

Fishers Perception of Marine Protected Areas in Belize

Introduction

The first MPA was declared in Belize in 1982, ten years later, there are 13 Marine Protected Areas (MPAs) comprised of eight marine reserves, and two wildlife sanctuaries, natural monuments, and national parks (Figure 1) These MPAs fall under the National Park Systems Act of 1981 and were established for fisheries management and ecosystem protection, recreational and tourism sites, research and education. Seven of these MPAs are recognized internationally as they lie within the Belize Barrier Reef System, which was named a World Heritage Site in 1995.

Several of these MPAs encompass traditional fishing grounds which have fuelled opposition against the establishment of MPAs, specifically marine reserves, by some fishers, who in some cases have spearheaded strong lobbying for de-reservation of some sites. A lack of information, and subsequently the development of misconceptions, is considered to be the major factor fuelling this opposition. Recognizing the importance of an education programme to combat such a perception, the Coastal Zone Management Authority and Institute and the Marine Protected Areas Working Group in 2001, designed a survey to collect data from fishers to verify if this was indeed a vastly held perception.

This is a report on the survey carried out on fishers perception of marine protected areas in Belize. The objective of the questionnaire is to collect information on fishers perception of and attitudes towards MPAs as well as measure their knowledge of MPAs and record their concerns. The resulting data is to be used to design an effective education and communication programme to improve knowledge and influence attitudes and perception. At the conclusion of this process, the areas that need to be addressed will be clearly identified.

Research Methods and Sites

The research technique used was a combination of the standardized, open-ended interview and closed, fixed response interview approaches (Patton 1990). Data collectors randomly choose fishers from the research sites, conducted one-on-one interviews and recorded their responses. In some cases, fishers recorded their own responses.

The sample areas and corresponding number of fishers identified were calculated based on the total number of registered fishers for the year 2000 (Coastal Zone Management Authority and Institute, 2001). According to statistics taken from State of the Coast Report 2000, there are 2,788 licensed fishers. To provide an accurate sample size of the 2,788 fishers, 247 fishers were interviewed allowing for a margin of error of $\pm 5\%$ at a 90% confidence level (Martin 1999).

The sample taken from each area was determined by first choosing the communities with the highest number of registered fishers and then finding the percentage this number represents for the overall registered fishing population (Table 1). This percentage was subsequently multiplied to the total sample number to determine the site sample. Pre-testing represented 8% of the total sample size and was implemented over a three month period (Figure 1).

Sample Area	No. of Fishers (Pre-testing)	No. of Fishers (Full sample)
Chunox	1	5
Caye Caulker	2	11
San Pedro	2	25
Copper Bank	1	7
Dangriga Town	2	17
Hopkins Village	1	7
Independence	1	5
Belize City	3	80
Placencia	1	14
Riversdale	1	2
Monkey River	1	3
Corozal	1	7
Sarteneja	2	50
Punta Gorda Town	2	14
Total	21	247

Table 1: Sample areas indicating population sample for pre-testing and full sample.

Key fishing communities were identified from statistics showing the number of licensed fishers for a particular area published in the State of the Coast Report 2000. A geographic view of the sample communities are illustrated in Figure 2.

The questionnaire included two open-ended questions and 14 closed-ended questions. Open-ended questions were analyzed using pre-determined categories with specific criteria used to rate the responses. Closed-ended questions were analyzed using frequency tables. Where a question applies to the whole sample, the results are calculated based on the whole sample, similarly, responses depend on responses to previous questions, and are calculated based on the total responses received.



Interviewing a fisher in Independence Village. (Jose Gonzalez)

III. Results

1. Understanding the purpose of MPAs

The overall results show that 49% of fishers interviewed have a basic understanding of the purpose of MPAs, however, 43% of the responses indicated a lack of understanding of the concept of MPAs. Responders often equated MPAs with an area closed to fishing and opened to tourism (Figure 3). Fishers of Sarteneja, Hopkins and Belize City ranked the highest in understanding the identified concepts of MPAs. Only 7% of the fishers interviewed indicated a high understanding of the purpose of MPAs.

For a response to be recorded as having a high understanding of MPAs it must include the various purposes such as, education, fishery and ecosystem protection, recreation and research. A basic understanding includes an MPA as an area where fishing is done, but also protects fishery resources to replenish the fishery stock.

