Research Paper

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Habitat Niche and Status of the Birds of Navegaon National Park, Maharashtra

Zoology

KEYWORDS : Navegaon National Park, avifauna, habitat niche, status.

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ABSTRACT

The class Aves stands apart from the rest of the vertebrates owing to their unique characteristic features and ability to fly. The present study of avifaunal ecology aims at understanding and documenting the status and ecological niche, particularly the spatial niche, occupied by the birds of Navegaon National Park, situated 140 km east from Nagpur city, Central India. The representative area was surveyed on a monthly basis for a period of two years from 2010 to 2012. Out of total 126 species observed, 84 species preferred the forest habitat and 42 species were found in and around the lake. The total count included 5 species of local migrants, 2 species of summer migrants, 15 species of winter migrants and the rest 104 species were found to be resident.

The status and ecological niches occupied by the avifauna was documented and the study area was found to have good density and diversity of birds. This shows that the area offers a variety of habitat niches to the avifauna. But recent increase in the human interference led to a disturbing development in the study area, the impacts of which were also recorded.

Introduction

Avian community studies prove as effective tools for monitoring a forest ecosystem (Jayson *et.al.,* 2000). With a diverse and varied landscape and a diversity of habitats, India harbors a rich avian life. There are less than 10,000 species of birds in the world and nearly 1200 of them are found in India (Shyamal, L. 2003). The subcontinent boasts of 48 bird families out of total 75 families in the world (Dar *et.al.,* 2009). Detailed studies on the diversity of tropical forest birds have been carried out in many developed countries. Similarly, montane zone avifauna of Sri Lanka was studied by Ranawana, *et.al.,* (1998) and birds of Goa were studied by Lainer, H. (1999).

An extensive study on the birds of Navegaon National Park with a focus on the avifauna of Navegaon lake adjoining the Park and their habitat niche has been carried out by Chitampalli, M. (2010). The study area lies in the central region of India and this region was designated as the "Highlands of Central India" by Capt. Forsyth (1872) during the British regime. Navegaon National Park is well-known and popular among tourists because of the diverse assemblage of avifauna especially the numerous water birds that congregate at the Navegaon lake in the winter. But, still a proper scientific report on the ecology of the avifauna of this region is lacking. A representative area of this National Park has been selected for the present study.

The area was visited on a monthly basis between 2010 and 2012. Here, we present the details of the status and spatial niche occupied by the avifauna based on the visits made in the span of these two years. The ecological niche involves not only the physical space occupied by an organism, but also its functional role (trophic position) in the community and its position in environmental gradients (Verma, *et.al.,* 2008).

Spatial habitat niche i.e., the physical space occupied is the aspect of ecological niche taken into consideration for the present study.

Study Area

The forests of the Navegaon National Park (20°59'10.87"N 80°10'52.36"E) belong to Southern tropical dry deciduous forests type - subgroup 5A as per revised classification by Champion and Seth (1968). The National Park is situated in Gondia district, 140 km. east from Nagpur city, Central India. The notified Protected Area covers 129.55 sq km whereas the Administrative area is of 133.88 sq km. It is more associated with the migratory birds that visit the well-known Navegaon lake situated at the southern fringes of the Park. The representative area of the National Park selected for the study is of 32 sq km (the tourist zone of the Park), which lies to the South Western region of the Park. The famous Navegaon lake lies to the South west of the study area. Considering the fact that the avifauna of the lake, after spending their day in the reservoir for feeding, would retreat to the bank of the lake for roosting, the aquatic avifauna coming within the visible range of the binoculars was also considered for the present study.

The study area starts from the Jambli gate of the National Park, then moving towards the centre, points like Bodrai, Badbada have been included, and then turning towards west from T.K. Joint, Agezari joint has been considered. From here, turning south, Gampi road (adjoining the Navegaon lake and the village Rampuri), after passing through Mama-Bhasa point concludes again at the Jambli gate. The Gampi road forms the south-western boundary of the Park as the Navegaon lake and the Rampuri village lie in the buffer zone of the National Park.

