

## Managed Access in Belize

## Acceso Manejado en Belize

## Accès géré au Belize

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### ABSTRACT

Belize's commercial and subsistence fisheries are important to the livelihoods of over 3,000 fishermen and their coastal communities. Belize's National Fishery, currently an open access fishery, faces the threat of resource depletion clearly indicated by fishermen whose catch is constantly declining. In an effort to address this situation and the threat of overexploitation of our fisheries resources, the Belize Fisheries Department in partnership with Toledo Institute for Development and Environment (TIDE); Wildlife Conservation Society (WCS) and Environmental Defense Fund (EDF) has embarked on the implementation of a managed access pilot project for fishermen in two of Belize's Marine Reserves. Managed access establishes limited dedicated access for fisheries in Belize – also known as territorial user rights fisheries or TURFs. The project is designed to empower traditional fishers by ensuring greater participation in the decision-making process that impacts their livelihood, and by improving the benefits to be derived from the fish stocks in terms of increased fish landings, reduction in fishing effort, larger size classes and increased prices and revenues. In addition, there will be benefits accrued to the ecosystem, contributing to the maintenance of the overall health and sustainability of the Belize Barrier Reef complex. Key to the success of this project is the reduction in the number of users at the project site coupled with a good monitoring program, a dedicated presence of enforcement personnel but most importantly, a greater participation of fishers themselves in the program. The pilot project is being implemented by a coalition of managers, NGOs and fishermen at Glover's Reef Marine Reserve and Port Honduras Marine Reserve; however the Government of Belize has indicated a commitment to expand the initiative to other areas and fisheries.

KEY WORDS: Limited access, rights bases management, Belize, open access, fisheries management tool

### INTRODUCTION

*“Fisheries, including aquaculture, provide a vital source of food, employment, recreation, trade and economic well-being for people throughout the world, both for present and future generations and should therefore be conducted in a responsible manner”* (FAO 1995). Oceans and seas cover about three quarters of our earth's surface and are hence of vital economic, ecological, political, and social importance, providing a myriad of services to mankind. For instance, they provide an essential and biodiverse habitat, are a valuable source of protein, minerals, and fossil fuels among many others. Fisheries resources were thought to be limitless based on the vastness of the oceans, but this is no longer a common thought; fisheries have declined, and many have been described as in a state of crisis (Pauly and Zeller 2003, Pauly 2009, Defeo and Castilla 2005, Clark 2006).

Unlike other renewable resources, fisheries resources present unique challenges (Berkes 2003, García and Charles 2007, 2008) that have kept many scientists working full-time trying to resolve the issues of overfishing. Despite Garret Hardin (1968) describing the underlining culprit, open access that results in a tragedy of the commons, fisheries management still poses many challenges to modern science because traditional management does not address the underlying causes of overfishing – the lack of clearly defined access rights. Traditional command and control approaches to fisheries management have largely failed because they do not provide the incentives for a long-term harvesting regime, but rather instill a race to fish leading to collapse of many fisheries. Moreover, many countries have a *de facto* open access provided for by the constitution or by cultural tradition. Hence, fisheries management in developing countries poses an even greater challenge because of the social, environmental, economic, political, and environmental challenges that these countries face, confounded even more so by the inherent complexities of the resources themselves (Dudley 2003).

Recent advances in fisheries management have identified that use of rights based fisheries could greatly improve management (Enriquez and Camargo 2000) and ensure the social, economic, and environmental outputs sought. In Belize, fisheries operate under an open access regime in which the Government acts as trustee for the public by managing fisheries in the interest of protecting the rights of future generations. The Government of Belize, Belize Fisheries Department, and a coalition of NGO and fisherman partners are innovating methods of rights-based management appropriately designed and scaled for the unique needs of small-scale fisheries in the developing world.

Belize's commercial and subsistence fisheries are important to the livelihoods of over 3,000 fishermen and their coastal communities. Fisheries are, in many cases, the sole source of income for families and a critical component of community and national economies. Belize's National Fishery faces the threat of resource depletion clearly indicated by an increase in

the number of fishers (Table 1) and a declining catch, especially for the most lucrative species- spiny lobster (Figure 1). Hence, fisheries resources in Belize are increasingly faced with the predicament of too many people chasing too few fish.

