Preliminary results from Reef Valuation study, Saint Lucia, West Indies 2000-2001

Nola Barker* and Callum M. Roberts
Environment Department, University of York, York YO10 5DD, UK
*Email: nhlb100@york.ac.uk

These results are preliminary findings from visitor and dive operator interviews carried out in Saint Lucia between December 2000 and September 2001. More detailed results will be forthcoming when analyses are complete. Nola Barker carried out all the interviews.

Summary

1. We interviewed 459 visitors about their holiday choices and expenditure patterns and 327 visitors about marine park issues including their views on proposed marine park programs and their willingness to pay increased marine park fees. In 2000, visitors spent US$7.3 million on diving and snorkeling tours, nearly half of which (US$3.5m) was attributable to tours taken within St. Lucia’s marine protected area, the Soufrière Marine Management Area (SMMA). 44% of visitors said they went to St. Lucia because of the existence of the SMMA and over 90% were willing to pay more than the stated fees. Using the maximum amount that 75% or 50% of visitors were willing to pay would increase annual revenue by 62% or 128%, bringing it to US$41,550 and US$58,475 respectively. Such increases in revenue could pay for higher management standards and support the park’s conservation efforts.

2. We also interviewed either the owner or manager of each of the nine dive businesses operating during 2001. Those businesses collectively employed over a hundred people, with St. Lucians taking up 71% of managerial and 97% of water sports staff positions and spent around US$1.4 million on salaries that year.

3. Analysis of the data showed that:

   • Each visitor spent on average US$2,276 on their trip to St. Lucia and on average, spent 7 days on the island.

   • Visitors staying on the island spent more on their trip (median of US$172 per day) than cruiseship visitors (median of US$69 per day).

   • Visitors coming primarily to dive spent more than those coming for a general holiday or business (median of US$2528 versus US$1896 for general holiday and US$1625 for business) whether they stayed on the island (median trip length of 7 days) or were cruiseship visitors (median trip length of <24hrs).

   • 75% of divers were willing to pay at least US$6 for a daily SMMA fee, and 50% US$7.
• 75% of divers were willing to pay at least US$20 for an annual SMMA fee, and 50% US$30.

• Over 90% of snorkelers were willing to pay at least US$2 per day, and 50% US$4.

• 40.5% of visitors said they would have liked the option of an annual snorkeler fee, and 75% were willing to pay at least US$10 for it, and 50% US$20.

4. Recommendations:

• Raise the SMMA fees to what 75% of visitors are willing to pay, i.e. daily dive fee to US$6, annual dive fee to US$20 and daily snorkel fee to US$2. This would significantly increase park revenue and is unlikely to reduce dive and snorkel numbers given the low level of fees relative to overall holiday spending.

Introduction

Tourism is one of St. Lucia’s biggest contributors to the economy, in 2001 accounting for an estimated 53% of the island’s GDP (WTTC, 2002). Annual visitors have doubled over the last decade and in 2000 numbered over seven hundred thousand with 64% arriving by cruise ship (St. Lucia government statistics, 2002). Part of St. Lucia’s priorities in tourism development is to target niche markets and diversify the tourist product (Ministry of Tourism and Civil Aviation, St. Lucia 2002). One such niche considered ready for expansion is marine-based tourism directly linked to the coral reefs that fringe the island, in particular diving and snorkeling. However, the diving and snorkeling product relies on the continued existence and maintenance of marine resources, particularly the coral reefs. Reefs suffer from many human-induced pressures not only including damage from users themselves, but also from pollutants such as sediment, chemicals and sewage coming from coastal and inland activities. With the potential increase in marine-based tourism, associated development and pollution problems, there is obvious need for management of coral reefs and land based activities, and visitors can help pay for this.

Marine protected areas (MPAs) have been useful in helping to conserve reef resources including fish stocks since the early 20th century (Badalamenti et al., 2000), although not widely established until the 1970s and 1980s. Some 660 MPAs that incorporate reefs now exist throughout the world (Spalding et al. 2001). Despite this, in many MPAs, protection has not been realised due to lack of finance and/or management (Kelleher et al. 1995). According to Mr. Wulf, manager of the Soufrière Marine Management Area, in 2001, user fees levied on visitors to the SMMA financed approximately 50% of the park’s management costs. However, to finance what Mr. Wulf perceives to be the desired level of management, additional economic support is necessary.
Anecdotal evidence suggests that the most popular and certainly the most advertised dive sites are those within the SMMA. Determining whether user fees to these sites could be increased, and if so by how much, is an obvious first step towards finding a solution to the present problem.

