

Marine resource management in Belize: Historical analysis & ways forward

Gestion des ressources marines au Belize: analyse historique et perspectives

Gestión de los recursos marinos en Belice: análisis histórico y caminos a seguir

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EXTENDED ABSTRACT

Introduction: Overfishing is one of the most severe anthropogenic threats to the world's oceans, marked by widespread degradation of marine food webs and disruption of ecosystem functioning¹. Global fisheries can be categorized as common-pool resource systems (CPRS) because restricting marine resource extraction is extremely challenging, and over-extraction contributes to an overall decline in availability to others². Because of these challenges, establishing effective institutions for the sustainable management of natural resources is essential. Community-based fisheries management (CBFM) offers a potential solution to overcome the challenges associated with fisheries as CPRs by including fishers in the management of their fisheries through collective action³. The purpose of this study was to examine the institutional robustness (e.g. presence of nested and decentralized enterprises as indicators of resilience to shocks) of over 40 years of fisheries management in Belize.

Methodologies: This study used a mixed methods approach that combined reviewing secondary data, semi-structured interviews with key informants and participant observation. The review of secondary data was ongoing throughout the process of this study, and included published and unpublished governmental and non-governmental reports, academic publications, and online resources. Semi-structured interviews with key informants and participant observation occurred in June and September 2017, and from April - June 2019. Key informants included individuals in leadership positions and natural resource managers in the governmental (n = 8) and non-governmental sectors (n = 26) as well as fisherfolk (n = 23). Participant observation included: attendance at fisher forums, meetings, and presentations by natural resource managers, and various formal and informal gatherings within the communities. All respondents remained anonymous.

Results and Discussion: Belize has a rich history of relying on natural resources for economic, political, and social benefit,⁴ stemming from the colonial occupation of the British until Belize independence in 1973. Over the last 40 years, Belize has developed a variety of institutions to protect, manage and sustain its diverse marine resources (Figure 1). Throughout this time, non-governmental organizations (NGOs) were formed, which are now some of the key stakeholders and regional co-managers of marine reserves. Fisheries management policies in Belize represent all eight of Ostrom's design principles for long-enduring CPRs² (Table 1), which could lead to the overcoming of collective action problems. However, there could be improvements in the monitoring of the resource system by users, conflict resolution mechanisms, and in recognizing rights to organize. Cross-scale linkages between institutions contribute to overall institutional stability and information transfer. The implementation of a new Fisheries Resources Bill (as of late 2019)⁶ in the coming years will put these institutions to the test, but Belize has the potential to continue to be a global leader in sustainable fisheries management.

Table 1. Ostrom's design principles for long-enduring CPRs applied to Belize's marine resource governance context ^{2,7}

	Design Principle	Belize Context
1	Clearly defined boundaries	Belize's exclusive economic zones (EEZ) and eight designated fishing areas (known as Managed Access areas)
2	Connection between local conditions and provisioning rules	Managed Access Committees; NGOs as co-managers of reserves; fishers associations; the Belize Federation of Fishers
3	Collective-choice arrangements	Fishers serving on Managed Access committees; fishers consulted throughout development of Managed Access; Belize Fisheries Department has final say
4	Monitoring of resource system by users	Fisheries Officers at Belize Fisheries Department and NGOs; fishers notice non-licensed users
5	Graduated sanctions	The three-strike rule: first is verbal warning, second is written warning, third is arrest
6	Conflict-resolution mechanisms	Fisher forums; boat-to-boat outreach
7	Minimal recognition of rights to organize	Government recognizes active fisher associations; Belize Federation of Fishers; Cooperatives
8	Nested enterprises	Fisher associations; Managed Access committees; Cooperatives

