CARIBBEAN NATURAL RESOURCES INSTITUTE
(CANARI)

SOCIAL AND ECONOMIC IMPACTS OF MARINE PROTECTED AREAS:
A Study and Analysis of Selected Cases in the Caribbean

Prepared in collaboration with
The French Mission for Co-operation and Cultural Affairs
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Parc National de la Guadeloupe

Coordinated by

Tom van't Hof
Marine Parks Consultant

Saba, Netherlands Antilles

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Executive Summary

The four marine protected area (MPA) cases treated in this study have a number of features in common They are relatively small in size, they are entirely or mostly marine, they are multiple-use areas, they were established for the protection and management of important marine ecosystems, and they provide a range of recreational opportunities. The Wreck of the Rbone Marine Park in the British Virgin Islands forms somewhat of an exception in that the wreck of the Royal Mail Steamer Rhone is the main feature of the park.

The recreational opportunities in these MPAs attract a large number of - mostly overseas - visitors, who engage in a variety of activities (the most important of which is SCUBA diving) while visiting the areas and most of whom stay for only a few days. About half of these visitors were unaware of the existence of the MPAs prior to their arrival and consequently, the existence of the areas was not very important in their decision to visit the destination. Yet the existence of the MPAs was important or very important to most visitors in their decision to engage in recreational activities in the areas.

Although visitor spending varies widely among the four MPAs studied, the visitation associated with the existence of the MPAs has an undisputed economic impact. The case studies demonstrate that there is a consumer surplus: 4550% of the visitors would spend l0-20% more on the costs related to their visiting the areas before they would decide to visit a less expensive destination. This willingness to spend more appears to be related to a large extent to features connected with the protected status of the area (quality of the environment and marine life). Also, a considerable portion of the visitors might not return if the quality of the environment were to degrade. A considerable percentage of visitors would furthermore pay higher fees than the present fees, In order to optimize revenue for protected area management and economic impact in general, MPAs and their special features need to be better marketed.

Although the MPAs that are the subject of the case studies can generally be considered successful, there is much room for improvement. In some cases the economic benefits are not evenly distributed among the different sectors in the community, while certain user groups feel disadvantaged by the restrictions imposed on them. Conflicts between different user groups exist in some cases, while crowding and overuse are also seen as existing or imminent problems.

In all cases there appears to be a need to improve or expand education programmes to increase awareness and support among the local population. There is also a need to carry out more biological, economic and social research of marine protected areas, in addition to resource monitoring and statistical information collecting. The results thereof will enable protected area management agencies to demonstrate the value of these MPAs and to increase political and community support.

Background and Introduction

An increasing number of marine protected areas (MPAs) have been established in the Caribbean region. The reasons for establishing such protected areas are of a varied and sometimes mixed nature, and include:

1. biological/ecological (maintenance of biological diversity, protection of critical habitats for endangered species or migratory species;

2. social (need for natural areas for public enjoyment and recreation);

3. economic (specialized tourism, protection of breeding or feeding grounds for commercially important species).

At the same time we know that many of these MPAs suffer from insufficient human and financial resources and consequently do not have active management, (OAS/NPS 1988; Van't Hof 1988). The underlying reasons for the lack of success of certain MPAs are generally related to insufficient understanding of the role of MPAs among politicians and decision makers, and insufficient consultation with stakeholder groups, which leads to tardiness in the decision making process and lack of financial and social support, or even conflict.

One way to increase understanding of the role of MPAs and to enhance support for the establishment and adequate management of MPAs is to document their social and economic benefits and make this information available to the decision makers. The present study intends to do this and has the following specific objectives:

- to assess the current benefits of marine and coastal marine protected areas;
- to provide guidelines for the enhancement of their social and economic benefits; and
- to provide materials and information that can be used to sensitize decision makers on the value and potential contribution of these protected areas to socio-economic development.

Methodology

The approach to the study was:

- to prepare five case studies of established MPAs, employing surveys, field observations, and the gathering and analysis of social and economic data;
- to conduct a comparative analysis of the results of the case studies;
- to provide an analysis of the larger socio-economic context; and
- to formulate conclusions and recommendations.

The five case studies selected for the study included:

- the Wreck of the Rhone Marine Park (WRMP) in the British Virgin Islands;
- the Saba Marine Park (SMP) in the Netherlands Antilles;
- the Reserve Ilets Pigeon in Guadeloupe;
- the Soufriere Marine Management Area (SMMA) in St. Lucia; and
- the Virgin Island National Park in the U.S. Virgin Islands.

Researchers were identified for each of the case studies and they were brought together for a two-day training workshop in Saba in December 1996. During this workshop the survey instruments and techniques for the case studies were developed and tested, and also the data analysis and case study format were discussed and agreed upon. This was essential to provide for a standardized approach to the surveys and case studies and to enable a comparative analysis.

No new visitor and stakeholder surveys were conducted in the case of the Saba Marine Park. It was decided not to do so because recent surveys that would yield largely the same information were available. In some instances this results in specific information not being available for the Saba case study, whereas it was collected for the others, but this is not considered a serious drawback of the study design.

Unfortunately, the surveys and preparation of most case studies took much longer than expected. By January 1998, no data had become available for the Virgin Islands National Park case study, which case could therefore not be included in the study. For the Soufriere Marine Management Area case study, only the surveys and data analysis were completed, and the interpretation of the data and the conclusions and recommendations are not those of the researcher, but of the coordinator of the study. Errors were made in the statistical analysis of the Ilets Pigeon case study data, and these have been corrected for use in this report.

Comparative Analysis of the Results of the Case Studies

Although there are marked differences between the four MPAs that are the subject of this study, they have in common that resource use for tourism and recreational purposes is important in all four areas. It is therefore useful to compare the results of the individual case studies.

Visitor profile

Table 1. Origin of MPA visitors.

