

Enforcement Chain Analysis within the Belize Barrier Reef System

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If it is to be effective, natural resource legislation must be efficiently enforced. The first Marine Protected Area (MPA) in Belize was declared in 1983 with the establishment of the Half Moon Caye Natural Monument. Since that time several other MPAs have been designated, and the legislative framework has been amended to accommodate various categories of MPAs, including Marine Reserves, National Parks, Wildlife Sanctuaries, Natural Monuments, and Natural Reserves. Currently there are 13 declared MPAs in Belize that contain all five IUCN categories: Multiuse Reserves, Natural Monuments, National Parks, Wildlife Sanctuaries and Wilderness Areas. These categories are embodied in the two laws that govern the declaration and management of protected areas in Belize: the National Parks System Act and the Fisheries Act.

This project studies the enforcement chain in Belizean MPAs and the effectiveness of its different links. We consider the enforcement chain to include public outreach and education of resource users about their obligations, the capability to detect of infractions, the ability to intercept and arrest violators, and ultimately the success of the judicial process that leads to sentencing and fines. This research examined the enforcement chain from the initial point of contact with the users to the point of sentencing in the event that an offense was committed.

Introduction

Belize is clearly a world leader in its creation and administration of Marine Protected Areas (MPAs). Thirteen MPAs protect maritime space, and additionally several others include coastal lands. Declared by UNESCO as a World Heritage Site in 1996, the Belize Barrier Reef Reserve System includes seven of these MPAs (Bacalar Chico National Park and Marine Reserve, Blue Hole Natural Monument, Half Moon Caye Natural Monument, Glover's Reef Marine Reserve, South Water Caye Marine Reserve, Laughing Bird Caye National Park, Sapodilla Cayes Marine Reserve). The following table lists the MPAs in Belize with their location and, additionally, they can be located on the map below.

Region	District	Name of MPA	Administrative Authority	Co-Management Partner
North	Corozal	Corozal Bay Wildlife Sanctuary	Forest Department	
		Bacalar Chico Marine Reserve	Fisheries Department	
Central	Belize	Hol Chan Marine Reserve	Fisheries Department	
		Caye Caulker Marine Reserve	Fisheries Department	
		Swallow Caye Wildlife Sanctuary	Forest Department	Friends of Swallow Caye
		Blue Hole Natural Monument	Forest Department	Belize Audubon Society
		Half Moon Caye Natural Monument	Forest Department	Belize Audubon Society
South	Stann Creek	South Water Caye Marine Reserve	Fisheries Department	
		Glovers Reef Marine Reserve	Fisheries Department	
		Gladden Spit & Silk Cayes Marine Reserve	Fisheries Department	Friends of Nature
	Toledo	Laughing Bird Caye National Park	Forest Department	SEA
		Sapodilla Cayes Marine Reserve	Fisheries Department	TIDE
		Port Honduras Marine Reserve	Fisheries Department	TIDE

To prevent the MPAs from becoming mere paper parks, the Government of Belize has employed a number of management strategies. These ranged from direct government involvement in all aspects of management to full co-management with Non-Governmental Organizations (NGOs) and Community-Based Organizations (CBOs), where the government's role is largely one of oversight. Two agencies have responsibility and jurisdiction for MPAs and take different approaches to their management. The Forest Department has jurisdiction for all MPAs that are established under the National Parks System Act (National Parks, Wildlife Sanctuaries, Natural Monuments), while the Fisheries Department has jurisdiction for all Marine Reserves.

Primarily because of resource issues, the government has encouraged the participation of community and non-governmental organizations in the management of protected areas through a co-management process. This process has had mixed results at all levels primarily because of the variation in authority created by the individual co-

management agreements. Nonetheless, the partnerships work and contribute to the management of the protected areas system as a unit.

Methodology

The study used a combination of surveys, data collection, interviews, focus groups and literature reviews. A survey instrument (Appendix I) was developed to gather information on the nature and perception of resource users – both fishers and tour operators, but primarily fishers. During February and March 2010, University of Belize student research assistants surveyed 100 users: 80 in Belize and 20 in Guatemala. They collected information on age, length of time in current occupation, previous occupation, marine protected areas (MPAs) most frequently used, familiarity with regulations and the management staff, familiarity with detention and arrest procedures and experiences, as well as the judicial process. The surveys in Guatemala provided a perspective based on the widely held assumption that foreign fishers are a threat to Belizean marine resources. Additionally, two focus group sessions with fishers in Belize City and Dangriga provided additional information on perceptions and expectations of the resource users.

The survey sample attempts to assess information from users of Belizean marine resources throughout the country and even in neighboring Guatemala. We conducted interviews in Northern (Corozal District), Central (Belize District), and Southern Belize (Stann Creek and Toledo Districts). However, the regional sample sizes do not reflect the proportion of fishers and tour guides in each zone. The sample merely obtains the perspectives of users throughout the country, as well as neighboring Guatemala. We located interviewees at fish houses, docks, and fishing cooperatives.

We also obtained data from the Courts, and Fisheries and Forest Departments related to infractions, arrests and convictions. The Southern Environmental Association (SEA), a co-management partner that manages two MPAs, also provided information on these issues. Literature reviews also revealed additional relevant information, particularly at the local level, which contributed to this process. Document searches at the Fisheries and Forest Departments, the Magistrate's Court, partner organizations and the internet provided additional data and perceptions. We also conducted interviews with major stakeholders from the Forest and Fisheries Departments, the Magistrate's Court, the NGO co-management partners and the tourism sector. The research team compiled the relevant information, identified trends, and conducted further analyses. The surveys were analyzed as a whole and then divided between Belize and Guatemala to allow for comparison between the two datasets.

Results

We report survey results in Appendix II and detail the information below. When interviewees did not answer questions, we recorded "no response". This might mean

that they did not understand the question, it did not apply to their situation, they felt uneasy about answering, or even that the interviewers erred. We report data from the entire sample of 100 interviewees and also break the sample into 80 persons questioned in Belize and 20 in Guatemala. The survey results form the basis for the following Discussion and Lessons Learned.