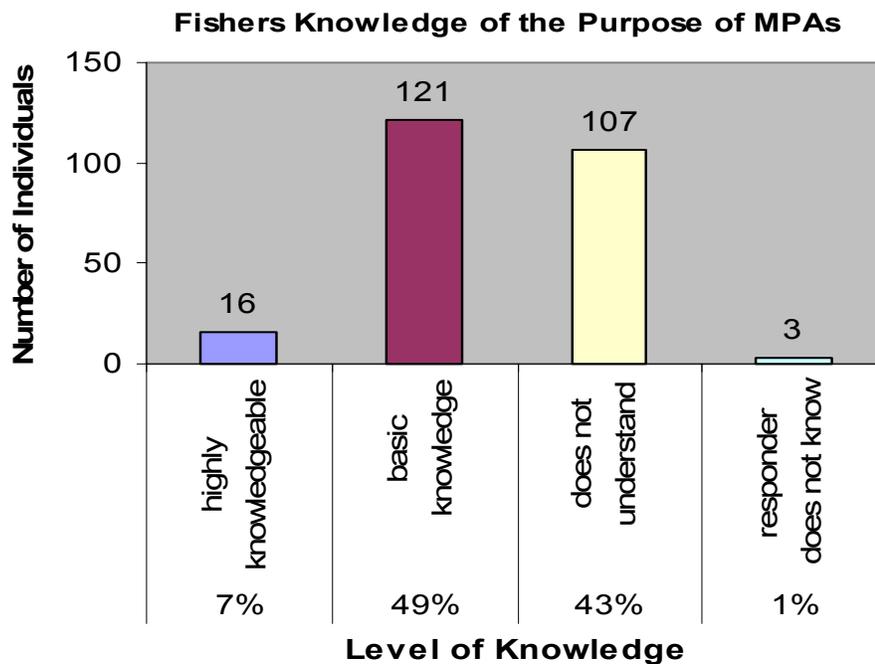


Figure 3: Fishers knowledge of the MPA concept

2. Impacts on fishery resources

Fishers perception of the impacts of MPAs on the fishery resources were negative as 45% of fishers interviewed perceive MPAs as having a negative impact on the fishery resources. Repeatedly cited in the negatives responses was that MPAs caused restricted access to traditional grounds, resulting in less product being captured and sold. Only 16% indicated that MPAs have had a positive impact on the fishery resources noting that there has been an increased in the population of fishery resources. 23% indicated that MPAs have in fact not made any changes to the fishery resources, but 4% of this portion were optimistic that positive changes would be seen in the future (Figure 4).

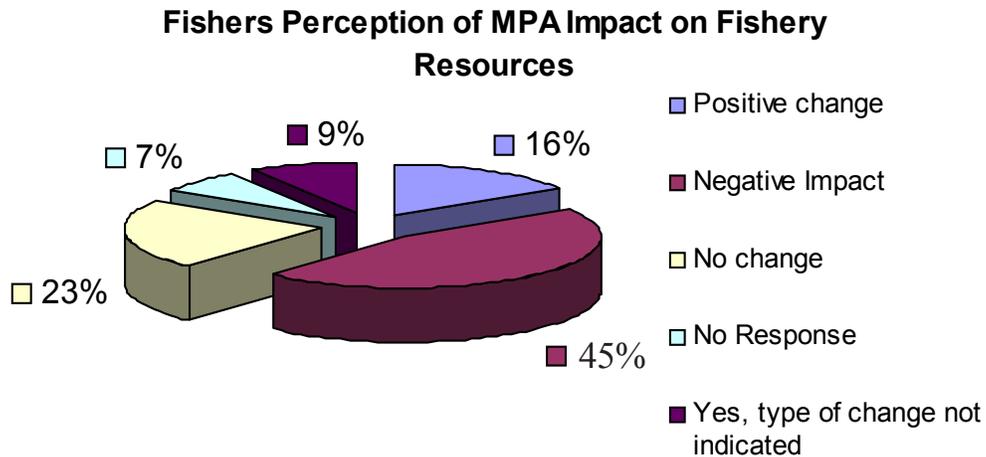


Figure 4: Impact of MPAs on fishery resources.

