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STUDY OF AVIFAUNAL DIVERSITY IN THE PERIPHERAL REGION OF NASHIK

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Abstract

The study is based on the background of avifaunal diversity in the peripheral region of Nashik, Maharashtra, India. As the research is based on photographic capturing methods, this gives a little concentration on previously-done research works to analyse the avifaunal community. However, a lack of approach to adequate information related to the potential risks of birds creates a gap in the literature. This addresses adequate threats and risk factors associated with Avifaunal species to consider the mapping exercise. Birds have been found to be renowned because of their transnational migrations. It has been encountered that the distribution of the birds is spreading in the Maharashtra Nasik area. It is also reported that the distribution of the birds is spreading in 15530 square km in Nasik (Nmc.gov.in, 2022). The subject of the study brings forward the peripheral region of Nashik.

Keywords – *Avifaunal community, Avifaunal diversity, Photographic capturing methods, Transnational migrations*

1. INTRODUCTION

1.1 Significance of the research

The study signifies the distinctive abilities of species inside the animal world. It has been encountered that the specialised offspring of prehistoric animals has changed with the evolving nature of Aves. As reported by Dethe and Medhe, (2020), most species still possess the capability of fighting while some other animals employ it to meet their basic demands for existence. This, in turn, specifies a diverse nature among species to address different kinds of environments that spontaneously come and are excellent for supporting bird life.

1.2 Aims and objectives

Aims

The study aims to investigate the avifaunal diversity in the peripheral region of Nashik, Maharashtra.

Objectives

- To identify the diversity of avifauna in the peripheral region of Nashik
- To investigate the conversation status of birds in the region
- To evaluate the distribution of globally threatened birds

2. LITERATURE REVIEW

This section introduces factual findings from research works based on the diversity of avifauna in Nashik. This, in turn, discusses key habitats of birds in the peripheral region of Nashik and thereby identifies their conservation status.

2.1 Diversity of Avifaunal in peripheral ecosystems of Nashik, Maharashtra

The ***"biological diversity and resources"*** are essential for the world's economy to address rich biodiversity. It is desirable to understand the conservation and ecology of an area as far as the avian community is concerned. In this regard, it is encountered that the *"Western Ghats of India"* is known for endemic species and species. The key bird habitats in Maharashtra are found to be the "***Jaikwadi***" reservoirs outside "***Paithan***", along with the "***Aurangabad region***" and "***Nandur Madhmeshwar Bird Sanctuary***".

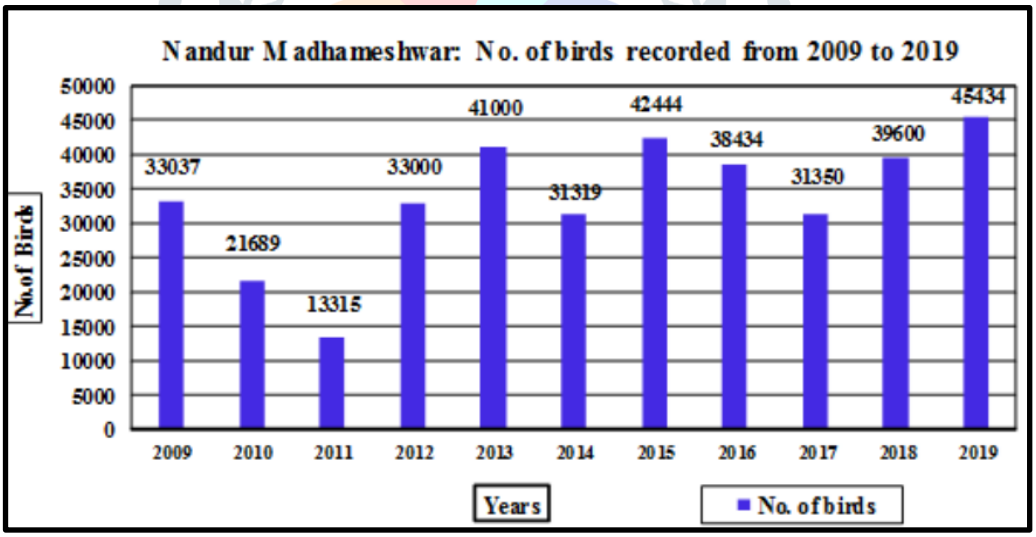

Figure 2.1: Birds observed in the peripheral region of Nashik

(Source: Soanwane, 2022)

The distinctive visualisation structure of the peripheral region of Nashik transforms into an ideal place for species (Shelke, 2019). It has been encountered that the region possesses many different kinds of environments that spontaneously come and are excellent for supporting bird life.

