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THE BARBADOS (ALIAS FOLKESTONE) MARINE RESERVE, BARBADOS: A LATE BLOOMER?

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ABSTRACT The Barbados Marine Reserve (BMR) is a 2.2 km^2 no-take marine reserve occuppying one of the most intensely used and impacted sections of the coast and comprises four zones: Scientific, Northern Watersports, Recreational, Southern Watersports. Establishment of the BMR in 1981 did little to change the *de facto* marine resource governance regime for the area. There was minimal consultation of stakeholders in determining the zoning and regulations. Fishers were negatively impacted, and no user group derived significant benefits from the reserve. A mandate to maximise revenues led the National Conservation Commission (NCC), responsible for BMR management, to virtually abandon the reserve. Efforts to spur institutional change were not effective, because of the centralized authority of the NCC and the belief that the BMR could not generate revenue. In 1998, the Government initiated a study to reform marine resource governance within the BMR and adjacent areas. Stakeholder consultation revealed complex patterns of use in the area. Recommendations, adopted by the Government in March, 2001 included establishing a broader Marine Protected Area (MPA) along an expanded coastline (from 2.6 km to 9.5 km) with seven types of management zones, and renaming the area as the Folkestone Marine Managed Area. Also proposed was a Marine Management Area Authority, within the Ministry of the Environment's Coastal Zone Management Unit, to designate and manage MPA's.

INTRODUCTION

The Barbados Marine Reserve (BMR), commonly known as the Folkestone Reserve, is located centrally on the west coast of Barbados (Figure 1). Along this portion of the Barbados coast, the island shelf is about 1 km wide, with a submerged bank reef along most of the outer edge at depths of 15–25 m (Figure 2). Beyond the bank reef, the shelf drops off steeply to depths of several hundred meters. The shoreline is marked by a series of bays, with numerous fringing reefs (primarily opposite the points between bays) alternating with sandy inter-reef areas that form beach cells. The fringing reefs extend 50–100 m offshore. Between the fringing reefs and the bank reef is an area of mixed sand, rubble, and low relief coral substrate with depths ranging down to 30 m (Figure 2). Most of the coast is fringed by white sand beaches.

The west coast of Barbados, from Bridgetown to Six Men's Bay, is home to about 30 hotels, numerous apartments and villas, and supporting services. Local residential developments, with associated public and private services, are interspersed among these tourism-based land uses. Many hotels have their own water sports operations; numerous small-scale independent operators offer diving, glass-bottom boating, day cruises, jet skiing, and other water sports activities. In the Holetown area, there is a concentration of tourism and non-tourism development and services (Figure 2). Offshore and inshore fishing takes place from several fishing beaches along the coast (Barbados Fisheries Division 2001). Inshore fishing includes small-scale trap, net, spear, and line fishing of various types.

The Barbados Marine Reserve, as presently defined, is a 2.2 km^2 no-take marine reserve comprising four zones: a scientific research zone, a northern water sports zone, a recreational zone, and a southern water sports zone (Figure 2). The BMR runs along the shoreline of the Holetown area for about 2.6 km and extends seaward to the edge of the island shelf. Thus, the BMR lies in one of the most heavily used areas of marine space in Barbados. Furthermore, the largest watersheds on the west coast enter the sea in the Holetown area. Coastal ponds that served to store floodwaters are now largely canalised, so storm waters quickly breach the sand berm and carry sediments and garbage (which is frequently dumped in gullies) directly into the sea. Consequently, marine habitats in this area are also impacted by land based inputs.

The BMR is presently managed by the National Conservation Commission (NCC), a quasi-governmental corporation with management responsibility for all public parks, beaches, and protected areas in Barbados. The NCC is guided by a Board of Directors, who establish its policies and direction. At the time of its establishment

