

Research Paper

Wading Birds in Lacustrine Wetland of Shrungarbandh Lake, District Gondia, Maharashtra

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Abstract- This Shrungarbandh Lake becomes increasingly productive as nutrients from the neighboring watershed collect in the form of compost, sediments, and other items. The Lake provides as an ideal wetland habitat for a variety of wading birds due to organic materials' enrichment that stimulate the growth of aquatic weeds, algae micro zooplanktons. By keeping a record of wading birds as per IUCN as well as Residential status, the present work of this wetland contributes in the protection and restoration of the existing condition of the wetland. The purpose of this study is to illustrate the state of wading bird biodiversity so that this habitat may be designated as a significant habitat for bird conservation. Anthropogenic activities have been shown to have an influence on this ecosystem. Wader tracking is a valuable method for emphasizing the significance of wetlands and its ecological values since it provides essential information on the condition of wetlands. From 2019 to 2021, a wading bird research was carried out in Shrungarbandh Lake. 16 families of wading birds recorded a total of 79 species. In the current findings, the birds were categorized using the IUCN Red Data Book for 2022, 07 species were identified as near threatened (NT), with the number of species decreasing (D). While 03 species were identified as vulnerable, their numbers were determined to be decreasing (D). Out of a total of 79 wading birds, 44 are determined to be residential, while 44 are winter migrants. The findings of this observations show that the avifauna in this area is plentiful, indicating the wetland is in good condition. The abundance is owing to the plenty of protein-rich invertebrates and other food, as well as safe environment. Long-distance migrants utilize the lake as a feeding area, while local migrants use it as a nesting site. Nesting colonies of grey herons, as well as other local migrants including cormorants, large egrets, and others, found here. For migrating birds, the lake looks to be ideal. But due to increasing anthropogenic activities around the lake creates disturbances to bird's habitats. The attempt of this study of wading birds is to conserve the habitat.

Keywords- Wading birds, Shrungarbandh Lake, Lacustrine water, Wetland, Conservation

1. Introduction:

Wetlands play a crucial role in preserving biodiversity. As a result of their location in the area between terrestrial and aquatic ecosystems, they provide exclusive hydrological and biological conditions, as well as perfect habitat for many endangered plant and animal species. Due to man-made pressures and natural succession, they are the planet's most sensitive habitats [1]. Wetlands are a type of integrated ecosystem that coexists with terrestrial and aquatic habitats. Less than 9% of the earth's surface is made up with wetland areas, yet they nonetheless offer a variety of biological functions that are regenerative [2]. Wetlands in tropical and subtropical locations are regarded to be rich avifauna hotspots, yet they are under enormous human pressure to maintain and safeguard biodiversity [3]. There are approximately 242 wetland bird species and 67 wetland

supported bird species among the 1300 species of birds that have been documented on the Indian subcontinent. 102 species migrate during the winter, 10 during the summer, and 3 during the passage period [4],[5]. 1,186 bird species, or 13% of the world's avifauna, are presently considered to be endangered, with 182 of them being considered Critically Endangered and at imminent risk of extinction. Wetlands are particularly important since 20% of Asia's threatened bird species live there. This number exceeds the 10% of aquatic birds that are endangered worldwide. Due to habitat loss or modification, intense hunting pressure, and other factors, several species are in risk of going extinct [6]. Habitat modification became the primary cause of long-term changes in bird distribution as consecutive environmental changes reached the species' tolerance threshold. In India, there are 67 species of birds that depend on wetlands and are associated to wetlands, in addition to 243 species of water birds, according

to [7]. Sea birds, shore birds, and waders are all important members of the wetland ecology [8]. Waders are a kind of duck that are excellent migrants. Waders have exceptional long-distance flying abilities. Waders prefer wetlands' interphase zones, lap regions, and open mudflats. Their eating habits vary greatly [9]. Shorebird ecologies are intricately related to the distribution and availability of food resources, particularly benthic invertebrates, since food abundance is crucial for migratory birds' winter habitat selection [10]. Herons, egrets, bitterns, ibises, coots, moorhens, rails, and sand hill cranes are a few examples of wading birds. Other huge, long-legged, long-necked birds, like egrets and herons, are commonly observed wading in shallow water in search of food. Small, solitary species like bitterns, rails, and moorhens can only be heard in the marsh plants where they hide. For breeding, foraging, and migration, all of these species are dependent on healthy wetland complexes and, in some cases, neighbouring uplands. Ecologists have recently concentrated on explaining the function of a community by focusing on habitat selection [11]. Birds are great indicators of ecosystem health and habitat quality because of their variable levels of habitat specialization. As a result, birds used to assess habitat quality; increasing plantations now offer and utilize them as a substitute for biodiversity [12]. Bird community ecology has been a primary focus of traditional ecological research for decades. Determining the variety and structure of bird populations can help us understand the significance of regional landscapes in avian conservation [13].

