Ecotourism in Bako National Park, Borneo: Visitors' Perspectives on Environmental Impacts and their Management

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Ecotourism potentially provides a sustainable approach to development in Malaysia. However, to realise this potential the adverse effects of visitor activity and associated infrastructure on the natural environment and the tourism experience must be identified to guide management actions and thus to sustain the resources on which ecotourism ultimately depends. This study, conducted in Bako National Park on the island of Borneo, reports one of the first efforts to identify the impacts of ecotourism in Malaysia from the perspective of visitors. Environmental conditions of greatest influence on visitors’ experiences included litter and biophysical conditions such as soil erosion and vegetation damage. These conditions were of greater concern to visitors than social conditions, such as the number of people. These results suggest that management efforts can be directed towards indicators of greatest concern such as litter, soil erosion and vegetation damage. The broad support given by those surveyed for a range of management actions provides managers with a choice of strategies to sustain ecotourism in Bako National Park. This study, with its sociopolitical approach, contributes to a greater understanding of the implications of the ecotourist experience for ecotourism management in Malaysia.

Introduction

Tourism has long played an important role in the economy of Malaysia, representing the second most important industry sector and generating at least RM 9.6 billion of the country’s gross domestic product (Razak, 1995). Within the tourism industry worldwide, ecotourism is one of the fastest growing sectors (Eagles, 1995). The World Tourism Organisation (WTO) has recently estimated that ecotourism is worth some $20 billion a year, and together with nature-based tourism, accounts for 20% of global international travel (WTO, 1998). In the Asia-Pacific region, ecotourism has grown faster than tourism generally (Lindberg et al., 1998). Ecotourism has therefore come to signify an attractive investment proposition. In particular, Sarawak’s tourist receipts have increased from RM 140.6 million in 1989 to RM 522.3 million in 1997 (Malaysia Tourism Promotion Board, 1997). The promise of ecotourism is that financial benefits originating from the influx of foreign tourist income may be employed to finance the provision and management of national parks to conserve the natural resources that ecotourists so willingly pay to experience. Thus, ecotourism confers economic value on the conservation and protection of natural areas.
representing the potential for a sustainable approach to development in Malaysia.

However, despite this mutually beneficial relationship between ecotourism and natural resource conservation, the impacts of ecotourism may also adversely affect the resources on which it depends. Therefore, in order to sustain ecotourism in Malaysia, it is essential to understand the potential effects of the expanding ecotourism sector on the natural environment, so as to identify management priorities for present and potential ecotourist destinations. It is widely recognised that both the environmental conditions of natural areas and the quality of the ecotourist experience are influenced not only by the number of visitors per se, but by the impacts those users have on the ecological and social conditions (Prosser, 1986). In this way, visitors are at the centre of ecotourism management: they impact the natural environment and the tourism experience, while the quality of the experience is affected by the management actions necessary to ameliorate those impacts. Hence, users represent a valuable resource for gaining information about the presence and extent of impacts, the acceptability of environmental change, and the consequences of management actions for their experience.

The centrality of visitors is embodied in the approach taken by the Visitor Impact Management (VIM) planning framework, which explicitly recognises the value of both judgemental and scientific considerations for effective management of natural areas (Graefe et al., 1990). This recognition means that identifying the significance of biophysical and social impacts is necessarily value-laden, and as such, natural area planning and management must be recognised as a sociopolitical process (Morin et al., 1997). Therefore, rather than relying on technical assessment to determine carrying capacity and use-limits – an approach that has proved unworkable in addressing resource management problems (McCool, 1989; Lindberg et al., 1997) – the VIM approach is based on the principle that both the environment and the quality of the recreation experience are complex, and are influenced by a number of factors besides use levels. The VIM process thus incorporates a number of successive stages: review database (identify unacceptable visitor impacts); review management objectives; identify measurable indicators; select standards for indicators; assess current conditions of impact indicators; identify probable causes of impacts; identify a range of alternative management strategies; and implement selected strategies (Graefe et al., 1990).