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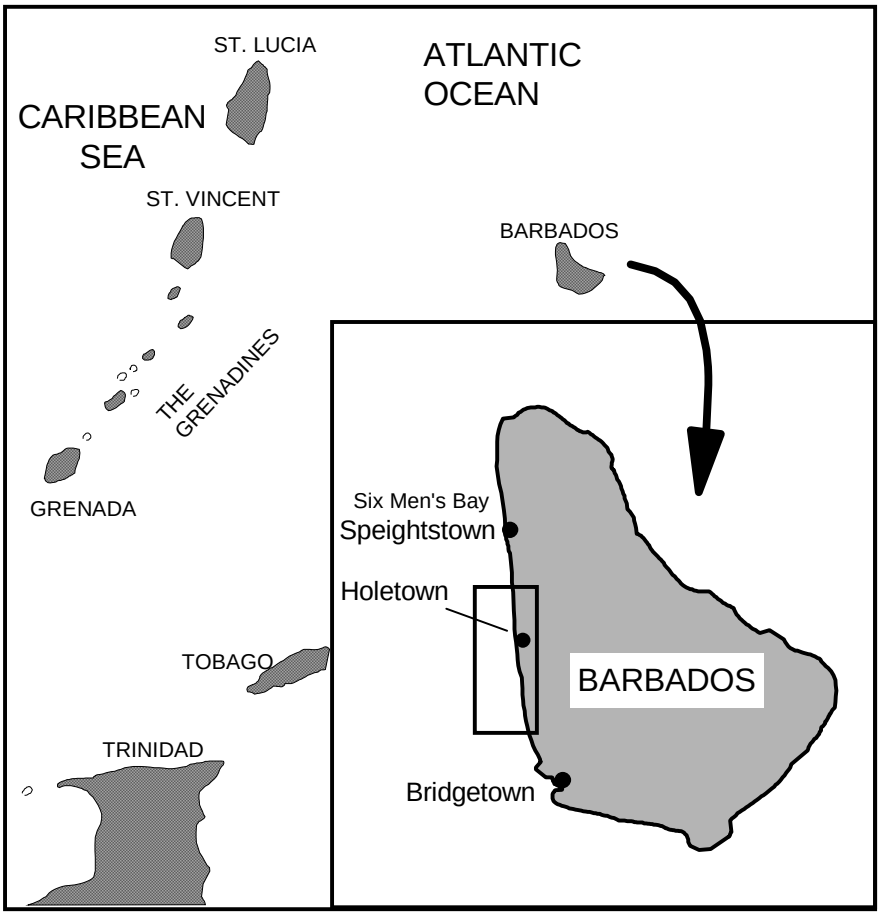

Figure 1. Location of Barbados and the area of the Barbados Marine Reserve and proposed Marine Management Area on the west coast.

in 1981, the BMR was the only marine park in Barbados and remained so until early 2001. The BMR is run by a Manager, with the assistance of a Park Biologist.

There is a wide variety of public and private stakeholders in the area of the BMR (Table 1). Many of these depend upon the area for their livelihood and are referred to by us as resource users (resource appropriators of Mascia 2000).The purpose of this paper is to provide a synthesis of the 35-years of development and operation of the BMR, based on previous studies and the first author's involvement in the process, to look broadly at the factors that may have influenced the process, and to articulate the 'lessons learned'.

The Phases of the BMR

Our review of the lessons learned in the establishment and operation of the BMR recognises three phases:

- Phase 1: The initial development and start-up of the reserve (1965–1981)—what it was expected to be;
- Phase 2: The operation of the reserve (1981–1998)—what it turned out to be;
- Phase 3: The expansion and restructuring of the reserve into the Folkestone Marine Management Area (FMMA) (1998–present)—what it is expected to become.

Mascia (2000) provides a thorough review of the first two phases based on document analysis, formal and informal interviews, and direct and participant observation. AXYS (1999) provides a detailed description of what is planned for the third phase as well as description of the process that was used to engage stakeholders in study. In this review we look at the potential and actual roles of the stakeholders in these phases. Our conclusions are based on results from these two studies, as well as the participation of one of us (RM) in the stakeholder process of Phase 3. For Phases 1 and 2, we assess whether stakeholders were given the opportunity to participate meaningfully in the development and/or management of the BMR and, if so, whether they were equipped to do so. For Phase 3, we assess the extent to which it has been possible