The Shrungarbandh Lake is a well-known 'lacustrine' wetland ecosystem, which consists of swamps within lakes with a shallow depth and a lot of aquatic plants growing on them. This wetland is popular with bird watchers because it was home to the world's largest flying bird, the Saras crane, which had been present for over 50 years. Shrungarbandh wetland is breathtaking. "Shrungar" means "ornamental," and the lake is quite lovely, with a variety of decorations including birds and foliage. The beautiful birds attracted a huge number of visitors as well as environmentalists. The villagers successfully produced a pair of Sarus cranes, who were zealously guarded by the residents; unfortunately, in 2011, the pair was tragically killed by pesticide. Villagers from Bondgaon/Surban, environment enthusiasts, and NGOs, as well as forest officials, put out several conservation efforts to save the Saras crane. "Saras Conservation Society" was founded by Forest Department of Gondia district to monitor their existence and conservation. Conservation efforts, however, began to weaken when the Sarus Crane was killed by pesticide. It was thought that they perished after eating "Thimet-infected" insects, fish, or frogs [14]. According to Bhandarkar and Chavan (2008)[15] and Bhandarkar and Paliwal (2014)[16], little is known about the variety of water birds in this area. This study was carried out with the aim of learning more about the aquatic avifauna of Shrungarbandh Lake and its surroundings in order to better protect them.

Our knowledge of the Shrungarbandh Lake's wetland birds, including their numbers, habitat preferences, and condition, is aided by the current study. The development of lake-specific water bird conservation plans will be aided by this

knowledge. Long-distance migrants utilise the lake as a feeding area, while local migrants use it as a nesting site. Nesting colonies of grey herons, as well as other local migrants including cormorants, large egrets, and others, found here. For migrating birds, the lake looks to be ideal. Water is introduced into the paddy field by canal and then flows to the lake as a result of the region's biennial agricultural pattern; as a result, the water level is said to stay consistent throughout the year. The lake's production, food supplies, and water quality may increase in the winter, making it more appealing to water birds. Because this lake is home to a wide variety of water birds, it's critical to protect the lake's biological niche in terms of water bird conservation by keeping its size, deep waters, and mudflats.

The lake has historically served as the center of social, spiritual, and economic activities as a shared resource. However, ecosystems all throughout the nation started to decline in the second part of the 20th century, which led to the disappearance of these habitats. For the preservation of environment and of natural resources like birds, it is essential to protect all prime bird habitats. Birds play crucial functions in all ecosystems, including pollination, seed distribution, predation, pest control, nutrient recycling, and eating. The goal of this initial research is to gather data on wader biodiversity in order to identify these regions as "Important Bird Area" habitat for wading bird conservation.

2. Methodology:

Throughout the year, routine weekly monitoring on aquatic birds were carried out, and birds were spotted using Binocular, Spot-scope and photographed with the help of Cannon 1200 D DSLR (Canon EF 400 mm f/5.6L USM Lens). The birds were identified using standard literature [17],[18]. Every Sunday from the morning through the evening from 2019 to 2021, observations were made. Bird observation was done around the lake. Temperatures ranged from 20°C to 35°C during the research. The implementation of the protocol has been effective (Turner, 2003)[19]. Wherever feasible, point counts of birds were conducted within the visual range by pausing for two to three minutes and using a spot-scope (Vanguard Endeavour 20x60), as done by earlier researchers (Froneman et al., 2001)[20] The birds were identified and counted in a variety of lighting conditions, either in the morning between 07:30 and 10:30 or in the afternoon between 15:00 and 18:00. The risk to aquatic birds was determined by direct observation and interactions with local birders.

