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short communications

Comparing Park Officials' and Visitors' Impact Acceptability in Khao Yai National Park, Thailand

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ABSTRACT

This study examined the level of acceptability of ecological impacts from visitor activities among Park officials and domestic and international visitors in Thailand's Khao Yai National Park. The study was based on questionnaire interviews, conducted on-site, with 548 domestic and 40 international visitors and 38 park officials during December 2008 and February 2009. The results showed that acceptability ratings of ecological conditions in Khao Yai National Park were all below 3.5 (5 point scale) indicating there is much room for improving ecological conditions. Domestic visitors were less tolerant of ecological impacts than either Park officials or international visitors. Areas that had the lowest acceptability rating, for example, garbage accumulation, solid waste in water, suspended solid matter on water surface, and monkeys begging for food, indicate that visitors were concerned particularly about these issues. Immediate attention to these issues is necessary, and should receive top priority for remedial action. The results indicate that Khao Yai National Park needs to strengthen its ecological education programs aimed at the visitors.

Keywords: impact acceptability rating, ecological impacts, national parks, Khao Yai National Park

INTRODUCTION

National parks play important roles in the provision and management of tourism opportunities. The development and growth of tourism in national parks presents a paradoxical situation. Economic benefit is a major positive impact of tourism to a national park and surrounding communities (Eagles *et al*., 2002), but not when poorly managed tourism threatens the natural resources on which it depends. Examples of resource

threats include ecological degradation, loss of biodiversity, habitat fragmentation and isolation, wildlife disturbance and deterioration of visitors' experiences. Reducing the negative effects of visitor impacts, and enhancing visitor enjoyment are of vital concern to many national parks. Although many national parks have implemented various strategies to minimize adverse impacts, the appropriateness and the acceptability of these strategies remain a critical issue. Studies have highlighted that information about visitors' acceptability of ecological impacts is an important aspect in the decision making processes (Miller and Twining-Ward, 2005; Marion and Reid, 2007). The evaluation of management practices can provide direct measures of their success.

Visitor impact acceptability refers to the degree to which an ecological condition at a site is judged to be tolerable based on visitor ratings (Floyd *et al*., 1997). In the literature, especially with regard to outdoor recreation, the focus of impact acceptability is mostly on the quality of the visitor experience and ecology (Goodnan *et al*., 2008). Research in this area has used the social norm theory, which defines social norms as rules and standards that are understood and used within a society or group (Bonnes *et al*., 2003; Ajzen, 2005). Norms are standards used for evaluating environments or management practices that are good or bad, and are specifically defined as what behaviors should be, rather than what the behaviors actually are (Donnelly *et al*., 2000). Norms are constructed by a social network that guides and/or constrains social behavior without the force of laws, and can vary and evolve not only through time but also from one age group to another, and between social classes and social groups (Gilbert *et al*., 1998). Social norms can be used to define tolerable levels of social and ecological impacts observed at a particular site (Shelby and Heberlein, 1986). A second approach to understanding impact acceptability is by determining the level of ecological concerns visitors have about a place or a setting. Generally, ecological concern refers to attitudes towards the natural environment (Dunlap *et al*., 2000), and is focused on two primary topics namely, determining the level of concerns specific to social and demographic characteristics, and secondly, the impact of concern on an individual's behavior (Kortenkamp and Moore, 2001). Studies have shown that individuals with greater ecological concerns are less tolerant to impacts (Floyd *et al*., 1997).

Using Khao Yai National Park (KYNP) as an example, this study examined: i) tourism-induced environmental changes in the Park, as perceived by Park officials and visitors and ii) the levels of acceptability of ecological impacts from visitor activities as rated by Park officials, domestic and international visitors and the preferred management recommendations for improving

the environmental conditions. The key question addressed was to what degree differences exist between the visitors and officials regarding their views about levels of acceptability of environmental impacts in the Park. Based on the results of the study, suggestions for impact management strategies and future research are provided.

