

Coastal Zone Planning for Belize

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Key Message

The government of Belize is developing a national Integrated Coastal Zone Management (ICZM) Plan to establish guidelines for the sustainable development and ecological integrity of the coastline for the long-term benefit of the Belizean people. In consultation with stakeholders in Coastal Advisory Committees and the private and public sectors, the Coastal Zone Management Authority and Institute (CZMAI) has designed several possible zoning options for the Plan. Using the modeling tool InVEST, they are able to identify the impact of these alternative zoning schemes on three ecosystem services – lobster fisheries, tourism and recreation, and coastal protection from storms and inundation – and habitat for culturally important species. CZMAI is now developing zoning and use recommendations with stakeholder input and information produced by InVEST. The ICZM Plan will be considered for approval by the Ministry of Forestry, Fisheries and Sustainable Development in December 2012.

What is the problem?

Belize is home to the planet's second longest unbroken reef system – over 280 kilometers long – and its coastal zone contains a rich diversity of habitats and attractions, including three offshore atolls, several coastal lagoons, mangrove forests, and over 300 cays. According to Belize census data from 2010, over 40% of the Belizean population live and work in the coastal zone, sharing the region with endangered

species like the West Indian manatee. World-renowned snorkeling and diving draw over 800,000 tourists to the region annually, driving construction of new coastal development. The same coastal ecosystems also support several commercial, recreational, and subsistence fisheries.

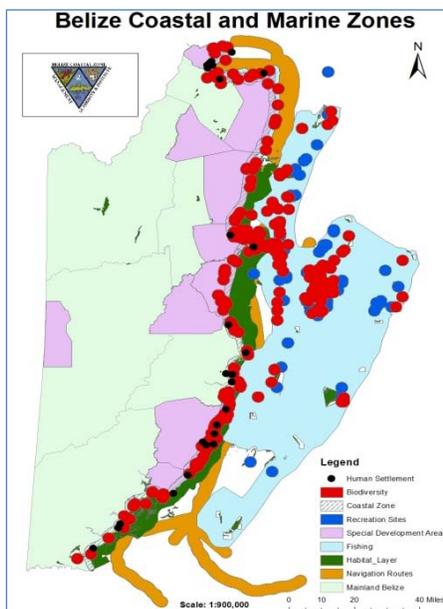


Figure 1 Current coastal and marine uses and zones.

In 1998 the Belizean government passed visionary legislation requiring government agencies to address rapid development, over-fishing, and population growth in the coastal zone, which threaten marine ecosystems and the industries and livelihoods that depend on them. Yet in 2010, an Integrated Coastal Zone Management Plan had not been passed. One obstacle was the lack of good information about the health of the coastal zone and the many existing uses it supported. A second related challenge involved competing interests among stakeholders for conflicting uses of the zone (Figure 1). For example, mangroves and corals provide protection from storms and critical habitat for lobsters – a major source of revenue for Belizean fishing communities – but they are increasingly at risk from coastal

development and marine transportation. Without an integrated plan, national and local governments in Belize have struggled to manage conflicting interests and to make defensible, enduring decisions in managing their marine resources.

What is the role of local policy?

The CZMAI is tasked by the national government to design the ICZM Plan that will serve as a guideline for future permitting and development in the coastal zone. The 1998 Coastal Zone Management Act mandates the CZMAI to submit the Plan to be approved by the House of Representatives and revise it every four years thereafter. The goal of the Plan is to recommend actions that ensure sustainable coastal development through a balanced mix of conservation and utilization, which can support economic growth while promoting the long-term viability of the country's treasured barrier reef and coastline and bolstering uses of the coast that provide for the enduring benefit of Belizeans.