2.2 Birds and their conservation status in the region

"Nandur Madhmeshwar Bird Sanctuary" near the peripheral region of Nashik, Maharashtra has been established as a unique natural habitat for migratory species. It has been reported that marshy lands, agricultural lands, wetlands and forests have made the region an ideal place for migratory birds.

Figure 2.2: Birds Sanctuary in Maharashtra

(Source: Timesofindia.indiatimes.com, 2022)

The place is found to be pollution free under the ***"Department of Forest and Wild Life",*** by the government of Maharashtra (Chavan *et al*. 2018). However, the conservation status of birds in the region ascertains their existing condition and recommends changes for their preservation.

3. METHODOLOGY

3.1 Research methods

The research has been made based on the identification of avifaunal diversity in the peripheral region of Nashik. In this regard, birds were identified using the ***"photographic capturing method"*** upon which birds were classified into separate categories. Using the ***Nikon D3500 DSLR camera,*** with ***AF-P 18-55 mm+ AF-P 70-300 mm,*** the avifauna variety has been ***"digitally recorded by photos"***. The photo sampling has been done between ***6.30-11.00 A.M.*** and ***4.30-6.30 P.M.*** However, the *"Olympus binocular"* was used to observe "birds and their movements" at a distance of 1-1.5 km. Furthermore, ***"Indian Birds"*** and ***"Birds of the Indian Subcontinent"*** coupled with ***"Internet Birds Database"*** were taken into consideration for field guides.

4. FINDINGS

In this chapter, there are particular threats and risk factors of Avian have been found. In this consideration, the major findings of habitat and degradation has been enabled as the threats factor of the species. Climate change and other perspectives are also considered essential confronting of this findings. From the perspective of invasive species, the bird mapping exercise so has become important to managing the ecosystem. It has been found that there are almost ***11000 species***, that have been relatively well handled in the environment (Shelke, 2019). In this discussion, the diversity of avian species is derived. The global threats of the birds and other perspectives are derived in this discussion. The obligates of grassland birds are implemented as an integrating part of this discussion.

4.1 Avian diversity in the peripheral region of Nashik

Aves has evolved, specialised ***offspring of prehistoric animals***. Most species still possess the capability of flight, something animals employ to meet their basic demands for existence. One of the most distinctive abilities of species inside the animal world is moving. Birds were renowned because of their ***transnational migrations*** (Chavan *et al*. 2018). They do escape extreme climatic situations like winter, ***scorching waves***, ***heavy rains***, and ***lack of food***. Species can migrate to new regions or stay in one spot for an extended period of time. The diversification of plants and animals and their allocation designs, laying eggs materials.

Among the key bird habitats in Maharashtra seems to be the "***Jaikwadi***" reservoirs outside "***Paithan***", along with the "***Aurangabad region***" and "***Nandur Madhmeshwar Bird Sanctuary***". It is crucial to evaluate IBAs to ascertain their existing condition and recommend changes for their preservation and preservation. The "***Nandur Madhmeshwar Bird Sanctuary***" is situated close to the villages of "***Nandur***", "***Khangaon Thadi***", and Chapadgaon inside the region of Nasik in the state of Maharashtra. It has been transformed into a region with a species multicultural because of its landscape's distinctive visualisation's structure. The sanctuary is only about ***19–20 Km2*** in size overall (Gore *et al*. 2021). Apparently were many different kinds of environments that spontaneously come and are excellent for supporting bird life.