This decline has occurred despite Belize extensive marine protection efforts – MPAs, spawning protections, destructive gear bans. This is because traditional control methods are not sufficient as long as there is a lack of clearly defined access rights, and no controls on landings (Costello 2008). In an effort to shift the current open access regime, Belize has embarked on implementing a system of rights-based management across its entire marine reserve network. “Managed Access” as this new initiative is called, seeks to revolutionize fisheries management in Belize by implementing a system of TURFs, combined with rigorous data collection and enforcement, as well as enhancing the current licensing system.

The project is designed to empower fishers by firstly ensuring greater participation in the decision-making process that would impact their livelihood, and secondly by improving the benefits to be derived from the fish stocks themselves in terms of increased fish landings, larger size classes, and increased prices and revenues. Benefits accruing to the ecosystem from the project are to include the recovery and rejuvenation of coral reef and seagrass habitats damaged by intense and unsustainable fishing pressures, as well as the recovery of the fished stocks that are a part of a complex and wider food web and energy transfer relationship which contributes to the maintenance of the overall health and sustainability of the Belize barrier reef complex.

### Project Site

Belize is located between 15° 52' 9" and 18° 29' 55" N and 87° 28" y 89° 13' 67" W with a territory of 22965 km<sup>2</sup>, including 688,94 km<sup>2</sup> of islands (Figure 2). Belize possesses a barrier reef that is approximately 269 km long with a shallow lagoon between the coast and the barrier reef including three offshore atolls with shallow inner lagoons that provide adequate habitats for species of commercial and ecological value, including the spiny lobster.

The Managed Access project is being implemented at two pilot sites (Figure 3). These include the Glovers Reef Marine Reserve on Glover’s Reef atoll, as well as the Port Honduras Marine Reserve in the southern seas off Punta Gorda Town. This project has been developed through notable partnership between The Belize Fisheries Department, the Toledo Institute for Development and Environment (TIDE), the Wildlife Conservation Society (WCS), and the Environmental Defense Fund (EDF) that is geared towards finding a feasible way to implement rights-based

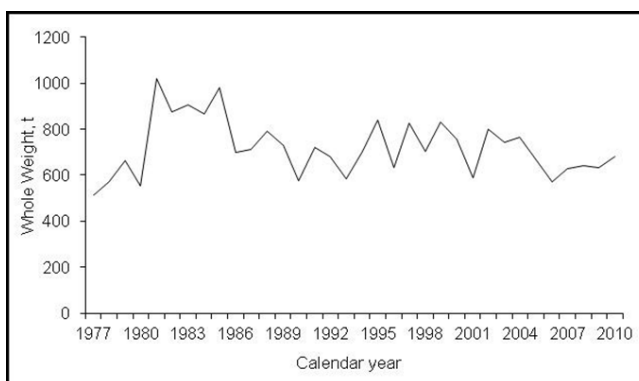
fisheries management in Belize. Managed Access is a tool that can help the fisheries and fishermen by addressing the continued pressure of increasing numbers of fishermen in a fully exploited, mature fishery. This program will grant access to fishing within the general use zone or fished areas of the marine reserves to customary users or “*traditional*” fishermen giving them the incentives to be good stewards of marine resources by ensuring that they are the beneficiaries of sustainable management. The process began in early 2008 with a scoping process and the development of a framework and design and was introduced formally on July 1<sup>st</sup> 2011.

## MATERIAL AND METHODS

### Consultation Process

Belize has achieved notable successes and innovations in the management of its marine resources, including a robust system of marine reserves and protection for spawning aggregation sites. However, the status quo for fisheries management is unsustainable. According to the Belize Fisheries Department, the number of fishermen in Belize increased over 20% from 2000 to 2010 (Table 1), with continued pressure from international fleets and new entrants from other industries in Belize. The result – too many fishermen are chasing too few fish in fisheries that are fully exploited or possibly in decline.

