International Journal of Science and Research Archive
eISSN: 2582-8185
Cross Ref DOI: 10.30574/ijsra
Journal homepage: https://ijsra.net/

(REVIEW ARTICLE)

Check for updates

Behavioral ecology of common birds in western Yamuna canal and Bhakra canal region of Karnal

Gian Bhushan Kindra *

Department of Zoology, Guru Nanak Khalsa College, Yamuna Nagar, India.

International Journal of Science and Research Archive, 2025, 15(03), 1863-1868

Publication history: Received on 19 May 2025; revised on 26 June 2025; accepted on 30 June 2025

Article DOI: https://doi.org/10.30574/ijsra.2025.15.3.1989

Abstract

Bird survey was conducted in Western Yamuna Canal and Bhakra Canal Region of Karnal from September 2024 to February 2025. The Western Yamuna Canal basically originates from the Hathni Kund barrage and flows through several districts of Haryana. The Western Yamuna Canal and habitats around the Bhakra River in Karnal are rich in avian biodiversity, mainly due to the presence of water bodies and agricultural landscapes. Out of the 61 Bird Species observed, maximum number of birds recorded were of the order Passeriformes followed by Pelecaniformes, and Coraciiformes. Present Western Yamuna Canal and Bhakra Canal Bird Species Studies revealed heterogeneous distribution of birds in different types of habitats, viz., in and around different habitats as well as in agricultural fields, scattered trees and Riverine area. The other common birds seen during the study periods are White Throated Kingfisher, Common Kingfisher, Pied Kingfisher, Black Kite, Indian Grey Hornbill, Spotted Dove, Blue Rock Pigeon, Yellow-footed Green Pigeon, Asian Green Bee-Eater, Red-Wattled Lapwing, Black-Winged Stilt, Greater Coucal, Grey Francolin, White-Breasted Water hen, White Wagtail, Alexandrine Parakeet, Black-Headed Ibis, and many others. Present studies showed that birds live in various diverse types of Habitats like farmlands, and Riverine areas, grasslands for foraging areas and nesting sites etc. In Karnal, Western Yamuna canal and Bhakra canal region, the loss of habitat and conversion of wetlands might be reason for decline in bird population. More extensive studies are required for the protection and conservation of avian fauna in this region.

Keywords: Behavioral Ecology; Bhakra Canal; Karnal; Western Yamuna Canal.

1. Introduction

Bird survey was conducted in Western Yamuna Canal and Bhakra Canal Region of Karnal from September 2024 to February 2025. The Karnal district is influenced by the Western Yamuna Canal (WYC) which branches off the Yamuna River. The Munak Canal (a part of the WYC), also conveys water from the Yamuna River through the Karnal district to Delhi for various water purposes like irrigation and drinking. The Bhakra Canal originates from the Bhakra Dam on the Sutlej River in Himachal Pradesh and this canal is a vital source of irrigation water for many districts in Haryana. The Munak Canal, 102-kilometer long aqueduct and a primary source of drinking water for Delhi, is a part of the Western Yamuna Canal system and starts from Munak in Karnal district. The Western Yamuna Canal basically originates from the Hathni Kund barrage and flows through several districts of Haryana. The Western Yamuna Canal and habitats around the Bhakra River in Karnal are rich in avian biodiversity, mainly due to the presence of water bodies and agricultural landscapes. The Bhakra Canal system, which originates from the Bhakra Dam, passes through Karnal for irrigating the district, alongside the Western Yamuna Canal. The Bhakra Canal irrigates a significant area in Haryana, including various parts of Karnal District. Kalsi and others (2019) mentioned comprehensively about Bird species in their book named Birds of Haryana - A Field Guide. It covered nearly 530 species of birds found across the state of Haryana. Birds are the key species in an agricultural ecosystem for maintaining the ecological balance. Birds form an

* Corresponding author: Gian Bhushan

important component of an ecosystem (Agarwal, 2000). Studies of avifaunal diversity are an essential ecological tool in the ecosystem. Bird species not only add aesthetic value to our life but also help in control of pest in agricultural crops, dispersal of seeds and also in maintaining a healthy ecological balance, thus they form an important components in natural ecosystem (Srinivasulu and Nagulu, 2001). Agricultural landscapes are essential for the conservation of biodiversity. Nevertheless, a negative trend continues to be observed in many rural areas for the most prominent indicator species group, the birds. Richness, abundance and community composition of birds are often used by ecologists to understand the diversity of species in natural occurrence (Maity *et. al.,* 2010). It's important to note that the bird populations in village ponds, especially smaller ones, might be heavily impacted by human activities like habitat alteration as well as water pollution. Some studies indicate a decline in migratory bird numbers in certain Riverine basins over time due to these factors.

