Journal of Sustainable Tourism and Entrepreneurship (JoSTE)
ISSN 2714-6480, Vol 2, No 4, 2021, 199-212 https://doi.org/10.35912/joste.v2i4.748

Wildlife status and ecotourism potentials of Lekki Conservation Centre, Lagos, Nigeria

Ojonugwa Ekpah
Nigerian Conservation Foundation, Km 19, Lekki-Epe expressway, Lagos, Nigeria
davisugwa@gmail.com; ojonugwa.ekpah@ncfnigeria.org

Article History
Received on 3 August 2021
1st Revision on 12 October 2021
2nd Revision on 16 October 2021
3rd Revision on 12 November 2021
4th Revision on 25 November 2021
5th Revision on 13 December 2021
Accepted on 14 December 2021

Abstract
Purpose: Information about the status of wildlife in Lekki Conservation Centre (LCC) which is required for biodiversity policy-making is lacking.
Methods: Day foot patrol to monitor wildlife in LCC was carried out and the wildlife species present were identified from January to December 2020. Data of animals sighted in the patrol and by the tourists were compared with records of animals sighted from March to July 2010 as recorded in the Protection Report Diary.
Results: The findings indicated a decline in the population of squirrel (Heliosciurus gambianus) and bushbuck (Tragelaphus scriptus).
Limitation: A list of fauna in LCC forest is provided as a result of the foot patrol although, some parts of the forest were inaccessible.
Contribution: The perception of ecotourists is highlighted which can serve as feedback about their experience with the resources useful for biodiversity policy.
Conclusion: Species diversity in the Protection Report Diary (in 2010) was higher compared to the total number of wildlife species sighted by visitors (in 2021) and during the patrol (in 2020) indicating that some wildlife species in LCC declined within 10 years.
Keywords: Biodiversity, Ecotourism, Endangered, Forest, Monitoring, Record, Satisfaction
How to cite: Ekpah, O. (2021). Wildlife status and ecotourism potentials of Lekki Conservation Centre, Lagos, Nigeria. *Journal of Sustainable Tourism and Entrepreneurship*, 2(4), 199-212.

1. Introduction

Ecotourism is considered as an environmentally responsible and sustainable form of a visit to nature-based sites (Oladeji & Fatukasi, 2017). Nature-based sites include forest reserves in which the harvest of species is prohibited. Ecotourism is an important contribution of the forest through products and services to improving livelihoods. The International Ecotourism Society (TIES) defined ecotourism as responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education (TIES, 2015). The thought behind sustainable tourism is driven by visits to destinations without harming the natural environment or local communities (Kipkosgei, 2020). Ecotourism creates an atmosphere for a symbiotic relationship between locals and visitors and therefore offer an opportunity for an exchange of idea and culture. Ecotourism can bring about several benefits to a local community including reviving the traditional culture and cultural pride of the people in that particular area (Reimer & Walter, 2013). More importantly, ecotourism principles are hinged on fundamental issues relating to waste management, minimization of energy usage, site disturbance, impacts on wildlife, and how the interpretation can affect their interactions (McGuffin, 2017).

A major area of interest to ecotourists is wildlife. Wildlife is a valuable tool for bringing more visitors to a given destination since some visitors primarily want to see indigenous species or endangered species (Ranasinghe, Kumudulali, & Ranaweera, 2020). Against this background, the management of wildlife has become a lucrative business especially in less industrialized and biodiversity-rich countries

of the world. Nigeria's tourism industry has been estimated to be worth in excess of one trillion nairas with a revenue yield of close to 200 billion nairas and employment for about 5 million people (Federation of Tourism Associations of Nigeria, 2011). Countries worldwide have designated some areas as protected areas resulting in many benefits. These include the central role they play in the socio-economic development of local inhabitants in surrounding rural areas (Ejidike & Ajayi, 2013). Visitation to view wild animals in their natural environments has grown continuously as the most prominent aspect of tourism (Anup, 2016). It then becomes important to protect these animals in their natural habitat and manage visitation in a way that has less impact on the environment which led to the introduction of wildlife-based tourism or ecotourism (Honey, 1999). Ecotourism creates wealth to fund conservation. It is a strategy to conserve biodiversity by creating an alternative and sustainable form of livelihood for both destination host communities and migrants from different areas of the world. Ecotourism when properly planned, implemented, and monitored will bring about biodiversity conservation, poverty alleviation, elimination of hunger, and provision of sustainable infrastructure (Ijeomah & Eniang, 2018). The mobility and feeding pattern of wild animals make them very relevant in dispersing seeds within their home range. Most animals (elephants, squirrels, birds, many rodents, and insects) are involved in the dispersal of seeds (Ijeomah, 2019). Seed dispersal is required to sustain the diversity of plant species on which animals rely directly and indirectly. Plants produce food and are useful in medicine as well as serve as raw materials and a source of income for people.

A contributory factor to wildlife loss is habitat destruction through bush fires and large-scale forest clearance for subsistence farming and population growth (Tiimub et al., 2020). A good strategy to counter wildlife decline is the creation of nature reserves where hunting and other anthropogenic activities are illegal. Inventory and monitoring of species in the nature park are then essential and the information obtained can be used to make predictions about the future conservation prospects of the species. An inventory is a list of the fauna and flora found in a given area while monitoring takes it one step further by studying a population or habitat over a long period of time with multiple inventories (https://www.fishwildlife.org/application/files/3815/6780/2184/Inventory_Methods.pdf).

A successful biodiversity conservation project involves the locals living in or near the conserved area. Tiimub et al., (2020) recommended that Wildlife Division should strengthen synergies on community participation in adaptive wildlife management by coopting educational interventions that positively influence indigenous behaviors through seminars, workshops, and face-to-face interactions. Inventory and monitoring are not only conducted in the pursuit of new knowledge but are cornerstones in the management of wildlife resources (Morrison et al., 2008). In general terms, inventories are conducted to determine the distribution and composition of wildlife and wildlife habitats in areas where such information is lacking, and monitoring is typically used to understand rates of change or the effects of management practices on wildlife populations and habitats. In application to wildlife, inventory and monitoring are typically applied to species' habitats and populations (https://link.springer.com/chapter/10.1007/978-0-387-75528-1_7).

