

ANALYZE THE IMPACT OF ANTHROPOGENIC PRESSURES ON BIRDLIFE IN THE TIGHRA FRESH WATER RESERVOIR OF GWALIOR (M.P.) INDIA

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ABSTRACT

Wetlands play a vital role in supporting avifaunal diversity but are increasingly threatened by anthropogenic pressures. The present study assesses the impact of human activities on Birdlife in the Tighra fresh water Reservoir, Gwalior (M.P.) during the study period 2022 to 2025, with special emphasis on migratory and residential-migratory species. Systematic field observations recorded 66 bird species belonging 11 orders and 18 families, including a significant proportion of migratory birds associated with the Central Asian Flyway. The avifaunal assemblage was dominated by members of Anseriformes, Charadriiformes, Pelecaniformes, and Gruiformes indicating the reservoir's importance as a wintering and stopover habitat. The study emphasizes the need for immediate conservation measures and sustainable wetland management to ensure long-term protection of avifaunal diversity in the Tighra Reservoir.

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INTRODUCTION

The wetlands of Central India confront enormous risks yet still provide various ecosystem functions (Ma et al., 2020). Wetlands are crucial, especially for many aquatic species. The ecological significance of resident and migratory birds, their movement patterns, their trophic status and their adaptability in different habitats are all determined by routine monitoring for evaluating biodiversity in wetland ecosystems (Sheta *et al.*, 2023; Prakash and Verma, 2023; Arya, 2024). Birds are the most elegant, and fascinating warm-blooded creatures capable of flight (Verma and Prakash, 2020). The importance of evaluating bird populations as a tool for biodiversity

conservation and for determining conservation actions in areas where the influence of humans and animals is greatest, especially for aquatic resources, is growing (Patode *et al.*, 2021).

The variety of bird species within an ecosystem serves as a strong indicator of its ecological health (Verma et al., 2015; Prakash and Verma, 2016). Water availability, safe habitat and food sources for adults and nestlings, and vital nesting/roosting places in and around the lakes are all critical for the occurrence and abundance of aquatic bird populations, which is why the richness of avifauna reflects the health of lakes. One of the most crucial ecological markers for

assessing the condition of ecosystems is avifaunal diversity (Puri and Virani, 2016). Anthropogenic activities in wetlands areas caused to decline avifaunal diversity and distribution (Bhadja and Vaghela, 2013; Prakash and Verma, 2022; Kirar and Sharma, 2025). Assess the avifaunal diversity help in order to provide a baseline for the future management of avian fauna in urban areas; the current activity has been conducted with the goal of identifying and recruiting different bird species that visit the dam.

MATERIALS AND METHODS

Study Area

Constructing the Tighra reservoir, Gwalior's lifeline, was mostly done to supply the city with water. The massive water reservoir known as Tighra Dam is

roughly 23 kilometres from Gwalior City's western location. The reservoir, which is located close to Tighra village in the Gwalior area of Madhya Pradesh, was built on the Sank River in 1917 (Fig. 1). From 78° 01'29" E to 77° 57'34" E longitude and 26° 11'42" N to 26° 14'08" N latitude, the Tighra Reservoir is a perennial water source that is 218.58 meters above mean sea level. This reservoir has a catchment area of 412.25 square kilometres, a maximum depth of 24 meters, and a length of 1341 meters. It can move up to 1274 cubic meters per second and has a 4.8 million cubic meter capacity. The hills encircle the reservoir on three sides. The hills on the south and south-east sides are roughly 225 meters high, while the hills on the north and western sides are 300 meters high. The Sank River enters the reservoir through a valley in a southwest direction.

