

Bird observations from Pulicate Lake Bird Sanctuary and the adjoining areas in India

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Abstract

The present study reports the results of ornithological surveys conducted in Pulicate Lake and its adjoining water bodies in the states of Andhra Pradesh and Tamil Nadu, India conducted from January to April 2021. A total of 161 bird species were recorded, belonging to 19 different orders, 52 families, and 114 genera. Of these, 11 species were classified as Near Threatened, 1 as Vulnerable, and 149 as Least Concern according to the IUCN threatened categories. The results revealed a rich bird diversity in the study area, with several noteworthy observations. Further, the surveys also revealed that 19 species are listed under Schedule I and 141 species are listed under Schedule II, of the Indian Wildlife Protection Act, 1972. In conclusion, this study provides a comprehensive report on the bird diversity in Pulicate Lake and its adjoining water bodies and emphasizes the need for conservation efforts to protect the threatened species and maintain the overall ecological balance. These findings could be of value in formulating conservation strategies for the avifauna in this region and serve as a valuable reference for future studies. The study's results offer practical insights for habitat management and conservation planning. The species we have identified can act as crucial indicators of the area's ecological well-being, guiding management choices. This study underscores the importance of ongoing monitoring and conservation initiatives to safeguard the region's avian diversity.

Keywords: Avian Diversity, Threatened Species, Pulicat Lake, Migratory Birds, Waterbirds

Introduction

Pulicat Lake Bird Sanctuary (13°24' 13° 47' N & 80°03' 80°18' E) is the second largest brackish water lagoon after Chilika (Odisha) in India, and one of the important shelters for waterbirds in southern India (Scott, 1989; Perennou & Santharam, 1990; Santharam, 1993, 1998; Samant & Rao, 1996; Rao, 1998; Balachandran 1998; Manakadan & Kannan 2003). The lake sprawled across two districts i.e., Nellore and Tiruvallur in Andhra Pradesh and Tamil Nadu, respectively. Pulicat lagoon's boundary limits range between 13.33° to 13.66° N and 80.23° to 80.25°E, with a drier part of the lagoon extending up to 14.0°N. About 84% of the lake falls in Andhra Pradesh and the remaining 16% in Tamil Nadu. Considering the importance of Pulicat Lake both the portions of the Andhra Pradesh and Tamil Nadu parts of Pulicat are notified as bird sanctuaries and are presently called Pulicat Lake Bird Sanctuary.

The Pulicat Lagoon in India has been formally recognized for its ecological and conservation significance through a dual designation as a Ramsar site (an internationally recognized wetland under the Ramsar Convention) and Important Bird Area (IBA) by the International Union for Conservation of Nature and Natural Resources (IUCN) (Rahmani, *et al.*, 2016). As an internationally recognized wetland under the Ramsar Convention, the lagoon's designation as a Ramsar site represents a global recognition of its ecological value and the need for its conservation. Its designation as an IBA emphasizes its critical importance for the conservation of bird populations, particularly migratory species.

Waterbirds are a diverse group of over 30 families which are characteristic of, and ecologically dependent on wetland habitats (BirdLife International, 2008). In 2006, an analysis found that overall 40% of the waterbirds (1,200 species) populations are declining globally, and

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only 17% have increasing trends (Delany & Scott 2006). Although Asia is a very important region for waterbirds, trend information is available for relatively fewer species (44% of 815 species), but of these, 59% are declining (Delany & Scott 2006). Studies indicate that, of the 1358 species (Praveen & Jayapal, 2023) found in the Indian subcontinent, about 229 are migrants that include both terrestrial and waterbirds (Majumder *et al.*, 2022). India is one of the destinations for several avian species that migrate from central Asia. The main wintering grounds for waders (shorebirds) in India are located especially along the east coast and a number of coastal passage migrants take this route to reach some of the potential coastal wetlands for wintering. One such important coastal flyway lies on India's east coast that connects Point Calimere in Tamil Nadu with Chilika and Pulicat Lakes is the Central Asian/South Asian Flyway (Balachandran, 2006).

Pulicat Lake has experienced significant changes in environmental parameters leading to a reduction in its water surface area, with a decrease in depth and closure of some lake mouths. Sedimentation rates have been recorded at 12.34 mm/y (Ramesh *et al.*, 2002), while a comparative analysis of depth data shows a 2.5 m depth reduction over 300 years (Gomathy, 2015). The northern part of the lake has seen a rapid shrinkage of water area, while the southern part remains active. The lake is an important habitat for aquatic fauna including migrant water birds and pisces, which provide livelihood to local communities. The closure of lake mouths and sand bars has led to a depletion of fish stocks, threatening the lake's ecosystem. Urgent measures are needed to ensure the survival of the lake and its biodiversity.

Faunal and Floral Diversity of Pulicat Lake Bird Sanctuary

The geomorphology of Pulicat Lake is the main reason for the rich avian and aquatic species biodiversity (Kumar *et al.*, 2010). Chacko *et al.* (1953) recorded 59 species of phytoplankton and 23 species of zooplankton, but Krishnan and Sampath (1973) recorded only 16 species of phytoplankton and 35 species of zooplanktons. They also recorded 65 species of fish, including three elasmobranchs and 62 teleosts. Along the shores and above high tide level, littoral forests occur (Champion & Seth, 1968) and the dominant species are *Spinifex littoralis* and *Ipomea biloba*

the pioneering sand binders, followed by the secondary colonizers.

On the other islands in the lake, the exotic *Prosopis juliflora* has invaded many areas. In the elevated mudflats, succulent halophytes, such as *Anthrocnemum indicus*, *Sesuvium portulacastrum*, *Salicornia brachiata*, *Suaeda maritima*, *Suaeda monoica* and *Suaeda nudiflora* occur (Basha *et al.*, 2012; Rajyalakshmi & Basha, 2016). Earlier studies have reported 10 species of mangroves from the banks of Buckingham Canal in the southern part of Andhra Pradesh. The most dominant mangrove species (about 80%) namely *Exoecaria agallocha* has dominated the eastern bank of Pulicat Lake (Jayasundaramma *et al.*, 1987). Some natural regeneration can also be found along the eastern banks of the Buckingham Canal, north of the Sullurpet-Sriharikota island road, south of the road up to Pulicheri Kuppam and Rattela and in the Sriharikota Island (Suryanarayana *et al.*, 2010). Rajyalakshmi and Basha (2016) have reported a total of 180 species of plants from the Pulicat wetlands, of which 117 species are dicotyledonous plants, 51 species are monocotyledonous plants and 12 are mangroves.

The lake supports around 500 species of macrofauna including 168 species of fish (Chacko *et al.*, 1953; Selvanathan & Kaliyamurthy, 1972; Raj, 2006), 12 species of penaeid prawns (Chacko *et al.*, 1953), 36 species of crabs (Kannan & Pandiyan, 2012), and 19 species of molluscs (Thangavelu & Sanjeevaraj, 1985). The Edible Oyster (*Crassostrea madrasensis*) is the most extensively found bivalve in this lake (Thangavelu & Sanjeevaraj, 1985), however, Raj (2006) has reported a declining trend of the species in Pulicat Lake. A total of 57 species of algae belonging to five families have been reported (Raghavaiah, 2007). Around, 14 species of algae and 88 species of zooplankton have been reported from Pulicat Lake, which is also the main diet of flamingos (Ramesh & Ramachandran, 2005).

Forty-four species of fish and 51 species of butterflies have also been recorded (Suryanarayana *et al.*, 1989; Samant & Rao, 1996; Manakadan & Sivakumar, 2004a, b; Sivakumar *et al.*, 2004; David *et al.*, 2011; Quadros *et al.*, 2017). The fish and prawn population is mainly determined by the entrance channel of Pulicat Lake. They in turn attract a variety of wetland birds, especially flamingos, pelicans, kingfishers, and herons. Aquatic vegetation in Pulicat Lake is a valuable source of food especially for waterfowls, ducks, teals and coots.