3. MPA Use and Knowledge of Regulations

Fishers interviewed were asked if they knew of any MPA within their fishing region. Significantly, 78% of fishers knew of a MPA in the region where they fish, and 49% of this stated that they used the general use zone of a MPA. Of those who utilize the general use zone of a MPA, 68% said that they knew the regulations of the particular MPA used while 23% stated that they did not know the regulations. Some fishers expressed mixed feelings about their knowledge of these regulations, reporting that they knew some of the regulations or “50/50”. These responses were indicated for both the negative and positive variables. Fishers in San Pedro had the highest ratio of responders who knew the regulations (Figure 5)

In relation to their perception of other fishers following MPA regulations, 60% of the total fishers interviewed said that they believed that most fishers follow the regulations of marine protected areas while 40% of the responders believed that fishers do not follow the regulations due to various factors. Of this 40%, only 15% stated that ignorance of the regulations was the main factor for fishers not following the regulations. Notably, 58% of those who believe that fishers did not follow the regulations said that fishers know the regulations but choose to ignore them. Fishers believe that the main reason their fellow fishers ignore MPA regulations was due to economic need. Only 14% of fishers said that they believe that fellow fishers did not follow the regulations due to lack of visible zone markers and other factors (Figure 6).

Knowledge and Use of MPAs

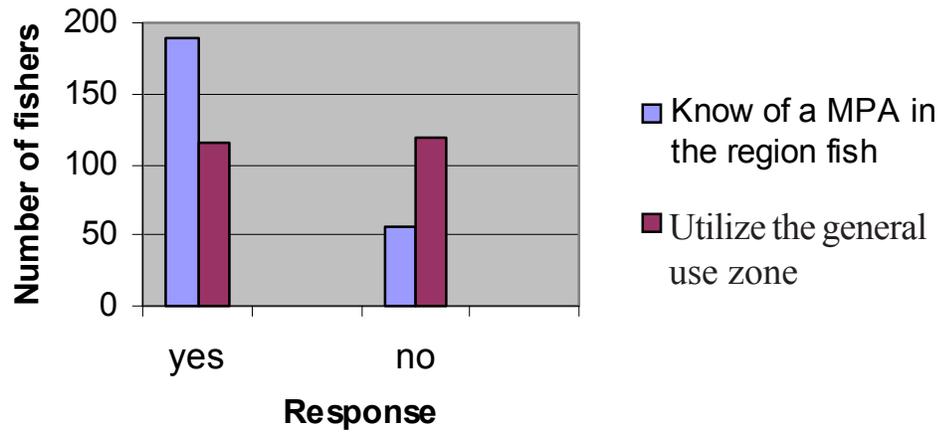


Figure 5: Knowledge of MPA within fishing region used and use of general use zone.

Compliance with MPA Regulations

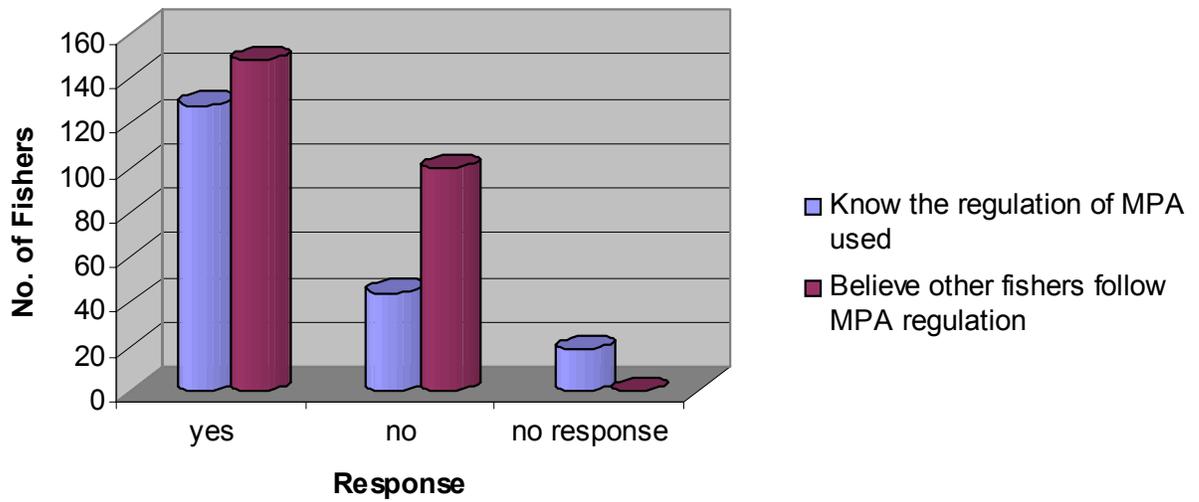


Figure 6: Fishers knowledge of MPA regulations and perception of other fishers in complying with the regulations.

