

# **Stakeholder use of Buccoo Reef Marine Park, Tobago.** - Incorporating socioeconomic analysis into MPA management using GIS as a tool.

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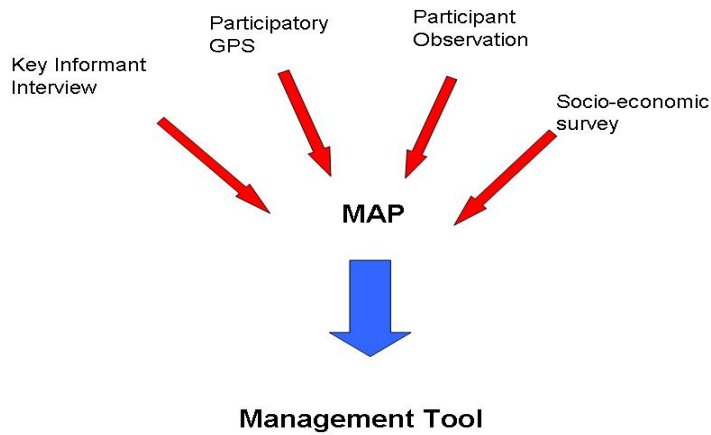
## *Introduction*

What has become apparent to natural resource managers in recent years is that natural resource management is a social science as well as biological as in order to maintain in environment you need also to manage the actions of humans. Incorporating social science into MPA management starts with asking fundamental questions about the human dimension of the marine system, for example, who are the stakeholders?, how are they using resources? and how important are these resources to them? Analysis of use patterns, as one socioeconomic variable, may provide managers with a better understanding of human, political, economic, and historical dynamics of an area to help make informed decisions. Use patterns include things such as recreational and commercial use, public rights and responsibilities of use, historical use of resources, and subsistence use.

## *Concept*

This research presents quantitative and qualitative data from a case study of the Buccoo Reef Marine Park in South – West Tobago to discuss the importance of bridging the gap between socio-economic studies and coral reef management using tools such as GIS. A socioeconomic assessment, of the primary user groups of BRMP, Tobago and participatory GPS mapping were used in order assess the current use patterns occurring in BRMP. It involved people in a simple consultation processes along the way. The power of consulting communities in various initiatives at any scale can help relations and highlight areas which need greater attention by NGOs for the local community.

## *Methodology*



As the diagram above shows different approaches were used in order to collect data from a variety of sources and were dependent on time and resources available over the study period (6/6/05 – 15/7/05).

Process Involved:

Stakeholder analysis, Key Informant interviews, Participant observation and Participatory GPS mapping.

### Results

The information collected went to producing maps of the area.