Out of the total 412 species of birds found in Vidarbha (Pimplapure, A. 2009), 209 species representing 56 families have been recorded in Navegaon National Park (Chitampalli, M. 1976) which is a good count owing to its small area of 133.88 sq.km. Wikipedia claims that nearly 60% of all the bird species found in Maharashtra can be seen at the Park (http://en.wikipedia.org/wiki/Navegaon_National_Park). The geographical location of the Park and its unique ecological set up makes it possible for both the Red Jungle Fowl and the Grey Jungle Fowl to coexist (Chitampalli, M. 2010). The other commonly found birds are Grey Hornbill, drongos, cuckoos, peafowl, babblers, quails, etc. Among the birds of prey, owls, eagles, buzzards, kites can be seen commonly.

Fig. 1: Location of the study area along with the Navegaon lake in Navegaon National Park.



Fig. 1: Location of the study area along with the Navegaon lake in Navegaon National Park.

Materials and Methods

The study area was visited on monthly basis from January 2010 to December 2012 by the author accompanied by bird enthusiasts. The survey was done on two-wheeler and on foot. Since the study area has an almost circular periphery, the starting point and the ending point is the same, which makes it necessary to take a complete round of the area for proper observations and documentation. The main road was travelled by two-wheeler while two small tracks till Bodrai and Badbada which are inaccessible on a two-wheeler were trekked on foot. These two spots do not lie on the main road like other points, but lie at a distance of about 50 mts and a kilometer respectively. Binoculars (Olympus 8X40) were used for collecting the data on the ecological niche of the present avifauna. Digital camera of the brand SONY model-DSC-H7 was used for photographic evidences. The different habitat niches occupied by the avian denizens were photographed. The study area was visited in the mornings (time range: 7am to 9:30am) when the activity of the birds is optimum. Some visits were also made in afternoon, so that the round would be completed in the evening. Therefore, all the three periods of the day were covered and it was possible to document the nocturnal species. Google earth website was used to take the picture of the location of the study area along with the Navegaon lake in Navegaon National Park.

Local bird experts were interviewed regarding the presence, ecological niche and the past and present status of the birds. The revised edition of Grimmett *et.al,* (2001) was followed for the nomenclature and information on species distribution, habitat preferred and status of avifauna.

Status of the birds is abbreviated as follows:

R- Resident Species; WV-Winter Visitor ; **LM**- Local Migrant ;**SM**- Summer Migrant .

Result and Discussion

During the study period from January 2010 to December 2012 ,representative area selected for the study (32 sq.km.) revealed the presence of 126 species . Chitampalli, M. in 1976 recorded 209 species in Navegaon National Park (area of 133.88 sq.km.) , which shows that the study area indeed represented the National Park habitat with more than half the total of the species found in the entire National Park. While in Vidarbha region 412 species of birds were found by Pimplapure , A (2009),

The diversity in the assemblage of avifauna can be attributed to the diversity of habitat type. The diverse flora with its multistoried vegetation provides excellent habitats for 84 species that were observed in the study area with green cover, 42 species were found in and around the lake. The total count included 5 species of local migrants, 2 species of summer migrants, 15 species of winter migrants and the rest 104 species were found to be residing in the study area throughout the year (Resident species). Species composition of birds in an area is related to the type of vegetation, availability of microhabitats and various other factors (Pramanik, *et.al*., 2010). The various natural and man-made waterholes in the forest habitat of the study area have rendered the landscape an attractive and comfortable habitat niche for the avifauna as well as the other denizens of the jungle. Plant communities and their successional stages present unique environmental conditions that are ecologically important as niches for wildlife species (Anderson,R.G., 1979).

The density of avifauna was found to be maximum in winter as the count increased because of the arrival of the winter migrants. The bird population shows fluctuation with site differences and with changing seasons (Dar, *et.al*, 2009).

The list of the species of birds observed during the study period along with their scientific names, seasonal status and the habitat niche occupied by these species is annexed as Appendix I. Appendix II shows the photographic evidences.

