



Habitat utilization by Gulls and Terns in Jhansi and Lalitpur, Northern India

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Abstract

The understanding about habitat utilization has long had an important role in the conservation of Aves. Habitat management and its restoration depend on data that indicates the selection of the breeding, feeding and roosting sites. Rich diversity of habitats supports the maximum congregation of water birds in the region and is also home to many resident terrestrial and local migratory species. The species richness and relative abundance of birds depend upon wetland characteristics such as size, water level, quality of water, availability and distribution of food resource. The habitat utilization by the 3 species of gulls (Pallas's Gull, Black-headed Gull, Brown-headed Gull) and 2 species of Terns (Gull-billed Tern and River Tern) was studied in Jhansi and Lalitpur districts from November 2016 to January 2017. All of the five species used the deep and shallow waters followed by Mudflats for feeding, foraging and resting. Pallas's Gulls preferred all the habitats equally. The shallow waters were more preferred by the Brown-headed and Black-headed Gull species. The agricultural regions were utilized by Pallas's Gull, river Tern and Gull-billed Tern. The Brown-headed and Black-headed Gulls however did not use the agricultural areas. The habitats were shared by a variety of water birds. About 30 bird species of 10 families were recorded. There are ample benefits of maintaining the in-situ records of bird species. Within each habitat, there may be more than one species that is vulnerable, threatened or endangered, for that reason it is more proficient to conserve the habitat instead of focusing on any single species. To monitor and manage Gulls, Terns and their habitats, it is vital to have the baseline data. In the study area, there is on hand info on Gull and Tern Species regarding their migration period, nesting and foraging sites and their necessities, type of habitat and utilization of habitats according to seasons. The findings reported here provide a baseline and improve current knowledge on these hitherto poorly-known species.

Keywords: Habitat, Gulls, Terns, Conservation, Management.

Introduction

The balanced miscellany of flora and fauna present in and the surrounding of water sources support maximum assemble of water birds of a particular area. Such water bodies of a province turn out to be an ideal abode for residential and migratory bird species. The numerous wetland characters like its area, water quality, and level of water, distribution and accessibility of feed are responsible for the richness and relative abundance of bird species. The habitat assortment by the bird species is resolute by accessibility to food, refuge, cover and protection from predators and also from climatic changes. Most of the birds are strictly confined to particular habitat where the abundant natural food and suitable micro climate is available. The habitat selection is also partly a psychological process. For the migratory species it is of utmost importance to have accessibility for roosting and foraging sites, particularly for those that take up the journey of thousands of kilometers to reach the wintering grounds. Birds recognize their ancestral habitat by certain conspicuous essential features¹. The vertical distribution of foliage within a habitat was correlated with the number of resident species by various researchers²⁻⁵. The habitat

utilization of birds was further studied by Vijayan who visualized the relationships between vegetation, food availability and bird density in Bharatpur⁶. Ramsar Convention has identified a number of wetlands in India to be significant at international level for the reason that they are competent to serve as wintering grounds for the species of trans-equatorial migratory birds.

There have been very few studies in India regarding terns and gulls to reveal the population status and occurrence as well as habitat utilization. Most of the studies focus on wetland birds particularly the migratory birds (ducks) in protected areas. The bird communities in any area assist in understanding the value of regional landscapes regarding conservation of avifauna⁷. The effect of various factors including the present climatic changes on the breeding of birds can be detected by analysis of the breeding time as well as their winter arrivals⁸. It is advantageous to analyze and document the birds within their natural habitats. Within each habitat, there may be more than one species that is vulnerable, threatened or endangered, for that reason it is more proficient to conserve the habitat instead of focusing on any single species.

Such outlook permits a clear center of attention on the foremost habitat problems that affect the territories of birds. The habitat areas are precisely plotted, so that it gets convenient to give an account of the management of birds within the land-use development procedures (such as EIAs) and other ventures like business projects with sustainable development; This scrutiny endow with an apparent ecological focus on strategy and support that advances towards protection; The habitations endow the outline that co-relates the conservational needs of Aves and other taxonomic orders such as primates to that with region-based management priority location analyses⁹.