Basha *et al.* (2012) recorded about 60,000 migratory water birds feeding in the northern part of the lagoon during winter. Samanth and Rao (1996) recorded 200 species of birds from Pulicat and its nearby Sriharikotta Island. A total of 28 species of shorebirds belong to seven families recorded by Kannan and Pandiyan (2012). Basha *et al.* (2012) reported that the concentration of flamingos depends on the water level along with high algal, fish and benthic diversity. About 15000 Greater Flamingos spend winter in this lake. In 2002, the average flamingo population density in Pulicat was recorded at 182 individuals/km². Flamingoes arrive at the lake during October as they come from the Great Rann of Kutch (breeding places) and leave during April (Ramesh & Ramachandran, 2005). Pulicat Lake attracts large congregations of Greater Flamingos *Phoenicopterus ruber*, Spot-billed Pelican *Pelecanus philippensis*, Painted Stork *Mycteria leucocephala*, Grey Heron *Ardea cinerea*, and other ducks, teals, terns, gulls and waders. Pulicat is the third most important wetland for migratory shorebirds and for several Palaearctic migratory waterfowls on the eastern board of India. Most of the waders visiting Pulicat are migrants because it comes through the hypothetical Central Asian Flyway.

Earlier surveys reported that October to January are the ideal months for migratory birds that come from Europe, central, western and eastern parts of Asia (Basha *et al.*, 2012). Breeding of “Near Threatened” species like the Spot-billed Pelican, Painted Stork, and White Ibis has been recorded in Pulicat. Eleven raptor species have been recorded from this lake. Annual avian census data available from the Andhra Pradesh Forest Department reports 115 bird species including terrestrial and aquatic species. Earlier surveys by Kalle *et al.* (2018) recorded 86 species of birds in the Tamil Nadu part of Pulicat Lake near Pasiyavaram Kuppam. Govindan *et al.* (2015) reported 13 species of migrants and 18 species of resident birds. Kudiri, Moolah Kuppam, and Annamalaicheri in the Tamil Nadu part of Pulicat Lake are three important places in Pulicat Lake where a large number of flamingoes can be seen.

In shallow water bodies like Pulicat Lake, benthic habitats and benthic biodiversity are crucial for biodiversity restoration. The major ecological threat to the benthic habitat and its associated life in Pulicat Lake is the siltation that happens during the monsoon floods, which also results in reduced depth of the water column (Raj *et*

al., 2002). Benthic animals buried more than 5 cm below the surface are beyond the reach of common shorebirds like Stints (bill length 16-22 mm), Curlew Sandpiper (bill length 32-43 mm) and Sharp-tailed Sandpiper (bill length 22-27 mm). Moreover, observations on these species have shown that they rarely probe deep into the mud, and usually take prey from the top sediment layer (Pandiyan *et al.*, 2014).

Study Area and Methodology

The surveys were conducted from January to April 2021. Four visits, each spanning five days were made to the area to study waterbirds and other associated species. Efforts were made to cover all habitats as the geomorphology of Pulicat lagoon includes water, mud flats, sublittoral and littoral areas, dunes, sand bars, sand pan, both human-inhabited and uninhabited islands, sandy and muddy shores, total saline to brackish water to freshwater pools. All of Pulicate Lake and adjoining areas such as Annamalaicheri, Kamripalem, Koridi Road, Koridi Village, Kotapalem, Meezuru, Tada, Shriharokita Road, Chunnambukulam, Velukada, Venadu and Tuplipalem except the large spindle-shaped barrier island named Sriharikota, were surveyed. All the localities' names and their geo-coordinates are listed in Table 1 and Figure 1.

Bird Diversity

The study area encompassed a 35 km radius around the western side of Pulicat Lake, situated within the states of Andhra Pradesh and Tamil Nadu. Both waterbird and terrestrial bird populations were enumerated within the sanctuary and its adjoining areas. To determine waterbird populations, the total count method, as suggested by Urfi *et al.* (2005), was employed. The method involved conducting total counts at sandflats, mudflats, sandy beaches, small islets, and alongside water channels, with opportunistic observations made during surveys by boat and on foot. All bird species were recorded for a predetermined period of 5 to 10 minutes at each total count station, following the recommendations of Bibby *et al.* (1998). The total count method, a widely used technique for counting waterbirds, involves counting all birds within a defined area of the coast, water channel, or lake from a vantage point (Urfi *et al.*, 2005). The Pulicat has limited vantage points hence we used vehicle tops as vantage points to enumerate waterbirds

Table 1. Name of the localities with the geo-coordinates

Locality Name	Name on Map	Latitude	Longitude	Date and Time	Altitude
Anamalaicheri	1	13° 28' 14.71"	80° 14' 18.55"	02-03-21 12:36	3.971
F-Chick	2	13°31'25.69"	80° 0'33.81"	04-03-21 9:15	28.965
Kamripalam	3	13° 51' 18.52"	80° 6' 4.71"	12-01-21 11:59	1.568
Koridi Road	4	13° 45' 8.48"	80° 4' 24.66"	30-01-21 17:27	2.529
Kotapalem	5	13° 52' 44.61"	80° 7' 0.93"	12-01-21 12:13	10.7
Kotapalem1	6	13° 52' 53.38"	80° 9' 59.1"	12-01-21 12:30	2.529
Meezuru	7	13° 44' 56.11"	80° 4' 4.49"	12-01-21 10:38	5.173
Nelapattu	8	13° 49' 39.94"	79° 57' 12.97"	10-01-21 9:24	27.764
Phase2 A	A	13° 34' 29.56"	80° 2' 2.96"	30-01-21 11:28	19.352
Phase2 B	B	13° 30' 51.58"	79° 57' 13.05"	30-01-21 11:49	28.965
Phase2 C	C	13° 30' 4.7"	79° 57' 22.08"	30-01-21 11:52	51.075
Phase2 D	D	13° 29' 45.24"	79° 58' 22.22"	30-01-21 12:00	42.424
Phase2 E	E	13° 30' 3.47"	79° 59' 39.71"	30-01-21 12:06	33.291
Phase2F	F	13° 30' 29.45"	80° 0' 19.14"	30-01-21 12:10	23.197
Pulicate W	9	13° 25' 59.47"	80° 18' 53.86"	11-01-21 6:37	-0.114
Pulicate W1	9A	13°27'57.50"	80°18'40.03"	11-01-21 6:45	-0.114
Pulicate W2	9B	13°27'48.16"	80°18'47.19"	11-01-21 6:58	-0.116
SC-Koridi	10	13° 44' 38.83"	80° 7' 50.46"	09-01-21 16:16	2.289
SC-Tada	11	13° 35' 22.38"	80° 2' 49.5"	09-01-21 11:05	9.258
Shari Road	12	13° 42' 39.59"	80° 5' 2.53"	11-01-21 15:43	2.77
Suna 1	13	13° 31' 59.16"	80° 11' 3.22"	01-03-21 9:30	2.77
Sunabukulam	14	13° 29' 39.94"	80° 11' 31.45"	01-03-21 7:47	-2.518
Velukadu	15	13° 47' 41.72"	80° 4' 32.07"	12-01-21 11:27	7.095
Venadu	16	13° 40' 15.2"	80° 7' 42.29"	11-01-21 16:26	-6.603
Sri City Inn	17	13°31'24.54"	80° 0'5.25"	10-01-21 16:25	28.656
Tupilipalem Beach	18	14° 1'31.68"	80° 9'11.98"	02-03-21 15:55	

especially while surveying lakes close to roads but when were on boats.