Conclusion

The high density of avifauna in such a small area indicates a healthy ecological setup of the habitat. As different species require different type of food and shelter for nesting, breeding and rearing their chicks, the encouraging count of the species recorded can be attributed to the richness of flora and the overall habitat. And thus, it can be concluded that the area offers a diverse array of habitat niches leading to the good diversity of avifauna. Abundant water is available in the representative area throughout the year, even in summer, because of the presence of good number of natural and artificial waterholes As a result, the density does not show much decline in harder times.

In spite of all these encouraging facts, a gradual decline in the density of avifauna was observed over the span of two years. Decline of species in a habitat is probably a sign of general environmental change or deterioration (Gregory, *et. al*., 2003).

The specific reasons for this environmental deterioration identified in this study are as follows:

- Near Jambli Gate, herds of cattle grazing on the vegetation were observed very frequently. Grazing of cattle is one of the reasons for the damage caused to the feeding and breeding grounds of birds. Also, the nests of the birds (like Red wattled Lapwing) that nest on the ground get destroyed because of the cattle hooves. Cattle grazing within and near Protected Areas causes severe erosion on previously forested slopes (Kotkar, 2012).
- Over the years, the tourist influx in the National Park has increased leading to the disturbance due to human presence in the study area. Government sponsored tourism in the National Park has led to better approachability to the denser and undisturbed areas in recent times.
- Use of insecticides in the agricultural fields near the lake poses a great threat to the aquatic avifauna.
- Incidences of poaching go unrecorded.

Some remedial measures are as follows:

- A strict check on cattle grazing would help to keep the mounting pressures on the habitat under control.
- The unplanned habitat modification to facilitate tourism leads to gradual degradation of quality of environment. So, the primary focus should be on sustainable tourism development, wherein well-being of wildlife and its habitat should be given priority and utmost importance.
- Awareness programmes should be conducted in the villages around the National Park regarding Organic farming and the harmful effects of insecticides.
- A regular vigilance mechanism and a strong network should be in place to help curb incidences of poaching.

- The present study reveals a healthy composition of avifauna in the selected representative area which shows that the area is rich in diverse habitat niches. As the area shows a rich floral diversity, the data collected highlights a good density of avian species. On the contrary, local experts claim that a few decades ago, the number of species found in the area and their density was much higher, which points out to the fact that there has been a gradual decline in the density of avifauna and disappearance of some species in the span of a few decades because of environmental degradation caused by above mentioned anthropogenic activities. Therefore, in order to conserve the delicate balance of the ecosystem of the given area, apt conservation measures should be resorted, some of which have been suggested in the present research work.

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Table 1 about here

APPENDIX I

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Birds recorded in representative area of Navegaon National Park, Gondia district, Maharashtra, 2010-2012
FOREST **BIRDS**