Location of Interview. A total of 20 interviewees were from the northern Corozal District: Sarteneja (5), Copper Bank (5), Chunox (5), and Progreso (5). Belize District accounted for 28 interviews. The southern districts of Stann Creek and Toledo provided 32 interviews: Dangriga (8), Hopkins (4), Placencia (15), Punta Gorda (5). An additional 20 interviews were conducted in Livingston (17) and Sarstoon (3), Guatemala.

Occupation. Of the 100 interviewees, 65 were fishers, 26 were tour guides, and 9 listed “other” as their occupation (Survey Question 1). One person identified himself as tour guide and fisher. Of the Belizean sample of 80, 64% were fishers, while 30% were tour guides, and 7.5% listed “other”. Of the Guatemalan sample of 20 persons, 70% were fishers, 10% were tour guides, and 15% listed “other”.

Age. The average age of the entire sample was 38.4 years with minimal difference between the Belizean sample (38.2 years) and the Guatemalan sample (38.9 years) (Survey Question 2). The ages ranged from 14 to 60 years. The following table lists the ranges of age of the sample.

Age	Belize (80)	Guatemala (20)	Entire Sample (100)
< 20	1	0	1
20 – 29	17	5	22
30 – 39	27	5	32
40 – 49	24	5	29
50 – 59	9	4	13
> 60	2	0	2

Tour guides were slightly younger (35.9 years for N=25) than fishers (39.4 years for N=65).

Gender. Only one person (a 28 year old woman fisher from Dangriga) in the Belize sample of 80 persons was female. No sampled Guatemalans were female (Survey Question 3).

Ethnic Background. Many Belizeans are of Mexican, Guatemalan, Honduran, or Salvadorean origin. Similarly, Mexicans, Guatemalans, and Honduran nationals use Belizean waters. Maritime boundaries in the Gulf of Honduras shared by Belize,

Guatemala, and Honduras are uncertain and in dispute. The following table indicates the ethnic breakdown of the sample (Survey Question 4).

Ethnic Background	Belize sample (80)	Guatemala sample (20)	Entire sample (100)
Native Belize	67	2	69
Guatemalan-Belizean	5	1	6
Honduran-Belizean	6	0	6
Mexican-Belizean	1	0	1
Guatemalan	0	17	17
Honduran	1	0	1
Mexican	0	0	0

Years Working at Current Occupation. Survey Question 5 asked how long the interviewee had been working at his occupation. The following table reports the results of the Belizean and Guatemalan samples. Over 65% of the entire sample had been engaged in their current occupation for more than 10 years.

Years in Current Occupation	Belize Sample (80)	Guatemala Sample (19)	Entire Sample (99)
≤ 1	1	0	1
2 – 3	4	1	5
4 – 5	5	0	5
6 – 10	19	4	23
11 – 15	11	2	13
16 – 20	12	5	17
21 – 29	15	3	18
30 – 39	11	2	13
≥ 40	2	2	4

Previous Occupation. Survey Question 6 asked what occupation the interviews had engaged in prior to their current occupation. The variety of previous occupations was surprising.

Previous Occupation	Belizean Sample (60)	Guatemalan Sample (10)	Entire Sample (70)
Student	9		9
Fishing	13	7	20
Tourism	4		4
Commercial	1		1
Construction	5		5
Farming	18	2	20

Watchman	2		2
Transportation	1		1
Boat Building	1		1
Diplomatic	1		1
Aquaculture	1		1
Teaching	1		1
Laborer	1		1
Technician	1	1	2
Cook	1		1

KNOWLEDGE OF MPAs AND INTERVIEWEES' USE OF MPAs

Knowledge of MPAs. Question 7 asked whether the interviewee knew the definition of an MPA was and requested that he define it. The vast majority of respondents said that they knew what an MPA was and indeed did give an acceptable definition. Of the 80 Belizean interviewees, 76 gave positive answers (95%), 2 did not know what MPAs were (2.6%), and 2 failed to respond (2.6%). Guatemalan interviewees provided similar results: 17 did know what MPAs were (85%), 2 did not know (10%), and one failed to respond (5%).

Knowledge of Belizean MPAs. Question 8 asked interviewees to list as many of the 13 Belizean MPAs that they could remember. These included the following: Bacalar Chico, Corozal Bay, Hol Chan, Caye Caulker, Swallow Caye, Blue Hole, Half Moon Caye, South Water Caye, Gladden Spit, Glovers Reef, Laughing Bird Caye, Sapodilla Cayes, and Port Honduras. The following table reports the number of the 13 MPAs that the respondents correctly named.

Number of MPAs Correctly Named	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
0	5	2	7
1	6	9	15
2	4	1	5
3	3	3	6
4	7	2	9
5	15	0	15
6	14	0	14
7	2	1	3
8	8	2	10
9	1	0	1
10	5	0	5
11	2	0	2
12	2	0	2
13	6	0	6

The Belizean sample had a greater ability to list the Belizean MPAs than the Guatemalan sample. The average number of MPAs listed by the Belizean sample was 5.3 while it was only 2.6 for the Guatemalan sample. The entire sample only listed 5.2 of the total of 13 Belizean MPAs.

The average number of MPAs that each of the 26 tour guides could name was 7.6. The remaining individuals in the sample (N = 74) named an average of 4.2 MPAs each.

Use of Belizean MPAs. Question 9 asked whether interviewees used a Belizean MPA for their fishing or tour guiding activities. The table that follows indicates that the majority does use one of the MPAs. MPA use ranged from 57.5% of the Belizean sample to 60% of the Guatemalan sample or 58% of the entire sample.

Do you use an MPA?	Belizean Sample (80)	Guatemala Sample (20)	Entire Sample (100)
Yes	46	12	58
No	27	8	35
No Response	7	0	7

Activities that Interviewees Conduct in MPAs. We only report responses from the Belizean sample due to surveying error of the Guatemalan sample. Fishing, tourism, and diving/snorkeling were the common answers to Question 10 that asked activities performed by interviewees in the MPAs.