This paper reports on a study of visitor impacts in Bako National Park in Sarawak, on the island of Borneo (Figure 1). Specifically, the aims of this study were to:

- identify unacceptable visitor impacts from the perspective of visitors (step 1 of the VIM process);
- identify potential indicators based on the impacts identified (step 3 of the VIM process); and
- identify visitors’ support for potential management actions (step 7 of the VIM process).

Bako National Park was selected as the study site for two main reasons: it is an established ecotourist destination and existing management objectives for the
Ecotourism in Sarawak

Ecotourism has been defined by the Ecotourism Society as ‘responsible travel to natural areas which conserves the environment and improves the welfare of local people’ (cited in Cochrane, 1996: 241), a definition which emphasises the view that ecotourism should have positive impacts. The government of Sarawak believes that ecotourism can contribute to the preservation of the environment (Anonymous, 1996), which is an approach consistent with this definition.

However, management of tourism in Malaysia’s natural areas is complicated by the federal system of government. Hall (1994: 87–88) reveals that ‘authority for various natural resources is haphazardly divided under different government umbrellas and respective state authorities. Forest parks, for example, fall under the jurisdiction of the national Wildlife Department. Land matters come under the state authorities while marine life and fisheries is overseen by the Fisheries Department’. This situation has meant that there is no single authority empowered to make decisions about the environmental implications of tourism development.

Bako National Park, in 1957, was the first of ten national parks to be gazetted in Sarawak. It covers an area of 2742 ha and is located 37 km east of the capital city of Kuching. A road was completed from Kuching to Bako National Park in 1985,
and access to the Park itself requires a short longboat journey along the Bako River. The government’s commitment to conservation in Bako National Park is evident in this statement by the permanent secretary for Sarawak’s Ministry of Tourism: ‘it would easily have been possible to build a road up to Bako National Park, but we decided against the idea, precisely because it would have made the park too accessible to visitors, and too difficult to protect’ (quoted in Anonymous, 1996: 112). Facilities within the Park, including the park office, information centre, canteen, accommodation and camping ground, are concentrated near the jetty where the tourist boat arrives. Recreational access within the Park is facilitated by a 30 km trail system that incorporates 16 colour-coded trails, and offers a number of trekking options ranging from relatively easy walking tours to full-day forest treks.

Attractions include the variety of coastal and forest ecosystems of the Park, and the abundant wildlife. The major vegetation types of Bako are associated with the diverse soil and geological formations, and include sandstone cliff vegetation, mangrove forest, mixed dipterocarp forest, peat swamp forest, kerangas (heath) forest and kerangus scrub on the plateau. Mixed dipterocarp forests dominate and provide habitat for the diverse wildlife. In particular, three species of monkey are found in the Park, including the proboscis monkey that inhabits the mangrove swamps and is found only in Borneo, and the silver leaf and the common long-tailed macaques.

There is a lack of reliable data specifically on ecotourist numbers to Sarawak (Davison, 1995). Bako National Park itself received about 5000 visitors per year between 1981 and 1984, mainly of local origin, with only a few hundred being overseas visitors. Following the completion of the road from Kuching in 1985, local visitor numbers peaked at about 30,000, and have since declined to approximately 10,000 per year since 1989. In contrast, overseas visitor numbers have increased steadily since 1989 to reach almost 9,000 in 1995, although numbers fluctuate and dropped to 6000 in 1996 (Bako National Park Information Centre, 1997). The increasing number of overseas visitors is probably due to the success of promotional strategies such as ‘Fascinating Malaysia’ in 1988 and ‘Visit Malaysia Year’ in 1990 and 1994. Total visitor numbers ranged between 15,000 and 20,000 from 1988 to 1996.

Despite this growth in visitors to Bako National Park, very little information exists regarding the environmental (biophysical and social) impacts of visitor activity and the effect of these impacts on the visitor experience. Lindberg et al. (1998) report that this is true of the Asia-Pacific region as a whole; and Valentine and Cassells (1991) have identified the need for studies of visitor impacts and experience in tropical rainforests generally. This study aims to contribute to the current information deficit by identifying the environmental impacts of ecotourism in Bako National Park as perceived by visitors.

