account the base of participation needed throughout society to ensure appropriate consultation in the decision-process.
- Through legislative and institutional review, identify specific mechanisms that will enhance the functions of these committees in influencing the decision-process on activities related to the coastal zone.

4.4.7 The Civil Society Movement and the Land Alliance for National Development

The Civil Society Movement, established in 1996, is a coalition of non government organizations who promote the concept of participatory democracy and the maximized involvement of society in policy initiation and implementation. It has five particular areas of focus: political reform, social and economic justice, education, youth empowerment, and land policy.

While themes run through all the areas of concern that are pertinent to management and allocation of coastal resources, the primary focus relates to the issue of land, which, from a wider coastal perspective, is regarded as a natural resource. Spearheading this concern on behalf of the Movement is the Land Alliance for National Development. The Alliance has identified several concerns of which the following have particular relevance to the Coastal Zone Management Strategy: These include:

- Lack of effective enforcement of the existing laws.
- Dominance of large scale interests, and the lack of policy, in the allocation and use of resources.
- Insufficient scope for the accommodation of community needs.
- Negative impact on the environment of unchecked development.

These areas of concern have been distilled into a call for the drafting of a comprehensive national land policy. A deadline for accomplishment has been set at September 2001.

The Ministry of Natural Resources and the Environment has announced the intention of establishing a Land Policy Committee to review most, if not all, land related legislation with a view to drafting a policy. As the majority of cayes are nationally owned and the sea bed is defined as National Land it can be assumed that the review will extend its remit into the coastal zone.

Actions

The Coastal Zone Management Authority and Institute will:

- Seek to participate in the proposed Land Policy Committee. It should also maintain an interest in initiatives stemming from the Land Alliance for National Development, to inform and advise as appropriate on coastal zone management policy.
- During public education campaigns, ensure that stakeholders within the Land Alliance for National Development are included in outreach activities.

5 CONCERNING STRATEGY IMPLEMENTATION

5.1 Taking Realistic Steps

This Strategy does not diverge drastically from the day-to-day responsibilities and functions of stakeholders involved in aspects of Coastal Area Management. Rather, the Strategy incorporates key elements of existing Strategies and Actions Plans that are relevant to the coastal area, and which are implemented by other players.

To do otherwise would be to invent unnecessary new mechanisms and invite unrealistic expectations for delivery of results from agencies already heavily involved with these issues.

The legislation, regulations, guidelines and policies available to the country for coastal area management will require additions, amendments and modifications in due course, and numerous actions are identified to this end in the Strategy. What must be reinforced, also, is the consistent application of existing and new 'policies' across their full geographic, institutional and technical spectrum. This *integration* of the wide range of activities currently in progress is an absolute requirement for successful management of the coastal resources of Belize.

The Strategy is a statutory document, and the Coastal Zone Management Authority and Institute, whose legally mandated responsibility is to ensure that the Strategy objectives are met will continue to work closely with all other agencies to ensure that the spirit and substance of the Strategy are fulfilled. The main thrust of this Strategy is therefore to *improve coordination* to achieve the Strategic Objectives.

5.2 Key Stages in Strategy Implementation

The process by which the Strategy will be adopted and implemented will be as follows.

Adoption of the Strategy

- Circulation of Draft Strategy to participants in consultations and other stakeholders- December, 2000 - May, 2001
- Submit to Ministry for approval – June/July, 2001
- Submit to House of Representatives for Approval – August, 2001
- Gazetted – September, 2001.

There is legal requirement for the Coastal Management Plan of which this Strategy is the first part, to be reviewed and amended every four years. This will require that the Authority and Institute commission an analysis of activities and achievements related to functional integration and policy improvement in advance of the statutory deadline for plan review.

Implementation of Actions

The Coastal Zone Management Authority and Institute will, as the lead agency, continue to implement the actions that are outlined in the Strategy. Many of these actions form part of the existing work-plan for the Global Environment Fund/United Nations Development Program Project under which this Strategy has been produced. These activities will take place between December 2000 and July 2004. Activities include:

- Upgrade of the Cayes Development Policy.
- Further development of the Coastal Advisory Committee system, as a pre-cursor to regional coastal management planning.
- The delivery of a demonstration project on coastal planning using Caye Caulker as a model.
- Strengthening of the management arrangements for Marine Protected Areas, including capacity building within government and the non-government organizations involved.
- A structured public education and awareness campaign.
- Legislative review and strengthening, taking account of proposals in the Strategy.
- Scientific research and monitoring of physical and biological characteristics of the coastal zone.
- A sustained program addressing wildlife conservation, especially manatees.
- Preparation of additional regional integrated coastal management plans.
- Coordination and enhancement of coastal area research and monitoring at a national level.