Specific Activities Conducted in the MPAs	Belizean Sample (80)
Fishing	25
Tourism	12
Diving/Snorkeling	28
No Response	30

MPAs that Interviewees Use the Most. Non-respondents to Question 11 included 8 Belizeans and 12 Guatemalans.

Frequently Used MPAs	Belize Sample (72)	Guatemalan Sample (8)	Entire Sample (80)
Glovers Reef	10		10
Half Moon Caye	9		9
Hol Chan	4		4
Caye Caulker	8		8
Swallow Caye	1		1
Laughing Bird Caye	15		15
Port Honduras	1		1

South Water Caye	6		6
Gladden Spit	10		10
Sapodilla Cayes	5	4	9
Bacalar Chico	2		2
Corozal Bay	1		1
Sarstoon		4	4

In our sample of Belizean MPA users, the most utilized sites include Laughing Bird Caye, Glovers Reef, and Gladden Spit, Half Moon Caye, and Caye Caulker. Guatemalan users appear to use the Belizean MPAs in southern Belize close to the border with Guatemala.

Frequency of Use of Belizean MPAs. Question 12 asked the sample to state how frequently that used the MPA that they visit most commonly.

Frequency of MPA Use	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample
Always	8	0	8
Frequently	24	7	31
Occasionally	14	6	20
Never	20	5	25
No Response	14	2	16

I define “MPA Site Fidelity” as MPA use that is “always” or “frequent”. With these assumptions, 40% of the Belizean sample, 35% of the Guatemalan sample, and 39% of the entire sample display site fidelity to the Belizean MPA that they most frequently use.

Interviewees’ Preferred MPA. Question 13 is similar to Question 11. However, it asks for one preferred MPA that interviewees favor. This MPA would not necessarily have to be the MPA that respondents “use” most frequently – rather the MPA that they “prefer” for a reason that they offer in Question 14. The results appear in the following table.

Preference for a Particular MPA	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Glovers Reef	8		8
Hol Chan	3		3
Gladden Spit	6		6
Swallow Caye	1		1
Half Moon Caye	6	1	7
Caye Caulker	2		2
Blue Hole	1		1
Port Honduras	2		2
Sapodilla Cayes	2	2	4

Laughing Bird Caye	6	1	7
Corozal Bay	1		1
South Water Caye	3		3
Sarstoon		3	3
No Response	39	13	52

The preferred MPAs appear to be Glovers Reef, Half Moon Caye, Laughing Bird Caye, and Gladden Spit. These results agree with those of Question 11.

Reason Why Interviewee Prefers this MPA. Respondents prefer the MPAs they have listed for a number of reasons, including abundance of marine resources, distance to their home port and accessibility, beauty of the site, and less competition from other fishers and tour operators. The table below presents these results (Question 14).

Reason	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
More marine resources to harvest	13	7	20
Distance & Accessibility	7	2	9
Good Snorkeling & Diving	6	4	10
Abundant Wildlife	8		8
Beauty of Site	2	2	4
Variety of Activities that the Site Allows	1		1
Less Competition in Terms of Fishing	6		6
No Response	37	5	42

The abundance of marine resources is the most common reason why the interviewees preferred one MPA for their activities (20% of the total sample). Good diving and snorkeling (10%) and accessibility (9%) were also given as common justifications.

Interviewee's Familiarity with Regulations in the MPA where he most often works. Question 15 asked the sample how familiar they were with regulations governing the use of the MPAs in which they work. These regulations cover topics such as closed zones ("no take" areas), closed seasons, size limits for marine species, and protected species.

Familiarity with MPA Regulations	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Very Familiar	19	1	20
Familiar	27	11	38
Somewhat Familiar	24	2	26
No Familiar	8	3	11
No Response	2	3	5

I define interviewee’s self-assessment of “good knowledge of MPA regulations” as the categories “very familiar” and “familiar”. Using this indicator, 57.5% of the Belizean sample and 60% of the Guatemalan sample claimed to have “good knowledge of MPA regulations” in the area where they work.

Interviewee’s Familiarity with MPA Staff in the MPA where he most often works. A personal relationship with the MPA staff can assist enforcement of the rules. Of course, a personal relationship that is “too close” can lead to favoritism, lack of objectivity, and corruption. Question 16 asked the sample how familiar they were with the MPA staff in areas they visit.

Familiarity with MPA Staff	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Very Familiar	17	0	17
Familiar	20	10	30
Somewhat Familiar	25	5	30
Not Familiar	16	5	21
No Response	2	0	2

I define “familiar with MPA staff” as the sum of categories “very familiar” and “familiar”. In this case, 37.5% of the Belizean sample was “familiar” with the MPA staff while 50% of the Guatemalan sample was “familiar” with the MPA staff.

ENFORCEMENT INFORMATION

The next set of questions inquired about interviewees’ experiences with enforcement patrols and warnings issued by enforcement personnel.

Interception by Officials on the Sea. Question 17 asked interviewees whether they had ever been stopped while working at sea for any reason (routine check, illegal activity, etc.). Many individuals had seldom been stopped; I define “seldom” as “occasionally” or “never” been stopped. Results appear in the following table.

Frequency of Interception on the Water	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Always	2	0	2
Frequently	14	0	14
Occasionally	38	1	39
Never	26	18	44
No Response	0	1	1

A large percentage of respondents reported fell into the “seldom” stopped category; 80% of the Belizean sample and 95% of the Guatemalan sample were “seldom” stopped. In the entire sample, about 84% of interviewees were “seldom” stopped.

Where the Interception Occurred. Question 18 asked where the interception and stoppage occurred. Only 2 of 20 Guatemala interviewees responded to this question and simply indicated “Belizean waters”. Several Belizean respondents listed more than one site where they were stopped; therefore, the number of responses surpasses 80.