Impacts of Ecotourism

This paper draws on previous research on the environmental impacts of visitors in ‘wilderness’ and natural areas as well as current ecotourism research. McKercher (1996) argues that there is little or no difference between tourists and ‘wilderness’ visitors because they share the same resources and facilities and
exert similar impacts when the same activity is undertaken. Further, McKercher (1996: 563-4) notes that making the artificial distinction ‘serves no practical management purpose because tourists and non-tourists alike are part of the broader visitor management issue’.

The environmental impacts of ecotourism have been published by a number of writers. Some have focused on tourism in natural areas (Cohen, 1978; O’Grady, 1981; Mathieson & Wall, 1982; Buckley & Pannell, 1990; Andereck, 1995; McArthur, 1996; Shackley, 1996), while others have taken a specifically ecotourism approach (Roo, 1990; Long, 1991; Ollindo 1991; Sherman & Dixon, 1991; Ceballos-Lascurain, 1996; Commonwealth Department of Tourism, 1994; International Centre for Tourism Research, 1995; Preece et al. 1995). Studies focusing on tourism in Malaysia have been documented by Din (1993), Hall (1994), Wright (1994), Sherman and Dixon (1991), Walton (1992) and Lindberg et al. (1998), and those concentrating on tropical rainforests include MacKinnon et al. (1986), Valentine and Cassells (1991), Valentine (1992), Kinnaid and O’Brien (1996), and Wearing and Larsen (1996). Of particular relevance to the study reported in this paper are a number of visitor impact studies conducted in natural areas (Anderson & Manfredo, 1985; Roggenbuck & Lucas, 1987; British Columbia Forest Service, 1995; Lucas, 1990; McCool et al., 1990; Department of Conservation and Land Management, 1991; McNeely et al., 1991; Watson et al., 1992; Dowling, 1993; Morin et al., 1997). The following brief summary of the environmental impacts of ecotourism is drawn from this literature.

The benefits of ecotourism include an enhanced appreciation of natural environments, both in terms of their intrinsic and economic worth for protection and conservation; the educational value of exposing visitors and locals to nature and conservation; and the potential of ecotourism to motivate the designation of additional natural areas for conservation and protection. Conversely, pressures originating from inappropriately managed infrastructure and visitor activities can adversely impact the receiving environment. Negative impacts on terrestrial ecosystems include destruction of plant and wildlife habitats; soil and dune erosion; soil compaction; disruption of soil stability; alteration of geological regimes; disruption of nutrient cycles; and reduction in biodiversity. Impacts on vegetation include structural alterations to plant communities; damage due to trampling; the introduction of exotic species carried in on clothing; and direct removal of specimens through harvesting. Further to these biophysical impacts, increased human presence may lead to disturbances such as litter, as well as air and noise pollution caused by vehicles.

Although there is limited understanding of the effects of tourism on wildlife (Andereck, 1995), all of the aforementioned impacts may have deleterious effects. Direct impacts on wildlife include disruption of behaviour such as feeding, breeding, and mother-offspring interaction; poaching; killing (usually accidentally); and the disruption of predator-prey relationships. Indirect impacts on wildlife include changed habitats and feeding patterns, due for example to the attraction of wildlife to litter (Mathieson & Wall, 1982), and the introduction of disease. Even the pressures of photography may impact on wildlife, and have been reported to cause a decline in the breeding success of many coastal bird species in the Galapagos Islands (Mathieson & Wall, 1982). Wildlife may also be directly impacted by visitor management techniques which place a
priority on visitor satisfaction. For example, in the Yucatan Peninsula boatloads of tourists were driven into groups of feeding flamingos to make them take flight (Long, 1991), and in the Galapagos Islands National Park visitors were allowed to approach frigate bird nesting areas (MacKinnon et al., 1986).

Many biophysical impacts also adversely affect the visitor experience. Buckley and Pannell (1990) have identified damage to the natural environment as one of the major detractors from the visitor experience. Additional impacts on such experiences include noise (human and mechanical), visual impacts (such as infrastructural developments and signs) and crowding. With respect to the latter, both overall numbers of people and group size are conditions identified as impacting on visitors’ experiences in natural areas (McNeely et al., 1991; Freece et al., 1995; Morin et al., 1997).