MATERIALS AND METHODS

Study Area

Located between 14°05' - 14°15' N latitude and 101°05' - 101°50' E longitude, and approximately 200 km from Bangkok, KYNP is Thailand's first national park (Figure 1). Established in 1962 and designated a World Heritage Site in 2005, it is the third largest park in the country, covering an area of 2166 km^2 (DNP, 2006). The Park encompasses a wide variety of habitats and forest types, with more than 2500 plant species, 67 different kinds of mammals, and over 300 bird species. More than 20 sites offer exceptional opportunities to visitors to view wildlife, hike, camp or bird watch. Approximately 750 000 people visit the park every year (DNP, 2010).

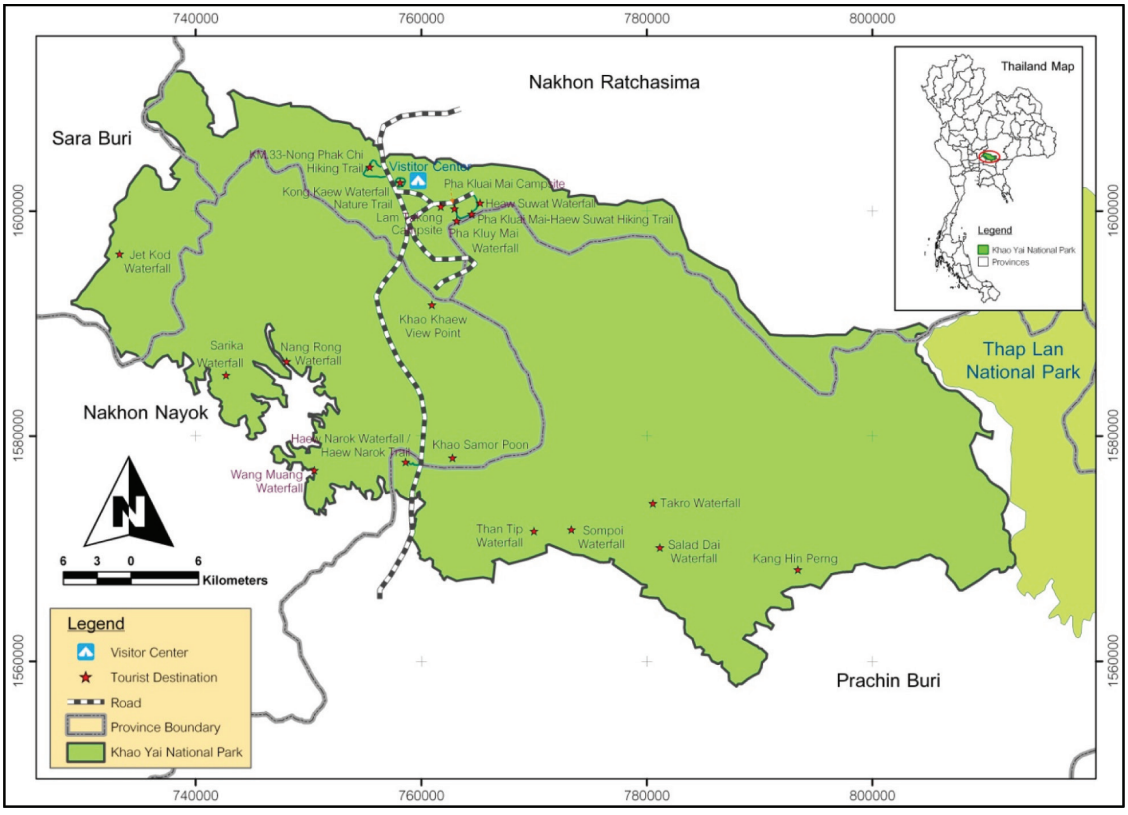

Figure 1 Map of Khao Yai National Park, Thailand.

