

*Feature Article*

# **Wildlife Viewing Preferences of Visitors to Sri Lanka's National Parks: Implications for Visitor Management and Sustainable Tourism Planning**

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## **1. Introduction**

Tourism is the largest service-sector industry in the global economy, and plays a key role in destination development, especially in developing countries. Tourism industry has long been a key player in the Sri Lankan economy. Traditionally, Sri Lanka's tourism industry has been oriented towards sea, sand and sun tourism (3S tourism). However, when compared with other popular tourism destinations in the region, Sri Lanka has diverse tourism opportunities to offer.

Sri Lanka at present is in a rapid post-war recovery process, and the country's tourism sector is also booming rapidly. Reflecting this positive growth, tourism sector's contribution to the country's GDP has increased from 2.7% in 2009 to almost 3% in 2010, primarily due to the strong growth in tourist arrivals and spending (ICRA, 2011). The interest on Sri Lanka as a travel destination has grown tremendously during the post-war period. For instance, The New York Times ranked Sri Lanka at the top in its "The 31 Places to go in 2010" travel article (*nytimes.com* 2010). The National Geographic Channel has also rated Sri Lanka as the second best place to visit in its travel documentary "World's Twenty Best Tourist Destinations" (National Geographic Channel 2010). More recently, "Lonely Planet", a leading travel and tourism information source rated Sri Lanka at the top in its "Best in Travel 2013 - Top 10 countries" list (*lonelyplanet.com*, 2012). Interestingly, all these sources have highlighted nature-based attributes and biodiversity as major attractions in Sri Lanka.

Sri Lanka boasts having the highest biodiversity per 10,000 km<sup>2</sup> in Asia, and it is also rated as one of the 25 biodiversity hot spots in the world (Ministry of Environment and Natural Resources, 2002). At the same time, Sri Lanka also has a highly sophisticated Protected Area network managed under Department of Wildlife Conservation (DWLC) and Forest Department (FD), where an area of over 1,710,000 hectares accounting for 26.5% of the land area of the country is legally protected. These Protected Areas (PAs) along with other natural landscapes provide diverse nature tourism opportunities within the country.

However, when considered the diverse natural and cultural resources, Sri Lanka's tourism resources still remain relatively under-exploited. Instead, most nature-based tourism activities are concentrated on few well-known destinations such as certain National Parks (NPs) and Forest Reserves. As a result, these sites are continuously subjected to increased visitor pressure. Hence, research focused on introducing better management strategies to alleviate negative impacts of tourism on highly visited nature-based destinations should be prioritized in the sustainable tourism research agenda. This article explores the recent developments in nature-based tourism in Sri Lanka's PAs and discusses the use of understanding wildlife viewing preferences of visitors in introducing visitor management strategies, and recreational planning in PAs.

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## 2. Sri Lanka's Protected Area Network

The history of wildlife protection and PA establishment in Sri Lanka goes back to 246 BC where King Devanam Piyatissa established one of the world's earliest wildlife sanctuaries in Anuradhapura (Wijesinghe, 2003). Contemporary history of legal protection of flora and fauna in the country dates back to 1889 where Colonel R.A. Clark, the Conservator of Forests pushed the Government of Ceylon to introduce immediate legislations forbidding the killing of wild animals and export of hides. Continued efforts of Mr. A.F. Broun resulted in Government of Ceylon declaring Yala (160 sq. miles) and Wilpattu (256 sq. miles) as Reserves under the Forest Ordinance (DWLC, 2012). Since then, the PA network in Sri Lanka has systematically expanded to include over 26% of the total land area of the country.

Sri Lanka's PAs are mainly administered by two state institutions; the Forest Department and the Department of Wild Life Conservation. From the total land area of the country, approximately 13% is conserved under the DWLC. This are comprise of 61 Sanctuaries, 22 National Parks, 4 Nature Reserves, 3 Strict Nature Reserves and 1 Jungle Corridor (Ministry of Economic Development, 2011). The Forest Department manages 65 conservation forests and one National Heritage and Wilderness Area (Table 1). Accordingly, a total area of 1,767,000 ha accounting for 26.5% of the land area in the country is legally protected. This is comparatively a higher percentage of protected areas than other countries in Asia.