Research Methods

This study was based on a literature review and questionnaire. The literature review identified the potential impacts of ecotourism as described in the previous section, which were then used to guide questionnaire development. The questionnaire was designed to gain information from visitors to Bako National Park. The sampling frame was limited to Park visitors approached while in the Park. Visitors were asked if they would like to participate in the study, and if they agreed, were given a brief description of the study objectives. The questionnaires were distributed at the canteen, accommodation areas and Park office, places which most visitors frequented at some stage of their visit.

The study was conducted between December 1996 and January 1997, with 284 questionnaires distributed by one on-site researcher assisted by two volunteers, and 46 questionnaires distributed by Park staff. A total of 210 responses were obtained from the 284 questionnaires distributed by on-site researchers, representing a 74% response rate. Of the 46 questionnaires distributed by Park staff, 26 were returned, representing a 56% response rate.

The questionnaire was written in English, and comprised three sections: visitor and visit characteristics; activities undertaken; and visitor perceptions of impacts and management strategies. The assumption underlying all aspects of this study is that information about, and generated by, visitors is essential to the successful planning and management of natural areas that aim to sustain ecotourism. The first part of the questionnaire was designed to obtain demographic information, including age, length of stay, travel companions, countries of origin, gender and source(s) of information about the Park. The second part investigated the types of activity visitors participated in, and asked visitors to rate the importance of each activity from ‘not at all important’ to ‘extremely important’. The third part focused on impacts and Park management. Respondents were asked to identify impacts they had observed, as well as impacts with the potential to affect both the Park itself and the experience of the visitor, even if they had no obvious effect at the time of the survey. These impacts were drawn from the literature surveyed earlier in this paper, including visitor surveys conducted in Malaysia (Lindberg et al., 1998), Canada (British Columbia Forest Service, 1995) and Australia (Morin et al., 1997). Visitors were also asked to rate
specific management concerns, and to express the extent of their support for potential management strategies.

The survey data was collated and analysed using several techniques: Minitab for Windows software for collation of data, supplemented by Microsoft Excel for Windows 95 for raw data transfer to Minitab; percentage comparisons to provide a general overview of responses; and statistical z-tests to analyse changes in the numbers of respondents identifying observed and potential impacts.

**Results and Discussion**

**Visitor and visit characteristics**

Successful management of tourism in natural areas depends on knowledge of both visitor and use characteristics (Buckley & Pannell, 1990; Morin et al., 1997). In this study, males and females were equally represented within the sample of visitors surveyed. A large proportion of visitors were aged between 16 and 40 years (76%), results supported by studies conducted in America, which have found that wilderness visitors tended to be younger than the general population (Roggenbuck & Lucas, 1987; Lucas, 1990). Visitor studies conducted in Taman Negara National Park in Malaysia also found that the majority of visitors (89%) were under 40 years old (Lindberg et al., 1998). These results contrast with those of a 1988 study of ecotourists visiting five Latin American and Caribbean countries, conducted by the World Wide Fund for Nature, which found that the average age was slightly higher than that of 'leisure tourists' at 44 years (Ceballos-Lascurain, 1996).

The relative youth of Bako visitors, when considered alongside the fact that a large proportion of Bako visitors were overseas travellers, originating from Western (45%) – predominantly Australia, the United Kingdom and continental Europe – and other Asian (14%) countries, may indicate that more 'adventurous' holiday destinations such as tropical rainforests tend to attract younger people. In contrast, visitors to the Nuyts Wilderness area in Western Australia were mainly of local origin and a more balanced proportion of people from 26 to 60 years old was found (Morin et al., 1997).

The number of visitors of distant origin (59%) corresponds to the number of visitors who stayed at least one night in the Park (58%). Good (1988) has observed that overseas visitors tend to stay in the Park for longer periods. Forty per cent of visitors originated locally – from other Malaysian states (17%), other towns and cities of Sarawak (14%) and Kuching (9%) – and local visitors are known to be dominated by day trippers (Good, 1988). Forty-two per cent of visitors stayed less than 24 hours in the Park. The extended length of stay of over half of all visitors signals an opportunity for the use of education as a potential management tool.