	WRMP	SMP'	Ilets Pigeon	SMMA
North America	82%	75%	2%	36%
UK	10%			
Local	5%			2%
Other Caribbean	1%			4%
France			91%	
Europe		20%	5%	58%[2]
Mixed/other		5%		

This data confirms that travel in general - travel to natural areas included - is influenced by culture and language. The influence is most significant in the case of the Ilets Pigeon Reserve in Guadeloupe.

Table 2. Repeat visitors.

	WRMP	SMP[3]	Ilets Pigeon	SMMA
First visit	79%	74%	80%	71%
Repeat visit	21%	26%	20%	29%

The number of repeat visitors to the SMMA seems remarkable, considering its relatively recent establishment (in 1995) but may well contain repeat visitors to the Soufi-iere area pre-dating the formal establishment of the SMMA.

[1] This information was not collected as part of the present study, but is an estimate based on SMP visitor statistics.

[2] European countries were lumped. This figure most likely contains a sizable number of French visitors.

[3] 1994 Visitor Survey.

Table 3. Single or multiple destinations?

	BVI	Saba [4]	Guadeloupe	St. Lucia
Single destination	47%	37%	73%	42%
Multiple destinations	53%	63%	27%	58%

For more than half the visitors interviewed in the BVI and in St. Lucia, these islands were not the only destination visited on their trip. Although this information is not available for Saba, the figure is likely to be similar, because a large proportion of tourism in Saba is day excursionists from St. Maarten. Also, for almost 45% of visitors interviewed in Saba, the possibility to combine other islands with a visit to Saba was "of utmost importance" or "very important". Guadeloupe was a single destination for a much higher percentage of visitors, perhaps because Guadeloupe is a larger island.

Table 4. Knowledge of the existence of the MPA before arrival?

	WRMP	SMP	Ilets Pigeon	SMMA
Yes	5 1%	N/A	45%	36%
No	49%	N/A.	55%	64%

The lower percentage of visitors who knew of the existence of the SMMA may be due to the fact that the SMMA was established only in 1995. Since both the Wreck of the Rhone Marine Park and the Saba Marine Park have been written up extensively in the diving literature, a similar figure for SMP as for WRMP can be expected.

Table 5. Importance of MPA in decision to visit the destination.

	WRMP[5]	SMP	Ilets Pigeon	SMMA
Very important	1 1%	2%	}	10.6%
	5%	10%	}8%	4.7%
Important	12%	20%	12%	17.6%
	10%	6 2 %	}	10.6%
Not important	20%	1 %	}24%	56.5%
No response	42%		55%	

The existence of the MPAs was typically not very important in the decision making to visit the destination. The relatively large percentage of visitors who rated the SMMA as "not important" in their decision making most likely includes a number of respondents who were unaware of the

[4] Figures based on percentage of stay-over tourists vs. day tourists. Actual number of visitors with multiple destinations may be higher.

[5] The researcher mentions in the case study that 51% of the visitors who knew that the area was a marine park rated the existence of the park as "important" to "very important" in the decision making on their destination. This table presents the data in a way comparable to the other MPAs, with the visitors unaware of the existence of the park listed under "no response".

existence of the SMMA. They should have been separated. With the exception of SMP, the results are rather consistent. In the SMP survey, visitors were asked to rate 15 different criteria for their destination on a scale of 1 to 5, ranging from "of utmost importance" to "not important". It seems that most respondents do not interrelate reef condition, lack of congestion, species abundance and diversity, and the fact that the area is protected.

Table 6. Length of stay at destination to facilitate visit to the MPA

# of days	BVI	Saba[6]	Guadelouoe'	St. Lucia
1	42%		22%	25.3% (1 day)
I-2	}		55%	20.2% (2 days)
2-3	}31%		4%	7.1% (3 days)
3-5	}		6%	3.0% (4 days)
5-7	}		1%	9.1% (5 days)
7-14	15%		5%	35.4% (> 5 days)
>14	10%[8]		3%	

A considerable proportion of visitors appears to be day tourists, especially in the BVI and Guadeloupe. By comparison, the SMMA in St. Lucia receives a higher number of stay over tourists. SMP visitors are roughly half day tourists and half stay over tourists.

Table 7. Type of accommodation used.

	BVI	Saba[9]	Guadeloupe[10]	St. Lucia
Cruise ship	54%	9%		
Hotel/guesthouse	18%	30%	55.6%	28.4%
Apt/cottage/villa	8%	20%	11.1%	6.9%
Yacht	6%	16%	11.1%	60.8%
Campground	2%			
Live-aboard boat	3%	20%		
Friend/relative	5%	5%	22.3%	3.9%
Cruise ship & hotel	4%			

The type of accommodation used varies widely over the four cases. In the case of the BVI and St. Lucia, over 60% of the visitors interviewed stayed on cruise ships or yachts, Such visitors contribute considerably less to the local economy than those using land-based accommodation.

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[6] Framhein (1995) found that 36% of SMP visitors are day tourists, 35% stay over tourists, 13% on live aboard boats, and the remaining 16% on cruise ships and yachts. The average length of stay of the stay over tourist was 5.5 nights for SMP visitors vs. 3.5 nights for stay over tourists in general.

[7] In the Ilets Pigeon study, the length of stay *in the immediate vicinity* of the reserve was recorded, rather than on the island.

[8] Includes BVI residents.

[9] Figures extrapolated from Framhein (1995) and Charles and Griffith (1994).

[10] Figures represent percentages of those who answered the question. Almost 75 % of those interviewed did *not* answer the question, so the reliability of this information is questionable.

Saba compares favorably to this with 50% of the visitors staying on land. The same seems to be true for Guadeloupe, but this data is not very reliable (see footnote 10).

Table 8. Activities engaged in while visiting the protected area.