2. Review of related literature

Nigeria is blessed with an abundance of natural and manmade tourism resources of astonishing quality (Nwokorie & Adiukwu, 2020). The attractions range from intriguing forests to animals as well as conservation centres (Ijeomah, Abubarkar, Ezeano, Adetola 2019; Obiora & Nwokorie, 2019). The Lekki Conservation Centre in Nigeria, possesses some attractions capable of attracting visitors which includes wildlife moving freely within the approximately 78hectres of land. These attractions contribute to the good destination image of the site, attracting both local and foreign visitors (Arowosafe, Tunde-Ajaye, & Ojo, 2020). Ecotourism provision in LCC forest gives room for interaction between local and international tourists. The tourists have sufficient space in a calm environment to interact without distraction as they take a walk into the forest. They observe games through the path on the wooden trails surrounded by trees of which the most dominant species are *Chrysobalanus icaco* L. and *Elaeis guineensis* Jacq. (Harrison, 2019). Visitors are more interested in sightseeing of animals and taking photos with excitement and with the view of future references of the species.

LCC is selected for this present study because of its strategic position within the city of Lagos, Nigeria. Other nature parks in Nigeria may be difficult to access by ecotourists, whereas LCC is well situated on a busy Lagos - Epe expressway. Also, visitors are feeling more secure in urban areas where security personnel are readily available hence LCC has potential for ecotourism drive in Nigeria. Safety and security are some of the tourist's fundamental expectations and these are readily available at LCC. If visitors discover a destination unsafe, visiting it is less probable (Ranasinghe et al., 2020). Easy access and security enhance visitors' satisfaction and increase the motivation to revisit LCC. However, visitors' satisfaction is not a simple thing (Ranasinghe et al., 2020). It is complex and also consists of multi-dimensions. It affects different variables such as level of development, absence of litter, perceived crowding, weather, the behavior of others, interactions with families and friends, and condition of trails (Howat & Crilley, 2007).

Chigozie & Esther (2021) mentioned that Lekki Conversation Centre in Eti-Osa Local Government Area of Lagos State, Nigeria is situated with a prospect for marine tourism. They noted that tourists' perception of the quality of specific services, variables of security, tour guide, relaxation facilities, games, the general environment, and culinary experience received affirmative satisfactory responses. Arowosafe, Tunde-Ajaye, & Ojo, (2020) reported that attractions such as canopy walkways and games served as pull attractions for the visitors to the LCC while adventure, sightseeing, and relaxation were highly ranked as push-motivations for the visitors to the site. Some areas have great potentials for realizing the benefit of ecotourism than others and in areas with low visitation, the potentials are not usually clear (Ajalla, 2010). Ijeomah (2019) listed some attractions and activities in an ecotourism destination mentioning nature trailing, climbing of treehouse, canopy walkway, serene environment, and picnicking as the attractions and activities in LCC. However, attractions and activities available in LCC also include game viewing, bird watching, and enjoyment of cool breeze. The Lekki Bird Club is a volunteer-based bird conservation group paying frequent visits to LCC to observe birds (https://www.africanbirdclub.org/news/lekki-bird-club-nigeria?language=fr).

Although no research studies about ecotourism's negative effect on wildlife in LCC were found, some of the activities listed in Table 5 may constitute some disturbances to the species. Animals in protected areas may face stress due to ecotourism. Nature-based tourism has great potential for negative impacts on animals, as tourists seek out rare or spectacular species often during sensitive times, such as breeding or nesting periods (Knight, 2009). Previous studies have found that tourists cause negative impacts on the movement, foraging and reproductive behavior of large felids, and the distribution of waterfowl (Murray, Becker, Hall, & Hernandez, 2016). Where human traffic is frequent, some species withdraw from their habitat, some of them change their behavior, and still, others may become habituated to human presence (Cardiff, Ratrimomanarivo, & Goodman, 2012). As animals become habituated to humans, they may use areas where tourists are present as "escape valves" from predators and human hunters. Ecotourism's impacts may result in abnormally high or low population abundance of some species in tourist destinations and can potentially lead to ecological change through population increment in the habituated or unaffected species, possibly altering the distribution of their competitors or prey (Jilo, 2018). There may also be long-term consequences of the floristic makeup of an area due to altered patterns of seed dispersal and predation (Cardiff, Ratrimomanarivo, & Goodman, 2012). These changes may have effects on the composition and functioning of the entire ecosystem (Jilo, 2018).

Objectives of the study

Ecotourism facilities in the LCC are fixed and could be available for tourists anytime but the animals are not caged. Ecotourists are attracted to wildlife and the sighting of fauna in LCC is by the opportunistic encounter. Ecotourism is an instrument used in monitoring biodiversity decline through proper record keeping of species sighted by visitors over a period of time. Climate change, poverty, population growth, invasive alien species, and habitat fragmentation were identified as core factors depleting biodiversity in Nigeria (Imarhiagbe, Egboduku, & Nwankwo, 2020). These factors are on the rise hence there is a need to monitor the occurrence of species in LCC. In this present study, the change in fauna diversity in LCC is assessed after 10years by comparison of records in the Protection Report Diary (PRD) with information from eco-tourists and surveillance patrol. Another objective of this study

is to verify the presence of the animals in LCC as reported in PRD and by the ecotourists by information from the literature.

3. Materials and methods

Study area

Lekki Conservation Centre (LCC) comprises freshwater swamp and grassland, covering an area of about 78hectares. The forest grassland is an open area with few trees and shrubs, while the forest swamp is waterlogged and has a lot of suspended organic material present in the water column (Ekpah, Adu, & Kemabonta, 2020). Lekki Conservation Centre (LCC) is a forest nature reserve that lies around 6.4364ºN to 6.4425ºN, 3.5356ºE to 3.538ºE along the Lekki-Epe expressway (Fig. 1). Lekki Conservation Centre is a protected forest area managed by the Nigerian Conservation Foundation (Harrison, 2019). The proximity of the forest to Lagos metropolis has encouraged institutions of learning and lovers of nature to visit the reserve regularly for both research and recreation.