Location where the Interception Occurred	Number of Belizean Responses (80)
MPAs	24
South Water Caye	9
Glovers Reef	5
Half Moon Caye	2
Caye Caulker	2
Gladden Spit	5
Laughing Bird Spit	1
NON-MPAs	33
Near Belize City	2
Turneffe Caye	3
Fresh Water Caye	1
Middle Reef	1
Goffs Caye	1
Offshore Belize	17
Main Reef	1
Long Caye	2
Hunting Caye	2
Garbutt Caye	1
Dangriga	1
Caye Glory	1
NO RESPONSE	29

What Type of Official was Involved in the Detention. Question 19 explored this issue. In Belize, Fisheries or Forest Officers have enforcement authority depending on the type of protected area. In many cases, enforcement authority has been delegated to fishery officers who are also staff of the co-management authority. In some cases, the Belizean Defense Force, the Police, and the Coast Guard may be involved in fishery enforcement actions. Responses indicate that most enforcement actions are led by officials of the Fisheries Department or “Rangers” – the enforcement personnel of Marine Protected Areas. In some cases, respondents listed more than one type of official. Thus, the Belize responses total more than 80.

Type of Official Involved in the Interception	Belize Sample (80)	Guatemala Sample (20)	Entire Sample (100)
Fisheries Department	35	2	37
Rangers (Park)	18		18
Police	2		2
Coast Guard	7		7
No Response	28	18	46

Fisheries Department and MPA Rangers account for over 84% of the interceptions in our sample. Police and Coast Guard play a minor role in fisheries enforcement. The 90% lack of response from the Guatemalan sample corresponds to Question 17 that indicated that few of the Guatemalans had been stopped while fishing in Belizean waters.

Familiarity with Fishery Regulations. In Question 20 we asked the sample to state their familiarity with fishery regulations in Belize. I define “familiar with regulations” as the sum of “very familiar” and “familiar” in the questionnaire. Thus, 70% of the Belizean sample claimed to be familiar with Belizean fishing regulations while only 30% of the Guatemalan sample made a similar claim.

Familiarity with Belizean Fishing Regulations	Belize Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Very Familiar	17	1	18
Familiar	39	5	44
Somewhat Familiar	18	8	16
No Familiar	4	6	10
No Response	2	0	2

Knowledge of Closed Seasons. In order to test the respondents’ knowledge about fishery regulations, Question 21 inquired whether the interviewees could state the closed seasons for lobster/crawfish (15 February to 14 June), conch (1 July to 30 September), and Nassau grouper (1 December to 31 March) in Belize. Only complete answers were considered to be “correct” – although if someone responded “14 February” instead of “15 February”, I considered the answer to be “correct”. The following table collects the results for these questions.

Sample	Crawfish/Lobster Closed Season			Conch Closed Season			Nassau Grouper Closed Season		
	Correct	Incorrect	No Response	Correct	Incorrect	No Response	Correct	Incorrect	No Response
Belizean	20	52	7	16	48	16	13	10	57
Guatemalan	0	11	9	0	7	13	0	0	20
Entire Sample	20	63	16	16	56	29	13	10	77

I assume that an “incorrect” response and “no response” means that the individual does not know the correct closed season whether he fishes the indicated species or not. Thus, in the Belizean sample only 25%, 20%, and 16% correctly stated the closed seasons for crawfish/lobster, conch, and Nassau grouper, respectively. Not one Guatemalan sample response was correct for any of the three species’ closed seasons in Belize.

Knowledge of Closed Areas. Question 22 also attempted to judge interviewees’ knowledge of MPA regulations. It asked whether there are some areas within MPAs where fishing is prohibited, i.e. “marine reserves” or “no take” areas (known as “Conservation I Zones” and “Preservation Zones” in Belize). Due to data entry error, we report only the Belize sample results.

Question – “Are there some areas within MPAs where fishing is prohibited?”	Belize sample (80)
Yes	44
No	27
No Response	9

Only 55% of the Belizean sample recognized correctly that zoning within Belizean MPAs has created some “no take” zones where fishing is prohibited.

Primary Source of Information about Fishery Regulations. In Question 23 we asked the source of users’ information on fishery regulations. The responses may indicate some overlap. For example, “Fisheries Department officers” and “meetings” may collapse

into one category if the individual attended a meeting organized by Fisheries Department officials. Incorrect data management eliminated the Guatemalan sample. The following table collects the results.

Source of Information about Fishery Regulations	Belizean Sample (80)
Fisheries Department officers	15
Cooperatives	2
Other Fishers and Friends	15
Tour Guides	1
Printed Materials	4
Meetings (Fisheries Department/MPA)	9
No Response	34

“Word of mouth” is an important source of information for fishers, as well as, Fisheries Department outreach activities via meetings and conversations during patrol operations.

Familiarity with the Patrol Procedures. We attempted to gauge interviewees’ familiarity with patrol procedures in Question 24. These include the duties of the intercepted vessel, captain, and crew; required presentation of vessel documentation and fishing licenses; responsibilities to show catch, gear, and fishing records to officials. The table that follows shows the results.

Familiarity with Patrol Procedures	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Very Familiar	23	0	23
Familiar	36	10	46
Somewhat Familiar	16	3	19
Not Familiar	4	6	10
No Response	1	1	2

I assume that the categories “very familiar” and “familiar” suggest that the respondent believes that he is “familiar” with patrol procedures. About 74% of the Belizean sample feels that they are “familiar” with patrol procedures while 50% of the Guatemalan sample falls into this category.

Perceptions of the Interception Experience. Question 25 examines the perceptions of users to the experience of being stopped on the water by Belizean authorities. This might gauge perceptions of fairness, respect and courtesy demonstrated by officials, efficiency, and arbitrary nature of the inspection.

Perception of Interception by Patrol Officers	Belize Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Very Good	6	0	6
Good	17	4	21
Normal	37	9	46
Bad	8	1	9
Very Bad	5	0	5
No Response	7	6	13

Only 16% of the Belizean sample and 5% of the Guatemalan sample had a “bad” or “very bad” experience during the patrol and inspection procedures.

Prior Warning from Enforcement Personnel. In Question 26 we attempt to determine the frequency of warning issued by enforcement personnel. Warnings do not result in arrest, seizure of vessel or products, or fine. However, they hopefully have a positive effect on compliance.