	BVI	Saba[11]	Guadeloupe	St. Lucia
Scenic land tour		9%		18.6
Scenic boat tour			11.%	8.4
Glass bottom boat tour			64%	
Sailing (private boat)				11.4%
Sailing (bareboat charter)				10.5%
Sailing (crewed charter)				0.8%
Organized snorkeling	4%	?		2.5%
Non-organized snorkeling		?	34%	17.7%
Organized SCUBA diving	96%	69%	35%	20.7%
Non-organized SCUBA	[12]?	4%		
Swimming			60%	5.9%
Others			3%	3.4%

Note that percentages may total more than 100 because of multiple activities. Activities vary considerably based on the nature of the MPA. For example, to visit the WRMP, one essentially must be a SCUBA diver. It is also not surprising that SCUBA diving and snorkeling appear to be the most important activities undertaken by visitors to these MIPAs. However, the data also indicates that there may be room for expanding the range of activities offered to visitors of MPAs, thus providing additional attractions and increasing visitor stays.

[11] Information is incomplete. Percentage of scenic land tours is probably higher because yacht visitors are not included. Yacht visitors also engage in non-organized snorkeling.

[12] The survey included only those yacht-based visitors diving with dive operators. Unaccompanied diving off sailboats and powerboats does take place at the WRMP.

[13] Not permitted in the SMMA.

Table 9. Importance of the existence of the MPA in decision to engage in activities rated on a scale of 1-5, from "very important" to "not important".

	BVI[14]	Saba[15]	Guadeloupe	St. Lucia
Scenic land tour				3-5
Scenic boat tour				3-5
Glass bottom boat tour			I-3	
Sailing (private boat)				3-5
Sailing (bareboat charter)				3-5
Sailing (crewed charter)				3-5
Organized snorkeling				3-5
Non-organized snorkeling			I-3	3-5
Organized SCUBA diving	3-5		1	5
Non-organized SCUBA				
Swimming			I-3	3-5
Others				

This table is not a precise representation of the data, but gives an indication where the greatest weight was placed. The results presented in this table, though incomplete, are interesting because they indicate that, in most cases, the existence of the MPA was not that important to visitors in their decision to engage in activities within the area. In the case of the SMMA this corresponds well with the fact that not too many visitors were aware of its existence prior to their visit (see also tables 4 and 5). The response by visitors to the Ilets Pigeon Reserve is quite surprising: although more than half of the visitors were unaware of the existence of the reserve prior to arrival, and although more than half - of those who answered the question - said that the existence of the park was not important in their decision to visit the destination, most visitors rated the existence of the reserve to engage in the listed activities "important" to "very important".

Table 10. Purchase of a package trip.

	BVI	Saba[16]	Guadeloupe	St. Lucia
Yes	55%[17]	55%	35%	29%
No	45%	45%	65%	71%

Several economic analyses of tourism have expressed concern over pre-paid packages and the fact that a portion of that money never reaches the destination country. This seems to be confirmed by the cases of the BVI and Saba, where over half of the visitors to the marine parks have bought packages offshore. The concern is only partially valid, though, as business owners are usually at liberty to transfer profits to offshore bank accounts, irrespective of the country where their

[14] Table relates to SCUBA diving only as this is the main activity in the WRMP.

[15] Comparison with Saba is not possible as the survey by Framhein (1995) addressed the importance of a different set of criteria (see case study on the Saba Marine Park).

[16] Rough estimate based on information from the dive shops.

[17] Only 5.4 % of the visitors bought a package in the BVI.

services were paid for. The main concern for local Governments would be that income received offshore is not liable to local profit taxes.

Table 11 a. What was included in the package price?

	BVI	Saba[18]	Guadeloupe	St. Lucia
Airfare from country of residence	40%		92%	14.4%
Airfare from other island	6%		5%	1.4%
Ferry	5%		8%	
Taxes	15%		27%	11.6%
Taxi transfers	7%		41%	10.3%
Car rental	1%		14%	
Tours	4%		24%	
Diving	16%		19%	11%
Snorkeling	16%		11%	8.9%
Park fees	3%			2.1%
Other water sports	3%		11%	11%
Room	48%		86%	15.8%
Meals	43%		62%	13.7%

In the case of Guadeloupe, a very high percentage of the packages included airfare, room and meals, compared to only about **15%** in St. Lucia. In the BVI about 45% of the packages included airfare, room and meals. All-inclusive packages (meant to include airfare, room, meals, taxes, transfers, tours, sports and leisure activities) do not appear to be the norm for the visitors to these MPAs.

Table 11 b. Package price (in US $).

	BVI[19]	Saba [20]	Guadeloupe[21]	St. Lucia
less than 1,000			36%	3.8%
l,OOO-1,500				38.5%
1,000-l ,800			30%	
1,500-2,000				23.1%
1,800-2,620			27%	
more than 2,000				34.6%
more than 2.620			6%	

[18] Breakdown not available for Saba.

[19] The information for the BVI was presented in a different format. Average package price for packages that included airfare, room and meals is almost $ 2,000, diving and room only $ 1,200, and diving only about $ 100. See case study for further details.

[20] No data.

[21] Conversion rate used of 5 FF to the dollar.

Although the number of visitors to the SMMA who had purchased a package is relatively low, the package price is comparatively higher than in the case of Guadeloupe

Table 12. Country where package was purchased.

	BVI	Saba 22	Guadeloupe	St. Lucia
N. America	87.5%			48.3%
France			86.5%	
UK	3.6%			
Europe			5.4%	48.3%
Caribbean				3.4%
BVI	5.4%			
Other	3.6%			
No answer			8.1%	

Table 13. Cost of airfare/boat fare to destination (in US $) for visitors who did not purchase a package.

	BVi123	Saba 24	Guadelouoe	St. Lucia
less than 400			11.4%	
400-800			81.4%	
more than 800			5.8 %	
less than 250				
250-500				15.8%
500-750				49.1%
750-I ,000				24.6%
1,000-I ,250				10.5%

Travel costs to St. Lucia appear to be somewhat higher than those to Guadeloupe. Travel costs to the BVI and Saba can be expected to be at the same level as St. Lucia.

[22] No data.

[23] The information for the BVI was presented in a different format. Average airfare from country of origin was $790, average fare from another island destination to the BVI was $ 157.

[24] No data.

Table 14. Estimated expenditure related to the visit to respective MPA (in US $).