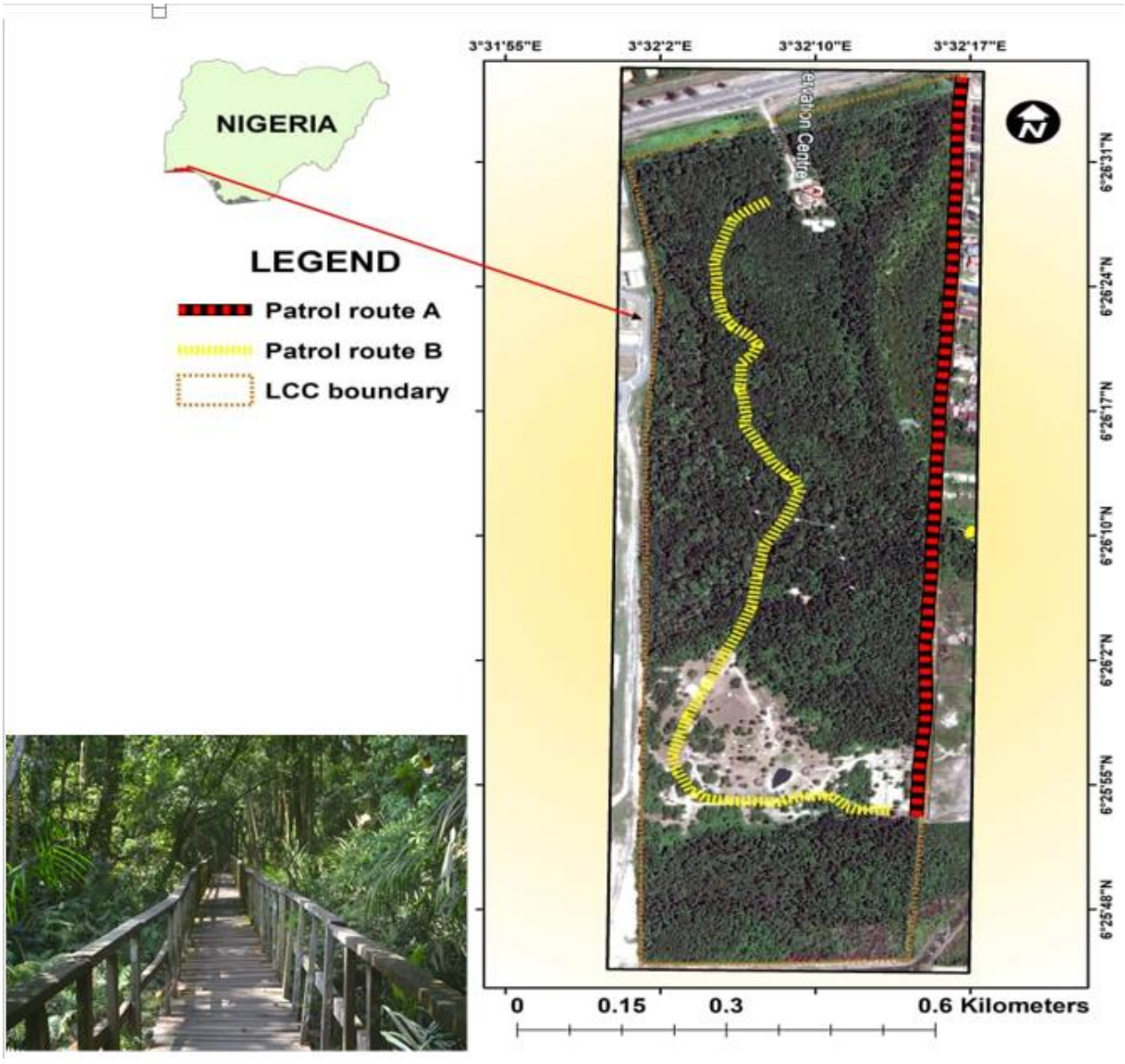

Figure 1. Nature trail and map of LCC with patrol routes

Foot Patrol method

Patrol technique as described by McComb, Zuckerberg, Vesely, & Jordan, (2021) was used for the survey. The standardized visual searches were carried out to determine species occurrence where sampling effort was standardized by time. Foot patrols (Nyirenda & Chomba, 2012) were carried out

during the day from January to December 2020 through the wooden trail, along the perimeter (fence) of the landscape, and in the grassland of LCC using routes that did not disturb the natural vegetation (Figure 1). There was a break in March and April due to the COVID-19 lockdown. Patrol routes can be viewed as transects with unfixed width used to collect information on indicators of illegal wildlife use and animal observations (Wiafe & Amoah, 2012). An approximate distance of 1.8km was covered each day (once a week) for a total of 48days. Species sighted were recorded and the GPS coordinates of the location were taken using handheld Global Positioning System (GPS) Garmin Etrex 10. Photo evidence of wildlife species sighted was documented by Nikon Coolpix P900 digital camera.

Identification of species

Species were identified using field guides (Borrow & Demey, 2014; Fougelrol, 2008; Kingdom, 1997; Larsen, 2005) and online keys after which the photos of each species were sent to specialists for confirmation. Evidence of the presence of each species identified in LCC forest was obtained from the literature.

Data collection and analysis

Primary data were collected by interview and structured questionnaire randomly administered face-to-face to consenting tourists who visited LCC from March to June 2021. Concise questionnaires to ease readability and obtain more responses (Tanalgo & Hughes, 2021) were administered to assess tourists' profiles, satisfaction, and animals sighted. Secondary data were extracted from the PRD of the Nigerian Conservation Foundation covering a period of March to July 2010. The Protection Report Diary is an inventory of animals sighted in the forest during foot patrols and tours guiding by rangers in LCC. Animals whose carcass, footprints, faces, feathers, and calls were the indicators of their presence as reported in the PRD were not included in this analysis. Animals mentioned with uncertainty in the PRD were excluded in the final analysis. Where an animal was reported once in the PRD, a frequency value of 1 is given. When an animal is reported twice (in the day and night patrols) a frequency value of 2 is allocated in the excel datasheet. Responses from the questionnaire and recorded interview were extracted and inputted in an excel sheet which was transferred to R statistics version 2 from which the tables were made. Visitors who declined to respond to a category were recorded as non-responsive.