Therefore, such information could be used as an indicator tool and impact assessment on the system. There are no reports on Gulls and Terns from this habitat; hence the present study has been conducted to focus on the ecological status, diversity, occurrence and habitat utilization by these lesser known species in Jhansi and Lalitpur district of Uttar Pradesh, India. There are 55 species of Gulls worldwide. Only 13 species of Gull occur in India. Gulls belonging to family Laridae are lesser studied bird species in India. There are 44 species of Terns worldwide. Only 23 species of terns occur in India. Terns are seabirds in the family Sternidae. Previously considered a subfamily of the gulls, Laridae, they are now usually given full family status and divided into eleven genera.

The study was carried out in an area of two districts of Southern Uttar Pradesh in India i.e. Jhansi and Lalitpur that are part of Bundelkhand Region lying between 23⁰35'-26'N and 78⁰-82'E. Physiographically the entire drainage of Bundelkhand forms a part of Ganga basin. The main river Betwa with minor rivers like Dhasan and Pahuj chiefly drain the districts. It is a semi-arid climatic region. There is acute deficiency of water sources. Jhansi district has a Geographical area of 5028 km². The Yamuna forms two tributaries, the Betwa and Pahuj while Dhasan is offshoot of the main river Betwa. The average annual rainfall is 850 mm. The maximum rainfall (about 91%) occurs from June to September. During winters, January is the coldest of all months with the mean daily minimum temperature 9.20°C and mean daily maximum temperature being 24.10°C. The hottest month is May with mean daily maximum temperature 42.60°C and mean daily minimum temperature 28.80°C. In Jhansi district total 10 sites were surveyed for the presence of Gulls and Terns (Table-1). These included rivers, lakes, and reservoirs on main rivers of the district such as Betwa, Dhasan, Pahuj. Most of these reservoirs suffer from seepage losses due to fractured nature of Bundelkhand granite and gneisses over these have been constructed¹⁰. The sites selected covered the entire district.

Materials and methods

From November 2016 to January 2017, the team visited all wetlands and water bodies of the Jhansi and Lalitpur district. Secondary and primary data was collected through questionnaire and datasheets.

Survey work were carried out for 4 hrs in the morning and 2 hrs in the evening (morning: 07:00-11:00 am, evening: 03:00-5:00 pm). Observations were made along line transects with the aid of 10x50 mm binoculars and Canon 7D DSLR Camera. Boat surveys were also carried out for more accurate data. Point count stations were made within the study plot either in a systematic manner or in a random manner. GPS was recorded with 20e-trex. The distance between the two points was at least 200 metres. For maximum field visits, photographic evidences of birds and water bodies were taken. For all the Gull and Tern species documented, it was categorized as residents (R) or migrants (M) according to their presence (season-wise). The abundance code (Common, Fairly common, Uncommon) and the IUCN Status (Critically Endangered, Endangered, Threatened, Vulnerable and Least Concern) of the birds recorded were also noted. Statistical Analysis was done with Species richness index, Shannon Wiener's general diversity index and Index of dominance. Identification of birds was done with the help of key reference books by Grewal, Salim Ali and Grimmett.

Table-1: Site details from Jhansi District.

Sites in Jhansi	River/Area	GPS
Pahuj Dam	Pahuj River/Length 2040m	25.295° N 78.323° E
Sukhma Dukhma Dam	Betwa	25.112° N 78.322° E
Lachuraghat	Dhasan	25.191° N 79.161° E
Saprar Dam	Sukhnai	25.125° N 79.051° E
Paricha Dam	Betwa	25.301° N 78.461° E
Erach	Dhasan	25.463° N 79.045° E
Dongri Reservoir	Pahuj/Length 2760m	25.232° N 78.274° E
Laxmi Taal	Natural Pond	25.271° N 78.355° E
Ghadmau Jheel	Natural Jheel	25.312° N 78.402° E
Bhasneh	Natural Jheel	25.312° N 79.095° E

Lalitpur district has a geographical area of 5039 km². The undulating topography has an elevation ranging from 350 to 650 m above mean sea level¹¹. The Average rainfall per year is 800-900 mm and dry months in a year may range between 3 mm to 7 mm. The highest temperature is 48°C in summers. In winters, the temperature ranges between 1-17°C. The northern and western boundaries of Lalitpur are formed by the Betwa River. The Jamni River, a tributary of the Betwa, forms the eastern boundary. The Dhasan River forms the district's southeastern boundary. In Lalitpur district total 10 sites were surveyed for the presence of gulls and terns (Table-2).