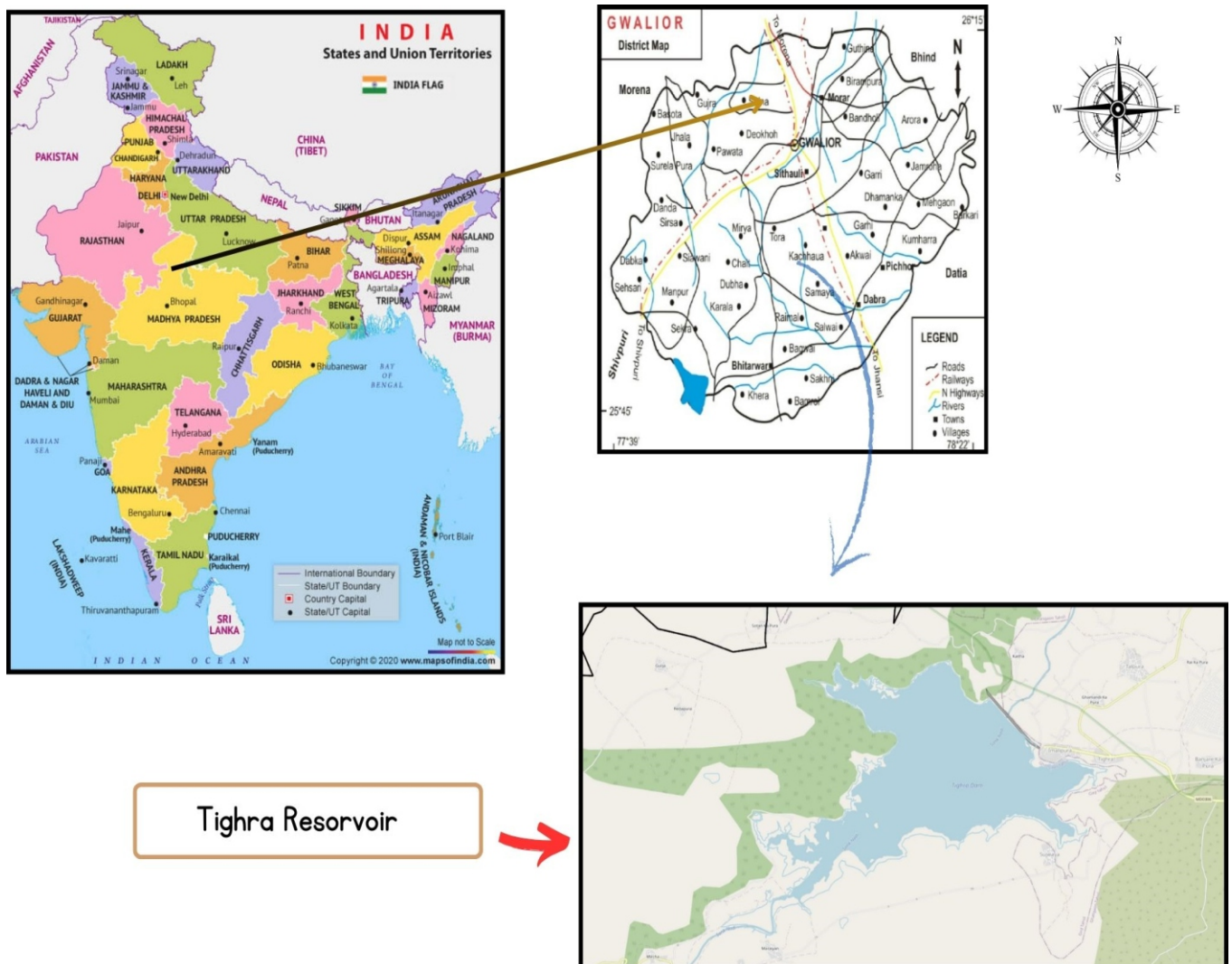


Fig.1: Tighra Reservoir, Gwalior Madhya Pradesh India.

Methodology

Point count and line transect methods were used to collect data in order to evaluate the avifaunal diversity in Tighra reservoir, Gwalior (Roy et al., 2012). Expert help and field guides (Grimmett et al. 2011) were used to finish the avifaunal identification process. During the field visit, birds were observed using binoculars, and field images were taken with a DSLR Nikon D-60 camera for documentation and confirmation. Every month from 2022 to 2025, when bird assemblage was at its peak, field visits were made between 7:00 and 10:00 am and 5:00 and 7:00 pm.

RESULT AND DISCUSSION

The study reveals the occurrence of 66 species of birds belonging to 18 families 11 orders were recorded from

Tighra reservoir (Table 1). The avifaunal assemblage was dominated by members of Anseriformes, Charadriiformes, Pelecaniformes, and Gruiformes, indicating the reservoir's importance as a wintering and stopover habitat. Although most recorded species fall under the Least Concern category, the occurrence of Near Threatened and Vulnerable species such as *Aythya ferina*, *Grus antigone*, *Mycteria leucocephala*, and *Sterna aurantia*.