Sr. No.	Name of the Bird	Zoological name	Status	Habitat Niche occupied
1	Ashy prinia	Prinia socialis	R	Bushes, scrubs, tall grass.
2	Indian Silver bill	Lonchura malabarica	R	Dry bushes, scrubs, (a pair was seen trying to occupy a used nest of Baya weaver).
3	White-rumped Munia	Lonchura striata	R	Small trees and bushes near waterhole.
4	Red Munia	Amandava amandava	R	Tall grass, scrub, cultivation at Rampuri.
5	Baya Weaver	Ploceus philippinus	R	Agricultural fields, tall grass, Babul trees near Navegaon lake.
6	Green bee-eater	Merops orientalis	R	Lower branches of small trees and vegetation like Ipomea near Navegaon lake.
7	Rain Quail	Coturnix coromandelica	R	Bushes, grass near cultivation.
8	Jungle Bush Quail	Perdicula asiatica	R	Forest floor in dense dry bushes and grass.
9	Red Spurfowl	Galloperdix spadicea	R	Forest floor, bushes, rocks, small trees.
10	Painted Spurfowl	Galloperdix lunulata	R	Forest floor near vegetation like Bamboo stands.
11	Red Junglefowl	Gallus gallus	R	Forest floor in dense dry bushes, scrub and grass.
12	Grey Junglegowl	Gallus sonneratii	R	Forest floor in dense dry bushes, scrub and grass.
13	Indian Peafowl	Pavo cristatus	R	Forest floor, bushes, scrub and grass.
14	Yellow-crowned Woodpecker	Dendrocopos mahrattensis	R	Medium and tall trees with softwood like Mahua.
15	Common Flameback	Dinopium Javanese	R	Medium and tall trees with softwood like Haldu.
16	Black-rumped Flameback	Dinopium benghalense	R	Medium and tall trees with softwood like Behda.
17	White-naped Woodpecker	Chrysocolaptes festivus	R	Medium and tall trees with softwood like Chichwa.
18	Coppersmith Barbet	Megalaima haemacephala	R	Medium and tall trees like Teak, Eucalyptus, Peepal, Banyan, etc.
19	Common Hoopoe	Upupa epops	R	Forest floor near cultivation and water.
20	Indian Roller	Coracias benghalensis	R	Medium and small trees near cultivation and lake.
21	Black drongo	Dicrurus macrocercus	R	Almost in every habitat, dense forest, near cultivation and lake, small as well as tall trees like Bombax ceiba.
22	Greater Racket-tailed Drongo	Dicrurus paradiseus	R	Dense Forest, medium and tall trees like Bamboo, Sal, Saja.
23	Laughing dove	Streptopelia senegalensis	R	Almost in every habitat, dense forest, near cultivation and lake, small and medium trees.
24	Spotted Dove	Streptopelia chinensis	R	Forest floor with grass, medium trees like Babool, Flame of forest, Jamun.
25	Eurasian Collared Dove	Streptopelia decaocto	R	On small trees near cultivation.
26	Red-vented bulbul	Pycnonotus cafer	R	Small and medium trees in forest, scrub, cultivation.
27	White-browed Bulbul	Pycnonotus luteolus	R	Scrub and small trees in the forest.
28	House swift	Apus affinis	R	Huge rock at Agezari.
29	Long-tailed Shrike	Lanius schach	R	Bushes, thorny scrub like Babul, cultivation.
30	Brahminy Starling	Sturnus pagodarum	R	Scrub, cultivation, medium and tall trees like Bombax ceiba.
31	Common mynah	Acridotheres tristis	R	Cultivation and trees on the forest edge.
32	Asian Pied starling	Sturnus contra	R	Cultivation, marshy bank of the lake.
33	House Sparrow	Passer domesticus	R	Cultivation, scrub and small trees near village.
34	Chestnut-shouldered Petronia	Petronia xanthocollis	R	Cultivation, scrub, small trees near village, medium trees in the forest.
35	Ashy-crowned Sparrow Lark	Eremopterix grisea	R	On ground near cultivation and scrub.
36	House Crow	Corvus splendens	R	Cultivation and small trees near village.
37	Large-billed Crow	Corvus macrorhynchos	R	Cultivation and small and medium trees near village.
38	Indian Robin	Saxicoloides fulicata	R	Cultivation, scrub near the village.
39	Oriental Magpie Robin	Copsychus saularis	R	Small and medium trees in the forest and near cultivation.