Table 1: Protected Areas Administrated by the Forest Department and Department of Wildlife Conservation

Protected Area Category	Area under each category (ha) in 2010
<b>Forests under the Forest Department (FD)</b>	
National Heritage Wilderness Area [N = 1]	11,127
Conservation Forests [N = 65]	96,249
Other Reserved Forests [N = 366]	630,701
Forest Plantations	79,941
<b>Total Areas under the FD</b>	<b>818,018</b>
<b>Forests under the Department of Wildlife Conservation (DWLC)</b>	
National Parks [N=22]	526,156
Nature Reserves [N=4]	57,056
Sanctuaries [N=61]	349,105
Strict Natural Reserves [N=3]	31,575
Jungle Corridors [N=1]	8,777
<b>Total Areas under the DWLC</b>	<b>972,669</b>

**Source:** Sri Lanka REDD+ Readiness Preparation Proposal, 2012

### *Compatibility of Sri Lanka's Protected Areas with Nature-Based Tourism*

National Reserves and Sanctuaries are the two major categories of PAs managed by the DWLC. National Reserves include National Parks, Strict Natural Reserves, Nature Reserves, Jungle Corridors and Marine Reserves. Over 450,000 ha of land are protected under National Reserves of which, nearly 75% are NPs (DWLC, 2012).

Strict Nature Reserves (SNRs) are highly protected landscapes. Only research and educational activities are allowed in SNRs with the permission of the Director General, DWLC. Hakgala, Yala and Ritigala are the three SNRs under Sri Lanka's PA network. Nature Reserves (NRs) are also similar to SNRs in many ways. Public entry is restricted except for research and education. However, traditional

human activities are allowed in NRs. Although recreation or wildlife observation is not allowed in SNRs and NRs by mandate, such venues have provisions for research and education under permission. Hence SNRs and NRs are compatible only with research/education oriented hardcore ecotourism activities.

NPs are areas established to ensure the maximum protection for wildlife and their habitats while allowing opportunities for the public to observe and study wildlife. There are 22 NPs in Sri Lanka’s PA network (DWLC, 2012). Recreational and tourism opportunities is an important dimension in establishing NPs as it generates the public interest while ensuring the economic viability of the establishment (Suntikul et al., 2010). Sri Lanka’s NPs allow wildlife viewing/observation by mandate (Fauna and Flora Protection Ordinance, 1938). When considered their magnitude and diverse recreational opportunities, NPs are highly compatible with both hard and soft ecotourism activities. In addition, NPs often contains monuments of cultural and religious importance and therefore can accommodate cultural tourism activities as well.

At present, Sri Lanka’s NPs are increasingly becoming prime tourism destinations for both international and domestic tourists. According to the 2011 Annual Statistical Reports of the Tourism Development Authority in Sri Lanka, the revenue received from the NPs increased by Rs 79,764,105.51 from 2010 to 2011. Total visitor arrivals to national parks increased to 836,634 from 630,463 from 2010 to 2011. Comparative to 2010 foreign tourist arrivals to NPs, year 2011 showed an improvement of 55,338 visitors, while local visitor arrivals increased by 150,833 (Table 2 and Figure 1).

**Table Error! No text of specified style in document.:** Visitor Arrivals Volume and Revenue to National Parks 2011

National Park	Foreign Tickets		Local Tickets		Total no. of Visitors	Total Revenue (Rs.)
	No. of visitors	Revenue (Rs.)	No. of visitors	Revenue in (Rs.)		
Yala	98,583	154,310,770.10	216,666	12,453,959.00	315,249	166,764,729.10
Horton Plains	29,854	50,103,251.89	166,818	8,971,550.00	196,672	59,074,801.89
Udawalawa	19,901	33,531,189.50	57,024	3,252,161.00	76,925	36,783,350.50
Minneriya	23,220	38,342,350.00	36,449	2,120,070.00	59,669	40,462,420.00
Hikkaduwa	5,958	170,415.00	46,011	216,275.00	51,969	386,690.00
Pigeon Island	4,185	4,456,160.00	31,035	1,190,610.00	35,220	5,646,770.00
Wilpattu	2,322	3,881,279.00	22,972	1,309,710.00	25,294	5,190,989.00
Wasgamuwa	367	403,170.00	18,732	697,230.00	19,099	1,100,400.00
Kumana	820	906,725.00	16,277	731,640.00	17,097	1,638,365.00
Kaudulla	8,331	9,458,461.00	7,374	292,480.00	15,705	9,750,941.00
Bundala	4,780	5,314,700.00	6,616	256,830.00	11,396	5,571,530.00
Horagolla	4	4,400.00	4,895	190,290.00	4,899	194,690.00
Lunugamwehera	27	29,826.00	2,703	99,880.00	2,730	129,706.00
Gal Oya	118	23,760.00	1,580	36,180.00	1,698	59,940.00
Angammedilla	0	-	1,483	52,590.00	1,483	52,590.00
Galwaysland	39	42,000.00	1,182	46,362.00	1,221	88,362.00
Lahugala	25	28,000.00	172	6,230.00	197	34,230.00
Maduru Oya	2	2,250.00	109	4,824.00	111	7,074.00
<b>Total</b>	198,536	301,008,707.49	638,098	31,928,871.00	836,634	332,937,578.49