In recent decades, the KYNP management has been increasingly concerned about the ecological impacts of tourism. Documents available from the Department of National Parks, Wildlife and Plant Conservation (DNP), KYNP, Thailand Library Integrated System and the National Research Council of Thailand, indicate that 153 studies were completed between 1963 and 2008. Of these studies, 40 were related to recreation and tourism and were primarily focused on understanding visitor attitudes, satisfaction levels, motivation and behavior. A review of past studies shows that visitor-induced ecological impacts in KYNP are widespread, particularly around the main attraction sites (waterfalls, camping areas and hiking trails). These include impacts on soil (changes in physical properties of soil, erosion, reduction in organic matter, area of bare ground), vegetation (changes in plant composition, loss of ground cover, root penetration, introduction of exotic species, and vegetation clearance), water quality, wildlife behavior (*Macaca mulatta, Rusa unicolor*), noise pollution and garbage accumulation. A summary of impacts is reported in Table 1.

Data Sources and Methods of Analysis

A questionnaire was developed to measure users' acceptability of impacts and pilot tested in early December 2008 before the actual fieldwork. It was divided into three major sections: section one solicited general information about visitors' recreation activities and prior experience at KYNP; section two focused on measuring ratings of ecological impact acceptability; and section three collected participants' socio-demographic information. Open-ended questions about perceived environmental changes in the park were also included along with suggestions for managing the impacts. Impact acceptability ratings were measured using 18 statements related to soil, vegetation, water, wildlife and others. Rating responses were based on a five-point scale: very unacceptable (1), unacceptable (2), moderately acceptable (3), acceptable (4), and very acceptable (5).

Visitors were approached randomly, and interviewed on-site as they were completing their activity for the day. Six favorite locations including two campsites (Lam Takong and Pha Kluai Mai) and four nature trails (Km. 33-Nong Phak Chi, Visitor Center-Kong Keaw Waterfall, Pha Kluai Mai - Haew Suwat, and Haew Narok Waterfall) were selected as data collection sites. The selection was based on the initial observation that these were the most preferred areas for visitor activities such as camping, hiking and bird watching. It should be noted here that while the three groups of domestic visitors are not mutually exclusive, this is not a concern in this paper, as the differences are compared not within but between domestic visitors and others. A total of 548 domestic and 40

Table 1 Summary of tourism-induced ecological impacts in Kao Yai National Park.

Impact Category	Ecological Impacts
Soil Impacts	- Muddiness along hiking trails [1]
	- Soil erosion [1,2]
	- Changes in physical properties of soil (bulk density, total weight of soil, and water infiltration rate) [3,4]
	- Soil compaction, removal of litter and human layer [2,3,4]
	- Higher infiltration rate [2,3,4]
	- Reduction in organic matter [2]
	- Bare ground [2]
	- User-created social trails [2]
Vegetation Impacts	- Vegetation trampling [3]
	- Alteration of plant communities [3]
	- Changes in plant composition [2,3]
	- Exposed tree root [2]
	- Reduced biomass [2,3]
Wildlife Impacts	- Impacts of wildlife feeding on the population and behavior of macaques (*Macaca mulatta*) and sambar deer (*Rusa unicolor*) [5]
	- Wildlife disturbance [5,6]
	- Changes in habitat utilization of sambar deer [5]
	- Vehicle-wildlife collision [6]
	- Beggar monkeys [6]
	- Wildlife on the road/ very close to the road [5,6]
	- Habituated deer [5]
Water Impacts	- Changes in water quality [2,4]
	- Bacterial contamination [2,4]
	- Effect on freshwater ecosystem [2,4]
	- Oil film on water surface [2]
Noise pollution	- Noise pollution from vehicles and tourists [2]
Garbage	- Garbage accumulation [1,2,7,8]
	- Increasing amount of solid waste [8]

Sources: [1] Utarasakul (2001), [2] DNP (2004), [3] Nuampukdee (2002), [4] Nimsantichareun (2007), [5] Sangjun *et al.*(2006), [6] Kanurai (2004), [7] Jaihaw and Panklang (2001), [8] Phaiboonsombat (2003).