Study area: (Fig. 1) Located close to Bondgaon/Surban village at Latitude- N 20o 47' 34.10" Longitude- E 80o 08' 50.00, Shrungarbandh Lake is a stunning lentic setting surrounded by paddy fields affected by fishing and agricultural activities. The lake's catchment area is estimated to be roughly 25 hectares. It is a man-made 60 year old lake that acquired seasonal water from the Bagh Itiadh Dam and surface runoff of rainwater. It is surrounded on three sides by agricultural fields. People use the water body mostly for agriculture and fisheries activities. Aquatic weeds such as

Ipomea, Nelumbo, Nymphaea, Nymphoids, and other aquatic plants are also found in the catchment area. The lake is littered with thick and short reed bed areas. There's a lot of Duckweed around. Invertebrates such as Odonates and Molluscs, as well as fish such as Rohu, Catla, and Mrigal, found here.

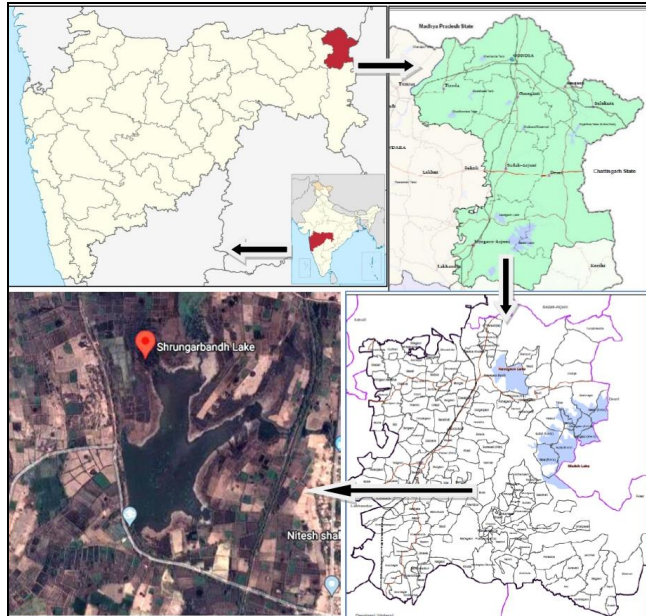


Fig.1: Map of study area of Wading birds.

3. Result:

Table.1: Diversity of wading birds in Shrungarbandh wetland lacustrine water.

Family and Scientific Name	Common Name	IUCN Status	Resident Status
Family- Podicipedidae			
<i>Tachybaptus ruficollis</i>	Little grebe	LC/D	RE
Family- Phalacrocoracidae			
<i>Phalacrocorax carbo</i>	Great cormorant	LC/I	RE
<i>Phalacrocorax fuscicollis</i>	Indian cormorant	LC/U	RE
<i>Microcarba niger</i>	Little cormorant	LC/U	RE
Family- Anhingidae			
<i>Anhinga melanogaster</i>	Oriental darter	NT/D	RE
Family- Ardeidae			
<i>Ardea cinerea</i>	Grey heron	LC/U	RE
<i>Ardea purpurea</i>	Purple heron	LC/D	WM
<i>Ardeola grayii</i>	Indian pond heron	LC/U	RE
<i>Bubulcus ibis</i>	Cattle egret	LC/I	RE
<i>Ardea alba</i>	Great white egret	LC/U	RE
<i>Egretta garzetta</i>	Little egret	LC/I	RE
<i>Ardea intermedia</i>	Intermediate egret	LC/D	RE
<i>Ixobrychus cinnamomeus</i>	Cinnamon bittern	LC/S	RE
<i>Ixobrychus sinensis</i>	Yellow bittern	LC/U	RE
<i>Nycticorax nycticorax</i>	Night heron	LC/D	RE
<i>Butoridus virescens</i>	Little green heron	LC/U	RE
Family- Ciconiidae			
<i>Anastomus oscitans</i>	Asian open bill stork	LC/U	RE
<i>Ciconia episcopus</i>	Wooly naked stork	NT/D	WM
<i>Ciconia nigra</i>	Black stork	LC/U	RE
<i>Leptoptilos javanicus</i>	Lesser adjutant stork	VU/D	RE
<i>Mycteria leucocephala</i>	Painted stork	NT/D	WM
Family-			