The similar pattern of study was reported by Bora et al. (2017) assessed the diversity of 30 bird species, representing 13 groups, in the Nagaon District of Assam in Samaguri Beel, which lies near Nagaon town. Wadatkar and Kasambe (2002) identified 171

S. NO.	ORDER	FAMILY	SCIENTIFIC NAME	COMMON NAME	LOCAL NAME	IUCN STATUS	RES. STATUS
1.	Pelecani- formes	Ardeidae	<i>Bubulcus ibis</i>	Cattle egret	Surkhia, Gay, Doria, Bagula	LC	M
2.			<i>Ardea intermedia</i>	Intermediate egret	Manjhla Bagula	LC	M
3.			<i>Egretta garzetta</i>	Little Egret	Karchiya Bagula	LC	R
4.			<i>Ardea purpurea</i>	Purple heron	Lal Anjan, Lal sain	LC	M
5.			<i>Ardeola grayii</i>	Indian pond-heron	Andha Bagula	LC	R
6.			<i>Ardea cinerea</i>	Grey heron	Khera Bagula, Anjan Bak	LC	R
7.			<i>Nycticorax nycticorax</i>	Night heron	Tar Bagula, Raat Bagula	LC	M
8.		Thres- kiornithidae	<i>Eudocimus albus</i>	White ibis	Dhobi Bird or Kank	LC	R
9.			<i>Pseudibis papillosa</i>	Red naped ibis	Kala baaja	LC	R
10.			<i>Platalea leucorodia</i>	Eurasian spoonbill	Chamacha- baajh, Dabil	LC	M
11.	Anseriformes	Anatidae	<i>Anas poecilorhyncha</i>	Spot-billed duck	Garpai, Gugral	LC	M
			<i>Dendrocygna javanica</i>	Lesser whistling duck	Choti seelhi, Silkahi	LC	R
13.			<i>Sarkidiornis sylvicola</i>	Comb duck	Nakta	LC	M

14.			<i>Anas crecca</i>	Common teal	Choti Murgabi, Kerra, Souchuruka	LC	M
15.			<i>Netta rufina</i>	Red crested pochard	Lal-sir btakh, Lal-Chonch	LC	M
16.			<i>Aythya ferina</i>	Common pochard	Lalsar Batakh	VU	M
17.			<i>Anas acuta</i>	Northern pintail	Sundi Batakh	LC	M
18.			<i>Spatula clypeata</i>	Northern shoveler	Tidari, Punana, Ghirah, Tokarwala	LC	M
19.			<i>Mareca strepera</i>	Gadwall	Myla, Bekhur batakh, Bhuar	LC	M
20.			<i>Anser anser</i>	Greylag goose	Dhoosar Hans	LC	M
21.			<i>Nettapus coromandelianus</i>	Cotton pygmy goose	Sooti Batakh	LC	M
22.			<i>Tadornna ferruginea</i>	Ruddy shelduck	Surkhab, Chakwa, Chakwi	LC	M
23.			<i>Anas platyrhynchos</i>	Mallard	Janagali battakh, Nilsar, Nil rugi	LC	M
24.	Ciconii-formes	Ciconiidae	<i>Mycteria leucocephala</i>	Painted stork	Janghil, Kankari, Dokh	LC	R
25.			<i>Anastomus oscitans</i>	Asian Openbill	Ghonghila, Gungla, Ghungil	LC	R
26.			<i>Ciconia episcopus</i>	Asian woollyneck	Ooni Gardan wala Sarus	NT	R
27.	Charadrii-formes	Recurvirostridae	<i>Himantopus himantopus</i>	Black winged stilt	Gajpaonv, Tinghur	LC	M
28.			<i>Vanellus malarbaricus</i>	Yellow wattled Lapwing	Peela Galfada Titahri	LC	R
28.			<i>Vanellus malarbaricus</i>	Yellow wattled Lapwing	Peela Galfada Titahri	LC	R
29.			<i>Vanellus indicus</i>	Red wattled lapwings	Srari Titeri, Titai, Titori	LC	R
30.			<i>Vanellus duvaucelii</i>	River lapwing	Nadi Tithari, Ngahoibi	NT	R