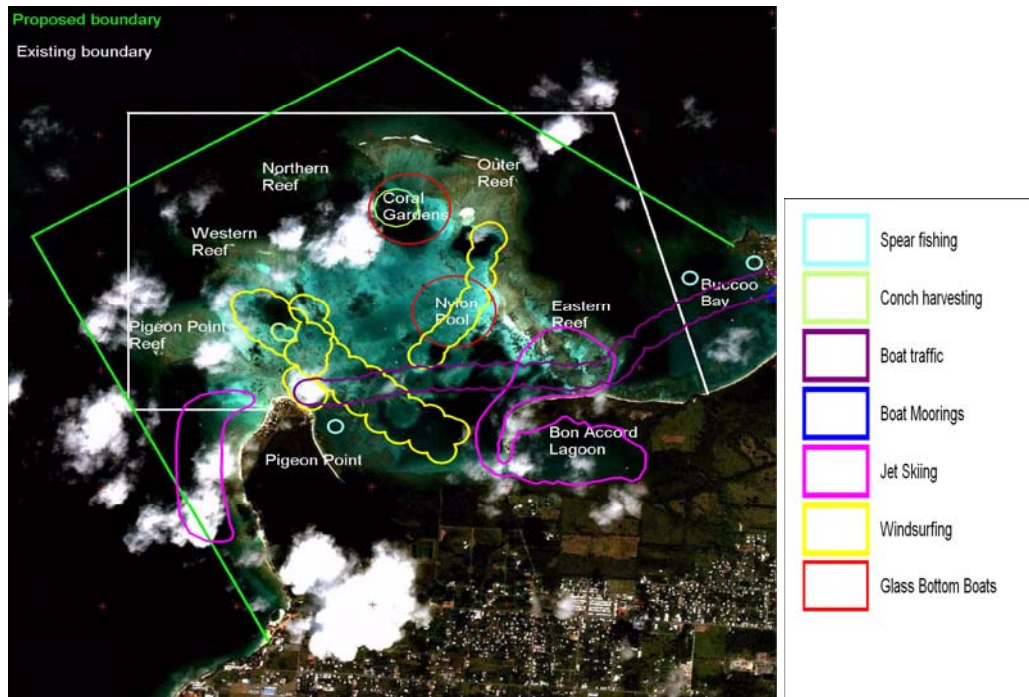


Figure 1. Map showing location of activities in the park in 2005.

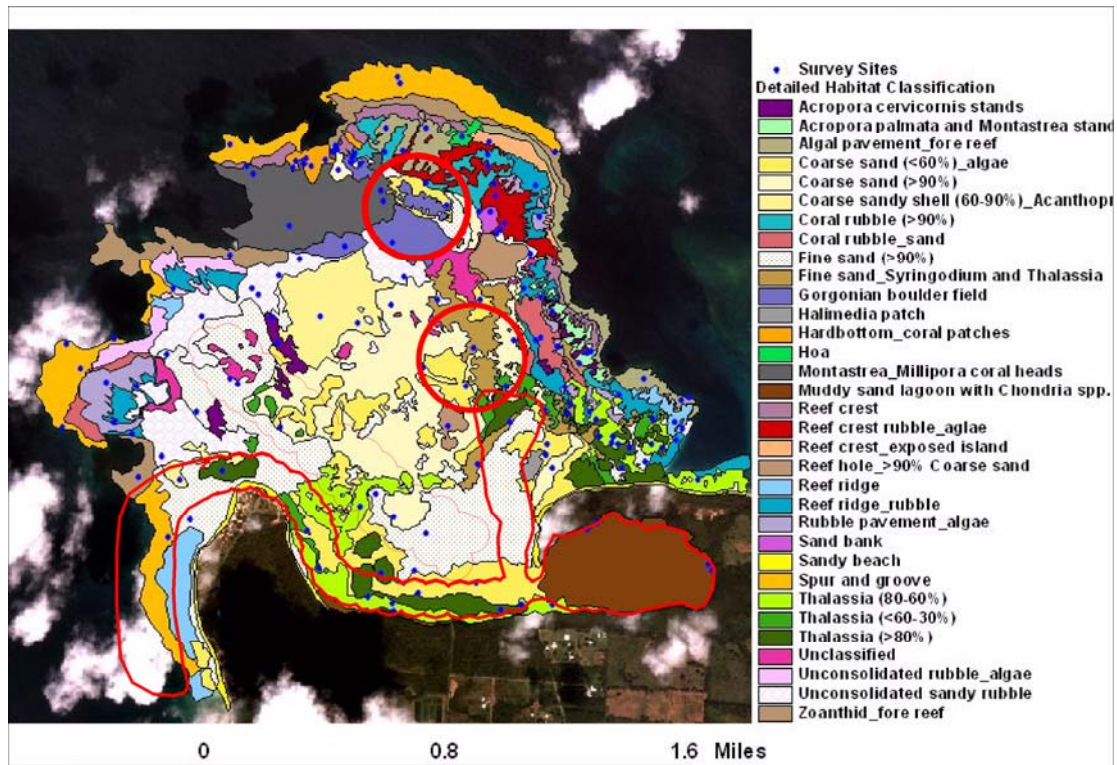


Figure 2. Overlay of GPS data of water sports activities with habitat map to show potential areas of conflict between use pattern and the natural environment.

Calculations were made on the intensity of an activity per km<sup>2</sup> and the value it created per km<sup>2</sup>. This information was overlaid onto a habitat map of Buccoo Reef (Laydo, 1985) in order to show the reef systems where heavy use is occurring.

