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ORIGINAL ARTICLE





Ambazari Lake - A Potential Stopover Point Of Winter Migrants In Central India

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Abstract:

Ambazari lake [21°10′N & 79°05′E] , one of the major freshwater wetland situated 6 km.to the west of Nagpur in Central India represented 135 species (47.53%) of total avifauna (284 sp.) found in and around the Nagpur region . During the study period from 2009 to 2010, 105 species (77.77%) were recorded as resident, 17 species (12.59%) as seasonal local migrant and 13 species (09.62%) were winter migrants. The aquatic migrant birds observed were , Mallard (Anas platyrhynchos), Greater Scaup (Aythya marila) Gadwall (Anas strepers), Northern Pintail (Anas acuta), Northern Shoveller (Anas clypeata), Euresian Wigeon (Anas Penelope), Common Pochard (Aythya ferina), Garganey (Anas querquedula), Red Crested Pochard (Rhodonessa rufina) Euresian Teal (Anas crecca), Ruddy Shelduck (Tadorna ferruginea), Wood Sandpiper (Tringa glareola),

Eurasian Marsh Harrier (Circus aeruginosus) and Rosy Starling (Sturnus rosetus) and make the Ambazari lake as their wintering ground .Seasonal local migrants observed were Spot billed duck (Anas poecilorhyncha), Open billed stork (Anastomus oscitans), Little ringed plover (Charadrius dubius), Pied Crested Cuckoo (Clamator jacobinus,) Euresian sparrow hawk (Acccipeter nisus) etc.. Resident birds were observed throughout the year. Abundance and diversity of migratory birds in Ambazari lake indicate the suitability of the habitat for the migrant birds and its sustainability to use as stopover site during their migration. The obtained information will provide base line data to study the migration pattern of winter migrants lying in Central Asian Flyways as well as to manage the habitat properly.

 $\textbf{KEYWORDS} - \textbf{Ambazari lake} \ , \textbf{avifauna} \ . \ \textbf{winter migrants}, \textbf{potential stopover site}.$

INTRODUCTION

Migration is the regular seasonal journey undertaken by the birds in response to changes in food availability, habitat or weather (Berthold et.al.,2001).Long distance migrants are believed to disperse as young birds and form attachments to potential breeding sites and to favorite wintering sites. Once the site attachment is made ,they show site fidelity visiting the same wintering site year after year (Ketterson and Nolan,1990). A stopover site is any place where a migratory bird pauses for some length of time between migratory flight. Migration success depends on the availability of certain key food resources at stopover

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points along the migration route .This gives the migrants an opportunity to refuel for the next leg of the voyage.

India is of outstanding international importance for migratory birds lying on some of the Central Asian Flyway. Large number of migrants are attracted especially during winter by the extensive areas of wetlands of Indian Subcontinent . These wetlands fulfill the food and habitat requirement of migrants and help to maintain biodiversity globally.

Of the 1200 bird species found in India, around 22% are totally dependent on wetlands. Unfortunately, many ornithologically important wetlands all over the world are threatened, and the birds are under pressure from increasing human population, socio-economic activities and man-induced adverse natural phenomena. Management of such habitats is only possible by using available information on existing habitat components and the avifauna utilizing it. Present study deals with the distribution of migratory birds in and around the Ambazari lake and the utilization of the lake as a potential stopover site .

AMBAZARI LAKE

Nagpur city ,the second capital of state Maharashtra is located at geographical centre of India ($21^{\circ}07'N$ & $79^{\circ}07'E$; 307.4 meter above MSL). It has dry subtropical monsoon climatic condition with temperature range 060 c - 450 c and receives an annual rainfall of 1,205 mm (47.44 in) from monsoon rains (Geo. Inf. Nat. Inf. Centre , 2006). City has got various water bodies in its limit which harbors a variety of huge and diverse avifauna, Ambazari lake [$21^{\circ}10'N$ & $79^{\circ}05'E$] is one of the major freshwater wetland situated 6 km.to the west of Nagpur from city centre spread over an area of 15.4 sq. kms (Fig. 1). Lake is surrounded by a picturesque garden. It covers a total area of 20 acres.. The lake and surrounding area is endowed with rich flora and fauna which attract various birds .