A total of 20 counts were completed during the study. Birds were counted directly using binoculars (Nikon 8x40) and spotting scope (Nikon Prostaff). Bird species were recorded from 6.00 a.m. to 10.30 a.m. and again from 3.00 p.m. to 5.30 p.m. During data collection, the bird species, number of individuals, feeding guild, observed distance (m) and habitat were recorded. During water bird sampling we also recorded the tidal action (low tide and high tide). For large flock counts we used a hand-tally counter. The latitude and longitude of each count and opportunistic locations were recorded using a GPS (Garmin etrex-30). Bird species were identified at the

species level using Majumder *et al.* (2022) and Grimmett *et al.* (2011). We also used Nikon SLR cameras (Z6, D500 and D7000 along with 500mm and 600mm telephoto lenses with 1.4X and 2X converters, respectively), and a Nikon spotting scope with eye-piece of adequate magnification to identify waders. Birds were classified as per their feeding behaviour as a carnivore, piscivores, insectivores, frugivores, crustaceovores, and nectarivores. The resident/migrant status of each bird species has been mentioned in the total checklist prepared based on Grimmett *et al.* (1999). For common and scientific names, we followed the checklist of Indian birds by Praveen *et al.* (2023). For each species, existing national and global conservation status has been assigned following the

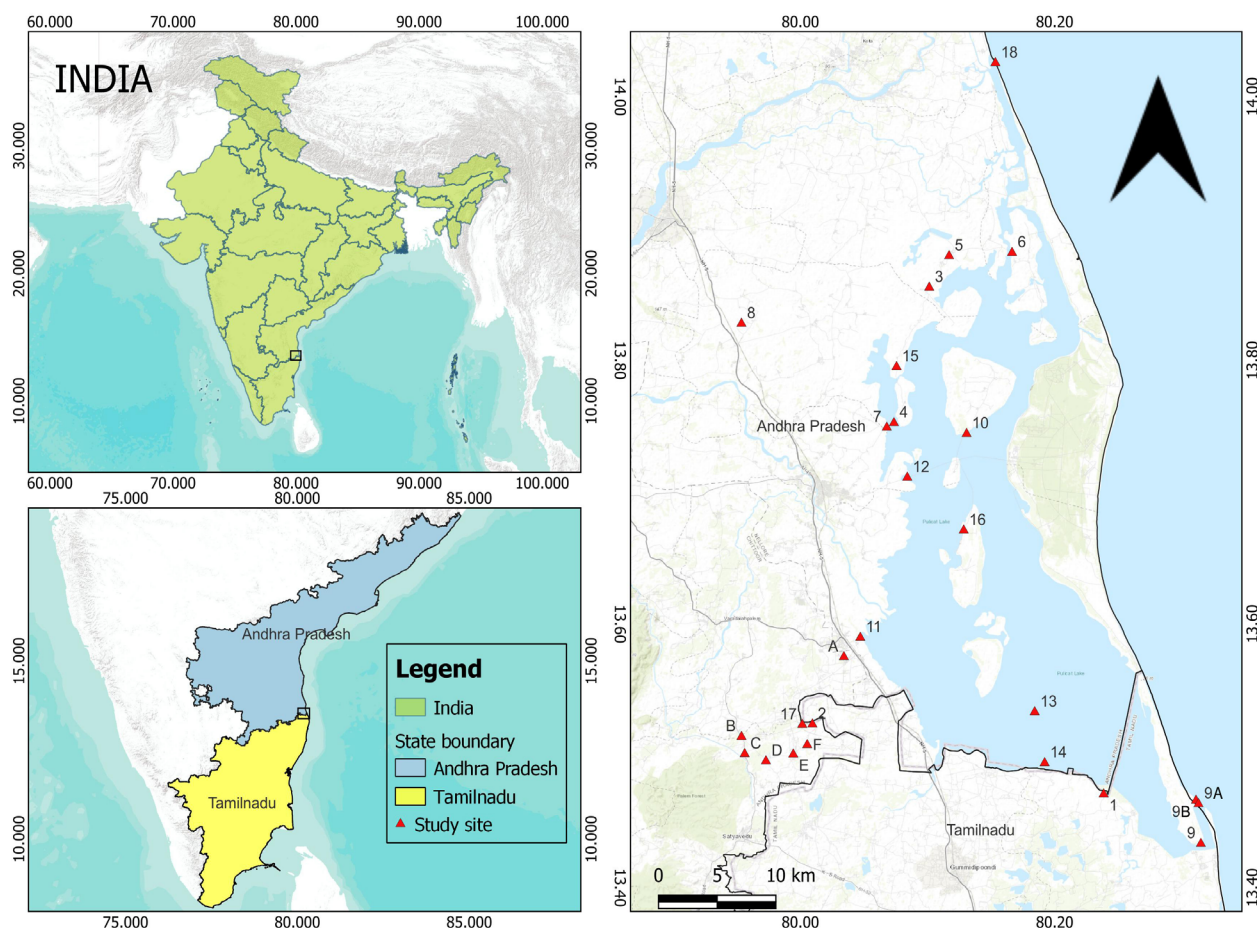


Figure 1. Map of the study area showing point locations.

Indian Wildlife Protection Act (IWPA 1972), and IUCN RED LIST (2020). The migratory status of each species was taken from Kazmierczak *et al.* (2000) and Grimmett *et al.* (2011).

Results and Discussion

A total of 161 bird species have been recorded from Pulicat Lake Bird Sanctuary and adjoining waterbodies under 19 Orders, 52 Families and 114 Genera during our surveys. Out of these, 85 species were recorded from adjoining waterbodies of which 2 are Near Threatened and 83 are least Concern, 3 species are in Schedule I, 81 are in Schedule II and one is not protected and 144 from different study sites in and around Pulicat Lake of which, 10 are Near Threatened, one is Vulnerable and rest 133 are Least Concern and 18 are Schedule I, 125 are in Schedule II and one is not protected. Sixty-eight species were common in both areas. Out of 161 species, 11 are

Near Threatened, one is Vulnerable and the rest (149) are Least Concern as per the IUCN category. However, as per the latest Indian Wildlife (Protection) Act 1972 (amended in 2022), 19 species out of 161 belong to the Schedule I category and the rest of the 141 species belong to Schedule II except 1 that belongs to Vermin (Table 2 and Figures 2 and 3) category.

These 161 bird species belong to 19 different orders of birds out of a total of 26 orders known from India. Order-wise break up of species is presented in Figure 4, whereas it is shown that the highest number of species were reported from the order – Charadriiformes (shorebirds), followed by Passeriformes (passerines) and then the Pelecaniformes.

Of the 161 species of birds, 52 (32%) are migratory species (Table 2; Figure 3). A total of 144 (89%) species were recorded in Pulicat and the surrounding areas. However, we could record only 85 species (52%) from adjoining waterbodies and 68 species (42%) were common to both

areas (Figure 5). Out of 52 migratory species recorded during our surveys, most of such species were sighted in Pulicat Lake areas in Andhra Pradesh and Tamil Nadu parts. According to Balachandran *et al.* (2018), around 165 species occurring in the Indian subcontinent are winter migrants and the Pulicat Lake Bird Sanctuary supports 52 of them. This shows how important Pulicat Lake is in terms of supporting such species, especially during winter. These species according to Balachandra *et*

al. (2018) come from far-off countries such as Kazakhstan, Turkmenistan, Uzbekistan, Kyrgyzstan and Tajikistan and some come from far-off extreme Western Europe. Pulicat Lake acts as over site for many long migrants especially Curlew Sandpiper *Calidris ferruginea* that enters into the subcontinent through the northwest to winter in southern India and then exiting northwards, especially travelling along the east coast (Balachandran, 1998).