2. Literature review

While the pioneer work in the field of ornithology, has been carried out by Salim Ali (1996) in Indian Subcontinent. Birds are closely tied to ecosystem services, such as acting as pollinators, facilitating seed dispersal, regulating pollution, providing sustenance for other animal predators, and contributing to nutrient recycling processes (Padmavathy *et. al.,* 2010, Jatav *et. al.,* 2022). Earlier research carried by Gupta and others (2009) on Analysis of winter migratory Wetland birds in KARNAL DISTRICT in Haryana, a total of 72 species of Wetland Birds belonging to 10 orders and 19 families were observed from rural village ponds of Karnal District. Out of these, 37 species of birds are winter migratory, 13 are local migratory, 20 are resident and 2 species are summer migratory. Again Gupta and others (2012) did analysis of avian-biodiversity in rural wetland environs in Panipat district in Haryana, India and observed 67 species of wetland birds, belonging to, 10 orders and 18 families from rural wetland environs. Similar field surveys were also conducted from April 2015 to March 2016, following point-transect and direct observations to document diversity and temporal variation of avifauna in agricultural landscapes of Panipat district of Haryana. A total of 99 bird species under 44 families and 15 orders were recorded, of which 79 were residents, 14 were winter migrants and 6 were summer migrants (Parmesh and Sahu, 2019). There are well detailed bird documentations since 1940's. Salim Ali (Ali and Ripley, 1987) in his historical landmark survey of different areas of Karnal covered many species from Haryana state characterized by passerines and non passerine avifauna. The present modern field ornithologist and birdwatchers organization have contributed significantly in adding many bird species in to the checklist. Bird migration is primarily, but not entirely, a Northern Hemisphere phenomenon. Many Northern-Breeding Ducks, Geese and Swans are Long-distance Migrants. The primary physiological cue for migration is the changes in the day length. These changes are also related to hormonal changes in the birds. Over a million Migratory Ducks, Teals, Geese including waders come to Bharatpur Sanctuary during the winter from far distant temperate regions of Eurasia, making it a truly international community of bird, unique in its richness and variety (Saharia, 1998). Numbers of bird species found in Haryana are around 628. Many new species have been added to the Indian Checklist since the publication of Ali and Ripley's (1968-1975) Handbook of birds of India and Pakistan, which is considered the Bible of Indian Ornithology.

2.1. Research objectives

The study aims to:

- Study the behavior of bird species of Western Yamuna Canal and Bhakra Canal Region of District Karnal.
- Study the impact of Pollution on bird population along the Western Yamuna Canal and Bhakra Canal Region of District Karnal.

3. Research methodology

3.1. Study areas

The present study was conducted in Western Yamuna Canal and Bhakra Canal Region of Karnal. The Karnal is a city located in the state of Haryana, India and is the administrative headquarters of Karnal District. The city is well connected as it lies on National Highway 44, in the south of the city lies the cities of Panipat and Sonipat and in the north lies Kurukshetra and Yamuna Nagar city while in the east lies the river Yamuna, on the other end of which lies Saharanpur and Shamli district of Uttar Pradesh on the eastern bank. Regular Sunday visits were made during the present studies at various selected sites in Western Yamuna Canal and Bhakra Canal Region of Karnal. A Pocket Guide to the Birds of the Indian sub continent was consulted to identify the birds (Grimmett *et. al.,* 1998). Line transects and point count methods were used during the bird diversity assessment. During the study period, observation was carried out once in every Sunday. Observations were usually made during the active phase of birds' activities. Birds were identified using a pair of binoculars. During surveys, birds were identified while being stationary and while walking slowly on various

paths along the WYC and Bhakra canal region. During each count, all bird species and individual bird calls were identified. Birds are active, energetic animals and quickly fly. Quick eye spotting is required in order to get possible detail in short span of time. Table 1 shows the birds found and its classification in western Yamuna canal and Bhakra canal region of Karnal.