international visitors were interviewed (the ratio of domestic:foreign visitors was 95:5; proportionately, the minimum sample size requirement is 20, however, for statistical comparisons, 40 foreign visitors were interviewed). Of these, 387 domestic and 10 international visitors were repeat visitors to the Park, and therefore, they were asked to provide their perspectives of environmental change based on their prior visits to the Park (Table 2). Among the international visitors, two each per tour group (on average there were 15 visitors per group arriving at the park on a guided-tour bus) were interviewed, as the schedule constraints of the visitors restricted the selection of respondents. Only English-speaking visitors were selected. Interviews were conducted

from December 2008 to February 2009 during both weekdays and weekends. A total of 38 Park officials completed the questionnaire; only those who were willing to be interviewed were asked to complete the questionnaire. The interview length varied between 20 and 57 minutes, with an average of 30 minutes. Data analysis was mostly descriptive. Analysis of variance (ANOVA) was applied to test if differences in ratings of acceptability existed between officials, domestic, and international visitors. SPSS (2007) Version 16 was used for data coding, processing and analysis.

RESULTS AND DISCUSSION

Tourism-induced Changes in KYNP

This section summarizes tourism-induced changes as perceived by officials and the visitors. The information here is based on the interviews with 387 domestic and ten international repeat visitors (within the last five years) and officials who had been with KYNP for at least five years. The officials stated that tourism development in KYNP has been a priority ever since the National Park was established in 1962. One of the positive changes was the Park's designation in 2005 as a World Heritage Site. However, this designation was also partly responsible for the increase in visitor numbers. The officials thought that limiting the number of visitors was necessary to minimize the impacts. They have noticed a decline in negative behavior of the visitors and consider that the development of tourism infrastructure and facilities has improved the quality of life of local communities. The officials stated that the KYNP administration had made significant efforts to educate visitors and encourage the use of recycle bins. Interviews with the visitors indicated that they were aware of the changes in the Park, as they listed 15 positive and 22 negative changes (Table 2). The top three positive changes were facility development (21%), reduction in visitor numbers (11%) and transportation development (9%). The negative changes frequently mentioned included ecological degradation (25%), crowding (20%) and garbage accumulation (15%). According to the overall users, facility development in KYNP was recognized as an improvement in management of the Park, while environmental degradation due to the adverse impacts of visitor activities was mentioned most frequently as a negative impact.

Levels of Acceptability of Impacts

Approximately 74% of the Park officials interviewed were male, with 40% of all respondents between 21 and 30 years old and 34% had completed high school education. A majority (56%) were local, from the neighboring provinces of Saraburi, Nakhon Nayok, Nakhon Rachasima and Prachinburi. The length of employment at KYNP varied between six months and 31 years, with an average of nine years; 40% had worked in the Park less than five years. Of the 18

Table 2 Perceived environmental changes in Kao Yai National Park.

	Positive changes (n = 141)	Negative changes (n = 138)
Ecological	Improved management (5.0%) More wildlife-human interactions, such as seeing wildlife closely (2.8%)	Ecological degradation (26.1%) Garbage (15.2%) Wildlife behavioral change, such as begging monkeys and habituated deer (7.3%) Noise from tourists (2.2%) Pollution (overall) (2.2%) Vehicular noise (1.4%)
Tourists	Control in number of tourists (14.1%) Noise prohibition after 10:00 pm. (7.8%) Enforcement of rules (2.8%) Increase in environmental awareness (1.4%)	Crowding (19.6%) Inappropriate tourist behavior (5.1%) Lack of tourist awareness (0.7%) Limit imposed on tourist number (0.7%)
Services and facility management	Facility development (27.0%) Transportation development (8.5%) Cleanliness (7.8%) Service improvement (6.4%) General tourism management (6.4%) Increased convenience (5.0%) Zoning in campground (2.8%) More recreation activities (1.4%) More safety (1.4%)	Too many facilities (4.3%) Camping reservation system (3.6%) Dirty (toilet) (2.9%) Expensive goods (1.4%) Bad service (1.4%) Insufficient facilities (1.4%) High entrance fee (0.7%) Inappropriate facility design (0.7%) High level of tourism development (0.7%) Staff behavior (0.7%) Too much convenience (0.7%) Too many cars for wildlife observation (0.7%)

