International Journal of
INTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING
ISSN:2147-6799 www.ijisae.org Original Research Paper

Avian Diversity Assessment of Ancholi Dam in Shergarh Wildlife Sanctuary, Baran District, Rajasthan

Arun Kumar Jatav[1], Amit kumar[2*], Smriti Johari[3]

Submitted:13/03/2024 **Revised**: 28/04/2024 **Accepted**: 05/05/2024

Abstract: This study was undertaken from May 2023 to April 2024 at the Shergarh Wildlife Sanctuary in the Baran District of Rajasthan, concentrating on the avian variety around Ancholi Dam. Throughout the investigation, 97 avian species from diverse orders, families, and genera were discovered. The investigation encompassed a 3-kilometer area along the Parvan River, incorporating green spaces, wetlands, and terrestrial ecosystems. The observed avian species were markedly affected by the richness of plant species within the sanctuary, particularly those cataloged in the IUCN Red Data Book.

The fieldwork employed systematic observational techniques, including Nikon Monarch 5 binoculars (10x42) for avian identification and surveys done during peak avian activity intervals. Data were gathered via time-restricted field surveys, which entailed recording avian species according to their physical traits and behaviors. The surveys aimed to document both resident and migratory species across several seasons, providing an extensive overview of the sanctuary's avifauna.

The findings indicate that the sanctuary offers essential habitats for numerous bird species while encountering multiple conservation problems. Habitat fragmentation, pollution, and disruptions from adjacent agricultural activities were recognized as significant risks. The presence of large herbivores, such as Nilgai and stray cattle, jeopardizes the nests and eggs of ground-nesting avifauna.

The study emphasizes the necessity of continuous conservation initiatives by local officials and the people to safeguard the diverse avifauna of Shergarh Wildlife Sanctuary. Future study should focus on long-term monitoring initiatives and the formulation of focused conservation plans to alleviate human influence. The research underscores the ecological importance of this site, providing critical insights into the bird biodiversity of Ancholi Dam and its vicinity, and stressing the necessity for ongoing conservation efforts.

Keywords: Shergarh Wildlife Sanctuar, Ancholi Dam, Avian diversity, bird diversity, conservation, Red Data Book species.

INTRODUCTION

Here's a revised version of your introduction, incorporating more recent and relevant in-text citations, followed by APA references:

Over 92,000 different animal species and 40,000 plant species inhabit India, making it one of the most biodiverse countries in the world (Khanna & Gupta, 2022; Bailey & King, 2019). This biodiversity is preserved through an extensive network of protected areas, including wildlife sanctuaries, national parks, and reserves, designed to safeguard a range of habitats and species (Kumar & Sahu, 2020). Rajasthan alone is home to 27 of India's 544 wildlife sanctuaries, which collectively play a critical role in the conservation of regional flora and fauna (Singh et al., 2021). Among these is the Shergarh Wildlife Sanctuary, located in Baran District, which is notable for its rich avian diversity and its unique population of snakes (Grimmett et al., 2016; Rahman & Ismail, 2018).

The Shergarh Wildlife Sanctuary, part of the Vindhya mountain range, spans 98.8 square kilometers and is recognized for its ecological and historical importance (Boyce et al., 2016; Shekhawat & Bhatnagar, 2014). It was declared a sanctuary in 1983 and later expanded in 1992. The sanctuary's horseshoe-shaped geography, with slopes running from north to south, is intersected by the Parvan River, creating a variety of habitats for diverse wildlife species (Kaushik & Gupta, 2021). Shergarh Fort, located within the sanctuary, adds cultural significance to the area, further enhancing its value as a conservation site (Shekhawat & Bhatnagar, 2014).

Today, Shergarh Wildlife Sanctuary remains a vital refuge for numerous bird species, including endangered and vulnerable species such as the White-Bellied Minivet (Pericrocotus erythropygius) and the Indian Black Ibis (Pseudibis papillosa), both of which are listed on the International Union for Conservation of Nature (IUCN) Red List (IUCN, 2023). The sanctuary's diverse ecosystems make it an ideal site for the study of bird diversity, with a particular focus on resident, migratory, and endangered species (Prasad et al., 2022).

