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Mammals Diversity in the Narayan WLS, Kachchh, Gujarat

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ABSTRACT: Narayan Sarovar Wildlife Sanctuary is an integral and unique part of the *Thar Desert ecosystem* situated in the Lakhpat taluka of Kutch district in the Gujarat State, India. The exceptional ecology of the sanctuary supports diverse fauna including vulnerable and rare animal species. During present studies 29 species referable to 25 genera, 16 families and 07 orders along with conservation status have been documented. The sanctuary area is one of the major eco-sensitive zone and sustain rare animal fauna of desert ecosystem. However, area of the sanctuary is facing threats due to various factors *viz.* Human interference/settlement, ever increasing pilgrims due to religious reasons, industrial development and speedy vehicular traffic etc. Awareness among the locals of the area by education about the importance of fauna is the utmost tool for the conservation of the habitat restoration of the area.

Keywords: Faunal, threatened, integral, eco-sensitive, pilgrim.

INTRODUCTION

Narayan Sarovar Wildlife Sanctuary is located between 23°27′-23°42'N latitude and 68°30'-68°57′E longitude in the westernmost part of the Country. It is a unique ecosystem in the arid zone of Great Rann of Kachchh (Kachchh, district) in the Lakhpat Taluka in the state of Gujarat. It lies in the Biotic Province-3A Kachchh Biogeographic Zone-The Indian Desert (Champion and Seth, 1968; Rodgers & Panwar 1988). The sanctuary had been notified in April, 1981 with an area of 765.79 sq. km., subsequently in August, 1995 due to various development inside and vicinity of the sanctuary region, Gujarat State reduced area of the sanctuary and at present expanse of the sanctuary is 444.23 sq. km. Elevation of the sanctuary ranges from 2.7m ASL (Tahera village) near costal area to 157m ASL (Manihal hills) in Kaniyaro Rakhal. Climate of the sanctuary is dry and very hot with average precipitation of 200-300 mm. The temperature ranges from 10 to 42^{o}C. Rainfall is scarce and erratic. In this harsh landscape, only animals well-adapted to the desert climate can thrive, with extreme heat, high winds and frequent storms. The forest in this sanctuary is said to be the only one of its kind in India. Vegetation of the sanctuary area comprises 2.8% dense forest, 25% sparse tree, 62.2% herbaceous, 3.8% cultivation, 0.5% water bodies and 5.2% other categories. It mainly comprises thorny flora and open large patches of grasslands. It is predominated by *Acacia nilotica* and *Acacia senegal*, *Euphorbia nivulia*, *Salvadora oleoides*, *Capparis drcidua*, *Grewia tenax* and has broad distribution of *Prosopis* spp. The forest of the sanctuary comes under 5/DS Dry deciduous scrub, 6B/C Desert thorn forest, 6B/DS Tropical Euphorbia scrub, 6/E Gorad (*Senegalia senegal*) forest, 6/E *Salvadora* scrub, 5/E Babul (*Vachellia nilotica*) forest, 5/DS Dry savannah type vegetation *Vachellia nilotica* (*Acacia nilotica*)-*Salvadora* association and 6B/DS *Zizyphus* Scrub and *Capparis* association (Singh, 1998).

Sanctuary is characterized by scrub vegetation, large trees, grassland and seasonal wetlands. Further, it shares boundary with coastal areas of the Kori creek with mangrove forests. It has distinctive habitat of *Savanna* and is characteristic of the arid zone. These habitat/ ecological assemblage bequeath environment for rare and threatened fauna of the country. Keeping in view present studies of the sanctuary was undertaken to work out the mammalian fauna by conducting the surveys from 2018 to 2020. Pertinent literature reveals that State Fauna of Gujarat has been worked out by ZSI (Dutta, 2000). Mammals of Kachchh region have been explored by Stoliczka (1872); Singh *et al.*, (1999) worked out the faunal diversity of the Wild Ass Sanctuary, LRK. Work on the Thar Desert area has been undertaken by Roonwal, (1983); Ghosh *et al.* (1996); Sharma, (2013). Faunal diversity of Kachchh Biosphere Reserve has been done by Kumar and Banyal, (2018). Further, Vertebrate diversity of Naryan Sarovar WLS has been published by GEER & GUIDE (Annonymous, 2001; Vyas, 2004; Banyal & Kumar 2020).

MATERIAL AND METHODS

The sanctuary is divided into Rakhals and keeping in view all the six (Rakhals) of the sanctuary *viz.* Pipar, Halapar, Godhatal, Mindhiari, Bitiyari and Ratipal have been worked out to observe mammals fauna in the sanctuary from period 2018-2020. The mammalian fauna in the sanctuary has been documented as per the observation made in the field, records of forest department, local's information, pugmarks, scats and literature.