	WRMP[25]	SMP[26]	Ilets Pigeon[27]	SMMA
less than 250				52.1%
250-500				17.8%
500-750				8.2%
750-1,000				4.1%
1,000-1,250				5.5%
1,250-1,500				12.3%

The distribution of the expenditure related to the SMMA in St. Lucia conforms rather well with the relatively large number of visitors on yachts who stay 1-2 days. Framhein (1995) calculated the total direct income for the local economy from Saba Marine Park related tourism at $ 1.8 million annually. This means an average expenditure of $ 180 per visitor per visit. Ganem and Sezanne (this study) estimate the expenditure into the local economy at $ 46 per person per visit.

Table 15. Willingness to spend more (percentage more over present expenses and airfare, before deciding not to come).

	WRMP	SMP[28]	Ilets Pigeon	SMMA
no more	41%		43.0%	46.8%
10% more	26%		31.8%	31.9%
20% more	23%		15.0%	13.8%
30% more	9%		1.9%	4.3%
50% more and over	1%		2.8%	3.2%

These figures are fairly consistent. Only about 45-50% of the visitors are willing to spend 10-20% more. In the case of the Saba Marine Park, willingness to pay was addressed somewhat differently. Framhein (1995) found that divers were willing to pay an average of 64% more on park fees, while yachtsmen would pay an average of 69% more for anchorage and mooring fees in the Park.

[25] Insufficient data.

[26] No data in a compatible format. See also case study.

[27] No data in a compatible format. See also case study.

[28] No data in a compatible format. See also case study.

Table 16. importance of MPA features in decision to spend more instead of going elsewhere (on a scale of 1-5 from "very important" to "not important").

	WRMP	SMP[29]	Ilets Pigeon	SMMA
Quality of the environment and marine life	1		1	1
Quality of the experience provided	1-2		I-3	I-3
Availability and quality of on-site park information	1-3		I-3	I-3
Availability and quality of park facilities	1-2		I-3	1-3
Availability and quality of services in the park provided by the private sector	1-3		I-3	2-4

This table is not a precise representation of the data, but gives an indication where the greatest weight was placed. It gives a clear indication though, that, despite the fact that the existence of the MPAs was not "very important" to most visitors in their decision to visit the destination, the features which are directly related to the existence and management of the areas are considered important to very important by most visitors.

Table 17. Intention to return if the environment and marine life were to degrade (i.e. a 30% decrease in fish abundance and diversity, and a 30% decrease in coral cover).

	WRMP	SMP[29]	Ilets Pigeon	SMMA
Definitely	3%		20.6%	5.1%
Probably	34%		21.5%	27.6%
Probably not	46%		30.8%	39.8%
No	17%		25.2%	27.6%

These answers demonstrate the value of the existence and management of the MPAs. A considerable portion of the visitors might not return if ineffective management or control were to lead to degradation of the resources. The relatively high percentage of visitors who would "definitely" return is most likely related to the general recreational value of the reserve, irrespective of the quality of the marine resources, and to the fact that most visitors are day excursionists.

Table 18a. SMMA: willingness to pay higher fees compared to existing fees (in US $).

Annual dive fee	No more	$15	$20	$25	More
	17.9%	17.9%	7.7%	30.8%	25.6%

Daily dive fee	No more	$ 5	$ 7	$ I0	More
	20.5%	30.8%	15.4%	25.6%	7.7%

[29] No data.

Mooring fee	No more	$15	$20	$25	More
up to 40 ft	53.8%	42.3%	0%	3.8%	0%

Mooring fee	No more	$20	$25	$30	More
40 ft-70 ft	36%	44%	12%	8%	0%

Mooring fee	No more	$25	$30	$35	More
over 70ft	16.7%	41.7%	16.7%	25%	0%

Table 18b. Ilets Pigeon: willingness to pay user fees (in US $). No current fees in place.

	none	$2	$5	$ 10	$20	>$20
General user fee	25.2%	31.8%	23.4%	11.2%	0.9%	4.7%

Table 18c. SMP: willingness to pay higher park fees compared to existing fees (in US $).

Current dive fees (per person per dive)[30]	$2.00
Averaae willinaness to oav	$5.50
Current yacht fees (per person per week)[31]	$ 2.00
Average willingness to pay	$6.50

The available data on willingness to pay user fees demonstrates that there is a considerable consumer surplus (i.e. the visitors are willing to pay more than they are currently asked). An exception is the mooring fee for small yachts at the SMMA. The reasons for this are not clear, other than that perhaps the majority of visitors to the SMMA arrive on chartered yachts in the 40 ft range and that these people feel they have already incurred substantial expenses to get to their destination. Clearly, MPAs can increase revenue by charging or increasing fees without deterring visitors. However, it is often the local tourism industry or the decision makers who are afraid to charge or raise fees for fear of competition. This fear appears to be unfounded.

[30] Framhein (1995). Dive fees have since been raised to $3 per person per dive.

[31] Framhein (1995). Yacht fees have since been raised to $3 per person per week.

Table 19a. Rating the main features of the MPA. Ratings are on a scale of 1-6, 1 being "excellent", 5 being "very poor", and 6 being "no opinion".

	WRMP	SMP[32]	Ilets Pigeon	SMMA
General scenery	1-2		1-2	1-2
General underwater scenery	1-2		1-2	1-2
Cleanliness	1-2		1-2	1-3
Welcoming/reception	1-3		1-2	1-3
Condition of the reef	1-3		1-2	1-3
Abundance of fish	1-4		1-3	6
Number of large fish	2-3		2-4	3-5
Availability and quality of on-site park information			1-3	[33]
Availability and quality of park facilities	1-3		2-3	2-3
Availability and quality of private sector services	1-3		1-3	[34]

This table is not a precise representation of the data, but gives an indication where the greatest weight was placed. However, it does demonstrate that, with a few exceptions, most of the MPA features are rated excellent to reasonable. Again, this illustrates the value of the existence and management of these protected areas.

Table 19b. Crowding in the protected areas. Ratings range from "overcrowded", "crowded", not crowded", to "no opinion".