[1]*Ph.D. Research Scholar, Department of Zoology, Career Point University, Kota (Rajasthan), India.*
Assistant Professor, Keshav Mahavidyalaya Atru.
(Corresponding author: A.K. Jatav, arun.atru@gmail.com)
[2]*Assistant Professor, Department of Zoology, Career Point University, Kota (Rajasthan), India.*
[3]*Professor, J.D.B Government Girls College, Kota (Rajasthan), India.*

Materials and Methods

Study area. This study was conducted in the Shergarh Wildlife Sanctuary, located in the Baran District of Rajasthan, India. The sanctuary covers a total area of 98.8 square kilometers and lies within the Vindhya mountain range. The specific focus of this research was the area surrounding Ancholi Dam, which is situated near the historic Shergarh Fort. This region was selected due to its diverse ecological environment, which provides rich habitats for both resident and migratory bird species.

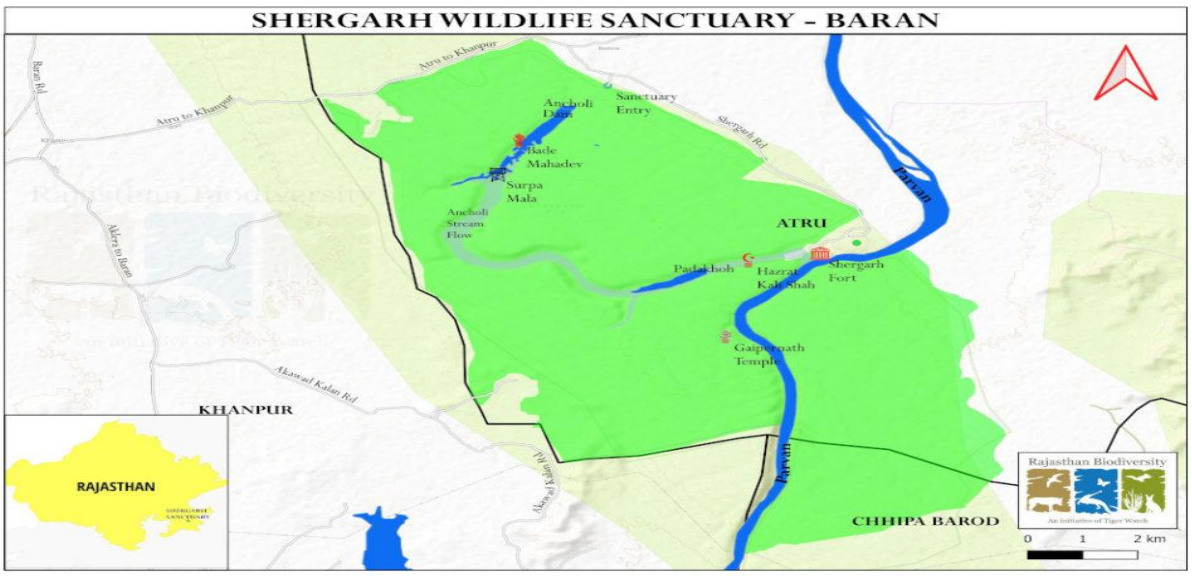
The study area extended over a 3-kilometer stretch along the banks of the Parvan River, which is a key feature within the sanctuary. This region is characterized by its high tree density, with over 3,000 trees forming a critical habitat for the avifauna. The vegetation in this area consists of a mix of wetland and terrestrial ecosystems, offering suitable environments for different bird species. The study area also includes several patches of undisturbed land, which are particularly important for ground-nesting birds. The geographic location and habitat diversity made the Ancholi Dam area an ideal site for studying bird diversity..

Research Design and Methodology

The study employed a systematic observational approach to document bird species diversity, distribution, and behavior. The research was carried out over a period of 12 months, from September 2023 to August 2024, to ensure the collection of data across multiple seasons, including migratory periods. This long-term approach allowed for a comprehensive understanding of both resident and migratory bird species present in the sanctuary.

Equipment used and Area search. To observe and identify bird species, Nikon Monarch 5 binoculars (10x42 magnification) were utilized. These binoculars were selected for their high optical performance, enabling clear and precise observation of birds from a distance. Observations were conducted from concealed positions to minimize disturbance to the birds. This method ensured that natural behavior could be observed, increasing the accuracy of the data collected.

