CLIMATE RESILIENT EASTERN CARIBBEAN
MARINE MANAGED AREAS NETWORK (ECMMAN) PROJECT

Socio-Economic Monitoring at The Cabrits National Park (Marine Component), Commonwealth of Dominica

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1 INTRODUCTION

1.1 Climate Resilient Eastern Caribbean Marine Managed Areas Network (ECMMAN) project

The *Climate Resilient Eastern Caribbean Marine Managed Areas Network (ECMMAN)* Project is a four-year (2013-2017), multi-million dollar project funded by the International Climate Initiative (ICI) via The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) grant to The Nature Conservancy (TNC). Involving six beneficiary Organisation of Eastern Caribbean States (OECS) countries, the project is being implemented by The Nature Conservancy (TNC) in collaboration with a consortium of partners. The overall aim of the project is to improve fisheries and conserve and restore marine resources, while providing for sustainable job opportunities in coastal communities. To this end, the project will focus on:

1. Establishing new Marine Managed Areas (MMAs) and strengthening existing ones;
2. Supporting fisher organisations and providing support for new livelihood opportunities;
3. Improving access to data and information regarding management of marine resources; and
4. Instituting sustainable funding mechanisms to support marine management as part of the Caribbean Challenge Initiative (ECMMAN Project Fact Sheet; ECMMAN Media Release, Jan 2104).

This socio-economic assessment of the Cabrits National Park-Marine Component (CNP-MC) is integral to strengthening and informing management within the area.

1.2 Socio-economic Monitoring for Coastal Management (SocMon)

Socio-economic Monitoring for Coastal Management (SocMon) is a global initiative being implemented at regional levels with the goal of establishing socio-economic coastal and marine monitoring programmes globally at the site level (Bunce et al. 2000; Bunce and Pomeroy 2003). This globally networked, regionally adapted, practical methodology of socio-economic monitoring works through regional and local partners to facilitate community-based socio-economic monitoring. The Centre for Resource Management and Environmental Studies (CERMES) at the University of the West Indies, Cave Hill Campus is the regional SocMon node for the Caribbean.

SocMon is aimed at helping coastal managers better understand and incorporate the socio-economic context of coastal resource use by various stakeholders into coastal management programs. This is essential for assessing, predicting and managing coastal resource use over time. This current socio-economic assessment represents the first SocMon assessment initiated at the marine component of the Cabrits National Park.

1.3 Situation overview

The Cabrits Peninsula is located approximately on the northwestern coast of the Commonwealth of Dominica, about 1.6 km north of the town of Portsmouth. The Peninsula is dominated by two volcanic peaks, East Cabrit and West Cabrit. Fort Shirley, the main and popular heritage attraction in the area is located on West Cabrit and is considered Dominica's most important historic site. The British undertook most of the construction of the Fort in the

1770s to defend Portsmouth, Dominica's first major town, from attack by the French. The French made significant additions during their occupation of Dominica from 1778 – 1784 http://whc.unesco.org/en/tentativelists/6020/. Restoration work on the fort was completed in 2007.

In addition to its historical significance, the Cabrits Peninsula is biologically rich and diverse and comprises some of the most significant stands of dry forest remaining in Dominica. East Cabrit is separated from the mainland by the island's largest wetland. Offshore, seagrass beds and coral reefs dominate (Espeut 2006).

The Cabrits Peninsula and surrounding marine area was declared a national park – the Cabrits National Park (CNP) - in 1986 under the National Parks Act of 1975; Dominica's second national park. The CNP is 5.3 km^2 in extent, of which the marine portion is approximately 4.2 km^2. The marine component is located between Prince Rupert's Bay and Toucarie Bay, extending from the mouth of the Lamothe River at Cottage, north of Toucarie Bay, to the southern side of the Cabrits pensinsula. The CNP is the only protected area in Dominica that encompasses both terrestrial and marine ecosystems. Since its declaration, a cruise ship berth and reception facility, and a visitor centre were constructed in 1990 and 1998, respectively (Ecoengineering Caribbean Ltd 2007; Espeut 2006).

Commercial activity specifically associated with the Cabrits area includes fishing (reported in 2007 as the main source of income for most families in the area), diving and snorkeling, watersports operation, ecotourism and boat tours, yachting and cruise tourism (due to a cruise ship pier and facility). As such there are several stakeholders whose livelihoods are directly or indirectly associated with the Cabrits National Park and its marine component (Ecoengineering Caribbean Ltd (2007).

Espeut (2006) notes that the marine component of the CNP is used for fishing with fishers from neighbouring villages and towns - Bioche, Capuchin, Colihaut, Dublanc, Portsmouth, and Toucarie - harvesting fishery resources from the CNP and landing their catch on their home beaches. Fishers target resources both inside and outside of the marine component of CNP.

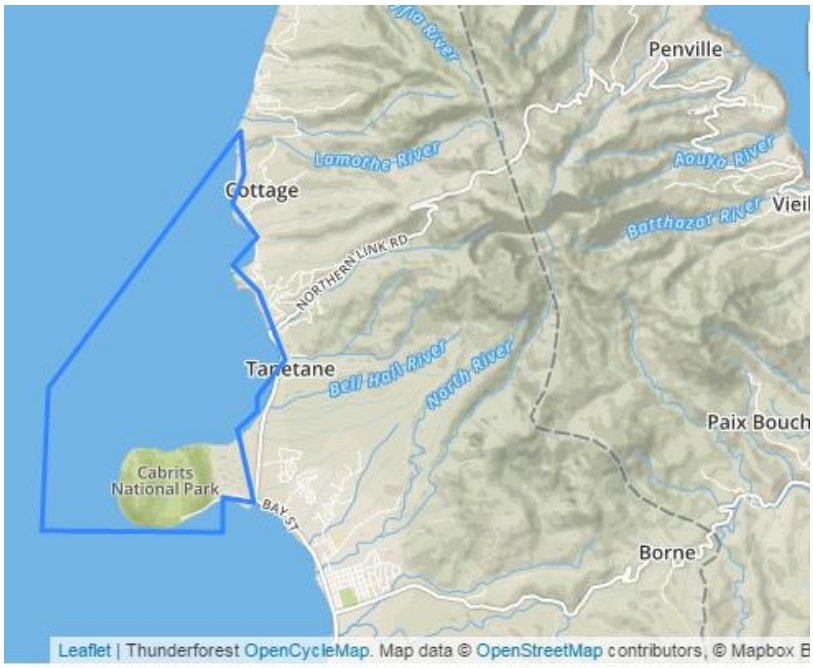

Figure 1 Cabrits National Park showing marine boundaries
Source: Caribbean-rris.biopama.org

1.4 Goal and objectives for monitoring

The socio-economic monitoring goal and objectives chosen for this assessment were determined at the SocMon capacity building training workshop in October 2016 (see Pena 2017; Table 1).

Table 1 SocMon monitoring goal and objectives for Cabrits National Park Marine Component

Goal	Monitoring objectives
Collect socio-economic data on trends, livelihoods and collaboration at the Cabrits National Park-Marine Component (CNP-MC) to inform decision-making and management planning.	1. To identify changes in users, user patterns, perceived resource conditions, and attitudes and perceptions to the CNP-MC.
	2. To determine motivating factors (if any) for the changes and impacts on stakeholder livelihoods.
	3. To understand the potential for, or interest in, sustained collaboration among ECMMAN stakeholders for managing coastal resources in the CNP-MC.

1.5 Organization of report

This report is divided into six sections. Section 1 provides a description of the 'Climate Resilient Eastern Caribbean Marine Managed Areas Network (ECMMAN) project, SocMon Caribbean, situation overview of the CNP-MC and the goals and objectives for monitoring. Section 2 outlines the methods used for gathering the data. The results of the CNP-MC SocMon survey are provided in Section 3 and Section 4 reports briefly on SocMon Spatial data collected. Section 5 comprises the discussion. Recommendations for management are provided in Section 6.

2 METHODS

2.1 SocMon training

Capacity of the Forestry Division, Physical Planning Division, Global Environment Facility-Small Grants Program (GEF-SGP) and Portsmouth Association for Yacht Services (PAYS) was built in SocMon via a three-day learning-by-doing SocMon methodology training workshop from 19-21 October 2016. See Appendix 1 for the list of participants. It should be noted that Dominica Fisheries Division staff were invited to attend and participate in the training workshop but acknowledgement of invitations and confirmation of attendance was not received prior to commencement of training. The Fisheries Division which served as the National Implementing Entity (NIE) of the ECMMAN project was expected to play a critical role in the training workshop in which at least one member of staff who had been previously trained in the SocMon methodology, and who had implemented two previous SocMon assessments, would have been engaged as an assistant SocMon trainer over the three-day workshop. Additionally, since a number of members of staff of the Fisheries Division had been previously trained in the SocMon Spatial tool, developed SocMon Spatial outputs and were deemed to be proficient in the use of the tool through a CERMES-implemented project in 2015, SocMon Spatial training was thought to be unnecessary for this ECMMAN project country. However, due the lack of participation of the Fisheries Division in the initiation of SocMon at the CNP-MC, a site visit by Jehroum Wood, SocMon Spatial trainer, was necessary to assist the CNP-MC SocMon team in spatial data collection.

The SocMon training workshop followed the format of typical SocMon trainings. Participants were (re-)introduced to the Global Socio-economic Monitoring Initiative, the SocMon approach to participatory, and community-based socio-economic monitoring (see www.socmon.org, Bunce *et al.* 2000; Bunce and Pomeroy 2003). The workshop format was similar to that detailed by Pena and Wood (2015) in Project Report No. 1 and as such will not be repeated here. See Appendix 2 for the workshop programme. The workshop emphasised practical field exercises and teamwork, seeking to simulate real monitoring programmes as much as possible. Maria Pena, Regional SocMon Coordinator, facilitated the training workshop.

Overall five persons received SocMon training, one of whom (from the Physical Planning Division) had participated in a 2015 training and had been engaged in data collection (particularly spatial data collection) for the socio-economic repeat assessment of three west coast fishing villages - Colihaut, Bioche and Dublanc, (Pena et al. 2015). The SocMon methodology training workshop included at least one site visit to the CNP for field scoping.

Critical to the workshop was the drafting of the SocMon site monitoring plan for the CNP-MC by the end of training. The plan, which formed the basis of the CNP-MC site monitoring programme was finalised by the SocMon team in 2017 subsequent to the completion of training (Appendix 3). Refer to Pena 2017 for more detailed information on the SocMon training workshop.

2.2 Preparatory activities

During the SocMon methodology training workshop, participants determined that the use of a survey instrument and informal key informant interviews (for spatial data collection) would be the best methods to collect the required socio-economic data and information. The survey instrument was drafted and designed by the SocMon team and were reviewed by UWI-CERMES and TNC Eastern Caribbean Office prior to administration. The survey instrument targeted a wide cross-section of users of the CNP-MC, while the key informant guiding questions focused on persons knowledgeable about the fishing and tourism sectors as well as the environmental impacts affecting the productivity of these sectors (Appendices 4 and 5).

Based on the goal and objectives of the site monitoring plan, 14 SocMon Caribbean variables, and 7 newly designed SocMon variables were chosen for measurement and analysis (

Table *2*; Appendix 3 for site monitoring plan). It should be noted that the variables chosen initially during the development of the site monitoring plan were refined to this final list on completion of the design of the survey and key informant guiding questions.

There was an unusually extended lag between development of the data collection instruments and the initiation of data collection due to limited capacity of the project partner and prior work commitments. However, once data collection began, it was completed within one month. Data tables and a coding sheet, which were later used for data entry, were also developed prior to data collection by CERMES.

Table 2 Variables chosen for monitoring

Variable	Variable name
S1/K5	Age
S2/K6	Gender
S4/K7	Education
S7/K12	Occupation
S9	Household income
S10/K14	Household activities/Activities
K19	Use patterns
S16	Perceptions of resource conditions
S17/K20	Perceived threats/Level and types of impact
K21	Level of use by outsiders
S21/K31	Participation in decision-making/Stakeholder participation
S22/K32	Membership in stakeholder organisations/Community and stakeholder organisations
S24	Perceived coastal management solutions
S26	Perceived successes in coastal management
[NEW]	MMA/MPA knowledge
[NEW]	MMA communication
[NEW]	Management priorities
[NEW]	Management responsibility
[NEW]	Management impacts
[NEW]	Livelihood dependency
[NEW]	Alternative livelihoods

2.3 SocMon team

The final SocMon team was chosen from among the participants of the training workshops where roles and responsibilities were agreed upon. It should be noted however that member participation and roles changed during the implementation of the assessment (Appendix 3).

2.4 Key informants

Key informants were located based on the list developed during the preparation stage. The key informant guide was then used to conduct interviews with each key individual with the primary intent of collecting spatial data. Laminated maps of the study area and markers were provided to each key informant to allow them to highlight areas of significance to them and their livelihoods within CNP-MC. These exercises were intended to collect feature data using the maps provided and rich attribute data that could be used to explain the feature data provided by key informants. A photograph of each map was taken and saved for later incorporation into a GIS for spatial data analysis.

Key informants provided information on the major activities that occur within the CNP-MC study area and explained the interrelationships between these activities. In the community of Toucarie, two key informants were targeted for information pertaining to fisheries and tourism in the area. In Tantan, a fisher and a representative from the Tantan/Savanne Paille/Toucarie/Cottage Village Council were targeted to glean information about trends and changes in the livelihoods supported by fisheries and tourism. Divers and restaurant operators situated in the St. Rupert's Bay area were targeted for information about tourism as this bay was identified as the tourism hub for the CNP-MC study area.

Spatial data collection was conducted during the two-day visit made by the SocMon Spatial trainer. Follow-up interviews, mapping exercises and further development of spatial outputs were not conducted as planned due to the passages and impacts of Hurricanes Irma and Maria.

Table 3 List of key informant sector representatives surveyed for the CNP-MC SocMon study

Activity	Sector	Sample size
Diving and marine tours	Tourism	4
Commercial fishing – (pot and net fishing)	Fishing	4
Artisanal fishing – shore net and line fishing)	Fishing	1
Community activities	Community management	1
	Total	**10**

2.5 Surveys

The primary data for this study were collected by surveys, which were designed to address the monitoring objectives. The Cabrits SocMon team, under the guidance of CERMES, was responsible for the development of the instrument.

The main communities of interest to data collection in the parish of St. John, the location of the CNP-MC, were based on the extent of the study area defined in the training workshop as well as available capacity and resources for data collection. The communities surveyed were Clifton, Hermitage, Cottage, Cocoyer, Toucarie, Morne Cabrit, Bell Hall, Tantan, and Savanne Pile. The community of Bioche in the parish of St. Peter was added to the overall sample size for data collection since participants of the training workshop mentioned that fishers from this community often fished within the CNP-MC and believed it was important to capture socio-economic information on these persons. Bioche was therefore considered a satellite study site.

Based on the population size for St. John (excluding Portsmouth) as well as the population size for Bioche, the sample size for surveying was calculated to be 149 in total. With the addition of Bioche to the total population to be sampled, the total population of the study area to be sampled was treated as two clusters meaning that 109 surveys were to be completed for St. John (cluster 1) and 40 for Bioche (cluster 2/satellite area). A total of 149 surveys were administered and completed by the SocMon team. The data collection period was from 31 May to 26 June 2017.

Table 4 List of communities surveyed for the CNP-MC SocMon showing population and sample sizes

Community	Population size	Sample size
Clifton, Hermitage etc.	163	11

Cottage, Cocoyer	279	37
Toucarie, Morne Cabrit etc.	63	6
Bell Hall, Tantan, Savanne Paille	446	55
*St. John's Parish (Cluster 1) Total**	***951***	***109***
Bioche (Cluster 2)	335	40
Total	**1,286**	**149**

* It should be noted that that combination of communities above for St. John's parish is as taken directly from the 2011 Population and Housing Census, Commonwealth of Dominica.

2.6 Data entry and analysis and report production

The data from the surveys were entered into an Excel spreadsheet (by Casey Defoe and Dorcas Mills) and then analysed using simple descriptive statistics by CERMES. The data from the key informant interviews were used to map activities and impacts within the CNP-MC. Due to work commitments and time constraints, the SocMon team was unable to conduct the data analysis. CERMES provided technical assistance with data analysis and compilation of results.

Report production by the Cabrits SocMon team was severely stalled by the passage and devastating impact of Hurricane Maria in September 2017. This report therefore has been largely developed by CERMES.

3 RESULTS – SURVEYS

Results are presented under headings corresponding to the assessment objectives:

1. Identify changes in users, user patterns, perceived resource conditions, and attitudes and perceptions to the CNP-MC.
2. Determine motivating factors (if any) for the changes and impacts on stakeholder livelihoods.
3. Understand the potential for, or interest in, sustained collaboration among ECMMAN stakeholders for managing coastal resources in the CNP-MC.

3.1 Identify changes in users, user patterns, perceived resource conditions, and attitudes and perceptions to the CNP

3.1.1 MMA knowledge and awareness

Just over half of all respondents (56%) have heard or read about the marine section of the Cabrits National Park (CNP-MC). See Figure 2.

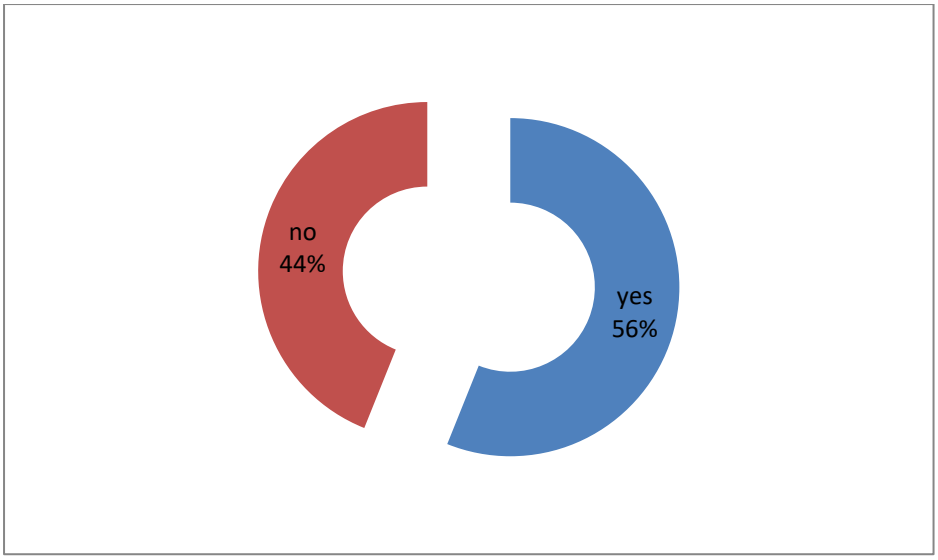

Figure 2 Respondent awareness of CNP-MC, n = 148

The majority of persons surveyed know that the CNP-MC is called a Marine Managed Area (MMA) and is a geographic area designed to protect and manage the use of resources within the marine environment, and its effectiveness is dependent on the development of clear boundaries. However, the proportion knowing this is just below half of all respondents. See Figure 3.

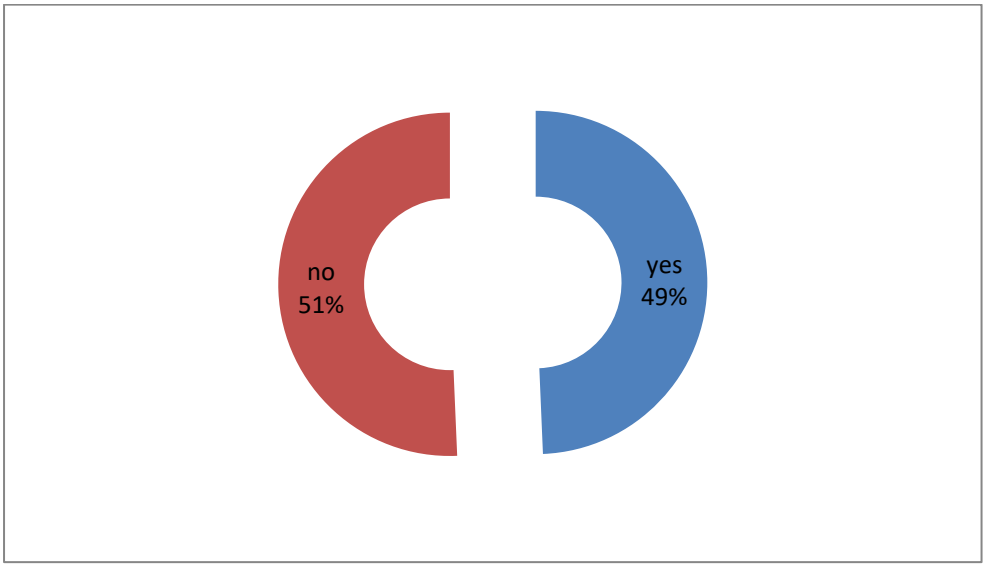

Figure 3 Awareness that the CNP-MC is a MMA, n = 148

The top four features persons associate with MMAs are protection of coastal and marine resources (82.5%), coral reefs with more life on them than at present (75.2%), more and bigger fish to be viewed and breed, but not caught (47.6%), and more work and activities (livelihoods) in the area encouraged (40.3%). Smaller proportions of respondents (28% and less) associate MMAs with negative characteristics such as less access by locals, tourists or both, and less work and activities (livelihoods) in the area. Approximately only one-quarter of persons associate alternative livelihoods, and more and bigger fish to be caught by fishermen for food with MMAs. More awareness of marine life preservation was provided by one individual as a characteristic of MMAs (Figure 4).

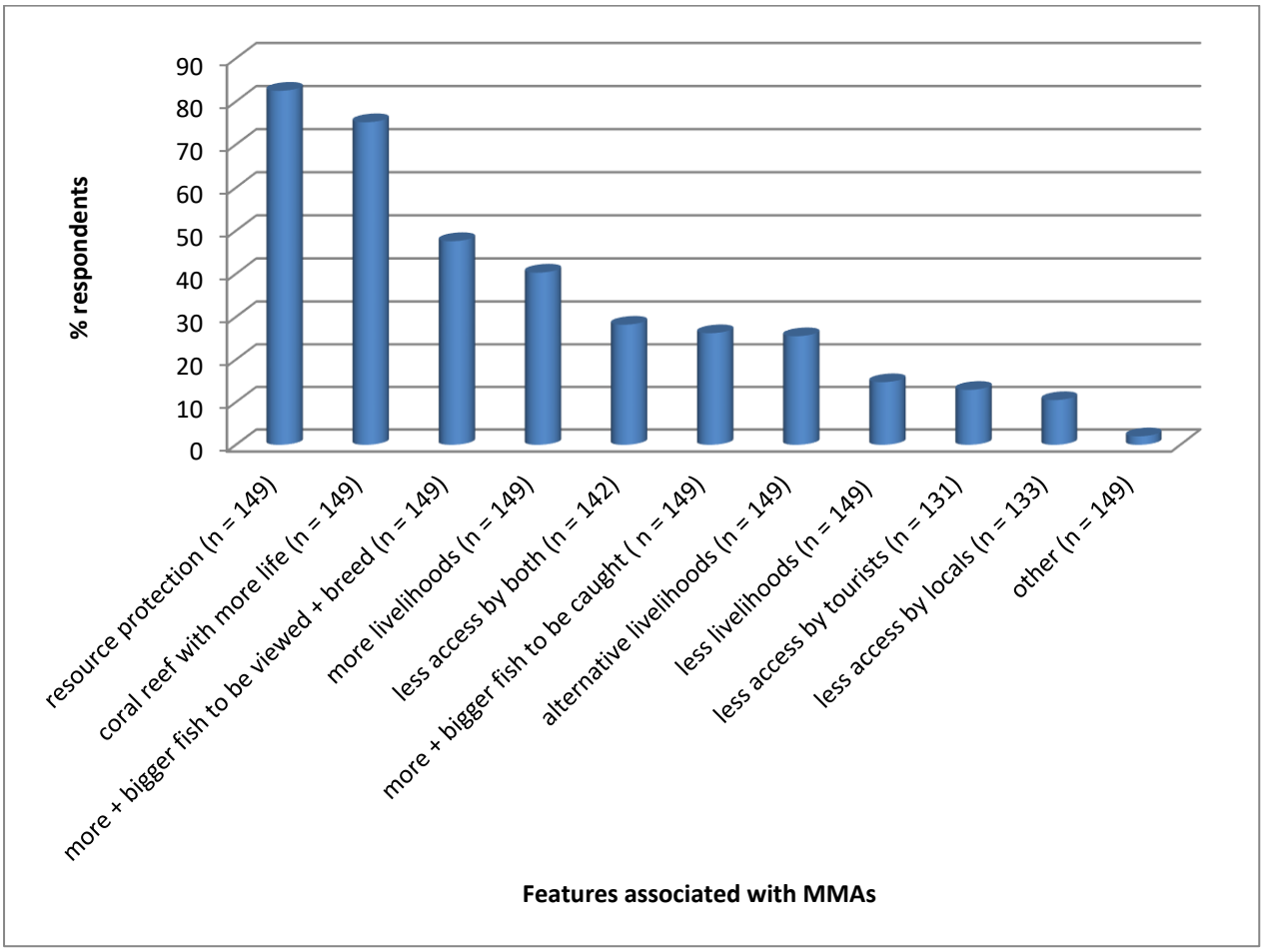

Figure 4 Features people associate with MMAs

The majority of persons surveyed (59% and greater) believe that a number of objectives should be the main purpose of the CNP-MC: recreation - yachts, diving and swimming (74.5%), environmental education and awareness (67.1%), conservation of fish (65%), conservation of ecosystems such as mangroves, seagrass and coral reefs (59.7%), and sustainable tourism (59.1%). Fairly large proportions of persons also feel that sustainable livelihoods for the community (48.3%) and scientific research (40.3%) should also be the purpose of the CNP-MC (Figure 5).

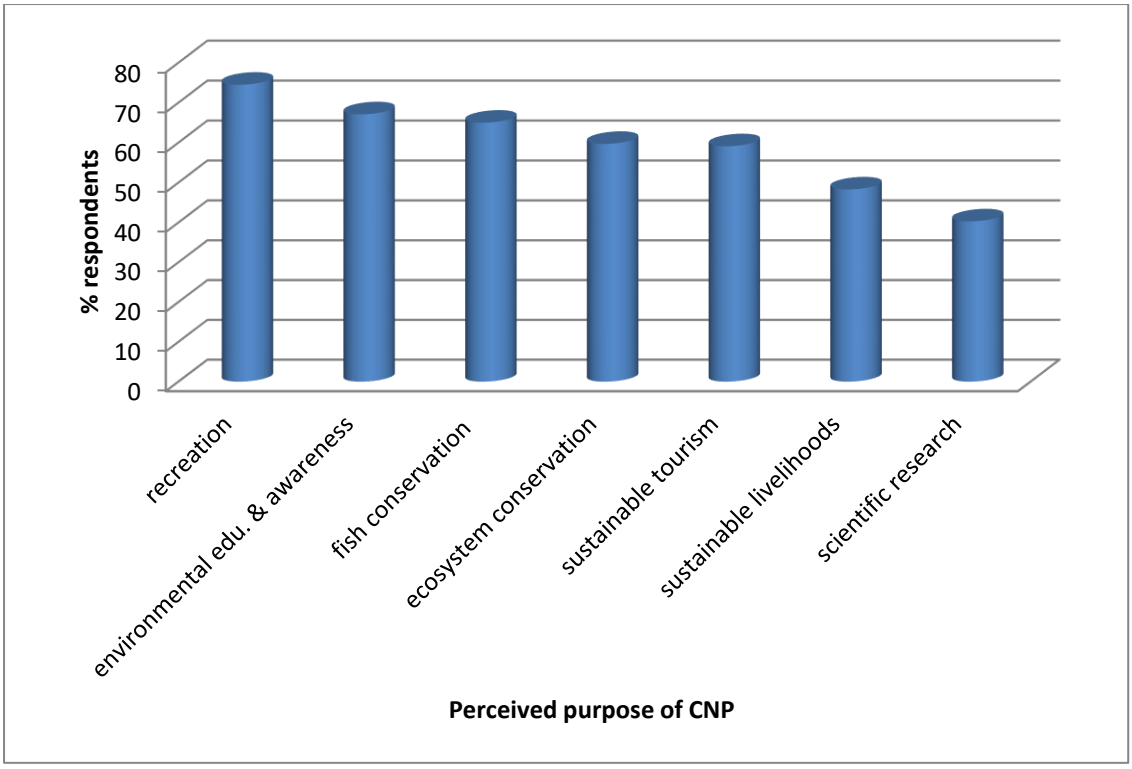

Figure 5 Perceptions of CNP purpose, n = 149

3.1.2 Recreational and income-generating activities in the CNP-MS

Swimming (40.9%), recreational fishing (26.8%) and picnicking (17.4%) are three of the most popular activities people engage in for relaxation within the CNP-MC and surrounding areas (Figure 6). Guitar playing, meetings (presumably casual and recreationally related) and general relaxation were noted as other relaxation activities by three persons.

