International Journal of Fauna and Biological Studies
Available online at www.faunajournal.com

IJFBS
International Journal of Fauna And Biological Studies

E-ISSN 2347-2677
P-ISSN 2394-0522
www.faunajournal.com
IJFBS 2022; 9(2): 21-24
Received: 13-12-2021
Accepted: 16-03-2022

Hyder Ali Rather
Department of Life Science, Rabindranath Tagore University, Raisen, Madhya Pradesh, India

Pragya Shrivastava
Department of Life Science, Rabindranath Tagore University, Raisen, Madhya Pradesh, India

Varsha Gautam
Department of Zoology, Govt. PG College, Bareli, Raisen, Madhya Pradesh, India

Nisar Ahmad Ganie
Lecturer Zoology, Govt. Degree College, Gurez, Jammu and Kashmir, India

Rasekh Ali Dar
Department of Zoology and Applied Aquaculture, Barkatullah University, Bhopal, Madhya Pradesh, India

Waheed Ahmad Hurra
Department of Environmental Science and Limnology, Barkatullah University, Bhopal, Madhya Pradesh, India

Corresponding Author:
Hyder Ali Rather
Department of Life Science, Rabindranath Tagore University, Raisen, Madhya Pradesh, India

Effects of anthropogenic activities on bird diversity in an urban waterbody (Bhoj Wetland), Bhopal, Madhya Pradesh, India

Hyder Ali Rather, Pragya Shrivastava, Varsha Gautam, Nisar Ahmad Ganie, Rasekh Ali Dar and Waheed Ahmad Hurra

DOI: https://doi.org/10.22271/23940522.2022.v9.i2a.886

Abstract
Tropical forests being rich in biodiversity are becoming increasingly fragmented and degraded, hence are declined due to human intervention, ultimately threatening survival of birds. The present study was envisaged to highlight the impact of anthropogenic activities on avifauna. Our study revealed habitat destruction (60%) being the most detrimental human activity on avifauna diversity habitats due to timber extraction, livestock grazing, firewood and medicinal herbs, however, hunting of birds for continuous use (15%) only affected limited bird species. Two areas were taken protected areas (possessing low cultivation, overgrazing, and logging) and second unprotected areas (having higher levels of intervention). Farms around the wetlands increased bird diversity. The current study demands strict actions on illegal forest exploitation to ensure survival of avifauna diversity in Bhoj Wetland, Bhopal. Proper management not only will improve the current situation for its dweller species, but also will attract more species in future.

Keywords: Hunting, bird diversity, anthropogenic pressure, habitat destruction

Introduction
The Degradation and destruction of habitats due human activities act as major cause of diversity declines globally [3]. The spread of more offensive and non-native species into wetlands is among one of the most anthropogenic affects profoundly altering both abiotic and biotic conditions [16]. Anthropogenic activities possess great impact on the physical appearance and hence bird diversity wetlands. Like the size of wetlands, their depth and distribution in the Indian subcontinent and elsewhere in world are highly exaggerated by human intervention [15], hence affecting the structure of bird's community greatly [10, 19, 23]. Among the different kinds of wetlands urban lake are possessing high risk of habitat degradation due to human activities in the vicinity, ultimately affecting the bird diversity [22]. Human activities and agricultural practices in the lake vicinity alters the bird diversity [17]. During the time spent fast urbanization, the land-use design changes drastically. The scene around the lake-wetland develops from straightforward, homogeneous and persistent entire to intricate, heterogeneous and intermittent patch mosaics. Urban buildings and roads act as a source of dividing continuous large scale natural habitats, the fragmentation of which is becoming more serious for large scale reduction of bird diversity and distribution pattern, and hence community composition [7, 14]. The impact of human activities in vicinity of the habitats is the need of hour [18]. In this context the present study was envisaged to highlight the effect of human activities in the Upper Lake an urban water body of Bhopal, Madhya Pradesh, India.

Material and Methods
Study area
Being an east-westerly stretched waterbody Upper Lake receives water from the Kolans River and through rainfall, and thus acting as a main source of drinking water for the growing population of Bhopal. By creating a dam across the Kolans River by Raja Bhoj of Dhar during the 11th century the lake got formed. Upper Lake possesses an area of 361 sq. km as a catchment area and 30.72 km as the water spread area. The overflow of Upper Lake drains into the Kaliasote river which further meets Betwa River and before finally being drained into the

Yamuna River. Being a tropical water body Upper Lake possesses the is situated at geological coordinates of 23º 16' N and 77º 25' E. Being an urban water body the lake is bordered by human settlements on eastern and western boundaries and intensively used for agricultural practices at western sides. However, on the south side a national park Vanvihar lies thus acting as a hotspot of biodiversity (Figure-1).