	WRMP	SMP[35]	Ilets Pigeon	SMMA
Overcrowded	6%		1.9%	6.2%
Crowded	57%		32.7%	61.7%
Not crowded	34%		66.3%	4.7%
No opinion	6%		14.0%	0.9%

[32] No data in a compatible format.

[33] Response inconclusive.

[34] Response inconclusive.

[35] No data in compatible format available. In a 1991 survey by then park manager Susan White, over 50 % of the respondents said that non-crowded diving was of the main features that attracted them to Saba.

Table 20. Likelihood to return

	WRMP	SMP[36]	llets Pigeon	SMMA
Definitely	26%		32.7%	32.7%
Probably	63%		38.3%	61.7%
Probably not	11%		12.1%	4.7%
No	0%		8.4%	0.9%
No response			8.4%	

These responses are important in relation to the question on likelihood to return if there were a 30% degradation of the marine environment (Table 17). In all cases the likelihood that visitors will return is considerably higher if they can expect a similar experience when they return.

[36] **No data.**

Socio-economic Context of Marine and Coastal Protected Areas

Conservationists use a number of factors or criteria in the selection of areas to be designated as marine protected areas. Kelleher and Kenchington (1992) list the following factors or criteria:

1. Degree of naturalness
2. Biogeographic importance
3. Ecological importance
4. Economic importance
5. Social importance
6. Scientific importance
7. International or national significance
8. Practicality/feasibility

Based on the relative weight of the selection criteria, MPAs may have different objectives. Although the conservation of biological diversity and the protection and maintenance of habitats for threatened, rare or endangered species is commonly the most important goal of any MPA, other factors, such as providing social and economic benefits to the communities living near the protected area, are becoming increasingly important. Although some "purists" may see the pursuit of such an objective as a trade-off, it is essential if we want to secure the public support that is crucial to the success of protected areas in the long term.

According to the classification of Caribbean MPAs by Kelleher, Bleakley and Wells (1995) 60% of the MPAs are category IV[37] and 25% are category II[38]. Following the revised classification, almost 75 % of the MPAs are of category IV[39]. This suggests that the main objectives of most Caribbean MPAs are the conservation of species and the maintenance of habitat, which contrasts with the study by OAS/NPS (1988). This study classifies 41% of Caribbean MPAs as "Wildlife-Reserve-like" and 50% as "Park-like" and attempts to reflect the real uses. The study comments that: "Not uncommonly the management category does not correspond to current use. " For the purpose of this analysis, we will assume that at least half of the Caribbean MPAs classify as "Park-like", that is that the provision of recreation and enjoyment is an important objective next to conservation of biodiversity.

It is important to establish this fact because it links MPAs with tourism. Tourism is the fastest growing sector of the economy, worldwide, and tourism is the world's largest employer. In turn, ecotourism is the fastest growing segment of the tourism industry. Although ecotourism

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[37] Refers to "old" IUCN category IV: Managed Nature Reserve/Wildlife Sanctuary. Mostly aimed at protection of nationally significant species or communities.

[38] Refers to "old" TUCN category II: National Park. Aimed at protecting natural and scenic areas of national or international significance for scientific, educational, and recreational use.

[39] Refers to category IV of the revised IUCN classification of 1992: Habitat/Species Management Area. Includes protected areas mainly for conservation through management intervention. Management intervention aims to ensure the maintenance of habitats and/or to meet the requirements of specific species.

does not equate with travel to protected areas, a distinct relationship exists between ecotourism and protected areas.

Caribbean tourism forms no exception to these worldwide trends. Although no recent statistics could be obtained, Holder (1991) presented the following data on Caribbean tourism:

- between 1980 and 1990, Caribbean tourism grew at an average rate of 5.6% per year, faster than world tourism at 4.1%;
- in 1990, Caribbean tourism - the number one foreign exchange earner for many Caribbean states and territories - earned US $ 8.9 billion;
- in 1990, Caribbean tourism employed over 350,000 persons.

With continued growth of Caribbean tourism during this decade - despite economic recessions, the Gulf War, and some devastating hurricanes - it appears that Caribbean nations are becoming increasingly dependent on tourism as a foreign exchange earner. With a few exceptions (bauxite and oil), the Caribbean states have little or no mineral resources, while the agricultural sector (sugar and bananas in particular) faces great uncertainties as a result of market forces and new trade agreements beyond the control of the producers. This means that the export sector has dwindled significantly as an earner of foreign exchange, which in turn has led to spiraling foreign debts for many Caribbean nations (Holder 1991). Promoting tourism is commonly seen as one of the most promising mechanisms to increase foreign exchange earnings.

There appears to be a rapidly growing awareness, both in the tourism industry as well as among politicians and decision makers, that the ability of nations to successfully promote tourism depends to a large extent on the quality of the social and natural environment (safety, cleanliness, scenery, natural and cultural attractions). This may well be in response to a change in attitude among the visitors, who increasingly seek out destinations that offer opportunities alternatively labeled as nature tourism, ecotourism, heritage tourism, special interest tourism, adventure travel, and the like. This has created a new market, and destinations are rapidly trying to respond to the demand of that market. Protected areas in general, and, in the insular Caribbean marine protected areas in particular, can play a very important role in satisfying this new demand.

Despite this obvious correlation, the case studies presented here are not very convincing in demonstrating that the existence of MPAs was an important factor for visitors in their choice of a destination, On the other hand, the appreciation by visitors of attributes directly related to the existence of the MPAs was generally high. Apparently we are not doing enough to link MPAs to the promotion of special interest tourism and to the quality of the experience that can be expected.

Before one jumps to conclusions, there are several - generally well-known - caveats that must be considered:

- tourism is an extremely sensitive industry, its success dependent on external and uncontrollable factors such as economic recession, natural calamities, and warfare;
- tourism development can have significant unwanted environmental and social impacts (infrastructure; waste disposal; water resources; pressure on already overexploited stocks of lobster, conch, snapper and grouper; import of labour; crime; loss of cultural identity; denial of access to traditional resources for local communities, etc.).