4.2 Findings from the distribution of habitat

Name and Scientific name of birds	Description	Image
Asian Koel *Eudynamys scolopaceus*	The female of the nominated subspecies has a lustrous blue body, a bill that is a light yellowish-grey, a red iris, and dark grey legs and claws (Nahid *et al*. 2021). The predominant champion's female bears tawny markings on her head and a chestnut head. Boasting white and brown markings, the shoulder, abdomen, and shoulder transposes are	

	chocolate brown.	
Blyth's reed warbler *Acrocephalus dumetorum*	These little birds of prey bird are a subspecies that inhabits woodland or roadsides, frequently close to water, but it cannot be found in marshland. Nesting in a shrub contains 4 to 6 eggs. This birdsong measures 12.5 to 14 cm in length, which is moderate. The organism's pubescent is light brown and its back is simple. The reed thrush, swamp flycatcher, and a few other Hippolais nuthatches are all readily confused for this bird. It most closely resembles a reed drab, but it has a grimmer background, a less rounded head, and a less robust, hooked beak (Shitikov *et al*. 2018).	
Asian green bee-eater *Merops orientalis*	This type of bee-eater is a slim, vividly coloured bird. The extended middle dorsal fins make up around 2 inches of its approximate inches wide (16–18 cm) length. There is no visible distinction between men and women. The chin and cheeks are particularly blue-tinged, and the overall feathers are vivid green (Mousavi, 2022). The spinal erectors and crown have bright reddish undertones. The legs resemble blueish grey, the iris is scarlet, and also the head is black. The third toes of the foot are feeble and are connected at the bottom.	
Cattle egret *Bubulcus ibis*	It is bent over and features a robust, rather short body, and a strong bill. The non-breeding adolescent is mostly white, with a yellow bill with limbs that are greyish-yellow (Metallaoui *et al*. 2020). The beak, legs, the eyelids of individuals of the typical eastern species briefly turn bright red just before mating throughout the reproductive cycle, and they generate coloured feathers on their backs, breasts, and crowns.	
Common Iora *Aegithina tiphia*	Throughout the tropical Indian peninsula as well as South-eastern Asia, there are diminutive birds of prey birds called uncommon Ioras. Its loud whistling and vivid colours make it an easy creature to identify in woodland and forests (Divyapriya and Pramod, 2019). Males advertise throughout the reproductive period by scrunching up their plumage and then spiralling in the air to resemble a ball of green, black, yellow, and white.	

Great coucal *Centropus sinensis*	With a height of 48 cm, this swallow subspecies is huge. The top cloak and underbelly are black with a lavender gloss, while the helmet is all black. Chocolate brown describes the wingspan and shoulder. They behave similarly and do not have any light column stripes. Ruby-red eyes are present (Skivington *et al.* 2021). Juveniles have a blander black colour with markings on the forehead, whitening bands on the underbelly and wings, and blander black overall. There are numerous geographical races, and certain of these individuals are occasionally considered to be entire animals.	
Zitting cisticola *Cisticola juncidis*	Old World warbler has a wide distribution that breeds in southern European, northern Asia, southern Australasia, and Africa. The simplest way to recognise this little bird, which is primarily located in meadows, is by its tawny underside. It also misses any yellow on the throat, and its reddish tail is capped with white.	
Gadwall *Mareca strepera*	The average weight difference between the sexes is 990 g (35 oz) for males and 850 g for females (30 oz). The reproducing male has a grey pattern, a black tail, light chocolate feathers, and a beautiful white ultrasound wand that is visible when flying or resting (Wei *et al*. 2019). The Kendrick's non-breeding appearance is often grimmer below and contains less yellow upon that beak. It resembles the female somewhat but still has the male wings patterning. The female is bright brown and has a mallard-like appearance. The brownish-orange bill edges, low density, white ultrasound wand, and white stomach set it apart from the other subspecies.	
Indian yellow tit *Machlolophus aplonotus*	The Indian peninsula is home to breeding individuals of this subspecies. It is a huge (13 cm), easily recognisable tit that has a broad black stripe that runs across changes caused by yellow breasts. The black stripe is wider in the males. Olive-green on the uppermost sections (Lawate *et al*. 2021). That has white outermost pectoral fins as well as 2 white as well as yellow wing bars. Predators are more interesting than females as well as younger animals. Through most of the habitat of such a tit, the underpart colouration gets progressively duller from east to west.	