The methodology is most suited for the research because there was little or no negative impact on the species in terms of disturbance as no transect was made, no alteration of their habitat, and no manipulation of the study animals being consistent with the National Centre for the Replacement Refinement and Reduction of Animals in Research (https://nc3rs.org.uk/wildlife-research).

4. Discussions of findings

Ecotourists' experience and satisfaction

Results are given in proportion (percentages) of the total 300 respondents. During their visit to the LCC (Table 1), 82% of visitors noted that they would revisit the forest while 12% were not sure (indifferent). 47% of the tourists were satisfied with their visit while 4% were not satisfied. On visitors' experience with the mona monkeys, 3% of the visitors fed the monkeys. 20% of the visitors described the monkeys as friendly while 16% of the ecotourists explained that monkeys attempted to snatch their food.

Table 1. Ecotourists' experience and satisfaction in LCC forest

Ecotourists' satisfaction		**Human-primate conflict**		**Revisit**	
Category	Percentage	Category	Percentage	Category	Percentage
Disgusted	1	Monkeys attacked	1	Indifferent	12
Not satisfied	4	Monkeys urinated on ecotourists	0.003	No	4

Okay	17	Monkeys attempted to snatch food	16	Yes	82
Satisfied	47	Monkeys snatched food	5	Non responsive	1
Very satisfied	31	Ecotourists feed the monkeys	3		
Non responsive	1	Monkeys are friendly	20		
		Non responsive	54		

Wildlife sighted and recorded

A total of 28 animal species were recorded during the patrol. Animals sighted by tourists are presented in Figure 2. Twenty-one (21) species of animals were reported to be sighted in the PRD in 2010. Some classes of animals in the PRD were not reported to the species level, for example, bird and snake. In 2021, visitors mentioned that they saw 12 species of animals. The birds reported in the PRD could be any of the species observed during the patrol (Table 2). The list of animals sighted in LCC from January to December 2020 during the patrol is also presented in Table 2. Some species recorded in the PRD were not sighted during the patrol nor reported sighted by the tourists during the survey. These include bat, civet cat, crab, duiker, owl, pangolin, and waterbuck.

Table 2. List of animals sighted in LCC forest from January to December 2020 during the Patrol

Class	Animal	IUCN Status
Aves	African Jakana (*Actophilornis africanus* Gmelin, 1789)	LC
	Purple-headed starling (*Hylopsar purpureiceps* Verreaux & Verreaux, 1851)	LC
	White-throated bee-eater (*Merops albicollis* Vieillot, 1817)	LC
	Piping hornbill (*Bycanistes fistulator* Cassin, 1852)	LC
	Yellow-billed kite (*Milvus aegyptius* Gmelin, 1788)	LC
	Red-eyed dove (*Streptopelia semitorquata* Rüppell, 1837)	LC
	Common bulbul (*Pycnonotus barbatus* Desfontaines, 1789)	LC
Amphibia	Tree frog (*Afrixalus dorsalis* Peters, 1875)	LC
Pisces	African bonytongue (*Heterotis niloticus* G. Cuvier, 1829)	LC
	The spotted tilapia (*Tilapia mariae* Boulenger, 1899)	LC
Insecta	Millipede*	
	Inspector (*Chalcosephia flavifrons* Kirby, 1889)	LC
	Common Pearly (*Eresiomera isca* Hewitson, 1873)	LC
	Black emperor (*Anax tristis* Hagen, 1867)	LC
	African giant skipper (*Pyrrhochalcia iphis* Mabille, 1904)	LC
	Honey Bee (*Apis mellifera* Linnaeus, 1758)	LC

	Meliponine bee (*Dactylurina staudingeri* Gribodo, 1893)	LC
Mammalia	Bushbuck (*Tragelaphus scriptus* Pallas, 1766)	LC
	Mona monkey (*Cercopithecus mona* Schreber, 1774)	LC
	Gambian sun squirrel (*Heliosciurus gambianus* Ogilby, 1835)	LC
Mollusca	Snail*	
Reptilia	Forest cobra (*Naja melanoleuca* Hallowell, 1857)	LC
	Rock python (*Python sebae* Gmelin, 1788)	NT
	Dwarf crocodile (*Osteolaemus tetraspis* COPE 1861)	VU
	Emerald green snake (*Philothamnus* sp)	LC
	African spurred tortoise (*Centrochelys sulcata* Miller, 1779)	EN
	West African black turtle (*Pelusios niger*)	NT
	Nile lizard (*Varanus stellatus* Daudin, 1802)	LC

EN-endangered, LC-Least Concern, NT- Near threatened, VU-Vulnerable
*Yet to be identified species

The conservation status of *Osteolaemus tetraspis* was Vulnerable while that of *Pelusios niger* and *Python sebae* were Near threatened according to the IUCN red-list. A single male and one female of *Centrochelys sulcata* (Endangered) were found at the premises of LCC. All other species observed were Least concern. (https://www.iucnredlist.org/search?query=Python%20sebae&searchType=species).