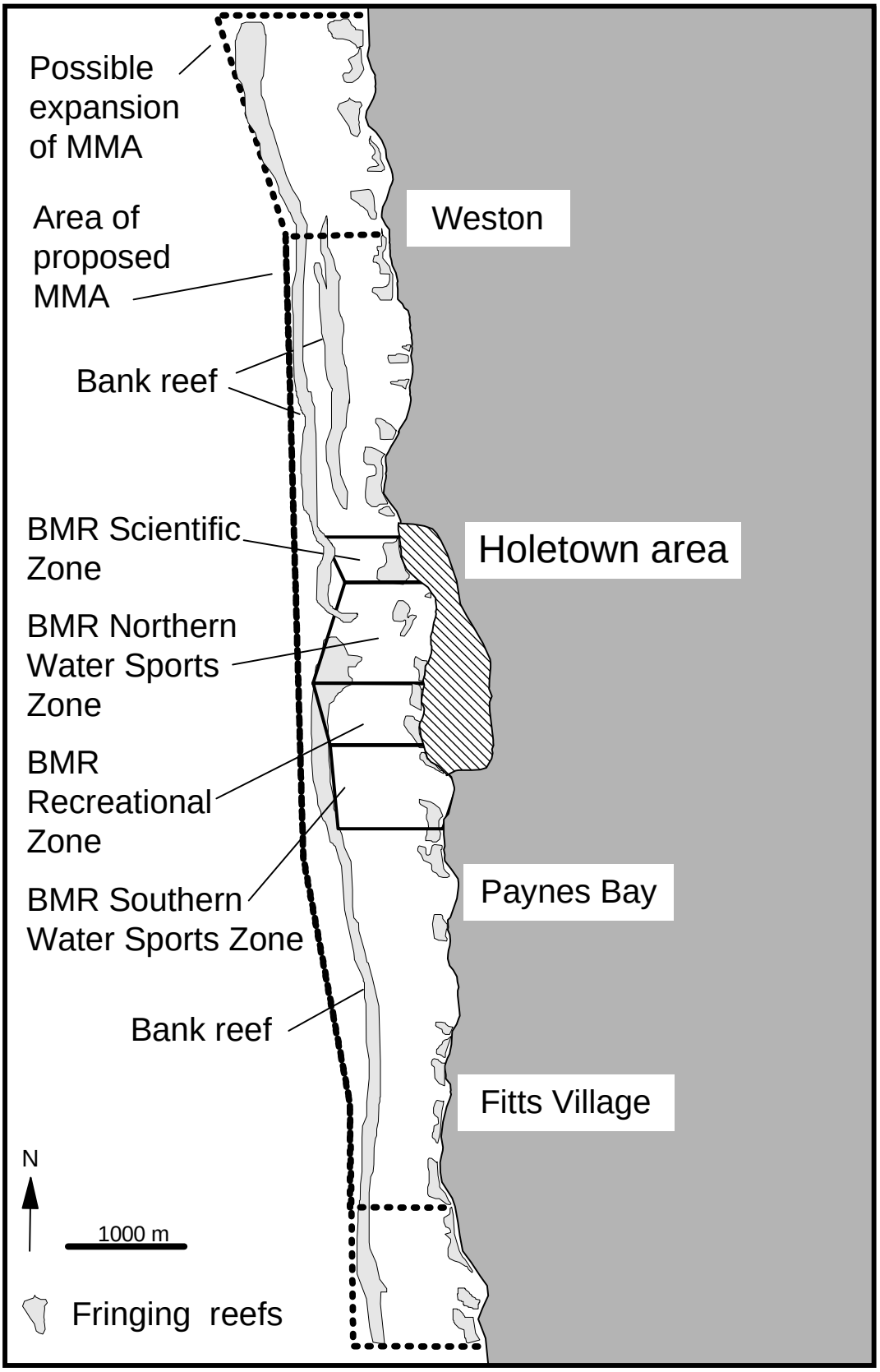

Figure 2. The original Barbados Marine Reserve (BMR) zones off Holetown and the proposed Marine Management Area (MMA).

TABLE 1

Public and private stakeholders in the present Barbados Marine Reserve and proposed Folkestone Marine Management Area.

Public	Private
National Conservation Commission	Shore-based swimming
Fisheries Division	Shore-based snorkelling
Environment Division	Water sport boats
Environmental Engineering Division	SCUBA dive boats
Coastal Zone Management Unit	Jet skis
Harbour Master	Fishers, boat and shore-based
Police	Party cruise boats
Coast Guard	Day-sail cruise boats
Drainage Unit	Glass-bottom boats
	Water taxis

to address the problems in Phases 1 and 2, and the extent to which capacity problems are likely to persist in Phase 3.

Phase 1. The idea to establish a marine reserve on the west coast of Barbados originated in the late 1960s, with the Barbados National Trust. The concept was further elucidated by Bellairs Research Institute (Sander 1972). The Barbados government delegated responsibility to the Parks and Beaches Commission in 1973. "The Commission sought advice from government agencies, scientific groups, and private individuals", and in 1974 an Underwater Park Committee was formed to advise the Parks and Beaches Commission on technical matters (Cotter 1982). The Underwater Park Committee recommended that the reserve be established at Holetown—specifically Vauxhall Reef, a fringing coral reef located just south of the center of the town.

In 1976, the Marine Areas (Preservation and Enhancement) Act was passed providing the Minister responsible for Lands with the authority to "designate [by ministerial order—no legislative action is required] any portion of the marine areas of Barbados as restricted areas where he considers it necessary" in order to protect marine organisms and shipwrecks, promote public enjoyment, promote scientific study and research, and preserve and enhance "the natural beauty" of a specified area.

The Act states that the National Conservation Commission (NCC) (the successor body to the Parks and Beaches Commission) may specify conditions for entry into and use of restricted areas, including the use of monetary fees. These regulations require Ministerial approval, but not Parliamentary consent.