4. Involvement in the Decision-making Process

Overall, 44% of fishers believe that they or their representatives (in context with those that belong to cooperatives) are not involved in the decision-making process in the designation of a MPA or subsequent management decisions. 33% of fishers believed that they or their representatives are “somewhat involved” in the decision-making process, however, only 16% of those interviewed believed that fishers are “very involved” in the decision-making process.

This trend was repeated when fishers were asked if they were ever consulted prior to the designation of a MPA or subsequent management decision-making. Significantly, only 32% of fishers stated that they had been consulted, while an overwhelmingly 68% of fishers claimed that they have never been consulted.

5. Fishing Areas

This perception of non-involvement in the decision-making process is contrasted against the fact that the most popular fishing areas, Area 4 and 5 (Table 2) encompass MPAs (Figure 7). 26% of fishers said they use Area 4 which includes the South Water Cayes Marine Reserve and the same number identified Area 5 as their traditional fishing area. Area 5 includes three marine reserves: Caye Caulker, Hol Chan, and Bacalar Chico Marine Reserves.

Area Fished	N(247)	%
Area 1	39	14
Area 2	29	10
Area 3	43	15
Area 4	75	26
Area 5	75	26
Area 6	29	10

Table 2: Areas Fished by Sample Group (fishing area boundaries defined by the Belize Fisheries Department)

6. Source of Income

Of those interviewed, 71% stated that fishing is their only source of income while 29% had an alternative source of income. For those who have additional income earnings, tourism ranked as number one with 52% of fishers being involved in this area, while 16% are involved in the areas of agriculture, and construction (Figure 8). Sarteneja fishers in particular, are heavily dependent on the fishing industry as 94% reported fishing as their sole income earner.

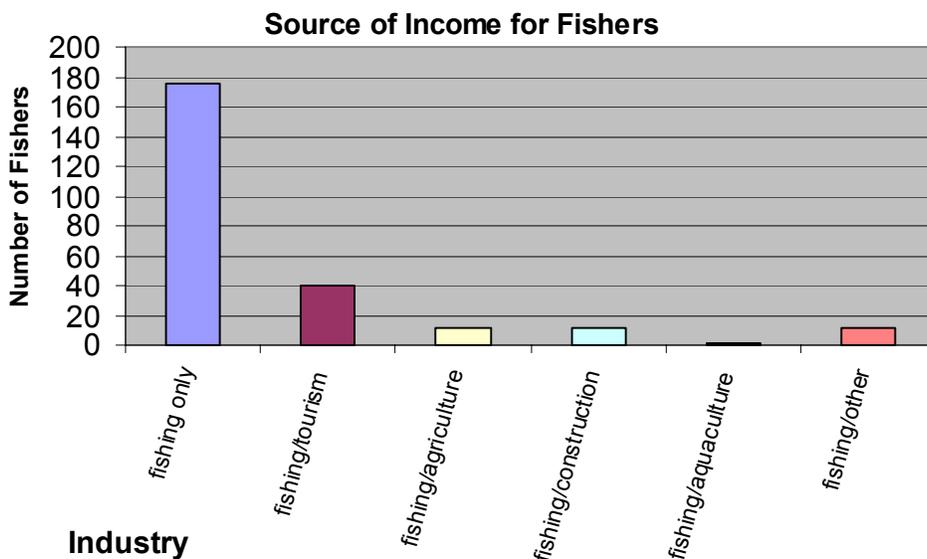


Figure 8: Source of Income for Fishers by Industry

7. Interest in an MPA Education Programme

Fishers’ interest in participating in an education programme is high with 84% of fishers interviewed expressing their willingness to attend such a programme. Only 16% indicated that they were not interested in participating in an education programme.

