



International Journal of Fauna and Biological Studies

Available online at www.faunajournal.com

I
J
F
B
S

International
Journal of
Fauna And
Biological
Studies

E-ISSN 2347-2677

P-ISSN 2394-0522

<https://www.faunajournal.com>

IJFBS 2025; 12(4): 53-59

Received: 25-05-2025

Accepted: 28-06-2025

Dr. Khagendra Kumar

Govt. PG College, Barmer,
Rajasthan, India

Dr. Amir Sohail

MBC Govt. Girls College,
Barmer, Rajasthan, India

Assessment of avian biodiversity in Hilly Memorial Park, Barmer, Rajasthan: Implications for conservation and ecological management

Khagendra Kumar and Amir Sohail

DOI: <https://www.doi.org/10.22271/23940522.2025.v12.i4a.1114>

Abstract

The Hilly Memorial Park located in the Barmer district of Rajasthan, a region celebrated for its unique ecological landscape, is home to a variety of animals and plants that enhance its natural beauty. This research paper seeks to evaluate the avian diversity in and around the Hilly Memorial Park, examine the factors affecting the avian populations, and suggest effective conservation strategies to protect this vital ecosystem. Through a thorough study, we aim to offer valuable insights into the area's avian biodiversity and contribute to the sustainable management of the park.

Keywords: Hilly, Barmer, Birds, Biodiversity.

Introduction

The Hilly Memorial Park is a state-owned area situated in the Barmer district of Rajasthan, India, near the village of Daroora, approximately 11 kilometres northwest of the city of Barmer. The geographical coordinates (25.7535557N, 71.3731098E), Barmer, Rajasthan 344001, pinpoint the location of this park. It is under the care of the Rajasthan Forest Department and is a fine specimen showing the management of natural heritage near urban areas. The Hilly Memorial Park plays a crucial role within the Thar Desert ecosystem. The Thar Desert is a distinct arid region characterized by extreme temperatures, scanty rainfall, and unique flora and fauna that have adapted to the harsh desert conditions (Sharma, 2013) ^[8]. The ecological importance of the Hilly Memorial Park is highlighted by its contributions to the following areas-

1. Floral Diversity: The park boasts a remarkable variety of plant and animal species that thrive in arid conditions. The vegetation includes various desert-adapted plants, such as cactus, thorny bushes, succulents as well as trees such as Ker, Jal, Khejri, Babool, Vilayati Babool, Rohida etc. This rich flora provides essential amenities such as food sources and shelter for local wildlife.

2. Faunal Diversity: The Hilly Memorial Park is notable for its animal diversity, especially avian diversity, attracting numerous species both resident and migratory and make it a prime destination for birdwatching in the district. In addition to its diverse bird population, the park is home to a range of desert wildlife.

In recent times, the ecological significance of Hilly Memorial Park has gained attention, and the need for its conservation has become more apparent. The Thar Desert ecosystem faces various threats due to increasing human activities, climate change, and habitat degradation. Efforts are being made to protect and preserve the park's unique biodiversity and maintain the balance of this fragile desert ecosystem.

Importance of the study

Studying avian biodiversity in the Hilly Memorial Park is crucial for several reasons, primarily related to maintaining ecological balance and the potential ecological services provided by avian species. Avifauna are often part of complex food webs, where they interact with other organisms, including insects, plants, and other animals. Also, many bird species are important pollinators for various plants. Birds are known seed dispersers, as they consume fruits and then disperse seeds through their droppings. This dispersal mechanism helps plants colonize new

Corresponding Author:

Dr. Khagendra Kumar

Govt. PG College, Barmer,
Rajasthan, India

areas, promoting forest regeneration and supporting plant diversity. Certain bird species are natural predators of insects and small rodents. They help control pest populations, which can otherwise cause damage to crop and other vegetation. Birds are often considered "indicator species" because their presence or absence can reflect the overall health of an ecosystem. The avian diversity in the Hilly Memorial Park adds cultural and educational value. Birds have long been admired and celebrated in various cultures and traditions. Observing and learning about different bird species can foster a sense of appreciation for nature, leading to increased support for conservation initiatives among visitors and local communities. Avian diversity can also have direct economic benefits, particularly in areas that rely on ecotourism. Birdwatching and eco-tourism can attract visitors and generate revenue for local communities, contributing to the park's conservation and sustainable management. Avian species can also serve as indicators of the effects of climate change on ecosystems.