The activities participated in by more than half of the respondents all related to the enjoyment of nature, and included hiking (76%), sightseeing (72%), observing wildlife (66%), relaxing (61%) and photography (61%). Less than half of the respondents went swimming (41%). Research reported by Lindberg et al. (1998) also found hiking to be the most common activity undertaken by visitors to Taman Negara National Park in Malaysia. These results also correspond to the findings of Morin et al. (1997) on wilderness use in Western Australia.
Conversely, wilderness visitors in the United States tend to participate in a wider variety of activities, which include such 'consumptive' activities such as fishing and hunting (Lucas, 1990).

The activities undertaken in Bako National Park were found to mirror the activities visitors indicated were most important to their visit. Over two-thirds of respondents indicated that being close to nature (78%), encountering wildlife (72%), learning about nature (70%) and viewing the scenery (71%) were very/extremely important (Table 1). Viewing wildlife was also an important activity in the tropical rainforest of Tangkoko Duasada Nature Reserve, where 74% of visitors surveyed indicated that viewing primates was a primary objective (Kinnaird & O'Brien, 1996). These activities are highly dependent on the quality of the natural environment, suggesting that visitors to Bako National Park specifically seek the natural qualities of the Park, rather than merely using the forest as a backdrop, as Valentine and Cassells (1991) found is often the case with visitors to Queensland’s rainforests in Australia.

**Visitor perceptions of impacts and management concerns**

**Table 1** Importance of activities undertaken by visitors in Bako National Park

<table>
<thead>
<tr>
<th>Activity</th>
<th>Very/extremely important</th>
<th>Somewhat important</th>
<th>Not at all/not very important</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentage of respondents*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close to nature</td>
<td>78</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>Observe/encounter wildlife</td>
<td>72</td>
<td>21</td>
<td>6</td>
</tr>
<tr>
<td>Learn about nature</td>
<td>70</td>
<td>20</td>
<td>6</td>
</tr>
<tr>
<td>Scenery</td>
<td>71</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>Break from routine</td>
<td>54</td>
<td>28</td>
<td>15</td>
</tr>
<tr>
<td>Solitude</td>
<td>30</td>
<td>34</td>
<td>33</td>
</tr>
</tbody>
</table>

* Percentages have been rounded to the nearest whole number, and therefore do not sum to a total of 100% in all cases.

Visitor perceptions of observed and potential impacts were examined to identify possible indicators for monitoring, based on the premise that conditions of importance to visitors themselves are the best indicators of factors likely to adversely affect visitor experiences (McArthur, 1996; Morin et al., 1997). Impacts most frequently observed by visitors included soil erosion along walk-trails, litter along the beach/shore, wildlife attracted to rubbish bins, and smelly/discoloured water (Table 2). Vegetation damage along walk-trails, and hiking away from walk-trails, were also noted as current impacts by over 20% of the sample. In contrast to these biophysical impacts, only 5% of respondents perceived visitor numbers – a social impact – to be a current concern (Table 2). A number of respondents also commented on impacts that were not given in the questionnaire, including litter on the forest floor, waterlogging along some trails and at the accommodation area, provocation of wildlife, and a lack of enforcement of Park regulations.
Table 2 Visitor perceptions of observed and potential environmental impacts in Bako National Park

<table>
<thead>
<tr>
<th>Impact</th>
<th>Observed</th>
<th>Potential</th>
<th>Comparison: observed and potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of respondents</td>
<td></td>
<td>Significance (p)</td>
<td></td>
</tr>
<tr>
<td>Soil erosion at walk-trails</td>
<td>50</td>
<td>40</td>
<td>NS*</td>
</tr>
<tr>
<td>Litter along beach/shore</td>
<td>42</td>
<td>58</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Wildlife attracted to rubbish bins</td>
<td>38</td>
<td>45</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Smelly/discoloured water</td>
<td>36</td>
<td>31</td>
<td>NS*</td>
</tr>
<tr>
<td>Vegetation damage along walk-trails</td>
<td>29</td>
<td>39</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Litter around accommodation area</td>
<td>27</td>
<td>41</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Feeding monkeys</td>
<td>26</td>
<td>47</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Hiking away from walk-trails</td>
<td>22</td>
<td>45</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Soil erosion at accommodation area</td>
<td>19</td>
<td>35</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Too many people</td>
<td>5</td>
<td>28</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

* NS = not significant.