Table 1 Resident birds species found in western Yamuna canal and Bhakra canal region of Karnal

Common Name	**Scientific name**	**Family**	**Order**
Indian Grey Hornbill	*Ocyceros birostris*	Bucerotidae	Bucerotiformes
Eurasian Hoopoe	*Upupa epops*	Upupidae	Bucerotiformes
Spotted Dove	*Spilopelia chinensis*	Columbidae	Columbiformes
Blue Rock Pigeon	*Columba livia*	Columbidae	Columbiformes
Yellow-footed green Pigeon	*Treron phoenicopterus*	Columbidae	Columbiformes
Indian Treepie	*Dendrocitta vagabunda*	Corvidae	Passeriformes
House Crow	*Corvus splendens*	Corvidae	Passeriformes
Jungle Crow	*Corvus macrorhynchos*	Corvidae	Passeriformes
Jungle Babbler	*Turdoides striata*	Leiothrichidae	Passeriformes
Common Babbler	*Turdoides caudatus*	Leiothrichidae	Passeriformes
Yellow Oriole	*Icterus nigrogularis*	Icteridae	Passeriformes
Indian Robin	*Saxicoloides fulicatus*	Muscicapidae	Passeriformes
Brown Rock Chat	*Cercomela fusca*	Muscicapidae	Passeriformes
Purple Sunbird	*Cinnyris asiaticus*	Nectariniidae	Passeriformes
House Sparrow	*Passer domesticus*	Passeridae	Passeriformes
Scaly- BreastedMunia	*Lonchura punctulata*	Passeridae	Passeriformes
Red-vented bulbul	*Pycnonotus cafer*	Pycnonotidae	Passeriformes
Brahminy Starling	*Sturnia pagodarum*	Sturnidae	Passeriformes
Common Myna	*Acridotheres tristis*	Sturnidae	Passeriformes
Bank Myna	*Acridotheres ginginianus*	Sturnidae	Passeriformes
Black Drongo	*Dicrurus macrocercus*	Dicruridae	Passeriformes
Paddy field Pipit	*Anthus rufulus*	Motacillidae	Passeriformes
Wire – TailedSwallow	*Hirundo smithii*	Hirundinidae	Passeriformes
Barn Swallow	*Hirundo rustica*	Hirundinidae	Passeriformes
White wagtail	*Motacilla alba*	Motacillidae	Passeriformes
Asian Koel	*Eudynamys scolopaceus*	Cuculidae	Cuculiformes
Greater Coucal	*Centropus sinensis*	Cuculidae	Cuculiformes
Indian Cuckoo	*Cuculus micropterus*	Cuculidae	Cuculiformes
Red-Wattled Lapwing	*Vanellus indicus*	Charadriidae	Charadriiformes
Yellow Wattled Lapwing	*Vanellus malabaricus*	Charadriidae	Charadriiformes
Rose Ring- Parakeet	*Psittacula krameri*	Psittaculidae	Psittaciformes
Alexandrine Parakeet	*Psittacula eupatria*	Psittaculidae	Psittaciformes