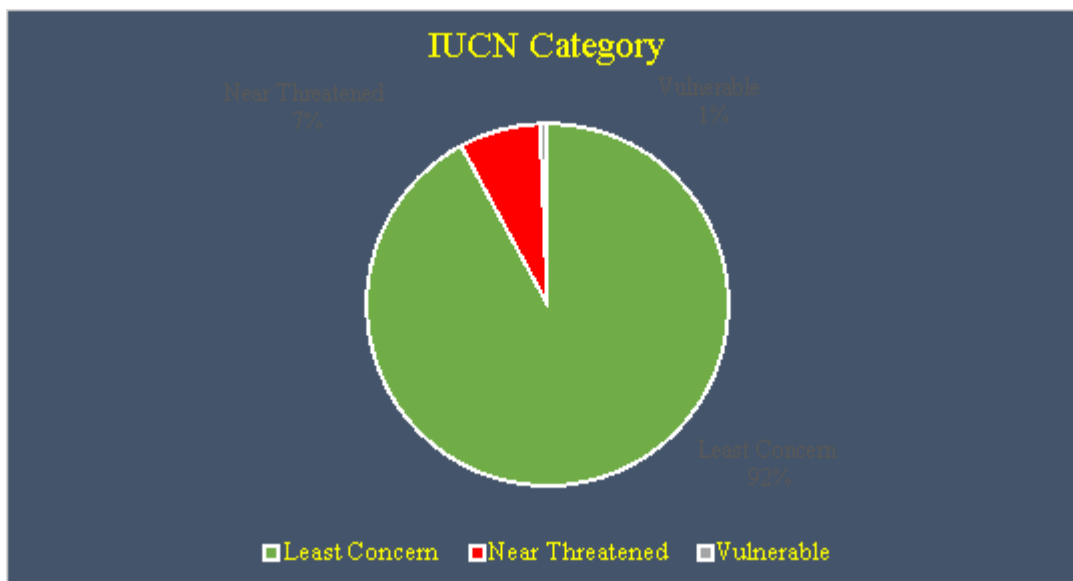


Figure 2. Distribution of bird species in the study area based on their IUCN threat category.

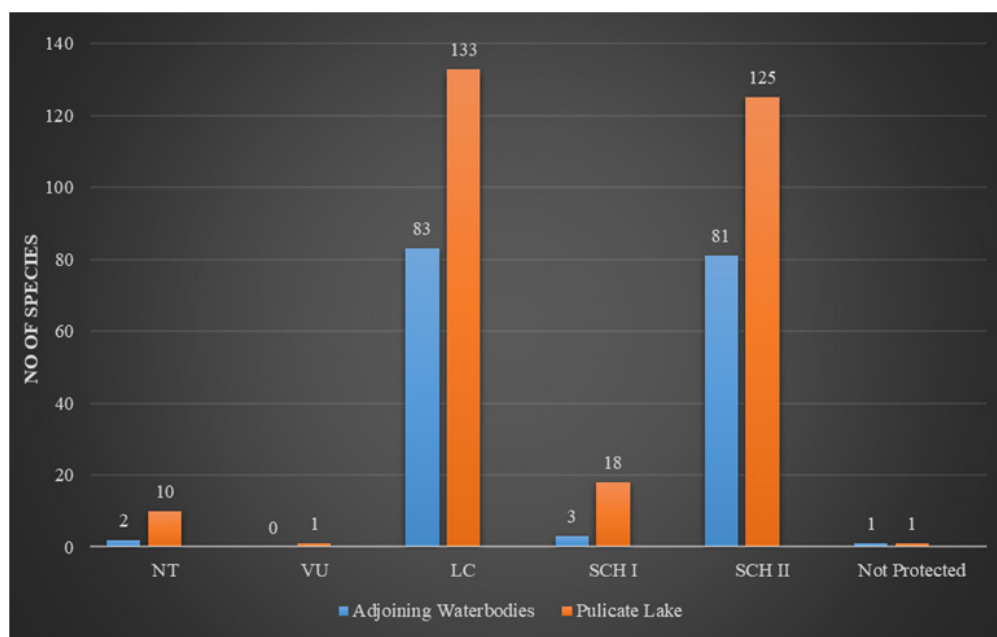


Figure 3. Number of bird species belonging to IUCN categories and IWPA schedules.

The Convention on the Conservation of Migratory Species of Wild Animals, also known as the Convention on Migratory Species (CMS), is an international agreement that aims to conserve migratory species throughout their ranges and it covers a great diversity of migratory species and lists them in either of two appendices - Appendix I –

Threatened Migratory Species and Appendix II – Migratory Species requiring international cooperation. In the present study, 73 species were reported to be listed in CMS appendices. Greater Spotted Eagle *Clanga clanga* comes under Appendix I of CMS and rest 72 species are listed under Appendix II of CMS such as Eurasian

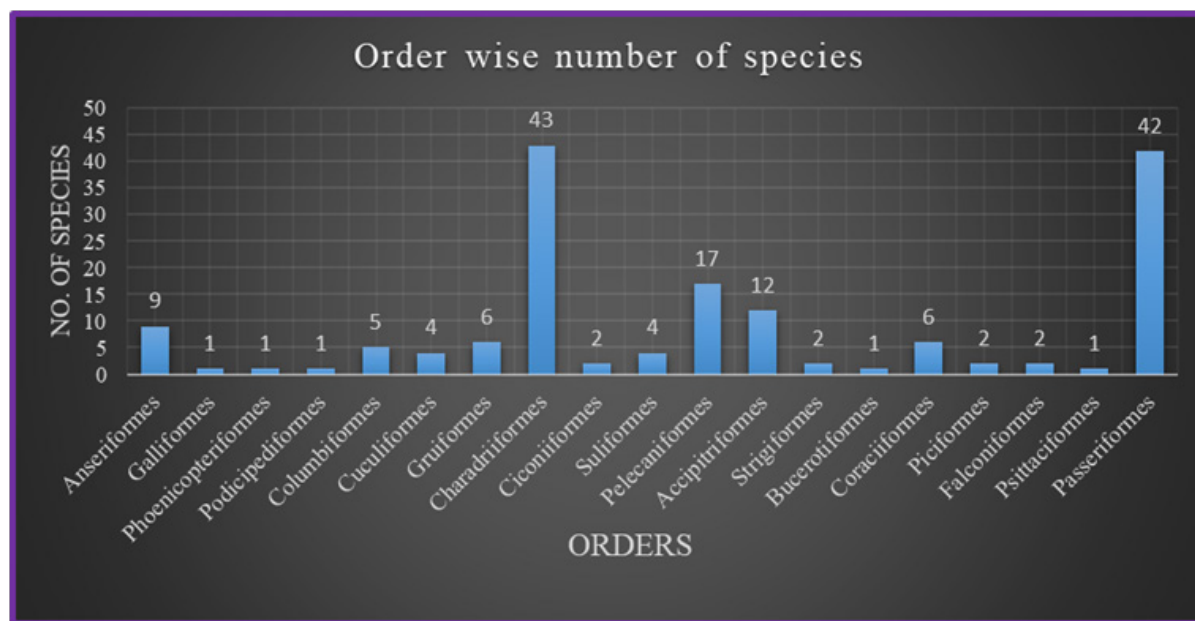


Figure 4. Order-wise break-up of bird species reported from the study area.