Prior Warnings for Fishery Offenses	Belize Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Frequently	1	0	1
More than Once	7	2	9
Once	18	0	18
Never	52	17	69
No Response	2	1	3

Officials had issued warning to 32.5% of the Belizean interviewees, but two thirds of these or 22.5% of the entire Belize sample had only received a single warning. Only 10% of the Guatemalan sample had received a warning. Of the entire sample, 69% had never received a warning for a fisheries offense.

Offenses that Led to the Warning. Question 27 probed the type of offense that led to the warnings issues by officers. Seventy two percent (72%) of the sample had never received a warning (67.5% of the Belizean sample and 90% of the Guatemalan sample). The most common type of offense for which officers issued warnings was an undersized product (21% of the individuals in the entire sample OR 70% of the offenses). Two individuals reported two different types of offenses.

Offense that Led to the Issuance of a Warning	Belizean Sample (N=80 BUT 82 offenses)	Guatemalan Sample (N=20)	Entire Sample (N=100 individuals BUT 102 offenses)
Undersized Fish	2		2
Undersized Conch	8		8
Undersized Lobster/Crawfish	6		6
Undersized Product	5		5
Possession of Spear Gun	1		1
Expired License or No License	2	1	3
Product out of Season	1		1
Fishing in a “no take” Marine Reserve	2	1	3
Damaging the Reef	1		1
No Response	54	18	72

Perception of Likelihood of Detection of Illegal Fishery Activity. Question 28 explores the perception that marine resource users have about the capability of fisheries officers to detect illegal activity. It asked “If the average fisher in Belizean waters disobeys fishery regulations, the likelihood that he will be discovered by fishery officers is very likely/more likely than not/50:50/ unlikely?”

Likelihood of Detection by Fishery Officers of Illegal Activity	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Very Likely	25	10	35
More Likely than Not	16	4	20
Average (50:50)	21	2	23
Unlikely	17	4	21
No Response	1		1

Of the Belizean respondents, 51% indicated that the likelihood of detection was “very likely” or “More Likely than Not”. Guatemala respondents had more confidence in the fishery officers’ capabilities, and 70% of them fell into this category. About 20% of both subsamples suggested the “unlikely” response.

ARREST, DETENTION, AND JUDICIAL PROCEDURES

The survey also addressed the issue of arrest and detention of presumed violators of Belizean fisheries laws and regulations. We note how many individuals in the sample size of 100 have been arrested and what the outcome was. The survey also explores the perceptions of these individuals regarding fairness and also the likelihood of recivism or repeat offenses.

History of Arrest for Fishery Offenses. Question 29 asks whether the interviewee or someone he knows has ever been arrested for a fisheries offense. Thus, the percentage that we obtained may be greater than the percentage of our sample that has actually been arrested.

Question – “Have you or someone you know ever been arrested for a fisheries offense?”	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Frequently	0	1	1
More than Once	19	6	25
Once	30	0	30
Never	28	8	36
No Response	3	5	8

The arrest rate for fisheries offenses for the sample *or someone they know* is 61% for the Belizean sample and 35% for the Guatemalan sample. The arrest rate for the entire sample is 56%.

Arresting Officer. Question 30 asks the institution of the arresting officers. In Belize this could be the Fisheries Department officers (who are also allowed to carry arms), the MPA rangers (who are also Fisheries Department personnel), the Police, Coast Guard of the Belize Defense Force (BDF). Some individuals in the Belizean sample indicated more than one arresting institution.

Who Performed the Arrest?	Belizean Sample (N=80 BUT 88 Responses)	Guatemalan Sample (N=20)	Entire Sample (N=100 BUT 108 Responses)
Fisheries Department	37	1	38
Police	9	2	11
Coast Guard	2		2
MPA Rangers	7	2	9
Belize Defense Force	2	1	3
No Response	31	14	45

Fisheries Department officers were responsible for more than 60% of the arrests while MPA Rangers were responsible for another 14%. The large “No Response” rate indicates the large percentage of the sample that has no immediate experience with arrest for fisheries violations.

Location of the Arrest. Question 31 asks the location of the arrest. We divide the responses into MPAs and non-MPAs. Again, the high “Non Response” rate reflects the lack of experience of a large percentage of the sample with arrests for fishery violations. About 47% of the arrests occurred within an MPA while 53% occurred outside an MPA.

Location of the Arrest	Belizean Sample (N=80)	Guatemalan Sample (N=20)	Entire Sample (N=100)
MPA			25
Glovers Reef	5		5
Gladden Spit	3		3
Half Moon Caye	4		4
South Water Caye	6		6
Caye Caulker	4		4
Port Honduras	2		2
Laughing Bird Caye	1		1
Non-MPA			28
Near Belize City	2		2
“Offshore”	12		12
Goffs Caye	1		1
Silk Caye	1		1
Hunting Caye	1		1
Harvest Caye	1		1
Turneffe	3		3
Long Caye	1		1
“Belize”		5	5
“Belize close to Guatemalan Border”		1	1
No Response	33	14	47

Perception of the Experience. In Question 32 we asked the sample to describe their experience during the arrest. Again, the high “No Response” rate reflected the significant number of our sample who had never been arrested.

Experience during the Arrest	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Good	2	1	3
Normal	16	6	22
Bad	13	1	14
Very Bad	13	1	14

No Response/“Don’t Know”	36	11	47
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Of the arrested individuals, 59% of the Belizeans classified their experience as “bad” or “very bad”, while only 10% of arrested Guatemalans described their experience as such.

Time of Detention. Question 33 asked the interviewees how long they were detained.

Time of Detention	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
More than 24 Hours	13	2	15
12 – 24 Hours	11	5	16
6 – 12 Hours	1		1
2 – 6 Hours	9		9
< 2 Hours	6		6
No Response	40	13	53

Approximately 32% of those arrested were detained for more than 24 hours. This included 32.5% and 29.5% of the Belizean and Guatemalan samples that had been arrested, respectively.