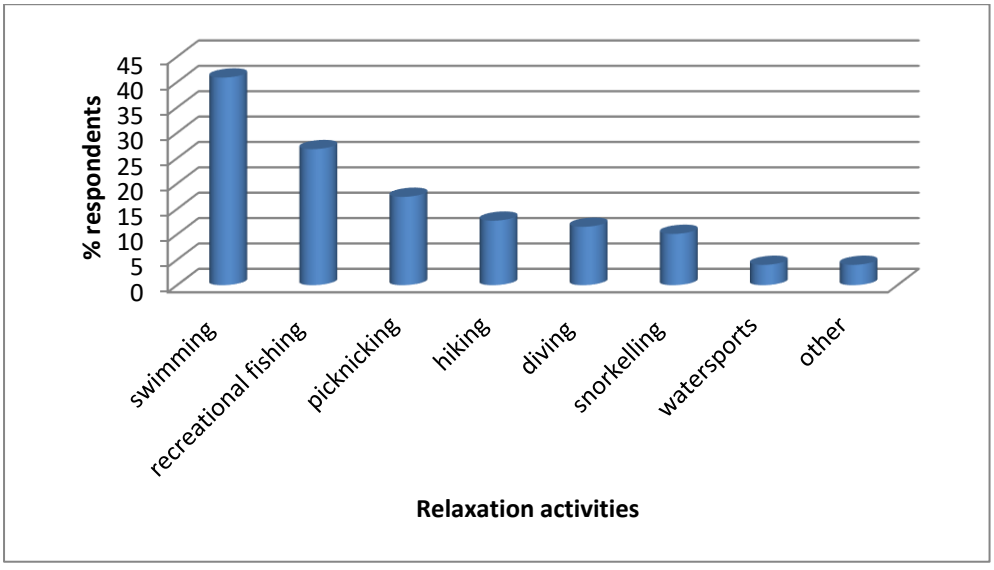

Figure 6 Activities people engage in for relaxation in the CNP-MS (n = 149 for all, except diving where n = 148)

The most popular frequency with which people participate in recreational activities within the CNP-MC is once per week, with between 33% to 63% of persons engaging in all investigated activities. Picnicking (62.5%), swimming (59.2%), recreational fishing and snorkelling (58.3%

each) are the activities most commonly engaged in by people once per week in the CNP-MC. Smaller but fairly significant proportions of people (ranging between 16 and 37%) relax within the area twice per week. Some people participate in diving, swimming and recreational fishing throughout the week (2-5 and 7-days/week) but this is representative of a minority of persons surveyed (ranging between 2 and 27%). A fairly significant proportion of people (33.3% in all cases) participate fairly often (1, 4, and 7 days per week) in watersports activities in the CNP-MC (Figure 7).

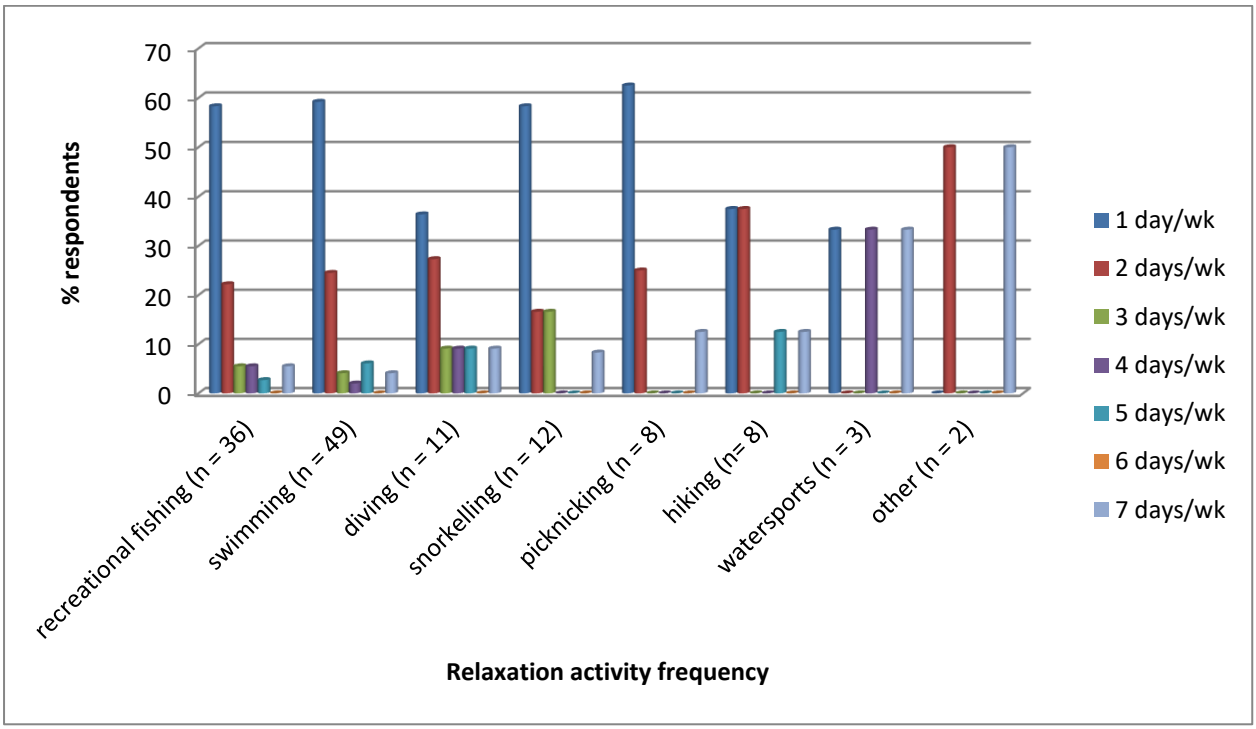

Figure 7 Frequency of participation in recreational activities within the CNP-MS

Persons provided 19 locations where they carried out their recreational activities (Figure 8). Tantan and Toucarie appear to be the most popular locations for relaxation for almost all activities examined. More persons engage in recreational fishing, swimming, and picnicking in Tantan (35.5%, 44% and 18.2%, respectively) than in Toucarie (29%, 24% and 9.1%, respectively). Toucarie appears to be the preferred location for diving and watersports (36.4% and 50%, respectively) rather than Tantan (18.2% and 0%, respectively). Equal proportions of persons surveyed participate in snorkelling (36.4%) and hiking (14.3%) each) in both Tantan and Toucarie (Figure 8).

For easier visualization, recreational activities are shown by location in Figure 9 to Figure 16.

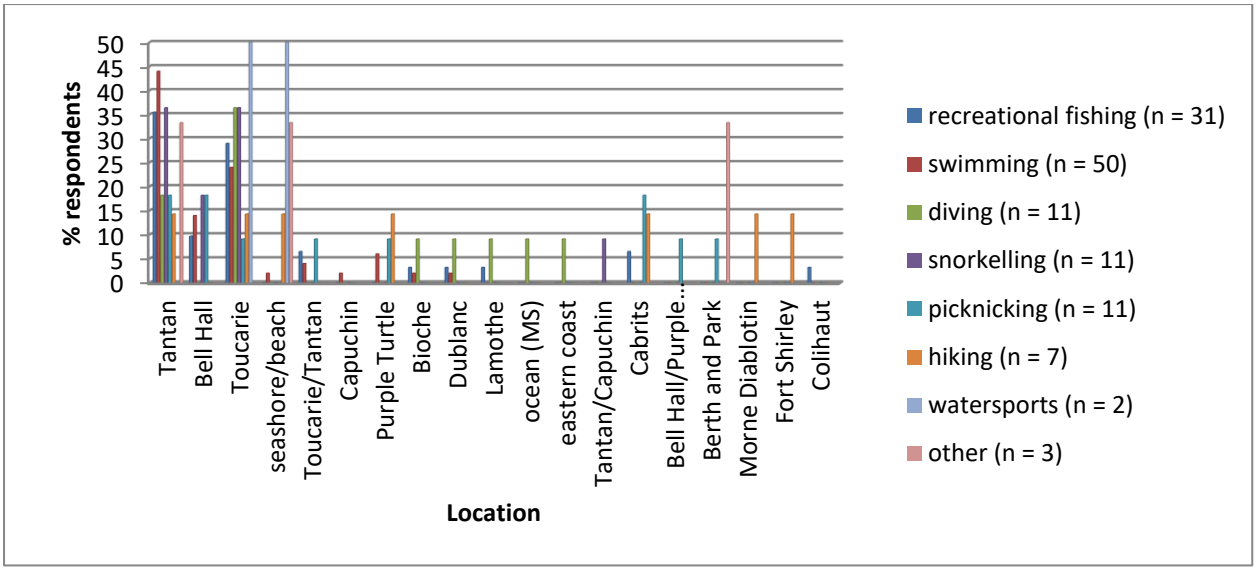

Figure 8 Places where people relax in the CNP-MC

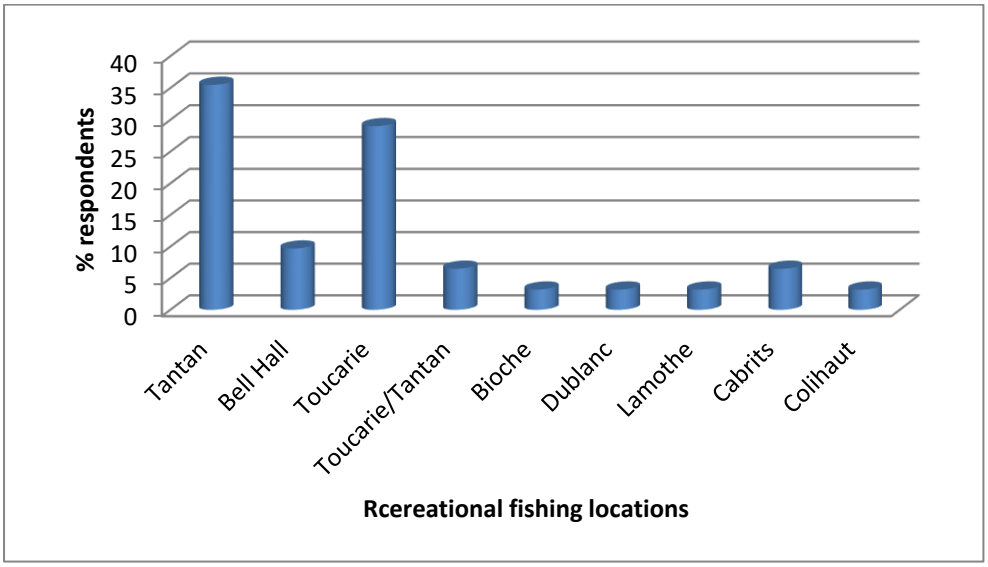

Figure 9 Recreational fishing locations in and around the CNP-MC (n = 31)

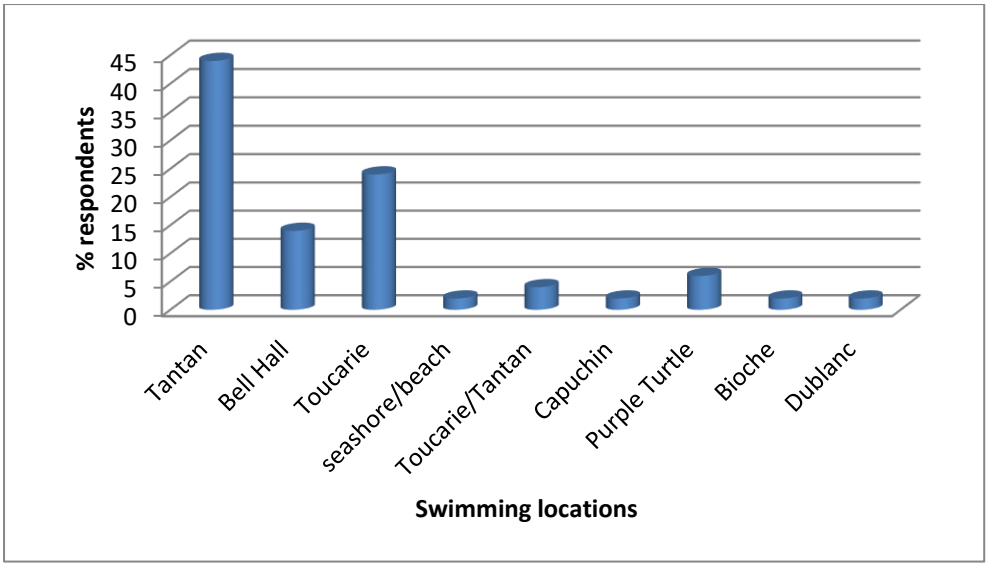

Figure 10 Swimming locations in and around the CNP-MC (n = 50)

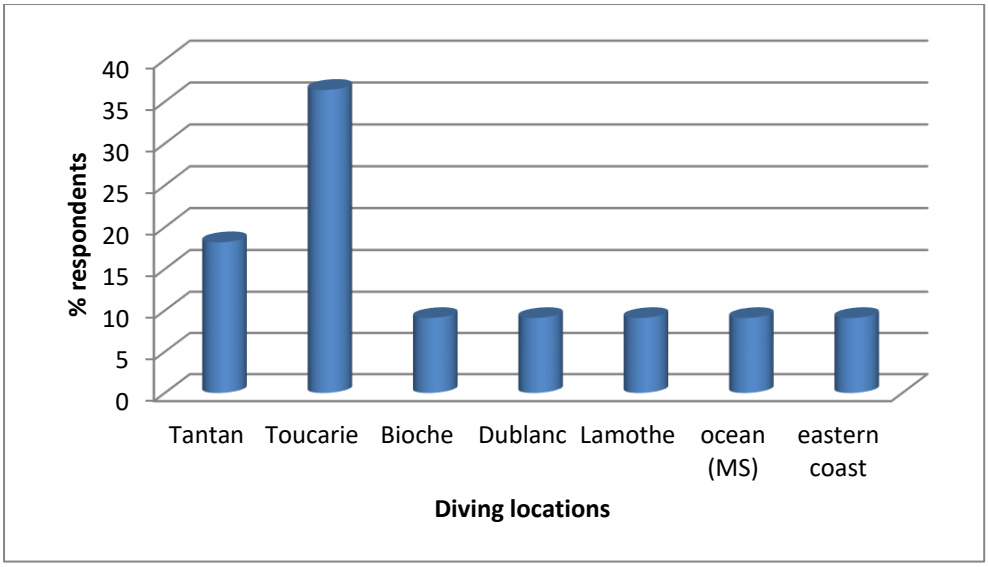

Figure 11 Diving locations in and around the CNP-MC (n = 11)

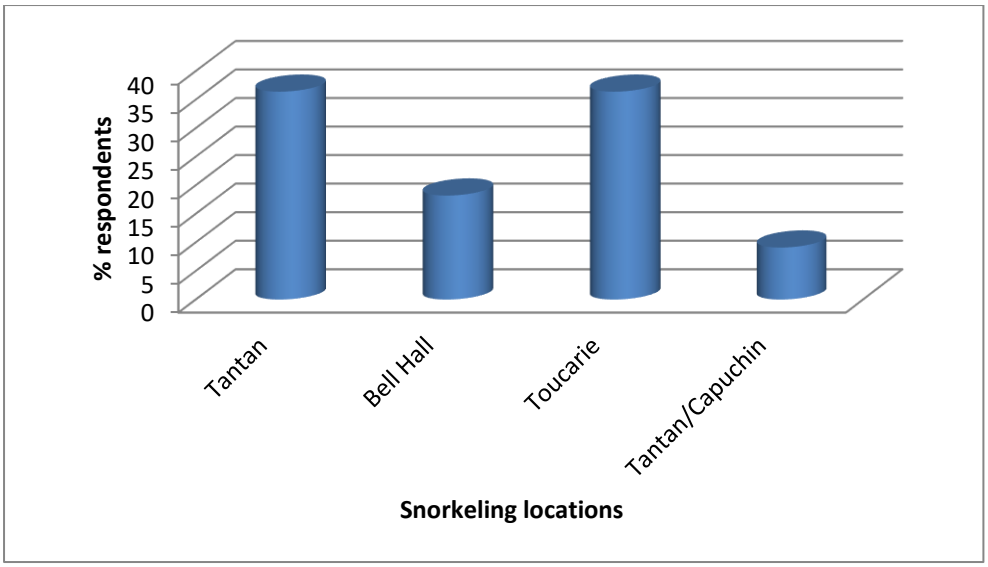

Figure 12 Snorkelling locations in and around the CNP-MC (n = 11)

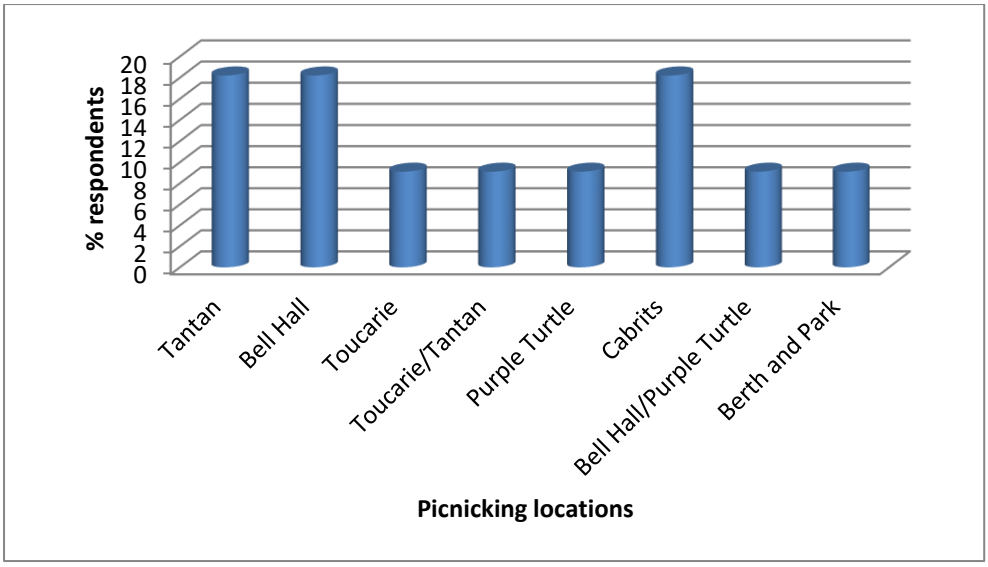

Figure 13 Picnicking locations in and around the CNP-MC (n = 11)

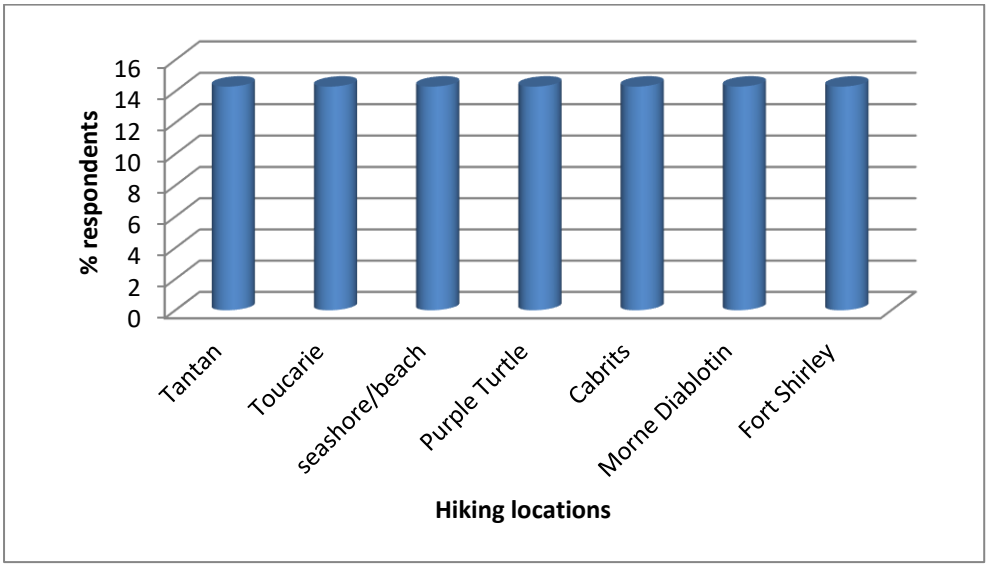

Figure 14 Places where people hike in and around the CNP-MC (n = 7)

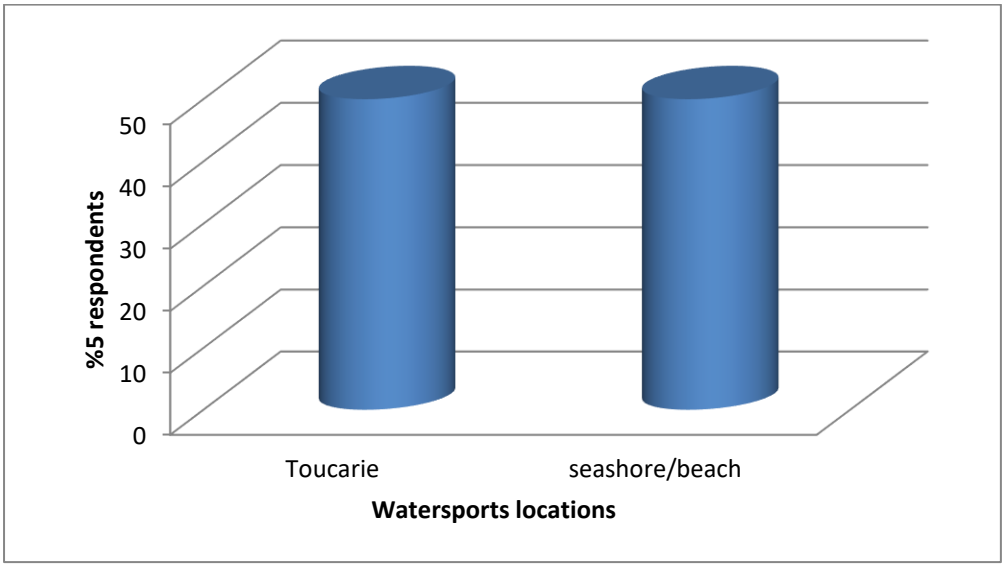

Figure 15 Places where people participate in watersports in and around the CNP-MC (n = 2)

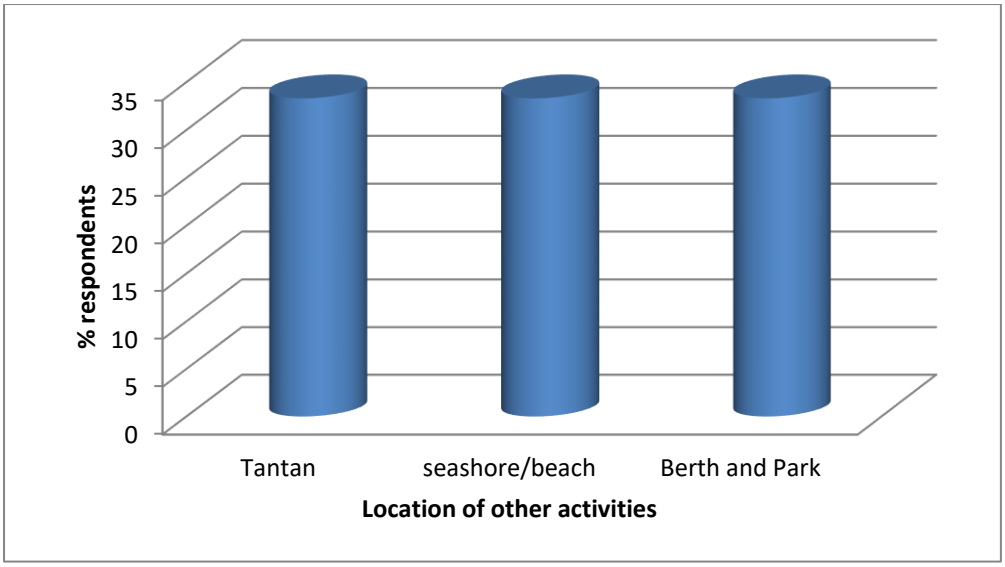

Figure 16 Places where people take part in other types of relaxation (n =3)

Three people each indicated that they play the guitar at Tantan, participate in general relaxation at the seashore/beach and engage in meetings (presumably casual and recreationally related) at Berth and Park.

Of all the potential means of making a living in and around the CNP-MC, fishing (30.8%) was identified by the majority of persons interviewed as the main activity they or members of their household engage in. Very small proportions of persons earn their living from activities in the pre-determined list provided in the survey (Figure 17). The majority of fishing activities occur in Tantan (36.1%) with smaller proportions occurring in Toucarie (19.4%) and Bell Hall (13.8%). Some persons noted they fish in Toucarie or Tantan (2.7%). Only 5.5% of persons noted they fished in Cabrits.

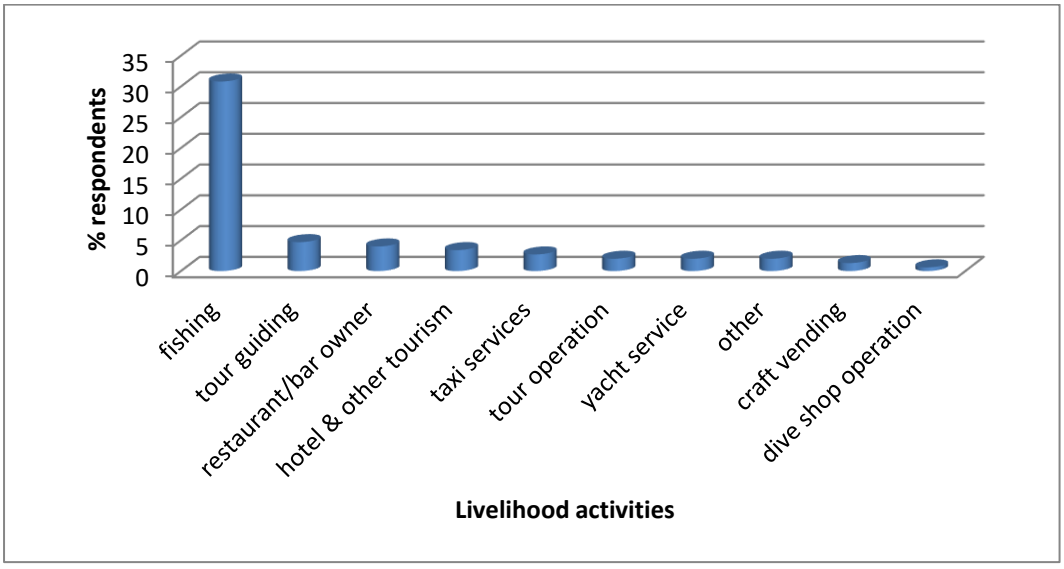

Figure 17 Ways of earning a living in and around the CNP-MC (n = 149)

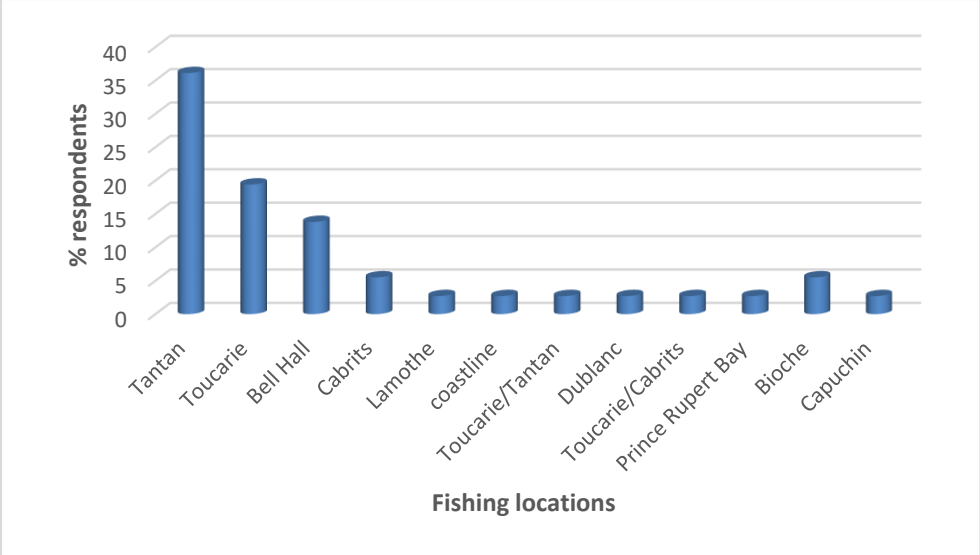

Figure 18 Places where people fish in and around the CNP-MS (n = 36)

Over half of all respondents (58.7%) or members of their household spend between one and two days per week making a living from the resources in the CNP-MC. Most people (32.6%) spend two days per week in the area pursuing income generation activities.