31.			<i>Charadrius dubius</i>	Little ringed plover	Zireya, Merwa	LC	M
32.		Jacaniidae	<i>Metopidius indicus</i>	Bronze-winged jacana	Jalmakhami, Dal or Jal	LC	R
33.			<i>Hydrophasianus chirurgus</i>	Pheasant-tailed jacana	Sui Poonch Jal murgi	LC	M
34.		Scolopacidae	<i>Tringa glareola</i>	Wood sandpiper	Ban Titihri	LC	M
35.			<i>Tringa ochropus</i>	Green sandpiper	Hara Titihri	LC	M
36.			<i>Actitis hypoleucos</i>	Common sandpiper	Panewa	LC	M
37.	Charadriiformes		<i>Actitis hypoleucos</i>	Common sandpiper	Panewa	LC	M
38.			<i>Tringa totanus</i>	Common Redshank	Laal Paav Titihri	LC	M
39.			<i>Limosa limosa</i>	Black-tailed Godwit	Kaali Poonch wali godwit	NT	M
40.			<i>Gallinago gallinago</i>	Common snipe	Samany chacha	LC	M
41.			<i>Gallinago nemoricola</i>	Wood snipe	Ban Snipe	VU	M
42.			<i>Tringa stagnatilis</i>	Marsh sandpiper	Chota gotra	LC	M
43.			<i>Numenius arquata</i>	Eurasian curlew	Lambi Chonch wali Baguli	NT	M
44.			<i>Numenius arquata</i>	Little stint	Chota Panlowa	LC	M
45.		Laridae	<i>Numenius arquata</i>	Little stint	Chota Panlowa	LC	M
46.		Burhinidae	<i>Esacus recurvirostris</i>	Great thick-knee	Bada Titihri	NT	R
47.		Glareolidae	<i>Cursorius coromandelicus</i>	Indian courser	Bhartiya Daudpakshee	LC	R
48.	Podicipediformes	Podicipedidae	<i>Podiceps cristatus</i>	Great crested grebe	Bada Choonpankhi	LC	M
49.			<i>Tachybaptus ruficollis</i>	Little grebe	Pandubi, Pantiri, Dubdubi, churaka	LC	M

50.	Passeriformes	Motacillidae	<i>Motacilla citreola</i>	Citrine wagtail	Peeli Khanjan	LC	M
51.			<i>Motacilla alba</i>	White wagtail	Badi Rangin Khanjan, Dhoban	LC	R
52.			<i>Motacilla cinerea</i>	Grey wagtail	Bhuri Khanjan, Dhoban	LC	M
53.			<i>Motacilla flava</i>	Western yellow wagtail	Peeli Khanjan	LC	M
54.		Alaudidae	<i>Eremopterix griseus</i>	Ashy-crowned Sparrow-lark	Bhure sir wali chidi	LC	R
55.	Suliformes	Phalacrocoracidae	<i>Microcarbo niger</i>	Little cormorant	Chota pan - kowwa	LC	R
56.			<i>Phalacrocorax carbo</i>	Great cormorant	Bada pan-kowwa	LC	M
57.	Gruiformes	Rallidae	<i>Gallinula</i>	Common moorhen	Jal - Murgi	LC	M
58.			<i>Fulica atra</i>	Common coot	Jalmurgi / Safed munh wali jalmurgi	LC	M
59.			<i>Amaurornis phoenicurus</i>	White breasted waterhen	Jal - Murgi	LC	M
60.			<i>Porphyrio porphyrio</i>	Purple swamphen	Jamuni jal murgi, Van Murgi,	LC	R
61.		Gruidae	<i>Anthropoides virgo</i>	Demoiselle crane	Kurja	LC	M
62.			<i>Grus antigone</i>	Sarus crane	Sarus	VC	M
63.	Caprimulgiformes	Apodidae	<i>Apus affinis</i>	Little swift	Babila	LC	R
64.		Alcedinidae	<i>Ceryle rudis</i>	Pied kingfisher	Chitkabre kilkila	LC	R
65.	Coraciiformes		<i>Halcyon gularis</i>	White-throated Kingfisher	Kilkila, Kourilla	LC	R
66.			<i>Alcedo atthis</i>	White-throated Kingfisher	Chhota kilkila	LC	R

bird species in the Pohar-Malkhed Reserve Forest located in Amravati, Maharashtra. Multiple man-made disturbances have affected the wide range of birds at Tighra Dam. The habitat of aquatic birds has been significantly altered by unregulated fishing, tourism, and coastal expansion. Similar problems were observed in Chilika Lake, Odisha, where unsustainable fishing practices led to habitat fragmentation (Pattnaik et al., 2019; Singh and Sharma, 2021).

Study revealed that anthropogenic activities impact bird populations have a significant impact on the bird population and species congregation of Tighra reservoir, Gwalior. Human presence, logging, wood cutting, grass cutting, pollution, weed abundance, drainage, agriculture, bathing, cattle wading, grazing, and irrigation were among the uses of anthropogenic activities that were ranked according to the quantity of uses (Fig.2). Rather et al., (2021) observed that human intervention and habitat destruction, such as reclamation, grazing, fishing, pollution and harvesting effected composition of bird species and their population in study area. The food, shelter, human presence, habitat loss, pollution, major fragmentation, invasive plant species, and plantation clearance all have an impact on the diversity and distribution of birds in various environments (Altaf et al. 2018; Singh et al., 2023).