Ability to Contact Someone while in Detention. Persons who have been arrested in Belize should be allowed to contact a family member or attorney. Question 34 asks the interviewees whether they were allowed to contact someone while under arrest. Not all detainees were given this right. Again, the large number of Non Respondents is due to the low arrest history of the sample.

Question – “Were you allowed to contact someone while in detention?”	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Yes	32	8	40
No	10	2	12
No Response	38	10	48

Notification of Rights during Detention. Similarly, arrested individuals should be informed of certain rights, such as the right to know why they are detained, the right to an attorney, the right to post bail, and the right to remain silent. Question 35 asks whether the arrested individuals were informed of their civil rights.

Question – “Were you advised of your rights while in detention?”	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Yes	24	7	31
No	18	2	20
No Response	38	11	49

Significantly, 43% of the Belizean individuals who responded and 22% of the Guatemalan sample that responded were not advised of their civil rights or did not remember this.

Perception of Conditions during Detention. Question 36 inquires into the respondents’ perceptions of conditions during this detention. Of individuals who responded (45% of the Belizean sample and 40% of the Guatemalan sample), many (64% of Belizean respondents and 37.5% of Guatemalan respondents) considered that the detention conditions were “bad” or “very bad”.

Perceived Conditions during Detention	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Good	3	0	3
Normal	10	5	15
Bad	10	3	13
Very Bad	13	0	13
No Response	44	12	56

Appearance before the Magistrate. Question 37 asks whether the arrested individual appeared before the Magistrate. Alternatively, the Government may have decided to drop the case for lack of evidence, faulty procedures, inability to transfer the accused to Court, or for subjective reasons. The high “No Response” rate is a function of the lack of arrest history in the sample.

Appearance before the Magistrate	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Yes	31	6	37
No	13	2	25
No Response	36	12	48

Location of Judicial Hearing. The survey (Question 38) asks where the individual appeared in Court. One individual in the Belize sample appeared before two Magistrates (Belize City and Punta Gorda).

Location of the Court	Belizean Sample (N=80 BUT 81 Reponses)	Guatemalan Sample (20)	Entire Sample (N=100 but 101 Responses)
Belize City	12		12
Mango Creek	3		3
Punta Gorda	1		1
Dangriga	13		13
San Pedro	1	5	6
No Response	51	15	66

The entire Guatemalan sample (5 responses) appeared before the Magistrate in San Pedro. The Belizean sample was split between Court appearances in five towns. However, Dangriga and Belize City were the most frequent venues with 43% and 39% of the Court appearances, respectively.

Outcome of the Hearing. Of the 34 persons who appeared before a Magistrate, outcomes varied for numerous reasons (Question 39). In some cases, the individual pleaded guilty or was found guilty based on the evidence presented by the authorities. In other cases, the individual was released and not charged because the fisheries officer failed to appear at the hearing, the procedures used by the authorities were flawed, or evidence was insufficient. It is possible that in some cases, personal or political influence resulted in pressure being placed on the Magistrate to release the individual.

Outcome of the Court Hearing	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Guilty	3		3
Fined	13	2	15
Fined and Confiscation	1	2	3
Release and Confiscation		3	3
Charged	5		5
Fined and Sentenced	1		1
Released/Not Charged/Case Thrown Out/Not Guilty	7		7
No Response	50	13	63

The government was unsuccessful in its cases 19% of the time for various reasons. Confiscation of vessels and equipment was relatively uncommon and only occurred in about 16% of the cases heard before a Magistrate and 20% of the successful cases.

Perception of the Judicial Procedure. Question 40 evaluated surveyed individuals perceptions about the judicial procedure. Perceptions of fairness and the outcome of the case may certainly cloud how individuals view their experience.

Perception of the Court Experience	Belizean Sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Good	1	1	2
Normal	15	8	23
Bad	11	2	13
Very Bad	3		3
No Response	50	9	59

Of individuals who responded to the question, 61% considered that the judicial experience was “good” or “normal”. Another 39% of respondents viewed the court experience as “bad” or “very bad”.

Perception of the Likelihood of Recivism. Question 41 attempts to examine the perception that marine resource users have about repeat offenders and asks whether they consider it likely that prosecuted individuals will engage in similar illegal behavior again in the future. In other words, are the arrest and conviction a deterrent for future violations by the same individuals? Can prosecution change behavior? The precise question is “If the average fisher in Belize is arrested for a fishery violation and prosecuted, the likelihood that he will commit the same or a similar violation again in the next three years is: highly likely/more likely than not/ average (50:50)/ unlikely?”

Question – “If the average fisher in Belize is arrested for a fishery violation and prosecuted, the likelihood that he will commit the same or a similar violation again in the next three years?”	Belizean sample (80)	Guatemalan Sample (20)	Entire Sample (100)
Highly Likely	10	4	14
More Likely Than Not	25	5	30
Average (50:50)	17	4	21
Unlikely	13	7	20
No Response	15	0	15

It appears that many respondents to this question have little faith that arrest and prosecution can change the behaviors of violators on fishery regulations. Almost 52% of the entire sample (54% of the Belizean sample and 45% of the Guatemalan sample) selected “highly likely” or “more likely than not” that prosecuted individuals would be “repeat offenders”.

JUDICIAL PROCEDURES

The court data revealed that the major offenses for which people appeared before the court were: absence of a valid fisherfolk or boat license, fishing during the closed season for a particular species, possession of undersized individuals (lobster or conch), and fishing within a restricted area. The fines ranged in value from BZ\$100.00 to BZ\$300.00 per offense (US\$1 = BZ\$2). In addition, mandatory penalties exist for capturing or possessing undersized individuals that could range from BZ\$20.00 - BZ\$30.00 per individual.

The data further indicated a lack of consistency in how fines were levied. This could result from officials’ lack of familiarity with the laws or their preparation of the cases. Data from the Fisheries Department indicated a lack of standardization in the preparation of cases and the procedure in which they were handled. Interviews with Fisheries Department staff further substantiated this observation. The research also indicated a noticeable lack of information sharing among enforcement partners, as well as the absence of inclusion of certain types of information during the preparation of cases. For example, data concerning past detentions or arrests did not form a mandatory part of case preparation and in most cases, were not considered by the presiding magistrate. This has great implication for repeat offenders. A universal database of detentions, arrests and/or cases that have passed through the Magistrate’s Court is absent, despite the fact that such databases exist in various forms within individual offices. A multi-agency initiative exists to develop a universal database and standardized patrol procedure protocol for protected areas. However, this universal database is not yet functional.