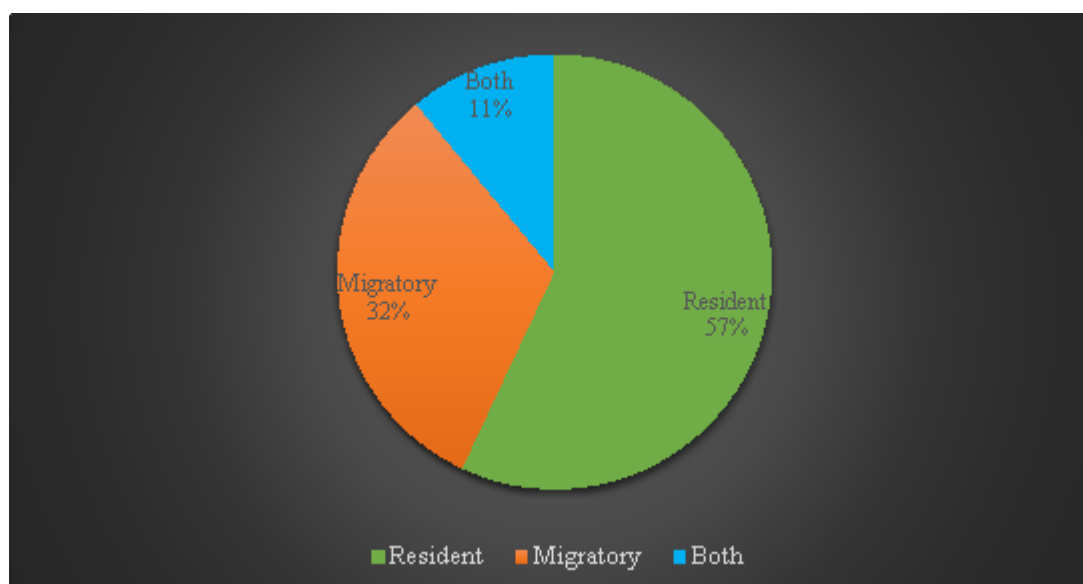


Figure 5. The proportion of resident and migratory bird species in the study area (N= 161 species).

Table 2: List of bird species observed in and around Pulicat Lake Bird Sanctuary during our surveys.

Sl No.	Species	Authority	IUCN Category	WPA Schedule	Adjoining waterbodies	Pulicate Lake	Status
Order: 1. Anseriformes							
Family: 1. Anatidae							
	Fulvous Whistling Duck <i>Dendrocygna bicolor</i>	(Vieillot, 1816)	Least Concern	Schedule-I	+		R
	Lesser Whistling Duck <i>Dendrocygna javanica</i>	(Horsfield, 1821)	Least Concern	Schedule-II	+	+	R
	Cotton Teal <i>Nettapus coromandelianus</i>	(J.F. Gmelin, 1789)	Least Concern	Schedule-II	+	+	R
	Garganey <i>Spatula querquedula</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	M
	Northern Shoveler <i>Spatula clypeata</i>	(Linnaeus, 1758)	Least Concern	Schedule-II		+	M
	Eurasian Wigeon <i>Mareca penelope</i>	(Linnaeus, 1758)	Least Concern	Schedule-II		+	M
	Indian Spot-billed Duck <i>Anas poecilorhyncha</i>	J.R. Forster, 1781	Least Concern	Schedule-II	+	+	R
	Northern Pintail <i>Anas acuta</i>	Linnaeus, 1758	Least Concern	Schedule-II	+	+	M
	Red-crested Pochard <i>Netta rufina</i>	(Pallas, 1773)	Least Concern	Schedule-II	+	+	M
Order: 2. Galliformes							
Family: 2. Phasianidae							
	Grey Francolin <i>Francolinus pondicerianus</i>	(J.F. Gmelin, 1789)	Least Concern	Schedule-II	+	+	R
Order: 3. Phoenicopteriformes							
Family: 3. Phoenicopteridae							
	Greater Flamingo <i>Phoenicopeterus roseus</i>	Pallas, 1811	Least Concern	Schedule-II	+	+	R,M
Order: 4. Podicipediformes							
Family: 4. Podicipedidae							
	Little Grebe <i>Tachybaptus ruficollis</i>	(Pallas, 1764)	Least Concern	Schedule-II	+	+	R
Order: 5. Columbiformes							
Family: 5. Columbidae							
	Rock Pigeon <i>Columba livia</i>	J.F. Gmelin, 1789	Least Concern	Schedule-II	+	+	R
	Oriental Turtle Dove <i>Streptopelia orientalis</i>	(Latham, 1790)	Least Concern	Schedule-II	+	+	R
	Red-collared Dove <i>Streptopelia tranquebarica</i>	(Hermann, 1804)	Least Concern	Schedule-II		+	R
	Spotted Dove <i>Streptopelia chinensis</i>	(Scopoli, 1786)	Least Concern	Schedule-II	+	+	R
	Laughing Dove <i>Streptopelia senegalensis</i>	(Linnaeus, 1766)	Least Concern	Schedule-II		+	R
Order: 6. Cuculiformes							
Family: 6 Cuculidae							
	Greater Coucal <i>Centropus sinensis</i>	(Stephens, 1815)	Least Concern	Schedule-II	+	+	R
	Pied Cuckoo <i>Clamator jacobinus</i>	(Boddaert, 1783)	Least Concern	Schedule-II	+	+	R,M
	Asian Koel <i>Eudynamys scolopaceus</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R
	Common Hawk Cuckoo <i>Hierococcyx varius</i>	(Vahl, 1797)	Least Concern	Schedule-II	+	+	R,M
Order: 7. Gruiformes							
Family: 7. Rallidae							
	Common Moorhen <i>Gallinula chloropus</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R
	Common Coot <i>Fulica atra</i>	Linnaeus, 1758	Least Concern	Schedule-II	+	+	R
	Grey-headed Swampphen <i>Porphyrio poliocephalus</i>	(Latham, 1801)	Least Concern	Schedule-II		+	R
	Watercock <i>Gallicrex cinerea</i>	(J.F. Gmelin, 1789)	Least Concern	Schedule-II		+	R,M
	White-breasted Waterhen <i>Amaurornis phoenicurus</i>	(Pennant, 1769)	Least Concern	Schedule-II	+	+	R
	Baillon's Crake <i>Zapornia pusilla</i>	(Pallas, 1776)	Least Concern	Schedule-II		+	M

Order: 8. Charadriiformes							
Family: 8. Recurvirostridae							
	Black-winged Stilt <i>Himantopus himantopus</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R,M
Family: 9. Haematopodidae							
	Eurasian Oystercatcher <i>Haematopus ostralegus</i>	Linnaeus, 1758	Near Threatened	Schedule-II		+	M
Family: 10 Charadriidae							
	Grey Plover <i>Pluvialis squatarola</i>	(Linnaeus, 1758)	Least Concern	Schedule-II		+	M
	Pacific Golden Plover <i>Pluvialis fulva</i>	(J.F. Gmelin, 1789)	Least Concern	Schedule-I		+	M
	River Lapwing <i>Vanellus duvaucelii</i>	(Lesson, 1826)	Near Threatened	Schedule-II		+	R
	Yellow-wattled Lapwing <i>Vanellus malabaricus</i>	(Boddaert, 1783)	Least Concern	Schedule-II	+	+	R
	Grey-headed Lapwing <i>Vanellus cinereus</i>	(Blyth, 1842)	Least Concern	Schedule-II	+	+	M
	Red-wattled Lapwing <i>Vanellus indicus</i>	(Boddaert, 1783)	Least Concern	Schedule-II	+	+	R
	Lesser Sand Plover <i>Charadrius mongolus</i>	Pallas, 1776	Least Concern	Schedule-II		+	M
	Greater Sand Plover <i>Charadrius leschenaultii</i>	Lesson, 1826	Least Concern	Schedule-II		+	M
	Caspian Plover* <i>Charadrius asiaticus</i>	Pallas, 1773	Least Concern	Schedule-II		+	M
	Kentish Plover <i>Charadrius alexandrinus</i>	Linnaeus, 1758	Least Concern	Schedule-II		+	M
	Common Ringed Plover <i>Charadrius hiaticula</i>	Linnaeus, 1758	Least Concern	Schedule-II		+	M
	Little Ringed Plover <i>Charadrius dubius</i>	Scopoli, 1786	Least Concern	Schedule-II		+	R,M
Family: 11. Jacanidae							
	Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	(Scopoli, 1786)	Least Concern	Schedule-II		+	R
	Bronze-winged Jacana <i>Metopidius indicus</i>	(Latham, 1790)	Least Concern	Schedule-II	+	+	R
Family: 12. Scolopacidae							
	Whimbrel <i>Numenius phaeopus</i>	(Linnaeus, 1758)	Least Concern	Schedule-II		+	M
	Eurasian Curlew <i>Numenius arquata</i>	(Linnaeus, 1758)	Near Threatened	Schedule-II		+	M
	Bar-tailed Godwit <i>Limosa lapponica</i>	(Linnaeus, 1758)	Near Threatened	Schedule-II		+	M
	Black-tailed Godwit <i>Limosa limosa</i>	(Linnaeus, 1758)	Near Threatened	Schedule-II		+	M
	Curlew Sandpiper <i>Calidris ferruginea</i>	(Pontoppidan, 1763)	Near Threatened	Schedule-II		+	M
	Temminck's Stint <i>Calidris temminckii</i>	(Leisler, 1812)	Least Concern	Schedule-II		+	M
	Sanderling <i>Calidris alba</i>	(Pallas, 1764)	Least Concern	Schedule-II		+	M
	Little Stint <i>Calidris minuta</i>	(Leisler, 1812)	Least Concern	Schedule-II		+	M
	Common Snipe <i>Gallinago gallinago</i>	(Linnaeus, 1758)	Least Concern	Schedule-II		+	M
	Terek Sandpiper <i>Xenus cinereus</i>	(Güldenstädt, 1775)	Least Concern	Schedule-II		+	M
	Common Sandpiper <i>Actitis hypoleucos</i>	(Linnaeus, 1758)	Least Concern	Schedule-II		+	M
	Spotted Redshank <i>Tringa erythropus</i>	(Pallas, 1764)	Least Concern	Schedule-II		+	M
	Common Greenshank <i>Tringa nebularia</i>	(Gunnerus, 1767)	Least Concern	Schedule-I		+	M
	Marsh Sandpiper <i>Tringa stagnatilis</i>	(Bechstein, 1803)	Least Concern	Schedule-II		+	M
	Wood Sandpiper <i>Tringa glareola</i>	Linnaeus, 1758	Least Concern	Schedule-II		+	M
	Common Redshank <i>Tringa totanus</i>	(Linnaeus, 1758)	Least Concern	Schedule-II		+	M