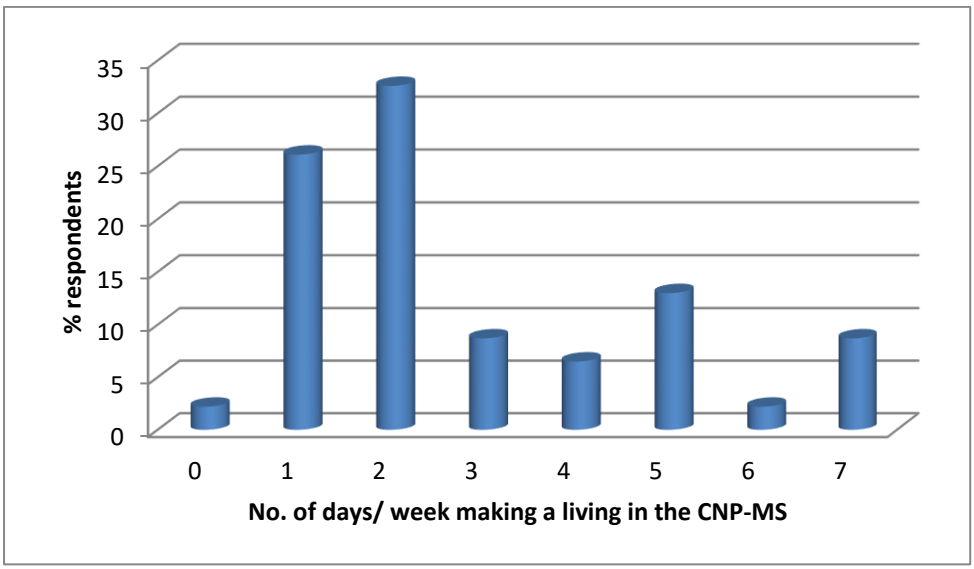

Figure 19 Number of days in an average week persons and their household members spend in the CNP-MC earning a living from the resources there (n = 46)

The CNP-MC has apparently not been beneficial to the majority of persons surveyed (72%) and their household. Of the 28% of persons who felt it had been a benefit, fishing (presumably due to higher quality and more catch; 34.2%), a good place to visit/for recreation (10.5%) and increased awareness of the marine environment (10.5%) were provided as the top three reasons for this. Better diving, increased sales, tour services and tourism, coral protection, provision of alternative income and employment, continued supply of fish for food, increased competition, research and provision of taxi services were all offered as ways in which the CNP-MC benefited persons (Figure 20).

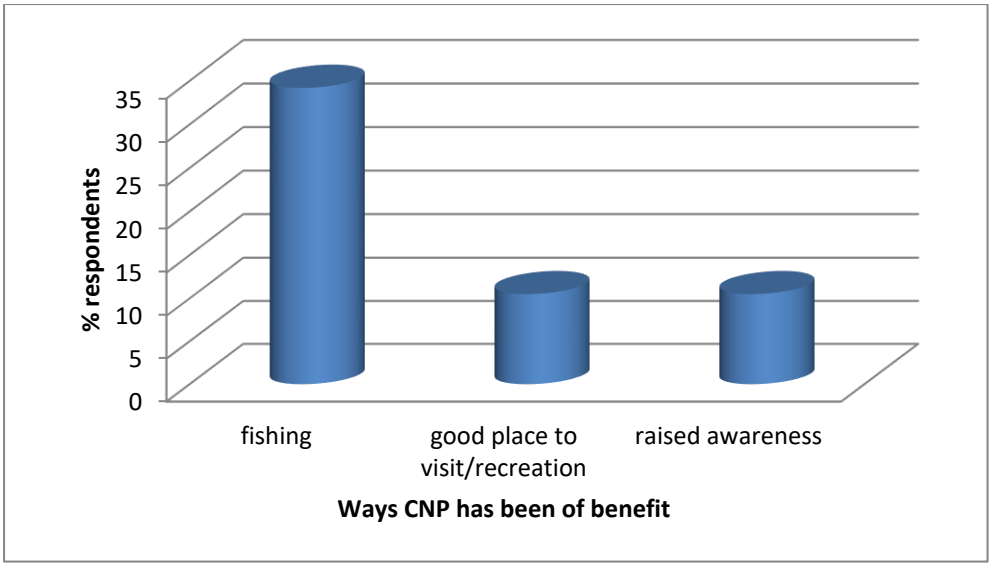

Figure 20Benefits of the CNP-MC

3.1.3 Perceptions and importance of, and threats to resource conditions

Perceptions of current (2017) resource conditions of mangroves, seagrasses, coral reefs and beaches in the CNP-MC varied (as expected) by resource (Figure 21). Mangrove condition was thought to be "very good" or "good" by just over one-third of persons surveyed (35.6%). Seagrasses were also thought to be in "very good" or "good condition" by a similar proportion of persons (40.2%). However for both these resources, there was a high proportion of uncertainty of condition among respondents with 55.3% and 50.4% stating they did not know what the condition of mangroves and seagrasses, respectively, was like currently. Almost equal proportions of persons thought that corals were in "very good" or "good" condition (47.3%) or did not know what the condition was (43.5%). The perceived condition of beaches in the CNP-MC was thought to be in "very good" or "good" condition (74.9%) by the overwhelming majority of persons interviewed. Only a minority of persons (13.9%) thought beach condition was "neither good nor bad" and an even smaller proportion (5.8%) was uncertain ("did not know") of the condition (Figure 21).

Although thirty-nine percent of persons (n = 136) noticed changes in the conditions of these resources over the last five years (since 2012), the majority (61%) had not. Mangroves, seagrasses and coral reefs were thought to be in "very good" or "good" condition at that time (2012) by the majority of persons surveyed in all cases – 46.8%, 59% and 58.7%, respectively. Although the majority of persons believed the conditions of these resources to be "very good" or "good", fairly high proportions – 30.6% for mangroves and 24.6% for seagrasses – were uncertain ("did not know") of the past condition. Past condition of beaches in the CNP-MC was rated as "very good" or "good" by the majority of respondents (74.2%).

Overall, perceptions of positive/healthy condition of resources in the CNP-MC remained fairly similar for all resources investigated over the five-year period of interest (from 2012 to 2017). Some decline in condition was perceived for all resources except beaches. Perceived "very good" or "good" condition of seagrasses decreased most significantly from 2012 to 2017 from 59% to 40.2%. Positive perceptions of the conditions of mangroves and coral reefs also decreased over the five-year timeline but less so than that for seagrasses. Positive perceptions of the conditions of these resources declined by almost equal proportions – 11.2% for mangroves and 11.4% for coral reefs. Most respondents (74.2%) rated the condition of

beaches to be in “very good” or “good” condition in 2012. This is almost equal to the proportions of persons who noted the very same condition in 2017 (74.9%).

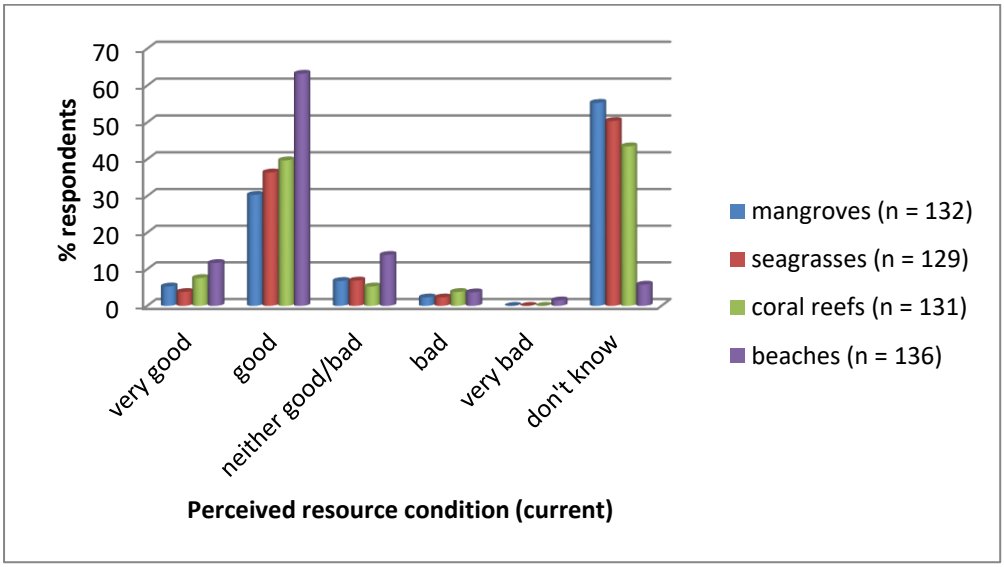

Figure 21 Perception of current (2017) conditions of resources in the CNP-MC

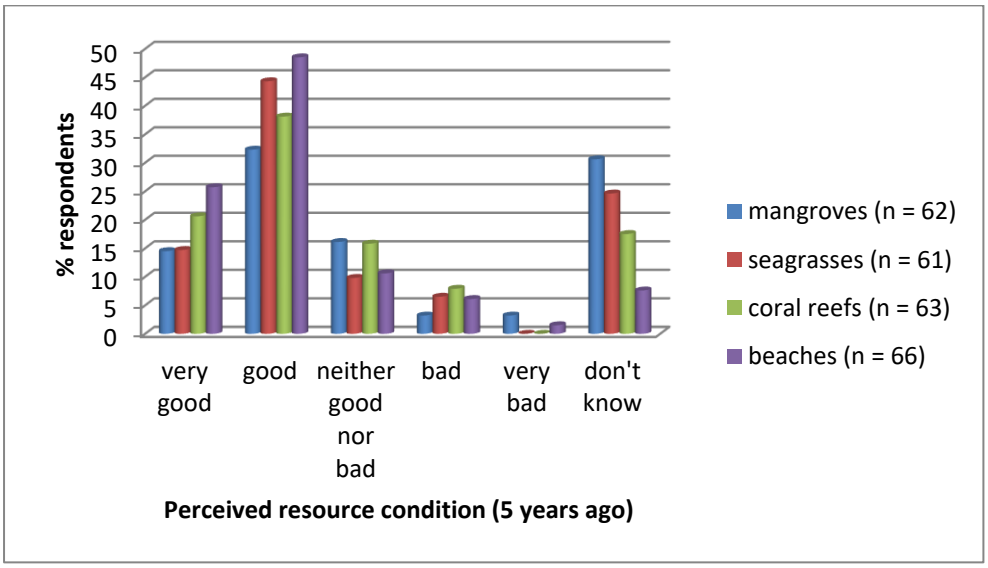

Figure 22 Perception of past (2012) conditions of resources in the CNP-MC

The overall majority of persons surveyed (95.8% combined) indicated that the condition of the marine environment (including coral reefs, mangroves, fish, water quality, beaches) is “very important” or “important” to them in general for work, relaxation and just for its existence value (Figure 23).

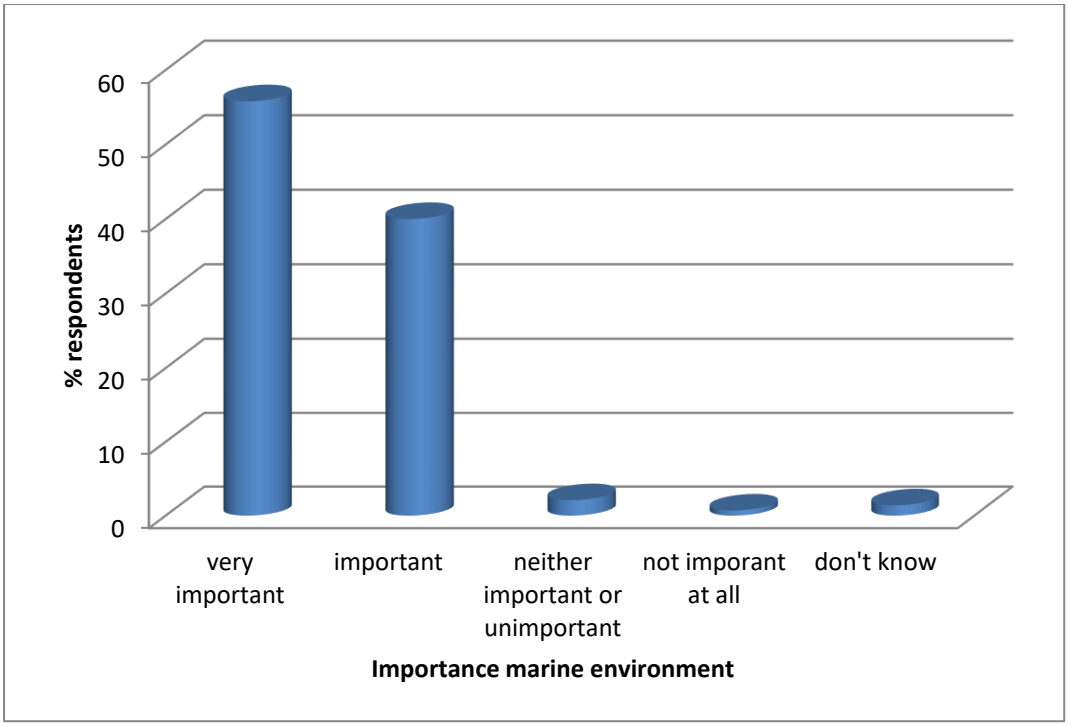

Figure 23 Rating of importance of the marine environment to people, n = 145

Size of fish and their abundance in the CNP-MC were thought to have decreased over the last five years by the majority of respondents (68.4% and 73.5%, respectively). Perceptions of trends in changes in the long-spined black sea urchin (*Diadema antillarum,* locally known as cobbler) were varied with similar proportions of persons believing they had decreased (46.4%) or there had been no change (42.8%). See Figure 24.

Although these results are being presented for general information, the trends are difficult to interpret since for the query on fish size and abundance they are non-specific in terms of species of interest. Additionally, trends in the black sea urchin do not indicate the characteristic of interest (size or abundance). These issues were highlighted to the SocMon team and suggestions for revision were provided by CERMES, however, this question was inadvertently overlooked by the team. Although the results indicate perceived overall decline in fish and urchins, caution must be taken in using these data.

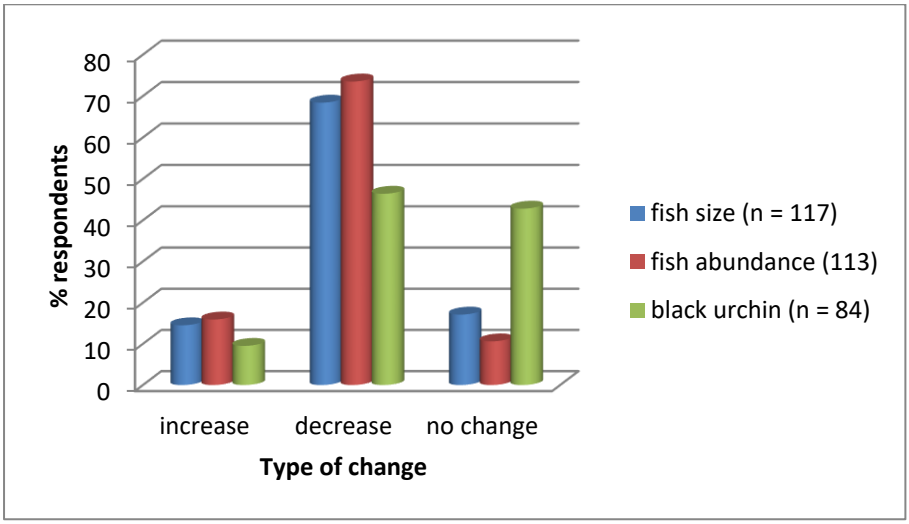

Figure 24 Trends in fish and urchins in the CNP over the past five years

Thirty different types of fish are targeted by persons surveyed and their families. These are listed in Table 5. The most commonly targeted fish species are redfish (18.7%), dolphin (15.3%), tuna (14.7%) and flyingfish (11.8%; Figure 25). Although parrotfish are caught, only 1.3% of persons noted this species as their target species.

Table 5 Types of fish targeted by persons surveyed (n = 320)

Fish species targeted	
dolphin	red snapper
lion fish	doctorfish
tuna	sea snake
flying fish	barracuda
red fish	blue marlin
mackerel	sardine (*chacha*)
red hind (*tash*)	octopus
butter fish	dowad
parrot fish	yellowtail snapper
lobster	butterfly fish
sword fish	soldier fish
snapper	coney fish
whitefish	grunts
ballyhoo (*ballow*)	sea tootoo*
jacks	knowing*

N.B. Derrick Theophille, Fisheries Officer, Dominica Fisheries Division, provided confirmation on species names when only local names (noted in italics) were provided by respondents.
* These fish names provided by respondents were unknown to the Theophille. They may have been misunderstood and incorrectly recorded by interviewers.

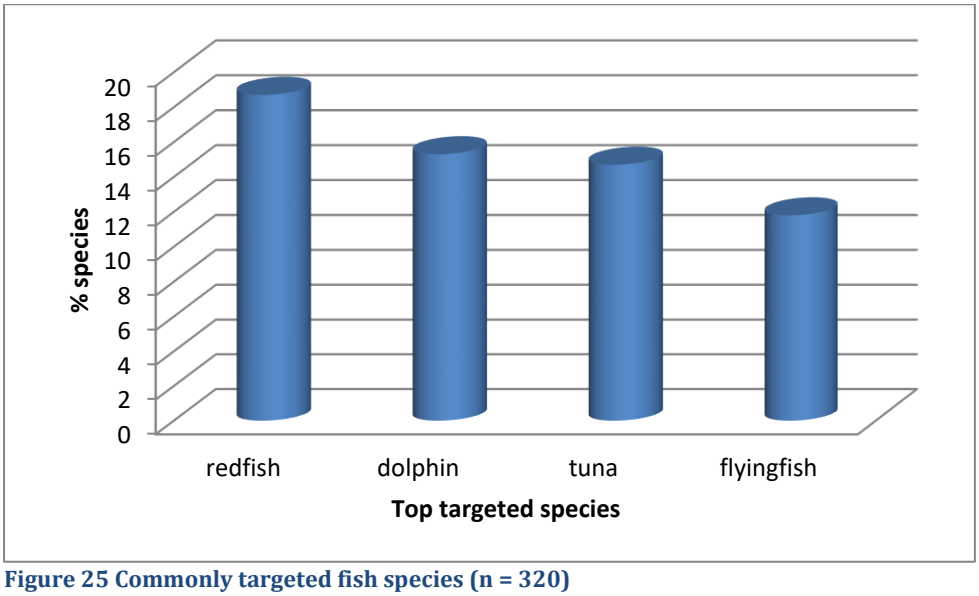

Figure 25 Commonly targeted fish species (n = 320)

Only a small number of persons (ranging between 13-37 individuals) provided information on threats impacting the condition of mangroves, seagrasses, coral reefs and beaches in the CNP-MC, and suggestions for ways in which the threats might be addressed or solved.

The top three perceived threats to mangroves include pollution (39.1%), soil erosion/sedimentation (21.7%) and physical development (13%). Proper garbage disposal, including the use of bins (30.7%) and building (i.e. developments) away from mangroves or the coastline (15.4%) were suggested as solutions to overcoming main threats.

Seagrasses are thought to be threatened mainly by pollution (50%), soil erosion/sedimentation (16.6%) and solid waste (11.1%). Persons suggested that these problems could be addressed by proper garbage disposal including provision of more bins (50%), and a combination of legislation, land use planning, implementation of restricted areas, limitation of yachts in the area and public education about garbage disposal (10% each).

Similar to seagrasses, persons believe coral reefs are threatened primarily by pollution (48%), sedimentation (16%) and solid waste (12%). A number of suggested solutions to these threats were offered by persons surveyed. Proper garbage disposal (38.8%) and restriction of anchoring (11%) were highlighted as main ways in which these problems could be addressed. Additionally, appropriate legislation, implementation of restricted areas, limiting the number of yachts in the area, land use planning, fishing zones, maintaining the CNP, establishment of fishing zones, limited development, and public education about coral reefs were recommended by 5.5% of individuals in each case as solutions to coral reef threats.

Pollution and solid waste were thought to be the main threats to beaches by persons surveyed (64.8% and 24.3%, respectively). Over three-quarters of respondents combined (77.4%) suggested proper garbage disposal and the provision of garbage bins as means of solving these threats to beaches in the area. Smaller proportions of persons suggested the maintenance of beaches (6.5%), building away from the coastline, public education on garbage disposal, land use planning, security, and enforcement of legislation (3.2% each) as ways in which pollution of and solid waste on beaches could be tackled.

Overall, top threats to all resources combined were pollution (52.4%), solid waste (15.5%) and sedimentation (14.6%). Main solutions suggested were proper garbage disposal (36.1%) and provision of or more garbage bins (20.8%). See Figure 26 and Figure 27.

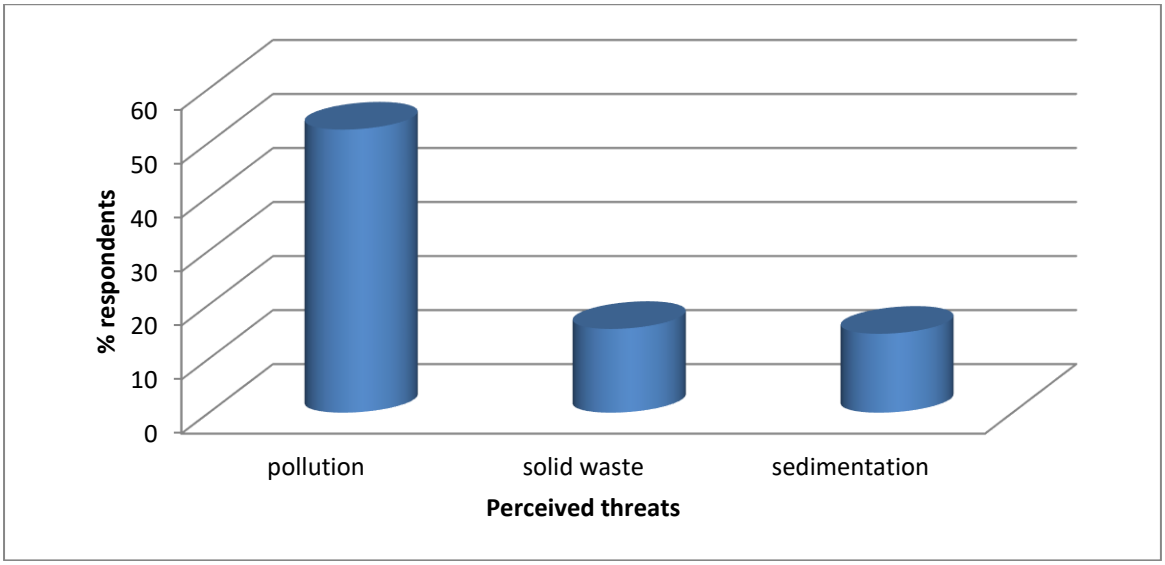

Figure 26 Perceived threats (combined) across mangroves, seagrasses, coral reefs and beaches (n= 103)

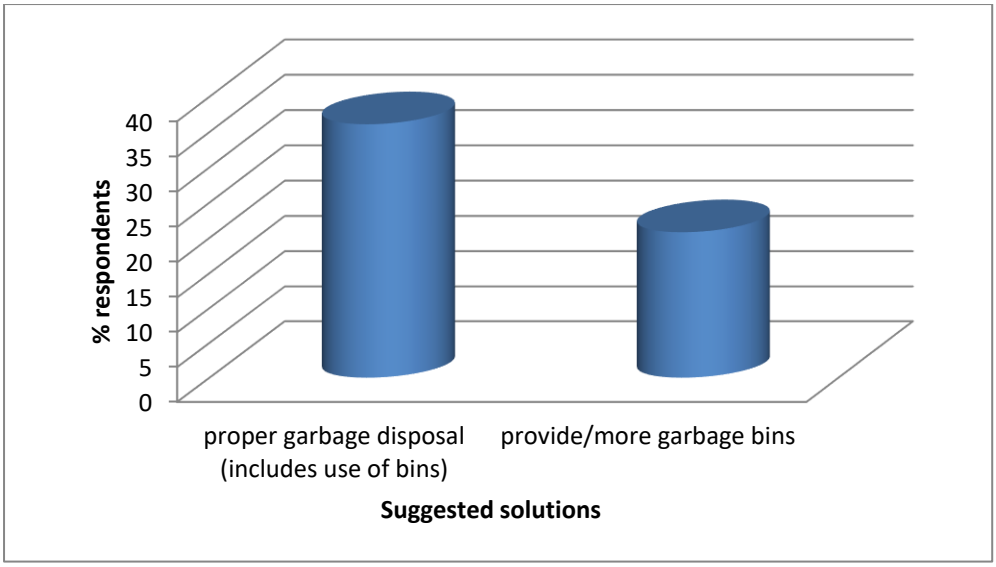

Figure 27 Suggested solutions (combined) to addressing or solving threats to resources (n = 72)

3.1.4 Perceived amounts of key activities occurring in the CNP-MC

Perceptions on the amount of fishing occurring in the marine section of the CNP indicate it is either too much or just enough. Similar proportions of persons believe there is "way too much" or "too much" (31.3% combined) fishing in the CNP-MC or that it is "just right" (32.6%). See Figure 28.