Common rose finch *Carpodacus erythrinus*	The commonplace rosefinch has a length of 13 to 15 cm. Its bill is thick and pointed. The adolescent adult has a forehead, throat, and rump that are bright rose coloured; a large bill; dark brown forewing without four hazy bands; and a white abdomen. The hue of females and younger men is drab, having an upper part (Lisovski *et al*. 2021). That is yellow-orange, stronger on the abdomen, and a browner on the forehead; the underparts are white.	
Plane prinia *Prinia inornata*	These 13–14 cm long blackbirds have powerful legs, small, flattened wings, as well as a tail that is relatively lengthy. The mouth is small as well as black. Individuals are brown or black overhead in their reproductive appearance, featuring a small white supercilium as well as reddish margins on their extended wrists. The pubescent are buff-white in colour (Oswald, 2019). Both genders are the same. The pubescent ones are brighter golden in the wintertime, and the conceptually distinct ones are a deeper brown. Compared to summers, the fringe is broader. There are several races with varying shades of colour.	
Purple sunbird *Cinnyris asiaticus*	This diminutive sunbird has a tiny bill, a black, square-shaped tail, and pronounced behavioural phenotypic differences. They are just under 10 cm long, have a descending bill, and have cylindrical mouths with brush tips to help them feed on nectar. The masculine is lustrous and violet to bluish iridescent (Singh *et al.* 2019). The wingspan resembles dark brown and the upper sections are black. The reproductive male also has brownish-black ventral fins, although non-breeding females can have a prominent black stripe on their yellow undersides.	
Red-vented bulbul *Pycnonotus cafer*	The red-vented bulbul can be recognised by its distinctive short crest that gives the forehead a square- shape. The helmet is deeper or completely black, whereas the stomach is a medium brown colour without a crusty appearance. The vent is crimson, whereas the buttocks are white. The white point of the black tail is black. The crests and underbelly streaking of the Himalayas species are particularly pronounced (Nowakowski and Dulisz, 2019). A black hood that reaches the playmaker is characteristic of the Species related information	

	between the point of the Southwestern Himalayas.	
Red-headed bunting *Emberiza bruniceps*	Long-tailed and 17 cm in length, this bird seems bigger that a marsh sparrow. The courting males have greenish strongest and most powerful, brown or black chests and dazzling yellow spots on the skin. The female resembles the masculine in appearance but has lighter ventral fins, a backbone that is grey-brown, as well as a forehead that is greyish (Tyagi and Bhardwaj, 2021). The adolescent is comparable; therefore, it might be challenging to tell them distinct from the dark-skinned bunting's equivalent plumages.	
Small minivet *Pericrocotus cinnamomeus*	The little minivet measures 16 cm in length and has a large wingspan and a powerful black mandible. The male distinguishes itself among the majority of other frequent minivets by sporting bright downy feathers that fade to yellow here on the abdomen, bright red-tailed margins, buttocks, and wings regions, as well as charcoal, not polished black, equipment and a forehead (Najar *et al.* 2022). The forehead, tailed margins, buttocks, and forewing patterns of the female, which is black beneath, are all yellow.	
Temmink’s stint *Calidris temminckii*	These little shorebirds have a length of 13.5 to 15 cm. These are smaller than the miniature stretch but have broader wings and smaller legs (Pakanen *et al.* 2019). In comparison to small stint's darker thighs and charcoal outside-tailed plumes, the legs were yellow and the exterior tail whiskers are white.	
Tickell's blue flycatcher	The Tickell's blue dragonfly nymph measures 11 to 12 centimetres in length. It sits straight and primarily grazes animals in the underbrush. The subject's chest and collar were red, while the remainder of the undersides are white (Khamcha *et al.* 2018). The human's top parts are a vivid blue. The background line of the female is paler, while her forehead, shoulders, back, and tails are deeper turquoise. Inside the Eastern Ghats of Maharashtra, it crosses with the yellowish-green blue flycatcher, and the resulting hybrids are also sometimes referred to as the very subtype.	