Family: 13. Laridae							
	Black-headed Gull <i>Chroicocephalus ridibundus</i>	(Linnaeus, 1766)	Least Concern	Schedule-II		+	M
	Brown-headed Gull <i>Chroicocephalus brunnicephalus</i>	(Jerdon, 1840)	Least Concern	Schedule-II		+	M
	Pallas's Gull <i>Ichthyaeetus ichthyaeetus</i>	(Pallas, 1773)	Least Concern	Schedule-II		+	M
	Lesser Black-backed Gull <i>Larus fuscus</i>	Linnaeus, 1758	Least Concern	Schedule-II		+	M
	Little Tern <i>Sternula albifrons</i>	(Pallas, 1764)	Least Concern	Schedule-II		+	R
	Gull-billed Tern <i>Gelochelidon nilotica</i>	(J.F. Gmelin, 1789)	Least Concern	Schedule-I		+	M
	Common Tern <i>Sterna hirundo</i>	Linnaeus, 1758	Least Concern	Schedule-II		+	M
	Caspian Tern <i>Hydroprogne caspia</i>	(Pallas, 1770)	Least Concern	Schedule-II		+	M
	Greater Crested Tern <i>Thalasseus bergii</i>	(M.H.C. Lichtenstein, 1823)	Least Concern	Schedule-II		+	R
	Lesser Crested Tern <i>Thalasseus bengalensis</i>	(Lesson, 1831)	Least Concern	Schedule-II		+	R,M
	Whiskered Tern <i>Chlidonias hybrid</i>	(Pallas, 1811)	Least Concern	Schedule-II		+	M
Order: 9. Ciconiiformes							
Family: 14. Ciconiidae							
	Asian Openbill <i>Anastomus oscitans</i>	(Boddaert, 1783)	Least Concern	Schedule-II	+	+	R
	Painted Stork <i>Mycteria leucocephala</i>	(Pennant, 1769)	Near Threatened	Schedule-II		+	R,M
Order: 10. Suliformes							
Family: 15. Anhingidae							
	Oriental Darter <i>Anhinga melanogaster</i>	Pennant, 1769	Near Threatened	Schedule-II	+	+	R,M
Family: 16. Phalacrocoracidae							
	Little Cormorant <i>Microcarbo niger</i>	(Vieillot, 1817)	Least Concern	Schedule-II	+	+	R,M
	Indian Cormorant <i>Phalacrocorax fuscicollis</i>	Stephens, 1826	Least Concern	Schedule-II	+	+	R,M
	Great Cormorant <i>Phalacrocorax carbo</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R,M
Order: 11. Pelecaniformes							
Family: 17. Pelecanidae							
	Spot-billed Pelican <i>Pelecanus philippensis</i>	J.F. Gmelin, 1789	Near Threatened	Schedule-II	+	+	R
Family: 18. Ardeidae							
	Yellow Bittern <i>Ixobrychus sinensis</i>	(J.F. Gmelin, 1789)	Least Concern	Schedule-II	+	+	R
	Cinamon bittern <i>Ixobrychus cinnamomeus</i>	(J.F. Gmelin, 1789)	Least Concern	Schedule-II	+	-	R
	Black Bittern <i>Ixobrychus flavicollis</i>	(Latham, 1790)	Least Concern	Schedule-II	+	+	R
	Grey Heron <i>Ardea cinerea</i>	Linnaeus, 1758	Least Concern	Schedule-II	+	+	R,M
	Purple Heron <i>Ardea purpurea</i>	Linnaeus, 1766	Least Concern	Schedule-II		+	R
	Great Egret <i>Ardea alba</i>	Linnaeus, 1758	Least Concern	Schedule-II		+	R
	Intermediate Egret <i>Ardea intermedia</i>	Wagler, 1829	Least Concern	Schedule-II		+	R
	Little Egret <i>Egretta garzetta</i>	(Linnaeus, 1766)	Least Concern	Schedule-II	+	+	R
	Cattle Egret <i>Bubulcus ibis</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R
	Western Reef-Heron <i>Egretta gularis</i>	(Bosc, 1792)	Least Concern	Schedule-II	+	-	R
	Indian Pond Heron <i>Ardeola grayii</i>	(Sykes, 1832)	Least Concern	Schedule-II	+	+	R
	Black-crowned Night Heron <i>Nycticorax nycticorax</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R