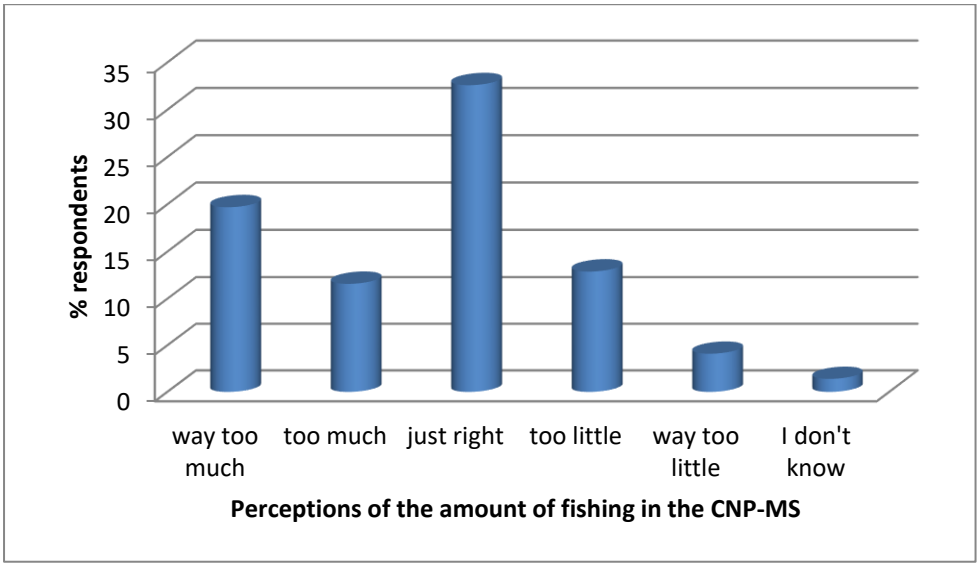

Figure 28 Perceived amount of fishing in the CNP-MC (n = 147)

Numerous tourism activities occur within the CNP-MC. Persons surveyed indicate activities associated with restaurants/bars (88.6%), snorkelling (81.2%), tours (79.2%), yachting (79.2%) and dive shops (63.7%) as the touristic activities within the area. Hospitality in terms of hotels was also noted but by a smaller proportion of individuals (42.3%). Although four persons indicated other tourism activities occurring in the area, these were not specified.

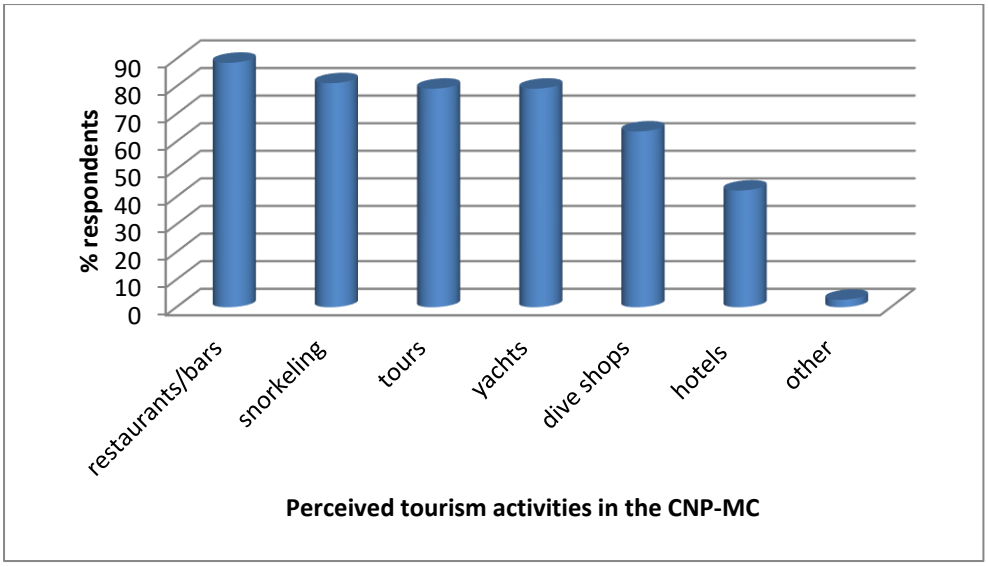

Figure 29 Tourism activities in the CNP-MC (n = 149)

Most persons thought the amount of tourism in the entire CNP-MC is "too little" or "way too little" (47.3% combined). A smaller proportion of persons (18.9%) felt the amount was "just right". However, it should be noted that a fairly significant proportion of individuals (33.1%) were uncertain ("did not know") about the amount of tourism in the area (Figure 30).

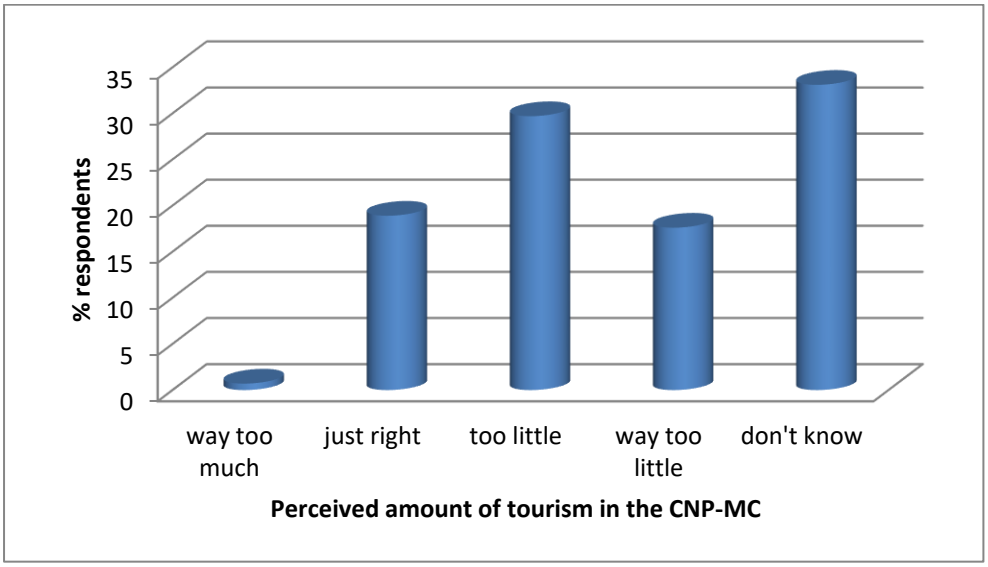

Figure 30 Perceived amount of tourism in the CNP (n = 148)

A number of reasons were given by persons for why they thought the amount of tourism in the CNP-MC was "way too little" or "little". Main reasons included the perception that not many or less tourists visit the area (35.2%), there was low or no tourism in the area (27.7%) and more tourists bring more benefits for people in the area and the country in general (11.1%). See Figure 31.

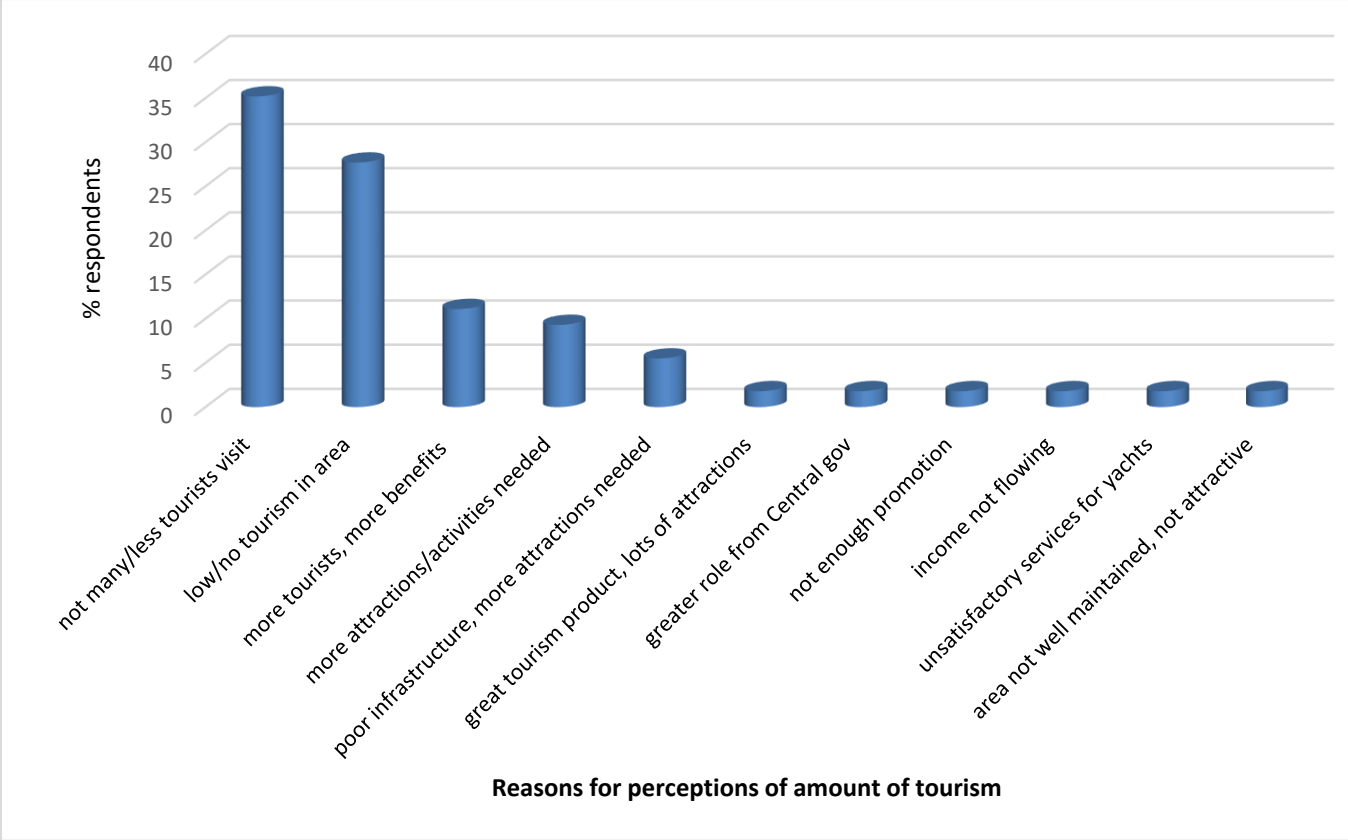

Figure 31 Reasons given for perceptions of "too little/way too little" amounts of tourism in the CNP-MC, n = 54

For those persons who thought the amount of tourism in the CNP was "just right", the primary reasons provided for this belief were that there were enough tourists visiting the CNP (44.4%), more tourists hinder livelihoods, particularly fishing (22.2%), and that there was a suitable amount of activities in the CNP-MC (11.1%). See Figure 32.

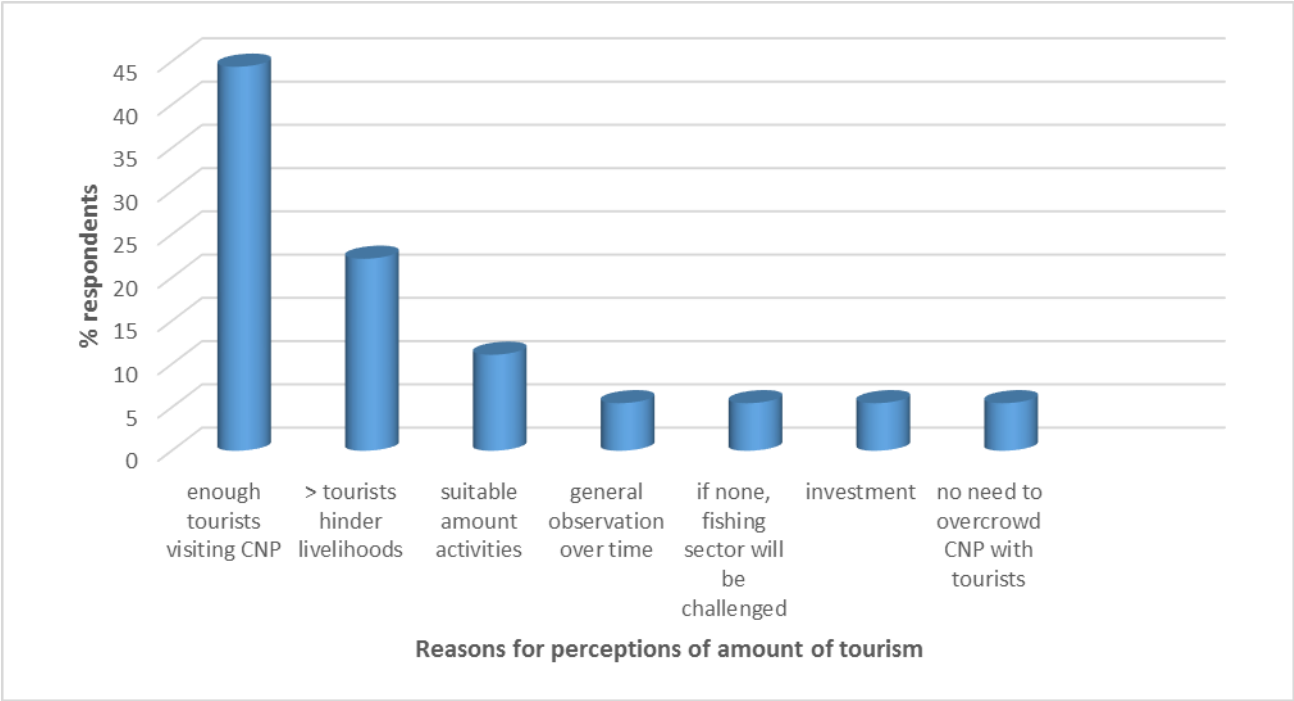

Figure 32 Reasons given for perceptions of "just right" amounts of tourism in the CNP-MC, n = 18

3.2 Determine motivating factors, if any, for the changes and impacts on stakeholder livelihoods

3.2.1 CNP impacts on livelihoods, alternative livelihoods and barriers to pursuing alternative livelihoods

The designation and management of the CNP-MC has not affected the way in which the vast majority (72.7%) of persons surveyed earn a living. Those persons affected note that imposed restrictions have impacted fishermen, decreased fishing and the availability of fish (13.6%), and persons can't manage like before, i.e. find it hard to make a living (4.5%). Others were unsure (4.5%) or did not know (4.5%) how the CNP-MC had affected them (Figure 33).

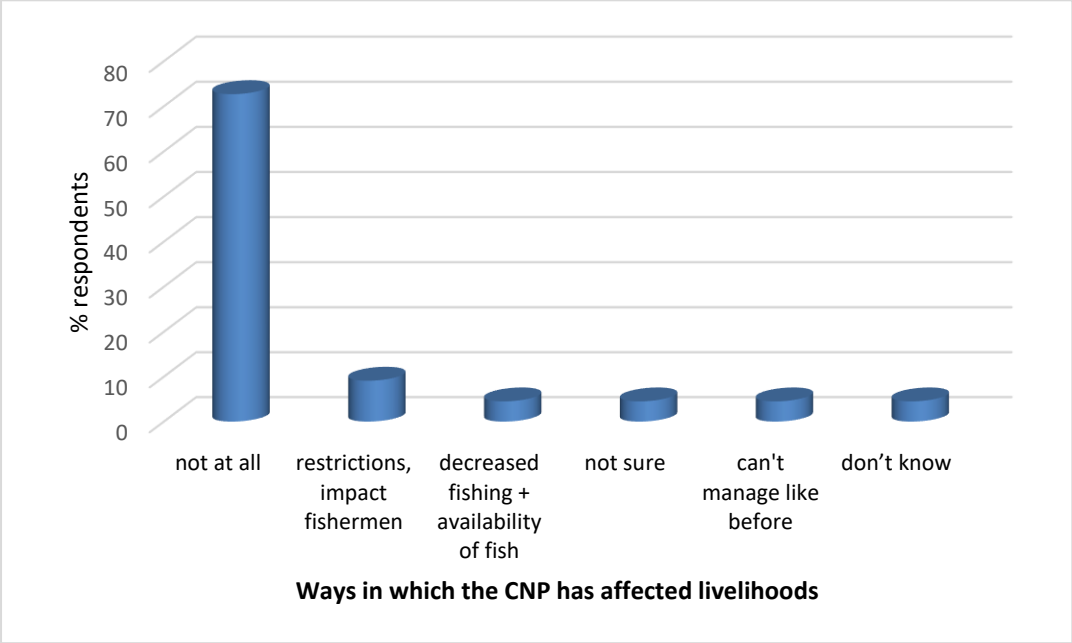

Figure 33 Ways in which the CNP has affected the way in which people earn a living in the area, n = 23

Generally, there is a broad range of livelihood activities that interest persons in communities surrounding the CNP-MC, most of which relate to the fishing and tourism sectors. A significant proportion of persons interviewed (between 25-40%) would be interested in fishing (40.9%), working in a restaurant or bar (32.8%), working in a hotel (28.8%) and tour guiding (28.2%).

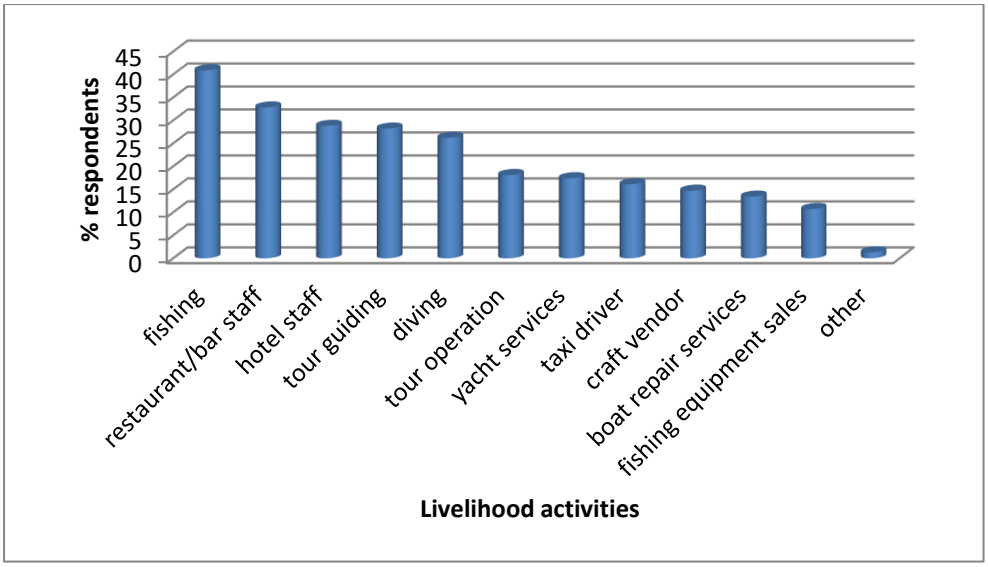

Figure 34 Livelihood activities of interest, n = 149

Most people identified the lack of money or assets (57.4%) and a lack of opportunities (42.6%) as the two main reasons that have or will prevent them or others in the household from trying a new livelihood. No time to pursue new livelihoods (15.5%), being too old (5.4%), family tradition (4.1%), and no interest (3.4%) were also provided as barriers to the pursuit of a new livelihood (Figure 35).

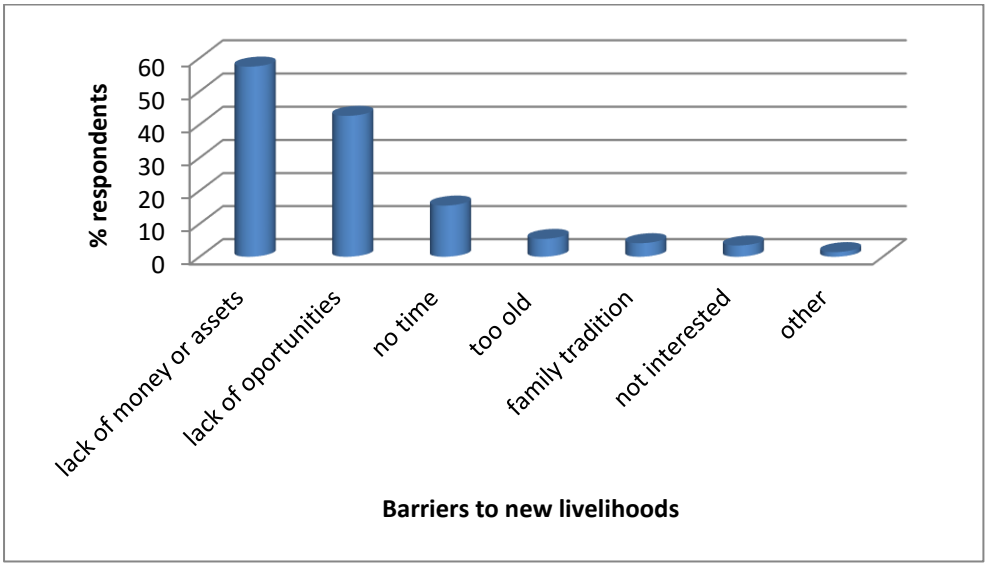

Figure 35 Barriers to pursuing new livelihoods, n = 148

Over two-thirds (68%) of persons say that fisherfolk from the neighbouring communities of Bioche, Dublanc and Colihaut fish in the marine section of the CNP. Persons seemed somewhat divided as to whether they would support limiting fishing access within the CNP-MC to only the local communities bordering the national park. While 51% do not support this, a similar proportion (49%) do (Figure 36).

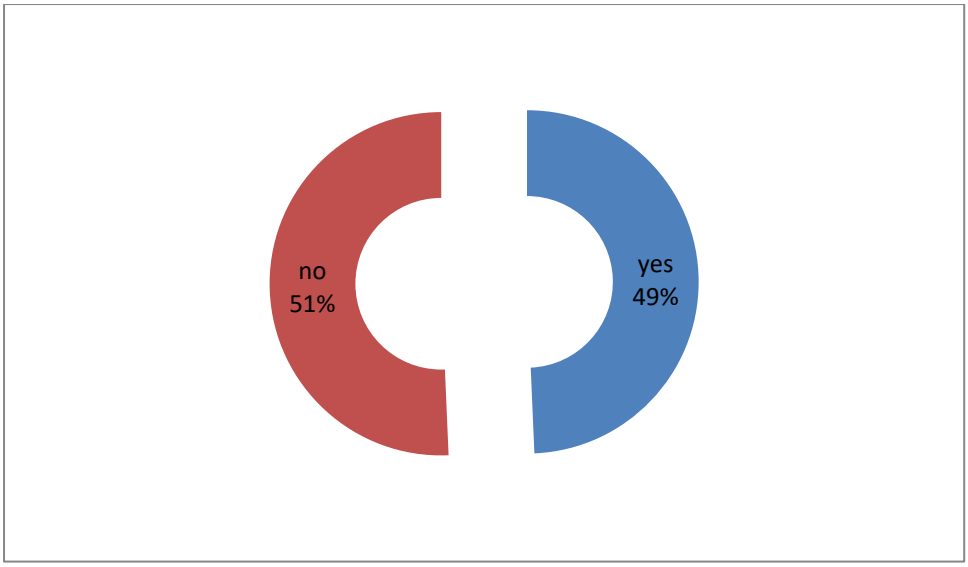

Figure 36 Support for limiting fishing access of fisherfolk from communities outside the CNP-MC, n = 146

3.3 Understand the potential for or interest in sustained collaboration among ECMMAN stakeholders for managing coastal resources in the CNP

3.3.1 Management focal areas and responsibility for management

Major CNP-MC management priorities for over 50% of persons interviewed include enforcement of rules and regulations (73.2%), awareness, education and outreach (66.4%), provision of training opportunities (64.4%), livelihood development (56.4%), monitoring ecosystem conditions (55.7%) and the creation of new rules and regulations (50.3%). Fairly substantial proportions of individuals would like management authorities to also focus management on sourcing equipment and facilities (49.6%), data collection (47.6%) and research (39.6%). See Figure 37.

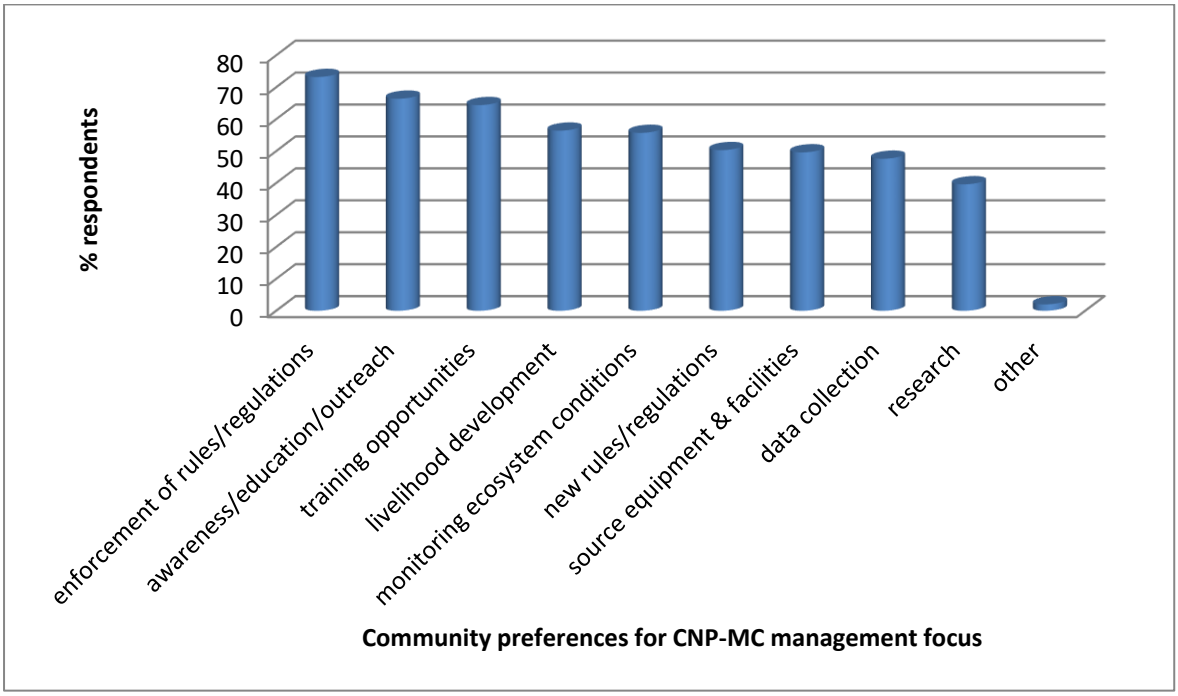

Figure 37 Preferred community priorities for CNP-MC management focus, n = 149

The overwhelming majority of individuals surveyed (77.8%) believe government should be responsible for solving problems in the CNP-MC. However it should be noted that fairly substantial proportions of persons also believe that local government (59.7%), the community in general (44.3%), fishermen, boat owners and people who use CNP resources (40.9%), business owners (35.6%) and the CAPMA (34.9%) all have a responsibility for problem-solving in the national park.

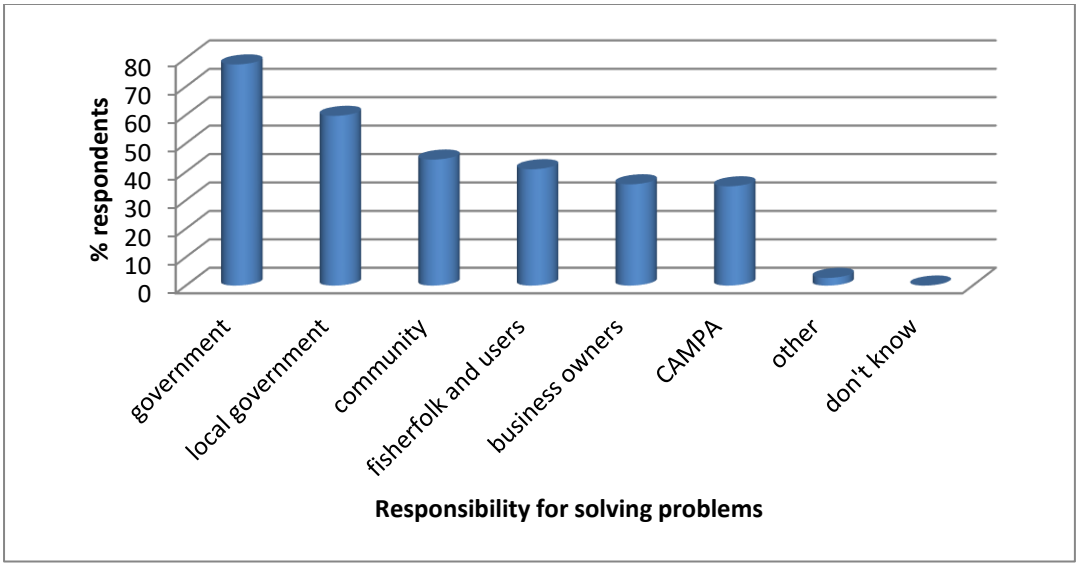

Figure 38 Perceived responsibility for solving problems within the CNP-MC, n = 149

3.3.2 Membership in community organizations/groups and stakeholder participation in management

Most people (72%) are not members of any community groups or organsations. Of the 28% who belong to such groups, most belong to fishers' cooperatives (32.5%) and sports groups (31.7%). It should be noted that membership occurs across a variety of different organisations or groups – church, environmental, youth, local government, cultural, school and farmers' cooperatives. Nearly 15% of persons noted membership in other groups such as the Tantan Village Development Corporation (TVDC), development NGOs, Toucarie Beachfront Development Committee (TBDC), disaster and enhancement, and search and rescue groups/organisations (Figure 39).