In 1979 a US Peace Corps volunteer was assigned to work with the Parks and Beaches Commission to develop its idea for an "underwater [tourism] attraction" in the historic region of Folkestone. With the consent of the Parks and Beaches Commission, a much bolder plan for a marine reserve took shape. The size of the proposed reserve was increased roughly tenfold, to include several fringing reefs and the first offshore bank reef, in an attempt to "protect the coral reef ecosystems and not just the physical structure of the fringing reef itself" (Cotter 1982).

In March, 1980, the BMR was established by Ministerial Order. A year later this Order was repealed and replaced by the Designation of Restricted Areas Order 1981, under which the BMR has since operated. The four zones shown in Figure 2 were established, together with a set of rules and regulations regarding the demarcation and use of the zones. The four areas were to be demarcated by coloured buoys at the seaward boundary and by signs on shore and the landward boundary. A park office was established at Folkestone House opposite the Scientific Zone. The following rules were established with a possible fine of up to Bdos $1,000 (US$500) for breaching them:

- No fishing boats may enter any zone of the BMR,
- No fishing is permitted in any zone,
- No removal, disturbance, destruction, or injury to any geological or archaeological material, or marine life, is permitted,
- Nonfishing boats entering the BMR are to register with the NCC,
- Watercraft are prohibited from entering buoyed-off swimming areas,

- No watercraft may exceed a speed limit of 3 knots within the Recreational and Scientific Zones,
- No jet skis, speedboats or sailboats are permitted in the Recreational and Scientific Zones,
- No boats are permitted within 40 m of a diver down flag,
- Scientists require permits for access by beach or boat,
- No explosives or weapons (except a dive knife) are permitted in the reserve,
- Users must comply with instructions from the Barbados Defence Force and individuals authorised by the NCC,
- Users must comply with Barbados Harbour Regulations.

The political process that led to the establishment of the BMR was highly centralized, non-participatory, and opaque. The Peace Corps volunteer was almost wholly responsible for decision-making regarding the development of the (operational level) *de jure* governance regime for the BMR. Furthermore, early plans to conduct a broad survey of marine resource users in the area (which might have informed his efforts) appear to have been abandoned. Records indicate that the volunteer did discuss the design of the BMR with the head of the Fisheries Division, as well as members of the Parks and Beaches Commission (Mascia 2000). At least one meeting was held with local stakeholders to discuss the BMR, but this meeting was targeted at non-consumptive users who might benefit from the establishment of the protected area (rather than all users) and occurred six months after the initial Ministerial Order designating the borders of the BMR had been promulgated into law (Mascia 2000). This timing suggests that the meeting with stakeholders was designed to inform the public rather than solicit their input. There is no evidence to suggest that fishers participated in the development of the BMR.

Phase 2. Subsequent to the legal establishment of the BMR, its borders were only partially demarcated. Buoys indicated the boundaries between zones, but no signs were installed on land and the seaward boundary was not demarcated. The buoys that were installed were not maintained and soon disappeared. Activities in the area by the various stakeholders that had been using it continued as before, with one notable exception: the fishers. The only rule that was enforced was the no-fishing rule. This resulted in serious disruption to the fishers that had been operating in the area. They were forced to either give up fishing; travel longer distances to fishing grounds, where they often were in conflict with the fishers already fishing there; or fish illegally, thus becoming criminals, where they once were respected members of their social units. Compliance with this rule was low, and fishers became highly innovative in avoiding detection, according to Mascia (2000) who elaborates on the impact that this regulation had on fishers depending on the types of gear that they used. The fishers that fished pots (traps) were most affected, as it was most difficult for them to fish new territories or to fish illegally without detection.

As a consequence of the lack of demarcation of the zones, attempts at enforcement were inevitably controversial. Inadequate enforcement of the rules resulted in the BMR failing to provide in any substantive way the outputs that its establishment was predicated upon: increased fish resources for recreational non-consumptive purposes, a protected area for scientific research, orderly access to the marine environment for recreation. Furthermore, there was no provision for addressing the land-based impacts (groundwater seepage, runoff, sewage effluents, etc.) that continued to degrade the marine habitats thus reducing their value for non-consumptive uses.

Beginning in 1985, the Environmental Education Officer in the Ministry of Tourism and Environment made a series of attempts to put the BMR on a more functional footing. These included establishing an underwater trail and a proposal to establish a Marine Reserve Advisory and Coordinating Committee (MRACC), comprising Government stakeholders, to identify problems and coordinate planning for the reserve. The MRACC was to consult with other public and private stakeholders, but was never formally established. The underwater trail was established but not maintained and was dismantled in 1988. In 1989, the Environmental Unit obtained funds from an international development bank to support installation of a new buoy system to demarcate BMR borders, but the new system was not maintained and again left the BMR without clear borders. In the early 1990s, a second attempt to establish a MRACC floundered. Subsequent management efforts by the NCC and BMR staff focused largely on revenue generation through mechanisms incidental to the BMR itself (e.g., gift shop sales, equipment rentals), rather than resource protection (Mascia unpublished data).