Field observations were carried out during two key periods of bird activity: morning (7:00 a.m. to 11:00 a.m.) and evening (4:00 p.m. to 7:00 p.m.). These time windows were chosen based on the peak activity levels of most bird species, allowing for more comprehensive data collection. Observers used stationary and roving techniques, alternating between fixed observation points and slow, systematic walking along predetermined transects within the study area. This combination of methods enabled the detection of both active and cryptic bird species.



Species Identification and Data Recording:

Bird species were identified using a combination of traditional field guides, such as "Birds of the Indian Subcontinent" by Grimmett et al. (2016), and digital resources, including mobile applications like eBird and Merlin Bird ID. These tools allowed for quick and accurate identification based on visual and auditory cues. Observers noted key characteristics such as plumage coloration, vocalizations, body size, feeding behavior, and flight patterns to distinguish between species. Special attention was given to the identification of rare and migratory species, as well as those listed in the IUCN Red Data Book (IUCN, 2020).

Data were recorded in standardized field sheets designed to capture important details for each sighting, including species name, time of observation, location, behavior, and environmental conditions (e.g., weather, temperature, and habitat type). The use of standardized protocols ensured consistency and reliability across the study period.

Sampling and Survey Protocols

The study employed a time-restricted area search method, which involved surveying defined areas within the 3-kilometer study region over a fixed duration. Each search area was systematically surveyed for 30 to 45 minutes, during which all bird species observed or heard were recorded. Birds flying overhead were also included in the survey to ensure a complete assessment of the local avifauna. Multiple survey sessions were conducted each week, ensuring that data were collected under a range of weather and seasonal conditions.

In addition to visual observations, the research team employed passive acoustic monitoring to record bird calls, particularly for species that are difficult to spot visually. These audio recordings were analyzed using sound identification software to confirm species presence, particularly during dawn and dusk, when vocal activity is highest.

Ethical Considerations and Habitat Management

All fieldwork was conducted in accordance with ethical guidelines for wildlife research, ensuring minimal disruption to the natural habitat and behavior of the birds. No invasive techniques were used, and special care was taken to avoid disturbing nests, particularly during the breeding season. The researchers worked closely with the Rajasthan Forest Department to ensure that the study complied with local conservation regulations and to promote the long-term management of the sanctuary's avian populations.

RESULT AND DISCUSSION

Bird Species Diversity

Throughout the yearlong observation period, which spanned from May 2023 to April 2024, a total of 97 bird species were documented within the study area at Ancholi Dam, Shergarh Wildlife Sanctuary. The species identified belonged to a variety of orders and families, highlighting the diverse avian population of the sanctuary. These findings align with previous studies that underscore the high biodiversity of Indian sanctuaries, particularly in regions that offer a mix of wetland and terrestrial habitats (Rahmani et al., 2016; Grimmett et al., 2016).

Endangered and Vulnerable Species

Significantly, the sanctuary serves as a critical habitat for several species that are classified as endangered or vulnerable by the International Union for Conservation of Nature (IUCN). For instance, sightings of the Red-Headed Vulture (Sarcogyps calvus) and the Spoonbill (Platalea leucorodia) were particularly noteworthy. Both species are classified as vulnerable due to declining global populations, driven largely by habitat loss and human interference (Rahman & Ismail, 2018). The presence of these species within the Shergarh Wildlife Sanctuary underscores the area's importance as a conservation zone, offering refuge to birds that are facing threats in other parts of their range.

Additionally, the monsoon season brought an influx of migratory species, including the Indian Pitta (Pitta brachyura) and the Paradise Flycatcher (Terpsiphone paradisi), both of which are known for their vibrant plumage and seasonal migration patterns (IUCN, 2020). The presence of these migratory species further emphasizes the sanctuary's role as a seasonal haven for birds traveling long distances.

Threats to Avian Populations

Despite the rich diversity of bird species documented, the study also highlighted several significant threats to the avian population in Shergarh Wildlife Sanctuary. One of the primary concerns is habitat fragmentation, which has been exacerbated by agricultural expansion and human settlement near the sanctuary's borders. Fragmentation disrupts the continuity of habitats, making it difficult for birds, especially ground-nesting species, to find suitable breeding sites. As Koshelev et al. (2019) observed, habitat fragmentation often leads to increased predation and reduces the availability of food resources, both of which contribute to declining bird populations.