In conclusion, studying avian biodiversity in the Hilly Memorial Park, Barmer, Rajasthan, is vital for maintaining ecological balance, promoting important ecological services like pollination and seed dispersal, and supporting the overall health and sustainability of the park's ecosystem as well as surrounding. Conservation efforts based on this research can help preserve the park's natural heritage for current and future generations.

Review of literature

Around 510 types of birds should be visible in the province of Rajasthan (Grimmett and Inskipp, 2003) ^[3]; though a total of 496 bird species have been recorded from Rajasthan by Devarshi (2004) ^[2], that is around 40% of Indian avifauna. Insight into the avian life of Barmer emerges from multiple sources—Rahmani (1997) ^[6], Sivaperuman *et al.* (2005) ^[9], and Kumar *et al.* (2006) ^[4]. Rahmani's observations in 1997 highlighted the Thar desert's rich avian diversity and his comprehensive survey documented 213 species, 35 of which were found in Barmer, revealing a diverse avian population, including numerous non-desert species.

Subsequent studies added depth to our understanding: Kumar *et al.* (2006) ^[4] focused on wetland birds, listing 53 species from Barmer in their Geo-spatial Atlas for the wetland birds of GITD (Great Indian Thar Desert). Recently, during 'General Faunistic Surveys,' conducted as part of the Zoological Survey of India's endeavour to assess the impact of proposed lignite mining in the Kapurdi and Jalipa Blocks and the surrounding 10 kilometre radius of Barmer district, meticulously recorded avian species observed in the study area spanning approximately 850 square kilometres. This meticulous effort uncovered a total of 60 bird species. The resulting comprehensive bird checklist for the Barmer district encompasses a total of 153 species, representing 103 genera and 46 families (Tak *et al.*, 2009) ^[10].

Material and Methods

The current study had been conducted from September 2021 to August 2024. This study was carried out at the Hilly Memorial Park (25.7535557N, 71.3731098E) situated in the Barmer district of Rajasthan. The Barmer is located in the western range of Rajasthan, forms a substantial part of the expansive GITD, surrounded by Jaisalmer in the north, Santhore in the south, while Pali and Jodhpur in the east, and Pakistan to the west. The area is situated between hills and sand dunes, and mainly covered by xerophytic vegetation *i.e.*, Ber (*Ziziphus nummularia*), Babool (*Acacia nilotica*), Kummat (*Acacia senegal*), Ker (*Capparis decidua*), Aak (*Calotropus procera*), Neem (*Azadirachta indica*), Jaal (*Salvadora persica*), Rohida (*Ticmela undulata*), Phog (*Calligonum polygonoides*), Cactus (*Opuntia elatior*), Guggal (*Commiphora wightii*), Sevan (*Lasiurus scindicus*), Khimp (*Leptadenia pyrotechnica*), Morali (*Tephrosia purpurea*), Bhui (*Cenchrus ciliaris*), Senna (*Senna auriculata*) etc..