In the years following establishment of the BMR, fishers became politically active and collectively sought permission to carry out cast net fishing for sprats in the reserve. This permission was given verbally, but never confirmed by law. This type of fishing is regularly seen in the BMR.

Mascia (2000) concludes that apart from the problems engendered from the outset through a lack of stakeholder participation in the process of establishing the reserve, or even their consultation, the main problem was the organisational mandate and shared belief system of the NCC. As a quasi-governmental corporation, the primary mandate of the NCC was to generate revenues. Unfortunately, the NCC Board failed to recognize the potential for effective BMR management (e.g., establishment of user fees) to generate revenues greater than those it derived from investing in its other revenue generating activities (e.g., landscaping). The longstanding belief that the BMR could not generate revenues comparable to other NCC activities may have been due to the lack of any experience in the NCC, or indeed in any Barbados institution, with the development and management of MPAs. This lack of a viable shared vision at the highest level responsible for the BMR, combined with a financial mandate (rather than a mandate to provide a public service), led the NCC to divest from the BMR in order to pursue other revenue generating opportunities.

Phase 3. In 1997, a "policy entrepreneur" within the NCC pushed for the BMR to be included as part of a project to examine the feasibility of developing revenue generating tourism enterprises. Mascia (2000) uses the term "policy entrepreneur" to refer to a person who stands out among contemporaries for investing personal resources (time, energy, reputation) to bring about policy change. The project conducted a feasibility study for the redevelopment of the Folkestone Park and Marine Reserve (AXYS 1999). The acceptance of the proposed plan by the Government of Barbados, and the declared intention to implement it, indicates that Public Sector stakeholders at large now have a greater appreciation for the potential value of the BMR as a tourism attraction and income generating entity.

The feasibility study included a consultative process that sought to engage all the stakeholders. The consultative process consisted of a series of discussions with various stakeholder groups as well as nine round-table meetings to which representatives of all stakeholder groups were invited (Table 2). The round-table meeting process was structured to engage stakeholders, develop a vision and management principles for the protected area, and to allow stakeholders to indicate their needs by contributing to the revision of the zoning and management system of the proposed FMMA.

The feasibility study concluded that the existing BMR was "not large enough to accommodate the range of existing commercial and recreational uses and still provide adequate protection for representative marine habitats and ecosystems of the West Coast of Barbados". Therefore, the proposal that emerged from the study was for a marine management area (MMA) that was substantially larger than the original BMR. The new proposed MMA would extend from Weston south to Fitts Village (about 9 km), where it would include a popular wreck dive site (Figure 2).

The new MMA, to be called the Folkestone Marine Management Area, will comprise seven types of zones in a complex mosaic (Figure 3). The complexity of the proposed zonation was acknowledged by the project consultants, but is considered to be a product of the consultations and round-table meeting process. It seeks to accommodate the needs of all participating stakeholders. Further extensions north and south are to be considered to accommodate two additional conservation areas and two sustainable fisheries management areas. The FMMA will be supported by an upgraded Folkestone Park at the same location as the original BMR headquarters.

The new FMMA and the proposed MMA in Carlisle Bay will be managed by a Marine Managed Area Authority (MMAA), which will be established for that purpose. The MMAA, with a staff of 10, will be established within the Coastal Zone Management Unit of the Ministry of the Environment. A Stakeholder Advisory Committee (SAC), comprising representatives of all public and private stakeholders, will advise the MMAA regarding zoning and enforcement.

Capacity and Community Involvement

We treat capacity as the ability of and opportunity for stakeholders to understand the issues that affect them, and the extent of their empowerment to address them. Thus, stakeholder capacity includes elements of information, interpretation, representation, and collective power. We pursue capacity to participate in the establishment and operation of the BMR with reference to the wide range of stakeholders, public and private, identified in Table 1.

Through the phases of development and operation of the BMR/FMMA, there was a progression from no, or minimal, consultation in Phase 1, through stakeholder initiated involvement and action at various points in Phase 2, to fuller consultation and potential involvement in Phase 3.

Increased participation in phase 3 was due to a deliberate effort to increase the opportunity for stakeholder input. This arose from the acute awareness of the problems that had been created in phases 1 and 2 by a lack of stakeholder input. This awareness was, to some extent,

TABLE 2

Number of participants, by stakeholder group, who attended Phase 3 round-table meetings (March 3–July 29, 1999) (participant details for meeting 8, July 21st, are not available).