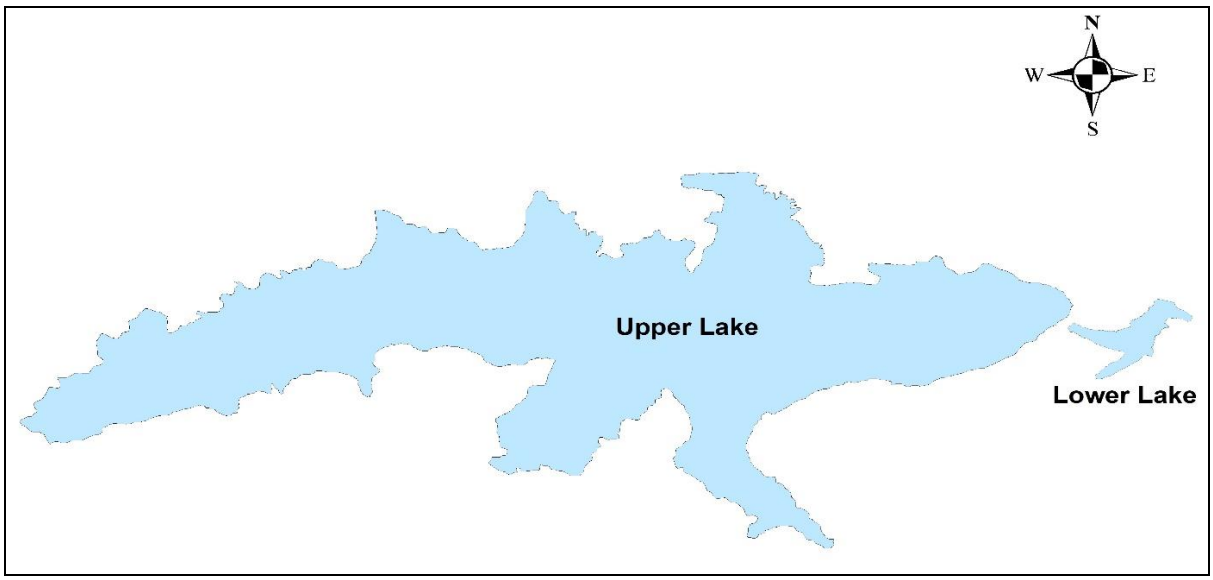

Fig 1: Map showing study area.

Methods

The present work was carried out from March 15th upto June 18th, 2020. Point count method was used to document the birds within the study area. Point count method was used in view of the fact that it allows the observer to move with in the area freely at every spot, allowing the birds to settle and thus gets recorded. It gives enough time to visualize and identify even shy and cryptic birds.

The present survey was conducted early during sunrise and sunset hours, during first and last week of every month. The birds were identified and counted using Binoculars (Nikon Action 8X40) and photographed by Canon D-60 [2]. The birds were identified as per the pictorial guide [1].