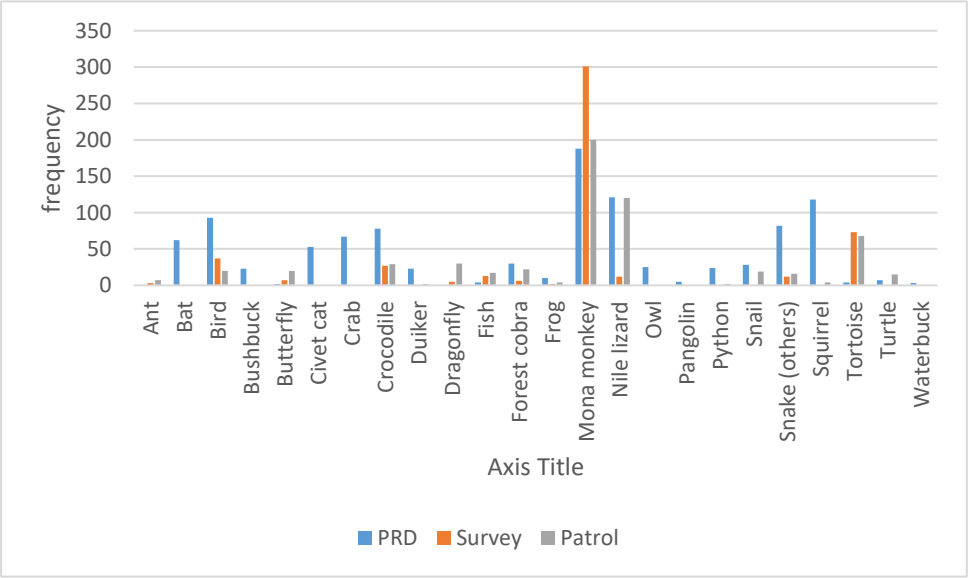

Figure 2. Frequency of wildlife species reported in the Protection Report Diary (PRD), sighted by ecotourists (Survey), and encountered in the patrol in LCC.

Figure 3. Python sebae and Osteolaemus tetraspis in LCC.

Discussion

Of the four types of ecotourists described by Lindberg (1991), the type of ecotourists to LCC is basically causal meaning that their visit is an accidental component of a broader trip. 31% of the ecotourists were very satisfied with their visits and were attracted to the vegetation, tree canopy, and serenity of LCC forest. In their related research in Finima Nature Park, Ijeomah & Duke (2016) opined that the consistent quietness of the park environment makes it possible for tourists to listen and enjoy different natural sounds produced by wind, birds, and other animals while in the park. The visitors see the LCC as a good environment for relaxation, inspiration, sightseeing, and enjoyment. Visitors were also motivated to visit the LCC by the experience of walking through the nature trail. It is about 1.8km wooden platform elevated to approximately 4m which creates a path for visitors to cross the swampy areas into the family park. From the platform, visitors could do the sightseeing activities and take pictures of themselves as well as the species sighted. Visitors (82%) noted that they would revisit the forest as LCC met their expectations. What motivates the tourist for subsequent visits to a destination are tied to their perception of the area in terms of the attitude of the local people, the overall satisfaction they derive, fulfillment of their expectation, and availability of desired resources (Ukabuilu, Nwokorie, & Ezeibe. 2008). The satisfactory experience that the visitors had during their visits must have necessitated their decision to revisit. A total of 5% were not satisfied and disgusted with the visit. Visitors in these categories expressed their displeasure in their inability to sight many species of animals which agrees with the report of Ijeomah, Nwanegbo, & Umokoro (2015) that tourists always complain of difficulties in sighting games in parks unlike in zoos where games are confined.

Encounter rate per day was the criteria used to assess the population of wildlife in LCC during the research. Snake, *Philothamnus* spp are common in southwestern Nigeria and hence in LCC where they blend with the leaves as a means of adaptation. Akinpelu & Areo (2007) recorded *Philothamnus heterodermus, Philothamnus irregularis,* and *Philothamnus semivariegatus* from Osun state, Nigeria. *Naja melanoleuca* was sighted 30 times in the PRD and was also sighted in the patrol. According to Luiselli & Angelici (2000), the presence of *Naja melanoleuca* was significantly influenced by the presence of a unique macrohabitat category (primary swamp-forest). LCC, therefore, provides a good microhabitat for *N. melanoleuca*.

Most species do not require much concentration and focus to see. All the visitors to the forest mentioned that they sighted the mona monkeys. Only 5 percent of visitors noted that they saw insects including ants, butterflies, and dragonflies despite the obvious presence of insects in the forest. Ekpah, Adu, & Kemabonta (2020) recorded 25 species of dragonflies in LCC of which *Chalcostephia flavifrons* and *Ceriagrion glabrum* were the most abundant. Butterflies sighted by visitors could also be the very common *Papilio demodocus*, *Eresiomera isca*, *Catopsilia florella,* and *Danaus chrysippus* as recorded by Dieuwho (2013). No visitor saw the bat, civet cat, crab, duiker, owl, pangolin, and waterbuck. The squirrel was also scarce and was not reported by the tourists though recorded twice during the patrol.

Since the survey period within the year (March to July) coincided with the period the wildlife species were recorded in the PRD, the effect of seasonal variations in species abundance is less likely. The results showed that the fauna of LCC forest became genuinely scarce after 10years. Since LCC forest is protected from human alterations to a larger extent, climate change and increased development (constructions) around the perimeter of the forest may have resulted in the decline of some fauna over the years.

Apart from poaching, another threat to species observed in the Lekki Conservation Centre is seasonal flooding of the reserve. Fishes such as *Heterotis niloticus* however seem to benefit from the flood as they were abundant during intensive rains which coincided with their spawning periods (Adite, Winemiller, and Fiogbe, 2005). From 2010 to 2020, LCC has witnessed a decline in squirrel and bushbuck populations (Figure 2) due to anthropogenic disturbance. Whereas the pangolin was sighted 5 times in 183 days/nights according to the PRD, not a single pangolin was sighted by the visitors and during the patrol. Since ecotourists visited only during the day, they couldn't have seen nocturnal species such as civet cats and bats as recorded in the PRD. However, the number of Gambian Sun Squirrel (*Heliosciurus gambianus*) reduced drastically as no visitor sighted it. LCC is a habitat for threatened species (Krishna, Kumar, Tripathi, & Koprowski, 2016). Pictorial evidence of the presence of endangered African grey parrot in LCC is available (Dazi, pers. comm.; 5 April 2021) as well as rare species like the Narina's Trogon *Apaloderma narina* (Onoja et al in press). The ball python (*Python regius*) was sighted in LCC during the patrol. Branch & Hacke (1980) noted that the African rock python is found throughout almost the whole of sub-Saharan Africa.