The majority of organisations or groups (60%) that persons are members of, organise events in the CNP-MC. Typical events predominantly include fundraisers (52.5%). Clean-ups (22.5%) and music/shows (21.9%) are also fairly common. Picnics (12.5%), hikes (10%) and political rallies (7.1%) occur but less commonly.

The majority of persons (83%, n = 141) believe that not enough is being done by the CNP-MC management authorities to encourage stakeholder participation in management of the marine managed area and its resources. Only 20% (n = 142) of the individuals surveyed or members of their household have participated in any meeting, workshop or other event organised specifically to discuss the management of the area. There is some interest among a fairly significant proportion of individuals (40%) in participating in management activities in the area. The majority of people surveyed (72.4%) prefer to participate in awareness-raising/educational activities within the CNP-MC. Roughly one-third of those surveyed would like to be engaged in enforcement activities such as patrolling (35.7%) and biological

monitoring of marine resources (31.6%). There is some interest (22.8%) in participating in socio-economic monitoring activities within the CNP (Figure 40).

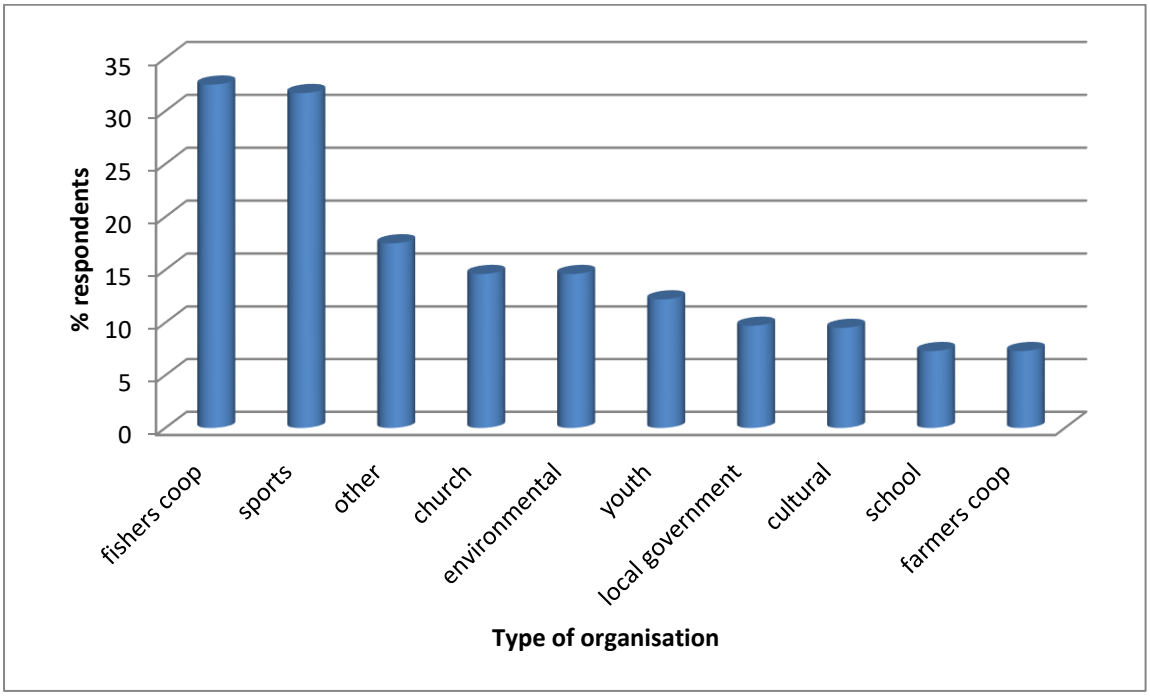

Figure 39 Types of organisations or groups to which people belong (fishers' cooperatives, other, n = 40; sports, church, environmental, youth, local government, school, farmers' cooperative, n = 41; cultural, n = 42)

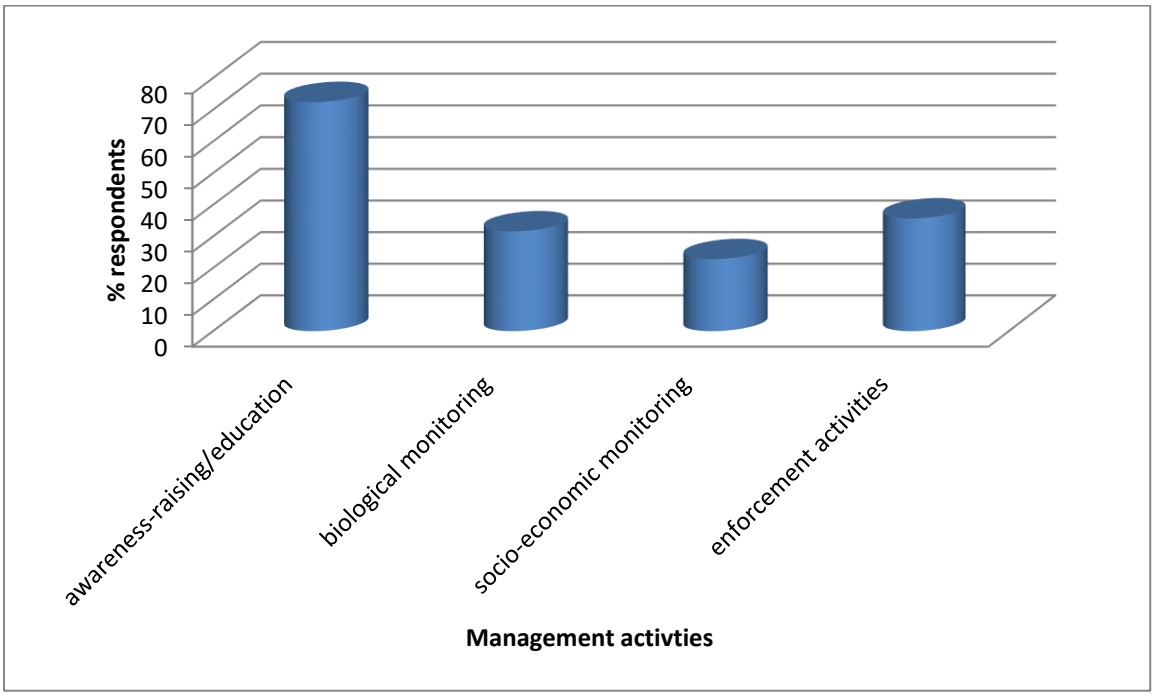

Figure 40 Preferred activities for participation in management of the CNP-MC (Awareness-raising, n = 58; biological monitoring, socio-economic monitoring, n = 57; enforcement activities, n = 56)

3.3.3 *Perceived improvements in management*

Information on improvements in the management of the CNP-MC were provided by thirty-five persons. Equal and fairly high proportions of individuals believed nothing had been done (28.5%) to improve management, while the same proportion thought that the repair and renovation of buildings (for example at Fort Shirley) in the CNP had contributed to improved management of the area. Smaller numbers of persons mentioned awareness-raising activities (8.5%, e.g. in schools), construction of the cruise ship berth (8.5%), the jazz festival (8.5%), management authority efforts to maintain the area in a tidy and presentable way (5.7%), the erection of the management building and employment of people (2.8%), management of Cabrits by Dr. Honeychurch (2.8%), and enforcement of laws (2.8%), had helped in improving the management of the area. Some persons were uncertain (2.8%) as to what had been done to improve management (Figure 41).

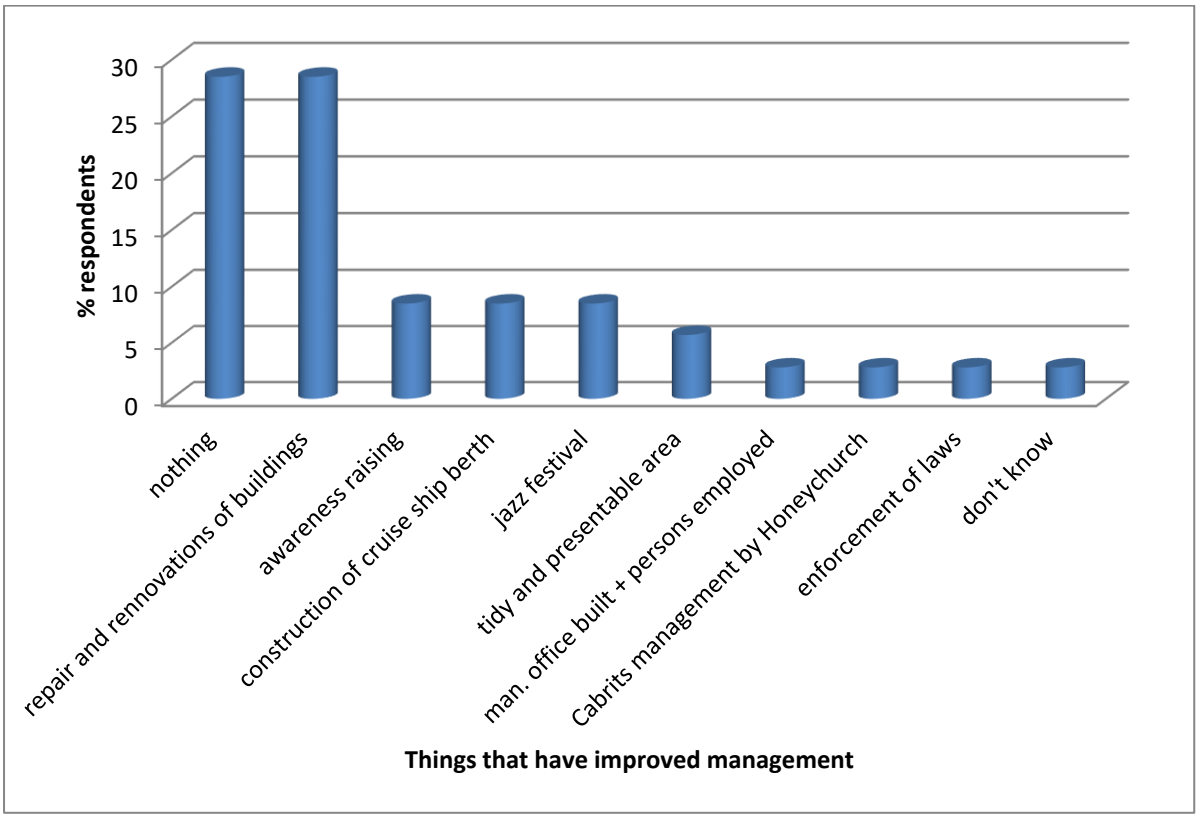

Figure 41 Things people believe have improved management of the CNP, n = 35

3.3.4 *Communicating about the CNP-MC*

A wide range of media can be used for informing persons about the CNP-MC, its resources and management of the area. Over 50% of persons surveyed in all cases say that the radio (87.2%), television announcements (83.8%), social media such as Facebook (78.4%), Whatsapp (70.9%), Twitter (59.5%) and Google Plus (59.5%), the newspaper (66.2%), through schools (52%) and activities/events (52%) are good ways of sharing information about the CNP-MC. Other more traditional means of sharing information could also be used to communicate about the CNP given that over one-third of persons interviewed also noted these as effective means of doing so – church (49.3%), flyers etc. (49.3%), friends/family (39.8%) and work (39.1%). See Figure 42.

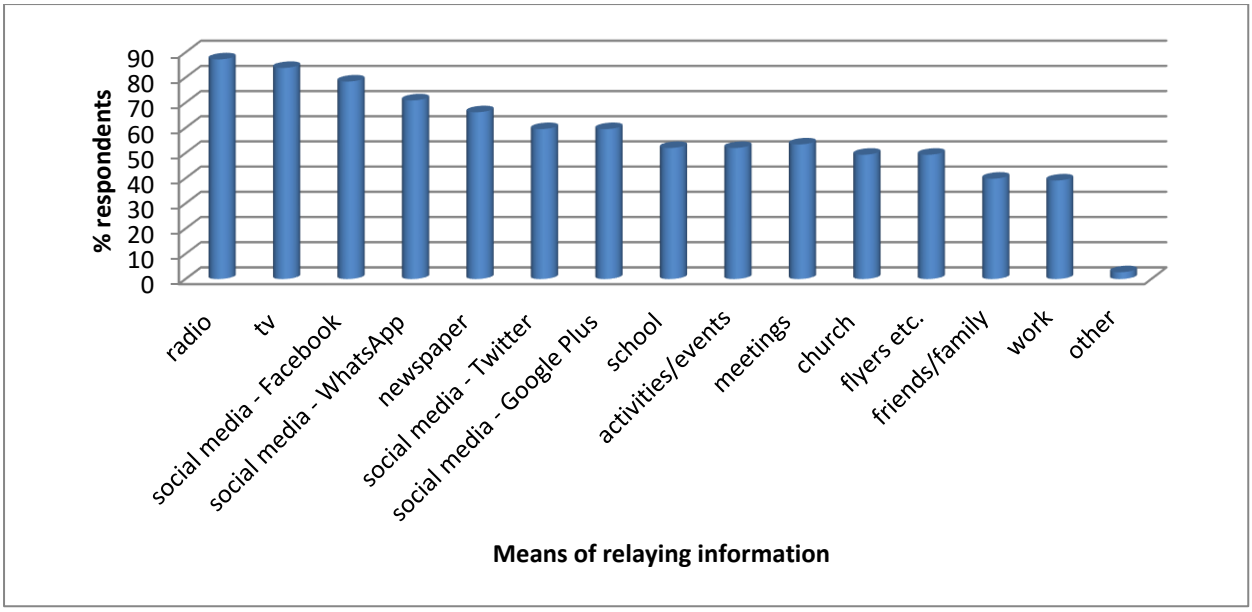

Figure 42 Best ways of informing persons about the CNP-MC, n = 148

3.4 Support for marine resource management measures: parrotfish, black sea urchin, coral reefs

A sub-sample of respondents who were fishermen, dive operators, divers and watersports operators were surveyed to determine their support for management of CNP-MC marine resources of interest. The overwhelming majority of individuals interviewed (88%) would support temporary measures to help keep populations of parrotfish growing and recovering.

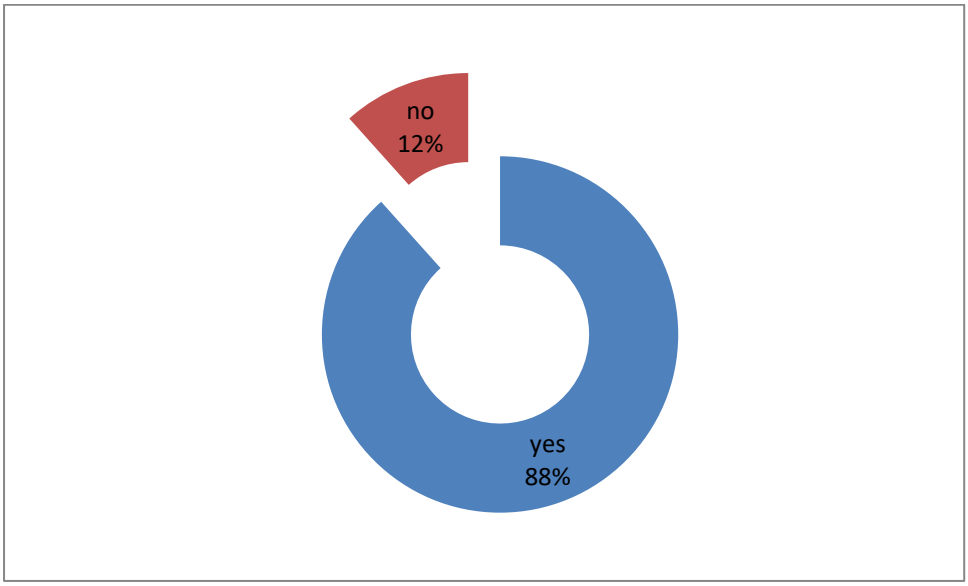

Figure 43 Support for proposed temporary parrotfish management measures, n = 43

Implementation of size restrictions (51.2%), fishing seasons (41.5%), catch limits (36.6%), campaigns for increasing awareness, education and outreach about this species (36.6%), and letting nature take its course (34.1%) all received fairly good support from fairly substantial proportions of persons surveyed. Persons were also supportive, to some extent, of gear restrictions and closed areas for research (21.9% each; Figure 44). Of the 12% of persons who indicated they would not support parrotfish management measures, only one person justified their position by stating that parrotfish are thought to be a threat to other fish.

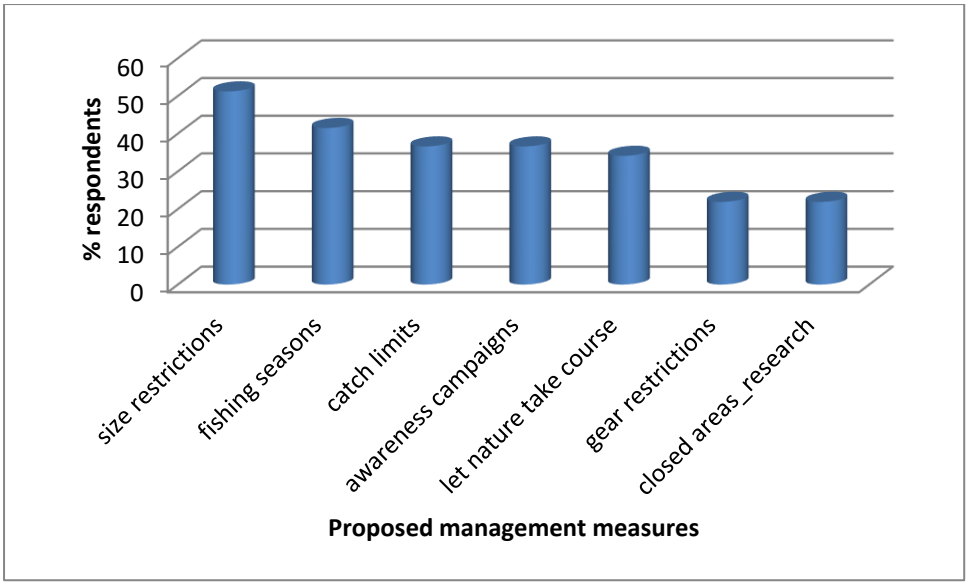

Figure 44 Range of support for proposed parrotfish population growth and recovery measures, n = 41

Support for management efforts to aid black sea urchin recovery in the CNP-MC was also very high with 79% of persons indicating their favour for such.

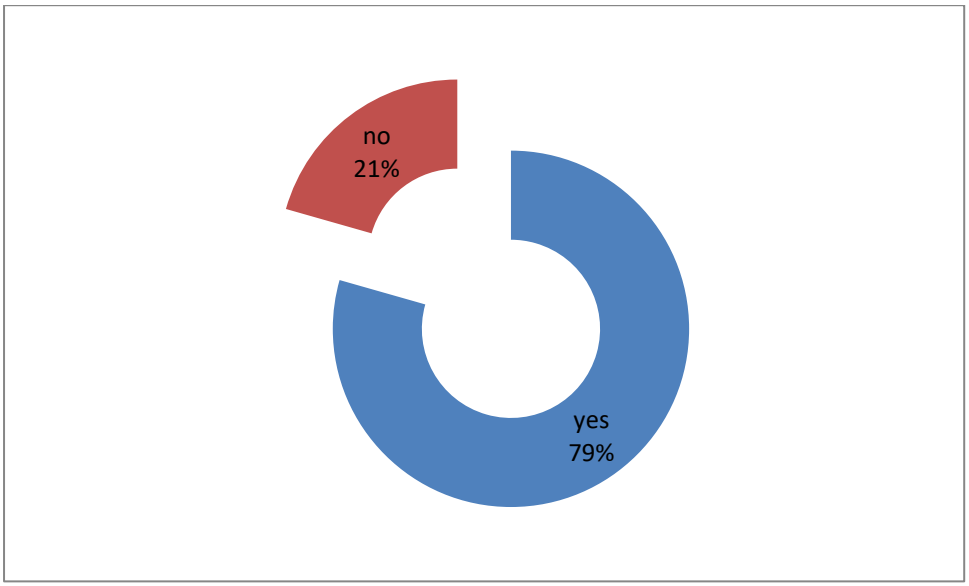

Figure 45 Support for proposed temporary black sea urchin management efforts, n = 34

Most persons felt that a more natural way of recovery was best (56.3%), while others felt that setting aside MPA zones for restoration (50%), transplantation from reefs with good abundance to those with poor abundance (46.8%) and laboratory rearing for replenishment of reefs (31.3%) would help recovery of this species (Figure 46).

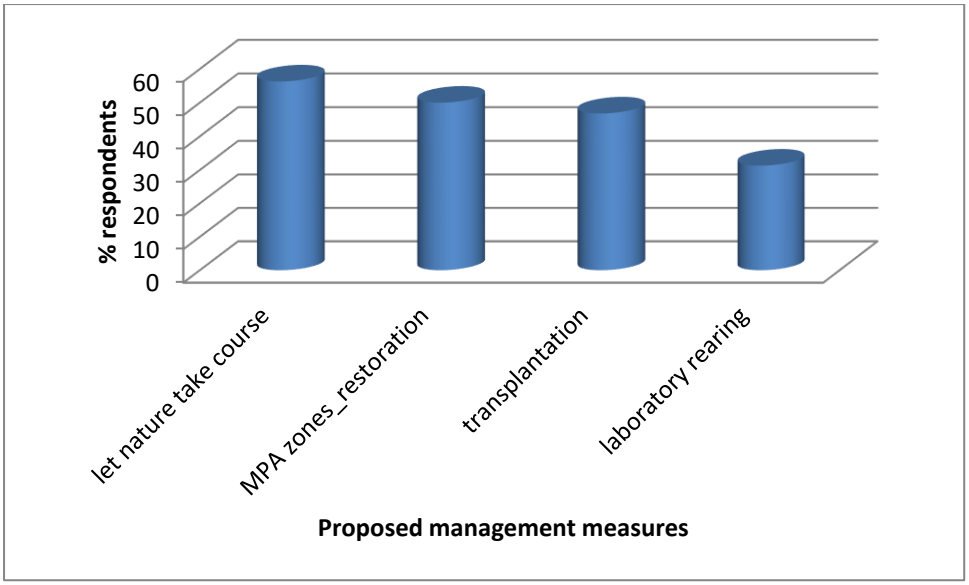

Figure 46 Range of support for proposed black sea urchin population recovery measures, n = 32

Of the 21% of persons who would not support black sea urchin management measures, two persons justified their response by noting the urchin is dangerous to sea bathers and divers, and that they did not the like the idea.

Support of measures to protect coral reefs received the highest support across all marine resources investigated with 92% favouring management measures. Fairly similar proportions of individuals are supportive of fishing seasons (47.4%), coral gardening (41%), size restrictions (38.5%), closed areas (33.3%), letting nature take its course (33.3%) and gear restrictions (28.2%) as means of protecting reefs in the CNP-MC.

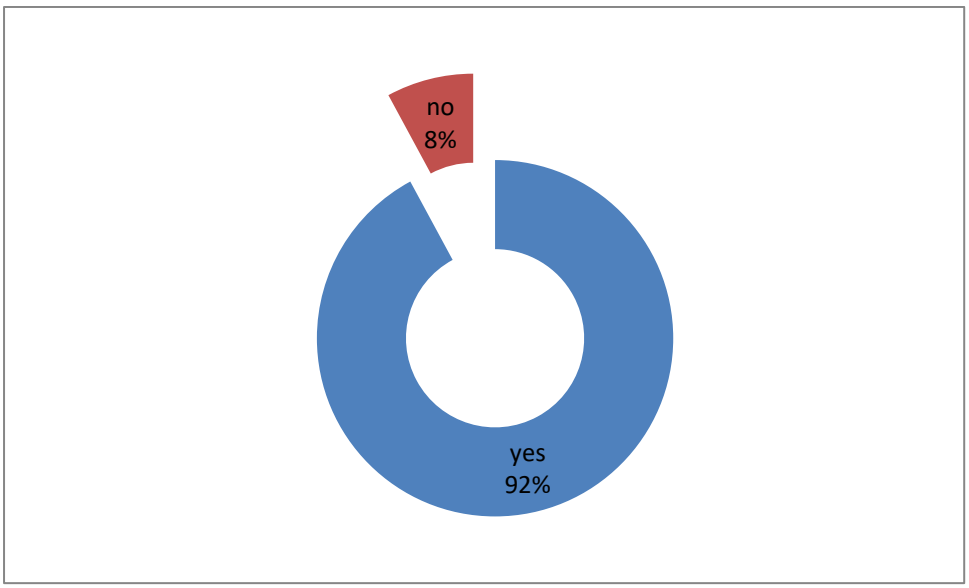

Figure 47 Support for proposed coral reef protection measures, n= 38

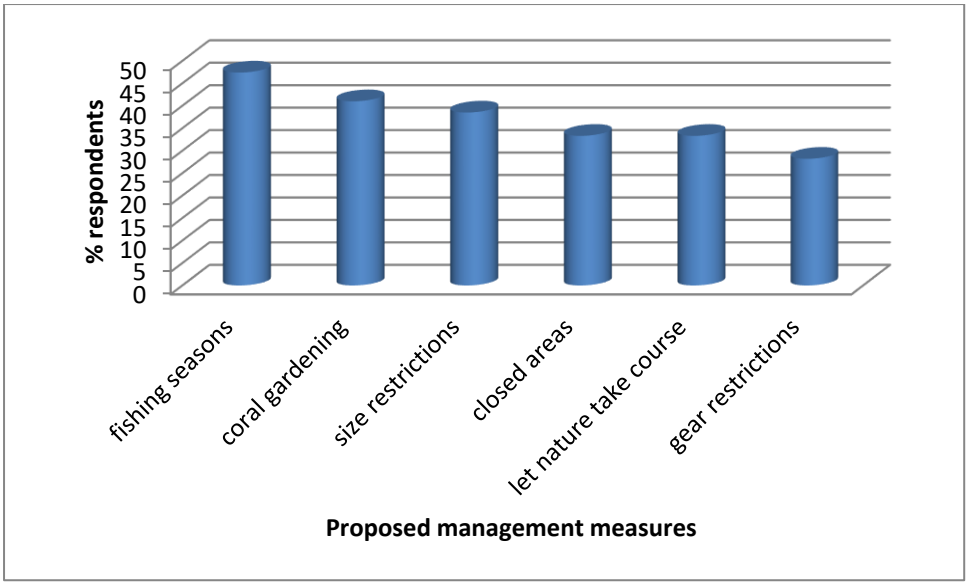

Figure 48 Range of support for proposed coral reef protection measures (Fishing seasons, n = 38; coral gardening, n = 42; size restrictions, n = 40; closed areas, n = 41; let nature take its course, n = 43; gear restrictions, n = 39)

3.5 Demographics

The sex for a significant amount of persons (n=109 or 27%) was not recorded by the interviewers. For those data recorded males comprised 82% of the respondents while 18% were females.