Sanctuaries on the other hand require no permission or fee to enter. Sanctuaries allow human activities while protecting the natural environment. Both state and private lands can be declared as

sanctuaries. Hence, sanctuaries are also compatible with nature-based tourism models such as ecotourism. However, due to their nature of establishment, wildlife viewing opportunities are comparatively limited.

In addition, significant number of forest reserves and proposed reserves are under the management of FD. Hurulu, Kanneliya-Dediyagala-Nakiyadeniya (KDN) and Sinharaja are UNESCO Man and Biosphere Reserves managed by the FD while Sinharaja and Central Highlands/Knuckles Range of Forests have been designated as World Heritage Sites. These PA categories under FD are highly compatible with nature-based tourism as they allow research, education, and recreation.

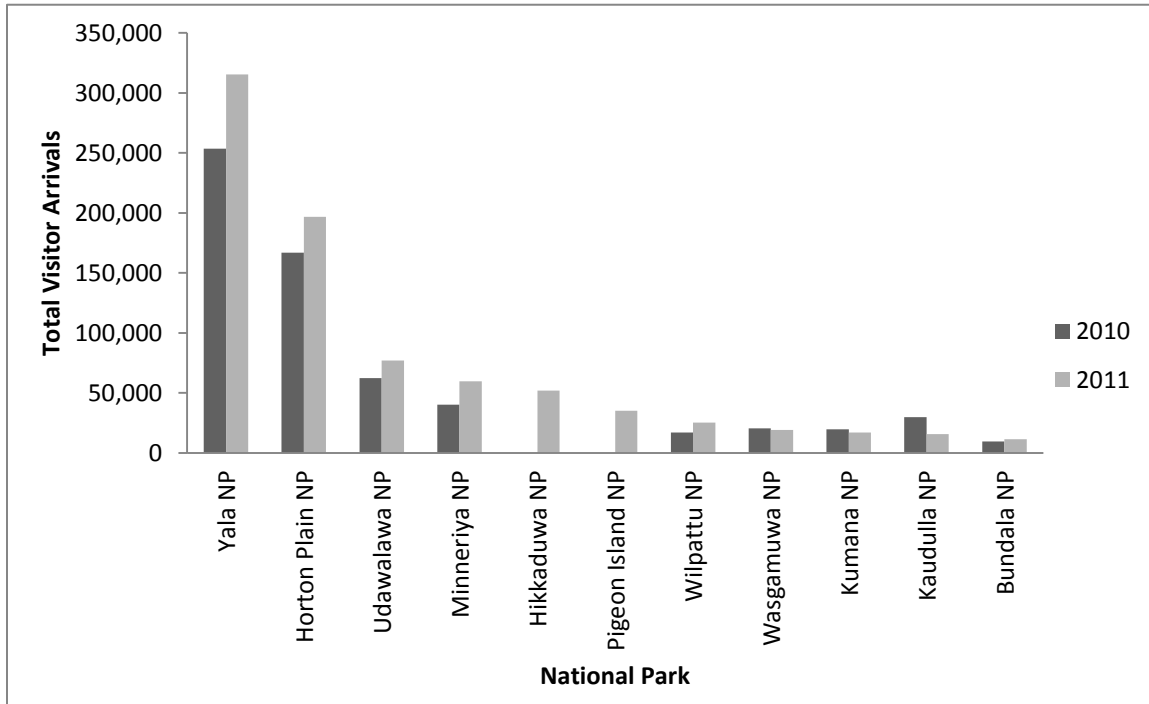


Figure 1: Total Visitor Arrivals to National Parks 2010-2011

Although it is evident that nature-based tourism in protected areas generate much-needed funds for conservation and development, there are substantial differences between revenues generated at different NPs in Sri Lanka. For instance, revenue at Yala NP in 2010 was Rs. 166,764,729.10 compared to Maduru Oya NP's Rs. 7,074.00 (STDA, 2011). Apart from unique recreational opportunities/attractions available at each NP, Herath et al. (1997) largely attribute this scenario to the lack of awareness among visitors and tour operators regarding the natural diversity and recreational opportunities in Sri Lanka's PAs.