In addition, mechanisms to sustain the longer-term financial future of the coastal management system beyond the period when the present external funding arrangements end in 2004 are being investigated through consultancies during 2001.

Day-to day activities of a collaborative nature will continue with agencies of Government on a range of issues, which include development control, through the work of the National Environmental Appraisal Committee.

The Authority and Institute will identify financial resources that will facilitate the more detailed requirements for regional coastal planning, as well as coastal research and monitoring programs, to progress further phases of the coastal management planning process.

The Summary provided at the beginning of this document tabulates the main topics, time frame and actions required to fulfil them. Text boxes in the Strategy provide full details of requirements for implementation under each topic area.

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APPENDIX 1, page 1

Statutory Coastal Functions and Responsibilities in Belize

PRIMARY FUNCTION	RESPONSIBLE AGENCY	LEGISLATION	CONT
Agricultural development and management	Department of Agriculture	Pesticides Control Act Banana Industry Act Citrus Control Act Sugar Cane Act Agricultural Fires Act	Chief Agriculture
Aquaculture management	Fisheries Department	Fisheries Act	Fisheries Adminis
Coastal construction	Lands and Surveys Department Housing and Planning Department Ministry of Works	National Lands Act Housing and Town Planning Act Dangerous Buildings Building Act Public Roads Act	Physical Planner Housing Officer Chief Engineer
Community development	Ministry of Rural Development Department of Human Development	Village Councils Act	Director of Human Director
Dredging and land creation	Geology and Petroleum Department Lands and Surveys Department	Mines and Minerals Act National Lands Act	Inspector of Mine Physical Planner
Emergency preparedness	National Emergency Management Organization		National Emergen ordinator
Environmental protection and impact assessment	Department of the Environment Public Health Bureau	Environmental Protection Act Dumping at Sea Act Public Health Act	Chief Environmen Chief Public Heal

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Statutory Coastal Functions and Responsibilities in Belize

PRIMARY FUNCTION	RESPONSIBLE AGENCY	LEGISLATION	CONTACT
Establishment and management of protected areas	Forest Department	National Park Systems Act	Chief Forest Officer / Protected Areas Officer
	Fisheries Department	Fisheries Act	Fisheries Administrator / Protected Areas Coordinator
	Department of Archaeology	Ancient Monuments and Antiquities Act	Archaeological Commissioner
Fiscal incentives and investment promotion	Belize Trade and Investment Development Service Ministry of Trade and Investment	Trades and Investment Promotion Services (Amendment) Act Export Processing Zone Act Fiscal Incentives Act	General Manager Permanent Secretary / Chief Executive Officer
Fishing management	Fisheries Department	Fisheries Act	Fisheries Administrator
Integrated coastal zone management	Coastal Zone Management Authority and Institute	Coastal Zone Management Act	Chief Executive Officer / Director
Land speculation and marketing	Lands and Surveys Department	Aliens Landholding Act Land Tax Act	Commissioner of Lands and Surveys / Physical Planner / Chief Valuer
Land use planning	Land Utilization Authority Physical Planning Section Central Housing and Planning Authority	Land Utilization Ordinance	Commissioner of Lands and Surveys / Physical Planner
		Housing and Town Planning Act	Housing Officer
Mangrove alteration	Forestry Department	Forest (Protection of Mangrove) Regulations	Chief Forest Officer / Mangrove Officer
Marine transportation management and regulation	Belize Port Authority	Belize Port Authority Act	Ports Commissioner
	Customs Department	Merchant Shipping Act	Comptroller of Customs
	Police Department		Officer in Charge (Traffic Branch)
Natural resource allocation	Lands and Surveys Department	National Lands Act	Chief Forest Officer
	Forest Department	Forest Act	Inspector of Mines
	Geology and Petroleum Department	Mines and Minerals Act	
		Petroleum Act	
Recreation	Local municipalities	Belize City Council Act	Mayor
		Town Councils Act Village Councils Act	Mayors Chairpersons
	Sports Council		Director