Results and discussion




The three month study reveals the Gull and Tern diversity in the selected districts. The team carried out exhaustive surveys in the study area. In the study area 3 gull species and 2 tern species have been recorded (Table-3). Gulls belong to Family Laridae while Terns belong to Sternidae. Only the River tern is resident species, all others Gull-billed Tern and all Gull species are migratory. River Tern is Near Threatened while the others are Least Concern according to IUCN Status. In the study area, the Pallas's Gull and Gull-billed Tern are uncommon while Brown-headed Gull, Black-headed Gull and River Tern are common.

The species distribution in various habitats has been illustrated and then the percentage family wise presence of birds in different habitats was analyzed. All the five species were recorded in deep and shallow waters followed by Mudflats, Agricultural area, and rocky area (Table-4). All of the five species used these habitats for feeding, foraging and resting. Pallas's Gull, Black-headed Gull, Brown-headed Gull and Gull-billed Tern are migratory so no breeding grounds were identified. The River Tern is a residential species but the breeding season is from March to May, so during the project duration (November 2016, December 2016 and January 2017) no breeding sites were identified.

Table-2: Site details from Lalitpur.

Sites in Lalitpur	River/Area	GPS
Jharar Ghat	Betwa	25.115° N 78.450° E
Matatila Dam	Betwa	Pond (Rajpur): 24.590° N 78.213° E Dam 25.055°N 78.222°E
Shahzad Dam	Shahzad/ Length 4160m	Main: 24.565° N 78.280° E Highway: 24.565°N 78.280°E
Sajnam Dam	Sajnam/Length 4524m	25.441°N 79.031°E
Jamini Dam	Jamini/Length 6400m	24.220°N 78.411°E
Rohini Dam	Rohini/Length 1647 m	24.211°N 78.472°E
Govind Sagar Dam	Shahzad/ Length3606m	24.384°N 78.265°E
Rajghat Dam	Betwa	24.372°N 78.193°E
Deogarh	Betwa	25.194°N 78.314°E
Saidpur pond	Natural pond	24.274° N 78.442° E

Table-3: Gulls and Terns in the study area.

Photograph	Habitat	Distribution and occurrence	Red List Criteria
 Pallas's Gull <i>Larus ichthyaetus</i>	Inland in large rivers and water reservoirs.	Winter visitor to the coasts of India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan and Maldives. Occasional vagrants to the inland waters. Breeds in South Russia to North West Mongolia. Also winters in SE Mediterranean, Red Sea, coasts of Middle East. Locally uncommon. Maximum population seen in December month in Sukhwa Dukhwa Reservoir in Jhansi and Matatila reservoir in Lalitpur.	Least Concern (IUCN 3.1)
 Brown-headed Gull <i>Larus brunnicapalus</i>	Rivers, lakes and reservoirs	Winter visitor to the coasts of India, Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka and Maldives. Breeds in Ladakh between 3000 and 4500m and in high plateaus of C Asia up to Mongolia. Also winters on coasts of Middle East, Sand South East Asia. Common. The population was maximum in December in in Sukhwa Dukhwa Reservoir in Jhansi and Matatila reservoir in Lalitpur	Least Concern (IUCN 3.1)
 Black-headed Gull <i>Larus ridibundus</i>	Reservoirs, lakes and rivers	Winter migrant to the coasts of India, Pakistan, Bangladesh, Sri Lanka, Nepal and Maldives. Breeds across Europe, W and C Asia up to S Mongolia. Also winters on coasts of N Africa, Mediterranean, Middle East and S and SE Asia. Common. Maximum population in December in Sukhwa Dukhwa Reservoir in Jhansi and Matatila reservoir in Lalitpur.	Least Concern (IUCN 3.1)