Financial and economic values of a resource highlighting the costs and benefits of uses have been used successfully in various protected areas in the world. These include, among others, the Great Barrier Reef Marine Park and the Tasmanian Wilderness World Heritage Area, in Australia (Drilm, 1994), Bonaire Marine Park in the Netherlands Antilles, Buckoo Reef in Tobago, Key Largo National Marine Sanctuary in Florida (Dixon and Sherman, 1990) and the Marine Reserve of Apo Island in the Philippines (Vogt, 1997). In St. Lucia, no information has so far been gathered on the financial and economic values of the island’s marine managed area in terms of diving and snorkeling, even though the coral reefs are part of its natural capital used for economic development and hence vital to the country’s dive and snorkel tourism industry. Using information from visitors and dive operators, we investigate benefits in terms of revenue directly attributed to diving and snorkeling activities, and in terms of number of people employed.

Unless the values of St. Lucia’s reefs are properly appreciated it is likely that predicted increases in pressures associated with visitor use, development and the plethora of stresses resulting from a growing population and economy may result in their gradual deterioration potentially culminating with their eventual loss. As reported by Bryant et al. (1998), more than 100 countries benefit from the recreational values associated with reefs and almost half a billion people live within 100km of a coral reef. More than 80 percent of these reefs are under high or medium risk, primarily due to pressures such as coastal development. Through this case study we hope to both illuminate some of the economic benefits of reef-based tourism for a developing country, and evaluate the potential of that tourism to support adequate resource protection.

**Methods**

We interviewed and completed questionnaires, of which there were three types, with visitors over 26 weeks spread over two sampling periods. Period 1 was from December 2001 to March 2002 and period 2 from July to October 2002.

During sampling period 1, we investigated visitors’ holiday choices and expenditure patterns. We interviewed 459 visitors and asked them questions about reasons for their visit, prior visitation, length and place of stay. We sought information on their diving and snorkelling activities on the island including whether they required rental equipment and noted their previous coral reef experiences. We also asked questions on their spending including total holiday cost, amount spent on travel, diving, tours and meals as well as country of residence and age. To determine their exposure to environmental issues, particularly with regards to marine life, we asked whether or not they belonged to an environmental group or read articles on marine life.

In sampling period 2, we interviewed 327 visitors using a separate questionnaire and asked how the existence of the marine park had influenced their decision to visit the island. We then gave respondents details on existing and planned programs of the SMMA before asking them what was the maximum amount they would be willing to pay for access to marine park sites, explaining that revenues would go to support improved
management. To explore their attitudes regarding spending of revenues from fees towards SMMA programs, we asked them to give a score to six proposed programs according to their view of importance. As in sampling period 1, we assessed respondents’ exposure to environmental issues. Lastly, we asked them to state their household income level.

During sampling period 2 we also interviewed and completed a questionnaire with either the owner or manager of the nine existing dive operators on the island asking questions relating to their business and clientele. Questions included number of years they had been in business, whether they were affiliated to a hotel and how much of the business was St. Lucian owned. We also asked whether they had a retail store, what percentage of their sales were derived from diving and snorkelling (versus equipment rental and retail sales) and whether they sold packages offshore and through whom. We asked how many full and part-time employees they had and where they were from, how much was spent on salaries and overall dive shop annual income and profit. We also enquired as to how many divers and snorkelers they sold trips to per year, the mean number of trips taken per visitor per trip to St. Lucia, average package value per customer and what sites they used for these activities.

The overall refusal rate for both sampling periods was less than 3% for visitors and 0% for dive operators.

**Results**

**Visitor characteristics**

Most respondents (61%) were American residents aged between 40-49yrs visiting St. Lucia for a holiday. Over a third (35%) of respondents stated their main reason for visiting St. Lucia was to dive or snorkel on the reef. The remainder who gave other reasons still partook in either one or both as a holiday activity. However, it should be remembered that interviews were conducted at beach resorts and this pattern is unlikely to fully represent visitors to St. Lucia in general. More than half of respondents had experienced diving or snorkeling on coral reefs elsewhere in the world. Repeat visitors made up 13% of the sample. Most respondents (72%) were exposed to environmental issues either by being members of an environmental organisation, reading articles on marine life or by watching environmental programmes on television.