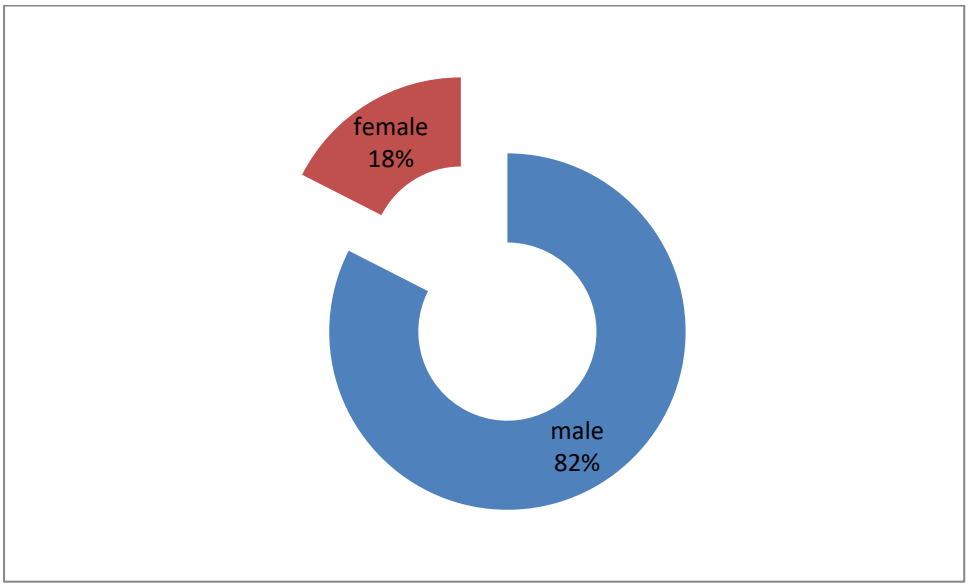

Figure 49 Male to female SocMon survey ratio, n= 40

The highest proportion of persons surveyed were in the 55-59 year age group (21.8%) followed fairly closely by those in 20-24 age group (15.6%). Significantly lower proportions of persons in the 40-54 and 65-74 age ranges were targeted. Again only the ages of approximately 20% of all persons surveyed was recorded.

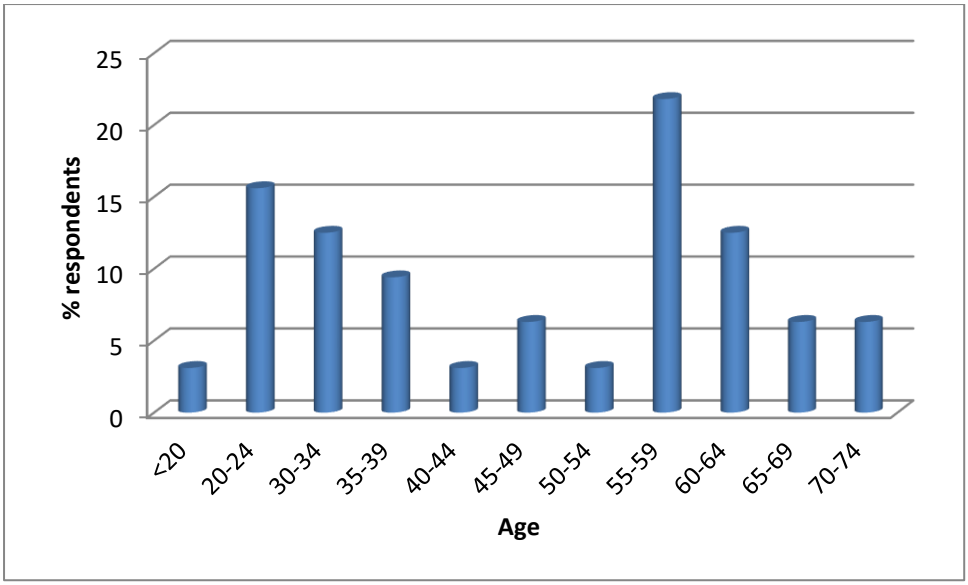

Figure 50 Age range of persons who participated in the SocMon assessment, n = 32

Fairly equal proportions of individuals have a primary (39.7%) and secondary (41.8%) level of education. Significantly lower levels of A-level/college (16.3%), university (0.7%), and professional, technical and vocational levels of training/education (1.4%) are exhibited among respondents (Figure 51).

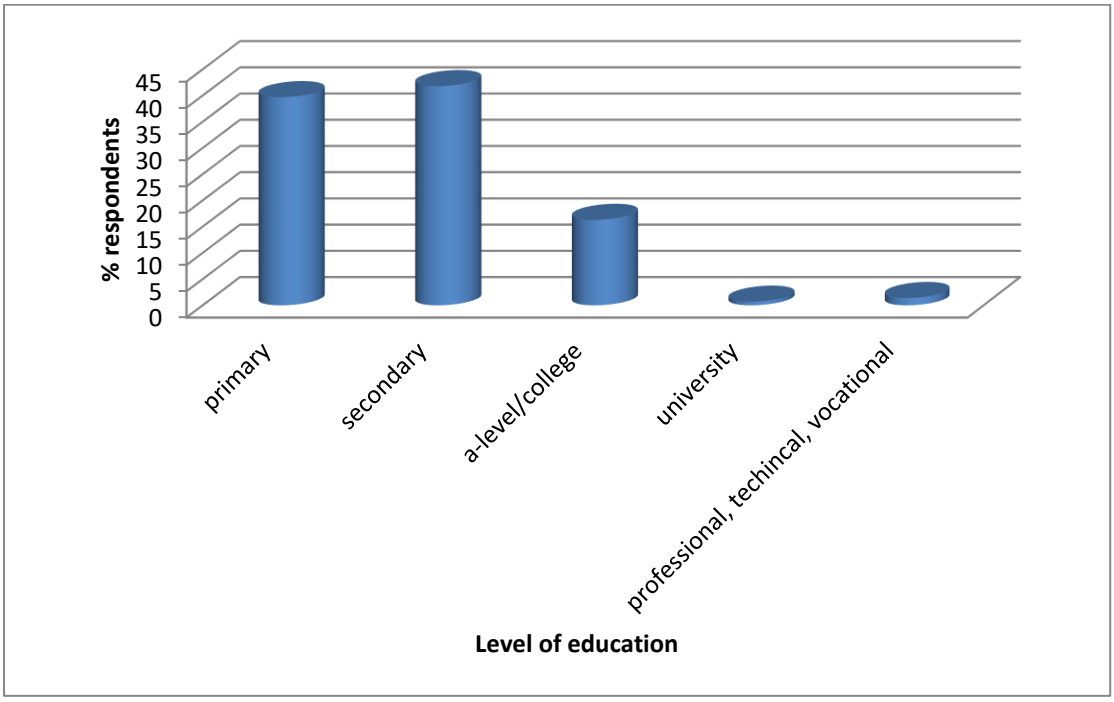

Figure 51 Level of formal education amongst respondents, n = 141

Primary sources of income of respondents were grouped into 15 categories. The top three sources of primary income include fishing (25.5%), skilled trade (19.6%) and domestic work (13.7%).

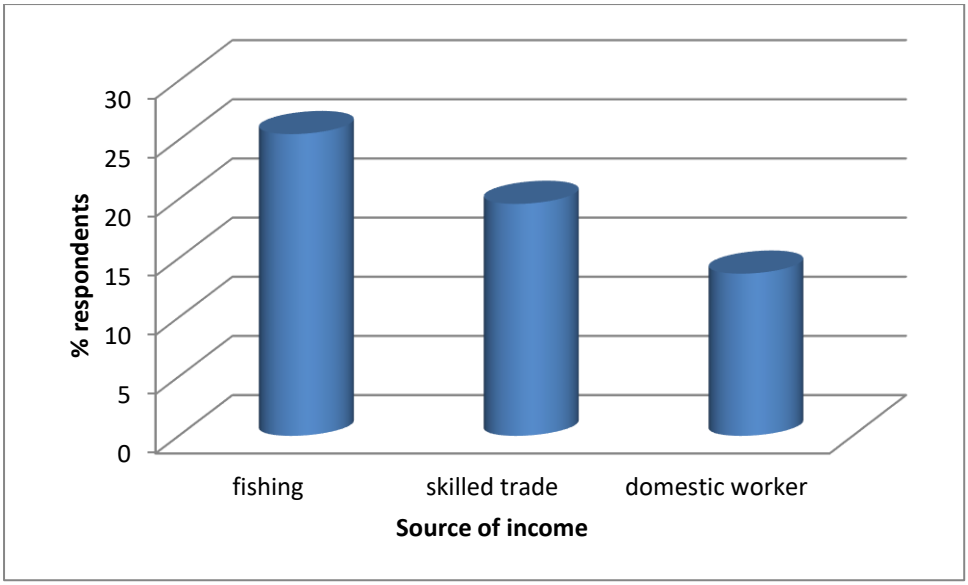

Figure 52 Primary sources of income of respondents, n = 51

The top five sources of secondary income include fishing (8.1%), hospitality service, domestic work, vending and business (5.4%). 10.8% of persons have no other source of income.

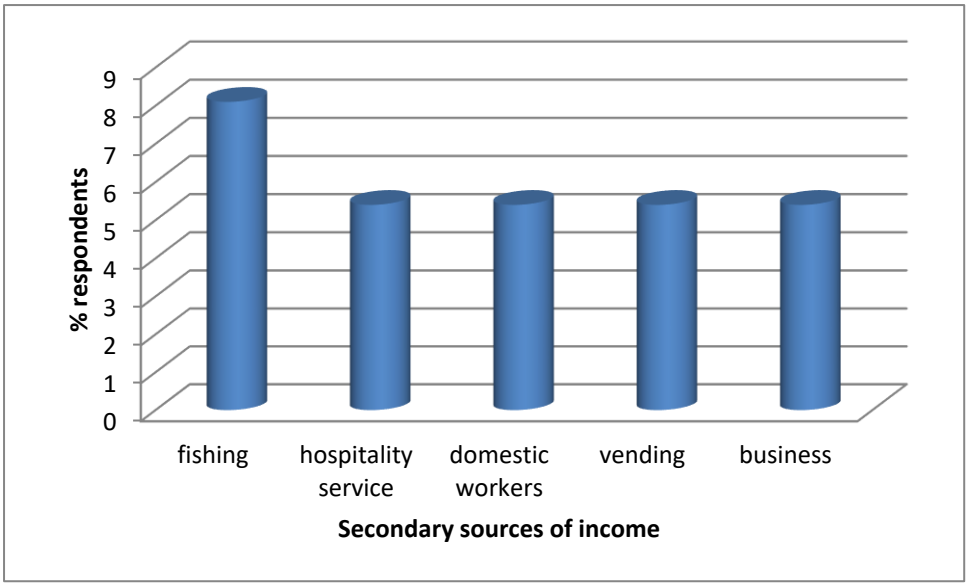

Figure 53 Secondary sources of income of respondents, n = 37

While a fairly significant proportion of persons (36%) derive greater than half of their income (51-100%) from livelihood activities in the area, most people (64%) make half or less of their income from the area (Figure 54).

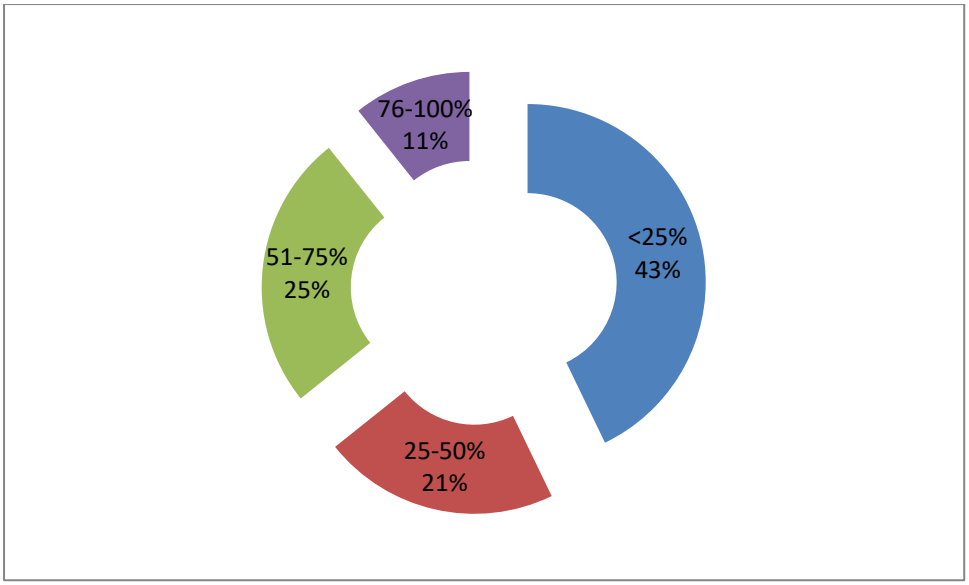

Figure 54 Proportion of income derived from income-generating activities in the CNP-MC, n = 28

4 RESULTS – SOCMON SPATIAL

Based on key informant interviews conducted, it was found that activities in the area are largely marine-based. The primary focus of mapping exercises was fishing and tourism; as a result, all of the activities highlighted on the map below (Figure 55) are related to these sectors. Of important note is the occurrence of spearfishing throughout the entire CNP-MC. One conflict that was identified by most key informants was the contact between divers and assorted boat traffic off of Fort Shirley.

Fishing activities and pollution impacts were identified by key informants as being particularly prominent within the Toucarie Bay. Other areas within the study area are perceived to be not as heavily impacted by stressors. The CNP-MC was highlighted as an important nursery habitat for a variety of marine species. Key informants identified pollution from stormwater outflows as a major threat to coral reefs in the area which were considered degraded. A connection between agricultural runoff and macroalgae blooms in certain areas was identified by some fishers but due to the limited scope of the SocMon Spatial inquiry this relationship could not be investigated further. The development of tourism infrastructure along the coast was highlighted as a major concern for important marine habitats in the area. Significant coral reef degradation was identified at Douglas Bay. This degradation was said to be directly related to the runoff from construction of a large hotel (Figure 56).

Figure 55 Activities occurring within the CNP-MC as identified by key informants

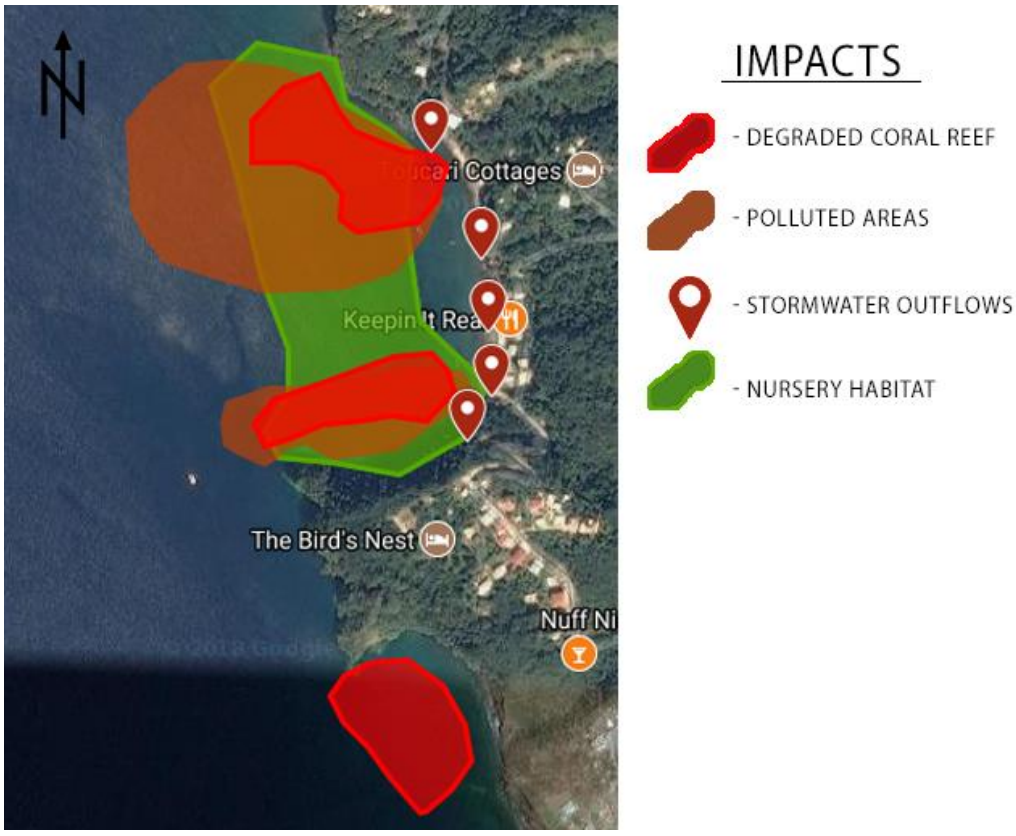

Figure 56 Perceived impacts on the CNP-MC as identified by key informants

5 DISCUSSION

This section was developed by the University of the West Indies Centre for Resource Management and Environmental Studies (UWI-CERMES). Due severe damage sustained in Dominica during the passage of Hurricane Maria in September 2017, CNP-MC SocMon team members were unable to contribute to this section of the report. It is therefore general in content.

This socio-economic assessment is the first of its kind in which the SocMon methodology was applied to the Cabrits National Park, specifically its marine component. As such it provides a reasonable baseline of users, user patterns, livelihoods and attitudes and perceptions to the CNP-MC.

In general, the primary data collection activity achieved the site monitoring goal of collecting socio-economic data on trends, livelihoods and collaboration at the CNP-MC to inform decision-making and management planning. The data and information collected will be useful in providing information on changes in use and user patterns, perceptions of resource conditions and attitudes towards the CNP-MC and its management over time with repeated socio-economic assessments. The information captured is also useful in determining interest in alternative livelihoods and the impacts of management of the CNP-MC on stakeholder livelihoods and for tracking changes in these characteristics over time.

The SocMon Spatial component was able to gather rich information about select activities occurring within the study area. Information on other activities in the area - agriculture, small commercial retail operations and a variety of local recreational uses - were not appropriately represented during key informant interview and mapping exercises. Although they may have been mentioned by stakeholders, spatial information and detailed activity outlines were not provided by the interviewees. There are therefore gaps in knowledge of other activities in the coastal area that may impact the health of habitats within the CNP. This requires further follow-up in future socio-economic assessments to gain a holistic understanding of the activities in the area, users, potential user conflicts and impacts of these activities on the CNP-MC.

The key informants targeted were very knowledgeable about the activities occurring in the MMA, however, a wider cross section of individuals and more extensive and broader interview guide will be necessary for the development of a comprehensive spatial geodatabase for the CNP-MC.

The survey data collection activity was highly successful in attaining the sample sizes required for a statistically representative sample of the population within the CNP. It is recommended that this assessment be repeated in about 3-5 years with a similar statistically representative sample for measuring socio-economic trends and changes in the CNP-MC.

5.1 Demographics

Information on the sex of only 27% of persons surveyed was recorded by interviewers. Of this, 82% of persons surveyed were males and 18% were females. It is unclear why these data were not recorded. Attempts by CERMES to have the raw data verified and to determine reasons for poor collection of this demographic variable have not been forthcoming. It can only therefore be interpreted as interviewer error.

Most persons targeted for surveying were between 55 to 59 years (21.8%). Equal proportions of persons (50%) in the senior category (50-74 years) and non-senior category (<20-49 years) were interviewed; a good representation across all age groups. Again only the ages of

approximately 20% of all persons surveyed was recorded, implying interviewer error in data collection.

Education level among respondents is fair with almost equal proportions of persons achieving a primary (39.7%) or secondary (41.8%) education. Education levels must be continuously taken into account in all efforts by relevant management authorities to engage stakeholders in management of the area. Awareness-raising activities and means of communicating with stakeholders about the MMA should be tailored according to the education level of the majority. Additionally, communicating about the CNP-MC should utilise a range of media persons readily access, which in this case appear to be radio, television, a range of social media platforms and the print media.

5.2 Livelihoods

The CNP-MC remains important to the fishing livelihoods of many persons and their families. Similar to information reported by Ecoengineering Caribbean Ltd. (2007), it was still noted as the main source of income in 2017 for most persons living in and adjacent to the CNP-MC. In general, the marine managed area (MMA) may be considered quite important to the livelihoods of people within communities adjacent to the CNP-MC. Commercial activities in the area, primarily fishing, contribute to varying proportions of people's income. In 36% of persons surveyed, such activities account for greater than half of their income earned. CNP income-generating activities also contribute 50% or less of the income earned by 64% of persons surveyed. These results are somewhat similar to national statistics of the 2011 Fishing Industry Census of Dominica (Fisheries Division 2012) in which similar proportions of fishers said they earned all or most (41%, n = 673) or half or less (58%, n = 673) of their income from fishing. This further emphasises the contribution of fishing to livelihoods both local and nationally. Fishing was also the most notable activity from which most persons or their families (30.8%) make a living from in and around the CNP. SocMon Spatial data indicate what appears to be extensive spearfishinig occurring in the CNP-MC. This is a point of concern that needs to be addressed by MMA management. Any fishery management measures implemented within the area have the potential of affecting livelihoods, particularly of fishers. In fact, while the designation of the CNP-MC had not impacted the ways in which the vast majority of persons made a living in the area, persons engaged in fishing noted that restrictions had indeed affected fishermen, with some finding it hard to make a living. Livelihood dependency needs to be taken into account in decision-making. CNP-MC management authorities should include fishers in the sustainable management of the area.

Perhaps surprisingly, the survey results indicated that lower than expected proportions of persons make their living from MMA-related income-generating activities such as tour guiding, restaurant or bar ownership, hotel and other tourism establishments, tour and dive shop operations, yacht services and craft vending. Skilled trade (construction) and domestic work were the two other primary sources of income mentioned by one third of persons combined.

There is high interest in trying new livelihoods related mainly to fishing and tourism in and adjacent to the CNP. Significant proportions of persons surveyed would be interested in pursuing alternative MMA-related livelihoods in fishing, hospitality and tour guiding. The feasibility of diversifying or introducing alternative livelihoods within communities adjacent to the CNP-MC will need to be further investigated by CNP-MC management.

Socio-economic conditions exist within the communities adjacent to the CNP-MC that could encourage the development of alternative livelihood options. These include the trend of more persons entering the fishing industry across all landing sites in Dominica (Ecoengineering Caribbean Ltd. 2007; Fisheries Division 2012) and few options for employment in the area

(Espeut 2006). Increased recruits in the fishing industry could result in increased fishing pressure if fishing practices are unsustainable, with accompanying declining resource condition within the CNP-MC. Perceptions of resource condition indicate declining health of all resources investigated except beaches (see discussion below).

Collaboration and partnerships between MMA management and public and private sectors is necessary in determining livelihood needs (supplementary, complementary or alternative) and is critical to the provision of appropriate livelihood options, development of livelihood programmes and the provision of skills training. Public and private sector partnerships and support is also very important to developing alternative livelihood options for CNP-MC communities since lack of money or assets, and lack of opportunities, were the two main barriers to pursuing new livelihoods.

The provision of alternative livelihood options to people living in communities adjacent to the CNP-MC should help in increasing stakeholder support for the MMA and its management. People should appreciate MMA management recognition of the importance of people in neighbouring communities and the stake they have in the CNP-MC. Additionally, it will aid MMA management in attaining its overall goal[1] and one of its five objectives[2].

5.3 MMA knowledge and perceptions of resource conditions

Knowledge and awareness of the CNP-MC is fair and mixed. A small majority (56%) have heard or read about the MMA but slightly lower proportions (49%) actually know the CNP-MC is called a marine managed area. Most persons associate MMAs with the protection of coastal and marine resources, and coral reefs with more life on them than at present. Although in the minority, some persons associated MMAs with negative features such as less access by locals, tourists or both, and less work and activities encouraged in the area. Stakeholders and users could benefit from educational or awareness-raising initiatives about the CNP-MC and its benefits for a more holistic understanding of this management tool. Awareness-raising activities should be developed to improve current understanding.

Most persons believe the main purpose of the CNP-MC should be recreation (yachts, diving and swimming). Fairly significant proportions of people (greater than 50% in all cases) believe environmental education and awareness; conservation of fish; ecosystem (seagrasses, mangroves, coral reefs) conservation; and sustainable tourism should be the focus. These focal areas are traditionally areas of MMA management focus and/or priority and therefore further indicate people's level of understanding of this management tool.

Overall, resources in the MMA were either thought to be in "very good" or "good" condition in both 2012 and 2017 by fairly significant proportions of individuals. Hence most people (61%) had not noticed changes in resource condition over the last five years. Slight declines in resource condition were observed by some over the five-year period but these results were attributed more to a slight increase in the number of persons being uncertain of the state of these resources rather than an increase in numbers of persons believing the resources were in a "very bad" or "bad" condition.

[1] *To manage the cultural, recreational and economic values of the marine park in such a manner as to maintain its biological diversity and value for future generations* (Ecoengineering Caribbean Ltd. (2007).

[2] Relevant objective – *To manage livelihood opportunities for the protection and enhancement of the values of the marine park* (Ecoengineering Caribbean Ltd. (2007).

Those who had noticed changes, perceived some decline in condition of all resources (seagrasses, mangroves and coral reefs), except beaches, from 2012 to 2017. Perceptions of beach condition over the five-year period of interest remained positive.

Declines in fish size and abundance over the last five years were perceived by most persons. These data are not specific to particular species and as such cannot be used in the interpretation of trends with any certainty. Should this assessment be repeated, fish species of interest – both commercial and herbivorous – must be specified for accurate data collection.

Overall, the "very good" or "good" ratings of coral reef conditions and declining fish size and abundance is comparable to some extent with the Reef Health Indices (RHI) as outlined in the Commonwealth of Dominica Coral Reef Report Card 2016 for West Coast (Subregion 29) which encompasses the CNP-MC (Kramer et al. 2016). Although inferences are made using the RHI for the West Coast, it should be noted that the RHI for this Subregion does not include surveys for any reefs within the CNP-MC. Extrapolation is therefore cautiously made in the absence of site-specific data.

The RHI provides the following information on a number of indicator species surveyed and indicates "good" coral cover of 20-39.9% and good reef condition due to low levels of fleshy macroalgae 1-5%) for Subregion 29. Commercial fish biomass was rated as "critical" with biomass values between <420g/100m^2. Healthy reefs (those in good or very good condition) typically have reference values of 1260 - ≥ 1,680 g/m^2 for commercial fish biomass. The RHI scores for herbivorous fish biomass were "poor" (960-1,919 g/100m^2) in Subregion 29. The information on these indicators is similar to perceptions of respondents of coral reef and fish conditions within the CNP-MC.

The healthy condition of coral reefs perceived by survey respondents is in stark contrast to SocMon Spatial key informant information that indicated significant coral reef degradation, particularly at Douglas Bay, which was said to be heavily impacted by the construction of a hotel on the coast. To be able to better compare the people's perceptions in this assessment with the condition of marine ecosystems and resources within the CNP-MC, site-specific bio-physical monitoring of reefs within the CNP-MC should be conducted for comparative analyses.

The zonation proposed in the 2007 CNP management plan (Ecoengineering Caribbean Ltd. 2007) should assist in improving marine and fisheries resource condition and the perceived decrease in abundance of fish species in the CNP-MC. The 'No-Take' or Nursery Zone should alleviate fishing pressure on fishery resources and result in increased abundance of resources through replenishment to areas adjacent to this zone once users comply with rules and regulations for the area. The Fishing Priority zone should aid in sustaining the livelihoods of the main users (fishers) of the area.

As might be expected, the condition of the marine environment is "very important" and "important" to persons for their livelihoods, relaxation and for its existence value. As such the management authority should continue to build relationships with all stakeholders and users in the area, engaging them in management and decision-making.