Photograph	Habitat	Distribution and occurrence	Red List Criteria
 Gull-billed Tern <i>Gelochelidon nilotica</i>	Reservoirs	A common winter migrant to all over India, Pakistan, Bangladesh, Sri Lanka, Nepal and Maldives. Breeds in NW India, Kashmir, Europe, W Asia, NW Africa to Middle East. Also winters in NE Africa, Middle East and S Asia. Winter visitor. Uncommon, not very numerous. The population was maximum in December in Pahuj Reservoir in Jhansi and Rajghat reservoir in Lalitpur	Least Concern (IUCN 3.1)
 River Tern <i>Sterna aurantia</i>	Large rivers, reservoirs and ponds	A resident species in the plains all over India, Pakistan, Bangla Desh, Sri Lanka and Maldives, SE Asia Resident. Locally common. The population was maximum in December in Sukhwa Dukhwa Reservoir in Jhansi and Jamini reservoir in Lalitpur	Near Threatened A2abce+3bce +4abce

Table-4: Habitat Preference by Gulls and Terns.

Habitat Preference in %	Pallas's Gull	Brown headed Gull	Black-headed Gull	River Tern	Gull-billed Tern
Deep water	10	16	28	42	68
Shallow water	10	80	61	11	09
Mudflats	10	02	04	31	11
Rocky areas	10	02	07	00	00
Agricultural area	10	00	00	16	12

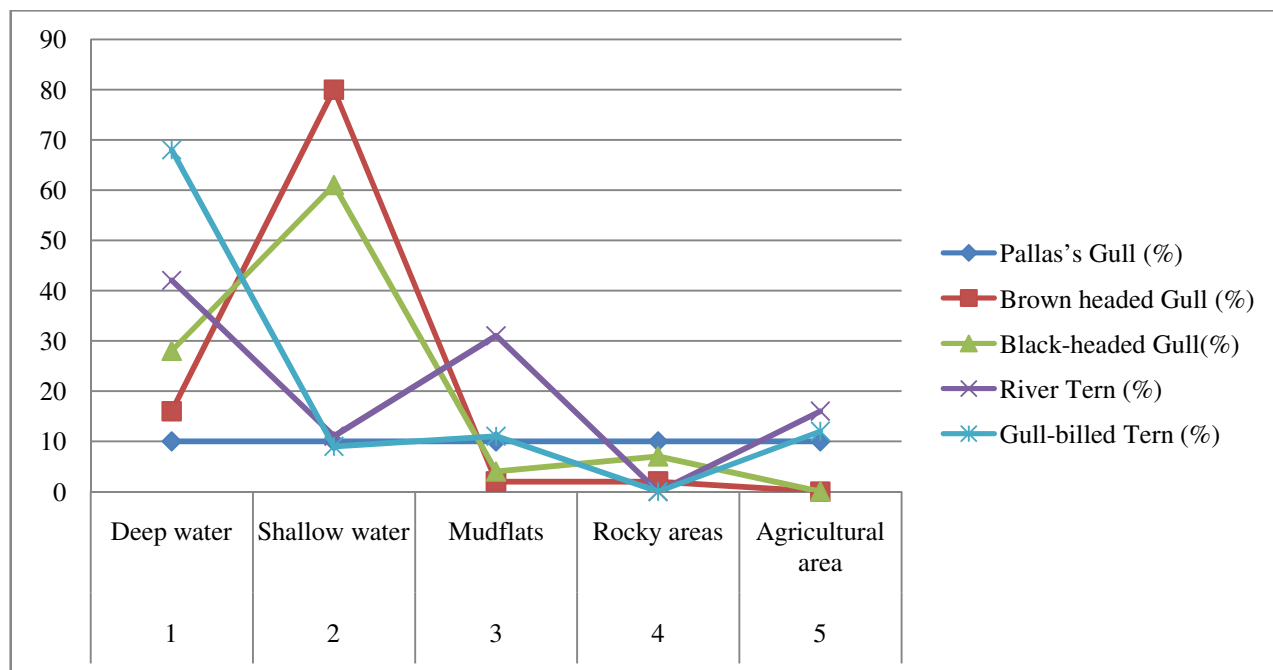


Figure-1: Preferred habitats by Gulls and Terns.