Length of stay ranged from a few hours (day-trippers) to permanent residence with the most common duration of stayovers of more than 24 hours being 7 days.

Divers among the respondents planned on completing between one and twenty day dives and a quarter of divers planned to do one or two night dives.

More than half of divers and a quarter of snorkelers rented equipment, ranging from mask and snorkel to buoyancy compensating devices (BCDs) and cameras.

**Expenditure patterns**

Analysis of total cost of trip including travel, accommodation and spending money per person, whether stayover or day-tripper, revealed a range from US$480 to US$10,000, with a mean of US$2,276. Stayovers spent on average more than day-trippers.
Data on expenditure per person and expenditure per person per day by main purpose of visit shows that those people that went to St. Lucia primarily to dive spent the most per trip out of all respondents, irrespective of whether they were stayovers or day-trippers.

Table 1. Total cost of trip per person classified by main purpose of visit

<table>
<thead>
<tr>
<th>Main purpose of visit:</th>
<th>Stayovers</th>
<th>Day trippers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of respondents</td>
<td>Median cost US$</td>
</tr>
<tr>
<td>To dive</td>
<td>63</td>
<td>2528</td>
</tr>
<tr>
<td>To snorkel</td>
<td>5</td>
<td>1825</td>
</tr>
<tr>
<td>To dive or snorkel</td>
<td>63</td>
<td>2044</td>
</tr>
<tr>
<td>among other reasons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For a general holiday</td>
<td>185</td>
<td>1896</td>
</tr>
<tr>
<td>For work or business</td>
<td>12</td>
<td>1625</td>
</tr>
</tbody>
</table>

Over two thirds of respondents (68%) were on a package holiday. These varied between those including only accommodation and airfare to those including meals, diving and snorkelling trips in addition to other watersport activities offered by their resorts. The mean total cost of a trip, whether as part of a package or not was similar at approximately US$2300.

The SMMA and visitors’ willingness to pay for increased fees

44% of respondents said they decided to visit St. Lucia because of the existence of the marine park. Only a small proportion (11% of divers and 17% of snorkelers) of respondents did not know of the existence of the marine park prior to their visit.

At the time of the research, marine park fees were US$4 and US$12 per diver (daily and annual fee respectively) and US$1 per snorkeler (daily fee available only). Figure 1 shows the willingness to pay for increased fees split between divers and snorkelers, daily and annual fees. Over 90% of divers and snorkelers were willing to pay more than the stated daily and annual fees. Seventy five percent of divers were willing to pay at least US$6 for a daily fee, and 50% US$7. Seventy five percent of divers were willing to pay at least US$20 for an annual fee and 50% US$30. Seventy five percent of snorkelers (and up to 91.5%) were willing to pay at least US$2 per day, double the current fee and 50% US$4. Although an annual fee is currently not available to snorkelers, 41% of respondents said that they would like such an option. 75% were willing to pay at least US$10 for it, and 50% US$20.
Fig. 1. Visitors’ maximum willingness to pay for daily and annual marine park fees.
Income appeared not to affect how much divers were willing to pay but for snorkelers, those earning more were willing to pay more for the fees. Most respondents noted that their marine park experience had satisfied their expectations and this experience did not influence willingness to pay. Exposure to environmental issues by belonging to an environmental group or organisation, reading articles on marine life or watching environmental programmes on television also had no effect on willingness to pay.

When respondents were asked to give proposed SMMA programs a score according to importance, relatively high importance ratings were given for all programs except for ‘increasing facilities for users of the marine park such as developing snorkel trails’. The other programs were: (1) Increase implementation and enforcement of existing policies e.g. increase patrols carried out by the rangers, so improving the effectiveness of protection, (2) Develop alternative employment programs for fishermen who are displaced by no-fishing zones, (3) Increase facilities for users of the marine park such as developing snorkel trails, (4) Train fishermen in deep sea fishing techniques to divert pressure from the near-shore resources, (5) Establish a trust fund to acquire critical land and beach area for conservation purposes and (6) Develop programs to share information and experiences with other marine parks e.g. the ranger exchange program.