METHODOLOGY

The survey of the residential and migratory avifauna of the lake was carried out on weekly basis by field observations through out the study period (year 2009 and 2010). The birds inside the lake ,on the shore as well as on bushes and trees surrounding the lake were observed from safe distance by using a field binocular (8X40 ,Olympus made). Birds from the adjacent garden were also surveyed . Identification was done with the help of field guides given by Ali and Ripley (1995) , Ali Slim (1996) and Grimith and Inskipp (1999). For making the list of birds, photographs (Camera - Nikon D -3100) as well as trip reports on the website www.nagpurbirds.org and actually observed birds were used as evidence . Unidentified birds were not taken into consideration .According to the status birds were categorized as Resident (R), Seasonal Local Migrant (LM) and Winter Migrant (WM) (Ali Salim 2001).

RESULT

A good number of amateurs have been working on avifauna of various water bodies in and around Napur city . The annonated checklist of Nagpur area represented 284 bird species in which Ambazari lake was included (Kasambe, 2009). But the potential stopover habitats of migrants in central India has not been yet studied properly .Out of total 135 species observed in and around Ambazari lake 105 species were recorded as resident (Table 1), 17 species were resident migrant(Table 2) and 13 as winter migrant (Table 3) . Chinchkhede and Kedar (2012) observed 13 species of winter migrants in Koradi lake of Nagpur . Giri and Chalise (2008) and Dayananda G. (2009) also observed 11 species of winter visitors in Phewa Lake ,Nepal and from the wetlands of Gudavi bird sanctuary ,Karnataka respectively.

The migratory birds were found to be wintering in the Ambazari lake during two consecutive wintering seasons of 2009 and 2010. Resident birds were observed throughout the year while migratory birds were observed from the beginning of the month of October up to the end of April . During the study period the avifaunal diversity was more in the months of winter months. This probably was due to higher movement of birds in this area in winter season. According to Kershaw and Cranswick (2003) water birds tend to be highly mobile in winter ,moving to other areas in response to factors such as cold weather and changes in water levels and in food resources. The minimum diversity was recorded in the months of monsoon due to heavy rain, increased flow of water, non-availability of food and return of migratory birds . Similar observations were also made by Bhat et al.,(2009) in Anekere wetland of Karnataka,India.

Seasonal local migrants observed were Grey Herron (Ardea cinera) Spot billed duck (Anas poecilorhyncha), Open billed stork (Anastomus oscitans), Little ringed plover (Charadrius dubius), Common Sandpiper (Actitis hypoleucos), Pied Crested Cuckoo (Clamator jacobinus), Euresian sparrow hawk (Acccipeter nisus), Oriental honey buzzard (Pernis ptilorhyncus), Darter (Anhinga melanogaster),



Great Cormorant (Phalacrocorax carbo), Black ibis (Pseudibis papillosa), Euresian Wryneck (Jynx torquilla), Common hawk cuckoo (Cuculus canorus), Brown headed gull (Larus brunnicephalus), Citrine wagtail (Motacilla c. citreola), Grey wagtail (Motacilla cinera) and Black-winged Stilt (Himantopus himantopus).