Pallas's Gulls preferred all the habitats equally. They were seen floating in deep waters of the reservoirs, as well as shallow waters with other bird species (Figure-2 and 3). They used the mudflats and rocky areas to rest in solitude and at times with other birds (Figure-4). They were seen flying over agricultural areas along the water bodies (Figure-5). They have wide-ranging feeding patterns. Undeniably, the Pallas's Gulls have no specialization like most of the water birds usually possess. Their morphological features permit them for equal adaptations in flights, swimming and while wandering about. In flight, Pallas's gull also snatched prey both on ground and in water, and they plunged-dives over water to grab the prey.



Figure-2: Pallas's Gull floating on water.



Figure-3: Pallas's Gull walking in Shallow water.



Figure-4: Pallas's Gull resting on rock.



Figure-5: Pallas's Gull flying near agricultural field.

The shallow waters were more preferred by the Brown-headed and Black-headed Gull species (Figure-6 and 7). Gulls are incapable of diving in deep water to get their prey. To overcome this, and get the access to the prey in deep water, most of the gull species search for food with other water bird, where the specialized divers such as cormorants bring the prey to the water surface. Both the selected districts, Jhansi and Lalitpur are rocky and dry regions. There are large rocks in the river beds that were used for resting by the Gulls at times, however the Terns did not use the rocks for resting (Figure-8). The agricultural regions were utilized by Pallas's Gull, river Tern and Gull-billed Tern. The Brown-headed and Black-headed Gulls on the other hand did not use the agricultural areas (Figure-1) Dipping was usually done while birds floated on the surface of water, and the technique to bring the invertebrates on the surface the gulls formed close circles or foot paddled.

Gulls utilize all the feeding opportunities that come across. Although fish are known to enhance the breeding success, gulls feed on other available prey as well¹²⁻¹⁵. Fishes are easy to digest and are source of numerous microelements such as calcium that is known to enhance the early development of chicks. The parent birds increase the fish contents in their diet during the upbringing of their chicks^{14,16}. As compared to the parent birds, the fledglings are inefficient foragers¹⁶⁻¹⁸. The observations were made and recorded for the number of successful and unsuccessful dives, together with the number of erratic and unsuccessful attacks (when the fledglings failed to touch the water surfaces or only their bills touched the water). After getting the fish, some birds handled and consumed the fish on the water surface.

The local colonization of large gulls depends and increasing with the accessibility of fish¹⁹. During winters, waste dumps and disposed of fishes serve as nutritious food resources that assist in surviving the winters^{20,21}. There are rich fish stocks in the fishponds as they are shallow and gulls are able to hunt without difficulty (Figure-9). However, they were seen foraging over deep water in reservoirs as well (Figure-10). This is the main reason for rich Gull population at Matatila and Sukhma Dukhma Reservoirs.



Figure-6: Gulls resting at mudflats.



Figure-7: Gulls floating on shallow water.



Figure-8: Habitat preference by Gulls.



Figure-9: Gulls diving and catching prey.



Figure-10: Gulls flying and foraging above deep water.

The terns preferred the deep water more and kept flying up and down the water bodies and plunging from a height with wings pulled in diving for the prey (Figure-11). Terns also utilized shallow water beds and agricultural fields (Figure-12-14). When the water level fell, small pools of water and mudflats appeared which served as resting sites for all the species. Some human activities such as ploughing and fishing are beneficial for the Terns populations.

These serve as easy food sources, but sometimes the birds get entangled in the fishing nets or consume plastic. The feeding flocks of terns on the other hand lead the Fishermen towards the fish shoals. There are steep declines in the Tern colonies when there is overfishing of small fish for example eels; terns rely on these primary food sources. There has already been decline and loss of Tern colonies due to human activities²².