Dive operators

Dive centres had a combined fleet of 18 boats capable of carrying a total of 357 passengers excluding staff.

Seasonality affected operators differently. For six of them, the high season was any time from November through to August, and a low season from February to November. The length of each season varied between operators and from year to year, ranging from 3 to 9 months for the high season and 2 to 6 months for the low season. Three operators found no distinct seasonality in their diver and snorkeler business.

Averaging over the years 1999-2000, number of divers buying trips from individual operators ranged from 450 to 14,000 divers annually, with a total of 34,500 divers for the year 2000. The annual number of snorkelers who bought snorkel trips through operators ranged from 50 to 28,000, and for the year 2000 totalled 32,900 (all operators collectively). The median number of dive and snorkel trips taken per customer was 4 and 1 respectively.

Annual gross revenue for dive operators collectively was estimated at US$1,597,413.

Collectively, the dive operators employed 14 management and 96 water sports staff full-time, plus 9 water sports staff part-time. The percentage of St. Lucians in managerial and water sports staff positions was 71% and 97% respectively. The remainder were non-Caribbean. Amounts spent on salaries annually, including all staff and managers for all nine operators totalled US$1,357,136. According to estimated gross revenue, this would suggest that dive businesses are making very little money or that the gross revenue figure may not be reliable.

Site use by operators for their dive and snorkel trips ranged from Pointe du Cap in the north to Caraibe Point in the south. In general operators tended to use sites closest to them, but with one exception, all routinely used sites within the SMMA. Operators also submit to the SMMA records of dive trips to individual sites. Using this and information
gathered from my interviews, we estimated that around 60% of the island’s total diving activity was occurring at sites within the SMMA, which also included some of the island’s most popular snorkel sites, namely Anse Chastanet and Jalousie. Anse Chastanet was estimated to receive 20% of the island’s diving activity and is one of the most advertised and used snorkel sites. Anse Cochon, 6km north of the SMMA is another locally renowned snorkeling area.

Anecdotal evidence and personal observations indicated times when several boats, including those with a capacity of over 70 people, were using this site simultaneously resulting in over a hundred snorkelers in the water. During interviews, some operators voiced their concerns regarding the high use of Anse Chastanet and Anse Cochon sites reporting that the reefs in these areas were being degraded and over used. Comments from visitors diving and snorkeling on Anse Chastanet reef varied. Some described it as amazing, and others, particularly those returning to the same site after between one and twenty-two years, noted that the corals appeared fewer and looked dead.

**Discussion**

Reef tourism in St. Lucia is a valuable business. Tourists spend significant amounts in order to dive and snorkel on St. Lucia’s coral reefs and for many, these activities are their prime motivation for choosing to holiday there. Marine parks are another significant factor in visitors’ decisions to visit an area but parks do not always maximise the financial benefits that these visitors could bring to them. This study shows that in St. Lucia, user fees could be increased and in so doing pay for improved management. By calculating the financial gain derived from visitors and dive businesses we can put a value on coral reefs directly attributable to reef tourism and thus highlight the value of conserving and managing the resources on which that tourism industry depends.

Although St. Lucia has no statistics on numbers of people taking part in reef-based activities, its financial significance is clear from diver and snorkeler expenditures. I estimate that reef tours and marine park fees alone contributed some US$7.3 million in 2000. Using the information on site use by operators, I estimate that roughly half of this revenue (US$3.5 million) comes from dive and snorkel trips done within the marine park. Dive and snorkel businesses also benefit. In St. Lucia, most of these businesses are St. Lucian owned and collectively employ a workforce of over a hundred people. In addition the hotel and restaurant industry that caters to visitors employs some 17,382 people or 11% of the total population (St. Lucia government statistics, 2001). Central government also derives revenues from hotel occupancy (US$8.5 million) and travel taxes (US$936,000) as well as reporting an annual visitor expenditure of US$108 million.