9.62% migratory birds of the total species make the Ambazari lake as their wintering ground . Deshkar et.al., (2010) also observed various migratory duck during winter in an inland wetland. Joseph Reginald et.al., (2007) observed different 17 migratory birds in Singanllur lake of Coimbatore, Tamilnadu . The winter migrants observed at Ambazari lake were as follow

1.MALLARD (ANAS PLATYRHYNCHOS)

Widely distributed across the Northern Hemisphere, North America from southern and central Alaska to Mexico, the Hawaiian Islands, and across Eurasia, from Iceland and southern Greenland and parts of Morocco (North Africa) in the west, Scandinavia to the north, and to Siberia, Japan, and China in the east. The Mallard is omnivorous and the diet seems to be made up of gastropods, invertebrates including beetles, flies, lepidopterans, dragonflies, and caddisflies as well as varieties of seeds and plant matter, and roots and tubers. (Krapu et al 1992)

2. GREATER SCAUP (AYTHYA MARILA).

The Greater Scaup has a circumpolar distribution, breeding within the Arctic Circle both in the Old World and North America. They mainly eat <u>mollusks</u>, aquatic plants, and aquatic insects, seeds, leaves, stems and roots, along with sedges and pondweeds (Banks, RC 1986).

3.GADWALL(ANAS STREPERA)

The Gadwall breeds in the northern areas of \underline{Europe} and \underline{Asia} , and central $\underline{North\,America}$.

A daytime feeder and plant materials include roots, leaves, tubers, buds and seeds of Potamogeton pectinatus, Scirpus, Ceratophyllum, Ruppia, Najas, Lemna, grasses and Chara spp.; animal materials include insects, molluscs, annelids, small amphibians, spawn and small fish (Cramp and Simmons 1977).

4.NORTHERN PINTAIL (ANAS ACUTA)

This <u>dabbling duck</u> breeds across northern areas of <u>Eurasia</u> south to about <u>Poland</u> and <u>Mongolia</u>, <u>Canada</u>, <u>Alaska</u> and the <u>Midwestern United States</u> (Robinson et.al 2002). The winter diet is mainly plant material including seeds, <u>rhizomes</u> of aquatic plants, roots, grain and other seeds in fields (Gooders et al .1997).

${\bf 5.NORTHERN\,SHOVELLER\,(ANAS\,CLYPEATA)}$

It breeds in northern areas of <u>Europe</u> and <u>Asia</u> and across most of <u>North America</u>, wintering in <u>southern Europe</u>, <u>Africa</u>, the <u>Indian subcontinent</u>, <u>Southeast Asia</u>, and <u>Central</u> and northern <u>South America</u>. (Clements and James, 2007) It can feed on a wide variety of tiny insects and planktonic crustaceans. nymph of dragonflies, flies, small fish, spawn of amphibians and tadpoles. The plant food include of Scirpus seeds, shoots and buds of aquatic plants.

6. EURASIAN WIGEON (ANAS PENELOPE)

It breeds in the northernmost areas of <u>Europe</u> and <u>Asia</u>. It is the Old World counterpart of <u>North America</u>'s <u>American Wigeon</u>. It is strongly <u>migratory</u> and winters further south than its breeding range. It migrates to southern <u>Asia</u> and <u>Africa</u>. The food is mainly leaves, stems, stolons, bulbils and rhizomes.

7. COMMON POCHARD (AYTHYA FARINA)

It breeds in the British Isles, South Scandinavia and from eastern Russia through West Siberia to Lake Baikal. Largely vegetarian and feed on rhizomes, buds shoots and seeds of aquatic plants. They also prey on crustaceans, molluscs, aquatic insect and larvae, worms and occasionally tadpoles and small fish. (Cramp and Simmons 1977).



8. GARGANEY (ANAS QUERQUEDULA)

Garganey are rare breeding birds in the <u>British Isles</u>, with most breeding in quiet marshes in <u>Norfolk</u> and <u>Suffolk</u>. One of the commonest and widespread migratory ducks in India. It feeds on insects, molluscs, annelids, young and fawn of frogs and fish. Plant materials include buds, leaves, roots, tubers and seeds of aquatic macrophytes such as Potamogeton, Scirpus, Nymphea, Polygonum, Lemna, Chara and seaweeds (Cramp and Simmonss 1977).