Results and Discussion

A total of 1896 individuals of birds belonging to 86 bird species were reported from the study area is an indication that the present area possesses ample bird diversity (Figure-2). The highest contribution of bird species was from Marshland Habitat and lowest was from Farmland habitat. However, due to the fact that most of the farmland are in vicinity to shallow waters, thus possessing ample plant diversity, abundant insect diversity and thus providing habitat and breeding grounds for bird's conditions for birds. However, the extent of human intervention and habitat destruction varies, such as reclamation, grazing and harvesting and thus the bird composition in various lakes also gets varied. Human interventions in the vicinity of the wetland significantly do not affect the bird abundance and diversity except for farming and hunting. Those areas of protected forests with low human interventions possesses higher species diversity and abundance, most of them being insectivorous, canopy foragers. The reduction of forest cover and over cultivation of crops, unprotected forests provide hostage to higher species diversity and abundance with most of these being associated with open areas. As per Duncan *et al*., (1999) there is an adverse consequence of agribusiness increase on wintering duck's populaces. However, Long *et al*., (2007) opined that the expansion in the space of agrarian land may be related with diminishing populaces. In any case, there are a few examinations detailing beneficial outcomes of horticulture on specific types of birds [8], which is as per my discoveries. In this exploration, wetlands with ranches possesses greater species diversity. 70% of the homesteads around the wetlands were agricultural practices, in spite of the fact that beans, millets and wheat cultivating likewise occur. Past work proposes that rice fields might be a significant territory for birds all through the world and in certain areas may as a matter of fact be the essential scavenging environment accessible to them [4]. A few examinations have revealed the significance of agricultural fields as a wintering site for aquatic birds in various areas all over the planet, like California [6]; Portugal [12]; and Japan [13] in Asia. Moreover, agricultural fields are utilized by an assortment of aquatic birds as rearing locales [9], in spite of the fact that less significantly than as rummaging destinations [4]. By and by, there are likewise farming advantages got from having waterbirds in agricultural fields, since they work on straw decay or weed control [21]. There is greater bird variety file in wetlands possessing no hunting activities than those having hunting activities. Ducks and Geese are enormous and most chased species inside the wetlands. In other words, wetlands with shooting are probably going to have just waders which are normally more modest in size. This off course will lower the bird richness in such ecosystems. Among various human interventions hunting is one that influences natural life mostly and has got expanding consideration in ecological, social and monetary aspects [20].

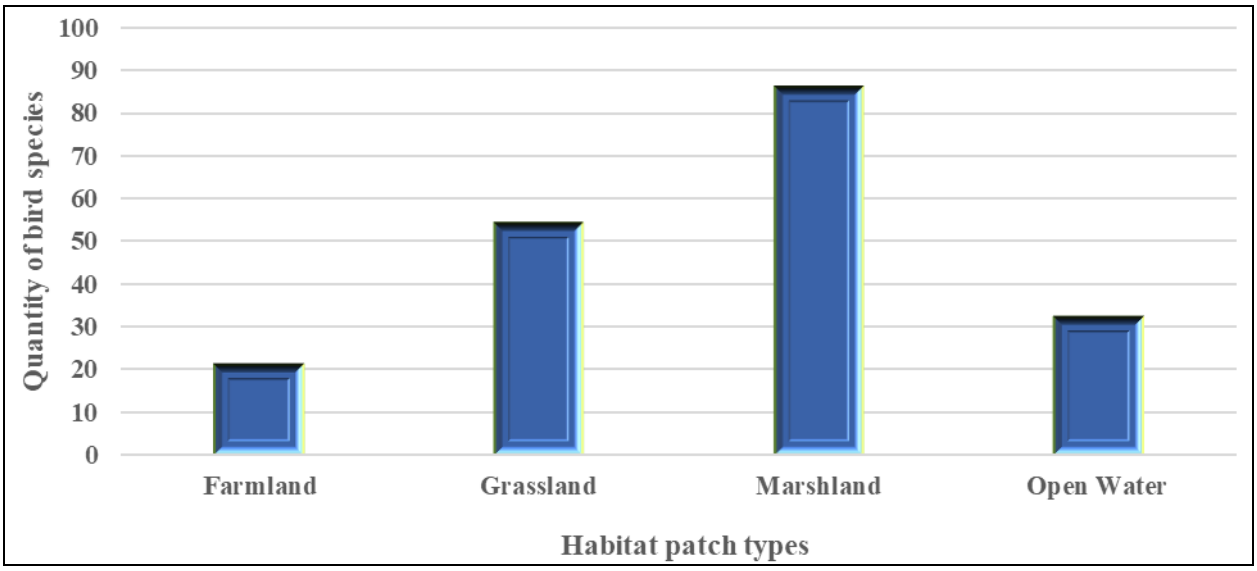

Fig 2: Bird richness in different habitat.

Conclusion

In spite of the pressures that wetlands possess from anthropogenic activities their impact on avifaunal variety and overflow is clearly of little natural impact. The after effects of this study have further importance while thinking about preservation of the Bhoj wetland and its avifaunal diversity. Although Anthropogenic exercises might appear to have a little impact presently yet may have an adverse consequence assuming this proceeds and more tension is mounted. All the more in this way, the enormous number of individuals and steers visiting the edges of wetlands expands the gamble of eggs and chicks being stomped on. Wetland should be watched to limit aggravation in the more touchy regions, especially during the reproducing season. For sustainable maintenance of the water bodies, active involvement and sensitization of local inhabitants towards the role of wetlands in welfare of humans and avifaunal diversity is of utmost importance.