In addition to habitat fragmentation, human disturbances, such as tourism and livestock grazing, pose a serious threat to the sanctuary's birdlife. During the breeding season, the presence of large herbivores like Nilgai (Boselaphus tragocamelus) and stray cattle was observed to cause significant damage to the nests and eggs of ground-nesting birds. These animals, while native to the region, have become a nuisance due to overpopulation and lack of natural predators (Koshelev et al., 2019). The trampling of nests and the destruction of vegetation by grazing animals result in the direct loss of eggs and chicks, which exacerbates the decline of vulnerable species, particularly during critical life stages such as breeding.

S. N.	Order	Family	*Scintific name.*	Common name.	Status in sanctuary	Guild
1.	**Accipitriforme.**	**Accipitridae.**	*Accipiter badius.*	Shikra.	Resident	Carnivorous
			Circus macrourus	Pied harrier.	Seasonal	Omnivorous
			Buteo buteo.	Common buzzard.	Seasonal	Omnivorous
			Elanuscaeruleus.	Black shouldered kite.	Resident	Omnivorous
			Milvus migrans.	Black kite.	Resident	Carnivorous
			Circaetus gallics.	Short- toed snake eagle.	Seasonal	Omnivorous
			Gyps idicus.	Indian vulture.	Resident	Carnivorous
			Accipiter virgatus.	Besra.	Resident	Insectivorous

			Sarcogyps calvus	Red headed vulture.	Resident	Carnivorous
2.	**Anseriformes.**	**Anatidae.**	*Anas strepera.*	Gadwall.	Seasonal	Omnivorous
			Dendrocygna javanica.	Lasser whistling duck.	Resident	Omnivorous
			Anas crecca.	Common teal.	Seasonal	Omnivorous
3.	**Apodiformes.**	**Apodidae.**	*Apus affinis.*	House swift.	Resident	Insectivorous
4.	**Pelecaniformes.**	**Ardeidae.**	*Ardeola grayi.i*	Indian pond heron.	Resident	Carnivorous
			Ardea cinerea.	Gray heron.	Resident	Carnivorous
			Ardea purpurea.	Purple heron.	Resident	Carnivorous
			Casmerodius albu.	Great egret.	Resident	Carnivorous
			Egretta garzeetta.	Little egret.	Resident	Carnivorous
			Bubulcus ibis.	Cattle egret.	Rare	Carnivorous
		Threskiornithidae.	*Platalea leucorodia.*	Spoon bill.	Rare	Carnivorous
			Pseudibis papillosa.	Inian black ibis.	Rare	Carnivorous
5.	**Bucerotiformes.**	**Bucerotidae.**	*Ocyceros birostris.*	Indian gray hornbill.	Resident	Omnivorous
		Upupidae.	*Upupa epops.*	Common hoopoe.	Resident	Insectivorous
6.	**Charadriiformes.**	**Charadriidae.**	*Tringa tetanu.s*	Red shank.	Seasonal	Insectivorous
			Tringa stagnatilli.s	Marsh sandpiper.	Seasonal	Insectivorous
			Tringa glareola.	Wood sandpiper.	Seasonal	Insectivorous
			Tringa hypoleucos.	Common sandpiper.	Seasonal	Insectivorous
			Vanellus indicus.	Red wattled lapwing.	Resident	Insectivorous
		Recurvirostridae.	*Himantopus Himantopus.*	Black winged stilt.	Resident	Carnivorous
		Jacanidae.	*Metopidius indicus.*	Bronze winged jacana.	Seasonal	Carnivorous
		Scolopacidae..	*Tringa nebularia.*	Common green shank.	Seasonal	Insectivorous
			Streptopelia tranqueb.arica	Red collard dove.	Resident	Granivorous
			Streptopelia senegalensis.	Laughing dove.	Resident	Granivorous
			Streptopelia chinensis.	Spotted dove.	Resident	Granivorou