Threskiornithidae			
<i>Platalea leucorodia</i>	Eurasian spoon bill	LC/U	WM
<i>Plegadis falcinellus</i>	Glossy ibis	LC/D	RE
<i>Pseudibis papillosa</i>	Red naped ibis	LC/D	RE
<i>Threskiornis melanocephalus</i>	Black headed ibis	NT/D	WM
Family-Jacaniidae			
<i>Hydrophasianus chirurgus</i>	Pheasant tailed jacana	LC/D	RE
<i>Metopidius indicus</i>	Bronze winged jacana	LC/U	RE
Family-Charadriidae			
<i>Himantopus himantopus</i>	Black winged stilt	LC/I	RE
<i>Vanellus indicus</i>	Red wattled lapwing	LC/U	RE
<i>Vanellus malabaricus</i>	Yellow wattled lapwing	LC/S	RE
<i>Charadrius dubius</i>	Little ringed plover	LC/S	RE
Family-Rostratulidae			
<i>Rostratula benghalensis</i>	Greater painted snipe	LC/D	WM
Family- Scolopocidae			
<i>Gallinago gallinago</i>	Common snipe	LC/D	WM
<i>Gallinago stenura</i>	Pintail snipe	LC/U	WM
<i>Lymnocyrtus minimus</i>	Jack snipe	LC/S	WM
<i>Numenius arquata</i>	Eurasian curlew	NT/D	WM
<i>Limosa limosa</i>	Black tailed godwit	NT/D	WM
<i>Tringa totanus</i>	Common redshank	LC/U	RE
<i>Tringa stagnatilis</i>	Marsh sandpiper	LC/D	RE
<i>Tringa glareola</i>	Wood sandpiper	LC/S	WM
<i>Actitis hypoleucos</i>	Common sandpiper	LC/D	RE
<i>Tringa nebularia</i>	Common greenshank	LC/S	WM
<i>Xenus cinereus</i>	Terek sandpiper	LC/D	WM
<i>Calidris minuta</i>	Little stint	LC/I	RE
<i>Calidris ferruginea</i>	Curlew sandpiper	NT/D	WM
<i>Calidris temminckii</i>	Temminck's stint	LC/U	RE
Family-Laridae			
<i>Chlidonias hybrida</i>	Whiskered tern	LC/S	WM
<i>Sterna albifrons</i>	Little tern	LC/D	WM
<i>Sterna aurantia</i>	River tern	VU/D	WM
<i>Sterna hirundo</i>	Common tern	LC/U	WM
Family-Anatidae			
<i>Anas acuta</i>	Northern pintail	LC/D	RE
<i>Anas clypeata</i>	Northern shoveler	LC/D	WM
<i>Anas crecca</i>	Common teal	LC/U	RE
<i>Mareca penelope</i>	Eurasian wigeon	LC/D	WM
<i>Anas platyrhynchos</i>	Mallard	LC/I	WM
<i>Anas poecilorhyncha</i>	Spot billed duck	LC/D	WM
<i>Anas querquedula</i>	Garganey	LC/D	WM
<i>Anas strepera</i>	Gadwall	LC/I	WM
<i>Ansar ansar</i>	Greylag goose	LC/I	WM
<i>Aythya ferina</i>	Common pochard	VU/D	WM
<i>Aythya fuligula</i>	Tufted duck	LC/S	WM
<i>Netta rufina</i>	Red crested pochard	LC/U	WM
<i>Aythya nyroca</i>	Ferruginous duck	LC/I	WM
<i>Nettapus coromandelianus</i>	Cotton pygmy goose	LC/S	WM
<i>Sarkidiornis melanotos</i>	Comb duck	LC/D	WM
<i>Tadorna ferruginea</i>	Ruddy shelduck	LC/U	WM
<i>Dendrocygna javanica</i>	Lesser whistling duck	LC/D	WM
Family-Rallidae			
<i>Amaurornis akool</i>	Brown crake	LC/U	WM
<i>Amaurornis phoenicurus</i>	White-breasted hen	LC/U	RE
<i>Gallicrex cinerea</i>	Watercock	LC/D	RE
<i>Fulica atra</i>	Common coot	LC/I	RE
<i>Gallinula chloropus</i>	Common moorhen	LC/S	RE
<i>Porphyrio porphyrio</i>	Purple swamphen	LC/U	RE
Family-Alcedinidae			
<i>Alcedo atthis</i>	Common kingfisher	LC/U	RE
<i>Ceyx erithaca</i>	Dwarf kingfisher	LC/D	RE
<i>Ceryle rudis</i>	Pied kingfisher	LC/U	RE

<i>Halcyon smyrnensis</i>	White-throated kingfisher	LC/I	RE
Family-Glareolidae			
<i>Glareola lactea</i>	Little Pranticole	LC/U	RE
Family-Recurvirostridae			
<i>Himantopus himantopus</i>	Black winged stilt	LC/I	RE