	Round-table meeting							
Stakeholders	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**9**
Date	**3 Mar**	**17 Mar**	**16 Apr**	**18 May**	**20 Jun**	**29 Jul**	**20 Jul**	**29 Jul**
Non-governmental								
Water sports	3	4			1	1	1	
SCUBA operators	4	2	1		1	1	1	1
Cruise operators	1	1	1		1	1	1	
West coast hotels	2							2
Barbados Hotel and Tourism Association			1	2	2	1	2	1
University of the West Indies	2			1	1		1	
Bellairs Research Institute	2		1	1	1	1		2
Fishers	15	15	4	5	5	3	2	3
Homeowners	2		2	2	1	1	1	
Barbados National Trust							1	
Barbados Museum and Natural History							1	1
Subtotal	**31**	**22**	**10**	**11**	**13**	**9**	**11**	**10**
Governmental								
Environment	7	3		2	2	1	1	3
Tourism	2	1	1			1	1	1
Fisheries	1	2	2	1	1	2	2	2
Coast Guard/Police/Attorney General	2	2	1		2	3	1	2
National Conservation Commission	2	1	1	1	1	2	2	2
Port Authority	1		1					1
Transportation and Works					1	1	1	1
Sanitation Services Authority/Health			1		1	2		
Town Planning			1					1
Education			1					
Subtotal	**15**	**9**	**9**	**4**	**8**	**12**	**8**	**13**
Total	**46**	**31**	**19**	**15**	**21**	**21**	**19**	**23**

common knowledge among those directly involved in the BMR, but was substantially enhanced and consolidated through the studies carried out by Mascia (2000) and AXYS (1999). Increased participation in phase 3 was also due to the increased capacity for participation on the part of most stakeholders.

Over the 20-year interval between the initial establishment of the BMR and the development of the proposal for the FMMA, global awareness and acceptance of the need for greater civil society involvement in government activities increased considerably (Burbidge 1997). The availability of methodologies for facilitation and stakeholder participation also increased considerably (e.g., Navia and Landivar 1997). Moreover, funding and development agencies began to insist on demonstrated stakeholder involvement in projects. One might say that in the period in question, there was a paradigm shift regarding stakeholder participation (e.g., Berkes et al. 2001).

The global increase in awareness of the need for stakeholder participation was also paralleled by an increase in environmental awareness and thus stakeholder interest at the national level in Barbados. Thus, it is highly probable that stakeholders in the late 1990s were much more likely and willing to participate in natural resource management activities than they had been previously. For example, Barbados had just implemented a suite of participatory demonstration projects in coastal zone management that received considerable media coverage (Almerigi et al. 1999). Preparation of a Fisheries Management Plan, which involved extensive consulta-