9. RED-CRESTED POCHARD (RHODONESSA RUFINA)

It breeds from southern France, Holland, through lower Danube south Russia east across Kirghiz steppes to West Siberia. Winters in the Mediterranean region, Myanmar and Shan States to China. It is mainly vegetarian and the food is mainly stems, leaves, roots, seeds, buds of aquatic plants especially Potamogeton and Ceratophyllum. It also prefers Chara spp. Occassionally prefers aquatic insects and larvae, small fish, frogs, crustaceans and molluscs (BirdLife International ,2004).

10. EURESIAN TEAL (ANAS CRECCA)

Eurasian Teal breeds across northern <u>Eurasia</u> and mostly winters well south of its breeding range. In winter, it shifts to a largely <u>granivorous</u> diet, feeding on <u>seeds</u> of aquatic <u>grasses</u>, including <u>sedges</u> and <u>grains</u> (Carboneras, Carles, 1992).

11. RUDDY SHELLDUCK (TADORNA FERRUGINEA)

There are very small resident populations of this species in north west <u>Africa</u> and <u>Ethiopia</u>, but the main breeding area of this species is from south east Europe across central <u>Asia</u> to <u>Southeast Asia</u>. These <u>birds</u> are mostly <u>migratory</u>, wintering in the <u>Indian Subcontinent</u>. The Ruddy Shelduck is one of the species to which the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (<u>AEWA</u>) applies. (BirdLife International, 2004).

12. WOOD SANDPIPER (TRINGA GLAREOLA)

The Wood Sandpiper breeds in <u>subarctic</u> <u>wetlands</u> from the <u>Scottish Highlands</u> across <u>Europe</u> and <u>Asia</u>. They <u>migrate</u> to <u>Africa</u> and southern <u>Asia</u>, particularly <u>India</u>. This bird is usually found on <u>freshwater</u> during migration and wintering. They forage by probing in shallow water or on wet mud, and mainly eat <u>insects</u> and similar small prey. (<u>BirdLife International 2008</u>).

13. ROSYSTARLING (STURNUS ROSETUS)

The breeding range of this bird is from easternmost <u>Europe</u> across temperate southern <u>Asia</u>. It is a strong <u>migrant</u>, and winters in <u>India</u> and tropical Asia. The Rosy Starling is highly gregarious, forming large winter flocks. It also shares other species' omnivorous diet, although it prefers insects (BirdLife International, 2004).

CONCLUSION

Ambazari lake represented 47.88% of total avifauna found in and around the Nagpur region . Such abundance and diversity of birds indicate the suitability of the habitat.

The congregation of large number of migratory species at Ambazari lake in Central India for feeding, resting and roosting is due to the abundance of food such as macrophytes, macrobenthic organisms and fishses , accessibility to food resources and availability of exposed mudflats and shorelines for roosting . Due to the heterogeneity in vegetation , the formation of different microhabitats is a common phenomenon . These microhabitat provide the niche required for diversifies fauna both micro and macroorganisms. Ambazari lake provides an ideal location as a stopover site to the ducks and waders while its surrounding area to the arboreal migrants like rosy starling . But increasing anthropogenic activities are causing disturbances to habitat and may lead to the destruction of this valuable stopover if not managed properly .

This study will be helpful to obtain comprehensive information on breeding areas of residential birds while staging and wintering areas of migrants that are globally important for the protection of



migratory birds. However available data are still insufficient to arrive at a meaningful conclusion with to the migration pattern of many species .Hence such urban wetlands should be prioritized and its conservation values should be highlighted.

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${\bf FIG.\,1.\,MAP\,SHOWING\,LOCATION\,OF\,AMBAZARI\,LAKE\,,} {\bf NAGPUR\,,CENTRAL\,INDIA}$

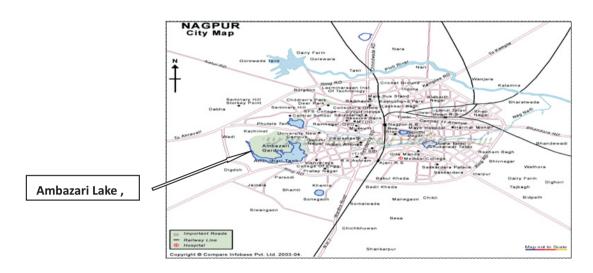


Table 1. Residential Avifauna of Ambazari lake, Nagpur Central India (2009-2010)