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Statutory Coastal Functions and Responsibilities in Belize

PRIMARY FUNCTION	RESPONSIBLE AGENCY	LEGISLATION	CONT
Tourism development, marketing and maintenance of standards	Belize Tourism Board	Belize Tourism Board Act	Director Product Developm
Waste management	Department of the Environment Public Health Bureau Water and Sewerage Authority City, town and village councils	Environmental Protection Act Public Health Act Water and Sewerage Act Belize City Council Act Town Councils Act Village Councils Act Solid Waste Management Authority Act	Chief Environmer Chief Public Heal Managing Directc Mayor Mayors Chairpersons
Water management	Water And Sewerage Authority Public Health Bureau Department of the Environment Hydrology Unit	Water and Sewerage Act Public Health Act Environmental Protection Act	Managing Directc Chief Public Heal Chief Environmer Chief Meteorolog
Wildlife management	Forest Department Fisheries Department	Wildlife Protection Act Fisheries Act	Chief Forest Offic Protection Officer Fisheries Adminis Ecosystems Mana

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Non-Governmental Organizations involved in Coastal Management in Belize

Organization	Acronym	Location of interest	Description	
Aquaculture Association of Belize		Nationwide	Representation of the aquaculture industry, product development, marketing and protection of standards	
Association of National Development Agencies	ANDA	Nationwide	A leading organization for policy analysis and change in the development sector	Chairp
Belize Audubon Society	BAS	Entire country and specifically Lighthouse Reef atoll	Preservation of the country's natural resources through co-management, advocacy, education and research	Execut
Belize Alliance of Conservation Non government Organizations	BACONGO	Nationwide	Umbrella association for environmental and natural resources management organizations	Execut
Belize Association of Producer Organizations	BAPO	Nationwide	Umbrella organization for environmental and natural resources management organizations in Belize	Execut
Belize Business Bureau	BBB	Nationwide	Developing and strengthening the production and service sectors	Genera
Belize Chamber of Commerce and Industry	BCCI	Nationwide	Private sector organization to foster economic and social well-being of the nation through free enterprise	Genera
Belize Civil Society Movement	BCSM	Nationwide	A network organization for civil society organizations to establish a role in the governance and development of Belize	Conver

APPENDIX 2, page 2

Non-Governmental Organizations involved in Coastal Management in Belize

Organization	Acronym	Location of interest	Description	Contact
Belize Enterprise for Sustainable Technology	BEST	Nationwide	Working with the poor and other in need to improve their social, economic and environmental conditions	Managing Director
Belize Fishermen Cooperative Society	BFCA	Nationwide	Representation of the fishermen, training, product development and marketing	Chairman
Belize/Mexico Alliance for the Management of Common Coastal Resources	BEMAMCCOR	Shared resources between Belize and Mexico	Umbrella organization for environmental and natural resources management organizations for shared resources for Belize and Mexico	Secretariat
Belize Tourism Industry Association	BTIA	Nationwide	Official private sector organization representing over 300 members of the tourism industry through product development and advocacy	General Manager
Caribena Fishermen Cooperative Society		Nationwide	Fisheries management, product development, marketing and training	Manager
Community Initiated Agricultural and Resource Development Project	CARD	Toledo	A quasi government agency working towards sustainable rural development	Project Manager
Cruise Ship Industry Association		Nationwide	Representation of cruise ship operators and affiliates through product development, advocacy and industry management	Secretary
Forest And Marine Association of Caye Caulker	FAMRACC	Caye Caulker Forest Reserve and Marine Reserve	Co-management of local protected areas	Secretary
Friends of Laughing Bird Caye	FOLBC	Laughing Bird Caye National Park and Gladden Split and Silk Caye Marine Reserve	Co-management, advocacy	Chairman

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Non-Governmental Organizations involved in Coastal Management in Belize