With respect to the role of MPAs in relation to tourism, we must also recognize that their role will only be adequately fulfilled when they are managed effectively and are successful in safeguarding the environment that attracts the visitor in the first place. Unfortunately, we know from the studies conducted by OAS/NPS (1988) and Van't Hof (1988) that 75% of these areas lack effective management and thus are not achieving their objectives. While changes have not been properly documented, there is reason to believe that management effectiveness among Caribbean MPAs has increased during the last ten years. A cautious estimate is that effective management has still not been attained for about 50-60% of the MPAs in the Caribbean region at this time.

Apart from the economic issues of MPAs and their role in tourism, there are several social issues that are reason for concern. These issues relate mainly to lack of understanding and social acceptance of MPAs - some of them closely interrelated, and include:

- lack of understanding among politicians and decision makers about the economic value of establishing MPAs;
- the fact that local resource users are sometimes denied access to their traditional resources without consultation or provision of acceptable alternatives;
- the perception that MPAs benefit only the "rich/white" visitors and those who cater to them (who are mostly expatriates);
- the hesitation among decision makers and the tourism industry to introduce user fees for foreign visitors, because of fear of competition.

All of these issues - perhaps with exception of the last - are understandable and valid. They present a challenge for Government agencies, as well as park management authorities and the tourism industry to address these issues.

Conclusions

The four case studies undertaken represent a rather small sample from which to draw conclusions. These conclusions and the recommendations that follow are therefore not based entirely on the case studies, but also represent the coordinator of the study's wider knowledge and experience of Caribbean marine protected areas.

1. There is a direct correlation between local support for marine protected areas and perceptions of benefits to the local community.

- The Saba Marine Park contributes significantly to the island's economy (SMP visitation generates 22% of the total income into the local economy). This linkage is well understood by the public, and local support for the Park is strong and widespread.

- The Wreck of the Rhone Marine Park is also a significant economic contributor, as a key attraction of the British Virgin Islands' marine-based tourism industry. Support for the Park is high, both with the industry and the local public.

- While the positive economic impact of tourism from Ilets Pigeon Reserve on neighbouring communities is not disputed, there is also the perception that the benefits are not sustainable or evenly distributed. Local support for the Reserve is therefore not so high as in the cases of SMP and WRMP.

- It is difficult to compare the SMMA with the other cases, because it has been in existence for only a short time. However, there is a widespread feeling within the Soufriere community that the management area has not contributed meaningfully to the local economy, and this is a source of resentment among some sectors of the population.

2. In areas where tourism is a viable economic sector, marine protected areas in the Caribbean are capable of generating adequate income to be fully self-supporting at reasonably high levels of management.

- The Saba Marine Park has been fully self-supporting and completely independent of government support for several years. Levels of management are considered high by all global standards.

- The Wreck of the Rhone Marine Park's management costs are fully covered through fees, although its management agency continues to rely on a government subvention for overhead and other expenses. Levels of management are also very high.

- The Ilets Pigeon Reserve does not charge any fees, and relies on a government subvention. The Reserve suffers from overuse, and there are concerns about long-term degradation of the environment.

- After only two years of full operation, the SMMA is already able to cover its day-to-day management costs through fees. Management of the area has improved since the implementation of the SMMA agreement, and as revenue increases, the level of management should as well.

3. Visitors value marine protected areas highly enough to be willing to pay more for the experience.

- All the marine protected areas surveyed showed a willingness-to-pay among the majority of visitors that was considerably higher than existing fees. This is referred to as a "consumer surplus".

4. There is a strong relationship between the quality and features of marine protected areas and a rewarding visitor experience, which can be exploited more effectively in marketing, promotion, and public relations.

- In the surveys, the quality of the marine environment was overwhelmingly cited as of major importance to visitors in their decision to visit the protected area and in their willingness to pay more for the experience. The availability and quality of park facilities was also rated highly.

5. Employment and income opportunities provided by marine protected areas have tended to fall disproportionately to non-local businesses and individuals.

- In Saba and the British Virgin Islands, the dive industry, which benefits most directly from the marine parks, is comprised almost entirely of expatriates from North America or Europe.

- In St. Lucia, the dive industry is also largely expatriate. In addition, the SMMA has "displaced" a number of local fishermen, who previously fished in areas that are now reserves. This has resulted in considerable tension, and despite efforts at compensation, no long-term solution has yet been developed.

- In the communities surrounding Ilets Pigeon, there is the perception that non-local tourism interests have benefitted more from the Reserve than local businesses.

6. The benefits of protected areas over the long term are dependent on sound management of both the area itself and its surroundings.

- All surveys indicated that the majority of visitors would be likely to return, but not if the environment and marine life in the protected area were to degrade.

- At the Saba Marine Park, there are concerns about the carrying capacity of popular dive sites, and even greater concern about the impacts of coastal development on the Park.

- At Ilets Pigeon, beach recreation, glass bottom boating, and SCUBA diving have already reached saturation levels. There is a strong feeling that these activities, as well as fishing within the Reserve, must be more strictly controlled.

- Management of the Wreck of the Rhone Marine Park is now compromised to some degree by the inaction of Government in developing adequate regulations concerning illegal fishing and the taking of artifacts.

- In all areas surveyed, the need for improved enforcement capacity is noted.

7. There exists some tension between government decision-makers and tourism interests, which tend to seek ever higher numbers of visitors, and MPA management agencies, which are concerned with carrying capacity and resource conservation.

- At the Wreck of the Rhone Marine Park, overcrowding has been made possible by the number of moorings available, a figure that was originally set by local dive operators anxious to maximize their benefits from the site.

- Decisions related to tourism development along the coast adjacent to the Ilets Pigeon Reserve are resulting in sedimentation and pollution in the Reserve.

- The political power of St. Lucia's major tourism interests, which are largely based in the capital, has been used to assure that benefits from the SMMA substantially accrue to them, at the expense of local businesses and occasionally of management needs.