						s
			Columba livia.	Rock pigeon.	Resident	Granivorous
			Treron phoenicoptera.	Yellow footed green pigeon.	Resident	Frugivorous
7.	**Coraciiformes.**	**Coraciidae.**	*Coracias benghalensis.*	Indian roller.	Resident	Carnivorous
			Coracias garrulous.	Eurasian roller.	Resident	Carnivorous
		Meropidae.	*Merops orientalis.*	Green bee-eater.	Resident	Insectivorous
			Merops philippinu.s	Blue tailed bee-eater.	Seasonal	Insectivorous
		Alcedinidae.	*Halcyon smyrnensi.s*	White throated kingfisher.	Resident	Carnivorous
		Meropidae.	*Merops pericus.*	Blue cheeked bee-eater.	Seasonal	Insectivorous
8.	**Cuculiformes.**	**Cuculidae.**	*Eudynamys scolopacea.*	Asian koel.	Resident	Omnivorous
			Clamtor jacobinus.	Pied cukoo.	Seasonal	Omnivorous
			Hierococcyx variu.s	Papiha.	Resident	Insectivorous
9.	**Piciformes.**	**Picidae.**	*Dendrocopos mahrattensis.*	Yellow crowned woodpeacker.	Rare	Insectivorous
			Dinopium benghalense.	Black rumped flameback.	Rare	Insectivorous
10.	**Psittaciformes.**	**Psittacidae.**	*Psittacula krameria.*	Rose ringed parakeet.	Rare	Granivorous
11.	**Gruiformes.**	**Ralliadae.**	*Porphyrio porphyrio.*	Purple swamphen.	Rare	Omnivorous
			Gallinulla chloropus.	Comman moorhen.	Resident	Omnivorous
			Amaurornis phoenicurus.	White breasted waterhen.	Resident	Omnivorous
		Gruidae.	*.Indian sarus crane.*	Antigone Antigone.	Rare	Carnivorous
12.	**Strigiformes.**	**Strigidae.**	*Athene brama.*	Spotted owlet.	Resident	Insectivorous
13.			*Ciconia episcopus.*	Wooly nacked stork.	Resident	Carnivorous
14.	**Falconiformes.**	**Falconidae.**	*Falco chicquera chicquera.*	Red nacked falcon.	Resident	Carnivorous
15.	**Galliformes.**	**Phasianidae.**	*Coturnix coturnix.*	Common bater.	Resident	Insectivorous
			Pavo cristatus.	Indian peafowl.	Resident	Omnivorous
			Francolinus pondicerianus.	Gray francolin.	Resident	Omnivorous
			Francolinus	Black francolin.	Resident	Omnivorou

			francolinus.			s
16.	**Suliformes.**	**Phalacrocoracidae.**	*Microcarbo niger*.	Little cormorant.	Resident	Carnivorous
17.	**Passeriformes.**	**Zostropidae.**	*Zosterops meyny*.	Lowland white eye.	Resident	Carnivorous
		Muscicaoidae.	*Copsychus fulicatus.*	Magpie robin.	Resident	Carnivorous
		Campethagidae.	*Pericrocotus erythropygius.*	white bellied minivet.	Resident	Insectivorous
		Pycnonotidae.	*Pycnonotus leucotis.*	White eared bird.	Resident	Insectivorous
		Muscicapidae.	*Copsychus saularis*.	Oriental magpie robin.	Resident	Insectivorous
		Alaudidae.	*Calandrilla brachydactyla*.	Greater short toed lark.	Resident	Omnivorous
		Corvidae.	*Corvus splendens.*	House crow.	Resident	Carnivorous
			Dendrocitta vagabunda.	Roufous treepie.	Rare	Frugivorous
		Estrildidae.	*Lonchura malabarica*.	Indian silver bill.	Rare	Omnivorous
		Hirundinidae.	*Hirundo rustica*.	Barn swallow.	Seasonal	Insectivorous
			Cecropis dauric.a	Red rumped swallow.	Rare	Insectivorous
			Petrochelidon fluvicola.	Streak throated swallow.	Rare	Insectivorous
			Hirundo smithii.	Wire tailed swallow.	Rare	Insectivorous
		Dicruridar.	*Dicrurus macrocercus.*	Black drongo.	Resident	Insectivorous
			Anthus hodgsoni.	Indian tree pipi.t	Seasonal	Insectivorous
			Anthus malcolmi.	Tree pipit.	Seasonal	Insectivorous
			Tudoides comprestris.	Tawny pipit.	Seasonal	Insectivorous
		Laniidae.	*Lanius vittatus.*	Bay backed shrike.	Rare	Insectivorous
			Lanius meridionalis.	Southern gray shrike.	Rare	Insectivorous
		Leiothrichidae.	*Turdoides malcolmi.*	Large gray babbler.	Resident	Insectivorous
			Turdoides striata.	Jungle babbler.	Resident	Insectivorous
		Nectariniid	*Nectarinia Asiatic.a*	Purple sunbird.	Resident	Nectarivorous