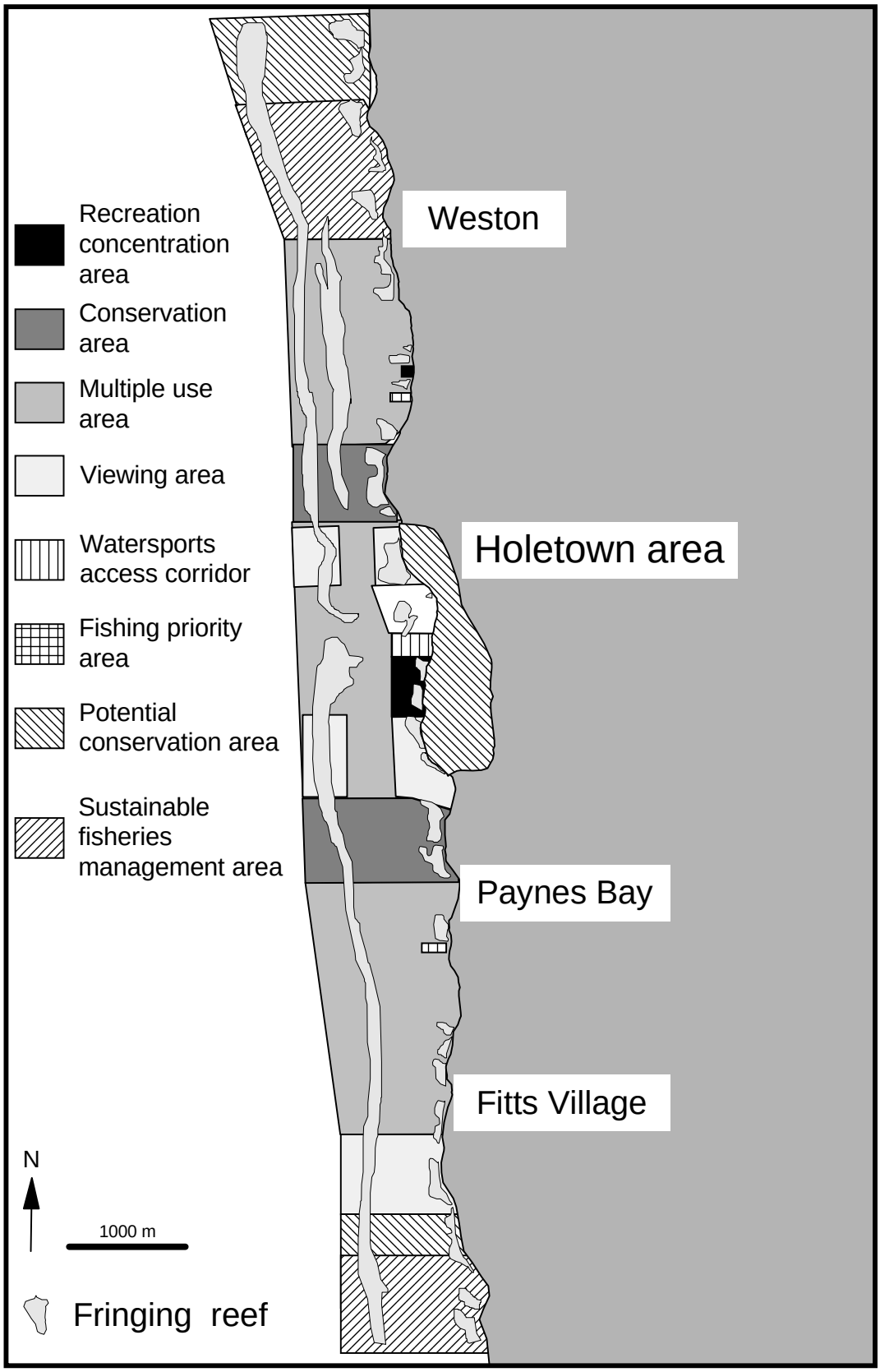

Figure 3. The proposed zonation of the Marine Management Area.

tion, also increased awareness and interest among stakeholders (McConney and Mahon 1998).

Changes in the awareness and culture regarding the role of stakeholder participation notwithstanding, the inequitable situation in the BMR, was a concern to many stakeholders throughout Phase 2 (Mascia 2000). Likewise, there was an increase in collective awareness of the benefits foregone as a result of ineffectual management of the BMR. Thus, the overall climate for a new approach to BMR management arose on many fronts, and may even have been seen as a crisis by some stakeholders. Even so, institutional change is often slow and difficult—particularly for governmental organisations. Mascia (2000) concludes that the decision to address the problems of the BMR via the study was primarily due to pressure from a concerned individual with a vision. The role of such a policy entrepreneur should not be overlooked as a factor in promoting change.

The capacity of various stakeholder groups to participate in BMR/FMMA design and management is worthy of examination. Through Phase 2, the capacity of the various tourism sector stakeholders to participate increased considerably through increased levels of organisation and awareness. The Barbados Hotel and Tourism Association created the post of Environmental Officer in 1997. Other related organisations were established or gained strength.

There was a substantial effort on the part of the Barbados Fisheries Division to facilitate collective action and self-help by organising fisher associations and creating a national umbrella organisation in the late 1990s (McConney et al. 1998). Due to this effort, the capacity of the fisher community increased slightly at one locationadjacent to the proposed FMMA, Weston, through the formation of a fisherfolk organisation, but was minimal for other locations, despite the presence of nominal associations at most. Consequently, although there was extensive consultation, fisher input at the round-table sessions was almost exclusively by two individuals from Weston and one from the national umbrella organisation. Nonetheless, these representatives were able to get the fishers' needs addressed to some extent through inclusion of two potential sustainable fishery management zones one at each end of the proposed FMMA. As the details of how these zones would be used remain unspecified, they could be perceived as an appeasement for the fishers rather than as providing a concrete solution to their needs. Indeed, the issue of how the management of fisheries in the FMMA area will be reconciled with the overall national plan remains unresolved.

Small-scale water sports operators (jet skis, glass-bottom boats, ski boats) were only marginally involved in the Phase 3 processes (Table 2). As was the case for the fishers, this was due to the lack of organisations that could represent them. There is an organisation of jet ski operators, but they chose not to participate.

Consequently, the bias in the round-table sessions was towards the organised, larger-scale tourism operators. Even so, the west coast hoteliers were notably absent from the process. We speculate that they did not feel the need to invest in the process because they had the political influence to override anything they did not like. If this influence is exercised, it could be very disruptive.