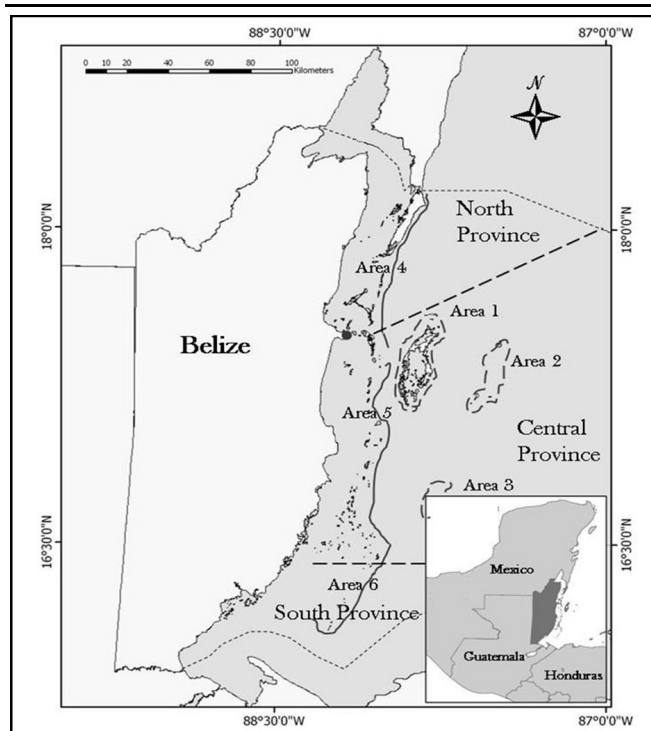
In an effort to obtain feedback and as many suggestions from the stakeholders as possible, the project partners held a series of consultations. This method resulted in input from several stakeholder groups such as fishermen, marine reserve advisory committees, Sarteneja and Hopkins fisherman associations, fishing cooperatives, and government officials, fisheries and legal experts, and fisheries management practitioners. Hence, the methodology demonstrated the successful use of a top-bottom and bottom-up approach. This methodology ensured that



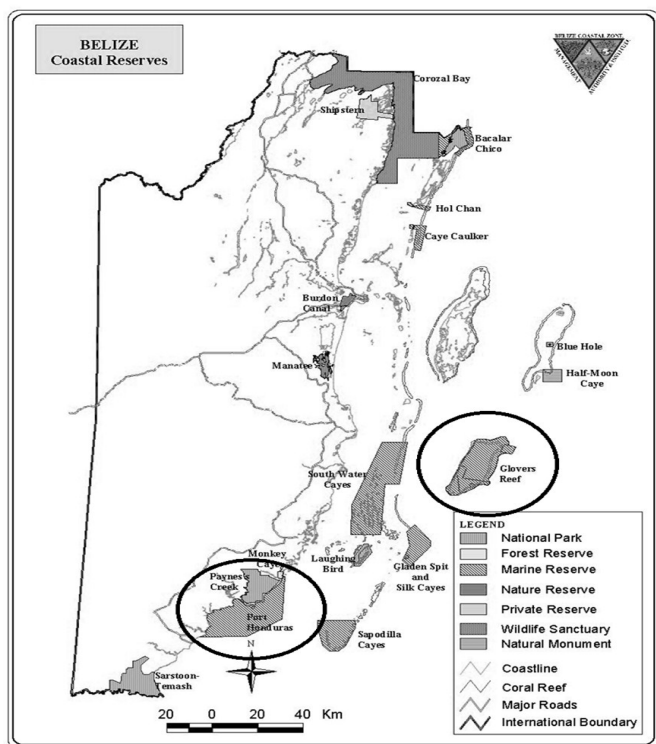
**Figure 1.** Historical Lobster Production 1977 to 2010. Production has remained relatively constant indicating a mature fishery.

**Table 1.** Number of licensed fishermen in Belize from 1999 to 2010.

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Fishers	2137	1872	1707	1947	2009	1731	2026	2131	2110	2267	2759	2472



**Figure 2.** Study area, the coast of Belize is divided into three provinces (North, Central and Southern) which are further sub divided into six areas.



**Figure 3.** Project sites (in circles) within Belize for the implementation of managed access: Glover's Reef Marine Reserve and Port Honduras Marine Reserve. (source: Coastal Zone Management Authority and Institute)

fishermen were the drivers of the initiative while on the other hand government officials were kept abreast of the process as it developed, fully supporting the initiative.