Figure-12: River tern swooping in shallow water for prey.



Figure-11: River tern flying above deep water for foraging.



Figure-13: Tern flying around agricultural lands.



Figure-14: Gull billed tern in different habitats.

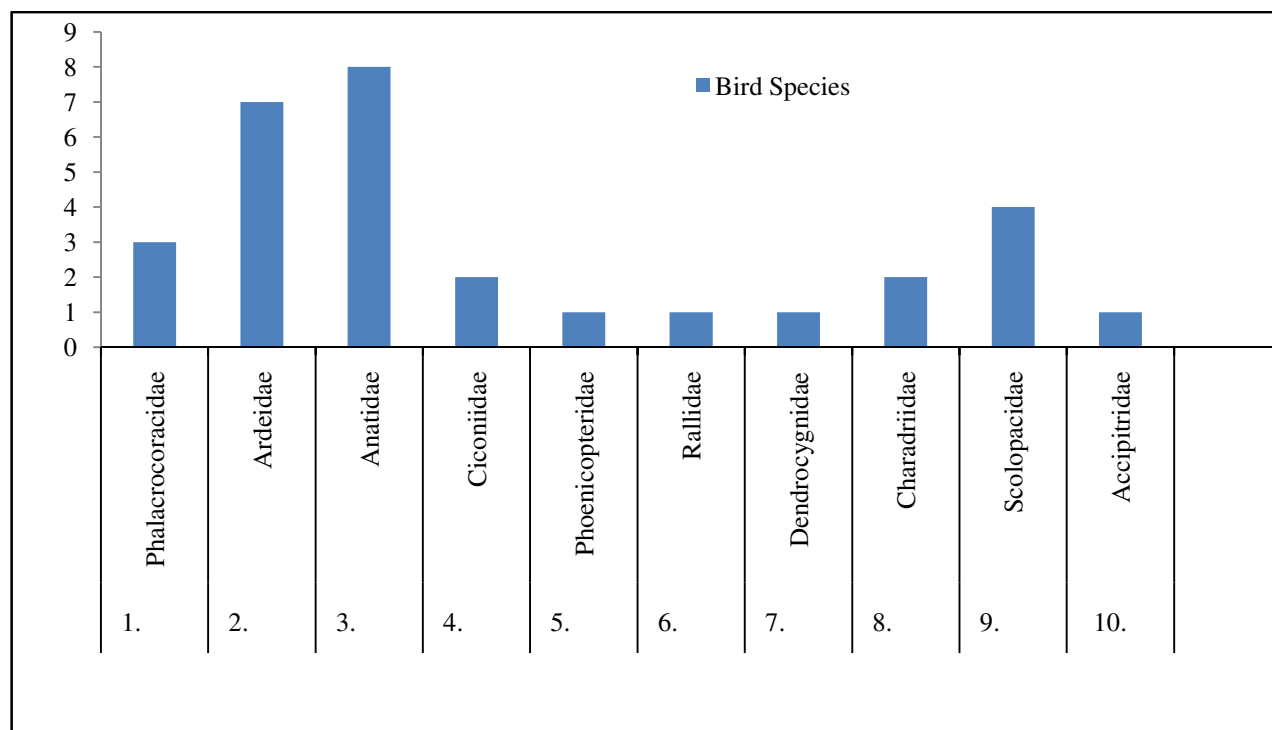


Figure-15: Family wise distribution of birds that shared the habitat with Gulls and Terns.

Figure-15 shows the family wise distribution of birds that shared the habitat with Gulls and Terns; the species belonging to the family Anatidae are seen to be maximum (8), followed by birds belonging to Ardeidae (7) and Scolopacidae (4). Three bird species of Family Phalacrocoracidae, two each of Ciconiidae and Charadriidae; one species of Phoenicopteridae, Rallidae, Dendrocygnidae and Accipitridae were also seen sharing habitat with Gulls and Terns.