Family: 19. Threskiornithidae							
	Glossy Ibis <i>Plegadis falcinellus</i>	(Linnaeus, 1766)	Least Concern	Schedule-II		+	R,M
	Black-headed Ibis <i>Threskiornis melanocephalus</i>	(Latham, 1790)	Near Threatened	Schedule-II	+	+	R
	Red-naped Ibis <i>Pseudibis papillosa</i>	(Temminck, 1824)	Least Concern	Schedule-II		+	R,M
	Eurasian Spoonbill <i>Platalea leucorodia</i>	Linnaeus, 1758	Least Concern	Schedule-I		+	R
Order: 12. Accipitriformes							
Family: 20. Pandionidae							
	Osprey <i>Pandion haliaetus</i>	(Linnaeus, 1758)	Least Concern	Schedule-I		+	M
Family: 21. Accipitridae							
	Black-winged Kite <i>Elanus caeruleus</i>	(Desfontaines, 1789)	Least Concern	Schedule-I		+	R
	White-eyed Buzzard <i>Butastur teesa</i>	(Franklin, 1831)	Least Concern	Schedule-I		+	R
	Western Marsh Harrier <i>Circus aeruginosus</i>	(Linnaeus, 1758)	Least Concern	Schedule-I	+	+	M
	Pallid Harrier <i>Circus macrourus</i>	(S.G. Gmelin, 1770)	Near Threatened	Schedule-I		+	M
	Pied Harrier <i>Circus melanoleucos</i>	(Pennant, 1769)	Least Concern	Schedule-I		+	M
	Montagu's Harrier <i>Circus pygargus</i>	(Linnaeus, 1758)	Least Concern	Schedule-I		+	M
	Shikra <i>Accipiter badius</i>	(J.F. Gmelin, 1788)	Least Concern	Schedule-I		+	R
	Brahminy Kite <i>Haliastur indus</i>	(Boddaert, 1783)	Least Concern	Schedule-I	+	+	R
	White-bellied Sea Eagle <i>Haliaeetus leucogaster</i>	(J.F. Gmelin, 1788)	Least Concern	Schedule-I		+	R
	Oriental Honey Buzzard <i>Pernis ptilorhynchus</i>	(Temminck, 1821)	Least Concern	Schedule-I		+	R
	Greater Spotted Eagle <i>Clanga clanga</i>	(Pallas, 1811)	Vulnerable	Schedule-I		+	M
Order: 13. Strigiformes							
Family: 22. Tytonidae							
	Common Barn Owl <i>Tyto alba</i>	(Scopoli, 1769)	Least Concern	Schedule-I		+	R
Family: 23. Strigidae							
	Spotted Owlet <i>Athene brama</i>	(Temminck, 1821)	Least Concern	Schedule-II	+	+	R
Order: 14. Bucerotiformes							
Family: 24. Bucerotidae							
	Indian Grey Hornbill <i>Ocyrceros birostris</i>	(Scopoli, 1786)	Least Concern	Schedule-II	+		R
Order: 15. Coraciiformes							
Family: 25. Alcedinidae							
	Common Kingfisher <i>Alcedo atthis</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R
	White-throated Kingfisher <i>Halcyon smyrnensis</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R
	Pied Kingfisher <i>Ceryle rudis</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R
Family: 26. Meropidae							
	Green Bee-eater <i>Merops orientalis</i>	Latham, 1801	Least Concern	Schedule-II	+	+	R
	Blue-tailed Bee-eater <i>Merops philippinus</i>	Linnaeus, 1767	Least Concern	Schedule-II	+	+	M
Family: 27. Coraciidae							
	Indian Roller <i>Coracias benghalensis</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R
Order: 16. Piciformes							
Family: 28. Megalaimidae							
	Coppersmith Barbet <i>Psilopogon haemacephalus</i>	(Statius Muller, 1776)	Least Concern	Schedule-II	+		R

Family: 29. Picidae							
	Black-rumped Flameback <i>Dinopium benghalense</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R
Order: 17. Falconiformes							
Family: 30. Falconidae							
	Common Kestrel <i>Falco tinnunculus</i>	Linnaeus, 1758	Least Concern	Schedule-II		+	R,M
	Peregrine Falcon <i>Falco peregrinus</i>	Tunstall, 1771	Least Concern	Schedule-I		+	R,M
Order: 18. Psittaciformes							
Family: 31. Psittaculidae							
	Rose-ringed Parakeet <i>Psittacula krameri</i>	(Scopoli, 1769)	Least Concern	Schedule-II	+	+	R
Order: 19. Passeriformes							
Family: 32. Campephagidae							
	Black-headed Cuckooshrike <i>Lalage melanoptera</i>	(Rüppell, 1839)	Least Concern	Schedule-II	+	+	R
Family: 33. Oriolidae							
	Indian Golden Oriole <i>Oriolus kundoo</i>	Sykes, 1832	Least Concern	Schedule-II	+		R
Family: 34. Vangidae							
	Common Woodshrike <i>Tephrodornis pondicerianus</i>	(J.F. Gmelin, 1789)	Least Concern	Schedule-II		+	R
Family: 35. Artamidae							
	Ashy Woodswallow <i>Artamus fuscus</i>	Vieillot, 1817	Least Concern	Schedule-II	+	+	R
Family: 36. Aegithinidae							
	Common Iora <i>Aegithina tiphia</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+	+	R
Family: 37. Dicruridae							
	Black Drongo <i>Dicrurus macrocercus</i>	Vieillot, 1817	Least Concern	Schedule-II	+	+	R
	Ashy Drongo <i>Dicrurus leucophaeus</i>	Vieillot, 1817	Least Concern	Schedule-II	+		R,M
Family: 38. Corvidae							
	Rufous Treepie <i>Dendrocitta vagabunda</i>	(Latham, 1790)	Least Concern	Schedule-II	+	+	R
	House Crow <i>Corvus splendens</i>	Vieillot, 1817	Least Concern	Vermin	+	+	R
	Large-billed Crow <i>Corvus macrorhynchos</i>	Wagler, 1827	Least Concern	Schedule-II	+	+	R
Family: 39. Alaudidae							
	Ashy-crowned Sparrow-lark <i>Eremopterix griseus</i>	(Scopoli, 1786)	Least Concern	Schedule-II		+	R
	Oriental Skylark <i>Alauda gulgula</i>	Franklin, 1831	Least Concern	Schedule-II		+	
	Jerdon's Bushlark <i>Mirafra affinis</i>	Blyth, 1845	Least Concern	Schedule-II		+	R
Family: 40. Cisticolidae							
	Common Tailorbird <i>Orthotomus sutorius</i>	(Pennant, 1769)	Least Concern	Schedule-II	+		R
	Ashy Prinia <i>Prinia socialis</i>	(Sykes, 1832)	Least Concern	Schedule-II		+	R
	Grey-breasted Prinia <i>Prinia hodgsonii</i>	Blyth, 1844	Least Concern	Schedule-II	+	+	R
	Plain Prinia <i>Prinia inornata</i>	Sykes, 1832	Least Concern	Schedule-II	+	+	R
	Zitting Cisticola <i>Cisticola juncidis</i>	(Rafinesque, 1810)	Least Concern	Schedule-II		+	R
Family: 41. Acrocephalidae							
	Clamorous Reed Warbler <i>Acrocephalus stentoreus</i>	(Hemprich & Ehrenberg, 1833)	Least Concern	Schedule-II	+		M
	Paddyfield Warbler <i>Acrocephalus agricola</i>	(Jerdon, 1845)	Least Concern	Schedule-II	+		M

Family: 42. Hirundinidae							
Barn Swallow <i>Hirundo rustica</i>	Linnaeus, 1758	Least Concern	Schedule-II	+	+	M	
Family: 43. Pycnonotidae							
Red-vented Bulbul <i>Pycnonotus cafer</i>	(Linnaeus, 1766)	Least Concern	Schedule-II	+	+	R	
White-browed Bulbul <i>Pycnonotus luteolus</i>	(Lesson, 1841)	Least Concern	Schedule-II	+		R	
Family: 44. Sylviidae							
Lesser Whitethroat <i>Sylvia curruca</i>	(Linnaeus, 1758)	Least Concern	Schedule-II		+	M	
Family: 45. Leiothrichidae							
Yellow-billed Babbler <i>Argya affinis</i>	(Jerdon, 1845)	Least Concern	Schedule-II		+	R	
Family: 46. Sturnidae							
Brahminy Starling <i>Sturnia pagodarum</i>	(J.F. Gmelin, 1789)	Least Concern	Schedule-II		+	R	
Common Myna <i>Acridotheres tristis</i>	(Linnaeus, 1766)	Least Concern	Schedule-II	+	+	R	
Bank Myna <i>Acridotheres ginginianus</i>	(Latham, 1790)	Least Concern	Schedule-II	+	+	R	
Family: 47. Muscicapidae							
Oriental Magpie Robin <i>Copsychus saularis</i>	(Linnaeus, 1758)	Least Concern	Schedule-II		+	R	
Pied Bushchat <i>Saxicola caprata</i>	(Linnaeus, 1766)	Least Concern	Schedule-II	+		R	
Family: 48. Monarchidae							
Indian Paradise-flycatcher <i>Terpsiphone paradisi</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+		R	
Family: 49. Nectariniidae							
Purple Sunbird <i>Cinnyris asiaticus</i>	(Latham, 1790)	Least Concern	Schedule-II	+	+	R	
Purple-rumped Sunbird <i>Leptocoma zeylonica</i>	(Linnaeus, 1766)	Least Concern	Schedule-II	+	+	R	
Family: 50. Estrildidae							
Indian Silverbill <i>Euodice malabarica</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+		R	
Scaly-breasted Munia <i>Lonchura punctulata</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+		R	
Tricoloured Munia <i>Lonchura malacca</i>	(Linnaeus, 1766)	Least Concern	Schedule-II	+		R	
Family: 51. Ploceidae							
Streaked Weaver <i>Ploceus manyar</i>	(Horsfield, 1821)	Least Concern	Schedule-II	+	+	R	
Black-breasted Weaver <i>Ploceus benghalensis</i>	(Linnaeus, 1758)	Least Concern	Schedule-II	+		R	
Family: 52. Passeridae							
House Sparrow <i>Passer domesticus</i>	(Linnaeus, 1758)	Least Concern	Schedule-II		+	R	
Family: 53. Motacillidae							
Paddyfield Pipit <i>Anthus rufulus</i>	(Vieillot, 1818)	Least Concern	Schedule-II	+	+	R	
White Wagtail <i>Motacilla alba</i>	Linnaeus, 1758	Least Concern	Schedule-II	+	+	M	
Western Yellow Wagtail <i>Motacilla flava</i>	Linnaeus, 1758	Least Concern	Schedule-II	+	+	M	