For almost all of the impacts, a greater number of respondents expressed concern about the potential impact than the observed impact. Statistical analysis using z-tests indicated statistically significant increases at the 1% level for most impacts (Table 2). In particular, about five times as many respondents indicated that 'too many people' represented a potential impact compared with the impact observed. Hiking away from trails, feeding monkeys and soil erosion at the accommodation area were identified as potential impacts by about double the proportion of visitors that had observed the impact. Differences between several other observed and potential impacts, namely wildlife attraction to bins and vegetation damage along walk-trails, were statistically significant at the 5% level (Table 2). These results suggest visitors believe that this suite of environmental conditions is likely to worsen in the future. Such perceptions are probably based on previous experiences in natural areas combined with pessimism regarding the ability of managers to deal with such problems.

Soil erosion along walk trails and smelly/discoloured water were the only two impacts where no statistically significant difference in respondent numbers was found for the observed and potential impact. For soil erosion, these results could be due to visitors' perceptions that the present severity of the impact means it is unlikely to get any worse. However, the results for water purity suggest a recognition that the observed problem is caused by naturally high tannin levels, which do not pose any health problems (Omar, pers. comm., 1997). Therefore, although water quality was identified as an impact, respondents did not consider it to be a factor influencing visitor experience of Bako in the future.

When asked to indicate how they felt about environmental impacts in Bako National Park, respondents emphasised biophysical rather than social conditions, such as the number of people or groups encountered (Table 3). These results contrast with the assertion of Lucas (1990) that social conditions generally affect visitor experiences more than natural conditions. However, the most important concern was litter, which is an indirect social (as well as a biophysical)
Table 3 Visitor perceptions regarding environmental conditions in Bako National Park

<table>
<thead>
<tr>
<th>Concern</th>
<th>Serious problem</th>
<th>Slight problem</th>
<th>No problem</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of respondents*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Litter around park</td>
<td>34</td>
<td>35</td>
<td>26</td>
<td>4</td>
</tr>
<tr>
<td>Damage to natural vegetation</td>
<td>19</td>
<td>38</td>
<td>35</td>
<td>9</td>
</tr>
<tr>
<td>Erosion along walk-trails</td>
<td>17</td>
<td>45</td>
<td>32</td>
<td>7</td>
</tr>
<tr>
<td>Health/condition of wildlife</td>
<td>15</td>
<td>26</td>
<td>44</td>
<td>15</td>
</tr>
<tr>
<td>Number of people encountered overall</td>
<td>11</td>
<td>20</td>
<td>65</td>
<td>4</td>
</tr>
<tr>
<td>Size of groups encountered</td>
<td>8</td>
<td>25</td>
<td>62</td>
<td>5</td>
</tr>
<tr>
<td>Number of human-made structures</td>
<td>4</td>
<td>24</td>
<td>66</td>
<td>6</td>
</tr>
</tbody>
</table>

* Percentages have been rounded to the nearest whole number, and therefore do not sum to a total of 100% in all cases.

Impact. Thus, issues felt to be a problem by more than 50% of visitors (inclusive of ‘slight problem’ and ‘serious problem’) included litter around the Park (69%), erosion along walk-trails (62%) and damage to natural vegetation (57%). These results are consistent with visitor perceptions of the hierarchy of potential impacts, where litter impacts were perceived as the most important issues (including litter along the beach and wildlife attracted to rubbish bins), followed by hiking away from walk-trails and erosion along walk-trails, and then vegetation damage (Table 2).