Family wise Distribution and Habits of Waders: (Table 2, Fig. 2) There are 11 species of Bitterns and Herons in the Ardeidae family. They are medium-sized to giant wading birds with lengthy legs. Bitterns normally lurk in reed beds, but one may forage in the open solo. Herons eat by remaining stationary at the water's edge or slow stalking in shallow water, whereas Bitterns feed by standing motionless at the water's edge or slow stalking in shallow water. The bitterns are known for their loud territorial cries. There are 14 species of snipes and sandpipers in the Scolopidae family. Waders of small to medium size with long beak, long legs, and cryptically patterned plumage. They primarily feed by probing soft surfaces with their bills. Their food consists mostly of tiny aquatic invertebrates, and they prefer marshy areas. There are 01 species of pranticole in the Glareolidae family. Most pranticole have short legs and arched and painted bills. They eat plants that grow near water and forage on the ground. There are 17 species of Whistling Ducks, Swans, Geese, and Ducks in the Anatidae family. They travelling, eating, roosting, and breeding in groups. The majority of species are vegetarians who eat seeds, algae, plants, and roots. There are 04 species of Terns in the Laridae family. They are a small to medium-sized airborne bird with gull-like bodies, long and painted wings, and buoyant and elegant flying. Terns are sociable and have a high level of vocalisation. The tails of sterna terns are usually deeply forked. Small fish and crabs are the most common foods. Hovering and then plunging from the air caught them. Marsh terns, also known as Chlidonias, are smaller than Sterna terns and have short tails. Marsh terns mainly hawk insects or swoop down to gather tiny items from the water surface. There are 04 species of ibises and spoonbills in the Threshiornithidae family. They have long necks and legs, somewhat webbed feet, and long wide wings. Ibis feed by probing in shallow water, mud, and grass with their long, curved bills. Spoonbills have long flat spatulate bills, which they use to grab floating food in shallow water. The Jacanidae family has two species of Jacans, both of which have exceptionally long toes that allow them to walk across floating plants in freshwater bodies and marshes. 04 plovers and lapwings make up the Charadriidae family. They're small to medium-sized waders with a rounded head, short neck, and short bills. They stand erect and stoop to catch invertebrate food. There are 01 species of painted snipe in the Rostratulidae family. The Greater painted snipe is the only species in the family that has been reported in the region. 03 Cormorants are members of the family Phalacrocoracidae. They're medium to big aquatic birds with long necks and rather long hook-tipped bills. They mostly consume fish that they catch by diving underwater. 06 Rails, crakes, and coots make up the Rallidae family. They are small to medium size having short rounded winged and medium to long legs for wading. Many are found in marshes, and most are heard rather than seen. They feed insects, amphibians, crabs, fish,

and other small animals, and are most active at twilight and night. There are 04 kingfishers in the Alcedinidae family. They are tiny to medium-sized birds with a huge head, a long and powerful beak, and short legs. Fish, tadpoles, and invertebrates are their major sources of food. Frogs, snakes, crabs, and lizards are also eaten by large species. There is just 01 Darter in the Anhingidae family. Darter is the sole species of the family in the region, and it is a huge aquatic bird ideal for chasing fish underwater. Grebes belong to the Podicipedidae family, which includes 01 species. It is designed to dive and swim underwater in order to collect fish and other aquatic invertebrates. 01 species of stilt belongs to the Recurvirostridae family. Its beak is large and its legs are lengthy. There are a total of 05 Storks in the Ciconiidae family. Fish, frogs, snakes, lizards, crabs, and mollusks are caught by these huge birds with long beak, neck and legs, broad wings, and a short tail.

Table 2-Family wise distribution of waders

Sr.	Family	Species
1	Podicipedidae	01
2	Phalacrocoracidae	03
3	Anhingidae	01
4	Ardeidae	11
5	Ciconiidae	05
6	Threskiornithidae	04
7	Jacanidae	02
8	Charadriidae	04
9	Rostratulidae	01
10	Scolopidae	14
11	Laridae	04
12	Anatidae	17
13	Rallidae	06
14	Alcedinidae	04
15	Glareolidae	01
16	Recurvirostridae	01