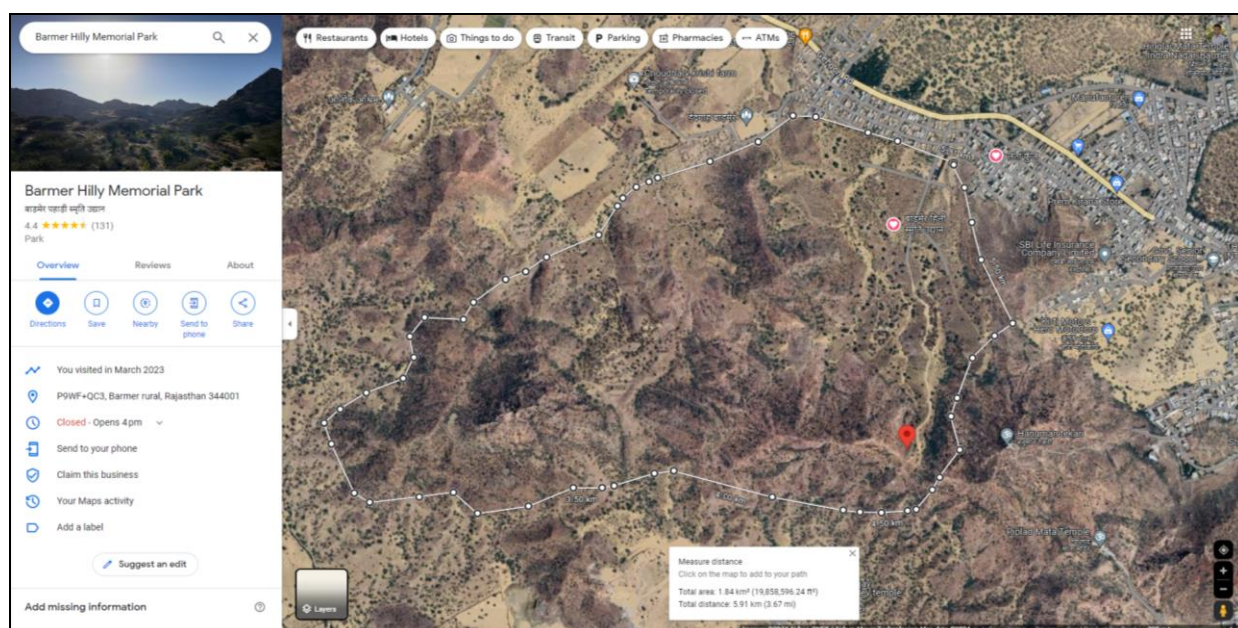
The average annual rainfall in the region is 150-280 mm, with extreme pre-monsoon temperatures ranging between 44 and 52 degrees Celsius. The high wind speed averages 10-40 km/hour annually during summers, and there is high evaporation and transpiration of 1000-1200 mm annually.

Current investigation was carried out to document and prepare a list of documented birds at the park and its surrounding. We visited the study area regularly in every season in the morning session (06:00 am to 09:00 am) & evening session (04:00 pm to 6:00 pm). During the study we used Binoculars (Olympus, 10x50 DPS I) for bird sighting and their identification. Cannon B600 camera used for their Photography. To note the geographical location of birds we used eBird app. For the identification of unidentified birds, we utilized famous Indian birds' field guidebook by Salim Ali and Ripley ^[1] as well as 'The Birds of the Indian subcontinent by Grimmett ^[4]', and thus, we tried to accurately identify and document the bird species encountered, including the count of individuals for each species. This current contribution primarily relies on extensive field observations conducted during visits spanning the year 2021-2024 in and around the park within the Barmer district. The observation was carried out in different season and direct observation method was employed. During our field work, we applied Point-Count Surveys (PCS) method to study the avian biodiversity of the park and its surrounding.

In PCS method, a count undertaken from a fixed location for a fixed time period. It can be undertaken at any time of the year, and it is not restricted to the breeding season. All birds that are seen or heard are recorded. A point-count survey is a widely used method in ornithology for assessing bird populations. (Kumar, 2018) ^[5]

While these survey methods are widely used, it's essential to consider ethical guidelines and permits when conducting research involving birds. Some species may be protected, and certain areas may have restrictions on handling or capturing wildlife. Researchers should prioritize the welfare of the birds and follow best practices to ensure the accuracy and reliability of their data while minimizing any potential negative impacts on avian populations.