Previous studies elsewhere further point out narrow wildlife viewing preferences of visitors as a main cause of higher visitor pressure in certain PAs (Kerley et al., 2003; Prideaux, 2006; Duffield et al., 2006). For example, an individual with narrow preference of viewing elephants would travel to Minneriya NP because of the destination's overall popularity, despite having several PAs in the same region with similar wildlife observing opportunities. The down-side of this scenario is the increased visitor pressure at few popular NPs, while NPs with low levels of visitation facing the risk of receiving fewer funds for park maintenance and conservation efforts. Heavy visitor arrivals to NPs are known to cause negative impacts such as interruptions to the behavior of wildlife including habituation, littering, damages to vegetation and increased cases of visitor non-conformities with environmental standards and park policy (Herath et al., 1997). In addition, limited perceptions of wildlife viewing can lead to the devaluation of biodiversity in a particular protected area (Kerley et al., 2003), and this in turn can lead to negligence of valuable biological resources for conservation by state agencies. Therefore, identifying wildlife viewing preferences of visitors has wider applications in visitor management at PAs.

### 3. The Case Study

To gain a preliminary understanding of wildlife viewing preferences of visitors to NPs in Sri Lanka, we conducted a visitor survey at Minneriya NP located in the North Central Province of Sri Lanka. Minneriya NP was selected as it is one of the top-five highly visited NPs in the country. A structured questionnaire was administered via face-to-face interviews, using a systematic sampling method with every one-in-third visitor being intercepted at the park exit to administer the questionnaire. Data collection was done from April to August, 2012, predominantly on weekends where higher visitor traffic was anticipated. Only visitors over 18 years of age were interviewed.

A main objective of this survey was to identify different visitor segments or nature-based tourism market segments based on wildlife viewing preferences. In order to assess the relationships of wild life viewing preferences and key biodiversity elements of NP with socio-demographic and trip characteristics of visitors, the multivariate logistic regression method was used. We developed two separate models using wild life viewing preferences and importance of key biodiversity elements of the park as dependent variables. Accordingly, we attempted to describe different visitor segments based on wildlife viewing preferences using their demographic characteristics.

A total of 735 individuals participated in the survey, and there were 701 usable questionnaires. This included 682 domestic respondents and 19 foreign respondents. Due to the low number of foreign respondents, they were excluded from further analysis. General respondent socio-demographic characteristics are summarized in Table 3. Of those who participated in the survey, 30.1% were first-time visitors to a NP in Sri Lanka. Majority of the respondents (62.2%) have visited NPs in one to five previous occasions. Only 7.8% of the respondents have visited a NP more than five occasions within the last five years.

Table 3: General Respondent Socio-demographic Profile – Domestic visitors

Socio-demographic Variable	Frequency	Percentage
Gender (n = 701)		
Male	397	56.6
Female	304	43.3
Age (n = 682)		
18-25	142	20.2
26-45	461	65.7
Above 45	98	14.0
Education (n = 682)		
Up to O/L or below	122	17.4
Up to A/L or A/L with Professional Qualifications	405	57.8
Undergraduate (UG) education & above	174	24.8
Income (n=597)		
≤Rs. 30,000	350	57.1
Rs. 30,001 to Rs 75,000	211	34.4
Above Rs. 75,000	36	5.9

#### *Respondent preferences for key biodiversity elements*

Respondents were asked to rank the importance of some key biodiversity elements of the NP that influenced them to choose Minneriya NP as the destination for travelling (on a 1 to 5 Likert scale where

1= least important and 5= highly important). Most respondents ranked “elephant herds” as the most important biodiversity element followed by mammal diversity, bird diversity and attractive scenery (Figure 2). When asked about their desire to observe different components of wildlife during the trip, most respondents gave priority to watching elephants, followed by herbivores (other than elephants), leopards, and bears (Figure 3). Majority of the respondents were interested in observing elephants in the wild (90.5%), while observing aquatic birds was least preferred (54.8%).