Organization	Acronym	Location of interest	Description	
Friends of Gra Gra Lagoon	FGGL	Dangriga vicinity	Preservation of the Gra Gra Lagoon south of Dangriga Town	Secre
Friends of Placencia Lagoon	FPL	Placencia Lagoon	Protection of the lagoon's natural values for conservation and eco-tourism	Secre
Golden Stream Corridor Preserve	GSCP	Toledo	Conservation of the Golden Stream corridor preserve running from the Maya Mountains to the coastal area in Toledo	Direc
Green Reef		Ambergris Caye and specifically the several cayes reserved as bird reserves	Sustainable use and conservation of Belize's marine and coastal resources	Exec
Help For Progress	HELP	Nationwide	Specializes in rural community development work in the poorest districts of Belize	Prog Direc
Institute of Marine Studies / University of Belize	IMS	Nationwide	An arm of the university which focuses on research in the marine environment	Coor
National Development Foundation Bank of Belize	NDFB	Nationwide	Institutional loans to small businesses	Mana
Northern Fishermen Cooperative Society		Nationwide	Fisheries management, product development, marketing and training	Mana
National Land Alliance for Development	LAND	Nationwide	An alliance of non-government organizations dedicated to a land policy in Belize based on equitable allocation, accountability and transparency	SPE/ BAP

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Non-Governmental Organizations involved in Coastal Management in Belize

Organization	Acronym	Location of interest	Description	Contact
Protected Areas Conservation Trust	PACT	Nationwide	A quasi government agency responsible for funding the management of protected areas, training, and publicity	Director
Raleigh International		Nationwide	Development of young people through participation in a series of demanding environmental, community and adventure projects	Expedition Leader
Sarstoon Temash Institute for Indigenous Management	SATIM	Sarstoon-Temash National Park area	Promoting local community enhancement through co-management	Program Coordinator
Shipstern Nature Reserve	SNR	Shipstern private Nature Reserve and the Sarteneja vicinity	Managing the only nature reserve in Belize protecting seasonally dry northern hardwood forests, lagoons and wildlife. Also promotes local research	Director
Sibun Watershed Alliance	SWA	Sibun River watershed	Community based environmental education organization working in the watershed	Project Support Coordinator
Siwa-Ban Foundation	SBF	Caye Caulker and vicinity	Helping to maintain the integrity of tropical marine systems through education, conservation and research	Coordinator
Society for the Promotion of Education And Research	SPEAR	Nationwide	Empowerment of people to struggle for justice, democracy and sustainable development through education, advocacy and training	Executive Director
SouthernAlliance for Grassroots Empowerment	SAGE	Toledo	An alliance of non government organizations in Toledo that undertake advocacy campaigns	Interim Programme Officer

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Non-Governmental Organizations involved in Coastal Management in Belize

Organization	Acronym	Location of interest	Description	
Tri-National Alliance of Non-Governmental Organizations in Gulf of Honduras	TRIGOH	Gulf of Honduras	Alliance of NGO's from Belize, Guatemala and Honduras working for the benefit of the Gulf of Honduras	Secret
Toledo Association for Sustainable Tourism and Environment	TASTE	Sapodilla Cayes Marine Reserve	Co- management of the marine reserve with a view to enhancing its value for conservation and tourism	Direct
Toledo Eco-Tourism Association	TETA	Toledo	Promoting eco-tourism and sustainable development amongst Maya and Garifuna communities	Chair
Toledo Institute for Development and Environment	TIDE	The Toledo coastal environment and specifically the Port Honduras Marine Reserve and Payne's Creek National Park	Working to attain sustainable development for the benefit of present and future generations in the Toledo District, through co-management, education, publicity, and research	Execu
United Nations Development Programme	UNDP	Nationwide	An intergovernmental agency that promotes and supports activities within the framework of sustainable human development. Administration of the Global Environmental Facility Fund	Progr
Wildtracks		North eastern Corozal District	Education and awareness with specific reference to wildlife	
Watershed Reef Interconnectivity	WRISCS	Belize, Stann Creek and Toledo Districts	Research on river catchment, sediment transport and its effect on the marine environment	