Map of the Hilly Memorial Park



(Source: Google Maps)

Observation

By conducting extensive investigation, we extensively covered a distance of 5 km in and around the area of Hilly Memorial Park, diligently recording the various bird species encountered during our observations. The study reveals that within study area, total of 66 bird species spanning 30 families have been documented. The prepared checklist of documented avian fauna has been given in Table-1. Notably, among these 66 species, 9 species are specifically categorized as water birds. Among kingfishers, White Throated Kingfisher and Pied Kingfisher are common. This rich small avian bird diversity attracts raptor i.e. hawks, kites, eagles etc. The photographs of some bird have been presented in below. The observations were confirmed using field guides of Ripley [7], Ali & Ripley [1] as well as Grimmett [3]. Study also investigated on current threats and challenges faced by avian fauna in and around study area. As development progresses there is always chances of extinction or destruction of habitats which put direct impact on avian as well as other organism survival and growth.

Following threats have been observed that are responsible for destruction of avian diversity in and around Hilly memorial Park, Barmer region. Some of the plausible major threats confronted by the birds are:

- Continuous and prolonged human activities in that area

for walk and visiting.

- Feral dogs are big threats for these birds as well as animals.

Result and Discussion

The study concludes that we observed 66 bird species representing 30 avian families and this data shows that area in and around study sites (Hilly memorial Park) is rich in terms of avian diversity which includes residential, resident migratory as well migratory birds. This study area site is surrounded by human settlements even though; it harbours a rich avian population and diversity. There are different kind of threats like increased population of feral dogs and increased human activities. It will affect the population and growth of the birds in that area. Possible remedial solution and awareness campaign should be run to educate the local dwellers about the environment and habitat preservation. By implementing conservation measures and fostering a community-driven approach, we can ensure the sustained existence of these feathered inhabitants for generations to come. This study not only contributes to scientific knowledge but also advocates for the protection of avian life as an integral part of our natural heritage.

The following list lists all the species that have been reported from the park during the study period-

Table 1: All the species that have been reported from the park

S.N.	Common Name	Scientific Name	Availability	Family
1	Yellow-throated Sparrow	<i>Gymnoris xanthocolis</i>	Resident	Passeridae
2	Yellow-eyed Babbler	<i>Chrysomma sinense</i>	Resident	Leiothrichidae
3	Plain Prinia	<i>Prinia inornata</i>	Resident	Cisticolidae
4	Indian Bushlark	<i>Mirafra erythroptera</i>	Resident	Alaudidae
5	Black Drongo	<i>Dicrurus macrocercus</i>	Resident	Dicruridae
6	Rose-ringed Parakeet	<i>Psittacula krameri</i>	Resident	Psittaculidae
7	Great Egret	<i>Ardea alba</i>	Resident	Ardeidae
8	Little Swift	<i>Apus affinis</i>	Resident	Apodidae
9	Delicate Prinia	<i>Prinia lepida</i>	Resident	Cisticolidae