Sr. No.	Common Name	Zoological Name	Sr. No.	Common Name	Zoological Name
01	Jungle Babbler	Turdoides striatus	54	Yellow throated sparrow	Petronia xanthocollis
02	Common babbler	Turdoidas caudatus	55	House sparrow	Passer domesticus
03	Yellow eyed babbler	Chrysomma sinense	56	Little cormorant	Pholacocorax niger
04	Indian Robin	Saxicolaoides fulicata	57	Little grebe	Tachybaptus ruficolis
05	Oriental Magpie Robin	Copsychus saularis	58	Cattle egret	Bubulcus ibis
06	Pied Bush chat	Saxicola caprata	59	Little Egret	Egretta garzetta
07	White browed Wagtail	Motacilla madraspatensis	60	Median Egret	Mesophoyx intermedia
08	Yellow wagtail	Motaci lla flava	61	Large egret	Casmerodius albus
09	White wagtail	Motacilla alba	62	Indian pond herron	Ardeola grayii
10	Baya weaver bird	Ploceus philippinus	63	Purple Herron	Ardea purpurea
11	Black headed munia	Lonchura Malacca	64	Black crowned night herron	Nycticorax nycticorax
12	White Rumped Munia	Lonchura striata	65	Yellow Bittern	Ixobrychus sinensis
13	Red Munia	A mandara amandara	66	Cinnamon bittern	Ixobrychus cinnamomeus
14	Small buttonquail	Turnix sylvatica	67	Grey francolin	Francolinus pondicerianus
15	Ballions crake	Porzana pusilla	68	Black winged stilt	Himantopus himantopus
16	Common coot	Fulica atra	69	Greater painted snipe	Rostratula benghalensis
17	White breasted waterhen	A maurornis phoenicurus	70	Red wattled lapwing	Vanellus malabarius
18	Little tern	Sterna alibifrons	71	Yellow wattled lapwing	Vanellus malabaricus
19	River tern	Sterna aurantia	72	Euresian collered dove	Streptopelia decaocto
20	Yellow footed green pigeon	Trer on pho enic optera	73	Little brown dove	Streptopelia sensgalensis
21	Greater coucal	Centropus sinensis	74	Spotted dove	Streptopelia chinensis
22	Asian palm swift	Cypsiurus balas iensis	75	Blue rock pigon	Columba livia
23	House swift	Apus affinis	76	Rose ringed parakeet	Psittacul crameri
24	Green bee eater	Merops orientalis	77	Plum headed parakeet	Psittacula cyanocephala
25	Common Hoopoe	Upupa epops	78	Asian koel	Eudynamys scolopacea
26	Indian Roller	Coracias benghalensis	79	Pied kingfisher	Ceryle rudis
27	Coppersmith barbet	Megalaima haemacephala	80	White Breasted Kingfisher	Halcyon smyrnensis