The significance of litter as one of the most basic concerns of Bako visitors is supported by the results of similar studies in Australia (Dowling, 1993; Morin et al., 1997), Canada (British Columbia Forest Service, 1995) and the United States (Lucas, 1990; Watson et al., 1992). The intolerance of many visitors to litter may be explained by the view that littering violates deeply held norms of Western culture, which inform a large proportion of the visitors to Bako, where littering is seen as abuse rather than normal use of natural areas (Lucas, 1990).

The concern with biophysical impacts such as soil erosion and vegetation damage as indicated by Bako visitors has also been expressed by wilderness users both in Canada (British Columbia Forest Service, 1995) and Australia (Department of Conservation and Land Management, 1991; Morin et al., 1997). One reason why many visitors identify biophysical impacts as problematic is that they are visually prominent. Further, greater visitor concern with biophysical over social conditions possibly reflects the view that although visitor use results in impacts, present levels of use are not in themselves reducing the quality of the visitor experience.

These results regarding visitor perceptions of the impacts of tourist use can be used to identify potential indicators for monitoring environmental conditions in Bako National Park. This approach is based on the premise that the best indicators are the conditions of most importance to visitors. As such, litter, erosion along walk-trails and damage to natural vegetation are potentially suitable indi-
cators. These indicators are measurable, allowing standards to be selected and measured by managers (step 4 of the VIM process).

**Potential management strategies**

Visitor attitudes to potential management actions can assist in predicting the consequences of specific actions on the ecotourist experience, and thus result in management actions that take into account both visitor satisfaction and ecological well-being (McCool et al., 1990). All management strategies gained substantial support (Table 4), including 'direct' regulatory actions such as limiting forest use and limiting the number of people, as well as 'indirect' actions such as education. In a study of wilderness areas in the United States, Anderson and Manfredo (1985) found that visitors supported both direct and indirect management actions. Morin et al. (1997) also found that Park visitors in Western Australia supported limiting strategies. In contrast, respondents in the Canadian study (British Columbia Forest Service, 1995) were less supportive of limiting the number of people and the type of forest use.

**Table 4** Visitor responses to potential management actions in Bako National Park

<table>
<thead>
<tr>
<th>Management action</th>
<th>Support/strongly support</th>
<th>Oppose/strongly oppose</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educate visitors more about conservation</td>
<td>79</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Provide more maps and signs at different points for directions</td>
<td>61</td>
<td>12</td>
<td>26</td>
</tr>
<tr>
<td>Limit overall number of visitors</td>
<td>60</td>
<td>14</td>
<td>26</td>
</tr>
<tr>
<td>Limit use of forest area (e.g. no hiking in some areas)</td>
<td>58</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>Limit number of people per group</td>
<td>56</td>
<td>16</td>
<td>28</td>
</tr>
<tr>
<td>Provide more staff</td>
<td>49</td>
<td>8</td>
<td>43</td>
</tr>
<tr>
<td>Limit length of stay during peak periods</td>
<td>48</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td>Provide more visitor facilities (e.g. accommodation etc.)</td>
<td>40</td>
<td>36</td>
<td>23</td>
</tr>
</tbody>
</table>

*Percentages have been rounded to the nearest whole number, and therefore do not sum to a total of 100% in all cases.

Visitor support for education in the Bako study replicates that found in Western Australian (Morin et al., 1997) and British Columbian (BC Forest Service, 1995) studies. Bako users also supported the provision of maps and signs in the Park, a strategy which was also supported by WA (Morin et al., 1997) and US (Anderson and Manfredo, 1985; Lucas, 1990) visitors. However, Canadian visitors were intolerant of human-made structures along trails. Morin et al. (1997) have interpreted the latter results in terms of the tradition in North America of not erecting signposts in wilderness areas, combined with the fact that the
well-worn nature of trails in these areas makes signs unnecessary. In contrast, the trails in Western Australia and Malaysia are less frequently used, so that signs are helpful for directions and are thus supported by users.

Bako respondents provided less support and more opposition to ‘providing more visitor facilities’ than any other suggested management strategy (Table 4). These results are supported by surveys of visitors to natural areas in Australia and the United States, where visitor expectation has been reported to be for little or no development (Buckley & Pannell, 1990). Similarly limited support was found for limiting the length of stay, indicating that visitors see the possibility of these actions reducing the quality of their experience.