impact items listed in the questionnaire, 14 were rated below 3. These were, in descending order, turbidity (51%), noise from visitors (49%), conversion of natural area into developed area (47%), bad smell from toilets, bins, garbage, etc. (42%), vehicular noise (42%), air pollution (40%), disturbed natural area by visitor activities such as vehicles parked in unauthorized area (40%), damaged trees/ saplings/seedlings (40%), wildlife on the road or very close to the road (35%), monkeys (*Macaca mulatta*) waiting for food from the visitors (34%), accumulation of garbage (34%), solid waste in water (32%), suspended solid matter on water surface (30%), and deer (*Rusa unicolor*) habituation (25%). Four items rated higher than 3.0 namely, exposed tree roots (47%), soil erosion (42%), bare ground (40%), and the presence of non-native plants (37%).

Among the domestic visitors, 55% were campers, 30% hikers and 15% bird watchers. The gender breakdown was almost even. Of this group of respondents, approximately 48% were aged between 21 and 30 years, 63% had completed their undergraduate level education and 84% were not local. The three main occupation groupings were student (32%), private company employee (28%) and government employee (14%). About 62% has visited KYNP before. Most (99%) visited KYNP as part of a group, especially with friends

(49%). The average group size was 9.4 persons, but most travelled in a group of two to five persons (38%). About, 66% stayed in KYNP for one night. Of the 18 impact items, 13 were rated below 3. These were: bare ground (48%), damaged tree/sapling/seedling (40%), accumulation of garbage (39%), noise from visitors (39%), disturbed natural area due to visitor activities (38%), vehicular noise (38%), solid waste in water (37%), turbidity (37%), air pollution from vehicles (35%), monkeys waiting for food from visitors (34%), conversion of natural area into developed area (32%), bad smell from toilets, garbage, etc. (32%), and suspended solid matter on water surface (30%). Five items were rated at 3.0 or higher namely, soil erosion (46%), exposed tree roots (42%), presence of non-native plants (39%), wildlife on the road/very close to the road (38%) and habituated deer (35%).

Among the international visitors, 78% were male, while 50% of the respondents in this group were aged 21 - 40 years and 61% had completed graduate level education. Approximately 20% were from the USA, 15.0% from the UK, and 10% each were from Germany and Switzerland. A majority (67%) had visited Thailand and 25% had visited KYNP before the current trip. Most (45%) were accompanied by their friends, with the group size ranging between 2 and 5 people (65%). The most favorite recreation activities were hiking (27%), sightseeing (22%), camping (12%), bird watching (12%), exploring nature (12%), viewing wildlife (7%) and enjoying nature (5%). Most (57%) were on a one-day trip, and stayed in hotels and resorts outside the Park. Of the 18 impact items, 12 were rated below 3. These included accumulation of garbage (41%), solid waste in water (40%), suspended solid matter on water surface (38%), disturbed natural area by visitor activities (36%), noise from visitors (35%), presence of non-native plant (33%), damaged tree/sapling/seedling (32%), air pollution from vehicles (32%), monkeys waiting for food from the visitors (31%), vehicular noise (31%), bad smell from toilets, garbage, etc. (30%) and turbidity (30%). Six items were rated above 3 namely, soil erosion (40%), conversion of natural area into developed area (34%), bare ground (33%), exposed tree roots (33%), wildlife on the road/very close to the road (32%) and habituated deer (32%).