Food availability was not measured in these areas; however other studies have attempted to relate the abundance of food in drained flats which generally provide suitable habitat for shore birds²³. The shallow water zone provides very good habitat for

the diversity of water birds. The low depths are ideal for many large and small sized waders. The families like Anatidae, Ardeidae, Charadriidae, Laridae and Rallidae showed high preference to these areas. This shallow zone provide variety of food items to the stints, plovers, stilts, curlews, godwits, shanks, sandpipers, egrets, herons and storks (Figure-16-21). The Gulls were also engaged in foot paddling. As discussed before, the gulls are not good at hunting their prey, therefore they share the shallow water habitats with the other bird species so as to get the food items easily. They often snatched the prey caught by each other and also by other bird species. Similar observations were made by Fedrickson and Taylor in 1982 on the waterfowl in relation to water depths²³.



Figure-16: Stilts, egrets and Gulls.



Figure-17: Whistling ducks and Gull.

The habitats were shared by a variety of water birds. About 30 bird species of 10 families were recorded (Table-5).

Table-5: Bird Species commonly seen with Gulls and Terns.

Species	Family
Cormorant (Little, Indian and Greater)	Phalacrocoracidae
Egrets (Cattle, Little, Intermediate, Great)	Ardeidae
Herons (Pond, Grey, Purple)	
Northern Pintail	Anatidae
Bar-headed goose	
Common Teal	
Comb's duck	
Ruddy Shelduck	
Common pochard	
Tufted pochard	
Northern Shoveler	
Asian Open-bill	Ciconiidae
Painted Stork	
Greater Flamingo	Phoenicopteridae
Coots	Rallidae
Lesser Whistling duck	Dendrocygnidae
Black-winged Stilt	Charadriidae
Lapwing (River and Red-wattled)	
Sandpipers (Common and wood)	Scolopacidae
Shanks (Red and Green)	
Buzzard	Accipitridae



Figure-18: Egrets, Cormorants and gulls.

Terns were seen with the colonies of Asian-Open bills and Pochards (Figure-22-27). They were also seen with cormorants, Gulls, Lap-wings, Stilts and Shanks. At few occasions they were seen with buzzards also.



Figure-19: Egrets, Cormorants and Gulls.



Figure-20: Pochards, Pintail and Gull.



Figure-21: Coots, cormorants, Pintail, Grebe and Gulls.



Terns, cormorants and egrets



Terns and pochaards

Figure-22: Terns with other bird species.



Tern and buzzard



Tern and Asian open-bills

Figure-23: Terns with buzzard and Asian open bill in shallow water.



Figure-24: Tern with cormorant.



Figure-25: Tern with Gull and red-wattled lapwing.

Availability of fish appeared to be predominantly significant in winters, and perhaps the foremost factor liable for thriving colonization of water reservoirs by the Gulls and terns. Such an exemplar demonstrates how flourishing species take advantage

of human-related activities and surroundings. Fitness is unswervingly influenced by the feeding habits and opportunities. Juveniles are less proficient foragers as compared to the adult birds. The results of this study also give an idea about the impact of foraging approaches and how the juveniles get better in the feeding skills with time. With maturation, the young birds enhance the searching speed with low cost of foraging tactic and high profits. They tried to seize fishes from each other and other water birds (Figure-28 and 29). The Gulls were seen hovering around the fishing boats so as to filch the fishes (Figure-30).

Levels of anthropogenic disturbance were low at all the sites in Jhansi and Lalitpur, though most sites are not in protected areas. The Gulls and terns utilized the habitats irrespective of human presence (Figure-31). During surveys the field observations at the same time interactions with local public revealed that there are no major anthropogenic activities like livestock grazing, extensive utilization of water for domestic purposes, soil digging, siltation, encroachment, utilization of its marshy vegetation for grazing of livestock that are usually the main pressures to the existing biodiversity of water sources.