8. Marine protected areas benefit from high levels of stakeholder and decision-maker involvement It helps to reduce user group conflicts, results in more effective and relevant management decisions, and strengthens linkages with larger development policies.

- The SMMA was established in part to reduce conflicts among users. By creating a forum to address issues, it has been effective in doing this.

- Sabans surveyed noted that greater interaction between SMP and the community could increase the educational benefits of the Park for the local population, particularly children

- The Ilets Pigeon survey indicated a general consensus that greater stakeholder dialogue could result in improved planning and reduction of user group conflicts. There was a feeling that rigid, externally imposed structures were not adequate to deal with actual management needs.

9. Caribbean marine protected areas can and do serve as global models. This attracts valuable research, serves as a useful public relations tool, and brings prestige to the countries and the region.

- Three of the four protected areas surveyed are well known internationally: the SMP for its high level of management and financial self-sufficiency; the SMMA for its innovative design and high level of stakeholder participation; and the WRMP for its effective reef protection mooring buoy programme. This international standing has attracted both visitors and marine researchers, who have contributed to the knowledge of the protected areas and their management requirements.

Recommendations

The following recommendations, based on the experiences of the Caribbean marine protected areas to date, could serve as guidelines for the development of other marine protected areas in the region:

1. Stakeholder participation in planning, though time-consuming and still not offering a complete guarantee for support among all stakeholders, offers a better prospect than top-down approaches for the achievement of objectives over the long run. It also is more effective in dealing equitably with conflicts, particularly between traditional users and others.

2. The inequitable benefits now accruing to locals from protected areas must be dealt with for the areas to contribute meaningfully to the local economy, and thus to attract and hold local support. Two directions are indicated:

- In areas where traditional use of marine resources (e.g., fishing) and unemployment are high, marine protected areas must be part of integrated development schemes that provide a diversity of realistic options to traditional users and others. Displacement of traditional users without the provision of acceptable alternatives will lead to major social disruption and can have serious local economic consequences.

- In areas where the marine tourism industry is active and growing, training, employment, business, and credit opportunities should be made available for locals in the diving and yachting sectors and other marine park related services (tours, transportation, hotels, restaurants, gift shops).

3. Marine protected areas have been demonstrated to attract significant numbers of high-end visitors, a majority of whom indicate a likelihood of returning. It is therefore in the interests of Governments and the tourism sector to actively promote and support them. It is also in their interest to work more closely with MPA management agencies to assure that visitor use levels do not exceed management capacity or compromise the quality of the environment,

4. Since all willingness-to-pay surveys indicate a consumer surplus, Governments, protected area management agencies, and tourism interests should not hesitate to implement or raise visitor fees, provided these fees directly benefit management and give tangible benefits to users.

5. Notwithstanding the potential of revenue generation through user fees, Governments must themselves accept a measure of financial responsibility towards the conservation and management of natural areas. Government's support is particularly critical for protected areas just being developed, for those whose features are not conducive to tourism, and for the protection of marine and coastal areas adjacent to marine reserves.

6. The social benefits of marine protected areas can be significantly enhanced by increasing their use for local education and recreation. Such programmes, particularly among youth, should also result in increased community support for marine conservation.

7. Since the economic and social benefits of marine protected areas diminish rapidly under poor management, programmes for research, monitoring, and data collection are indispensable. These should include baseline surveys of the resources, monitoring of the effects of restrictive measures and the impact of permitted uses, collection of user statistics, and carrying capacity and resource valuation studies. The results should be shared regularly with decision-makers, including politicians, as well as the general public.

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Annex I
Survey instruments

Generic survey form for visitors.

1. What is your normal place of residence (country, state, island)?

2. Is this your first visit to [name of MPA]? Yes No, this is my .visit.

3. Is [name of island] the only destination on your trip? Yes no..

4. Did you know about the existence of this park before you came to the island?
Yes no If not, go to question 6.

5. How important was the existence of the [name of park or reserve] in your decision to visit this destination?

Very important		important		not important
1	2	3	4	5

6. During the present visit, how many days and nights will you spend [in the park] [on the island to facilitate your visit to the park]?

7. What type of accommodation are you using?

Hotel/guesthouse	apartment/cottage/villa	live-aboard boat
cruise ship	yacht	friend/relative
none (day trip)	campground	

8. What kind of activities are you engaging in while you visit the park?

- scenic land tour
- scenic boat tour
- glass bottom boat tour
- sailing (private boat)
- sailing (bareboat charter)
- sailing (crewed charter)
- day charter with snorkeling
- day charter w/o snorkeling
- organized snorkeling trip
- non-organized snorkeling trip
- organized SCUBA diving
- non-organized SCUBA diving
- swimming

- other water sports (windsurfing, paddle boats, water skiing, hobie cat sailing, banana boat rides, etc.)
- submersible tour
- sport fishing

9. How important was the existence of the park in your decision to engage in any of these activities?

	Very imp				Not imp.
• scenic land tour	1	2	3	4	5
• scenic boat tour	1	2	3	4	5
• glassbottom boat tour	1	2	3	4	5
• sailing (private boat)	1	2	3	4	5
• sailing (bareboat charter)	1	2	3	4	5
• sailing (crewed charter)	1	2	3	4	5
• day charter with snorkeling	1	2	3	4	5
• day charter w/o snorkeling	1	2	3	4	5
• organized snorkeling trip	1	2	3	4	5
• non-organized snorkeling trip	1	2	3	4	5
• organized SCUBA diving	1	2	3	4	5
• non-organized SCUBA diving	1	2	3	4	5
• swimming	1	2	3	4	5
• other water sports (windsurfing, paddle boats, water skiing, hobie cat sailing, banana boat rides, etc.)	1	2	3	4	5
• submersible tour	1	2	3	4	5
• sport fishing	1	2	3	4	5

10. Did you purchase a package trip? Yes ... no...

If yes, answer questions 11 and 12, if no, go to 13.