The average cost of trip per person to St. Lucia in 2000 was US$2000. Stayovers in St. Lucia spent more than day-trippers and other researchers have also found stayovers to spend more than day-trippers. This backs up research in Dominica, an island 150km north of St. Lucia, which also found stayovers to spend more than day-trippers (US$65 compared to US$36 per day, Westbrook *et al* 1997). Despite the lower expenditure of day-trippers arriving by cruiseship, this type of holiday has significantly increased since the early 1980s and the trend is set to continue (CLIA, 2002). Many countries in the Caribbean actively encourage it.
Similarly, package holidays have, over the years increased and are now the major form of vacation (Wood and House, 1991 cited in Gössling, 1999). Almost half of respondents interviewed in the present study bought their holiday as a package. Although the total holiday cost, whether package or not, was the same for respondents, it is likely that non-package holidays resulted in greater financial benefits to the St. Lucian economy. Package holidays are renowned for problems associated with ‘leakage’. Significant proportions, sometimes up to 80%, of revenue is repatriated due to expenditures on tourism-related imports and services, foreign ownership of businesses, or overseas credit loans (Gössling, 1999). Estimates of the leakage rate in St. Lucia range from 45% in 1978, to 61% for 1986 (Wilkinson, 1997 cited in UK CEED, 1998). The increase in cruiseship activity and development of all-inclusive resorts both in St. Lucia (UK CEED, 1998), and the Caribbean in general (Miller and Auyong, 1991) where all or most guest services are included in one pre-paid holiday package price, may aggravate the problem of leakage. In addition, there may be an increase in conflict between visitors and local communities, who often perceive that all-inclusive resorts exclude them from benefiting from tourism.

The environment plays an important role in attracting these tourists who bring with them financial benefits. Coral reefs and marine parks are particularly valuable resources and attractions. Many visitors to St. Lucia showed an interest in environmental issues and nearly half of those interviewed said they visited St. Lucia because of its marine park. This demonstrates the value of marketing protected areas for economic gain.

For the marine park in St. Lucia, part of the economic gain from visitors comes in the form of user fees but these fees appeared to be lower than what most visitors were willing to pay. More than 90% of divers and snorkelers interviewed were willing to pay above the current daily and annual fees for the SMMA.

Anecdotal evidence suggests that visitors would be willing to pay higher fees so long as they could see where the money was going. In this study many visitors wanted information on the biological aspects of the reef and marine park projects. What many visitors did express, was their objection to paying for an ‘annual’ fee when they were only staying a few weeks and were unlikely to be revisiting the island within the next 12 months. However, this is more of a marketing problem than a cost problem since as my data shows, most visitors are willing to pay above the current fees. Replacing ‘annual’ with ‘multiple day, valid for 12 months’ for example, may resolve this issue.

Implementing and increasing fees could result in a decrease in visitation. However studies have showed that visitation appears to be relatively insensitive to price and despite a possible initial drop, numbers recover rapidly (Walpole et al., 2001, Mundet and Ribera, 2001). We therefore suggest that fees should be increased to the level that 75% of people are willing to pay, i.e. to raise diver daily fees to US$6, diver annual fees to US$20 and snorkeler daily fee to US$2.

When we asked visitors to score the various proposed SMMA programs according to importance, only one received a low score, ‘increasing facilities for users of the marine park such as developing snorkel trails’. This is interesting since it is one of the only things that would directly affect tourists. Many visitors disliked the idea of snorkel trails suggesting that it would lead to overcrowding and spoil the naturalness of the area. Certainly, research in the Great Barrier Reef has shown that snorkel trails localise damage to that area and immediate surrounds, particularly near interpretative signs.
Concentrating damage to certain areas may be helpful though if it means other areas are left less disturbed.

For countries whose economies are significantly supported by coral reef tourism such as St. Lucia, Saba, Bonaire, the Maldives, the Seychelles and Australia, continued existence and growth of their industries requires a high quality underwater environment. This only comes from management, control of development and controlled use of the resources. The establishment of marine protected areas and the charging of fees to use protected areas for recreation and commercial purposes can go a long way to providing the funds necessary to finance such protection. As this study shows, the vast majority of reef users are willing to pay such fees and in many cases are willing to pay much more than is currently being asked. If marine protected areas were to harness more of the potential income from visitors, a greater proportion of management costs could be met.

Acknowledgements

We thank the dive operators and their staff for their valuable input, time and co-operation, and the visitors themselves. Thanks also go to assistance given by the staff of the SMMA and the Department of Fisheries. This publication is an output from a project part-funded by the UK Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID. The research was co-funded by the Natural Environment Research Council.

References


CLIA Cruise Lines International Association
http://www.cruising.org/press/overview/ind_overview.cfm#c2


WTTC: World Travel and Tourism Council, 2002