Although national in scope, the Plan will build upon efforts at the local level to develop sustainable resource guidelines. These efforts are coordinated with Coastal Advisory Committees for eight of the nine coastal planning regions along the coast and offshore cayes (Figure 2), which convene representatives of multiple sectors and interests – from tourism to fishing to preservation – and make recommendations for development and conservation in their regions. One of these committees, for Turneffe Atoll, finalized a pioneering set of development guidelines in 2003. The other committees will develop theirs through regular meetings and coordination with the CZMAI. These regional plans will be scaled up to a national set of guidelines.

As an important complement to written guidelines, the Plan will include a zoning scheme, which spatially locates permissible activities and uses. Zones include locations set aside for marine protected areas, as well as areas prioritized for fishing, coastal development, marine tourism, aquaculture, and transportation, and other human uses. The zoning scheme is intended to resolve conflicts in resource use and negotiate competing interests for management of the coastal zone.

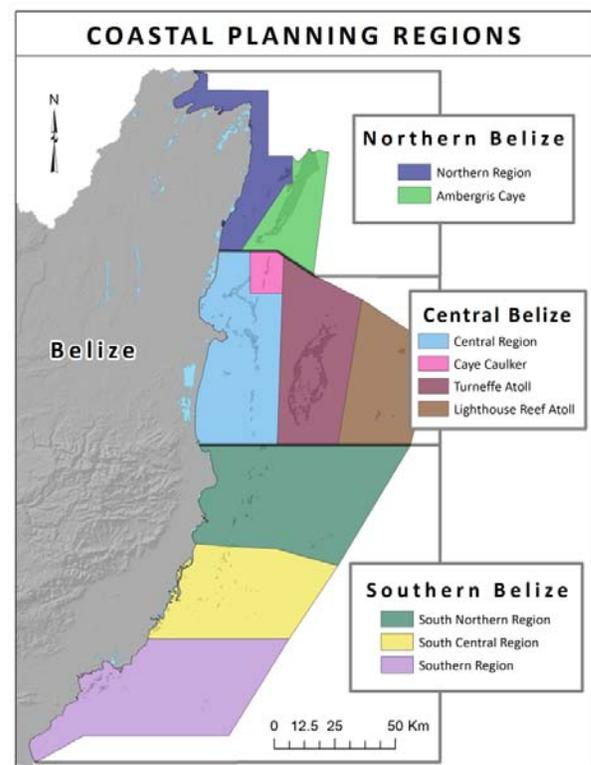


Figure 2 The nine coastal planning regions of Belize.

What have we achieved?

In 2010, the CZMAI established a partnership with WWF and the Natural Capital Project to bring together critical information about the benefits coastal and marine ecosystems provide for people and the impacts human activities have on them, and to use that information to resolve conflicts among competing interests and thereby ensure a sound ICZM Plan. Starting with two major challenges – lack of information and conflicting resource uses – the team set up an advisory committee of regional experts to guide the process (for a summary of this and the following steps, see Figure 3). Next, the team set out a flexible work plan that made knowledge-building, ecosystem services, and stakeholder engagement central to the process. The team spent several months gathering existing data about biodiversity, habitats, and marine and coastal uses in collaboration with universities, government agencies, industry associations, citizens' groups, and non-governmental organizations.

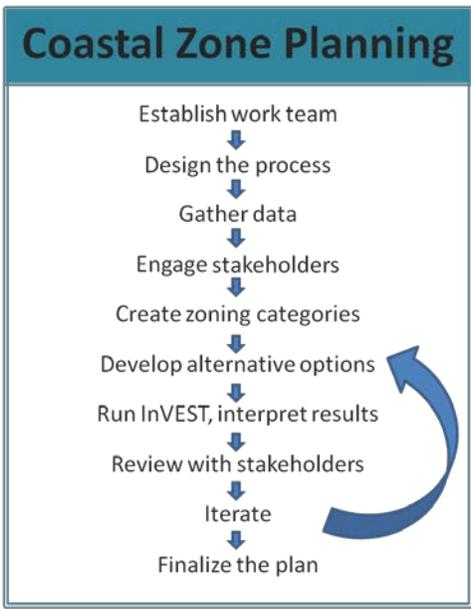


Figure 4 Suggested steps, with detail, in coastal zone planning based on lessons from this case.