11. What was included in the package price?

- airfare from your country to [name of island]
- airfare from other island destination to [name of island]
- ferry
- taxes
- park fees/permits
- taxi transfers
- car rental
- tours
- diving
- snorkeling
- other water sports
- room

- meals

What was the package price per person? Indicate currency used

12. Where did you purchase the package?

13. If you did ***not*** purchase a package trip, or if travel costs were not included in the package price, what was the cost of the airfare/boat fare to [name of island]?

From the country where you live

From other island destination that served as point of departure

14. Estimated expenditures per person on [name of island] related to your visit to the park (if you purchased a package, only list additional expenses not included in the package price).

- airfare from your country to [name of island]
- airfare from other island destination to [name of island]
- ferry
- taxes
- park fees/permits
- taxi transfers
- car rental
- tours
- diving
- snorkeling
- other water sports
- room
- meals

15. How much more would you be willing to spend overall on the above expenses and airfare related to your visit to the park before you would decide not to come?

No more	10% more	20% more	30% more	50% more and over
a	b	c	d	e

16. If you answered b,c,d, or e to question # 15, how important are the following features in your decision to rather spend ***more*** to visit this park instead of looking for a cheaper alternative?

	Very imp.			Import.	Not imp.
a. The quality of the environment and the marine life	1	2	3	4	5
b. The quality of the experience provided	1	2	3	4	5
c. The availability and quality of on-site park information	1	2	3	4	5

d. The availability and quality of park facilities (such as moorings or u/w trails)	1	2	3	4	5
e. The availability and quality of services in the park provided by the private sector	1	2	3	4	5
f. Other reasons (specify)	1	2	3	4	5

17. If degradation of the environment and the marine life in the park would take place (abundance and diversity of fish decreased by 30% and coral cover decreased by 30% compared to the present circumstances), would you return to the park?

definitely probably probably not no..

18. The present fees for visiting the park [using park facilities, as applicable] are __
Provided that the protection of the environment and the resources remains the same or improves, and that higher fees would be applied to improve management, what is the maximum fee you would be willing to pay for visiting the park [using park facilities]:
[give a range of figures; for example, if present fee is $ 10, list $ 10, $ 15, $ 25, $ 50, and "other" as options.]

19a. How do you rate the following features of the [park] (now that you have seen the park)?

	excellent	good	reasonable	poor	very poor	no opinion
a. general scenery around the park	1	2	3	4	5	6
b. general underwater scenery	1	2	3	4	5	6
c. cleanliness	1	2	3	4	5	6
d. welcoming/reception	1	2	3	4	5	6
e. condition of the reefs	1	2	3	4	5	6
f. abundance of fish	1	2	3	4	5	6
g. number of large fish	1	2	3	4	5	6
h. The availability and quality of on-site park information	1	2	3	4	5	6
i. The availability and quality of park facilities (such as moorings or u/w trails)	1	2	3	4	5	6
j. The availability and quality of services in the park provided by the private sector	1	2	3	4	5	6

19b. Do you think the [park] is:

overcrowded crowded not crowded no opinion

20. Would you plan a return visit to the park?

definitely probably probably not no

21. What is your opinion on the [park] in general? Do you have any suggestions or comments on how park management could be improved to increase the value of your visit?

Questionnaire for semi-structured interviews with key stakeholders on social impacts.

1. Do you feel that the [park] is beneficial to the community in general?

2. What kind of benefits does the [park] bring to the community?

3. Do all sectors of the community benefit, or are the benefits unevenly distributed? If unevenly distributed, which sectors benefit more and which less?

4. Do you think that the people's attitude towards the marine environment and marine resources has changed as a result of the [park]? If so, in what ways?

5. Is the [park] contributing to a better understanding and appreciation of the marine environment and its resources?

6. Is the [park] contributing to the education of the youth?

7. Is the [park] playing a role as a model for others?

8. Is more research carried out as a result of the existence of the [park]? Is more knowledge available now - as a result of research - on the resources and how to manage them properly?

9. Has the [park] reduced, increased, or made no difference in conflict between resource users?

10. Has the [park] disadvantaged local people by reducing access to resources? If so, has there been any kind of compensation or have alternatives been offered?

11. Has the [park] displaced local resource users? If so, has there been any kind of compensation or have alternatives been offered?

12. Has the [park] influence on the type of visitor which is attracted? If so, do you feel that it is the "desirable" type of visitor which is attracted?

13. Visitation is likely to have increased significantly as a result of the existence of the [park]. What are the social and economic benefits and costs associated with increased visitation?

Possible economic benefits	**Possible economic costs**	**Possible social benefits**	**Possible social costs**
increased revenue	need for more infrastructure	more contact with other cultures	loss of culture and identity
increased employment	burden on water resources	pride due to success of park	increase of crime
	more waste produced		more conflict between resource users
			more foreign investment
			more foreign labor

14. Do you feel that the [park] is achieving its objectives, that is:
- its environmental objectives?
- its economic objectives?
- its social objectives?

15. Do you have any suggestions for improving management of the [park] or better achieving its objectives?

Caribbean Natural Resources Institute

The Caribbean Natural Resources Institute (CANARI) is a regional non-governmental organisation concerned with issues of conservation, environment, and sustainable development in the insular Caribbean.

CANARI's mission is to create avenues for the equitable participation and effective collaboration of Caribbean communities and institutions in managing the use of natural resources critical to development.

The Institute has specific interest and extensive experience in the identification and promotion of participatory and collaborative approaches to natural resource management.

Trinidad
Femandes Industrial Centre
Eastern Main Road
Laventille, Trinidad
Tel.: (868) 626-6062
Fax: (868) 626-1788
canari@tstt.net.tt

St. Croix
P.O. Box 644
Christiansted, St. Croix
U.S. Virgin Islands 00821
Tel.: (340) 773-9854
Fax: (340) 773-5770
canari@islands.vi

St. Lucia
P.O. Box VF 383
Vieux Fort
St. Lucia
Tel.: (758) 454-6060
Fax: (758) 454-5 188
canari@candw.lc