Tree pipit *Anthus trivialis*	This little pipit looks like a meadow's pipit. It has brown streaks above and black patterns on its white abdomen and buff pectoral underneath, giving it an unremarkable appearance. It differs from the grassland pipit, which is significantly shorter, by having a thicker bill and having a more pronounced distinction between its buff shoulder and white abdomen. Tree pipits could conveniently hang in branches. In contrast to the grandparent's feeble call, this one is a robust speech. There is no denying the musical flying. The singing gets longer at the conclusion as the bird ascends off the tree a small distance before falling on stiffened feathers. Open forests and scrub make up the nesting sites.	
Twany bellied babbler *Dumetia hyperythra*	A little blubbery mess that rotational grazing in small numbers in low scrub woodlands is also referred to as the reddish bumbling moron in ancient Indian writings. They resemble a bird of prey birds that share traits with other representatives of the huge Old World babbler group, such as delicate, feathery feathers. Only throughout Indian Subcontinent, there seem to be several varieties. Whereas the albogularis from a southwestern Indian mainland has a white neck, the archetypal Hypertherm prevalent in north-eastern as well as eastern India is consistently brown below.	
Verditer flycatcher *Eumyias thalassinus*	Its unique copper-sulphate turquoise colour and slight indentation behind the eyelids and below the bottom of the bill are what gave this animal its nickname. The black eye patches and the greyish outlet are the only parts of the adolescent male's body that are not intensely azure. Made explicit and adolescent females are a brighter shade of blue.	
Vigor's Sunbird *Aethopyga vigorsii*	the mail Bird has Scarlet in its breast and throat. The best part of the bird is uniformly grey. The winner of the board is also grey and the lower back of the bird is considerably green. In his consideration, the similarity is also found in the females. The dull scarlet is found in the scarlet throats and breasts of female birds.	

4.3 Distribution of globally threatened birds

In this discussion, it has been found that the distribution of the birds is spreading in the Maharashtra Nasik area. The subject of this discussion is depending on the ***Tapi basin***. As a consequence, the distribution of the birds is spreading in ***15530 square km in Nasik***. Aves have evolved, specialised offspring of prehistoric animals. Most species still possess the capability of flight, something animals employ to meet their basic demands for existence (Heerah *et al.* 2019). One of the most distinctive abilities of species inside the animal world is moving. Birds were renowned because of their transnational migrations. They do escape extreme climatic situations like winter, scorching waves, heavy rains, and a lack of food. Species can migrate to new regions or stay in one spot for an extended period of time.

The diversification of plants and animals is based on their allocation designs. They are laying eggs materials, burrowing techniques and grassland biodiversity (Loiseau *et al.* 2020). The demographic complexities of plant communities have preservation of natural resources. The mammal's land management, relevance of pest management is developed through cultivation. The carriers of ***pathogens***, indicators of ***ecological functions***, and many other things are critical elements of bird surveys.

It was discovered that the dominating population group came from the family Due to the increasing population. There are ***76 varieties of the genus in Chapala Wildlife*** Sanctuary, Districts Gadchiroli, Maharashtra. They were discovered among ***53 varieties*** of species of birds at wetlands in Delhi. In the original investigation, ***60.9% of the lifeforms*** have been anadromous and ***39.0%*** have been domiciled (Zurell *et al.* 2018)

This is showing that NMBS is among the contenders for favoured nature reserves. This has been developed by the migration routes of bird organisms. At that time people evaluate certain other sacred sites in India through concepts of speciation diversification. There seem to be 157 organisms of bird species belonging to 56 communities, of which ***85.9% were inhabitants*** and ***14.1% became anadromous***.

4.4 Distribution of obligate grassland birds

The findings from this discussion have been considered that The value of each environment utilised by every creature is coded by Native birds. "***Major***" environments are these which are significant for the conservation of animals. It is possibly due to the environment being essential to life and forms at every stage in its product development process. Examples are such as during reproduction or as a vital resource of sustenance van (Vliet *et al.* 2020). It serves as the main environment. one of the two main natural habitats, where the organism typically resides or where the majority of specimens are found. Environments that are "***suitable***" include ones where the organism is present consistently or on a continuous basis. Grasslands that are considered "***marginal***" include locations wherever an organism only sometimes or intermittently appears. The ecosystem only contains a very small part of the total population (Shew and Nielsen, 2021).