This information was mapped comprehensively for the first time in Belize and shared with Coastal Advisory Committees and other stakeholder groups in the nine planning regions, who through meeting minutes, surveys, and interviews communicated their values and goals for marine and coastal environments and management. With this information, the CZMAI determined how to group marine and coastal uses into useful zoning categories, which could be used by government agencies and stakeholders to guide implementation of the ICZM Plan. The team also began to develop three possible zoning scenarios, beginning at the local level and scaling up to countrywide. Each of these three schemes emphasizes different priorities of stakeholders: the conservation scenario presents a vision of long-term ecosystem health through sustainable use and investment in conservation; the compromise scenario blends strong conservation goals with current needs for coastal development and marine uses; and, the development scenario prioritizes immediate development needs over long-term sustainable use and future benefits from nature (Figure 4).

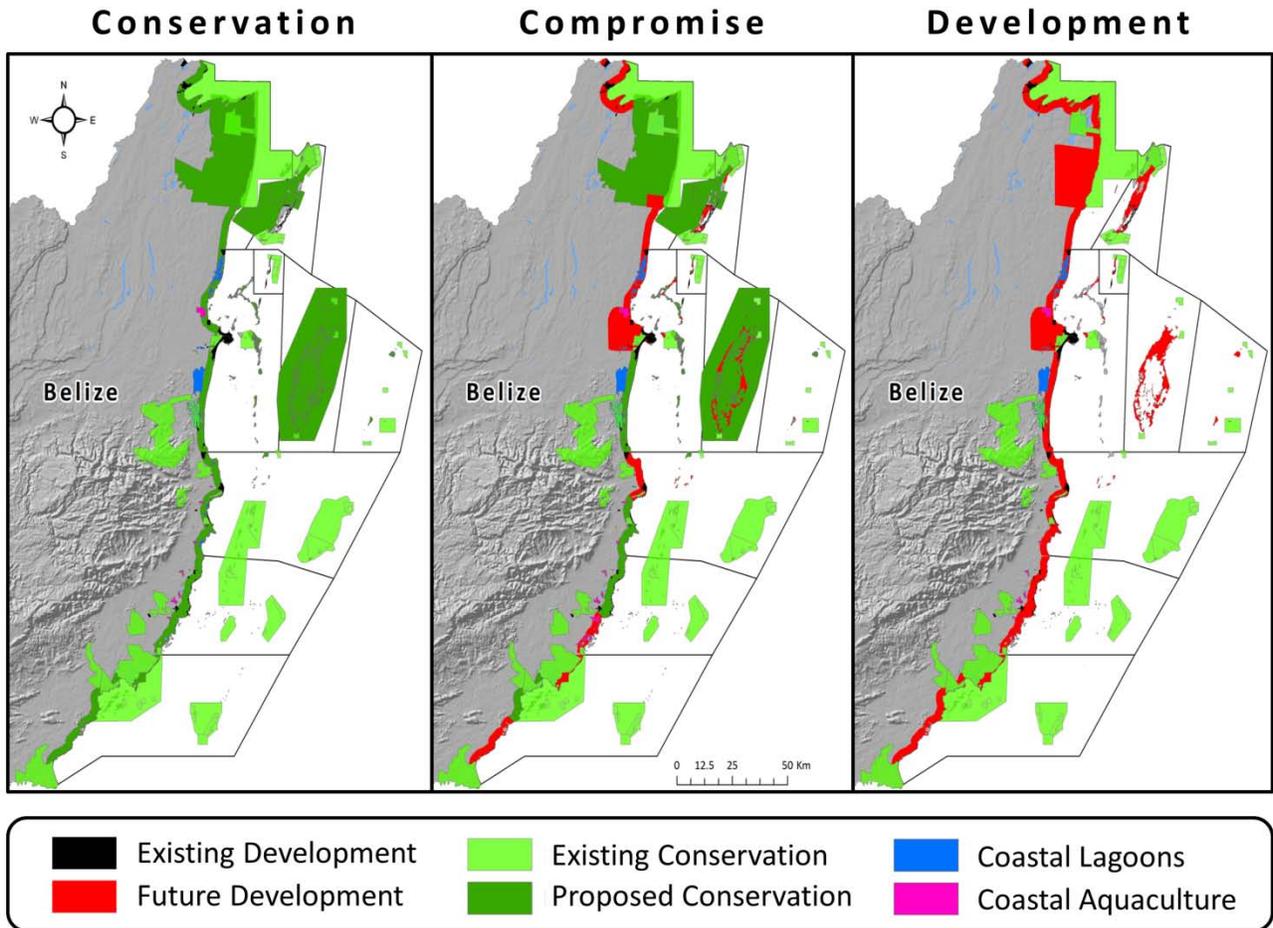


Figure 3 The three future zoning scenarios designed and shared with stakeholders.

To understand the implications of each zoning scenario, the team is using a software-based tool for mapping and valuing ecosystem services called InVEST (Integrated Valuation of Ecosystem Services and Tradeoffs), developed by the Natural Capital Project. InVEST provides information about the location, quantity, and value of ecosystem services, and tradeoffs among options. Based on available data and the key services of interest to stakeholders, the partners are modeling several ecosystem services with InVEST, including lobster fisheries, coastal and marine tourism and recreation, risk to habitats, and coastal protection from inundations and storms by coastal zone habitats. InVEST results are being used to communicate options to stakeholders and improve new iterations of possible zoning scenarios.

Results thus far indicate that where coastal development expands, the risk to habitat generally increases. With consequent habitat degradation, lobster catch and revenue for lobster fishers decrease while the area of coastline vulnerable to storm surges significantly increases. Yet in many cases, as development increases, the number of visitors and revenue from recreation and tourism activities increase as well. Such examples of tradeoffs among ecosystem services illustrate the complexity of coastal zone management decisions.

The distribution and value of ecosystem services differ across the scenarios. For instance, coastal protection for Belize is highest in the conservation scenario and relatively lower in the compromise scenario. In the development scenario, the service value reduces to nearly zero in affected areas. These outcomes can have a substantial economic and ecological impact within each planning region, too. In Turneffe Atoll in central Belize, for example, different levels of permitted coastal development and conservation zones affect the amount of mangrove, coral and seagrass habitat important for spiny lobsters (Figure 5).