APPENDIX 3, page 1

Status of Coastal and Marine Protected Areas in Belize

Protected Area		Declared or Proposed	Private or State Owned	UNESCO World Heritage Site	Responsible Agency	Legislation	Management Plan +	Active Management
Category	Name							
National Park	Laughing Bird Caye	Declared	State	Yes	Forest Dept	NPSA	Yes (Draft Under Revision)	In process
	Payne's Creek	Declared	State	No	Forest Dept	NPSA	Yes (Draft)	Yes
	Sarstoon-Temash	Declared	State	No	Forest Dept	NPSA	Yes (Draft)	In process
	Bacalar Chico	Declared	State	Yes	Forest Dept	NPSA	Yes	Yes
Natural Monument	Half Moon Caye	Declared	State	Yes	Forest Dept	NPSA	Yes	Yes
	Blue Hole	Declared	State	Yes	Forest Dept	NPSA	No	Yes
Wildlife Sanctuary	Corozal Bay (Manatee)	Declared	State	No	Forest Dept	NPSA	In process	No
	Gales Point (W. I. Manatee)	Declared	State	No	Forest Dept	NPSA	No	No

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Status of Coastal and Marine Protected Areas in Belize

Protected Area		Declared or Proposed	Private or State Owned	UNESCO World Heritage Site	Responsible Agency	Legislation	Management Plan +	Active Management
Category	Name							
Forest Reserve	Deep River	Declared	State	No	Forest Dept	Forest Act	No	No
	Fresh Water Creek	Declared	State	No	Forest Dept	Forest Act	No	No
	Manatee	Declared	State	No	Forest Dept	Forest Act	No	No
	Mango Creek	Declared	State	No	Forest Dept	Forest Act	No	No
	Cay Caulker	Declared	State	No	Forest Dept	Forest Act	Yes (Draft)	In process
	Bird Cayes	Declared	State	No	Forest Dept	NPSA	Yes	Yes
Marine Reserve	Monkey Caye	Declared	State	No	Forest Dept	Forest Act	No	No
	Sapodilla Cayes	Declared	State	Yes	Fisheries Dept	Fisheries Act	Yes	In process
	Southwater Caye	Declared	State	Yes	Fisheries Dept	Fisheries Act	Yes	In process
	Glover's Reef	Declared	State	Yes	Fisheries Dept	Fisheries Act	Yes	Yes
	Hol Chan	Declared	State	No	Fisheries Dept	Fisheries Act	Yes	Yes

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Status of Coastal and Marine Protected Areas in Belize

Protected Area		Declared or Proposed	Private or State Owned	UNESCO World Heritage Site	Responsible Agency	Legislation	Management Plan +	Active Management	Management Institution/ Contact
Category	Name								
	Bacalar Chico	Declared	State	Yes	Fisheries Dept	Fisheries Act	Yes	Yes	Fisheries Department (02-44552)
	Caye Caulker	Declared	State	No	Fisheries Dept	Fisheries Act	Yes (Draft)	Yes	Fisheries Department (FAMRACC * 022-2043)
	Port Honduras	Declared	State	No	Fisheries Dept	Fisheries Act	Yes (Draft)	Yes	Fisheries Department (TIDE * 07-22274)
	Gladden Split and Silk Cayes	Declared	State	No	Fisheries Dept	Fisheries Act	No	No	Expected to be FOLBC * (06-23166)
Archaeological Reserve	Cerro Maya	Declared	State	No	Archaeology Dept	Ancient Monuments and Antiquities Act	No	Yes	Archaeology Department (08-22106)
Nature Reserve	Burdon Canal	Declared	State	No	Forest Dept	NPSA	No	No	
Private Reserve	Golden Stream	Declared	Private	No	No				
	Shipstern	Declared	Private	No			Yes	Yes	Shipstern Natur Reserve (02-33855)

KEY: NPSA = National Park Systems Act; TIDE = Toledo Institute for Development and Environment; FOLBC = Friends of Laughing Bird Caye; UNESCO = United Nations Educational Scientific Cultural Organization; BAS = Belize Audubon Society; FAMRACC = Forest And Marine Reserves Association of Caye Caulker; HCTF = Hol Chan Trust Fund; TASTE = Toledo Association for Sustainable Tourism and Environment; Satem = Sarstoon Temash; ITCF = International Tropical Conservation Foundation; + denotes unofficial management plans; * denotes an arrangement is or will be signed).