Governmental participation in the round-table meetings was intermittent for all but a few core ministries with primary interest in the FMMA (Coastal Zone Management Unit, Fisheries Division, enforcement agencies) (Table 2). Consequently, the full range of sectoral interests was not consistently addressed in the process.

The extent to which stakeholders were adequately informed to participate in the development process must also be considered. In this regard, the round-table process was constrained by a lack of technical information. Lacking were clear guidelines for what was possible for a MMA, particularly with regard to the feasibility of zone demarcation, maintenance and communication to users of the sets of rules that would apply to each zone. Consequently, stakeholders devised a set of zones that may not be feasible because they will be costly to demarcate and maintain, and that users may find difficult to learn and use.

The failure to provide stakeholders participating in the round-table process with sufficient knowledge arose partly because the study team did not have personnel with good practical knowledge and experience in MPA development and management, including enforcement and stakeholder education. The structure of the round-table process also failed to provide adequate information flow to stakeholders.

The need for a responsible agency with the capacity to manage the MMA was given extensive consideration in the study (AXYS 1999). The proposed MMAA will have a team of about 10 persons to manage the FMMA, the Carlisle Bay Managed Area, and ultimately other areas. The qualifications and experience outlined for these persons should serve to remedy the current shortcomings in management capacity, particularly the required 10 years experience with MPA management. However, most of the previous problems have been in senior management support for initiatives. Acceptance of

the proposal at senior levels should overcome that problem. However, it remains to be seen if this acceptance will extend into the policy and financial support that will be required by the MMAA for successful establishment and operation of the MMAs.

CONCLUSIONS

The history of the BMR provides a clear example of why it is essential that the vision, beliefs, and values of MPA proponents are shared by the stakeholders—particularly the responsible management agency. The BMR degenerated into a virtual 'paper park' because of the absence of such a shared vision. The resulting dysfunction persisted for almost 20 years, despite several efforts to remedy it.

It also emerges clearly that there is the need for attention to developing a balance in the capacity of stakeholders. An area that will require attention in further developing the FMMA is the capacity of stakeholder groups that have not been adequately involved to date: the fishers and the small-scale water sport operators. There will also be a challenge to involve the hoteliers in the ongoing process so that their input is not limited to the exercise of a veto power.

Finally, it is clear that when a participatory approach is taken, stakeholders must be provided with adequate information regarding the technical constraints on MPA design and operation. Without such technical assistance, participatory processes may create unrealistic expectations or lead the group to develop plans that cannot be implemented effectively.

LITERATURE CITED

Almerigi, S., R. Mahon, Y. Alleyne, K. Atherley, J. Cumberbatch, and S. Mahon. 1999. Barbados Coastal Conservation Programme (Phase 1), Demonstration Projects. Participatory coastal zone management in Barbados. Coastal Zone Management Unit, Barbados, 30 p.

AXYS. 1999. Report of the feasibility study for the devlopment of Harrisons Cave, Carlisle Bay Marine Reserve and Folkestone Marine Reserve: Barbados. Environmental Special Projects Unit, Ministry of Environment, Energy and Natural Resources, Barbados.

Berkes, F., R. Mahon, P. McConney, R. Pollnac, and R. Pomeroy. 2001. Managing small-scale fisheries: Alternative directions and methods. International Development Research Centre (IDRC), Ottawa, Canada, 309 p.

Burbidge, J. [ed.]. 1997. Beyond Prince and Merchant: Citizen Participation and the Rise of Civil Society. PACT Publications, New York, NY, USA, 314 p.

Cotter, P. 1982. Barbados' new marine reserve. Parks 7:8–11.

Fisheries Division. 2001. Barbados Fisheries Management Plan: Schemes for the Development and Management of Fisheries in the Waters of Barbados. Fisheries Division, Ministry of Agriculture and Rural Development, Barbados, 61 p.

Mascia, M. B. 2000. Institutional emergence, evolution, and performance in complex common pool resource systems: marine protected areas in the wider Caribbean. Ph.D. Thesis, Duke University, Durham, NC, USA, 388 p.

McConney, P. and R. Mahon. 1998. Introducing fisheries management planning to Barbados. Ocean and Coastal Management 39:189–195.

McConney, P.A., A.Atapattu, and D. Leslie. 1998. Organizing fisherfolk in Barbados. Proceedings of the Gulf and Caribbean Fisheries Institute 51:299–308.

Navia, O. and J. Landivar. 1997. Inter-American Development Bank (IDB) Resource Book on Participation. Section VII: Methodologies, Approaches and Techniques for Participation, IDB, Washington, DC, USA.

Sander, F. 1972. Suggestions on marine parks in Barbados. Paper presented at the Carribean Conservation Association AGM, St. Kitts and Nevis.