Red-eyed doves (*Streptopelia semitorquata*) were frequently sighted on trees within the swamp forest of LCC. This species has an extremely large range and the population trend appears to be increasing (http://datazone.birdlife.org/species/factsheet/22690499). They have a weak flight and hence were well observed within the forest. *Chalcosephia flavifrons* were well abundant in LCC forest. Its habitat is standing and often temporary waters and open areas in the forest (http://addo.adu.org.za/index.php?taxon_id=70600). Whereas *Cercopithecus mona,* was sighted in almost every walk into the LCC, *Tragelaphus scriptus* and *Heliosciurus gambianus* were sighted only two times and were scarce during the survey. Some fauna populations (*Tragelaphus scriptus* and *Heliosciurus gambianus*) had reduced in 10 years while *Cercopithecus mona* population had increased. The mona monkeys in LCC forest are prolific and prey to few animals. The finding is consistent with Olaleru & Omotosho (2020) who reported that there was no direct evidence of hunting of monkeys and findings showed that they were not being hunted and their population did not decline over the years. Yeboah, Afram, Quampah, & Kulega (2020) also reported that there was an increase in the monkey population in Boabeng-Fiema Monkey Sanctuary in Ghana in recent years.

Many visitors enjoyed the sight of mona monkeys jumping from tree to tree while others complained that the monkeys snatched their food. From an oral interview with the tour guides at LCC forest, it was explained that the capacity of the monkeys to snatch food from visitors increased over the years. This could be as a result of visitors feeding the monkey, the introduction of a domesticated mona monkey known as 'mama' into the troop, or food scarcity due to competition and/or climate change. Monkey-human conflict is however not peculiar to LCC forest. Similar cases have been reported in Gashaka Gumti that monkeys invaded people's villages (Ijeomah & Eniang, 2018)

5. Conclusion

Lekki Conservation Centre, being rich in biodiversity is well situated in the busy city of Lagos as an instrument of ecotourism and biodiversity conservation. Evidence from literature and the result from the patrol proves that the species reported by visitors and in the PRD are found in LCC. However, some wildlife species in LCC became scarce within the past 10 years, therefore, reducing its eco-tourism potentials. Visitors saw less of species during the survey period as compared to the report in the PRD in a decade gap. This decline of species diversity of LCC is capable of reducing the satisfaction of future eco-tourists to the forest. The ecotourism industry will suffer the loss of wildlife.

Recommendations

The following recommendations are proposed:

1. Twenty – two (22) of the 28 animal species observed during the patrol were least concerned although some including *Tragelaphus scriptus* were rare during the study. There is therefore a need for a regional reassessment of the species based on the IUCN guidelines.
2. Also, eco-tourists to LCC should be given more opportunities to give feedback about their experience with wildlife. The information provided by the ecotourists could be a valuable resource for biodiversity conservation policy-making and also a reference for future researchers.
3. To mitigate primate-human conflict in LCC, visitors must be advised to stop feeding the monkeys.
4. Researchers have shown that there are critical breeding and nesting periods when animals are most vulnerable to disturbances. In such periods, appropriate restrictions of ecotourism activities should be enforced.
5. Playing music within the LCC forest should be prohibited. Efforts must be made to keep noise levels low and maintain a specified minimum distance between visitors and wildlife (Jilo, 2018). For example, the minimum distance from which visitors are allowed to view sea lions at Seal Bay is 6m (Wolf & Croft, 2010).

Acknowledgment

Special thanks to Mr. Adedamola Ogunsesan, the project manager of LCC for approving the study.
The views expressed in this information product are those of the author and do not necessarily reflect the views or policies of the Nigerian Conservation Foundation.

References

Adite, A., Winemiller, K. O., & Fiogbe, E. D. (2005). Ontogenetic, seasonal, and spatial variation in the diet of Heterotis niloticus (Osteoglossiformes; Osteoglossidae) in the Sô River and Lake Hlan, Benin, West Africa. Environmental Biology of Fishes, 73:367-378.

Ajalla, J. N. U. (2010). Ecotourism as a Conservation Strategy for a Protected Area and Sustainable Community Development in Nigerian National Park. *International Journal of Communication*, 12:341-361

Akinpelu, A. I. & Areo, A. (2007). The Snakes of Osun Grove: a World Heritage Site in Osogbo, Nigeria. *International Journal of Tropical Biology*, 55 (2):717-721.

Anup, K. C. (2016). Ecotourism and Its Role in Sustainable Development of Nepal, Tourism - From Empirical Research Towards Practical Application, Leszek Butowski, IntechOpen, https://www.intechopen.com/books/tourism-from-empirical-research-towards-practical-application/ecotourism-and-its-role-in-sustainable-development-of-nepal

Arowosafe, F. C., Tunde-Ajayi, O. A. & Ojo, B. D. (2020). Examining Motivation and Perception of Visitors at Lekki Conservation Centre (LCC) in Nigeria. *European Scientific Journal*, 16(29): 1857-7881.

Borrow, N. & Demey, R. (2014). Birds of Western Africa. 2ed. Princeton University Press.

Branch, W, R, & Hacke, W, D. (1980). A fatal attack on a young boy by an African rock python *Python sebae*. *Journal of Herpetology*, 14 (3): 305–307. doi:10.2307/1563557.

Cardiff, S. G., Ratrimomanarivo, F. H. and Goodman, S. M. (2012).The effect of tourist visits on the behavior of *Rousettus madagascariensis* (Chiroptera: Pteropodidae) in the caves of Ankarana, northern Madagascar. *Acta Chiropterol*ogica14:479-490.

Chigozie, N. E. and Esther, A. E. (2021). Tourists' Perception of Ecotourism Development in Lagos Nigeria: The Case of Lekki Conservation Centre. *TURIZAM*, 25(1):11–30

Dieuwho, (2013). Butterflies at Lekki Conservation Centre (Checklist in Personal communication)

Ejidike B. N. & Ajayi S. R. (2013). Trends in wildlife conservation practices in Nigeria. *International Journal of Biodiversity and Conservation*, 5(4):185-191.