Oystercatcher *Haematopus ostralegus*, Sanderling *Calidris alba*, Marsh Sandpiper *Tringa stagnatilis*, Pied Harrier *Circus melanoleucos*, Peregrine Falcon *Falco peregrinus* etc. During our survey, we recorded one Eurasian Oystercatcher in the Tamil Nadu part of Pulicat Lake in April 2021.

Survey of Migratory Birds in Pulicat Lake Wetlands

Pulicat Lake, spanning across Andhra Pradesh and Tamil Nadu, serves as a crucial habitat for a diverse array of avian species. Notably, it plays a pivotal role as a daytime resting

spot for trans-Himalayan migrants, including Gadwall, Shovellers, Northern Pintail, and Common Teal, forming mixed flocks that reside here from late November to early April.

In addition to these migratory ducks, resident waterbirds such as Grey Heron, Openbill Stork, Little Cormorant, Little Egret, Intermediate Egret, and Great Egret were observed during our visits. These fish-eating birds sustain themselves by feeding on the abundant fish populations in the area. A study by Kundu *et al.* (2008) reported approximately 168 different fish species in Pulicat Lake and its surrounding water bodies, as well as 12 species of penaeid prawns, 36 species of crabs, and 19 species of mollusks (Chacko *et al.*, 1953; Selvanathan & Kaliyamurthy, 1972; Raj, 2006; Kannan & Pandiyan, 2012; Thangavelu & Sanjeevaraj, 1985).

Despite its high biodiversity, Pulicat Lake has undergone significant changes in recent years. Excessive siltation, muck deposition, and the proliferation of *Prosopis juliflora* weed along the lake's banks have made it less suitable for small waders and long-legged wading birds. This weed primarily serves as a roosting place for a few species like the Yellow-billed Babbler and the Red-vented Bulbul. Nonetheless, the lake remains a crucial habitat for a wide range of avian species. Our survey recorded a total of 88 bird species, including the Common Sandpiper, Wood Sandpiper, Eurasian Oystercatcher, and Bar-tailed Godwit. Additionally, planktonic diversity studies have revealed a high diversity of phytoplankton and zooplankton species in the lake. In summary, our study underscores Pulicat Lake's significance as a vital ecosystem for avian biodiversity and aquatic life.

Survey of Migratory Birds in Different Wetlands within Pulicat Lake

The migration of birds during their non-breeding season typically follows a north-south axis, with many species moving to milder climes at lower altitudes (Newton, 2008). During our survey of various villages, including Kamaripalem, Velukadu, Vennadu, Chhunambukumal, Mezzure, Annamalaicheri, Koridi, and Kotapalam, we observed that the drained fish pans in these locations provide an optimal foraging habitat for migratory waders, such as the Little Stint, Kentish Plover, Little Ringed Plover, Lesser and Greater Sand Plovers, Common Sandpiper, Wood Sandpiper, and Greenshank.

Resident birds, including the Grey Heron, Great Egret, Intermediate Egret, Little Egret, and Indian Pond Heron, were also present in abundance. The shallow waters of these areas prevented fishes and fingerlings from escaping, allowing these birds to assemble and feast upon them in quick succession. Despite visiting the area on three separate occasions during our surveys, no ducks were spotted in the water during our last trip in April 2021, likely due to the lack of aquatic weeds, a preferred food source for these birds.

Survey for Migratory and Resident Ducks in and around Pulicat Lake

Chilika Lagoon, near Meezuru village, hosts a substantial population of migratory ducks, including Northern Pintail, *Anas acuta*, Eurasian Wigeon, *Mareca Penelope*, Northern Shoveler *Spatula clypeata*, Garganey, *Spatula querquedula*, and Red-crested Pochard, *Netta rufina*. These ducks primarily favour freshwater and brackish water lakes for foraging, with Northern Pintails being the most numerous, followed by Shovelers. In the nearby rice paddies, farmers who also raise domestic ducks allow them to forage on harvested rice fields, which attract many migratory duck species due to the abundant food resources. These areas provide deep water, suitable for diving ducks.

While Pulicat Lake and its open water bodies attract numerous migratory ducks and waders, the freshwater wetlands and man-made tanks in the Chittoor and Nellore districts of Andhra Pradesh are equally appealing to resident ducks and cormorants. Four major seasonal water bodies in the vicinity support species like Lesser Whistling Duck *Dendrocygna javanica*, Spot-billed Duck *Anas poecilorhyncha*, and Fulvous Whistling Duck, *Dendrocygna bicolor*. The Fulvous Whistling Duck was once considered rare in the region, but increased sightings have been reported from the coastal districts of Andhra Pradesh and Tamil Nadu. Surprisingly, two water bodies within Sri City, despite their proximity to SEZ factories, host a significant breeding population of Fulvous Whistling Ducks due to effective protection against illegal fishing and bird hunting. These water bodies benefit from good monsoons and remain untouched by pollution or water diversion, making them preferred breeding grounds. While monitoring is necessary as water levels fluctuate, likely, these ducks migrate further north to

states like West Bengal and Assam during dry periods. Additionally, the water bodies within Sri City support both Lesser Whistling Ducks and Fulvous Whistling Ducks, coexisting peacefully.

Survey of Migratory Birds in Various Man-Made Water Bodies in Chittoor District Close to Sri City

Chittoor district in Andhra Pradesh boasts of numerous natural and man-made waterbodies, created primarily to support paddy cultivation. These tanks serve as temporary homes to migrant waterbirds such as the Cotton Pygmy Goose *Nettapus coromandelianus*, White-breasted Waterhen *Amaurornis phoenicurus*, and Common Moorhen *Gallinula chloropus*, with a few Open-bill Stork *Anastomus oscitans*. However, these tanks are not suitable for migratory ducks due to their shallow nature and lack

of nutrients. Furthermore, the tanks remain unprotected and are subject to degradation.

To add to the problem, there are plans to reclaim the wetlands for residential and office complexes, given the high real estate value in India, including Andhra Pradesh. As per Balachandran (2006), the degradation of wetlands habitats on the east coast of India has resulted in dwindling populations of various waterbird species in their traditional wintering sites. Factors such as rapid urbanization, unplanned development, filling and reclamation of wetlands, eutrophication, weed growth, conversion of wetlands to croplands, fragmentation of existing waterbodies, poaching, excessive pisciculture, boating, pollution from household and industrial wastes, domestic and municipal sewage, and the discharge of toxic industrial effluents from tanneries have contributed to the decline of waterbird populations in India.

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