White Throated Kingfisher	*Halcyon smyrnensis*	Alcedinidae	Coraciiformes
Common Kingfisher	*Alcedo atthis*	Alcedinidae	Coraciiformes
Pied Kingfisher	*Ceryle rudis*	Alcedinidae	Coraciiformes
Asian Green Bee-Eater	*Merops orientalis*	Meropidae	Coraciiformes
Blue-Cheeked Bee-Eater	*Merops persicus*	Meropidae	Coraciiformes
Spotted owlet	*Athene brama*	Strigidae	Strigiformes
Grey Francolin	*Francolinus pondicerianus*	Phasianidae	Galliformes
Jungle Bush Quail	*Perdicula asiatica*	Phasianidae	Galliformes
Red Jungle Fowl	*Gallus gallus*	Phasianidae	Galliformes
White Stork	*Ciconia ciconia*	Ciconiidae	Ciconiiformes
Open bill Stork	*Anastomus oscitans*	Ciconiidae	Ciconiiformes
River Tern	*Sterna aurantia*	Laridae	Charadriiformes
Common Moorhen	*Gallinula chloropus*	Rallidae	Gruiformes
Purple Moorhen	*Porphyrio porphyrio*	Rallidae	Gruiformes
White-Breasted Waterhen	*Amaurornis phoenicurus*	Rallidae	Gruiformes
Common Coot	*Fulica atra*	Rallidae	Gruiformes
Cattle egret	*Bubulcus ibis*	Ardeidae	Pelecaniformes
Little Egret	*Egretta garzetta*	Ardeidae	Pelecaniformes
Medium Egret	*Ardea intermedia*	Ardeidae	Pelecaniformes
Large Egret	*Ardea alba*	Ardeidae	Pelecaniformes
Pond Heron	*Ardeola grayii*	Ardeidae	Pelecaniformes
Black-Headed Ibis	*Threskiornis melanocephalus*	Threskiornithidae	Pelecaniformes
Brahminy Kite	*Haliastur Indus*	Accipitridae	Accipitriformes
Black Kite	*Milvus migrans*	Accipitridae	Accipitriformes
Shikra	*Accipiter badius*	Accipitridae	Accipitriformes
Baya Weaver	*Ploceus philippinus*	Ploceidae	Passeriformes
Common Tailor Bird	*Orthotomus sutorius*	Cisticolidae	Passeriformes
Small Green Barbet	*Megalaima viridis*	Megalaimidae	Piciformes
Pileated Woodpecker	*Dryocopus pileatus*	Picidae	Piciformes

4. Results and discussion

The Indian Subcontinent represents 2094 forms belonging to 1200 species of avifauna (Ali and Ripley, 1987). This abundance and diversity of avian community obviously indicate the high ecological diversity of the country. Out of the 61 Bird Species observed, maximum number of birds recorded were of the order Passeriformes followed by Pelecaniformes, and Coraciiformes.

Present Western Yamuna Canal and Bhakra Canal Bird Species Studies revealed heterogeneous distribution of birds in different types of habitats, viz., in and around different habitats as well as in agricultural fields, scattered trees and Riverine area. Mobbing Behavior was commonly observed during the various visits to the study areas (Mobbing Behavior is very cooperative anti-predator behavior where individuals of a prey species, often in a group, approach, vocalize loudly, display aggressively, and may even physically attack a predator belonging to a more powerful species). Earlier also a total of 156 avian species were identified during the periodic fortnightly visits to the “Lower Shivalik

Foothills" from December, 2009 to November, 2011 (Chopra and Sharma, 2014). Similarly, Vats (2019) also reported 122 bird species in different sites of Karnal district, with Passeriformes having the maximum number of species. Similar studies on bird survey (2021, 2022 and 2023) was also conducted in order to document the checklist, density, and diversity of bird species assemblage of agricultural landscapes in the Karnal district of Haryana, India, to obtain the richness of birds in different agricultural habitats. A total of 79 bird species from 36 families and 14 orders were recorded from this study (Kour *et. al*., 2023). In these studies, the percent composition of different orders shows that Passeriformes (44 species) is the most abundant order with a total percentage of 55.70 followed by Pelecaniformes (5) and Columbiformes (5) with 6.32 percent each. The order Accipitriformes (3) and Gruiiformes (3) have percent composition of with 3.79 percent and the orders having least percent composition are bucerotiformes (1), Piciformes (1) and Upupiformes with only 1.26 percent. (Kour *et. al*., 2023). The other common birds seen during the study periods are White Throated Kingfisher, Common Kingfisher, Pied Kingfisher, Black Kite, Indian Grey Hornbill, Spotted Dove, Blue Rock Pigeon, Yellow-footed Green Pigeon, Asian Green Bee-Eater, Red-Wattled Lapwing, Black-Winged Stilt, Greater Coucal, Grey Francolin, White-Breasted Water hen, White Wagtail, Alexandrine Parakeet, Black-Headed Ibis, and many others. The difference in bird diversity across different habitats might be associated with the availability of food, roosting and nesting sites, predation pressure and disturbance (Hossain and Aditya, 2016). Trees along riverbanks also influence the species richness and abundance of bird species (Mistry, 2015).