Ekpah, O., Adu, B. W. & Kemabonta, A. K. (2020). An inventory of Odonata in relation to water quality in Lekki Conservation Centre, Nigeria. *British Journal of Entomology and Natural History*, 33(4): 367-382.

Federation of Tourism Associations of Nigeria. Boosting Tourism in Nigeria. Daily Sun Newspapers (Lagos, Nigeria). 21 March 2011P11 https://www.eajournals.org/wp-content/uploads/Ecotourism-Potential-of-Ebonyi-State-Nigeria.pdf

Fougelrol, L. (2008). Crocodiles. France.

Harrison, E. A. (2019). Tree species of Lekki Conservation Center, Lagos State, Nigeria. *International Journal of Bioscience*, 15:308-314.

Honey, M. (1999). Ecotourism and Sustainable Development. Who Own Paradise? Island Press, Washington D.C., USA.

Howat, G. & Crilley, G. (2007). Customer service quality, satisfaction, and operational performance: A proposed model for Australian public aquatic centres. *Annals of Leisure Research*, 10(2):168-195.

Ijeomah, H. M. (2019): Relevance of Wildlife Resources and Ecotourism as Instruments for Achieving Sustainable Development Goals (Lead paper), pp.144 – 166 In: Adekunle,V.A.J. and Akinwole, A.O.(eds.) Sustainable Development Goals through Appropriate Forest Management – Keynote and Sub-themes. Proceedings of the 41st Annual Conference of the Forestry Association of Nigeria held in Abuja, Federal Capital Territory 07 – 11 October, 2019At: Abuja, Federal Capital Territory of Nigeria

Ijeomah, H. M., Abubarkar, S. I., Ezeano, C. I. & Adetola, B. O. (2019). Assessment of Tourist Attraction and Satisfaction in Selected Eco-destinations in Lagos State, Nigeria. *African Journal of Agriculture, Technology and Environment*, 8(1):85-104.

Ijeomah, H. M. & Duke, E. K. (2016). Prospects and Sustainability of Ecotourism in Finima Nature Park, Bonny Island, Rivers State, Nigeria. *Journal of Research in Forestry, Wildlife & Environment*, 8(4): 39-52.

Ijeomah, H. M. & Eniang, E. A. (2018). Ecotourism and National Development in Nigeria: Prospects and Challenges. Proceedings of 6th NSCB Biodiversity Conference; University of Uyo (1 - 12pp).

Ijeomah, H. M., Nwanegbo, O. C. & Umokoro, O. (2015). Assessment of Tourist Attractions in Okomu national park and Oguta Lake ecodestinations of Nigeria. *Production Agriculture and Technology*, 11 (2), 219-239.

Imarhiagbe, O., Egboduku, W. O. & Nwankwo, B. J. (2020). A review of the biodiversity conservation status of Nigeria. *Journal of Wildlife and Biodiversity*, 4 (1): 73-83.

Jilo, K. (2018). The effect of ecotourism on the distribution of wild animals and their abundance in Abijatta Shala Lakes National Park Master's Thesis. https://www.grin.com/document/426846

Kingdom, J. (1997). The Kingdom Field Guide to African Mammals. A & C Black Publishers Limited.

Kipkosgei, B. (2020). Sustainable Tourism and Economic Growth Nexus in Kenya: Policy Implications for Post-Covid-19. *Journal of Sustainable Tourism and Entrepreneurship*, 1(2): 123-138, doi:10.35912/joste.v1i2.209.

Knight J., (2009). Wildlife Responses to Recreationists. Chapter 4 in Wildlife and Recreationists: Coexistence through Management and Research. Richard L. Knight and Kevin J. Gutzwiller (eds). Island Press. Washington, DC.

Krishna, M. C., Kumar, A., Tripathi, O. P. & Koprowski, J. L. (2016). Diversity, Distribution and Status of Gliding Squirrels in Protected and Non-protected Areas of the Eastern Himalayas in India. *Hystrix, the Italian Journal of Mammalogy*, 27 (2):111–119

Larsen, T. B. (2005). Butterflies of West Africa. Apollo Books, Svendborg, Denmark. 595 pp + 135 color plates.

Lindberg, K. (1991). Policies for Maximizing Nature Tourism's Ecological and Economic Benefits. Washington DC Ecotourism Society.

Luiselli, L. & Angelici, F. M. (2000). Ecological relationships in the AfroTropical cobra species (*Naja melanoleuca* and *Naja nigricollis*). *Canadian Journal of Zoology*, 78(2):191-198.

McComb, B., Zuckerberg, B., Vesely, D. & Jordan, C. Monitoring Animal Populations and their Habitats: A Practitioner's Guide Download for free at https://open.oregonstate.education/monitoring/ Accessed June, 2021.

McGuffin, D. 2017. Describe the Main Elements of Ecotourism. Retrieved from https://getawaytips.azcentral.com/describe-the-main-elements-of-ecotourism-12311082.html

Morrison, M. L., Block, W M., Strickland, D. M., Collier, B. A. & Peterson, M. J. (2008) Inventory and Monitoring Studies. In: Wildlife Study Design. Springer Series on Environmental Management. Springer, New York, NY. https://doi.org/10.1007/978-0-387-75528-1_7

Murray, M. H., Becker, D.J., Hall, R. J., & Hernandez, S. M. (2016). Wildlife health and supplemental feeding: a review and management recommendations. *Biological Conservation,* 204:163-174

Nwokorie, E. C. & Adiukwu, I. K. (2020). Hospitality and Tourism Entrepreneurship: Administrative Barriers in Imo State, Nigeria. *International Scientific Journal Turizam*, 24(1):13-32.

Nyirenda, V. R. & Chomba, C. (2012). Field foot patrol effectiveness in Kafue National Park, Zambia. *Journal of Ecology and the Natural Environment* 4(6):163-172.