40	Jungle Babbler	Turdoides striatus	R	Small and medium trees in the forest and near cultivation.
41	Yellow-eyed Babbler	Chrysomma sinense	R	Scrub, bushes, cultivation.
42	Common Iora	Aegithina tiphia	R	Small and medium trees in forest and cultivation.
43	Asain Koel	Eudynamys scolopacea	R	Small and medium trees near cultivation.
44	Greater Coucal	Centropus sinensis	R	Small and medium trees near cultivation, scrub and on ground in agricultural fields.
45	Rufuos Treepie	Dendrocitta vagabunda	R	Medium and tall trees in the forest, mostly near waterholes.
46	Rose-ringed Parakeet	Psittacula krameri	R	Medium and tall trees in the forest and small trees near cultivation.
47	Plum-headed Parakeet	Psittacula cyanocephala	R	Medium and tall trees in the forest and small trees near cultivation.
48	Eurasian Golden Oriole	Oriolus oriolus	R	Medium and tall trees in the forest, on Bombax ceiba in full bloom.
49	Black-hooded Oriole	Oriolus xanthornus	R	Medium and tall trees in the forest.
50	Tree Pipit	Anthus trivialis	R	Medium trees near cultivation, sometimes forest.
51	Paddyfield Pipit	Anthus rufulus	R	Cultivation, marshy bank of the lake.
52	Barn Owl	Tyto alba	R	On medium trees near cultivation.
53	Collared Scops Owl	Otus bakkamoena	R	Medium trees in forest, Bamboo stands.
54	Brown Fish Owl	Ketupa zeylonensis	R	Dense forest near the lake.
55	Mottled Wood Owl	Strix ocellata	R	Medium trees in the forest.
56	Spotted Owlet	Athene brama	R	Small trees in the forest, near cultivation.
57	Indian Nightjar	Caprimulgus asiaticus	R	Small trees in the forest and forest floor.
58	Indian Grey Hornbill	Ocyceros birostris	R	Small and medium trees in forest like Peepal, Banyan.
59	Malabar Pied Hornbill	Anthracoceros coronatus	R	Medium and tall trees like Kusum, Ain, Arjun, Peepal, Banyan, etc. in dense forest.
60	Changeable Hawk Eagle	Spizaetus cirrhatus	R	Tall trees at Badbada stream with huge rocks.
61	Shikra	Accipiter badius	R	Medium and tall trees like Mango, Eucalyptus.
62	White-eyed Buzzard	Butastur teesa	R	Medium and small trees in sparse forest near Jambli gate.
63	Crested Serpent Eagle	Spilornis cheela	R	On tall trees near the lake.
64	White-rumped Shama	Copsychus malabaricus	R	Undergrowth in bamboo stands.
65	Common Tailorbird	Orthotomus cuculatus	R	Bushes, small and medium trees.
66	Black-naped Monarch	Hypothymis azurea	R	On small trees and bushes near the waterhole.
67	Tickell's Blue Flycatcher	Cyornis tickelliae	R	Small and medium trees in forest and bushes near the waterhole.
68	Asian Paradise Flycatcher	Terpsiphone paradisi	R	Small and medium trees like Arjun, Ain, Dhawda.
69	White-browed Fantail	Rhipidura aureola	R	Small and medium trees in forest and near waterholes.
70	Blue-winged leafbird	Chloropsis cochinchinensis	R	Medium trees like Bamboo near waterhole.
71	Yellow-footed Green Pigeon	Treron phoenicoptera	R	Tall trees like Eucalyptus, Banyan, Teak, etc.
72	Common Hawk Cuckoo	Hierococcyx varius	R	Tall trees like eucalyptus
73	Oriental White-eye	Zosterops palpebrosus	R	Bushes, Medium trees like Flame of forest.
74	Orange headed Thrush	Zoothera citrine	R	On ground and undergrowth in forest and near cultivation.
75	Purple Sunbird	Nectarinia asiatica	R	Bushes, scrub and small trees with juicy flowers.
76	Large Cuckooshrike	Coracina macei	R	Trees like Peepal, Babul, etc.
77	Pied Bushchat	Saxicola caprata	R	Bushes, scrub, near cultivation.

LAKE BIRDS

Sr. No.	Name of the Bird	Zoological name	Status	Habitat Niche occupied
	Resident Species		R	
1	Purple Swamp hen	Porphyrio porphyrio	R	Marshy bank of the lake.
2	Common Moorhen	Gallinula chloropus	R	In the lake among the reeds.
3	Lesser Whistling Duck	Dendrocygna javanica	R	In the lake among the reeds.