The process was highly participatory, lengthy, and exhaustive; the design was guided by well thought-out ideas coming from a broad audience and comprehensive discussions ranging from a general introduction to rights based fisheries management, to in-depth discussions on the design of Managed Access program. Fishermen were given presentations and printed materials in English and Spanish so as to ensure that they understood the concepts better and were able to participate more actively in the process. Extensive use of interactive fisheries modeling games simulating what happens to fisheries under open access versus what happens under rights-based systems such as catch shares helped to make the presentations clearer and more participatory

From the more than 80 consultation meetings, consensus was achieved that the fisheries are in decline and that the financial crisis is making the situation even more strenuous for the fishermen. Fishermen agreed that there is an overpopulation of fishermen on the fishing grounds. They also agreed that new management measures need to be taken to protect the industry – fishermen said that their participation in monitoring and enforcement, plus alternative livelihoods, could go a long way in improving management.

The consultation processes for Port Honduras and Glover's Reef have been an extensive effort aimed at ensuring that fishermen fully understand the harm caused by open access and traditional management, and how a rights-based system could deliver improved management of the fisheries. Through a series of one-on-one meetings, coupled with many small group sessions and general workshops, strong support has been garnered for the implementation of managed access and the further development of an adaptive form of rights-based management for the fisheries in the pilot sites. Fishermen for the most part are of the impression that Managed Access can help find tangible solutions to most to the issues they are currently facing, from lack of proper enforcement to improved livelihoods.

A significant number of fishermen see the issues of illegal fishing and overfishing as the two most important threats to their livelihoods. They also recognize that the lack of organization and poor collaboration among fishermen (most often making reference to past experiences with the fishermen cooperatives and associations), as one of the main factors that both directly and indirectly continue to contribute to the decline of fisheries resources. Managed Access is strengthening licensing protocols to reduce the incidence of illegal fishing and illegitimate licensing, and it is a priority to ensure the Managed Access design encourages capacity-building and institutional strengthening for community-based fisherman associations.

## RESULTS

Managed Access was launched on the July 4<sup>th</sup> 2011; although licenses started to be issued on July 4<sup>th</sup>. In order to ensure that the monitoring component would be complete, the data collection component started on June 15 2011 to coincide with the opening of the lobster season. About 70% of the total users at both pilot sites have been submitting their daily log books as requested, and efforts are underway to ensure full compliance. Fishermen are expected to provide reports of their catch as part of the criteria for renewal of their licenses. However, because this is the first time Belize has attempted 100% catch reporting, it is expected to be a learning and adaptive process.

Furthermore, infractions have declined significantly since the implementation of Managed Access for the period June to September 2011 compared to the same period in 2010, with only 11 arrests compared to 29 arrest in 2010 (Belize Fisheries Department 2010, 2011). In addition, the offence gravity has also reduced to the possession of very small quantities of undersized product. During the early period of implementation, fishers were complying with the requirement of applying and possessing a Managed Access license. Currently 141 licenses have been issued for Glover's Reef Marine Reserve and 170 for Port Honduras Marine Reserve, almost a 30 % less than the number of fishers that were expected to apply. The "race to fish" during the opening of the conch season had less participants. Fishers were more relaxed with one vessel not reaching the fishing grounds until the evening of the first day of the season, which would be unheard of previously due to the financial benefits that can be obtained from the first day of fishing. *"Traditional fishers were very content to see that opportunistic fishers were not present at the site, and they did not have to compete for fishing grounds and products"*. Generally, fishers were satisfied with the implementation of the Managed Access program (Alicia Eck, Manager Glover's Reef Marine Reserve, Personal communication). Fishers have also been cooperating more by reporting infractions via telephone calls where possible to the Fisheries Department or the WCS staff. Several fishers have commented that Managed Access will work, but they are cognizant that it takes time for results to be tangible. It is for this purpose that The Fisheries Department and partners will be conducting a comprehensive survey to assess fisherman impressions of the program and get recommendations for adaptive management.

In order to ensure that better tracking of licenses issued and that the process is legitimate, two components were given priority. Firstly, the licensing database system was upgraded and secondly Managed Access Committees were formed for each site. The licensing hardware and software infrastructure were updated to a system that can store information from all fishers, including coding according to area of fishing and incorporating the legal history and information of all fishing vessels. A socioeco-

nomical and catch data component will also be incorporated into the system in the near future. One unique feature is that the licenses are printed on tamper proof and durable PVC material. The licensing system also provides for new protocols for the issuance of licenses that involve more checks and balances and the reconciliation of data inputted by specific users. A socio-economic survey of all Managed Access license holders was also carried out, and these data will be analyzed as part of the evaluation of the program.