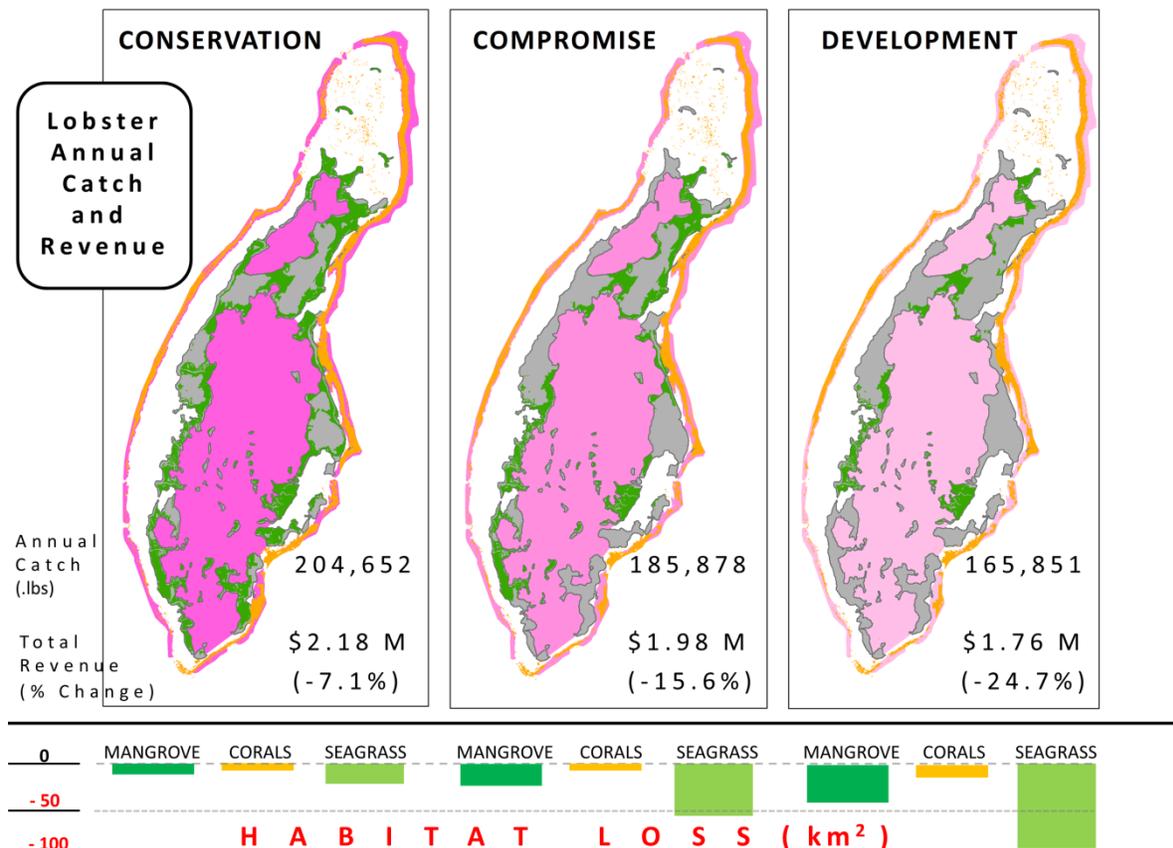


Figure 5 Outcomes for lobster fisheries and habitat for Turneffe Atoll under the three alternative zoning scenarios.

In the conservation scenario, protection of these habitats provides an annual potential catch of over 200,000 lbs of lobster, which equals about BZ\$2.18 million in annual revenue for fishermen in the Turneffe area. In the development scenario, risks of habitat destruction could lead to an annual loss of up to BZ\$420,000 in lobster revenue. In contrast, less habitat degradation in the compromise scenario results in a cost savings of about BZ\$220,000 annually relative to the development scenario, but still a loss of BZ\$200,000 in revenue from lobster fishing in comparison to the conservation scenario.

These tradeoff maps provide guidance for government agencies and users that must work together to manage these systems, by identifying the magnitude and locations of conflicting uses and contrasting the outcomes for multiple services.

The team is using this analysis – at the national and regional scales – to determine how alternative zoning plans affect ecosystem services. CZMAI is also using the results to identify areas for coastal development that limit impacts on habitats and the services they provide, as well as those that are most critical for conservation and the sustainable delivery of nature’s benefits. The InVEST results are being presented to Coastal Advisory Committees in each planning region and will be available for review in public comment meetings. With feedback and review from industry, civil society and government partners, the team will iteratively develop and refine natural resource use guidelines and a zoning scheme for the ICZM Plan.

The Plan will be submitted to the Ministry of Forestry, Fisheries and Sustainable Development for approval by December 2012. In early 2013, it will go to the House of Representatives for a vote. If approved, the result will be Belize’s first national Integrated Coastal Zone Management Plan for the sustainable use of critical marine resources and ecosystems. With a coalition of government agencies and civil society partners, the CZMAI expects to continue to use InVEST and the Plan in the future to guide environmental impact assessments for the coastal zone and create an interactive, online map to review and respond to national development permit requests. InVEST also has the potential to inform selected mechanisms for implementation – from payment for ecosystem services schemes to new regulations to adaptation to new risks due to climate change.

Sources:

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