5.4 Support for resource management

Generally, there is high support among relevant users (fishers, dive operators, divers, watersports operators) for the implementation of management measures for the protection of parrotfish, long-spined black sea urchins and coral reefs in the CNP-MC. This could be interpreted as a sense of stewardship users have towards the resources they are dependent

on. It also could indicate their awareness of the importance of and value of such resources to their livelihoods and to overall ecosystem functioning. Hence their willingness to support management efforts that would aid in resource protection and recovery. It is likely that with such a sense of stewardship among these users at this time, any temporary management measures implemented by the management authorities would be met with cooperation from these stakeholder groups.

Nearly all persons interviewed would support measures to protect coral reefs in the area. This is a particularly striking result and could be attributed to the uncertainty a large proportion of persons feel about the current condition of reefs in the CNP-MC. Support for management of the black sea urchin may be due to the fact that there is no fishery for the resource in Dominica, hence fishers would not be impacted by any measures implemented to manage and aid recovery of this species. Due to the importance of parrotfish to the reef complex, the fact that only a minority of persons target this species, and persons support of size restrictions, fishing seasons, catch limits and education campaigns to increase population abundance and recovery of this species, management should investigate and move to implement some of these management measures in the area.

5.5 Problems affecting the CNP-MC and suggestions for improving resource conditions

Pollution, solid waste and sedimentation are thought to be the main threats to CNP-MC resources. These threats require immediate remedial action since they have apparently been ongoing for a number of years; having been identified in the 2007 Draft Management Plan for the CNP (Ecoengineering Caribbean Ltd 2007). Areas within the CNP-MC are depositories of waste from nearby rivers due to the topography of the area and currents (e.g. Toucarie) and suffer from high turbidity from sedimentation (e.g. Douglas Point South). Improvements in solid waste disposal, land use planning and restricted development along the coastline, establishment of fishing zones, limitation of yachts in the area, appropriate legislation and public education were some of the suggestions offered by respondents to solve these issues in the CNP-MC. Indeed, any efforts to resolve these threats should be conducted in consultation with stakeholders for greater buy-in and support.

5.6 Potential for and interest in collaborating for managing the CNP-MC

The majority of persons believe government should be responsible for solving problems in the MMA. However, a significant proportion of individuals also believe that co-management with local government, the community, and users groups is also possible. Collaborative management (or co-management) and community-based management with the differences between these relating to the degree of stakeholder participation in the process and the location of management authority and responsibility, are two general arrangements for MPA or MMA management.

The overwhelming majority of persons interviewed believed that CNP management is not doing enough to encourage stakeholder participation in management of the area and its resources. There is interest among some to participate in management activities such as educational campaigns, and enforcement and monitoring (biological and socio-economic). CNP management should focus on including or increasing stakeholder participation in management of the MMA since it has been shown that a high degree of stakeholder participation in MPA/MMA planning and management leads to stronger and greater conservation success over the long term. Linkages and collaboration with organisations or groups to which most people are members – fisheries cooperatives and sports groups – should

be developed to encourage and promote participation in MMA management activities. If stakeholders are involved in the CNP-MC, feel that their views and concerns are being heard and considered, and feel ownership of it, they are more likely to support and sustain the MMA.

There were mixed views concerning improvements in management of the area. Individuals interpreted management improvements in relation more to increases in development of the area (e.g. renovation of Fort Shirley), rather than typical aspects of management effectiveness such as regular enforcement of rules and regulations, decreases in infractions, improved ecological condition, livelihood benefits etc. This is interesting and potentially highlights people's perception that better management of the CNP-MC will ultimately contribute to "knock-on" effects in other areas surrounding the MMA and in important sectors.

Main focal areas for management suggested by most individuals include but are not limited to enforcing rules and regulations, awareness and education, providing training opportunities for communities, facilitating livelihood development, and monitoring ecosystem conditions. CNP-MC management must improve its visibility and management of the area. Consultations with stakeholders and their inclusion in the management process and activities will assist in the overall acceptance of management interventions and support for the MMA.

5.7 Key activities within and use of the CNP-MC

The CNP is important to many persons providing livelihoods for some and as an area of relaxation (swimming, recreational fishing and picnicking) for many. Fishing and tourism are the primary socio-economic activities occurring in the CNP-MC. A slim majority of individuals believe the amount of fishing in the area to be just right, while a similar proportion believe there is too much fishing in the area. Perceptions of fish abundance and size, and the results from the 2016 Coral Reef Report Card which indicated declining resources, and critical and poor fish biomass (cautiously extrapolated to the CNP-MC as explained above) support perceptions of too much fishing in the area. Level of fishing pressure in and around the CNP-MC requires further assessment and monitoring especially given the fact that fishers from neighbouring villages of Bioche, Dublanc and Colihaut fish in the marine section of the CNP.

Many believe the amount of tourism in the CNP is too little or way too little. Although there are restaurants and bars in the area, dive and tour operators, and yachting, very little tourism has been observed there. There is room for sustainable tourism development in the north west given the relatively new cruise ship berth and two major visitor attractions – Fort Shirley and the Cabrits National Park. Developers are taking advantage of this relatively undeveloped area. The Cabrits Resort Kempinski Dominica is one such development due to be completed this year. MMA management needs to be engaged in coastal development in the area to ensure that it occurs sustainably and with little impact to CNP-MC.

6 RECOMMENDATIONS FOR MANAGEMENT

As previously stated, this assessment represents the first SocMon assessment for the marine component of the Cabrits National Park. The assessment has provided a valuable baseline on which future studies can be developed. It is recommended that a repeat assessment be conducted in the next three to five years to measure trends in socio-economic conditions and characteristics of the area.

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8 APPENDICES

Appendix 1: SocMon workshop participants

SocMon Capacity Building Workshop for the CNP
19-21 October 2016

Surname	First name	Position	Organisation
Baron	Daniel	Forestry Officer	Forestry Division
Edwards	Lucia	Physical Planning Officer	Physical Planning Division
Esprit	Agnes	National Coordinator	GEF SGP Dominica
Honore	Fabien	Dive operator	PAYS/CAPMA
John	Kemai		GEF SGP

Appendix 2: Workshop training programme (SocMon methodology)

ECMMAN Socio-economic Monitoring for Coastal Management (SocMon)
Capacity Building Workshop for
the Cabrits National Park
Portsmouth Fisheries Complex, Portsmouth, Dominica

19-21 October 2016

SOCIO-ECONOMIC MONITORING FOR COASTAL MANAGEMENT (SOCMON) PROGRAMME

Day and time	Activity
Wednesday [19 October]	
9:00 -9:30	Welcome and introduction to SocMon training component SocMon participant introductions Workshop goals and objectives Workshop schedule Workshop expectations
9:30 – 9:45	Introduction to the Global SocMon initiative and SocMon Caribbean
9:45 – 10:15	Overview: The Six Steps to SocMon Case study – Canaries, St. Lucia
10:15 – 10:30	***BREAK***
10:30 – 10:45	*Situation overview:* The Cabrits National Park
10-45 – 12:00	**Group work: Site monitoring plan development** *SocMon preparatory activities for socio-economic assessment and monitoring* - Goals and objectives for monitoring; - Boundaries for monitoring; - Identification of stakeholders; - Location of stakeholders and key informants; - SocMon team *(SocMon Preparatory Activities Worksheet, pages 1-4)*
12:00 – 1:00	***LUNCH***
1:00 – 3:00	**Group work: Site monitoring plan development contd.** *SocMon preparatory activities for socio-economic assessment and monitoring* - Goals and objectives for monitoring; - Boundaries for monitoring; - Identification of stakeholders; - Location of stakeholders and key informants; - SocMon team

Day and time	Activity
	(SocMon Preparatory Activities Worksheet, pages 1-4)
3:30 – 5:00	1st field trip to the Cabrits National Park for field scoping and de-brief on site
Thursday [20 October]	
9:00 – 9:30	Review of Day 1 Cabrits National Park field scoping discussion
9:00 – 10:15	Introduction to field data collection methods: - Secondary sources of data - Semi-structured interviews (key informants) - Structured surveys (household) - Group interviews - Focus groups - Visualisation techniques
10:15 – 10:30	***BREAK***
10:30 – 12:00	**Group work: Site monitoring plan development continued** *SocMon preparatory activities and planning for socio-economic assessment and monitoring* - Review and compile available sources of secondary data, including secondary spatial data; - Identify secondary data sources - Select SocMon variables for monitoring; - Determine gaps in information *(SocMon Preparatory Activities Worksheet, pages 4-14)*
12:00 – 1:00	***LUNCH***
1:00 – 3:00	**Group work: Site monitoring plan development continued** *Planning for field data collection* - Determine data collection methods to be used, type of sampling and sample sizes; - Formulate semi-structured interview guides for key informants; - Develop household interview survey, coding sheet and data table; - Select and develop visualisation techniques for data collection; - Contact key informants to arrange appointments for interviews; *(SocMon Preparatory Activities Worksheet, pages 15-17)*
3:00 – 3:15	***BREAK***
3:15 – 4:30	**Group work: Site monitoring plan development continued** *Planning for field data collection* - Continue preparations for field data collection (as above); - Pre-test data collection instruments in teams; - Print data collection instruments (if necessary); - Pre-design visualisation material (e.g. seasonal calendars, daily time use patterns etc.); - Contact key informants to arrange appointments for interviews
Friday [21 October]	
9:00 – 9:30	Review of Day 2 Final preparations for field data collection

Day and time	Activity
9:30 – 12:00	**Group work: Data collection** *2nd field trip to the Cabrits National Park for team to implement work plan* - Conduct key informant interviews - Conduct visualisation techniques - Make observations - Collect photos - Fill in any gaps from previous site visit ***Team meeting on return to enter and analyse data***
12:00 – 1:00	***LUNCH***
1:00 – 1:30	Data analysis - How to analyse data - A quick look at developing key informant narratives - Examples of displaying assessment results
1:30 – 3:00	**Group work: Data analysis** - Data entry; - Conduct data analysis; - Discuss interpretation, conclusions, key lessons learned; and adaptive management for the Cabrits National Park
3:00 – 3:15	***BREAK***
3:15 – 3:45	Post data analysis: Validation and communicating results Social Media Revolution 2016 video
3:45 – 4:00	**Group work: Site monitoring plan development continued** - Communication plan essentials – Who, how and what?; - Develop workplan for site assessment; - Determine critical resources required for the assessment; - Develop the budget for implementation of the assessment *(SocMon Preparatory Activities Worksheet, pages17-20)*
4:00 – 4:30	- Reporting results in plenary - Key lessons learned by participants about SocMon - Implementing SocMon at the Cabrits National Park – activities for follow-up, challenges, issues, concerns - Workshop evaluation - Wrap-up

Appendix 3: Cabrits National Park-Marine Component SocMon site monitoring plan

1 Introduction

You may use this worksheet to help structure your formulation of an ecosystem-based socio-economic monitoring plan for the Cabrits National Park. The worksheet forms the basis of your SocMon site monitoring plan. Feel free to provide explanations, where applicable, for your choices in each of the section notes.

Read the SocMon literature — GCRMN manual, Caribbean guidelines and climate addendum. Also read relevant literature on the Cabrits National Park and adjacent areas from which you can gather useful information on what should be monitored, how, when and where.

The socio-economic data and information from monitoring need to be useful for management planning, decision-making and adaptive management. A monitoring plan must take into account the local reality - available funds, human resource capacity and the demands of decisions. It has to prioritise particular variables to monitor, with good reasoning behind choices. When completing the worksheet, be sure to refer to the SocMon Caribbean guidelines and GCRMN manual for guidance.

2 Goals and objectives guiding socio-economic monitoring

Monitoring must have a goal and specific objectives for being undertaken. These are often based on management plans (e.g. fisheries, MPA, tourism) or other expressions of policy.

Monitoring goal	Monitoring objectives (up to three SMART ones)
Collect socio-economic data on trends, livelihoods and collaboration at the Cabrits National Park (CNP) to inform decision-making and management planning.	1. To identify changes in users, user patterns, perceived resource conditions, and attitudes and perceptions to the CNP.
	2. To determine motivating factors (if any) for the changes and impacts on stakeholder livelihoods.
	3. To understand the potential for or interest in sustained collaboration among ECMMAN stakeholders for managing coastal resources in the CNP.

Notes:

GCRMN Manual: Pages 19-20, 36-40

3 Defining the study area

Using the information on issues and stakeholders, define the geographic area appropriate for the study site (contains all or most critical activities/issues and stakeholders). Document the specific selection criteria that you used. Clearly identifying the study area is important in

1

identifying use patterns and potential threats to resources. The study area should include where the stakeholders live and work.

Study area selection criteria	Study area description (or attach area map)
Fishing (including spearfishing)	Study area encompasses the CNP boundaries. The extent of the marine component should include Bioche and Dublanc. The landward (eastern) boundary is the coastal road.
Diving and snorkeling	
Yachting	
Ecotourism	
Watersports	
Crab harvesting	

Notes: The extent of the study area is based on the OPAAL (2207) for comparison.
Since fishers from Bioche fish in the CNP, the study area will be extended to include Bioche.

GCRMN Manual: Pages 26-28

4 Stakeholder identification

Stakeholder identification and selecting the boundaries for the study site are iterative processes. Start by identifying the activities in the area and then determine who the likely stakeholders are. Name their organisation, if any.

Study area activity or issue	Primary stakeholder [and organisation]	Secondary stakeholder [and organisation]
Fishing	Fisherfolk – spearfishermen, Bioche fishers St. John's Fisheries Cooperative St. Peter's Fisheries Cooperative	Fisheries Division Restaurants – Tomatoes, Des Champs, Prince Rupert Tavern
Diving/snorkeling	Island Dive Operation (I DO) JC Ocean Divers	Fisheries Division Hotels Discover Dominica
Yachting	Portsmouth Association for Yacht Services (PAYS) Portsmouth Indian River Tour Guides Association (PRITGA) Tour guides Yachties Dominica Air and Seaport Authority (DASPA)	Tour operators Hotels Foreign yacht charter companies Discover Dominica
Crab harvesting	Harvesters	Forestry Department DASPA Consumers
Ecotourism	Tour guides Tour operators – Cobra Tours, Providence	Ministry Tourism Forestry Department

2

Study area activity or issue	Primary stakeholder [and organisation]	Secondary stakeholder [and organisation]
	Keepin' It Real Toucarie Bar and Grill	Hotels – Secret Bay, Keepin' It Real, Picard Beach Hotel, Manicou, Des Champs Ross University
Watersports – Kayaking, jet ski, banana boat, paddle boarding	Wave Dancer Sports Keepin' It Real	Dominica Watersports Association Ross University Enthusiasts Visitors Emergency services

Notes:

GCRMN Manual: Pages 21-25

5 Stakeholder locations and key informants

The communities where SocMon will take place will depend primarily on the stakeholders involved in coastal management. Suggest key persons who can talk about the larger population.

Stakeholders (1° and 2°)	Location of stakeholder	Key informants for stakeholders
Fishing		
St. John's Fisheries Cooperative	Cottage/Clifton Portsmouth	Philson Wallace Jack Harney
St. Peter's Fisheries Cooperative	Bioche	Francis Paul
Fisheries Division	Roseau	Riviere Sebastien Candy Stoute Jullan Defoe
Prince Rupert Tavern	Cabrits	Hilma Marie
Des Champs	Picard	Hans Schneider
Tomatoes	Picard	?
Yachting		
PAYS PRITGA	Portsmouth Portsmouth	Clive Shem St. Jean Andrew O'Brien Jerome Leboubou
Providence (tour operator)	Portsmouth	Martin Carriere
Tour operator	Portsmouth	Faustin Alexis

Stakeholders (1° and 2°)	Location of stakeholder	Key informants for stakeholders
Tour operator	Portsmouth	Sam Frank
Tradewinds (foreign yacht charter)	Guadeloupe	Franco ?
Hotels	As above	As above
Discover Dominica	As above	As above
Diving		
I DO	Portsmouth	Fabien Honore
JC Ocean	Portsmouth	Jorge Gamarra
Fisheries Division	Roseau	As above
Discover Dominica	Roseau	Samantha ?
Des Champs	Picard	Kathy Jno Jules Hans Schneider
Manicou Resort	Guillette	Katie ?
Regens	Tebay	"Renno" Lawrence
Secret Bay	Tebay	Gregor Nassief
PBH	Picard	Janice Armour
Crab harvesting		
Harvesters	Portsmouth	Richard Laville
Forestry Department	Cabrits	Richie Laville Daniel Baron
DASPA	Portsmouth	Bethude Azille
Ecotourism		
Cobra Tours	Portsmouth	Andrew O'Brien
Providence	Portsmouth	Martin Carriere
PAYS	Portsmouth	Clive Shem St. Jean Jeff Frank
Toucarie Bar and Grill	Toucarie	Greg Francois Ashton Mason
Keepin' It Real	Toucarie	Derek

4

Stakeholders (1° and 2°)	Location of stakeholder	Key informants for stakeholders
Ross University	Picard	Flavia Leatham
Forestry Department	Cabrits/Roseau	Daniel Baron Jacqueline Andre Minchinton Burton
Ministry of Tourism		Melvina Walsh Leslie ? Maxwell
Watersports Wave Dancer Sports	Picard	Clint ?
Keepin't It Real	Toucarie	Derek?
Dominica Watersports Association	Roseau	Daniel Perryman
Ross University	Portsmouth	Flavia ?
Emergency Services	Portsmouth	John Brumant

Notes:

GCRMN Manual: Pages 21-25

6 SocMon Spatial reconnaissance checklist

Good reconnaissance is critical in the initial phases of the SocMon Spatial process. In this phase, researchers gain an understanding of on-the-ground spatial interactions which guide future monitoring activities. A checklist should be created to guide reconnaissance observations. Information of importance is "What are we looking for?", "Where is it?" and "Who can tell us?" These questions are related to the monitoring objectives, and later to the specific variables selected for monitoring.

Feature (What are we looking for?)	Location (Where is it?, What is it close to?)	Key informants (Who can tell us about it?, Who uses this space?)
Activities		
Resources		

Feature (What are we looking for?)	Location (Where is it?, What is it close to?)	Key informants (Who can tell us about it?, Who uses this space?)
Key infrastructure		

7 SocMon leader and team

Although an initial study or monitoring program can be done by a single person (e.g. MSc student), the process is intended to be undertaken by an interdisciplinary team, the size and the required talents of which partly depend on the goal and objectives of the study or monitoring program. What types of expertise do you need and where from?

Skill requirement or role on team	Names and affiliations of team leader and members
SocMon coordinator	Agnes Esprit
Community Liaisons	Fabien Honore Daniel Baron
SocMon Spatial	Lucia Edwards Lyn Baron (Jehroum Wood)
Data collection	Fabien Honore Kemai ? Daniel Baron Glenda ? Akmel St. Jean Lucia Edwards Dawn Francis Lisa ? (ECMMAN Project)
Data analysis	Kemai ? Agnes Esprit Dawn Francis
Communications	Agnes Esprit

Notes:

GCRMN Manual: Pages 43-47

8 Secondary data sources

One of the first steps in SocMon is to consult secondary data sources that can be used for guiding the investigation and interpreting the results. Use this table to identify the sources of secondary data based on the objectives set for your SocMon. When completing the table also think about secondary spatial data. In future monitoring you can check if additional sources of information on the objectives become available. One row is added for general types of information. Where possible make notes about the suitability, quality, method(s) of collecting the data, when it was collected, who collected, analysed and interpreted it. When reporting, documents should also be listed in your 'References'.

Tips for scoping secondary spatial data:

- Look for information that is specifically related to the area of interest.
- Information should not be restricted to GIS data and/maps; descriptive information is important as well. For example, newspaper articles about user conflicts within a specific area.
- For GIS data:
    1. Look for information on data collection methodologies that can be easily replicated in your study, and
    2. Ensure quality by looking out for the 5 Ws: What, Where, When, hoW and by Whom.

SocMon objective	Sources of secondary data	Notes
1. Changes in users, use patterns, perceived resource conditions, attitudes and perceptions to the CNP	OPAAL ECO Report (2007) Land use map Fisheries assessments and records ECMMAN project documents CNP Draft Management Plan ECMMAN Reef Report Card – Dominica Sub Curacao expedition (fisheries)	
1(a) Changes in users and user patterns		
1(b) Changes in perceived resource conditions		
1(c) Changes in attitudes and perceptions to the CNP		
2. Motivating factors for the changes and impacts on livelihoods	OPAAL ECO Report (2007) ECMMAN LSF and small grant project documents Discover Dominica/Invest Dominica Tourism Master Plan Land use plan	

SocMon objective	Sources of secondary data	Notes
3. Potential for/interest in sustained collaboration among ECMMAN stakeholders for managing CNP resources	ECMMAN project documents	Most of the information on this objective will have to be collected from the relevant stakeholders
General types of information		

Notes:

GCRMN Manual: Pages 53-57

9 Key indicators to be monitored

Based on the goal and objectives of the monitoring, you need to determine which (if not all) of the SocMon Caribbean variables[1] need to be measured, sources of secondary information to consult before interviewing (key informant, household, visualisation techniques), and practical considerations for each variable. The practical considerations include levels of difficulty in acquiring information, issues, error or uncertainty, challenges in implementing fieldwork, links to data sources that are desirable, etc. Refer to the Caribbean guidelines when selecting the variables to determine the information measured by the variable and its suitability for monitoring based on its relevance to monitoring goals and objectives. Recently broad socio-economic parameters with links to drivers of ecological change have been developed by GCRMN-Caribbean. See below.

**Since most socio-economic information can be gathered from secondary data rather than interviews (key informant) and surveys (household) rigid distinction between variables (as shown in the SocMon Caribbean guidelines) is unnecessary. Select your variables and choose the most appropriate data collection method.*

Also remember that if a variable/indicator specific to your purposes of monitoring is not available among the suite of SocMon Caribbean and GCRMN-Caribbean parameters, you can design new variables.

The variable selection process for SocMon Spatial must consider the spatial relationships between features. Certain spatial representation goals may require the packaging of related variables E.g. We may have to group Use Patterns and Types of Impacts if we are monitoring. In selecting variables for monitoring, identify whether they represent a feature, an attribute or

[1] For the purpose of these worksheets, variable and indicator are being used synonymously

both. This will help in determining which variables must be linked as features and attributes for monitoring of spatial characteristics in this assessment.

GIS abbreviations:

a. F = Feature (These are physical points and/or areas highlighted on the map)
b. A = Attributes (These are sets of information which describe the features that they are related to)

a) SocMon Caribbean variables

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
Demographics				
K1. Study area	1	Satellite imagery, land use map	High	F
K2. Population	1, 2	Village Council, national census	High	
K3. Number of households				
K4. Migration rate				
K5/S1. Age	1, 2	Country Poverty Assessment, National Census	Medium	
K6/S2. Gender				
K7/S4. Education	1, 2	OPAAL ECO Report	Medium	
S5. Religion				
K8. Literacy				
K9/S3. Ethnicity				
K10/S5. Religion				

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
K11/S6. Language				
K12/S7. Occupation	1,2	OPAAL ECO Report	Medium	
S8. Household size				
S9. Household income	1-3	ECMMAN SLF project documents	Medium	
Community infrastructure and business development				
K13. Community infrastructure and business development	2	OPAAL development plan		
Coastal and marine activities				
K14/S10. Activities Household Activities				
K 15/S11. Goods and services (from activities)/ Household goods and services	1,2	National census	High	
K16/S12 Types of use (of good/service) /Types of household uses	1,2		High	
K17. Value of goods and services	1,2		Medium	
K18/S13. Goods and services market orientation/Household market orientation				

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Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
K19. Use patterns	1		High	
K20. Levels and types of impact	2	Fisheries Division	High	
K21. Level of use by outsiders	1		High	
K22/S14 Household use(s)	1			
K23. Stakeholders	1-3		High	
K24. Tourist profile	1, 2		Medium	
Governance				
K25. Management body	3	Fisheries Division, Council, OPAAL document	High	
K26. Management plan	3	OPAAL ECO report		
K27. Enabling legislation	2,3	Fisheries Division, Forestry Department		
K28. Management resources				
K29. Formal tenure and rules				
K30. Informal tenure, rules, customs and traditions				
K31. Stakeholder participation	3		High	

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Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
K32. Community and stakeholder organisations	3		High	
Attitudes and perceptions				
S15. Non-market and non-use values				
S16. Perceptions of resource conditions	1	OPAAL ECO report	High	
S17. Perceived threats	1,2	OPAAL ECO report, Fisheries Division	High	
S18. Awareness of rules and regulations				
S19. Compliance	1		Medium	
S20. Enforcement	1,2		Low	
S21. Participation in decision-making	1,3		Medium	
S22. Membership in stakeholder organizations	1,3		Medium	
S23. Perceived coastal management problems	1,2	OPAAL ECO Report, Fisheries Division		A
S24. Perceived coastal management solutions	1,2	ECMMAN Project Document, Cabrits Management Plan		A
S25. Perceived community problems	1,2			A
S26. Successes in coastal management	1-3		High	A

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Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
S27. Challenges in coastal management	1-3			
Material style of life				
S28. Material style of life	1,2		Low	

See SocMon Caribbean Guidelines: Bunce and Pomeroy (2003); Pages 18-23, 30 – 68

Notes:

b) GCRMN-Caribbean parameters

Parameter to monitor (see the GCRMN-Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
Tourism arrivals	1, 2		High	
Tourism recreation	1, 2		High	
Tourism infrastructure	1,2		High	
Fishing infrastructure	1,2		High	
Fishing pressure	1,2			
Agriculture (large-scale)				

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Parameter to monitor (see the GCRMN-Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
Other point sources pollution				

See GCRMN-Caribbean Socio-economic Guidelines

10 Variables associated with climate change

Abbreviations are used for data collecting methods:

a. BM = Biological monitoring
b. FG = Focus group interview/survey
c. HH = Household survey
d. KI = Key informant interview/survey
e. M = Mapping
f. O = Observation
g. S = Secondary data (referenced from the SEM-Pasifika Guidelines)

Area and Indicator number	Indicator and data collecting methods	Obj. # 1, 2, 3	How information might be used	Priority (high, med, or low)	Spatial info F/A
Exposure					
CC1	Demographically vulnerable groups **KI, S, HH**				
Sensitivity					
CC2	Dependence on resources and services vulnerable to climate change impacts **S, M, BM, KI, HH**				
Existing SocMon and SEM-Pasifika	Perception of resource conditions **HH**				
Adaptive Capacity					

Area and Indicator number	Indicator and data collecting methods	Obj. # 1, 2, 3	How information might be used	Priority (high, med, or low)	Spatial info F/A
CC3	Current livelihood and income diversity of household **HH, KI, seasonal calendar**				
CC4	Perceived alternative and supplemental livelihoods **HH, KI**				
CC5	Awareness of household vulnerability to climate hazards **HH (S, KI)**				
CC6	Access to, and use of, climate related knowledge **KI, HH**				
CC7	Formal and informal networks supporting climate hazard reduction and adaptation **KI**				
CC8	Ability of community to reorganise **KI, HH**				
CC9	Leadership and governance **KI, HH**				
CC10	Equitable access to resources **HH**				

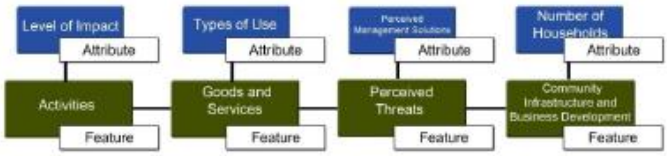
Notes:
See Climate Change addendum Guidelines, Wongbusarakum and Loper (2011)

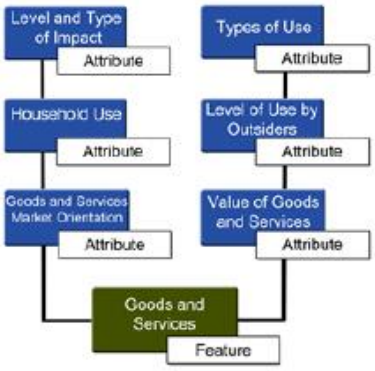
11 Organising SocMon Spatial variable packages

What features must be visualised?