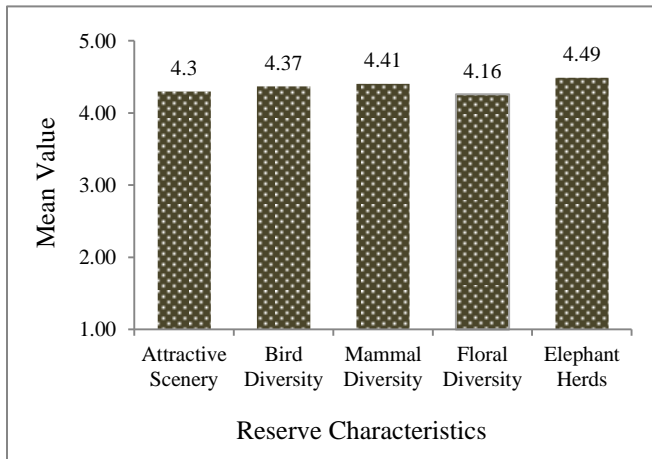


Figure 2: Mean Values for Responses of Essentiality of Key Biodiversity Elements

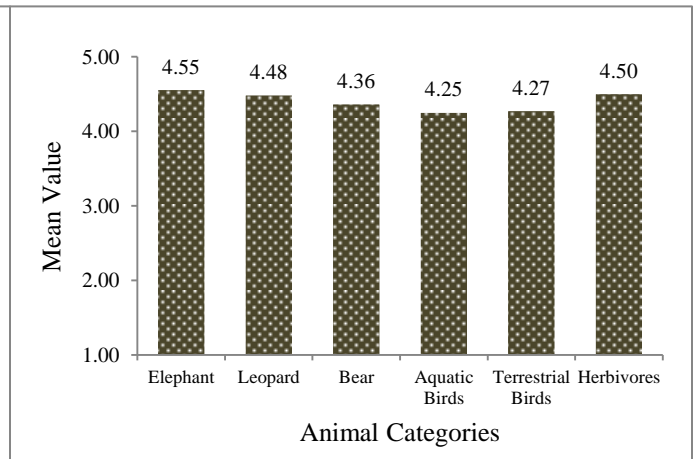


Figure 3: Mean Values for Viewing Preferences of Different Animal Categories

**The Relationship between key biodiversity elements and the socio-demographic variables**

To understand the relationships between key biodiversity elements of the park and socio-demographic variables, scores given by respondents to key biodiversity elements were categorized as ‘indifferent’ (scores 1 to 3) or ‘interested’ (scores 4 and 5), and was analyzed relative to respondent age, education, and number of visits to NPs in the last five years. Table 4 summarizes the results of logistic regression models developed for each reserve characteristic. It indicates the odds of visitor in each category being interested in each reserve characteristic, relative to the reference category. Underlined values represent statistically significant relationships ( $p < 0.05$ ). Statistically non-significant variables are also reported for illustrative purposes.

**Table 4:** Relationship between Reserve Characteristics and the Socio demographic Characteristics of the respondents

Reserve Characteristics	Model	Previous Visits	Age			Education		
			18-25	26-45	Above 45	Up to O/L or <O/L	Up to A/L or A/L-PQ	UG or higher
Attractive Scenery	$X^2 = 70.056 ; p < 0.001$	0.025	.281	-0.093	0 <sup>b</sup>	<u>-2.413</u>	<u>-0.831</u>	0 <sup>b</sup>
Bird Diversity	$X^2 = 55.476 ; p < 0.001$	<u>0.174</u>	.012	0.150	0 <sup>b</sup>	<u>-1.026</u>	0.110	0 <sup>b</sup>
Floral Diversity	$X^2 = 62.932 ; p < 0.001$	-0.015	-.032	-0.069	0 <sup>b</sup>	<u>-1.729</u>	-0.233	0 <sup>b</sup>
Mammal Diversity	$X^2 = 20.004 ; p = 0.01$	0.071	.042	0.136	0 <sup>b</sup>	<u>-0.773</u>	-0.139	0 <sup>b</sup>
Elephant Herds	$X^2 = 28.290 ; p < 0.001$	<u>-0.083</u>	-.325	-0.261	0 <sup>b</sup>	0.199	-0.017	0 <sup>b</sup>