The survey results were compared to test for differences in ratings among the three groups. Based on the average rating of each impact (mean values), overall, the results indicated that domestic visitors tended to rate impact acceptability at a lower scale, that is, they rated impacts to be more severe than international visitors and officials. Ten items that were rated lower (or more severe) by the domestic visitors were soil erosion, bare ground, suspended solid matter on water surface, solid waste in water, turbidity, conversion

of natural area into developed area, air pollution from vehicles, bad smell from toilets, bin, garbage, etc., accumulation of garbage and disturbed natural area by visitor activities. Four items were rated lower (that is the impacts were less acceptable) by the officials namely, damaged tree/sapling/ seedling, monkeys waiting for food from visitors, wildlife on the road/very close to the road and habituated deer. Four items were rated lower by international visitors namely, exposed tree roots, presence of non-native plants, vehicular noise and noise from visitors. The ANOVA results indicated that the differences in acceptability ratings were significant for four items only (presence of non-native plant, solid waste in water, wildlife on the road or very close to the road and conversion of natural areas into developed areas) as shown in Table 3.

Table 3 Comparison of impact acceptability ratings between Kao Yai National Park (KYNP) officials, domestic, and international tourists.

	Mean impact rating (based on a five-point scale)			F	*p*
	Domestic tourists	International tourists	KYNP officials		
Soil impacts					
Soil erosion	2.98	3.00	3.20	1.259	0.285
Bare ground	2.95	3.07	3.29	2.085	0.125
Vegetation impacts					
Exposed tree roots	3.18	3.07	3.36	0.716	0.489
Damaged tree/sapling/seedling	2.85	2.69	2.63	0.938	0.392
Presence of non-native plant	3.28	2.39	3.32	4.228	0.015*
Water impacts					
Suspended solid matter on water surface	2.34	2.63	2.68	1.923	0.147
Solid waste in water	2.18	2.35	2.71	3.399	0.034*
Turbidity	2.76	2.93	2.97	0.938	0.392
Wildlife impacts					
Monkeys waiting for food from the tourists	2.59	2.80	2.32	1.447	0.236
Wildlife on the road/ very close to the road	2.99	3.53	2.89	3.655	0.026*
Habituated deer	3.01	3.31	2.72	1.852	0.158
Other impacts					
Conversion of natural area into developed area	2.48	3.03	2.71	4.011	0.019*
Air pollution from vehicles	2.48	2.50	2.70	0.707	0.493
Bad smell (from toilets, garbage, etc.)	2.43	2.83	2.53	1.462	0.233
Accumulation of garbage	2.12	2.41	2.32	1.214	0.298
Disturbed natural area by tourist activities, such as vehicles parked in natural area	2.45	2.46	2.58	0.270	0.763
Vehicular noise	2.56	2.30	2.78	1.697	0.184
Noise from tourists	2.60	2.38	2.78	1.085	0.339

Remark: * Significant at 0.05 level.

Management Recommendations

Table 4 shows the recommendations made by the officials and visitors to improve KYNP's current management practices. The recommendations that were most frequently stated were visitor oriented and were concerned with controlling numbers during holiday seasons, regulating inappropriate behavior, informing visitors about park rules and regulations, and educating them about minimum-impact practices, respectively. Site-related recommendations included closing impacted sections (3%) and zoning of conservation and tourism sites. Administration-oriented recommendations included improving reservation systems, increasing the maintenance interval, providing additional services and facilities, and encouraging environmentally friendly tourism such as ecotourism.

Table 4 Recommendations for impact management in Kao Yai National Park (KYNP).