The Managed Access Committees were integral to the licensing process. Applications for Managed Access licenses were submitted to the Committees for vetting – the first time fishermen were involved in taking decisions on who could fish. Not all applicants were able to obtain license since they did not meet the criteria for eligibility which focused on identifying *bona fide* fishermen dependent on fishing in the TURFs for their livelihoods. Thus, the Managed Access Committees have been vital in ensuring the legitimacy and transparency of the licensing process. The Managed Access Committees are composed primarily of fishermen from each stakeholder community who were elected to represent fishermen from their community. Specific terms of reference were developed for members and for the Committees. The Government of Belize has officially recognized and sanctioned the committees.

The data collected from the fishery independent monitoring, catch per unit effort (CPUE), catch logs along with the socioeconomic information gathered will be used to determine of a total allowable catch (TAC) in the near future. Also a vessel monitoring system (VMS) utilizing digital radio frequency will be piloted at the sites as a mechanism for surveillance and reporting.

## DISCUSSION

The Managed Access program is not intended to be a panacea for all fisheries problems but rather a first step towards establishing a full rights-based management system, such as catch shares, which could entail a TAC, a territorial user rights for fisheries (TURFS), or a quota system. Managed Access will be important in identifying and providing the platform to ensure coordination of and decision making by local organized groups. Current efforts are underway to strengthen the managing and coordinating capabilities of established fishermen associations and encouraging the formation of new organized groups which makes coordination and management less burdensome. The Fisheries Department and partners also depend on alternative livelihoods to reduce fishing effort and increase support form fishers. The project will be looking at new available technologies for reporting and monitoring that will be piloted at these sites that can be replicated once all glitches have been sorted to all the countries.

This will also be important for the development of alternative livelihoods and fisheries diversification that can help reduce the extractive dependency on lobster and conch. The program will also address the need for

improved marketing of the fisheries products originating from these sites through value-added and promotion of responsible consumption.

The success of the program could be greatly attributed to building confidence and trust of the fishermen via the Managed Access Committees and the great partnership that was developed.

#### LITERATURE CITED

- Berkes, F. 2003. Alternatives to conventional management: Lesson from small scale fisheries. *Environments* **31**(1):1-16.
- Belize Fisheries Department, 2010. Glovers Reef June to September Quarterly Report 2010.
- Belize Fisheries Department, 2011. Glovers Reef June to September Quarterly Report 2011.
- Clark, C.W. 2006. Fisheries bioeconomics: why it is so widely misunderstood? *Population Ecology* **48**:95-98.
- Costello, C., et al. 2008. Can Catch Shares Prevent Fisheries Collapse? *Science* **321**:1678.
- Dudley, R.G. 2003. A Basis for understanding fisheries management complexities. Presentation at the 21st International Conference of the System Dynamics Society, Nueva York.
- Defeo, O. and J.C. Castilla. 2005. More than one bag for the world fishery crisis and keys for co-management successes in selected artisanal Latin American shellfisheries. *Fish Biology and Fisheries* **15**:265-283.
- Enriquez R. and B.G. Camargo. 2000. Perspectives of rights based fisheries management in Mexico. IIFET Proceedings FAO. 1995. Code of Conduct for Responsible Fisheries. Rome, Italy. 41 pp.
- García, S.M. and A.T. Charles. 2007. Fishery Systems and Linkages: From Clockwork to Soft Watches. *ICES Journal of Marine Science* **64**:580-587.
- García, S.M. and A.T. Charles. 2008. Fishery Systems and Linkages: Implications for Science and Governance. *Ocean and Coastal Management*, **51**:505-527.
- Hardin, G. 1968. Tragedy of the Commons. *Science* **162**:1243-1248.
- Pauly, D. and D. Zeller. 2003. Part 1: Fisheries Trends; The Global Fisheries crisis as a rationale for improving the FAO's database of fisheries statistics. Fisheries Centre Research Reports, Volume 11 (6).
- Pauly, D. 2009. Beyond duplicity and ignorance in global fisheries. *Scientia Marina* **73**(2):215-224.