		ae.	*Cinnyris lotenius.*	Long billed sunbird.	Resident	Nectarivorous
			Arachnothera longirostra.	Little spider hunter.	Resident	Nectarivorous
		Sturnidae.	*Acridotheres ginginianus.*	Bank myna.	Resident	Granivorous
			Acridotheres tristis.	Common myna	Resident	Granivorous
			Sturnus pagodrum.	Brahminy starling.	Resident	Granivorous
			Sturnus contra.	Asian pied starling.	Resident	Granivorous
			Sturnus roseus.	Rosy starling.	Resident	Granivorous
		Pycnonotidae.	*Psycnotus cafer..*	Red vented bulbul.	Resident	Frugivorous
		Ploceidae.	*Ploceus philippinus.*	Baya weaver.	Rare	Omnivorous
		Sylviidae.	*Sylvia curruca.*	Lesser white throat.	Seasonal	Insectivorous
		Passeridae.	*Passer domesticus.*	House sparrow.	Resident	Granivorous
		Laniidae.	*Lenius Schach.*	Long tailed shrik.e	Rare	Insectivorous
		Pittidae.	*Pitta brachyura.*	Indian pitta.	Seasonal	Insectivorous
		Monarchidae.	*Paradise Flycatcher.*	Shah bulbul.	Seasonal	Insectivorous

Moreover, pollution from nearby agricultural activities also poses a threat to the sanctuary's avifauna. The runoff of pesticides and fertilizers into the wetland areas not only contaminates the water but also affects the insects and small vertebrates that many bird species rely on for food. The impact of agrochemical pollutants on bird populations has been well-documented in other regions, where declines in insect populations have led to a corresponding reduction in bird diversity (Rahman & Ismail, 2018). This suggests that without stricter regulation of agricultural practices near the sanctuary, the long-term health of its bird populations may be at risk.

Conservation Implications

The findings of this study underline the urgent need for conservation measures to protect the bird species of Shergarh Wildlife Sanctuary, particularly those that are endangered or vulnerable. The study's results are consistent with broader conservation literature, which emphasizes the importance of habitat protection and management in mitigating the threats faced by bird populations (Kumar & Sahu, 2020). Effective conservation strategies for the sanctuary should include the implementation of buffer zones to reduce human-wildlife conflicts, stricter enforcement of anti-poaching laws, and habitat restoration projects aimed at reforesting degraded areas.

Furthermore, public awareness campaigns could play a crucial role in fostering local support for bird conservation. Engaging local communities in conservation efforts through educational programs and ecotourism initiatives may help mitigate some of the pressures on the sanctuary's ecosystems, such as habitat destruction and pollution (Prasad et al., 2022). By promoting the ecological and economic value of biodiversity, these efforts could contribute to the long-term sustainability of Shergarh Wildlife Sanctuary as a vital bird habitat.

Future Research Directions

Future studies should aim to monitor bird populations over a longer period to better understand the effects of seasonal variation and climate change on avian biodiversity in the region. Longitudinal studies that incorporate population dynamics and breeding success rates would provide valuable insights into the health of the bird species present in the sanctuary. Additionally, research into the impacts of

human activity, such as agricultural encroachment and livestock grazing, on bird populations would further inform conservation strategies. By combining ecological research with conservation policy, future studies can contribute to the effective preservation of Shergarh's unique avian diversity.

CONCLUSIONS

This study revealed that the Shergarh Wildlife Sanctuary harbors a remarkable diversity of avian species, with a total of 97 different bird species identified during the yearlong research period. These findings underscore the sanctuary's crucial role as a habitat for both resident and migratory bird populations. The presence of such a wide variety of species, including those listed as vulnerable and endangered by the IUCN, highlights the ecological importance of the sanctuary within the broader conservation landscape of Rajasthan. The sanctuary's ability to support both local and migratory species illustrates its ecological value as a biodiversity hotspot and a critical area for avian conservation in the region.