References

1. Ali S. The Book of Indian Birds. Bombay Natural History Society, Bombay, 2006.
2. Bibi F, Ali Z. Measurement of Diversity Indices of Avian Communities at Taunsa Barrage Wildlife Sanctuary, Pakistan. The Journal of Animal & Plant Science. 2013;23(2):469-474.
3. Brooks TM, Mittermeier RA, da Fonseca GAB, Gerlach J, Hoffmann M, Lamoreux JF, *et al*. Global biodiversity conservation priorities. Science. 2006;313:58-61.
4. Czech HA, Parsons KC. Agricultural wetlands and waterbirds: a review. Waterbirds. 2002;25:56-65.
5. Duncan P, Hewison AJM, Houte S, Rosoux R, Tournebize T, Dubs F, *et al*. Longterm changes in agricultural practices and wildfowling in an internationally important wetland, and their effects on the guild of wintering ducks. J Appl. Ecol. 1999;36:11-23.
6. Elphick C, Oring L. Conservation implications of flooding rice fields on winter waterbird communities. Agriculture, Ecosystem and Environment. 2003l94:17-29.
7. Farmer AH, Parent AH. Effect of the lands-scape on shorebird movements at spring migration stopovers. The Condor. 1997;99(3):698-707.
8. Fasola M, Rubolini D, Merli E, Boncompagni E, Bressan U. Long-term trends of heron and egret populations in Italy, and the effects of climate, human-induced mortality, and habitat on population dynamics. Population Ecology. 2010;52:59-72.
9. Fasola M, Ruiz X. The value of rice fields as substitutes for natural wetlands for waterbirds in the Mediterranean Region. Waterbirds. 1996;19:122-128.
10. Kler TK. Bird Species in Kanjali wetland. Tiger Paper. 2002;39:29-32.
11. Long PR, Szekely T, Kershaw M, O'Connell M. Ecological factors and human threats both drive wildfowl population declines. Animal Conservation. 2007;10:183-191.
12. Lourenco PM, Piersma T. Stopover ecology of black-tailed godwits *Limosa limosa* in Portuguese rice fields: a guide on where to feed in winter. Bird Study. 2008;55:194-202.
13. Maeda T. Bird use of rice field strips of varying width in the Kanto plain of central Japan. Agriculture, Ecosystem and Environment. 2005;105:347-351.
14. Mathews S, O'Connor R, Plantinga AJ. Quantifying the impacts of biodiversity of policies for carbon sequestration in forests. Ecological Economics. 2002;40(1):71-87.
15. Prasad SN, Ramachandra TV, Ahalya N, Sengupta T, Kumar A, Tiwari AK, *et al*. Conservation of wetlands of India- A review. Tropical Ecology. 2002;43:173-186.
16. Ramsar Convention Bureau. Background papers on wetland values and function. Gland, Switzerland: Ramsar Convention Bureau, 2000.
17. Rather HA, Shrivastava P. Status of avifaunal diversity in Bhoj Wetland Bhopal, Madhya Pradesh, India. Journal of Entomology and Zoology Studies. 2021;9(6):89-92.
18. Rather HA, Shrivastava P, Gautam V. Study on avifaunal diversity and species richness in and around upper lake, Bhopal, India. International Journal of Applied Research. 2022;8(2):121-126.
19. Reginald LJ, Mahendran C, Kumar SS, Pramod P. Birds of Singanallur Lake, Coimbture, Tamilnadu. J. Zoos' Print. 2007;22:2944-2948.
20. Sulaiman IM, Apeverga PT, Ringim AS, Ibrahim KM. Effects of anthropogenic activities on Bird diversity and

abundance at Hadejia- Nguru Wetlands, Nigeria. Standard Scientific Research and Essays. 2014;2(10):546-551.
21. Van Groenigen JW, Burns EG, Eadie JM, Horwath WR, Van Kessel C. Effects of foraging waterfowl in winter flooded rice fields on weed stress and residue decomposition. Agriculture, Ecosystem and Environment. 2003;95:289-296.
22. Veerwal H, Balapure S, Vyas V. "Diversity and conservation status of water birds at Upper Lake, Bhopal: A Ramsar site in central India". Journal of Research in Biology. 2014;4(8):1534-1542.
23. Verma A, Balachandran S, Chaturvedi N, Patil V. A preliminary survey on the Biodiversity of Mahul Creek, Mumbai, India. J Zoos Print. 2004;19:1599-1605. 217.