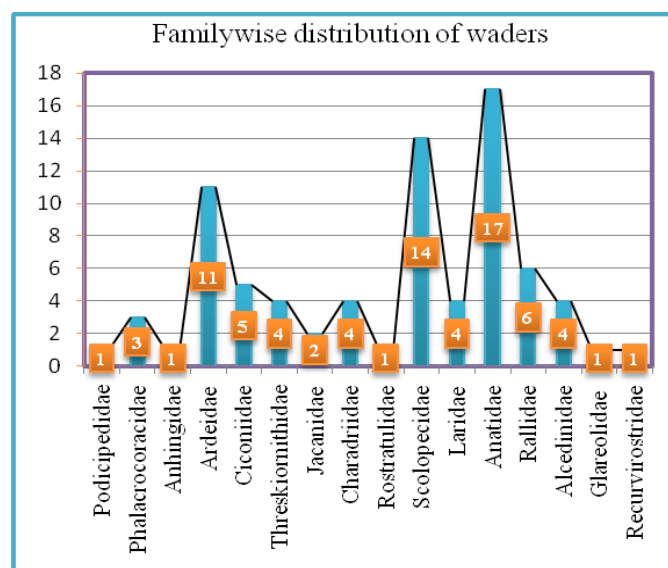


Fig. 2. Family wise distribution of waders

List of abbreviations: LC=Least Concern, U=Unknown, I=Increasing, D=Decreasing, S =Stable, NT=Near threatened, VU= Vulnerable, RE=Resident, WM =Winter Migrant.

IUCN Status wise distribution of Waders: (Table 3, Fig. 3)

In the present findings, the birds were classified according to the IUCN (2022)[21] Red Data Book, only 25 species of wading birds are classified as least concern (LC) since their condition is unknown (U). There were also 23 least concern (LC) wading birds with decreasing (D) species numbers. A total of 11 wading bird species were designated as least concern (LC), with the number of species increasing (I). While 10 species were designated as least concern (LC), their numbers remained stable (S). 07 species were identified as near threatened (NT), with the number of species decreasing (D). While three species were identified as vulnerable, their numbers were determined to be decreasing (D).

Table 3. IUCN Status wise distribution of waders.

Sr. No.	Status	Species no.
1	LC /I	11
2	LC /D	23
3	NT/D	07
4	LC /U	25
5	LC /S	10
6	VU /D	3

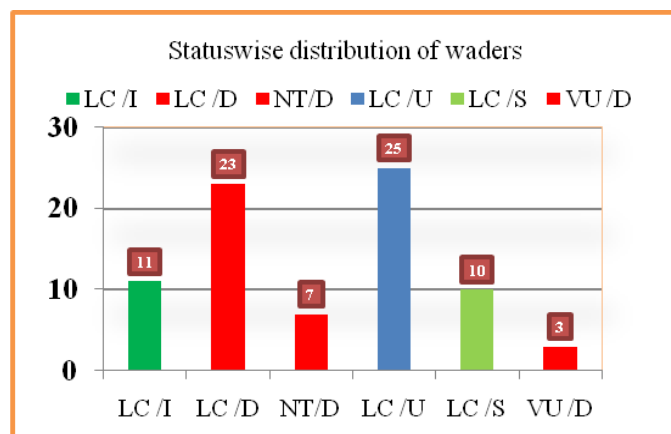


Fig. 3 IUCN Status wise destitution of waders

Residential Status wise distribution of Waders: (Table 1) the wading birds in this lacustrine wetland are categorized according to their residential status; out of a total of 79 wading birds, 44 are determined to be residential, while 44 are winter migrants.

4. Discussion

Indian wetlands are home to 318 species of birds, 193 of which are entirely dependent on them (Vijayan, 1986)[22] 79 species were recorded during the routine survey of bird

observations from this location, including notable migrating birds such the Graylag geese, Red-crusted pochard, Painted stork, Glossy Ibis, and other species. The 16 families of birds that were seen were present.

The Family Anatidae is the group of birds with the greatest variety in this lacustrine marsh. It has been observed that whereas more birds are visible in spring, early monsoon, and late winter, less birds are visible in late summer, late rainy season, and early winter (Kedar and Patil, 2005;[23] Bhandarkar and Chavan, 2008)[15]. During the research period, migrating species such as Painted storks and Greylag geese were seen in significant numbers, especially in the late summer. Datta (2011)[28] made similar discoveries. The migratory bird population was found to be dominating in the area. During the monsoon season, local migratory and resident birds frequented this marsh to nest. Local migratory species, especially open-billed storks, were common in the summer because the water shrank, exposing numerous molluscan shells that birds could eat on. Mollusks were the favoured diet of this species. Lapwings and River Terns were also witnessed breeding in large numbers at the locations. Grey herons, Cotton Teal, and Asian open bill storks have all been seen nesting in the area.