Discussion

Fishers do not see MPAs as an added value to the fishing industry in relation to its long-term sustainability. MPAs are viewed as restricting access to traditional fishing areas to allow the tourism industry to move in. This perception is apparent in many of the responses given in questions 1 and 2. An example of this perception is captured in the following response given by one fisher: “A MPA is a reserve and a money making institution for tourism.” A similar response provides a conflicting perception that some fishers hold, “Reserves aren’t convenient for fishermen but do preserve fish. Good for tourism, not so good for fishermen. Good, protects industry [assumed to mean fishing industry].” Even a response meant to be positive reflected this perception of MPAs = tourism benefits, as one fisher stated, “more fish for tourists to see”. In addition to this perception, there is also growing resentment that illegal fishers are benefiting from MPAs as they are exploiting the protected areas, while the Belizean fishers must obey the rules.

While these perceptions may be fostered by several circumstances, the two main contributing factors are lack of information being provided to this important stakeholder group and involvement in the decision-making process. The first factor can be supported by the 49% of fishers who do not understand nor perceive MPAs as relevant to the long-term sustainability of the fishing industry. Opposition to MPAs is

also due to fishers believing that MPAs have not had a positive effect on the fishery resources. One cause of this view may be that information is not being relayed directly to fishers, but through intermediaries who may not necessarily provide an objective view.

The second factor is notable in an almost even split between those who believe there is no involvement of the fishing industry in the decision-making process for MPAs at 50%, and the 47% who believe that there is strong or moderate involvement. This can be attributed to fishers frustration that when their opinions are sought out and provided, those opinions are largely ignored.

Furthermore, while 78% knew of the existence of MPAs in the region where they fish, there was hesitancy in admitting to using the general use zone of an MPA. An assumption could be made that this number may be higher, but that uncertainty exists about the legality of fishing in an MPA. Of course, this is an assumption based only on observation and not measured by any variable, therefore subject to error.

With 71% of fishers declaring fishing as their only source of income, opposition will continue to grow if MPAs are continued to be perceived as limiting fishers yield, therefore reducing economic benefit. However, the high interest in the MPA education programme proposed to fishers interviewed does show an openness to receive information and to learn more about the possible benefits of these MPAs to their livelihoods. The research reflected that though a minority, 16% of fishers do believe that MPAs have had a positive effect on the fishery resources, which is evidence that there is a foundation on which to build.

Factors that may have introduced error in the results of fishers attitudes towards and perception of MPAs, are strongest in the open-ended questions as the responses may not provide an accurate account. In particular this applies to question 1 which was designed to measure fishers understanding of the purpose of MPAs. The responses given may reflect a reactionary rather than a rationalized response on the part of some fishers and may have warranted further probing by the interviewer.

Secondly, questions which should have been skipped depending on the negative or positive response of a preceding question were asked and the responses recorded which skewed the results in those instances. Similarly, questions which should have been answered because of a previous response were not answered.

The results of several variables tested may have already changed since the survey was carried out. At the time of the survey, management personnel for many of these MPAs were just being finalized or recently appointed. Since then, education programmes for resource users have been held by personnel of some of these MPAs.

Finally, the sample number represents licensed fishers and does not take into account those that are unlicensed.

Conclusions

The MPA questionnaire was designed to determine fishers attitude towards and perception of marine protected areas in Belize. Data collected shows that there are mixed feelings about the level of involvement of fishers in the decision-making process regarding MPAs. There is also a high level of misconception about the purpose of MPAs which fosters opposition to their establishment and encourages lack of cooperation.

Knowledge about the regulations which govern MPAs is reasonable at 68%, but can be improved. The same cannot be said for perceived compliance with these regulations as 57% of fishers believe that the regulations are largely ignored.

The proposed education programme is essential based on the above and there is high interest in participating in such a programme.

Recommendations

1. Liaise with cooperatives on designing programme and appropriate implementation dates to ensure a high level of participation in the programme.
2. The perception of MPAs as being all “no fishing zones” and only benefiting the tourism industry be addressed, particularly in light of marine reserves being used largely as a tool to improve fishery yield with MPAs in general having various zoning schemes. Recommendation 3 should allow for this.
3. Education programme should be customized to address concerns of particular fishing community or fishing region used. Specifically, include a verbal and written presentation of the structure of specific MPAs, in terms of zones and regulations, used by that particular fishing community.
4. MPA staff be directly involved in programme, particularly in recommendation 2 and 3.
5. The proposed education programme include a component where fishers can make recommendations on the best methods to involve them in the decision-making process.