*Underlined odds ratios are the significant ones  $p < 0.05$*

<sup>b</sup> Reference category (fixed)

In this case study, we interpreted the results using odds ratios. For example, attractive sceneries seem to be a more important biodiversity element for respondents with higher levels of education i.e. comparative to a visitor with graduate education, “attractive sceneries” are 0.831 times less important for

a visitor with an education level of “up to A/L or A/L and professional qualified”. For a visitor with an education of “up to O/L”, the same biodiversity element is 2.413 times less important in comparison to the reference group. Essentiality of the bird diversity was influenced by variables “number of visits” and education. This indicates that experienced visitors with higher levels of education are more interested in bird diversity. Bird diversity was 1.026 times less important for a visitor of least educated group in comparison to highest educated group. Education level was the only factor that significantly affected preference for floral diversity. Floral diversity was 1.729 times less important for a visitor of least educated group in comparison to highest educated group. Similar observations were made for the key biodiversity element “mammal diversity”. The biodiversity element “elephant herds” was specially included as it is a site specific attribute to Minneriya NP. Only the number of visits was significant in the model. This indicated that novice visitors are more interested in observing elephant herds.

### ***The Relationship between wildlife viewing preferences and the socio-demographic variables***

Respondent scores for preference to observe different components of wildlife were categorized into ‘indifferent’ (scores 1 to 3) and ‘interested’ (scores 4 and 5), and were analyzed relative to respondent age, education, and number of visits to NPs in the last five years (Table 5). Results indicate that experienced visitors with higher level of education tend to prefer watching aquatic birds as well as terrestrial birds. For instance, least educated individual is 1.008 times less likely to prefer the wildlife component “aquatic birds”. Rarely observable mammals such as bears and leopards were mostly preferred by individuals who are frequent visitors to the NPs. Both age and education were non-significant for respondent preference to observe elephants. The variable “number of visits” was also negatively related, indicating that first-time visitors or less experienced wildlife enthusiasts prefer charismatic species such as elephants. Similar trend was observed for the preference for other larger herbivores such as deer, buffalo and sambar deer.

**Table 5:** Relationship between Wildlife viewing Preferences and the Socio demographic Characteristics of the respondents

Wildlife Preferences	Model	Previous Visits	Age			Education		
			18-25	26-45	Above 45	Up to O/L or <O/L	Up to A/L or A/L-PQ	UG or higher
Aquatic birds	$X^2 = 116.972 ; p < 0.001$	<u>0.433</u>	-0.029	-0.359	0 <sup>b</sup>	<u>-1.008</u>	-0.129	0 <sup>b</sup>
Bears	$X^2 = 84.288 ; p < 0.001$	<u>0.321</u>	-0.422	-0.242	0 <sup>b</sup>	<u>-0.727</u>	-0.058	0 <sup>b</sup>
Elephants	$X^2 = 20.709 ; p < 0.01$	<u>-0.094</u>	-0.539	-0.170	0 <sup>b</sup>	-0.616	-0.139	0 <sup>b</sup>
Herbivorous	$X^2 = 18.990 ; p < 0.01$	<u>-0.056</u>	-0.120	0.094	0 <sup>b</sup>	-0.560	-0.422	0 <sup>b</sup>
Leopards	$X^2 = 87.147 ; p < 0.001$	<u>0.442</u>	-0.497	-0.566	0 <sup>b</sup>	-0.648	0.032	0 <sup>b</sup>
Terrestrial birds	$X^2 = 28.290 ; p < 0.001$	<u>0.417</u>	0.312	0.172	0 <sup>b</sup>	<u>-1.116</u>	-0.211	0 <sup>b</sup>

*Underlined odds ratios are the significant ones  $p < 0.05$*

<sup>b</sup> Reference category (fixed)

## **4. Impetus for Visitor Management**

Analysis of visitor preferences found that visitor preferences differ according to their previous experiences as well as demographic characteristics. Logistic regression models developed for “importance of reserve characteristics” indicate that level of education is an important determinant in an individual’s tendency to appreciate alternative natural components of a protected landscape. In general, importance of less popular components such as floral diversity, bird diversity and attractive landscapes were substantially influenced by an individual’s level of education.