28	Ashy crowned sparrow lark	Eremoperix grisea	81	Small Blue Kingfisher	Alcedo meninting
29	Indian Bush lark	Mirafra assamica	82	Indian pitta	Pitta brachyuran
30	Ashy drongo	Dicrurus leucophaeus	83	Bramhny starling	Sturnus pagodarum
31	Black drongo	Dicrurus macrocercus	84	Common Myna	Acridotheres tristis
32	Euresian Golden oriole	Oriolus oriolus	85	Bank Myna	Acridotheres ginginianus
33	Indian Treepie	Dendrocitta vagabunda	86	Asian Pied Starling	Strunus contra
34	Common woodshrike	Tephrodornis pondicerianus	87	House crow	Corvus splendens
35	Bay backed shrike	Lanius vittatus	88	Black kite	Milveus migrans
36	Common Iora	aegithina tiphia	89	Black shouldered kite	Elanus caeruleus
37	White browed bulbul	Pyc no notus luteo lus	90	Short toed snake eagle	Circaetus gallicus
38	Red vented bulbul	Pyc no notus cafer	91	Shikra	Accipiter badius
39	Asian Brown flycatcher	Muscicapa dauurica	92	Spotted Owlet	Athene brama
40	Verditer flycatcher	Eumyias albicaudata	93	Small Minivet	Pericrocotus cinnamomeus
41	White browed fantail flycatcher	R hipidura aureola	94	Rufous Tailed Finchlark	Ammomanes phoenicurus
42	Common Tailor bird	Orthotomus sutorius	95	Skyes Crested Lark	Galerida de va
43	Franklin's Prinia	Prinia hodgsonii	96	Small Pratincole	Glareola lacteal
44	Jungle prinia	Prinia sylvatica	97	Wire tailed Swallow	Hirundo smithi
45	Plain prinia	Prinia inornata	98	Rufous Ashy Backed Shrike	Lanius scach
46	Streaked Fantail Warbler	Cisticola juncidis	99	Common Quail	Coturnix coturnix
47	Ashy Prinia	Prinia socialis	100	House Swallow	Hirundo rustica
48	Clamorous Reed Warbler	A croc ephalus stentoreus	101	Water Cock	Gallicrex cinera.
49	Paddy field pipit	Anthus rufulus	102	Purple Moorhen	Porphyrio porphyrio
50	Oriental Tree pipit	Anthus hodgsoni	102	Cotton Teal	Nettapus coromandelianus
51	Pied Pipit	Parus nuchalis	104	Bronzed Winged Jacana	Metropidus indicus
52	Purple rumped sunbird	Nectarinia zeylonica	105	Pheasant -Tailed Jacana	Hydrophasianus chirurgus
53	Purple sunbird	Nectarinia asiatica			

Table 2. Seasonal Local Migratory Avifauna of Ambazari lake, Nagpur Central India (2009-2010)

Sr.	Common Name	Zoological Name	Sr. No.	Common Name	Zoological Name
No.					
1	Grey Herron	Ardea cinera	10	Great Cormorant	Phalacrocorax c arbo
2	Spot billed duck	Anas poecilorhyncha	11	Black ibis	Pseudibis papillosa
3	Open billed stork	Anastomus oscitans	12	Euresian Wryneck	Jynx torquilla
4	Little ringed plover	Charadri us dubius	13	Common hawk cuckoo	Cuculus canorus
5	Common Sandpiper	Actitis hypoleucos	14	Brown headed gull	Larus brunnicephalus
6	Pied Crested Cuckoo	Clamator jacobinus	15	Citrine wa gtail	Motacilla c. citreola
7	Euresian sparrow hawk	Acccipeter nisus	16	Grey wagtail	Motacilla cinera
8	Oriental honey buzzard	Pernis ptilorhyncus	17	Black-winged Stilt	Himantopus himantopus
9	Darter	Anhinga melanogaster			



Table 3. Winter Migratory Avifauna of Ambazari lake, Nagpur Central India (2009-2010)

Sr.No.	Common Name	Zoological Name	Order
1	Mallard	Anas platyrhynchos	Anseriformes
2	Greater Scaup	Aythya marila	Anseriformes
4	Gadwall Northern Pintail	Anas strepera Anas acuta	Anseriformes Anseriformes
5	Northern Shoveller	Anas clypeata	Anseriformes
7	Eurasian Wigeon Common Pochard	Anas Penelope Aythya farina	Anseriformes Anseriformes
8	Garganey	Anas querquedula	Anseriformes
9	Red-crested Pochard	Rhodonessa rufina	Anseriformes
10	Euresian Teal	Anas crecca	Anseriformes
11	Ruddy Shelduck	Tadorna ferruginea	Anseriformes
12	. Wood Sandpiper	Tringa glareola	Ciconii for mes
13	Rosy Starling	Sturnus rosetus	Passeriformes

