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Quantitative analysis of avifauna of sringar lake, near navegaon national park, maharashtra

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Abstract—Birds, the warm-blooded bipeds with amazing adaptations evolved millions of years ago from reptiles. These colorful, delicate-looking, highly evolved animals are the only creatures with feathered wings that make them capable of true and perfect flight. This ecologically valuable group of vertebrates is the subject of the present study which deals with the quantitative analysis of the various species of birds found at Sringar Lake situated 18 km from Navegaon National Park, Maharashtra towards Southeast.

The total count stands at 59 species which was differentiated into resident (45 species), seasonal local migrant (4 species), winter migrant (8 species) and summer migrants (2 species). The number of individuals of each species found during observations was noted and their average population for the year 2010 and 2011 was calculated. Several species in the bushes and on trees around the lake were also recorded which included some migrants. Human disturbances were also observed. The diverse assemblage of avifauna observed proves the richness of the habitat. Not only the lake waters, but the surroundings of the lake also attracted some of the winter and summer migrants. On the other hand, the overall decline in the number of birds of almost all the species visiting this water body is a matter of concern.

Keywords—avifauna, Navegaon National Park, quantitative analysis, Sringar Lake.

I. INTRODUCTION

Over eight thousand five hundred different species of birds in the world have been calculated by scientists and the number would rise to 30,000, if the subspecies or geographical races are considered (Merriam, E. 1960). In India, small water-storage reservoirs or tanks are a distinctive feature which provides important feeding and nesting areas for a wide range of water birds (Grimmett et al. 2001). Present study deals with one such small water-storage reservoir, Sringar Bandh, in Surban Bondgaon village, near Navegaon National Park, Gondia district, Maharashtra State, Central India.

The lake is the winter home of a number of species of migratory birds. These birds cross the continents to migrate and spend their winters in this lake attracted by a safe haven for feeding, breeding and nesting. As well the lake is a major tourist attraction because of two things- firstly because of the blooms of Nymphea, which is mistaken for the Nelumbo or *Kamal Phool* and which covers the lake entirely and gives it a beautiful look. Secondly because of the pair of Sarus that has made this lake and its surroundings its home. Since, this tallest bird of India is rare in Maharashtra State and elsewhere and is protected under Schedule I (A) of the Wildlife Protection Act (1972), and the species is listed on Appendix II of CITES, birders visiting Navegaon National Park or the Navegaon lake come to 'Sringar bandh', as it is locally called. But, a proper checklist of this particular water body and scientific documentation is yet to be done. Informal visits were made to the lake between 2010 and 2011. Here, we present the checklist of the avifauna and their average population (quantitative analysis) based on the visits made in the span of these 2 years.

Study Area

Sringar lake (Latitude- N 20°47'39.1"; Longitude- E080°08'44.1") lies 18 km southeast from the Chutia gate of Navegaon National Park (Latitude- 20°45' to 21°2'; Longitude- 80°5' to 80°15'). The lake is 16 km east from the famous Navegaon tank.. The visual estimate of the catchment area of the lake is around 20 ha.

It is a manmade reservoir and receives water from 'Itiadoh' dam and from rains. It is flanked by agricultural fields on the three sides, whereas, the western side has an elevated kuccha road running immediately along the lake, allowing easy accessibility to the periphery at the western side of the lake on foot. Running parallel to this track is a pucca road joining Gothangaon village to Surban Bondgaon village, again followed by agricultural fields. In short, the lake is in the midst of agricultural patches.

The catchment area has a variety of aquatic weeds like *ipomea, nelumbo, nymphea, nymphoidea*, etc. Thick and short reed bed patches are scattered over the lake. Duckweed is found in abundance. Fish like Rohu, Catla, Mrigal, etc. are found here, besides several invertebrates including odonates and molluscs.