According to Allen et al. (2019), the use of insecticides, decreased nesting sites, bird mortality from farming

operations, and an increase in the rate of predation following crop harvest are all consequences of agricultural intensification that have a negative effect on bird diversity. Because trees can provide food and shelter for birds, it has been observed that broad areas with a high tree population have a favourable relationship with bird variety (Asefa et al., 2017; Maurice et al., 2020).

Despite the fact that wheat, rice, and millet are also grown, 80% of the homesteads surrounding the wetlands were used for agricultural purposes. Previous research suggests that rice fields could be an important bird habitat worldwide, and in some places, they might even be the primary scavenging habitat that birds can reach (Czech and Parsons, 2002).

Wetlands with no hunting activity have a higher bird variety file than those with hunting activities. The largest and most sought-after species in Tighra reservoir are ducks and geese. Put another way, waders, which are often smaller in size, are likely to be the only vegetation found in marshes with shooting. The avian diversity in these environments will decrease as a result of this deviation. Hunting is the most significant human intervention that affects natural life and is increasingly being taken into account from an ecological, social, and financial standpoint (Sulaiman et al., 2014).

CONCLUSION

The present study clearly demonstrates that the Tighra Fresh Water Reservoir, Gwalior, continues to function as

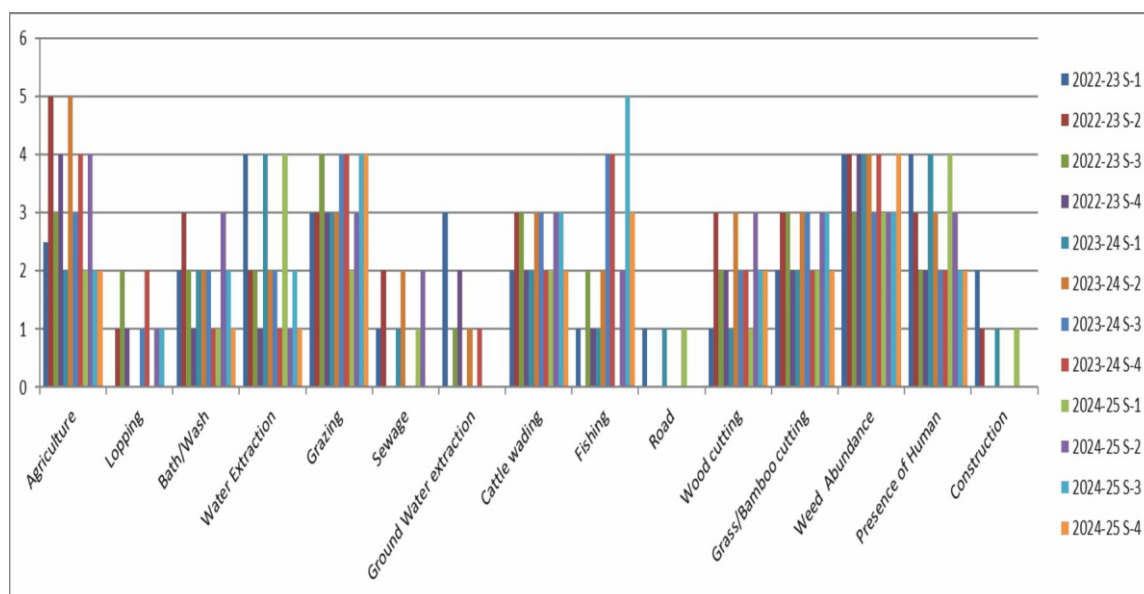


Fig. 2: Anthropogenic activities in and surrounding area of Tighra Reservoir at different sites.

an important habitat for a diverse assemblage of wetland birds, including migratory, resident-migratory, and resident species, particularly those associated with the Central Asian Flyway. The documentation of 66 avian species across 11 orders and 18 families during the study period (2022–2025) confirms the ecological significance of the reservoir as a wintering, feeding, and stopover site for waterbirds. However, the increasing intensity of anthropogenic pressures—such as urban expansion, agricultural runoff, unregulated fishing, water extraction, religious tourism, and habitat modification—has adversely affected the quality and availability of critical wetland habitats. The dominance of disturbance-tolerant species alongside the reduced representation of sensitive waders and large waterbirds indicates a gradual shift in community structure in response to human disturbance. Furthermore, the presence of Near Threatened and Vulnerable species underscores the reservoir's growing conservation concern. In conclusion, while Tighra Reservoir still supports substantial avifaunal diversity, continued unregulated human activities pose a serious threat to its ecological integrity. The study strongly recommends habitat protection, regulation of anthropogenic activities, pollution control, and long-term avifaunal monitoring to ensure sustainable conservation of Birdlife and the wetland ecosystem.

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