10	Ashy-crowned Sparrow-Lark	<i>Eremopterix griseus</i>	Resident	Alaudidae
11	Black-crowned Sparrow-Lark	<i>Eremopterix nigriceps</i>	Resident	Alaudidae
12	Rufous Treepie	<i>Dendrocitta vagabunda</i>	Resident	Corvidae
13	Indian Pitta	<i>Pitta brachyura</i>	Resident	Pittidae
14	Red-wattled Lapwing	<i>Vanellus indicus</i>	Resident	Charadriidae
15	Tawny Pipit	<i>Anthus campestris</i>	Resident	Motacillidae
16	White-browed Wagtail	<i>Motacilla maderaspatensis</i>	Resident	Motacillidae
17	Desert Wheatear	<i>Oenanthe deserti</i>	Migratory	Muscicapidae
18	Rosy Starling	<i>Pastor roseus</i>	Resident	Sturnidae
19	Common Tailorbird	<i>Orthotomus sutorius</i>	Resident	Cisticolidae
20	Indian Roller	<i>Coracias benghalensis</i>	Resident	Coraciidae
21	Eurasian Hoopoe	<i>Upupa epops</i>	Resident	Upupidae
22	Long-legged Buzzard	<i>Buteo rufinus</i>	Migratory	Accipitridae
23	Bonelli's Eagle	<i>Aquila fasciata</i>	Resident	Accipitridae
24	White Wagtail	<i>Motacilla alba</i>	Resident	Motacillidae
25	Yellow-crowned Woodpecker	<i>Leiopicus mahrattensis</i>	Resident	Picidae
26	Long-billed Pipit	<i>Anthus similis</i>	Resident	Motacillidae
27	Jungle Babbler	<i>Argya striata</i>	Resident	Leiothrichidae
28	Large Gray Babbler	<i>Argya malcolmi</i>	Resident	Leiothrichidae
29	Great Gray Shrike	<i>Lanius excubitor</i>	Resident	Laniidae
30	Blue-cheeked Bee-eater	<i>Merops persicus</i>	Migratory	Meropidae
31	Little Ringed Plover	<i>Charadrius dubius</i>	Resident	Charadriidae
32	Variable Wheatear	<i>Oenanthe picata</i>	Migratory	Muscicapidae
33	Brown Rock Chat	<i>Oenanthe fusca</i>	Resident	Muscicapidae
34	Pied Bushchat	<i>Saxicola caprata</i>	Resident	Muscicapidae
35	Black Redstart	<i>Phoenicurus ochruros</i>	Migratory	Muscicapidae
36	Long-tailed Shrike	<i>Lanius schach</i>	Resident	Laniidae
37	White-browed Fantail	<i>Rhipidura aureola</i>	Resident	Rhipiduridae
38	Shikra	<i>Accipiter badius</i>	Resident	Accipitridae
39	Indian Peafowl	<i>Pavo cristatus</i>	Resident	Phasianidae
40	House Sparrow	<i>Passer domesticus</i>	Resident	Passeridae
41	Indian Silverbill	<i>Euodice malabarica</i>	Resident	Estrildidae
42	Purple Sunbird	<i>Cinnyris asiaticus</i>	Resident	Nectariniidae
43	Indian Robin	<i>Copsychus fulicatus</i>	Resident	Muscicapidae
44	Common Myna	<i>Acridotheres tristis</i>	Resident	Sturnidae
45	Brahminy Starling	<i>Sturnia pagodarum</i>	Resident	Sturnidae
46	Common Babbler	<i>Argya caudata</i>	Resident	Leiothrichidae
47	Asian Desert Warbler	<i>Curruca nana</i>	Resident	Sylviidae
48	White-eared Bulbul	<i>Pycnonotus leucotis</i>	Resident	Pycnonotidae
49	Red-vented Bulbul	<i>Pycnonotus cafer</i>	Resident	Pycnonotidae
50	Desert Lark	<i>Ammomanes deserti</i>	Resident	Alaudidae
51	Asian Green Bee-eater	<i>Merops orientalis</i>	Resident	Meropidae
52	Laughing Dove	<i>Spilopelia senegalensis</i>	Resident	Columbidae
53	Red Collared-Dove	<i>Streptopelia tranquebarica</i>	Resident	Columbidae
54	Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	Resident	Columbidae
55	Rock Pigeon	<i>Columba livia</i>	Resident	Columbidae
56	Gray Francolin	<i>Ortygornis pondicerianus</i>	Resident	Phasianidae
57	Laggar Falcon	<i>Falco jugger</i>	Resident	Falconidae
58	Eurasian Kestrel	<i>Falco tinnunculus</i>	Migratory	Falconidae
59	Striolated Bunting	<i>Emberiza striolata</i>	Resident	Emberizidae
60	Siberian Stonechat	<i>Saxicola maurus</i>	Migratory	Muscicapidae
61	European Roller	<i>Coracias garrulus</i>	Migratory	Coraciidae
62	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	Resident	Alcedinidae
63	Pied Kingfisher	<i>Ceryle rudis</i>	Resident	Alcedinidae
64	Black-winged Kite	<i>Elanus caeruleus</i>	Resident	Accipitridae
65	Black Kite	<i>Milvus migrans</i>	Resident	Accipitridae
66	House Crow	<i>Corvus splendens</i>	Resident	Corvidae