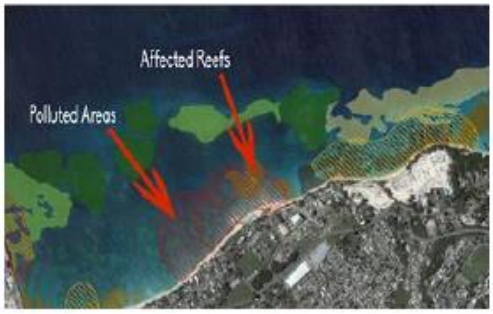
Depending on your management objectives, feature variables can sometimes be closely linked. For example, if you are monitoring fishing pressure on coral reef resources, you may want to show both where coral reef habitat is located and where fishing pressure is greatest. As a result you may be required to represent both Goods and Services and Use Patterns as features.

How do you want features and attributes to interact within your database? In the space provided on the following page, show which attributes are used to describe which features. Remember that attribute variables will be used to provide descriptive information about the features you are highlighting. Draw diagrams (flow charts, matrices etc.) as outlined below, which show how your feature and attribute variables are linked.





E.g **Output** – If we are analysing pollution effects, we must look at it in relation to the affected feature.



Draw your variable packages here

12 Interview sample design

Depending on many factors ranging from the objectives of monitoring to area demographics, you need to determine 'how' and 'how many' for selection of key informants and households.

a. Key informants	b. Households
Critical information areas Fishing Yachting Diving Crab harvesting Eco-tourism Watersports	**Estimated number of households in study area and means of obtaining estimate** To be determined
No. of informants: Approx. 42 key informants identified in Section 5.	**Approx. sample size:** To be determined
Selection process: SocMon team to determine critical key individuals based on activities of interest, time for conducting the assessment and persons available to carry out interviews. As a result the number of key informants could be reduced.	**Sample selection method:** User/stakeholder surveys

GCRMN Manual: Pages 72-73, 229-234

13 Draft interview (key informant and household) questions

There are many ways of asking the same question (content) and many types of question layout (structure). Rules apply. Select variables in your study and draft questions per variable to get information from respondents. Demonstrate that you can craft questions well using a variety of layouts, and ensure that each question is designed to provide data related to one or more of the objectives.

Questions (for key informant survey). Try a mix of both open and closed-ended questions		
Var. No.	**Var. name**	**Question**
K21	Level of use by outsiders	Do fisherfolk from neighbouring communities use the CNP? If yes, what do you think about outsider fishermen using the resources of the CNP?
K19	Use patterns	Zoning refers to the process of dividing an area into sections for conducting various marine activities. How, if at all, will the zoning of the CNP impact your livelihood? (for fisherfolk)
K27	Enabling legislation	Do you think government intervention in the CNP will have an impact on fisherfolk in the area? (for government officials)
S17	Perceived threats	Within the CNP a decline in marine life has been observed. Can you identify some of the threats leading to this decline? Can you recommend ways to combat (mitigate) it? (for fisheries officials)
Questions (for stakeholder surveys).		

Questions (for key informant survey). Try a mix of both open and closed-ended questions		
Var. No.	Var. name	Question
Try a mix of both open and closed-ended questions		
Var. No.	Var. name	Question
K15/S11	Goods and services from activities	Which good and services are produced from the CNP? [ ] fishing [ ] lobster [ ] sand [ ] diving [ ] snorkeling [ ] bathing [ ] other _____ Do you use the CNP? [ ] Yes [ ] No Do you utilize any of the goods/services produced? [ ] Yes [ ] No How?/Explain.
K31	Stakeholder participation	Have you been involved in any group or organization that uses the marine park? [ ] Yes [ ] No Are the groups organized for activities related to: [ ] business [ ] CNP management [ ] Other In what way do you participate or have participated?
S17	Perceived threats	Which of these would you consider threats to coastal and marine resources? [ ] garbage [ ] siltation [ ]anchoring [ ] pot fishing [ ] boating [ ] other, specify _____ Are there any others you would consider a threat? How would you rate these on a scale of 1 (most negative) to 5 (least negative)? How would the primary threat affect your household? How would it affect other households?

GCRMN Manual: Pages 96-100, 109-112

14 Visualisation techniques

The GCRMN manual describes several visualisation techniques that are useful for collecting, displaying and communicating socio-economic data informatively to document or assist decision-making. Many methods may be used simultaneously or sequentially. The means of presenting socio-economic monitoring results is critical in showing relationships among the data. Which methods will you use?

Technique and page in manual	Variable and objective nos.	Notes on application of the technique to the variable and objectives (e.g. for all or some stakeholders? Issues?)
Maps – 113	1	For data collection and display via SocMon Spatial outputs. Used for mapping study area (including neighbouring communities); participatory mapping with communities. Map areas of users and important buildings.
Transects - 119	1	Identify important zones and activities in the area
Timelines - 121	1 - 3	Historical activities from the establishment of the CNP to present - mapping, projects etc. Display changes in user patterns and resource conditions, legislation and historical activities.
Seasonal calendars - 125	1	Show changes in resource conditions and activities at different times
Historical transects - 129	1 2	Changes in use over time. To establish the relationship between factors that impact stakeholder livelihoods.
Decision trees - 131		
Venn diagrams - 133	3	Flow chart/network diagram to display collaborating agencies and/or opportunities for collaboration.
Flow charts – 136	3	Management structures
Ranking - 138	2	Motivating factors for changes, threats

GCRMN Manual: Pages 113-145

15 Communication plan

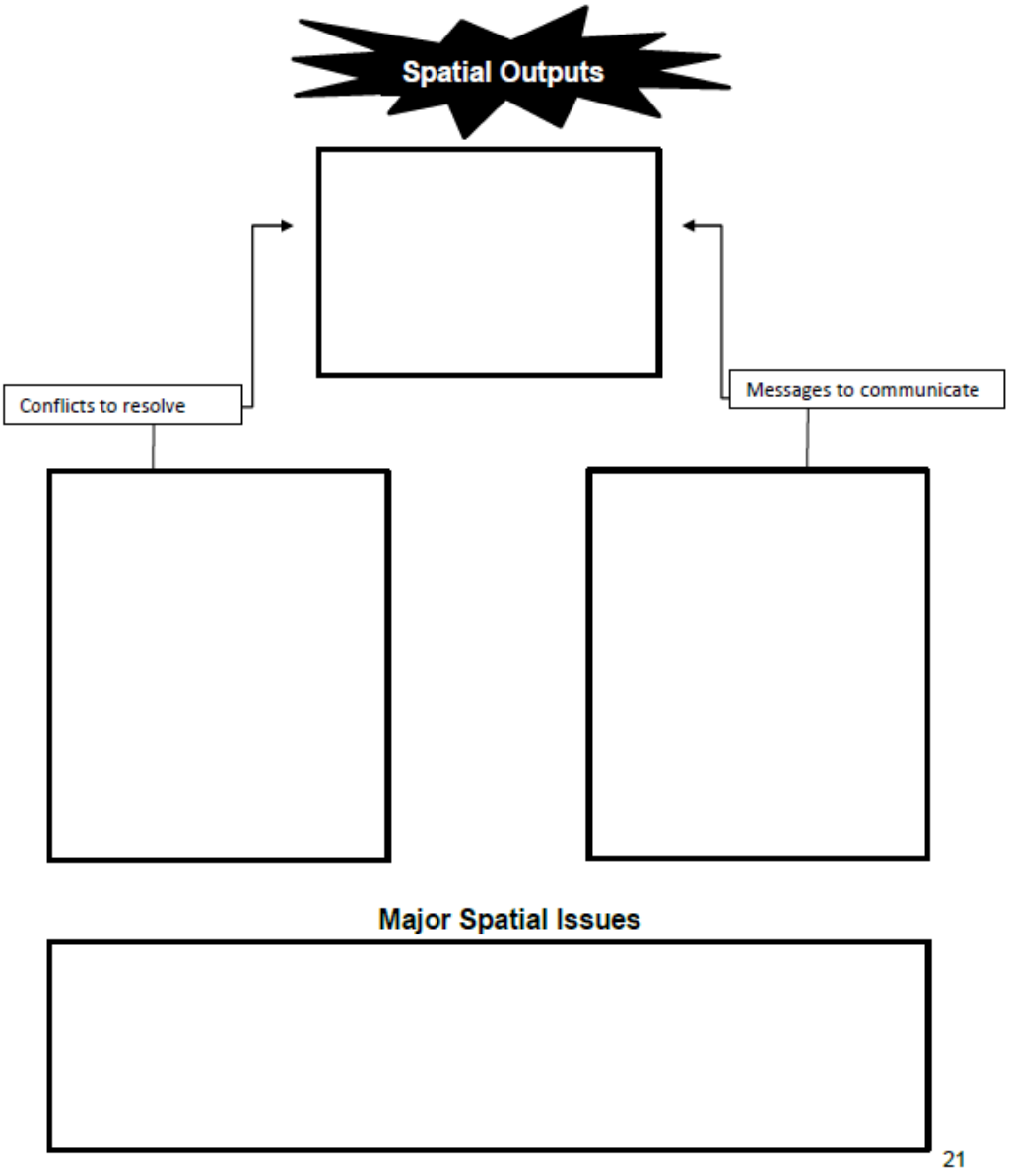
Communication of results and key learning is often done in terminal workshops, but other means are used to supplement this and ensure that various audiences receive the outputs.

Target audience	Main message	Communication product + pathway
Fisherfolk	Sustainable use of resources	Posters, stories; story telling events, popular domino events, radio, tv, group meeting
Youth (school age)	Conservation and preservation	Essay, visual art, mini-movie; competitions, movie nights
Farmer	Sustainable agriculture; pesticides kill fish	Products to be determined; radio, tv, group meetings, forums, work
Restaurants and hoteliers	Informing and enforcing regulations on the size of seafood purchased Join hands to regularize best practices	Brochures, reports; stakeholder meeting

Notes:
Main messages for communication will depend on lessons learned from the assessment and will have to be revised subsequent to data analysis.

16 Determining spatial outputs

Using a "bottom-up" approach complete the diagram below. Start by identifying the major spatial issues and work your way up.



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17 Work plan schedule

A SocMon study should take no more than one month (at most 6 weeks), so you need to schedule your work accordingly, remembering the SocMon stages including validation. For the purposes of this training workshop, set out tasks under each heading for the implementation of the SocMon assessment at the NEMMA. Provide an estimate of the number of days/weeks required for each task.

Activity / task Week →	1 24 Oct	2 31 Oct	3 7 Nov	4 14 Nov	5 21 Nov	6 28 Nov	7 5 Dec	8 12 Dec	9 9 Jan
Preparatory activities									
Finalise site monitoring plan (Agnes/Maria)									
Announce project activities (Agnes/Dawn)									
Finalise assessment team (Agnes/Fabien)									
Secondary data collection									
Collet and compile data (Dawn/Makeda)									
Review and extract information (Kemai, Dawn, Makeda)									
Identify gaps in knowledge (SocMon team)									
Primary data collection and observation									
Develop key informant interview guides (SocMon team, Maria, Jehroum)									
Design stakeholder surveys (SocMon team, Maria, Jehroum)									
Pre-test data collection instruments (Agnes)									
Collect data (including spatial)									
Data analysis and interpretation									
Enter data (Lisa/Dawn)									
Conduct data analysis									
Draft site monitoring report (Kemai, Agnes, Makeda, Dawn)									
Validation, communication, adaptation									
Host validation meeting (Dawn/PAYS intern)									
Produce communication outputs (SocMon team, Agnes, Kemai, Makeda, Dawn)									

Notes: Communication products may have to be produced beyond January 2017.

18 Critical research resources required (budget and non-budget)

Many resources will be used in the research, but there are usually just a few that are so critical the assessment may not be able to proceed without them. You must know early what these are.

Resource description	Use of resource	Comments on availability
Stipends	To cover administrative and data collection fees	To be provided by small grant

19 Budget

The SocMon methodology is intended to be affordable so that monitoring can be sustained. Pay close attention to what are realistic costs, including in-kind contributions that may be available.

Description of expense	No. of units	Unit cost*	Total cost*
Communication(telephone calls)			200.00
Transportation (data collection)			500.00
Materials (including printing and photocopying)			650.00
Labour (Stipends to Admin and survey field personnel)			2,200.00
Training/Validation and/or team meetings			500.00
		Sum total of SocMon costs	4,050.00

* = currency used [XCD]

Budget explanatory notes (use if needed to explain calculations/estimations)

Appendix 4: CNP-MC SocMon survey

Date: _____ Community of residence:_____ Q#____/ID#____

This survey is being done by the Eastern Caribbean Marine Managed Areas Network (ECMMAN) project to collect socio-economic data on trends, livelihoods and collaboration, and changes at the Cabrits National Park Marine Section (CNP-MS) to inform decision-making and management planning. Your participation is optional, but we hope that you will help us monitor changes and trends in the CNP-MS. Any information you give will be anonymous.

Identify changes in users, user patterns, perceived resource conditions, and attitudes and perceptions of the CNP-MS

1.

a. Have you heard or read about the CNP-MS? *[NEW: MMA Knowledge]*

☐ Yes ☐ No

Show a map of the area and explain its extent, protected ecosystems and sites (e.g. Cabrits Historical site) to verify respondent comprehension. The Cabrits Marine Park was established in 1986 under the National Park and Protected Areas Act of 1976. The Cabrits National Park has a marine and terrestrial component. The CNP-MS includes both land and marine areas. The boundaries of the CNP-MS begin at the Cabrits Cruise Ship birth and extend all the way to the Lamothe River. This means that communities of Tantan, Savanne Paille, Cottage, Toucarie border the CNP-MS.

b. Are you aware that the CNP-MS is called a Marine Managed Area? *[NEW: MMA Knowledge]*

☐ Yes ☐ No

For either response, explain to the respondent that a Marine Managed Area is a geographic area designed to protect and manage the use of resources within the marine environment, and their effectiveness is dependent on the development of clear boundaries.

c. When you hear the term Marine Managed Area what features come to mind? Tick **ALL** that apply. *[NEW: MMA Knowledge]*

- ☐ Protection of coastal and marine resources
- ☐ Less access to area by
  - ☐ Locals
  - ☐ Tourists
  - ☐ Both
- ☐ More and bigger fish to be caught by fishermen for food
- ☐ More and bigger fish to be viewed and breed, but not caught
- ☐ Coral reefs with more life on them than at present
- ☐ Less work and activities (livelihoods) in the area encouraged
- ☐ More work and activities (livelihoods) in the area encouraged
- ☐ Alternative livelihoods to working in the area encouraged
- ☐ Other: _____

Date: _____ Community of residence:_____ Q#____/ID#____

2. In your opinion, what should be the main purpose of the Cabrits National Park? *[NEW: MMA Knowledge]*. Check **ALL** that apply.
   - ☐ Marine conservation of fish
   - ☐ Scientific research
   - ☐ Sustainable tourism
   - ☐ Sustainable livelihoods for the community
   - ☐ Recreation (yachts, diving, swimming)
   - ☐ Conservation of ecosystems (mangrove, sea grass, coral reef)
   - ☐ Environmental education and awareness

3. What activities do you and members of your household do for relaxation within the CNP-MS and surrounding areas, and where exactly and how often? *[K14/S10]*

Activity	Frequency (# days per week)	Location
☐ Recreational fishing	[ ]	_____
☐ Swimming	[ ]	_____
☐ Diving	[ ]	_____
☐ Snorkeling	[ ]	_____
☐ Picnicking	[ ]	_____
☐ Hiking	[ ]	_____
☐ Watersports	[ ]	_____
☐ Other: _____	[ ]	_____

4.

a. What, if anything, do you or members of your household do to make a living from the resources (coastal and marine) in and around the CNP-MS, and where exactly? *[K14/S10; K12/S7]*

Activity	Location
☐ Fishing	_____
☐ Dive shop operation	_____
☐ Tour operation	_____
☐ Tour guiding	_____
☐ Craft vending	_____
☐ Taxi services	_____
☐ Hotel and other tourism (hotel manager, bartender, etc.)	_____
☐ Restaurant or bar owner/staff	_____
☐ Yacht service provider	_____
☐ Other, please specify_____	_____

b. How many days in an average week do you or members of your household spend in the CNP-MS making a living from the resources there? *[NEW: Livelihood Dependency]*. ____ days/week

Date: _____ Community of residence:_____ Q#____/ID#____

5 a. Thinking back from when you first knew of it, has the CNP-MS been beneficial to you and your household? *[S26]*

☐ Yes ☐ No

b. If YES, in what way(s)?

_____

6 a. How would you describe the current resource conditions within the CNP? *[S16]*

Resource	Very good	Good	Neither good / bad	Bad	Very bad	Don't know
Mangroves						
Seagrasses						
Coral reefs						
Beaches						

b. Have you noticed any changes in the condition of these resources in the last five years?
[ ] Yes [ ] No *[S16]*

If YES, go to part c. If NO, move to next question.

c. How would you describe the condition of these resources in the CNP 5 years ago? *[S16]*

Resource	Very good	Good	Neither good / bad	Bad	Very bad	Don't know
Mangroves						
Sea grasses						
Coral reefs						
Beaches						

d. How important is the condition of the marine environment (coral reefs, mangroves, fish, water quality, beaches etc.) to you (in general for work, relaxation and just for its existence value)? *[S16]*

[ ] Very important
[ ] Important
[ ] Neither important or unimportant
[ ] Not important at all
[ ] Don't know

Date: _____ Community of residence:_____ Q#____/ID#____

7 *a.* Describe the change in size and abundance of fish and other resources in the CNP over the last 5 years. *[S16]*

	Increase	Decrease	No change
Fish size			
Fish abundance			
Long-spined black sea urchin (Diadema/cobbler)			

b. What are the top three fish species you or members of your household target the most?

Fish species 1: *Fish Species2:* *Fish Species 3:*

---

8 In your opinion, what is a main threat impacting the condition of each of the coastal and marine resources in the CNP-MS and suggest **ONE** way in which that threat might be addressed or solved. *Solutions should correspond to threats provided. [K20/S17]*

Resource	**Perceived threat**	**Suggested solution**
Mangroves		
Sea grasses		
Coral reefs		
Beaches		

9 The amount of fishing (for near shore species) in the entire CNP-MS is:
Check **ONE**. *[K20]*

- ☐ Way too much
- ☐ Too much
- ☐ Just right
- ☐ Too little
- ☐ Way too little
- ☐ I don't know

10 What are the tourism activities in the CNP-MS? Tick **ALL** that apply.

- ☐ hotel
- ☐ dive shops
- ☐ snorkeling
- ☐ restaurants/bars
- ☐ tours
- ☐ yachts
- ☐ other: _____

11 a. The amount of tourism in the entire CNP-MS is: Tick **ONE**. *[K20]*

- ☐ Way too much
- ☐ Too much
- ☐ Just right
- ☐ Too little
- ☐ Way too little
- ☐ Don't know

b. Why do you say so?

_____

_____

Determine motivating factors, if any, for the changes and impacts on stakeholder livelihoods

12 In what way, if at all, has the designation of the CNP in 1986 affected the way(s) in which you or members of household earn a living in the area? *[S23/NEW: Management Impacts]*

_____

_____

_____

13 a. Which of the following livelihood activities would you be interested in? Tick **ALL** that apply.

- ☐ Tour guiding
- ☐ Tour operation
- ☐ Taxi driver
- ☐ Hotel staff
- ☐ Restaurant/bar staff
- ☐ Fishing
- ☐ Diving
- ☐ Craft vendor
- ☐ Yacht services
- ☐ Boat repair services
- ☐ Fishing equipment sales
- ☐ Other: _____

14 What, if anything, has or will prevent you or others in the household from trying a new livelihood? *[K12/S7 or NEW: Alternative Livelihoods] Tick **ALL** that apply.*

- ☐ Too old to try something different
- ☐ Family tradition
- ☐ Lack of available opportunities
- ☐ Not interested in trying something new
- ☐ Lack of money or assets (e.g. land, property, vehicle etc.)
- ☐ No time to train for anything else
- ☐ Other, please specify_____

15 Do fisher folk from neighbouring communities (Bioche, Dublanc , Colihaut, Layou) fish in the use the CNP-MS? *[K21]*

- ☐ Yes
- ☐ No

16 Do you support limiting fishers from communities outside the CNP-MS area from fishing within the area. In other words, do you support limiting fishing access within the CNP-MS to only the local communities bordering the CNP-MS? Eg. Tantan, Toucarie, Clifton,

- ☐ Yes
- ☐ No

Date: _____ Community of residence:_____ Q#____/ID#____

Understand the potential for or interest in sustained collaboration among ECMMAN stakeholders for managing coastal resources in the CNP-MS

The authorities responsible for managing the Cabrits National Park are the Fisheries Division (Marine Section) and the Forestry and Wildlife Division (Terrestrial Section), both of the Ministry of Agriculture and Environment. Stakeholder groups, such as Portsmouth Association of Yacht Services (PAYS) and Tantan Village Development Corporation (TVDC) have been also been involved in management activities. Management activities involve restricting certain uses within particular areas for the protection of marine resources (coral reefs, fish etc.); awareness activities; monitoring the conditions and uses of marine resources, enforcing rules and regulations.

17 Is there anything in particular that you would like the authorities responsible for managing the CNP to focus on in the area? [NEW: Management Priorities]
Tick **ALL** that apply. *[NEW: Management Priorities]*

- ☐ Enforcement of rules/regulations
- ☐ Awareness/Education/Outreach
- ☐ Monitoring ecosystem conditions
- ☐ Data collection
- ☐ Research
- ☐ Livelihood development
- ☐ Providing training opportunities
- ☐ Creating new rules/regulations
- ☐ Sourcing equipment and facilities
- ☐ Other: _____

18 Whose responsibility is it to solve problems within the CNP-MS? Check **ALL** that apply. *[K25 or NEW: Management Responsibility]*

- ☐ Government agencies (e.g. Fisheries Division)
- ☐ Local government (village council, parliamentary representative)
- ☐ Fishermen, boat owners, people who use the resources
- ☐ Community in general
- ☐ CAPMA
- ☐ Business owners (hotel, dive shop, restaurant)
- ☐ Don't know
- ☐ Other:_____

19 a. Are you a member of any community group(s) or organization(s)? *[K32/S22]*

- ☐ Yes
- ☐ No

b. If YES, what type of organization is it? *[K32/S22]* Tick **ALL** that apply.

- ☐ Sports
- ☐ School
- ☐ Church
- ☐ Youth
- ☐ Cultural (dance, drama, music)
- ☐ Farmer's Cooperative
- ☐ Fisher's Cooperative
- ☐ Local government (Village/Town Council)
- ☐ Environmental
- ☐ Other: _____

c. If YES, does your community group organize events in the CNP-MS? *[K32/S22]*

- ☐ Yes
- ☐ No

d. If YES, what types of events are most commonly hosted by your group in the CNP-MS? *[K32/S22]*

- ☐ Picnics
- ☐ Hikes
- ☐ Fundraisers
- ☐ Clean-ups
- ☐ Music/shows
- ☐ Politically rallies
- ☐ Other: _____

20 Do you think enough is being done by the authorities who manage the CNP-MS to encourage stakeholders to participate in management of the MMA and its resources? *[K31/S21]*

☐ Yes ☐ No

21 Have you or any member of your household participated in any meeting, workshop or other event organized specifically to discuss the management of the CNP-MS? *[K31/S21]*

☐ Yes ☐ No

22 (a) Would you be interested in participating in management activities (such as *awareness-raising activities, biological monitoring of marine resources, monitoring of people's use and dependency on CNP resources, enforcement of rules and regulations etc.)* within the CNP? *[K31/S21]*

[ ] Yes [ ] No

(b) If YES, in what areas? Tick **ALL** that apply.

- [ ] Awareness-raising/educational activities
- [ ] Biological monitoring of marine resources
- [ ] Socio-economic monitoring (people's interaction with and dependence on resources)
- [ ] Enforcement activities (e.g. patrolling)
- [ ] Other, please specify_____

23 What, if anything, have you seen done that has really improved the management of the Cabrits National Park in a major way? _____

_____

_____

Date: _____ Community of residence:_____ Q#____/ID#____

24 What is the best way to inform you about the CNP-MS, its resources and management? Check **ALL** that apply. *[NEW: MMA Communication]*

- ☐ TV announcements
- ☐ Radio
- ☐ Newspaper
- ☐ Social media
  - ☐ Facebook
  - ☐ Twitter
  - ☐ Google Plus
  - ☐ WhatsApp
- ☐ Church
- ☐ School
- ☐ Meetings
- ☐ Flyers/posters/noticeboards
- ☐ Friends/Family
- ☐ Work
- ☐ Activities/events
- ☐ Other: _____

For respondents such as fishermen, dive operators, divers, watersports operators ONLY Questions 25 to 29.

25

a) Parrotfish, especially large-sized fish, are important to keep reefs healthy. They eat and remove microalgae (seaweed) that would otherwise cover coral reefs causing them to become unhealthy and hindering their growth. Would you support temporary measures to help keep their populations growing and recovering? *[S24]*

[ ] Yes [ ] No

b) If **YES**, which of the following would you suggest? Check **ALL** that apply. *[S24]*

[ ] Fishing seasons
[ ] Gear restrictions
[ ] Size restrictions
[ ] Catch limits
[ ] Closed areas for research
[ ] Campaigns to help increase awareness, education and outreach
[ ] Let nature take its course
[ ] Other, please specify_____

c) If **NO**, why not?

_____

_____

_____

Date: _____ Community:_____ Q#____/ID#____

26

a) Long-spined black sea urchins are important coral reef residents as they help keep microalgae (seaweed) from overgrowing corals and keep the reef bottom clear for young corals to settle on. Would you support management efforts to help black sea urchins recover? *[S24]*
[ ] Yes [ ] No

b) If **YES**, which of the following would you suggest? Check **ALL** that apply. *[S24]*
[ ] Transplantation from reefs with good abundance to those with poor abundance
[ ] Laboratory rearing for replenishment of reefs
[ ] Let nature take its course
[ ] MPA zones set aside for restoration
[ ] Other, please specify_____

c) If **NO**, why not?

_____

_____

_____

27 Some reefs provide more and better habitat for reef creatures, do you support measures to help protect them? What types of measures (e.g. restoration, protection, mooring buoys to prevent anchor damage etc.)? *[S24]*
[ ] Yes [ ] No

a) If **YES**, which of the following would you suggest? *[S24]*
[ ] Fishing seasons
[ ] Gear restrictions
[ ] Size restrictions
[ ] Closed areas
[ ] Coral gardening (restoration)
[ ] Let nature take its course
[ ] Other, please specify_____

Demographics

28 Gender *(observe) [K6/S2]*
☐ Male ☐ Female

29 What is your current age? _____(# of years old) *[K5/S1]*

Date: _____ Community:_____ Q#____/ID#____

30 What is your last level of formal education completed? Check **ONE**. *[K7/S4]*

- ☐ Primary school
- ☐ Secondary school
- ☐ A-level college/Dominica State College/Clifton Dupigny Community College
- ☐ University (e.g. Bachelors, Masters, PhD)
- ☐ Professional, Technical and Vocational School

Income Questions

31 What is your main source of income?(Most of your income comes from this activity) *[S9 or K12/S7]*

_____ _____

32 What, if anything, is your secondary source of income? *[S9 or K12/S7]*

_____

33 What proportion of your income, if at all, is derived from your activities in the CNP-MS?

- ☐ <25%
- ☐ 25-50%
- ☐ 51-75%
- ☐ 76-100%

34 Is there anything else you would like to say about the CNP-MS that I have not asked about?

_____

_____

_____

Thank you for your time

Appendix 5: Key informant guiding questions (SocMon Spatial)

1. What are the main fishing and tourism activities that occur in the area and where do they occur?
2. How long have you been operating in area and how have these activities changed over the last 5-10 years?
3. What are the most pressing conflicts between activities in the area?
4. Do you see any impacts/environmental issues as a result of these activities?
5. Where are these impacts worst and how do they affect you and other users?