Conclusions and Implications for Management

Soliciting the views and preferences of recent visitors to Bako National Park enabled the identification of impacts perceived as significant by ecotourists. Most important were litter, erosion and vegetation damage, all visual impacts with the potential to reduce the natural experience ecotourism offers. Greater visitor concern regarding potential impacts, compared to observed impacts, indicates a perception that social and biophysical conditions in the Park are likely to worsen in the future. Management concerns identified by the majority of respondents – litter, erosion and vegetation damage – correspond to the identified impacts of concern. Therefore, these management concerns are potential indicators for monitoring visitor impacts in Bako National Park. Further research is required to complete the remaining steps of the VIM framework if it is to effectively guide ecotourism management in the Park.

Respondents indicated strong support for management actions in general, including both educational and regulatory strategies such as controlling visitor numbers and limiting forest use. Such broad support provides managers with a choice of direct and indirect strategies to address management concerns. Such choice is essential as effectively minimising the environmental impacts of ecotourism requires a combination of planning and regulation, behavioural incentives and education (Buckley & Pannell, 1990).

One of the major challenges for the management of ecotourism is using interpretation and education to help visitors gain a better understanding of the natural environment of an area, thereby enhancing their experience and protection of the area. As Lucas (1990) notes, visitors to natural areas provide a particularly good audience for information and education, and such approaches are ideal for conservation reserves because they do not directly alter the natural environment. In this study, 90% of respondents indicated the importance of learning about nature as part of their experience, suggesting that visitors to Bako would be highly receptive to educational strategies.

Education also has an important role in terms of communicating the reasons behind management actions to visitors, so that visitors are more likely to support management strategies, especially those restricting their activities. Cole (1995) commented that indirect techniques such as education are most likely to be effective when used proactively. A US study by Oliver et al. (1985; cited in Anderson & Manfredo, 1985) demonstrated that educational material can potentially reduce visitor impacts by 50% if it is given to visitors entering an area. These results are
supported by Anderson and Manfredo’s (1985) study of visitor preferences for management actions in a US wilderness area. The Bako study, indicating that potential impacts are considered more significant than those observed, suggests that proactive management techniques such as education could be invaluable. Respondents’ support for education, together with the extended length of visitor stay—which in itself does not contribute extensively to overuse (Lucas, 1990)—support this conclusion.

The findings of this study also have implications for conservation management. The notable support for direct as well as indirect management actions implies that visitors generally recognise that overuse of forest areas and overcrowding have the potential to further degrade natural areas, and hence are inclined to support restrictive measures. These results also suggest that visitors are likely to accept strategies for limiting access to areas where, for example, erosion and vegetation damage require the implementation of rehabilitation strategies. Further, over 90% of Bako visitors felt that being close to nature and observing nature/wildlife were important or very important. These results reinforce the value of Bako for passive conservation-related activities and imply visitor support for conservation-oriented management.

The potential for increased numbers to adversely impact on visitor experiences also has implications for future Park management, especially ‘visitor displacement’ (Buckley & Pannell, 1990; Shackley, 1996; Lindberg et al., 1998). In this process, as visitor densities increase at a particular site and the characteristics of an area change in consequence, the nature-based experience is gradually replaced by activities such as sport or outdoor socialising (Shackley, 1996). As such, the type of people visiting the area changes because visitors who become dissatisfied with the changed experience will not visit again. This phenomenon has implications both for the future of ecotourism with respect to preserving the natural integrity of an area, and for the challenge of monitoring the quality of visitor experience as visitors and their requirements and expectations change.

In conclusion, this study represents one of the first efforts to identify the impacts of ecotourism and associated indicators in a national park in Malaysia, from the perspective of visitors. This work provides the foundation for a comprehensive framework for managing visitors in Bako National Park. More generally, the sociopolitical approach taken in this study contributes to a greater understanding of the implications of the ecotourist experience for ecotourism management in the natural environments of Malaysia.

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References