Recommendation	% (n = 216)
Tourist related	
Controlling tourist number during holiday season	14.4
Regulating tourist behavior	13.4
Informing tourists about rules and regulations	11.6
Educating tourists about minimum-impact practices	8.8
Restricting certain tourist activities	0.9
Providing highly supervised wildlife observation opportunities	0.5
Site related	
Closing sections on a rotational basis to allow for regeneration/close impacted area for rehabilitation	2.8
Separating (zoning) conservation sites from tourism sites	2.8
Providing more camping areas	2.3
Monitoring impacts routinely	1.4
Reforestation in certain sites	0.9
Stopping all constructions within KYNP	0.5
Administration, staff, and service related	
Improving accommodation/camping reservation systems	3.7
Increasing maintenance interval	3.7
Providing additional services and facilities	2.3
Encouraging more environmentally friendly forms of tourism, such as ecotourism	2.3
Raising park officials' awareness of tourist impacts	1.9
Strengthening overall management system	1.4
Training KYNP staff about impact assessment and monitoring	1.4
Putting more emphasis on conservation than economic benefits	0.9
Providing sufficient budget for park management	0.9
Restricting big events, such as concerts	0.5
Developing public transportation system to discourage the use of private vehicles	0.5

Discussion

Studies of ecological impacts are critical in enhancing the understanding of a park's overall tourism management strategy in areas of tourism use, ecology and management conditions (Nepal and Nepal, 2004; Nepal and Way, 2007). The current study summarized current ecological impacts

and examined visitors' perceived environmental changes in KYNP. The main focus of the study was analyzing how the Park officials and domestic and international visitors rated their acceptability of ecological impacts. Also discussed briefly were improvements suggested by the respondents. When the three groups were compared, the domestic visitors rated impact acceptability at a lower scale than officials and international visitors. This indicates that domestic visitors were the least tolerant to ecological impacts in the Park. This finding contrasts with previous studies which have indicated that park managers mostly show the lowest level of tolerance to ecological impacts (Floyd *et al*., 1997; Manning 1999; Vaske *et al*., 2001). This difference cold perhaps be attributed to different group norms (Vaske *et al*., 2001). In the current study, acceptable standards for environmental conditions among the visitors were found to be higher than park managers' standards. One likely explanation for this is the exposure of the visitors, particularly the domestic visitors to the local media that often portray Khao Yai as a national park with pristine environmental conditions. When conditions on the ground do not appear as they are advertised, or are expected to be, it is natural for the visitors to respond differently. Also, recent research has indicated place attachment as a significant variable that influences whether or not park visitors show pro-environment behavioral intention (Halpenny, 2010). While the current study did not explore the effect of place attachment, it is reasonable to argue that Thai visitors may have a stronger attachment than international visitors, as Khao Yai is Thailand's flagship park of which the Thais are very proud. The Park officials, on the other hand, may be indifferent to the Park because for them it is a "work" place and not a place to "visit"; as such, they may consider their daily activities rather mundane and acceptable conditions for them are determined not by what they think they should be but by what the Park administration has determined them to be. While these are speculative statements, place attachment is a topic that needs further exploration in the context of visitors to national parks in Thailand.

The study also showed that acceptability of impacts varied between domestic and international visitors. This difference could be due to their engagement in different types of recreation activities and the resources associated with those activities (Hillery *et al*., 2001; Vaske *et al*., 2001). The study indicated that the favorite activities of domestic visitors were camping, photographing, hiking, sightseeing and relaxing. Expectation of a higher quality environment to perform these activities may have influenced how domestic visitors rated the level of acceptability of specific items such as soil, water and air quality. International visitors' activities were focused more on hiking and wildlife observation,

which are forest-based activities. This may explain why they rated vegetation impacts and the amount of noise as less acceptable than domestic visitors. Also, for a majority of the international visitors, a visit to Khao Yai is often their first exposure to a Thai national park. While two Thai national daily newspapers (The Nation, and The Bangkok Post) are published in the English language, it is likely that international visitors to Thailand's national parks rely more on what they have read in the guidebooks than how national parks are portrayed in local newspapers. In contrast, domestic visitors are routinely exposed to environmental issues in Thailand as local newspapers have actively covered these topics, and such media are likely to be their primary sources of knowledge about the state of the environment in Thailand.