5. Conclusions

Western Yamuna canal and Bhakra canal region in Karnal, with their mix of agricultural fields, scattered trees, Riverine area, and human settlements, provide very diverse types of habitats for a variety of common resident birds. Different studies showed a blend of common resident species, as well as seasonal visitors, especially around the Riverine area and agricultural fields. Present studies showed that birds live in various diverse types of Habitats like farmlands, and Riverine areas, grasslands for foraging areas and nesting sites etc showing various types of social behavior and impact of different types of pollution. In Karnal, Western Yamuna canal and Bhakra canal region, the loss of habitat and conversion of wetlands might be reason for decline in bird population. More extensive studies are required for the protection and conservation of avian fauna in this region.

References

[1] Agarwal, K. C. (2000). Wildlife of India- Conservation and management, Nidhi Publishers, India.

[2] Ali, S. (1996). *The birds of Indian subcontinent.* Bombay Natural History Society, Oxford University Press, Delhi.

[3] Ali, S., and Ripley, S. D. (1987). *Handbook of birds of India and Pakistan* (Compact edition.). Oxford University Press, Mumbai.

[4] Chopra, G. and Sharma, S.K. (2014). Avian Diversity of Lower Shivalik Foothills, India. *International Journal of Research Studies in Biosciences* **2** (7), 1-12.

[5] Grimmett, R., Inskipp, C and Inskipp, T. (1998). Birds of the Indian Subcontinent. Oxford University Press, Delhi.

[6] Gupta, R. C.**,** Kaushik, T. K., and Kumar. S. (2009) Analysis of winter migratory Wetland birds in KARNAL DISTRICT in Haryana. *Journal of Advanced Research* 30(2): 104-117.

[7] Gupta, R. C.**,** Kaushik, T. K., and Gupta P.K. (2012). Analysis of avian-biodiversity in rural wetland environs in Panipat district in Haryana, India. *Journal of Applied and Natural Science* 4(2): 252-257.

[8] Hossain, A. and Aditya, G. (2016). Avian diversity in agricultural landscape: records from Burdwan, West Bengal, India. *Proceedings of the Zoological Society* 69, 38-51.

[9] Kalsi, R.S., Sharma, S. C. and Choudhary J. R. (2019). Birds of Haryana - A Field Guide. Unique Publications, India

[10] Kour, A., Singh, D., Kiran and Khushbu (2023). Documentation of Avian Species Composition and Assemblage in Agricultural Landscapes of Karnal, Haryana. Bulletin of Pure and Applied Sciences Zoology (Animal Science). 42A2: 280-291.

[11] Jatav, S. K., Kardani H. K., Katara S. and Singh C. (2022). Avifaunal diversity of mangrove along Sikka coast, Gulf of Kachchh, Gujarat. *Journal of Experimental Zoology*, *India* 25(2): 1397-1400.

[12] Maity, S., Balachandran, S. and Chaudhury, S. (2010). Interdependency of macrophytes and avian diversity in the wetlands of Ballavpur wildlife sanctuary, Santiniketan. *Science and Culture*. 76 (5-6):180-184.

[13] Mistry J. (2015). Avifaunal diversity in and around Berhampur, Murshidabad district, West Bengal, India. *International Journal of Fauna and Biological Studies.* 2(4): 06-10.

[14] Padmavathy A, Alexandar R and Anbarashan, M. (2010). Diversity of birds in Ouster Wetland, Puducherry, India. *Our Nature* 8 (1): 247-253.

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

[16] Saharia, V. B. (1998). Wildlife in India. Natraj Publishers, Dehradun, India.

[17] Srinivasulu, C. and Nagulu, V. (2001). Mammalian and Avian diversity of the Nallamala Hills, Andhra Pradesh. *Zoo's Print Journal*. 17 (1): 675-684.

[18] Vats, P. (2019). Preliminary Survey on Relative Diversity and Residential Status of Avifauna in district Karnal, Haryana (India). *International Journal of Advanced Scientific Research and Management*. 4(6):160-169.