There are also seven other **proposed coastal/marine protected areas** currently. These include: Mexican Rocks, Shipstern Caye and Lagoon, Belize River Mouth, Placencia Peninsula, Four Mile Lagoon, Marco Gonzalez Site (South San Pedro) and Turneffe Sites. However, the proposed classification for most of these is unclear.

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Consultees in the ICZM Strategy

1. Martin Alegria, Deputy Environmental Officer, Department of the Environment
2. Anthony Andrews, Planning Technician, Housing and Planning Department
3. Marcelino Avila, PS, Ministry of Agriculture & Fisheries
4. James Azueta, Marine Ecosystems Officer, Fisheries Department
5. Malukah Cardona, Physical Planner, Lands & Survey Department
6. Roy Cayetano, PS, Ministry of Rural Development
7. Gregory Choc, Sarstoon Temash Institute for Indigenous Management
8. Angel Chun, Conservation Officer, Forest Department
9. Ismael Fabro, Chief Environmental Officer, Department of the Environment
10. Carlos Fuller, Chief Meteorological Officer, Department of Meteorology
11. Eden Garcia, Institute of Marine Studies, University of Belize
12. Diane Haylock, Executive Director, Society for the Promotion of Education and Research
13. Nimmi Herrera, Advocacy Officer, Belize Audubon Society
14. Noel Jacobs, Consultant to the Mesoamerican Barrier Reef Project
15. Capt John Watson, Port Commissioner, Belize Port Authority
16. Lydia Leacock, Atlantic Insurance
17. Wil Maheia, Director, Toledo Institute for Development and the Environment
18. Anthony Mahler, Deputy Director of Tourism, Belize Tourist Board
19. Rachel Montejo, Fiscal Incentives Officer, Belize Trade and Investment Development Service
20. George Myvette, Senior Fisheries Officer, Fisheries Department
21. Nancy Namis, Senior Economist, Ministry of Economic Development
22. Jack Nightingale, Toledo Association for Sustainable Tourism and Environment
23. Jose Novelo, Export Business Advisor, Belize Trade and Investment Development Service

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24. John Pinelo, Protected Areas Officer, Forest Department
25. Elvis Requena, Economist, Ministry of Economic Development
26. Osmany Salas, Executive Director, Belize Audubon Society
27. Pio Saqui, Natural Resource Management Co-ordinator, University of Belize
28. Tracy Taegar, Director of Tourism, Belize Tourist Board
29. Peter Usher, General Manager, Belize Trade and Investment Development Service
30. Dylan Vernon, Programme Officer, United Nation Development Program
31. Sergeant Villanueva, Maritime Wing, Belize Defence Force
32. Evadne Wade Garcia, Director, Geology & Petroleum Department
33. Beverly Wade, Ag Fisheries Administrator, Fisheries Department
34. Valerie Woods, Executive Director, Protected Areas Conservation Trust

APPENDIX 5

Participants at the ICZM Strategy Consultation Meetings

Northern region: Corozal Town (November 11th)

Victor Alegria, Bacalar Chico Marine Reserve
 Maria Angelita Magana, CORAL
 Leonal Chan, Corozal Junior College, student
 Jeir Gaspar Valladarez, University of Belize
 Hon Juan Vildo Marin, Area Representative
 Isaias Majil, Bacalar Chico Marine Reserve
 Florencio Marin Jr, Northern Data Processing Ltd
 Eulogio Noh, Corozal Cane Farmers Association
 Orlando Olivera, Copperbank Village Council
 Andres Patt, Chunux Village Council
 Herman Pollard, tour guide
 Lydia Ramcharan Pollard, community member
 Graham Sampson, Corozal Junior College, Environmental Club
 Adina Vello, Candelies Cabanas
 Jorge Verde, Sarteneja Village Council
 William Wildman, Belize Land Consultants Ltd
 Jenny Wildman, Consejo Shores Ltd

Central region: Belize City (November 14th)