RESULT AND DISCUSSION

During present studies 29 species referable to 25 genera, 16 families and 07 orders have been recorded from the sanctuary. *Gazella bennettii* (Sykes, 1831)-Chinkara is most important species of the sanctuary. They inhabits in thorn forest with *Acacia nilotica*, *Prosopis chilensis* and open land more intensively. Overall distribution pattern of the sanctuary shows that they use 81% and 76% area of the sanctuary during summer and winter respectively (GEER & GUIDE Annonymous, 2001). However, during present surveys their observation in the sanctuary were less/rare and it could be sighted (03 Nos) once in the locale. *Vulpes vulpes* (Linnaeus, 1758); *Boselaphus tragocamelus* (Pallas, 1766); *Sus scrofa* Linnaeus, 1758 and *Canis aureus* Linnaeus, 1758 were frequently recorded animals from the sanctuary. Most dominating order in the area is Carnivora (13 spp.) followed by Rodentia (05 spp.); Chiroptera, Eulipotyphla, Artiodactyla (03 spp.) and Lagomorpha, Pholidota (01 spp.). Some species *viz. Cynopterus sphinx* (Vahl, 1797); *Canis lupus* (Linnaeus, 1758); *Pipistrellus coromandra* Gray, 1838; *Panthera paradus* (Linnaeus 1758) and *Manis crassicaudata* Geoffroy, 1803 could not be ascertained by direct or indirect evidences and have been in incorporated in the list from the literature. *Manis crassicaudata* Geoffroy, 1803; *Hyaena hyaena* Linnaeus, 1758 and *Panthera paradus* (Linnaeus, 1758) are the threatened animals in the sanctuary and comes under endangered, near threatened and vulnerable category respectively as per IUCN. Further, *Vulpes vulpes pusilla* Blyth, 1854; *Canis lupus* (Linnaeus, 1758); *Caracal caracal* Schreber, 1776; *Felis silvestris* Schreber, 1777; *Manis crassicaudata* Geoffroy, 1803; *Gazella bennettii* (Sykes, 1831) comes under Schedule I as per Wild life protection Act (1972). Thus, sanctuary supports habitats to various threatened and rare animals. However, due to various anthropogenic activities sanctuary is facing several threats. The present studies on the mammals of the sanctuary will provide basic data for further studies and conservation of the habitat and faunal wealth of the sanctuary.

Table 1: Mammal diversity of the Naryan WLS, Kachchh, Gujarat.

Sr. No.	Species Name	Common Name	Conservation Status		
			IUCN	IW(P)A (Schedule)	CITES (Appendix)
	Order: CHIROPTERA Family: PTEROPODIDAE				
1.	*Pteropus giganteus* (Brünnich, 1782)	Indian Flying Fox	LC	V	II
2.	*Cynopterus sphinx* (Vahl 1797)	Greater short-nosed fruit bat	LC	IV	-
	Family: VESPERTILIONIDAE				
3.	*Pipistrellus coromandra* Gray, 1838	Indian Pipistrelle	LC	-	-
	Order: LAGOMORPHA Family: LEPORIDAE				
4.	*Lepus nigricollis* Cuvier, 1823	Indian Hare, *Khargosh*	LC	IV	-
	Order: RODENTIA Family: SCIURIDAE				
5.	*Funambulus pennantii* Wroughton, 1905	Northern Palm Squirrel, *Gilheri*	LC	IV	-
	Family: MURIDAE				
6.	*Nesokia indica* (Gray, 1830)	Indian Gerbil	LC	V	-
7.	*Meriones hurrianae* Jordon, 1867	Indian Desert Gerbil	LC	V	-
8.	*Mus booduga* (Gray, 1837)	Common Indian Field Mouse, *Chuhiya*	LC	V	-
	Family: HYSTRICIDAE				
9.	*Hystrix indica* Kerr, 1792	Indian Crested Porcupine	LC	IV	-
	Order: EULIPOTYPHLA Family: ERINACEIDAE				
10.	*Hemiechinus collaris* (Gray,1830)	Indian Long-eared Hedgehog	LC	IV	-
11.	*Paraechinus micropus* (Blyth,1846)	Indian Hedgehog	LC	-	-
	Family: SORICIDAE				
12.	*Suncus murinus* Linnaeus, 1766	Asian Musk Shrew, Chhuchhundar	LC	-	-
	Order: CARNIVORA Family: CANIDAE				
13.	*Canis aureus* Linnaeus, 1758	Golden Jackal	LC	II	II
14.	*Vulpes bengalensis* (Shaw, 1800)	The Indian Fox, Lumri/Bengal Fox	LC	II	III
15.	*Vulpes vulpes* (Linnaeus, 1758)	Common Red Fox, Lomri	LC	II	III