In order to avoid making the mistake of overvaluing ESH instead than underestimating it, they considered environments even under four categories of significance. Birds of Maharashtra with Particular reported ***361 varieties***. It goes throughout the exploratory research conducted in the provinces of ***Pune***, ***Satara***, Sangli, Ahmednagar, and Solapur as well as the Maharashtra River valley. Hamilton provided a preliminary checklist of the species of the Maharashtra and Southern ***Malabar Province in 1881***, listing ***452 species***. The observations made on waterfowl in Maharashtra, encompass both British Deccan and Khandesh.

4.5 Possible threats to the birds

Birds frequently hybridise, and genomic fingerprinting and behavioural characterization show that invasive plants can alter the lineage of native populations. ***Dysfunction*** due to decreased reproduction or longevity becomes a method that hybridization can contribute to the loss of the hereditary identity of native species. The native biological code can also be contaminated by biological gene transfer and inundation. A number of ailments, especially protozoa, can indeed be transmitted by avians (Hausmann *et al*. 2019). It is stored in their bodies as reservoirs. There is a high risk that transplanted species would spread sickness towards the native bird population. There is compelling information that migratory birds spread mysterious disease variants. Due to the possibility that breeding locations could be a limited commodity.

It is for local animals; the quantity and cleanliness of breeding locations are particularly crucial. Direct observation of competitiveness may well be possible, and the second demonstration of it (Dias *et al.* 20190. In this perspective either an indication of duplication in hatching areas or decreased reproducing performance. The encounters with both the ***Pervasive Sparrow, Common Myna***, ***Green-backed Firecrown*** and ***House Sparrow*** provided a fairly convincing indication of an absence of competition. There are only two instances were competing for breeding places. This would perhaps be regarded as a concern of moderate indication of concern from ***Northern Peninsula's Scarlet*** (Linden *et al.* 2019). It is formed with speciality and high information for potential danger from ***America's Tangerine Cockatiel***.

4.6 Summary

This chapter can be summarised that Particular risks and concerns related to avian have been covered in this chapter. The destruction of the habitat has been highlighted in this analysis as a concern to the species. Other viewpoints and the topic of climate change are also seen to be crucial to the debate. The bird mapping exercise has become crucial to maintaining the ecosystem from the standpoint of invasive species. Nearly 11000 species have been discovered to have been relatively effectively managed in the ecosystem. The variety of avian species is derived from this topic. This conversation derives the global challenges to birds and other viewpoints. The duties of grassland birds are included in this topic as a whole.

5.1 Discussion

This section of the research analyses key findings from the study based on the identification of avifaunal diversity in the peripheral region of Nashik. In this context, the study encounters the movements of birds in that region by focusing more on the photographic capturing method.

5.2 Analysis of results

It has been analysed that almost 11000 species are relatively well handled in the environment. From this perspective, the diversity of avian species is analysed throughout the study. However, the global threats of the birds and other perspectives are taken into consideration in order to identify their diversity. However, the commensurate of grassland birds are implemented as an integrating part of the results. It has been analysed from the research that the ***"Book of Indian Birds"*** (Ali, 2001) and ***"Birds of the Indian Subcontinent"*** Grimmet *et al.* 2016) are taken into consideration to analyse the identification as field guides. Moreover, the research has recorded avian birds from ***17 families*** coupled with ***6 orders*** while determining their ***"ecological abundance status as C/U/FC/1/R".***

5.3 Discussion

It can be discussed that avifauna turns out to be crucial in ecology as it ensures the food chain. With the bird population maintaining the ecosystem, migratory birds act as a driving factor to bring changes in the population. From this perspective, the research has identified ***21 birds*** in the peripheral region o Nashik, Maharashtra.

	Ecological status				
No. of species	C	FC	R	I	U
	7	7	3	2	2

Figure 4.1: Avifaunal quantity status

(Source: Observed data)

It can also be discussed that the majority of birds are found to be ***common and fairly common*** on the lists of avifauna. As reported by Sanjay and Sanjayrao, (2018) the diversity of migratory birds helps predict the *"health of the ecosystem".*

6. CONCLUSION

The bird mapping exercise has become crucial to maintaining the ecosystem from the standpoint of invasive species. The study has discovered 11000 species to consider an effective ecosystem. However, the variety of avian species has been derived based on the photographic capturing method. In addition, climate changes have been taken into consideration to identify threats to avian species in the Nashik region.

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