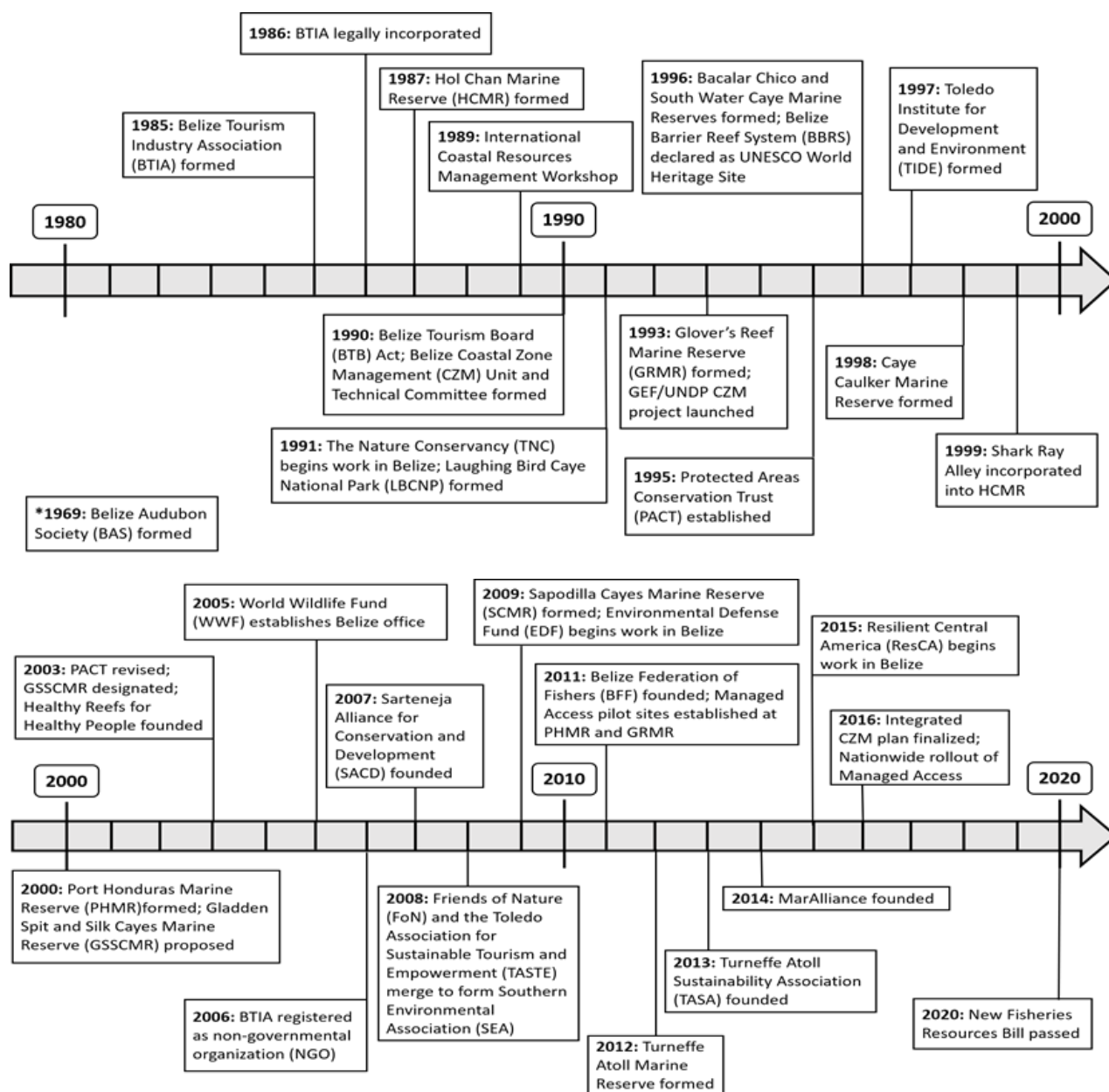


Figure 1. Timeline of significant milestones in coastal zone management in Belize from 1980 to present. Top panel shows 1980-2000 while the bottom panel shows 2000-2020. Source: key informant interviews and review of secondary literature.

KEYWORDS: *Sargassum*, citizen science, community science, monitoring, macroalgae

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