Obiora, J. N. & Nwokorie, E. C. (2019). Enhancing Destination Loyalty through Online Presence in the Tourism Industry in South-East Nigeria. *Accounting and Taxation Review*, 3(1): 69-81.

Oladeji, S. O. & Fatukasi, D. (2017). Participatory approach to conservation and management of protected areas in Nigeria: Case study of Osse River Park Project. *African Journal of Environmental Science and Technology*, 11(9):471-485.

Olaleru, F. & Omotosho, O. O. (2020). Human-monkey conflict in and around Lekki Conservation Centre, Lagos, Nigeria. *Journal of Research in Forestry, Wildlife & Environment* 12(4):54-64.

Ranasinghe, R., Kumudulali, U. & Ranaweera, A. K. (2020). The Role of Park Attributes in Visitor Satisfaction: Evidence From Minneriya National Park in Sri Lanka. *Journal of Sustainable Tourism and Entrepreneurship*, 1(2):87-104, doi:10.35912/joste.v1i2.218.

Reimer J.K. & Walter, P. (2013). How do you know it when you see it? Community based ecotourism in the Cardamom Mountains of southwestern Cambodia. *Tourism Management*, 34 (2013), pp. 122-132.

Tanalgo, K. C. & Hughes, A. C. (2021). The potential of bat-watching tourism in raising public awareness towards bat conservation in the Philippines. *Environmental Challenges*, 4, 100140.

The International Ecotourism Society (TIES). (2015). Ecotourism. The International Ecotourism Society. www.ecotourism.org.

Tiimub, B. M., Gbolo, B., Tiimob, R. W., Tiimob, E. L., Kumedzro, V. & Tiimob, E. (2020). Impact of Community Participation in Adaptive Wildlife Resources Management at Mole National Park, Ghana. *Journal of Sustainable Tourism and Entrepreneurship*, 1(2): 139-149. doi:10.35912/joste.v1i2.245.

Ukabuilu, E. N., Nwokorie, E. C. & Ezeibe, N. (2018). Empirical investigation of Problems of Inbound Tourism in South-Eastern Nigeria: Catalyst for Regional Development. *HAT-MAN Journal of Hospitality and Tourism*, 8(1):29-35.

Wiafe, E. D. & Amoah, M. (2012). The Use of Field Patrol in Monitoring of Forest Primates and Illegal Hunting Activities in Kakum Conservation Area, Ghana. *African Primates*, 7 (2): 238-246.

Wolf, I. D. & Croft, D. B. (2010). Minimizing disturbance to wildlife by tourists approaching on foot or in a car: a study of kangaroos in the Australian rangelands. *Applied Animal Science*, 126:75-84.

Yeboah, T., Afram, C. S., Quampah, B. & Kulega, A. (2020). Adaptation to Risks Related to Ecotourism: Development at Boabeng in the Bono East Region, Ghana. *Journal of Sustainable Tourism and Entrepreneurship*, 1(2):105-121, doi:10.35912/joste.v1i2.168.

Appendix

With a total of 661 visitors, Nigerians were the highest number of visitors to LCC during the survey. Although some Nigerian visitors may have traveled from other countries to LCC, a larger part of the 661 Nigerian visitors must have taken advantage of the proximity of LCC. 120 visitors were Indians who prefer to come in groups rather than individually. The Indians sometimes carry their food and drinks as well as games along to the LCC. African visitors were also well represented with 21 Beninese, 5 Kenyans, and 4 South Africans.

Table 3. Nationality of Ecotourists to LCC forest.

Nationality	**Number of visitors**
American	26
Beninese	21
British	3

Cameroonian	2
Chinese	42
English	5
French	27
German	13
Ghanaian	8
India	120
Italian	7
Japanese	3
Kenyan	5
Lebanese	26
Nigerian	661
Pakistani	4
Philippine	10
South African	4
Spanish	8
Syrian	27
Tunisian	5
Turkish	18
Others	27

Lack of information about ecotourism resources in LCC is a limitation to the number of visitors. Since ecotourism offers an opportunity for environmental education, the lack of information about ecotourism resources translates to insufficient knowledge of the importance of wildlife and the need to protect them. 127 tourists heard about LCC through friends who must have previously visited the forest while 46 visitors were aware of LCC through the internet. 49 visitors could not remember how they heard about LCC while 2 visitors mentioned that they discovered LCC by merely passing by (Self-discovery).

Table 4. How visitors heard about Lekki Conservation Centre

Criteria	**Frequency**
Could not remember	49
Friends	127
Google map	5
Guide to Lagos (Book)	3
Internet	46
News	1
Referral	5
School	2
Self-discovery	2
Social media	28
Trip advisor	1
Word of mouth	20
Others	7

Table 5. Some attractions and activities in an ecotourism destination

S/N	**Attractions/Activities**	**Examples of destinations where the activities are present**
1.	Game viewing	Yankari wildlife park, Kainji Lake National Park, etc
2.	Mountain climbing	Shere hills
3.	Swimming	Oguta lake, Elegbusi royal beach

4.	Trekking	Annapurna region in Nepal
5.	Nature trailing	Finima nature park, Lekki Conservation Centre (LCC)
6.	Bird watching	Pandam lake, Gashaka gunti national park
7.	Enjoyment of cool breeze	Elegbusi Royal Beach
8.	Sport Fishing	Oguta lake
9.	Boating	Oguta lake, Pandam wildlife park, Rayfield resort
10.	Climbing of tree house	Okomu national park, Lekki conservation center
11.	Rafting	
12.	Canopy walkway	Lekki Conservation Center, Kakum forest in Ghana
13.	Biking	
14.	Enjoying sunlight	
15.	Serene environment	Pandam play ground, Lekki conservation center
16.	Playing in the sand or beach	Elegbusi royal beach
17.	Picnicking	Oguta lake, Elegbusi royal beach, LCC
18.	Watching waterfall	Farin ruwa water fall, Erin Ijesha waterfall, Urashi Dikenafai

Source: Ijeomah (2019).