Various anthropogenic activities were sites surrounding the wetland throughout the year. Fishing activity was seen throughout the year at the location, as well as heavy agriculture activity during the monsoon and winter seasons as well as in summer season as “Double Fasal” (twice in a year) crops cultivated which was dependent on the adjacent irrigation by Bagh Itia Doh Dam of Gothangaon Village. A large number of tourists and nature enthusiasts visited as well, although such human activities are unlikely to pose a threat to their survival. However, the Sarus Crane, the biggest flying bird in the world, continued to survive there until July 2011. Farmers from nearby farms bring their livestock to the lake for water. The birds were disturbed as a result of this.

The lake has biological potential and is more productive because nutrients from adjacent watersheds collect in the form of compost, sediments, and other organic components that promote the growth of aquatic weeds, phytoplankton, and zooplanktons. As a result, the lake serves as a good wetland habitat, providing ample food for various organisms such as birds (Bhandarkar and Chavan, 2008)[15]. Geographic variation in hydrophytes vegetation and organic enrichment exists in this wetland habitat. Because this region was simple to spot from the air and less affected by urban activity, this site hosted a greater number of birds than other sites in the Gondia district. The quantity of avifauna indicates the health of lakes due to the availability of water, safe habitat and food sources for both adults and nestlings, and essential nesting/roosting areas in and around lakes (Joshi, 2012)[24]. Ample and consistent lake management would assist to further increase aquatic bird populations since water level, quality, and trophic structure are important habitat variables that affect the number and variety of aquatic birds in lakes. In wetlands with a variety of microhabitats, there are frequently significant concentrations of water birds. The most

fascinating information is that, according to Paracuellos (2006)[25], birds primarily depend on wetlands that are unpolluted, rich in food, and unaffected by anthropogenic pressure. In order to protect biodiversity and the environment, aquatic birds must be protected as important bio-indicators of lake ecosystems [26],[27]. The results of this study will contribute to the preservation of water bird populations in the Gondia area of Maharashtra. The findings observations show that the avifauna in this area is plentiful, indicating the wetland is in good condition. The abundance is owing to the abundance of protein-rich invertebrates and other food, as well as the rich and safe environment. Every organism has a unique relationship with the surroundings in which it lives. Different environmental elements, such as temperature, humidity, nutrition needs, and so on, are involved in these relationships. The high number of birds of various species at Shrungarbandh Lake demonstrates that this environment meets the majority of these characteristics and hence serves as an important bird refuge.

The paper reveals that the information regarding water bird biodiversity of this peaceful wetland may be recognized as a significant habitat for bird population conservation. It is critical to safeguard this perfect environment, as well as substantial efforts by the involved authorities and local community, in order to sustain biological richness in light of the water body's ecological, economic, and recreational potential.

5. Conclusions

Planning and monitoring management of wading birds and their habitats require baseline data. Without scientifically valid time series data on population distribution and status, the success or failure of active conservation cannot be assessed. According to the current study, the Shrungarbandh Lake has a wide variety of birds, many of which are fragile or on the verge of extinction and requires special attention to avoid extinction. The results show a few human activities that have an influence on the biodiversity of waders and their niche. To completely understand how the waders interact with ecological components throughout time, more investigation is necessary.

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Authors' Contributions:

Dr. Sudhir Bhandarkar: Wrote the final draft, researched literature and conceived the study. **Dr. Gopal Paliwal:** involved in protocol development, gaining ethical approval, patient recruitment, and data analysis. **Dr. Sandeep Bande:** wrote the first draft of the manuscript. All authors reviewed

and edited the manuscript and approved the final version of the manuscript.

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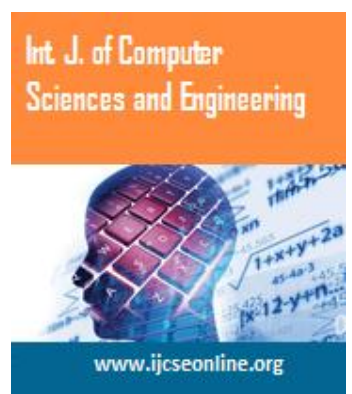
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