Marcial Alamilla III, President, Forest And Marine Reserve Association of Caye Caulker
 Froylan Alvarado, Senior Town Planner, Belize City Council
 Eugene Ariola, Coastal Zone Management Authority & Institute
 Henry Atherley, Product Development / Public Awareness, Belize Tourist Board
 Nicole Auil, Coastal Zone Management Authority & Institute
 James Azueta, Marine Protected Areas Co-ordinator, Fisheries Dept
 Nadia Bood, Coastal Zone Management Authority & Institute
 Phillip Brackett, Head of Department, Housing & Urban Renewal Dept
 John Burks, Manager, Regent Realty Ltd
 Malukah Cardona, Physical Planner, Ministry of Natural Resources & the Environment
 Marion Cayetano, Planner, RME Consultants Group
 Godsman Ellis, President, Belize Institute of Environmental Law & Policy
 John Estephan Jr, Emerald Futures Real Estate
 John Foster, Manager, Animal Management, Belize Zoo & Tropical Education Centre
 Ramon Frutos, Head of Hydrology Unit, National Meteorological Service
 Eden Garcia, Ag Director, Institute of Marine Studies, University of Belize
 Jeanette Garcia, Trade Economist, Ministry of Trade & Investment

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Alma Gomez, Ag Supervisor of Insurance, Office of Supervisor of Insurance
 Frances Griffith, Griffith Personalized Services
 Thom Grimshaw, Thom Grimshaw Aquaculture & Environmental Consultants
 David Heredia, Anchorage Resort, Caye Caulker
 James Hyde, Director, Nova Companies (Belize Ltd) Ltd
 Gaspar Martinez, Programme Officer – Community Empowerment, SPEAR
 Melanie McField, Chairperson BACONGO / Director Shipstern Nature Reserve
 Ellen McRae, Managing Director, Siwa Ban Foundation
 Jose Mendez, Local Co-ordinator, COMPACT / GEF SGP, UNDP
 Domingo Perez, Chairman, San Pedro / Ambergris Caye Planning Committee
 John Pinelo, Protected Areas Officer, Conservation Division, Forest Dept
 Oscar Pollard, President, Belize Rural Association of Leaders
 Elvis Requena, Economist, Ministry of Economic Development
 Julianne Robinson, Marine Protected Areas Co-ordinator, Belize Audubon Society
 Albert Roches, Environmental Technician, Department of the Environment
 Oswaldo Sabido, Chief Forest Officer, Forest Dept
 Greg Smith, Advisor / Director, Green Reef
 Pablo Sosa, Office Manager, Ambergris Caye Planning Committee
 Hart Tillett, President, Organisation of Insurance Companies
 Maria Vega, Director, Belize Tourism Industry Association
 Evadne Wade, Director, Geology & Petroleum Dept

Southern Region: Independence (November 17th)

Marchilio Ack, Golden Stream Corridor Preserve / Golden Stream Village Council
 Oswald Arzu, Banana Growers Association
 Carol Bevier, Belize Tourism Industry Association, Placencia Branch
 George Bevier, Belize National Tour Operators Association
 Fernando Bol, Toledo Community College
 Bridget Cullerton, Citrus Growers association
 Ainsworth Elijah Nunez, Toledo Institute for Development & Environment
 Jose Encalada, Ministry of Works
 Randolph Fleming, Del Oro (Belize) Ltd
 Allen Genus, Community Initiated Agriculture & Resource Rural Development Project
 Steve Gittings, National Ocean & Atmosphere Administration (USA)
 Jennifer Hall, International Zoological Expeditions
 Ruth Halstead, Toledo Eco-tourism Association
 Will Heyman, The Nature Conservancy
 Ray Jacobs, Punta Negra Village Council
 Eduardo Juarez, Toledo Community College
 Wil Maheia, Toledo Institute for Development & Environment
 John Mcdougall, International Zoological Expeditions

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Alain Robinson, Environmental & Social Technical Assistance Project
Kennon Rodney, Toledo Institute for Development & Environment
Kirby Salisbury, Port Honduras Stakeholders
Christina Salisbury, Port Honduras Stakeholders
Eleanor Sandlin, Monkey River Village Council / Belize Tourism Industry Association, Toledo
Gerald Sharp, Del Oro (Belize) Ltd
Richard Sjogreen, Blue Marlin Lodge
Griffith Small Jr, Placencia Producers Association
Terri Valentine, Pelican Beach Resort
Carlton Young, Placencia Fisherman's Cooperative
Rosella Zabaneh, Blue Marlin Lodge



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