Regarding the legislative framework, in Belize at least four pieces of principal legislation each with their appropriate regulations govern the enforcement chain within MPAs and Belizean maritime space. The Fisheries Act is the principal legislation for Marine Reserves and is administered by the Fisheries Department. The Forest Act, National Parks System Act, and Wildlife Protection Acts are all administered by the Forest Department. Finally, detentions, arrests and court procedures are the jurisdiction of the Judiciary. Even though they impact the same resources, major inconsistencies exist in the way the Fisheries and Forest Departments structure and administer these laws. A

current initiative is underway to revise the Fisheries legislation. There is no indication whether this revision will also include the Forest Act and the National Parks System Act.

Discussion

Most survey respondents knew what an MPA was and could name several of Belize's larger MPAs, with the tour guides being able to name the most. Belizean respondents had a greater knowledge of the geographical details of Belizean MPAs than did Guatemalan interviewees. About 60% of our sample used Belizean MPAs for fishing, tourism, or diving, and about 40% of the sample claimed to use one MPA frequently because of its accessibility to them and the high quality of its marine resources. Most respondents stated that they had good knowledge of the regulations of this MPA, as well as fisheries regulations. However, when probed about the actual dates of closed season for lobster, conch, and Nassau grouper, respondents demonstrated their knowledge to be rather deficient. Only about 20% of Belizean respondents knew the correct dates of these closed seasons, and no Guatemalan respondent gave a correct answer.

Most MPA users have been approached by a patrol at least once and in most cases it was Fisheries Department personnel. However, 33% of the Belizean sample and 90% of the Guatemalan sample had never been stopped at sea. Similarly, 69% of the entire sample had never received a warning from Belizean authorities. Hopefully, this suggests that users are complying with the regulations rather than weak enforcement presence on the water. When asked their perception of detection of illegal activity on the water, 51% of Belizeans and 70% of Guatemalans stated that it was likely that the authorities would detect the alleged violation.

Over half of the respondents had been arrested or knew someone who had been arrested. The majority of users were familiar with detention and arrest procedures. About half of those who had been arrested at least once felt that it had been a bad experience. Interviewees considered that the court process was fairly straightforward and that the experience was generally not negative. In our sample, the government appeared to be unsuccessful in about 20% of the cases brought before the Magistrate. A major concern about individuals surveyed was the belief of a significant number of interviewees that political and personal interference in the process occurred resulting in preferential treatment being given to some individuals. This could certainly undermine users' faith in the enforcement and judicial system.

Conclusions and Lessons Learned

During the interviews with enforcement personnel, NGO co-managers, and judges, as well as from results of the surveys with marine resource users, several points surfaced appear as the priority concerns. These are:

- Lack of trained and competent staff
- Lack of financial resources and proper equipment
- Lack of political will to provide the necessary support and enabling environment in which to conduct enforcement
- Personal and political interference in the enforcement process
- Misconceptions about the role of foreign fishers in the management equation. The widely-shared belief within Belize is that foreign fishers are the principal contributors to overfishing, fishing during the closed season, and fishing undersized individuals.

Generally, the interviews and surveys demonstrated the perception that managers were doing a good job with the resources available and displayed a general commitment to enforcement. However, there is a perception of a difference in that commitment depending on the organization or manager involved. Interviewees considered that the NGOs had the higher commitment to enforcement – perhaps because of their obligations to donor agencies or their commitment and training. Most NGOs had a monitoring and enforcement component as part of their funded projects.

The perception of commitment to good enforcement is less for the Fisheries and Forest Departments both of which have enforcement obligations as part of their legislative mandates and their commitments to good management. As a result, the Fisheries Department conducts its own enforcement, as well as partnering with NGO partners and other enforcement agencies. The Forest Department takes a more laissez-faire stance leaving the enforcement to co-management partners and providing institutional and prosecutorial support when requested.

A general feeling of dissatisfaction was evident with the level of political and personal interference in the enforcement process, especially given that most agencies are working with shoestring budgets and staff. Political and personal interference serves to undermine the efforts of the enforcement agencies, decrease morale among the field staff and, most importantly, in the country's present violent environment with the reality of drug running in Belizean maritime space, places enforcement personnel at a greater risk of physical danger. The absence of inter-agency exchange of pertinent information is a deep problem in enforcement of Belizean marine resources.

The two main points that arose from the focus groups and surveys with users included: 1) the need to provide stronger enforcement, particularly in certain strategic areas, 2) the willingness of most users to obey the regulations. However, they feel that given the current practice of political and personal interference, the enforcement efforts will not produce results that lead to protection of the resource. Other important points from the focal group discussions included the following:

- The government must provide additional resources for enforcement,
- Technically qualified persons need to be employed,
- Fines need to be increased to better reflect the nature of the offenses, and
- Users must be better integrated in the monitoring and enforcement processes.

The study identifies several points about the enforcement chain in MPAs in Belize. Most discussions were frank, and most stakeholders appeared to be committed to the goal of sustainable resource management and the effective management of the MPA system. Although gaps exist and some areas need strengthening, compared to other countries in the region (both Central America and CARICOM), the current regulatory system functions satisfactorily most of the time. Based on the results obtained, we reached the following conclusions:

- All the components required for a functional enforcement system are currently in place in Belize. Functioning mechanisms and agencies exist that are responsible for patrols and surveillance, detection, arrest/interception, prosecution, and sentencing. In Belize, the two agencies with statutory authority over MPAs (Fisheries Department and Forest Department) both have developed productive partnerships with NGOs that have created shared responsibility for management of MPAs – including enforcement functions. MPA partners provide funding and training for enforcement staff and infrastructure in many Belizean MPAs. This has produced in a robust enforcement situation with close to 100 enforcement personnel in the country.
- Interviews indicate that fishers felt that MPA managers are doing a satisfactory job but that those who have an NGO partnership connection demonstrate a deeper commitment to resource protection. Perhaps these partnerships result in greater financial support and increased oversight of MPA management activities.
- While marine resource users' knowledge is quite extensive, many survey respondents lacked detailed knowledge of fisheries regulations. This suggests a clear need to enhance education and outreach activities to the various marine user groups in a language (literally and figuratively) that they can understand well.