Photo plate 1 (Left to Right- Laughing dove, Rufous treepie, Purple sunbird, Asian green bee-eater, Indian silverbill, Gray francolin, Black winged kite, Red collared dove)



Photo plate 2 (Left to Right- Variable wheatear, Eurasian collared dove, House sparrow, Indian robin, White wagtail, European roller, Siberian stonechat, Purple sunbird.)



Conclusion

The Hilly memorial park is a fascinating site for observing both resident and migratory avifauna characteristic of the Thar desert. This study highlights the value of this protected region for its biodiversity. Although the density of bird diversity of the park was slightly low and the sightings were erratic and random. The most likely cause of this randomness is believed to be the lack of a water body/reservoir in the area which could be used by all the animals residing in the area for their water needs as well as host migratory water birds as their winter ground. This finding is also consistent with absence of waterfowl from the park. The park is home to beautiful birds of the desert ecosystem, and it can be modelled as a safe haven for birds in the vicinity of the city.

Acknowledgements

We are grateful to Prof. (Dr.) Ummed Singh Godara, Principal, Govt. PG College, Barmer as well as Prof. (Dr.) Mukesh Pachauri, Principal, MBC Govt. Girls College, Barmer for willing support. Acknowledgement is also due to Department of Zoology, Govt. PG College, Barmer for providing equipment and lab facilities.

References

1. Ali S, Ripley SD. Compact Edition of the Handbook of the Birds of India and Pakistan. Bombay Natural History Society, Mumbai; 1987.
2. Devarshi D. A Study of Avifauna of the Rajasthan State (India). [Ph.D. Dissertation]. University of Rajasthan, Jaipur; 2004.
3. Grimmett R, Inskipp T. Birds of Northern India. Oxford University Press, New Delhi; 2003.
4. Kumar A, Kankane PL, Baqri QH. Geo-spatial Atlas for the Wetland Birds of Thar Desert, Rajasthan: i-xii; 1-202 (Published by the Director, Zool. Surv. India). 2006.
5. Kumar K. Role of Common Property Resources in Village Economy and Biodiversity Management by Ethics of the People in the Thar Desert, Rajasthan. [Ph.D. Thesis]. JNV University; 2018.
6. Rahmani AR. Wildlife of the Thar. World Wide Fund for Nature, New Delhi; 1997. p. 100.
7. Ripley S. A synopsis of the birds of India and Pakistan together with those of Nepal, Bhutan and Ceylon. First Ed. Bombay Natural History Society, Bombay; 1961. p. 1-702.
8. Sharma G. A review on the Studies on Faunal diversity, status, Threats and Conservation of Thar Desert or Great Indian Desert Ecosystem. Biological forum- An international Journal. 2013;5(2):81-90.
9. Sivaperuman C, Dookia S, Kankane PL, Baqri QH. Diversity, abundance and dominance of avian species in the Thar Desert of Rajasthan. In: Changing Faunal Ecology in Thar Desert (eds. B.K. Tyagi and Q.H. Baqri). Scientific Publishers, Jodhpur; 2005. p. 187-229.
10. Tak PC, Kankane PL, Bohra P. Birds of Barmer district, Rajasthan, India. Newsletter for Birdwatchers. 2009;49(2):17-22.