16.	*Vulpes vulpes pusilla* Blyth, 1854	Desert fox	LC	I	-
17.	*Canis lupus* (Linnaeus,1758)	Grey Wolf	LC	I	-
	Family: HYANIDAE				
18.	*Hyaena hyaena* Linnaeus, 1758	Striped hyena	NT	III	III
	Family: FELIDAE				
19.	*Caracal caracal* Schreber, 1776	Caracal	LC	I	I
20.	*Felis chaus* Schreber, 1777	Jungle Cat, Jungli Billi	LC	II	II
21.	*Felis silvestris* Schreber, 1777	Desert Cat	LC	I	II
22.	*Panthera paradus* (Linnaeus 1758)	Leopard	VU	-	I
	Family: VIVERRIDAE				
23.	*Viverricula indica* Hilarie, 1803	Small India Civet	LC	II	-
	Family: HERPESTIDAE				
24.	*Herpestes edwardsii* (É. Geoffrey Saint-Hilaire, 1818)	Indian Grey Mongoose	LC	IV	III
25.	*Herpestes auropunctatus* (Hodgson, 1836)	Small Indian Mongoose	LC	IV	III
	Order: PHOLIDOTA Family MANIDAE				
26.	*Manis crassicaudata* Geoffroy,1803	Indian Pangolin	EN	I	I
	Order: ARTIODACTYLA Family: SUIDAE				
27.	*Sus scrofa* Linnaeus, 1758	Wild Boar/Wild Pig	LC	III	-
	Family: BOVIDAE				
28.	*Gazella bennettii* (Sykes, 1831)	Indian Gazelle, Chinkara	LC	I	-
29.	*Boselaphus tragocamelus* (Pallas, 1766)	Blue Bull, Nilgai	LC	III	III

Threats and Conservation:

a) As, it was claimed by the State Govt. of Gujarat that there are huge deposits of limestone, ignite, bentonite and bauxite in the sanctuary and Industrial development is necessary in the area to raise the economy of the State. Keeping in view, more than 40% area *i.e.* 767.79 km^2 (1981) to 321 km^2 (1995) had been reduced. Several industries/factories have come up adjacent to the sanctuary area. Due to the development of the industries it has been seen that metaled/pakka road network has been come up in the sanctuary. **b)** Road kill of various animals *viz.* (*Varanus bengalsnsis*, Mongoose; Red fox *Hoplobatrachus tigerinus*, Indian Bull Frog; *Varanus bengalensis*, Common monitor; *Bungarus sindanus*, Sind Krait, have been recorded during present studies. Vyas (2002) also reported that Herpetoofauna (*Calotes versicolor*, *Brachysaura minor*, *Sitana ponticeriana*, *Chamaeleo zeylanicus*, *Varanus bengalensis*, *Eryx johnii*, *Ptyas mucosus*, *Echis carinatus*) were found dead due to road kills in the way of the sanctuary area. Further, it was also stated while working in the area that the State Highway passes through the Sanctuary (approximately 32km), *viz.* Panandhra to Koteshwar, Koteshwar to Dolatpur *via* Ravereshwar Village and Dolatpar to Dayapar Village. Daily an average of total 150-200 vehicles passes only on Koteshwar to Dolatpur road. A large number of amphibian and reptilian species get killed on these roads during monsoon, which is the breeding season of most of the species. **c)** Vehicle traffic also increasing pollution in the area and has adverse impact on the faunal resources. Narayan Sarovar and Koteshwar are the two temples situated contiguous to the sanctuary area. These are most scared pilgrims and huge tourists/ pilgrims visit throughout the year in the area. d) There are 32 villages and 11,200 people and 14,400 live stocks residing inside the sanctuary as per census 1997-1998. Subsequently, due to degradation of the habitat owing to human intervention has also adverse impact on the sanctuary area.

Therefore, due to industries and huge traffic inside the area, sanctuary is facing problem of Environmental pollution and may be serious threat in long term. It is important to mention here that the movement of the wild animals cannot be restricted in the de-notified area of the sanctuary. Thus, awareness among the people residing in the area as well as in the fringe of the sanctuary is one of the utmost tool to conserve the fauna/wild animals of the sanctuary. Through Eco-tourism camps youth of the area can be sensitized and it will also provide them job opportunities and will go long way to conserve the faunal wealth /biodiversity of the sanctuary.

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Conflict of Interest. None.

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