However, despite its rich biodiversity, the study also brought to light the significant threats facing the sanctuary's bird populations. Habitat destruction, primarily due to human activities such as agricultural expansion, unsustainable tourism, and pollution, poses a significant risk to the long-term survival of these species. Fragmentation of habitats disrupts vital ecological processes, including breeding, feeding, and migration. This is particularly concerning for species with specialized habitat requirements or those already categorized as vulnerable or endangered. These findings are consistent with existing literature, which emphasizes the detrimental impact of human activities on wildlife in protected areas (Koshelev et al., 2019; Prasad et al., 2022).

The study stresses the need for a deeper understanding of the ecological requirements of the bird species residing in Shergarh. Long-term ecological monitoring and research are essential to track population trends, especially for species of conservation concern. Detailed studies on habitat use, breeding patterns, and migratory behavior would provide valuable insights into the specific needs of different species, enabling more targeted conservation interventions. Moreover, understanding the ecological interactions between bird species and their environment will be crucial for maintaining the ecological balance within the sanctuary.

Conservation efforts within Shergarh Wildlife Sanctuary must be prioritized, and these efforts will require the active participation of both government authorities and local communities. Government-led conservation initiatives should focus on habitat restoration, the establishment of protected buffer zones, and the regulation of human activities such as tourism and agriculture within and around the sanctuary. In particular, the implementation of stricter controls on agricultural runoff and the creation of sustainable tourism practices are necessary to minimize the negative impacts on the sanctuary's fragile ecosystems. As previous studies suggest, effective conservation strategies must be multidimensional, addressing both ecological and socio-economic factors to ensure long-term sustainability (Rahman & Ismail, 2018; Kumar & Sahu, 2020).

Local community involvement is essential for the success of these conservation efforts. Engaging communities through education and awareness programs can foster a sense of stewardship for the natural environment. Promoting eco-friendly practices such as responsible tourism and sustainable agriculture can mitigate some of the threats posed by human activity. Furthermore, empowering local residents to take part in conservation initiatives, such as monitoring bird populations and protecting critical habitats, can enhance the overall effectiveness of conservation strategies. Community-based conservation programs have been shown to be successful in other protected areas and could serve as a model for Shergarh Wildlife Sanctuary (Prasad et al., 2022).

The need for comprehensive, long-term research cannot be overstated. Future studies should not only focus on species identification and population monitoring but also address the impacts of climate change on bird species, particularly migratory birds. As climate patterns shift, the availability of suitable habitats and food resources for birds may change, potentially exacerbating the pressures already faced by vulnerable species. By anticipating these changes, conservationists can develop adaptive management strategies that ensure the continued protection of the sanctuary's avifauna.

In conclusion, Shergarh Wildlife Sanctuary serves as a vital refuge for a diverse range of bird species, but the long-term preservation of this biodiversity will require concerted efforts from both governmental and non-governmental stakeholders. Effective conservation strategies must be built upon a foundation of robust scientific research, community engagement, and sustainable management practices. By addressing the threats posed by habitat destruction, pollution, and unsustainable human activities, we can safeguard the ecological integrity of the sanctuary and ensure the survival of its bird populations for future generations.Conflict of Interest. None.

REFERENCES

[1] Bailey, B. A. and King, D. I. (2019). Habitat selection and habitat quality for wintering wood thrushes in a coffee growing region in Honduras. *Global Ecology and Conservation 20*, 1-10.

[2] Banerjee, P. and Pal, A. (2016). A note on Sultanpur National Park, the Bird Paradise of Haryana. *Sarovar Saurabh 13*(3), 7-10.

[3] Boyce, M. S., Johnson, C. J., Merrill, E. H., Nielsen, S. E., Solberg, E. J. and Moorter, V. B. (2016). Can habitat selection predict abundance? *Journal of Animal Ecology 85*, 11-20.

[4] Chopra, G., Tyor, A. K. and Kumari, S. (2013). A study on wetland avian species of Sultanpur National Park Gurgaon, Haryana (India). *The Ecoscan 7*, 21-26.