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4	White-breasted Waterhen	Amaurornis phoenicurus	R	Marshy bank of the lake, among Ipomea weeds.
5	Purple Heron	Ardea purpurea	R	In water, among the tall reeds.
6	Grey Heron	Ardea cinerea	R	In the water near the bank.
7	Indian Pond Heron	Ardeola grayii	R	Marshy bank of the lake.
8	Pheasat-tailed Jacana	Hydrophasianus chirurgus	R	In the water.
9	Bronze-winged Jacana	Metopidius indicus	R	In the water.
10	Little Grebe	Tachybaptus ruficollis	R	In the water.
11	Common Kingfisher	Alcedo atthis	R	On small stumps protruding from the water.
12	White-throated Kingfisher	Halcyon smyrnensis	R	On trees near the lake.
13	Pied Kingfisher	Ceryle rudis	R	Hovering over the lake.
14	Little Cormorant	Phalacrocorax niger	R	Ipomea weeds on the marshy bank of the lake.
15	Darter	Anhinga melanogaster	R	Small trees and Ipomea weeds on the marshy bank of the lake.
16	Black-headed Ibis	Threskiornis meloanocephalus	R	Marshy bank of the lake.
17	Black Ibis	Pseudibis papillosa	R	Marshy bank of the lake.
18	Asian Openbill	Anastomus oscitans	R	Marshy bank of the lake.
19	Great Cormorant	Phalacrocorax carbo	R	In the water and on the weeds on the bank.
20	Little Egret	Egretta garzetta	R	Marshy bank of the lake, shallow water.
21	Grear Egret	Casmerodius albus	R	Rock in the water.
22	Cattle Egret	Bubulcus ibis	R	Cultivation
23	Intermediate Egret	Mesophoyx intermedia	R	Shallow water, on the bank.
24	Cotton pygmy-Goose	Nettapus coromandelianus	R	In the water.
25	Red-wattled Lapwing	Vanellus indicus	R	On the bank of the lake.
26	Wire-tailed Swallow	Hirundo smithii	R	Among tall reeds on the bank of the lake.
27	Cinnamon Bittern	Ixobrychus cinnamomeus	R	Tall reeds on the lake bank.

MIGRANTS

Sr. No.	Name of the Bird	Zoological name	Status	Habitat Niche occupied
1	Lesser Adjuatant Stork	Leptoptilos javanicus	LM	Marshy bank of the lake.
2	Black Redstart	Phoenicurus ochruros	LM	Lower branches of small and medium trees.
3	Indian Pitta	Pitta brachyuran	LM	Lower branches of medium trees, foraging on ground.
4	Spot-billed Duck	Anas poecilorhyncha	LM	In the water, among the reeds.
5	Common Coot	Fulica atra	LM	In the water, among the reeds.
6	Barn Swallow	Hirundo rustica	WV	Among tall reeds on the bank of the lake.
7	Yellow Wagtail	Motacilla flava	WV	Near the small streams in the forest.
8	Grey Wagtail	Motacilla cinerea	WV	Near the small streams in the forest.
9	Gadwall	Anas strepera	WV	In the water.
10	Eurasian Wigeon	Anas Penelope	WV	Bank of the lake.
11	Mallard	Anas platyrhynchos	WV	In the water.
12	Garganey	Anas querquedula	WV	In the water.
13	Northern Pintail	Anas acuta	WV	In the water, roosting on the bank.
14	Northern Shoveller	Anas clypeata	WV	In the water.
15	Red-crested Pochard	Rhodonessa rufina	WV	In the water.
16	Common Pochard	Aythya ferina	WV	In the water.
17	Tufted Duck	Aythya fuligula	WV	In the water
18	Ruddy Shelduck	Tadorna ferruginea	WV	In the water, shallow water and on the banks of the lake.
19	Wood Sandpiper	Tringa glareola	WV	Marshy bank of the lake.

20	Chestnut-tailed Starling	Sturnus malabaricus	WV	On trees like Palas, Bombax ceiba when in blossom
21	Pied cuckoo	Clamator jacobinus	SM	Cultivation.
22	Rosy Starling	Sturnus roseus	SM	On trees like Palas, Bombax ceiba when in blossom

APPENDIX II
Photographs of study area and the subject



1. The diverse flora



2. Cattle grazing & human presence leading to habitat degradation



3. Natural pool of water



4. Indian Pitta



5. Rufous Treepie at an artificial waterhole



6. Black Ibis and black-headed Ibis together at Gampi road (adjoining the lake).

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