This case-study further indicates that most of the visitors preferred charismatic fauna such as elephants, leopards, and bears. Even though charismatic faunal species are important in attracting new visitors to NPs, subordinate features of NPs also play a key role in sustaining visitor numbers by attracting more experienced visitors. When considered the visitor arrivals to the Minneriya NP in 2011, the total was 59,669 visitors. Among those visitors 61% were local visitors. From 2009 to 2011, total visitor arrivals to NPs in Sri Lanka has improved by 31.6%, while local visitor arrivals has increased by 27.3% (STDA, 2009; STDA, 2010; STDA, 2011). This increase of visitor arrivals indicates the growth of unexperienced or first-time visitor arrivals to NPs. This signifies the increase in demand for viewing charismatic fauna. However, results of this study also indicate a gradual increase in experienced visitors. As a result, the demand for viewing alternative component of biodiversity within NPs could be anticipated to increase. Recent studies also indicate that nature-based tourism and ecotourism markets in Sri Lanka has become more heterogeneous (Perera et al., 2012; Perera and Vlosky, 2013). This is likely to provide new opportunities to promote NPs or PAs which are less-known for charismatic species, but contain more subordinate features of biodiversity.

Statistics show that few NPs in Sri Lanka receive higher visitor arrivals while most NPs having relatively low visitations. For instance, only Yala and Horton Plains NPs had visitor arrivals more than 100,000 in year 2011 (STDA, 2011). In the case of Minneriya NP, higher visitor arrivals can be observed during the period of August to October especially to witness the “elephant gathering”, and the destination is largely marketed as a venue for observing elephants. Opening NPs for visitor levels above carrying capacity can have negative impacts such as lack of visitor satisfaction and disturbances and altered natural behaviors of wildlife. As suggested by Herath et al. (1997), diversification of visitation is an option available to administrators of NPs to reduce the pressure of overcrowding in few NPs. Marketing a diversity of tourist products in line with the diverse viewing preferences of visitors to protected areas may prevent over-crowding of popular nature-based tourism destinations. Furthermore, based on wildlife viewing preferences, strategies could be formulated to prevent less-desired types of visitors entering into more sensitive areas of NPs, and alternatively providing them with sufficient recreational opportunities in already disturbed sites within NPs.

Visitor experience (determined by number of previous visits to NPs) has been found to be a key visitor characteristic that drives the demand for nature-based tourism or ecotourism (Perera and Vlosky, 2013). Results of this case study further indicate that there is a considerable demand for viewing subordinate features of NPs, especially from highly educated and frequent visitors to NPs. This opens up new opportunities to introduce sustainable forms of tourism such as ecotourism in NPs and other PAs. For instance, specialized programs or tourism opportunities focused on bird identification, bird biology, and bird watching shall be introduced for experienced birders. Similar programs may be introduced for other components of biodiversity as well. On the other hand, less sophisticated programs/tours aimed at providing a fundamental knowledge on nature and ecosystems (introduction to the park and its flora and fauna, birding, and other sites of importance) shall be introduced for novice visitors.

The study also highlights the necessity to adopt an integrated regional approach for visitor management at PAs with the involvement of public and private sectors. For instance, Minneriya NP is known as a destination ideal for elephant watching. Minneriya is located in close proximity to three more wild life parks of Sri Lanka: Kaudulla NP to the north, Wasgamuwa NP to the south and Flood Plains NP to the north-east. These venues are also ideal for elephant watching except during the peak dry period. By adopting an integrated regional visitor management strategy, the visitor pressure at one highly popular NP could be lessened by diverting portion of the visitors to other venues. However, this requires appropriate destination promotion and marketing strategies to popularize alternative venues as ideal nature tour destinations. Alternative destinations should be identified and promoted to divert visitors interested in subordinate features of NPs, as popular NPs are already receiving enough traffic with visitors interested in observing charismatic species.



Sri Lanka's PAs include diverse ecosystems and the recreational opportunities available in PAs differ substantially from one to another. This case-study was restricted to a single highly-visited NP in Sri Lanka and only domestic visitors were considered in describing visitor segments. Hence, the present study is not without its limitations. However, visitor segments identified by the present study are comparable with nature-based tourist segments described in previous studies (Perera et al., 2012). Nonetheless, this case study provide useful insights to wildlife viewing preferences of visitors to NPs and forms a foundation for future studies on identifying biodiversity observation preferences of visitors to PAs in Sri Lanka, and impetus for visitor management.

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