CONCLUSION

This study examined tourism-induced environmental changes in KYNP and determined the levels of acceptability of ecological impacts from visitor activities as rated by Park officials and visitors. Based on the perceptions of Park officials and repeat visitors in the last five years, the most common positive changes include facility development, reduction in visitor numbers and transportation development, respectively, while ecological degradation, crowding and garbage accumulation are the negative changes most frequently mentioned. The study showed that the ratings of impact acceptability are all below 3.5, that is, they ranged from being unacceptable to moderately acceptable; the domestic visitors rated impact acceptability at a lower scale than officials and international visitors. Garbage accumulation, solid waste in water, suspended solid matter on water surface, and monkeys begging for food received the lowest acceptability ratings, indicating that visitors were particularly concerned about these issues. Thus, these impacts should receive top priority for remedial actions.

The results of this study raise several important questions. First, what do the lower ratings given by the domestic visitors, in comparison to the international visitors and Park officials, mean? Whose assessment should receive priority, and why? Clearly, from the perspective of the domestic visitors, environmental conditions in the Park need to be improved so that the impacts are rated in the acceptable range. While the international visitors indicated that their tolerance level may be higher than that of the domestic visitors, focusing the impact management strategy only on domestic visitors is not sensible. What is also interesting is that domestic visitor activities were conducted in relatively crowded settings (for example, camping and hiking), which were much different from the norms for international visitors. One could argue that since domestic visitors

do not mind crowded settings, they may also not mind a higher level of environmental impacts, but the research results indicated that this was not the case. A good balance in use levels and impacts is in the long-term interest of the Park.

Second, what could these results mean for other parks trying to increase the numbers of both domestic and international visitors; should one group get priority over others? The study indicates this should not be so; the tourism management strategy in the Park should be based on a mix of incentives and disincentives. While the support of domestic visitors is certainly critical to the Park, goodwill and support from international visitors are critical if the Park is to raise its profile internationally.

Third, is tourism impact in Thai national parks a major issue relative to other issues, for example, the decades-old conflict between local communities and the park agency over resource use and access to natural resources as has been reported by Roth (2008)? It is true that issues arising from visitor impacts are less pressing when compared to conflicts between the Park and the people living in the surrounding region. But parks worldwide are increasingly under the pressure of tourism, which has often been conceptualized as a way to alleviate problems associated with resource extraction and other livelihood needs of the local communities (Spiteri & Nepal, 2008). Therefore, it is in the interest of the Park to ensure an adequate balance between economic and environmental considerations.

Fourth, given the goals of the Park agency, its financial capacity and the costs of implementing mitigating actions, and the skills required to conduct monitoring surveys, one has to consider how realistic it would be to demand prompt action to improve the environmental conditions in the Park. Khao Yai National Park, compared to other parks in Thailand, has access to better resources, for example, a group of Bangkok-based researchers have been helping the Park take stock of its resource conditions, streamline its conservation priorities, implement monitoring projects, and make decisions that are supported by scientific research. Therefore, it is also a conclusion of the current study that the research results provide the Park with an additional input to management, not as a basis for redirecting the focus of their current tourism management strategy.

Fifth, in what ways do the results of the study help the Park management to consider its decisions about protection of natural resources, rehabilitation of degraded sites, carrying capacity limitations, visitor education programs and other relevant actions? Most importantly, the results suggest that there is a real difference in the levels of tolerance among the domestic visitors, international visitors and Park officials. This is useful information that can be

used in developing tactical, site-specific strategies (for example, in communications) that are group-specific and which are part of a broader tourism management strategy at the Park level.

Finally, there is the consideration of what would happen if environmental conditions worsened; would this cause the displacement of current visitors and discourage potential visitors from visiting the Park? Would the change (worsening) in conditions cause a replacement of dissatisfied visitors with others who have a higher level of tolerance to degraded environments? Elsewhere, research has shown that displacement is caused when impacts reach a level so that those who are less tolerant to the impacts seek similar experience elsewhere. When conditions deteriorate, formerly satisfied visitors may cease to come and may be replaced by those who have a higher tolerance level. Thus, visitor satisfaction may be retained in spite of declining environmental quality. This is certainly an issue that merits further research.

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