Gulls (Laridae) are amongst the bird groups that has accustomed to densely populated human areas and their activities^{24,25}. There have been increase in the populations of some species of gull in several parts of North America because of the ease to utilize the food sources from food sources such as facilities for managing the waste (like landfills), unwanted items left by fishing activities, agriculture, and urbanization due to human-activities^{26,27}. Gulls show a diversity in their diets, furthermore make use of a array of habitats (both aquatic and terrestrial), variety of food, and foraging strategies^{15,28-30}. This opportunistic and general feeding behavior may permit the gulls to modify their diet, the feeding locale and foraging variety in aquatic and terrestrial habitats. When different species share the same habitats, there is an increase in competition to avail the present food sources, but with the flexibility in feed type and foraging tactics, such situations can be managed appropriately^{28,31}.



Figure-26: Terns with Red shanks, Stilt and Spot-billed duck.



Figure-27: Gull billed terns with cormorant and egrets.



Figure-28: Black-headed Gulls hovering around the cormorant with fishes.



Figure-29: Pallas's gull chasing the other for fishes.

However, decrease in rainfall and water pollution due to agriculture run off is threats to these landscapes. Overfishing is another activity that is affecting food availability to the birds (Figure-32). There is no monitoring of the laws to govern fishing in the Reservoirs. The tenders are given and people from other States are hired for fishing for commercial purposes.

These are then exported for medicinal purposes. There have been cases of poaching and hunting of water birds in Jhansi and Lalitpur. There are no reports about killing of Gulls and Terns. Long-term monitoring of these sites may provide information on population trends of Gulls and Terns and can lead to decisions regarding water conservation and habitat protection.



Figure-30: Gulls flying around the fishing boats.



Figure-31: Gulls around the fisherman and near human dwellings.



Figure-32: Commercial fishing in Jhansi and Lalitpur.

In the food chain of wetlands, birds are usually at or on their top and are considered as good bio-indicators of the habitats owing to the highly susceptible nature for any changes taking place^{32,33}. In order to have a detailed assessment of the water bodies, there is an urgent need for standard surveys related to the diversity of water bird species and the awareness amongst the neighboring people³⁴. It is always advantageous to investigate and document about the avifauna within a particular habitat. There are ample benefits of maintaining the in-situ records of bird species. Within each habitat, there may be more than one species that is vulnerable, threatened or endangered, for that reason it is more proficient to conserve the habitat instead of focusing on any single species. Such outlook permits a clear center of attention on the foremost habitat problems that affect the territories of birds. The habitat areas are precisely plotted, so that it gets convenient to give an account of the management of birds within the land-use development procedures (such as EIAs) and other ventures like business projects with sustainable development; This scrutiny endow with an apparent ecological focus on strategy and support that advances towards protection; The habitations endow the outline that co-relates the conservational needs of Aves and other taxonomic orders such as primates to that with region-based management priority location analyses⁹. The management and restoration of breeding habitats of bird colonies rely on the understanding of the indicators used for selecting the colony and breeding sites, incorporating the communal cues as well³⁵⁻³⁷.

Conclusion

The flexibility of the foraging habits of the species suggests that it is able to adapt itself successfully to local changes in food availability. The Habitat utilization fluctuate within the species as well as between species at dissimilar localities. To date no specific measures have been taken to help the species; therefore the study is a great step in providing the information about the present state of the Gull and Tern diversity and their habitat utilization. To monitor and manage Gulls, Terns and their habitats, it is vital to have the baseline data. In the study area, there is on hand info on Gull and Tern Species regarding their migration period, nesting and foraging sites and their necessities, type of habitat and utilization of habitats according to seasons. The findings reported here provide a baseline and improve current knowledge on these hitherto poorly-known species. Adding together is a clear requirement of research on the habitat utilization of lesser explored geographic sites and lesser studied biodiversity. A foremost topic that runs through the studies undertaken above is that the habitat utilization by gulls and terns are inconsistent, together with and within species. For this reason the conservational policies should not be based on indicator species and on sites where short-term studies have been undertaken owing to geographical variations. Scientific studies based on the utilization of habitats have significant contribution to the conservation of gulls and terns that will continue in future too. The other way round is also correct, as applied research on terns has enhanced the

information of habitat utilization. However, this is only the initial stage of study, there are numerous species and sites that are inadequately studied, and there is need of conservation action for threatened species. There is a good deal to be learned.

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