[5] Chopra, G., Tyor, A. K., Kumari, S. and Rai, D. (2012). Status and conservation of avian fauna of Sultanpur National Park Gurgaon, Haryana (India). *Journal of Applied and Natural Science 4*, 207-213.

[6] Garden, J. G., McAlpine, C. A., Possingham, H. P. and Jones, D. N. (2007). Using multiple survey methods to detect terrestrial reptiles and mammals: what are the most successful and cost-efficient combinations? *Wildlife Research, 34*(3), 218-227.

[7] Grimmett, R., Inskipp, C. and Inskipp, T. (2016). Birds of the Indian Subcontinent: India, Pakistan, Sri Lanka, Nepal, Bhutan, Bangladesh, and the Maldives. *Bloomsbury Publishing*.

[8] Hansell, M. (2000). Bird nests and construction behavior. Cambridge, UK: *Cambridge University Press.*

[9] IUCN (2020). The IUCN Red List of Threatened Species. *Version 2019-3.*

[10] Kaushik, T. K. and Gupta, R. C. (2016). Status and Diversity of Avifauna in Sultanpur National Park in Gurgaon District-Haryana, India. *Indian Forester 142*, 989-998.

[11] Koli, V. K. (2014). Diversity and status of avifauna in Todgarh-Raoli Wildlife Sanctuary, Rajasthan, India. *Journal of Asia-Pacific Biodiversity 7*, 401-407.

[12] Koshelev, O. I., Koshelev, V. O., Fedushko, M. P. and Zhukov, O. V. (2019). The bird community's diversity and indicator groups of natural and anthropogenic landscapes of the South and South-east of Ukraine. *Agrology 2*, 229-240.

[13] Kumar, P. and Gupta, S. K. (2013). Status of wetland birds of Chhilchhila Wildlife Sanctuary, Haryana, India. *Journal of Threatened Taxa 5*, 3969-3976.

[14] Kumar, P. and Sahu, S. (2020). Composition, diversity, and foraging guilds of avifauna in agricultural land scapes In Panipat, Haryana, India. *Journal of Threatened Taxa 12*, 15140-15153.

[15] Kumar, P. and Sahu, S. (2019). Avian Diversity in Agricultural Landscapes of District Panipat, Haryana, India. *Asian Journal of Conservation Biology 8* (2), 188-198.

[16] Jatav, A. K., Sharma, A. K. and Johari, S. (2023). A Study on the Bird Diversity of Shergarh Wildlife Sanctuary District, Baran, Rajasthan, India. *Biological Forum – An International Journal, 15*(3), 771-777.

[17] Pattimahu, D. V., Bone, I., Mardiatmoko, G. and Kastanya, A. (2017). A study of strategic plan for Forest Stand Conservation in the Nature Reserve of Taliabu Island. *Asian Journal of Conservation Biology 6* (2), 73-80.

[18] Pragasan, L. A. and Madesh, M. (2018). Species diversity and abundance of birds on Bharathiar University Campus, Tamil Nadu, India. *Journal of Threatened Taxa 10*, 11725-11731.

[19] Rahman, F. and Ismail, A. (2018). Waterbirds: An important bio-indicator of ecosystem. *Pertanika Journal of Scholarly Research Reviews 4*, 81-90.

[20] Rahmani, A. R., Islam, M. Z. U., and Kasambe, R. M. (2016). Important Bird and Biodiversity Areas in India. *Priority Sites for Conservation. Second Edition: Revised and Updated. Volume I*.

[21] Shekhawat, D. S. and Bhatnagar, C. (2014). Guild, status, and diversity of avian fauna in the Jhunjhunu district, Rajasthan, India. *Journal of Asia-Pacific Biodiversity, 7*, 262-267.

[22] Singh, P., Javed, S., Shashtri, S., Singh, R. P., Vishwakarma, C. A. and Mukherjee, S. (2017). Influence of changes in watershed landuse pattern on the wetland of Sultanpur National Park, Haryana using remote sensing techniques and hydrochemical analysis. *Remote Sensing Applications: Society and Environment*, *7*, 84-92.

[23] Young, A. C., Cox, W. A., McCarty, J. P., and Wolfenbarger, L. L. (2019). Post fledging habitat selection and survival of Henslow's Sparrow: management implications for a critical life stage. *Avian Conservation and Ecology*, *14*(2), 10.