- Efficiency and effectiveness can be significantly improved through enhanced communication of pertinent information, greater collaboration and more efficient coordination. With the recent budget cuts it has become essential that marine enforcement agencies pool their limited resources. This will be critical for areas that buffer the MPAs.
- Enforcement is an expensive process that has very few results that are immediately tangible. It is essential to develop and apply indicators or an efficiency index to relate the amount of resources expended on enforcement to the general health of the marine resources and the effectiveness of management. The preparation of quantitative indicators for enforcement efforts could be the basis for improving the efficiency of the Belizean government to protect and manage its marine resources.
- From our discussions with resource users, it appears that much more illegal activity actually occurs in MPAs than is being reflected by the number of cases that have been reported and taken to court. Using the conviction rate alone as an indicator of the effectiveness of the enforcement process could be misleading because a violator could be simply warned but never charged or prosecuted in the judicial system. For example, a violator might be admonished several times about an offense before he/she is finally taken to court by which time several offenses may have been committed. There is a need to document the issuance of warnings and for what offenses, and this information needs to be shared in a timely fashion.
- Moreover, from interviews with fishers, it is clear that authorities fail to detect a significant amount of illegal activity. Although Belizean MPA enforcement activities are fairly robust, there is a clear need for increased patrol and presence on the water. A surprising number of respondents to the survey had never been stopped at sea. Similarly, about half believed that illegal activity would be undetected.
- Enforcement activities and presence must be improved in strategic areas – particularly in southern Belizean waters where much illegal activity appears to be undetected.
- Documentation of the enforcement process and proper handling of the documents must be improved. While a considerable amount of enforcement work has occurred, there is little record of it because the documentation cannot be found or does not exist.

- There is a need for standardized procedures for patrolling, detection, arrests, and development of judicial cases. At the moment these tasks are performed by a number of different agencies with different levels of authority. All MPA enforcement personnel should follow the same procedures and process information and violations a uniform manner. The lack of consistent levying of fines and preparation of reports and judicial cases indicates a need for improved training and capacity building of enforcement personnel.
- Several bodies of legislation govern Belizean maritime space. Jurisdictional overlaps and gaps resulting from contradictory legislative mandates need to be addressed. Currently an Advisory Committee is undertaking the revision of the Fisheries Law, but it is unknown whether this process will extend to legislation giving authority to the Forest Department. In addition, this situation is further complicated by the passage of the Coast Guard Act a few years ago. Belizean MPAs need to be managed legislatively as one unit, regardless of the type of designation and level of protection.
- MPA management in Belize is highly fragmented among government agencies. Belize needs a single institution with clear authority over MPAs. At present both the Fisheries Department, Forest Department, and their various co-management partners have their unique approaches to enforcement. The lack of coordination and sharing of enforcement information between the Fisheries Department and the Forest Department – agencies that share responsibility for management Belizean MPAs) - reduces the efficiency of the enforcement process.
- Furthermore, with the current situation of illegal activities in the country, victimless crimes such as natural resource infractions are not a priority. As a result, managers' actions are not given close scrutiny. A lead agency needs to be identified that will have responsibility for proper surveillance, detection, arrests and prosecution of Belizean maritime space and resources.
- The Magistrate Courts are currently overwhelmed with the current situation so a clear need exists for a new more efficient system of dealing with offenses that will not take as much time and require the resources that the current system demands. A ticket system for minor violations has been suggested, but the mechanics of concept still need to be developed.
- The fine and penalty structure for fishery violations needs to be revised to better reflect the nature of the offense.

- Belizean authorities should make greater use of confiscation of vessels and equipment for repeat offenders. Respondents' strong beliefs that prosecuted individuals will become repeat offenders suggests that confiscation might be one vehicle to reduce repeat violations.
- Some sensitivity training and capacity building concerning environmental legislation must be given to magistrates who are new to natural resources offenses. This will help with the regularizing the trial and sentencing phase.
- Education is a key part of compliance, but currently information dissemination is fragmented. A number of agencies are involved in outreach about enforcement and violations, but each has its own agenda. Agencies and their NGO partners must collaborate in circulating basic information on the regulations for MPAs to the users on a regular and frequent basis.
- The political and personal interference in the enforcement and sentencing processes must cease. This is essential to instill confidence in the system and improve morale in the staff charged with conducting patrols. It would be pointless to improve all the other aspects of the enforcement chain and allow corruption to undermine normal enforcement procedures.
- Guatemalan and Honduran fishers appear to be responsible for a significant amount of illegal activities in southern Belize MPAs. The Gulf of Honduras maritime dispute between Belize, Guatemala, and Honduras greatly complicates this enforcement issue. Nevertheless, specific outreach and educational efforts must be developed to target these Spanish-speaking audiences. Surveys of 20 Guatemalan fishers who fish in the maritime space claimed by Belize suggest that many are unfamiliar with the details of Belizean fishery regulations and precise locations of Belizean MPAs. Similarly, Belizean MPA and fishery authorities must improve communication with their Guatemalan and Honduran counterparts to attempt to manage their marine resources using ecosystem-based principles.

Despite the challenges, gaps and overlaps, the enforcement chain in Belize works fairly well under the circumstances. Belizean MPA management framework, despite its problems, is clearly a model for other countries in the region. Consensus and commitment concerning the concept of sustainable natural resource management appear to be present particularly because of the recognition that a high quality

environment provides the basis for tourism revenues that generate a significant portion of the Belizean economy. The challenge is to improve the efficiency of the system.