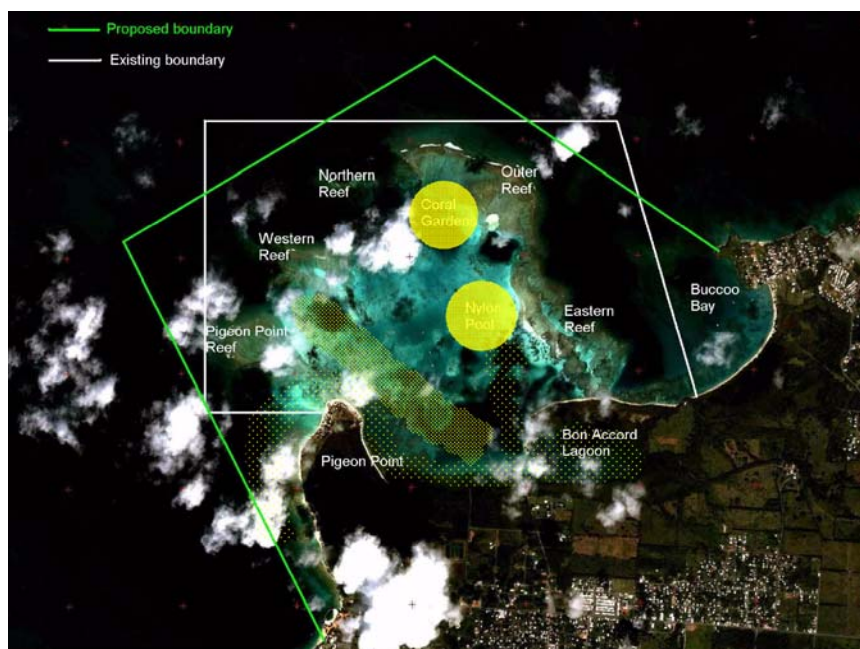


Figure 3. Use intensity of BRMP. Based on Glass Bottom Boat, Windsurfing and Jet skiing data. Heavy fill equates to heavy intensity. Use intensity on a scale of 1-3 (3 being most heavily used area) GBB 3, Windsurfing 2, Jet Skiing 1.

Table 1. Past vs. Present. Comparing past and present glass bottom boat use.

	1991	2005	% Change
Value (TT\$)	30	90	33.3%
Intensity	1	2	50%

Value generated per km<sup>2</sup> was calculated only for those activities that had been surveyed and had a direct use value and where the activity occurred exclusively in the marine park. This made jet skiing, windsurfing and glass bottom boats the only viable options. For an economic vs. environmental analysis of activities occurring in the marine park the value each activity generated per km<sup>2</sup> was overlaid onto the habitat map in order to show what areas of the reef generated the most value from use. The area generating the highest value per km<sup>2</sup> and the area of highest use intensity are the same. Further comparison with Laydoos (1985) biodiversity map shows the sites with high use intensity, the highest value generated per km<sup>2</sup> and high biodiversity are all the same.

Combining the use intensity and value figures the ideal scenario envisioned would be to have activities which have a high value and low use intensity see table 2. Glass bottom boating occurs at a high intensity but produces the greatest value per km<sup>2</sup>.

Table 2. Conceptual diagram of intensity and value of activities generated per km<sup>2</sup>

		Value (\$TT per km <sup>2</sup> )		
		Low	Medium	High
Environmental Intensity	Low	Jet Skiing		
	Medium		Windsurfing	
	High			Glass Bottom Boats

## *Conclusion*

Conflict between use patterns and user patterns observed at Buccoo Reef along with the increasing pressures on BRMP to achieve a variety of objectives and cater to a variety of stakeholders typifies the new pressures MPAs around the world have to accommodate. These issues extend beyond the boundaries of BRMP to include most developing countries attempting to balance conservation with development.

It is important for managers to be aware of current use patterns occurring in a protected area. User activities are always going to reflect a trade-off between the different benefits of the area and are reflective of the wider trade-off happening in the environmental movement as conservationist seek partnerships with different sectors such as development (tourism) in order to protect biodiversity. Use patterns are the physical manifestation of mans relationship with his environment and the wider socio economic context in which it is embedded.