Methods

The study area was visited on monthly basis from 2010 to 2011 by authors accompanied by bird enthusiasts. To observe the birds, Point count method was adopted, the point being at the kuccha mud path running parallel to the lake on western side. Data on present bird species was collected by direct observations with the help of binoculars (Olympus 8X40). Almost all the species mentioned in the checklist were photographed. For this purpose, digital camera of the make SONY model-DSC-H7 was used. The birds were observed from the elevated kuccha road and this western periphery was surveyed on foot regularly. Most of the times, the reservoir was visited in early mornings (time range: 6am to 9:30am) when the birds are most active. Some visits were also made in afternoon. Birds found in shrubs, bushes and tall trees surrounding the lake were also documented. The threats to water birds were identified through direct observation and by interviewing the local bird experts. Nomenclature in this paper follows the revised edition of Grimmett et.al, (2001). Information on species distribution and status was obtained from Salim Ali (2002) and Fisher J. (1951). Average population for each year has been calculated using the following formula:

Addition of total number of individuals of a species found in each month/12

Status of the birds was classified as:

R- Resident Species (these species are found throughout the year in the study area).

WM-Winter Migrant (these species migrate from the northern hemisphere and are found in the study area during winter only).

LM- Local Migrant (these species migrate locally within the country and are found in the study area)

SM- Summer Migrant (these species migrate from different continents and are found in the study area during summer only).

II. RESULT AND DISCUSSION

During the study period 59 species of birds were counted in and around Sringar lake , of which 45 were recorded as resident species,08 as winter migrants, 04 as local migrants and 02 were found to be summer migrants. The list of birds observed during the survey along with their scientific names and their residential status is annexed as Appendix I, whereas photographic evidences are given in Appendix IV. Appendix II and III gives the average population and comparative data of quantitative analysis in 2010 and 2011 in the form of Pie chart and Bar graph.

The surveys revealed the presence of 59 birds in and around the lake which is a remarkable number for such a small area. Avifaunal diversity of Navegaon National Park stands at 209 (Chitampalli, M. 1976) while bird checklist of Vidarbha stands at 412 (Pimplapure, A. 2009) .

Out of all the birds living on earth, approximately one fifth make the annual trip called 'migration' (Dmitriyev, Y. 1984). The regular wintering of several migratory birds such as huge flocks of Greylag goose, Pintail, Garganey, Gadwall, Wood Sandpiper, Northern Shoveller, Eurasian Wigeon, Chestnut-tailed Starling is very significant to the lake since this means that the habitat is rich enough to attract some of these one-fifth of the world's birds and make them spend their winter months here. The tree of Bombax ceiba on the western periphery is covered with red juicy blooms in summer that attracts the summer migrants, Rosy pastor (Sturnus roseus) along with several resident birds. The present observation is in agreement with the study conducted on roosting habits of rosy pastor (*Sturnus roseus)* in Poona, Maharashtra State by Mahabal, A. and Bastawade, D. (1980).

III. CONCLUSION

The results of our surveys and observations highlight the fact that avifauna here is abundant which indicates healthy status of the lake. Abundance is due to the rich and safe habitat and easy availability of protein-rich invertebrates and other food. Every organism maintains specific relations with the environment in which it lives. These relations entail different environmental parameters, eg: temperature, humidity, diet requirements, etc. (Bologna, G. 1979). High density of birds of different species at Sringar reservoir shows that this ecosystem fulfills most of these requirements and is therefore an important refuge for birds.

There are some negative aspects also. Farmers from the adjoining fields bring their cattle to the lake for drinking water. This disturbs the birds. On 29th july 2011, the Sarus pair that attracted hordes of tourists who came to visit the Navegaon National Park, died. It was suspected that they might have died after consuming 'thimet' infected insects, fish or frog. This pesticide is excessively used by the farmers in India. (www.unicondirect.com/share-price/Insecticides-(India)-Ltd-fundamental-132851*)*. Phorate (Thimet) was involved in the deaths of hundreds of waterfowl and several bald and golden eagles in South Dakota in 1989

(www.ag.ndsu.edu/pubs/ansci/wildlife/wl1017-1.htm). It was a breeding pair, which used to rear chicks every year, thus maintaining the Sarus population in the region. (Times of India news report, 30th July 2011). This pair had made the reservoir famous amongst the bird watchers and bird experts from far off areas. This was a blow to the reputation of the reservoir as a safe haven for avifauna. The Red Data status of the Sarus crane is 'Vulnerable' (IUCN, 2011).

Also, looking at the graph of Comparative Data of Quantitative Analysis in Appendix III, one can make out that the population of almost all the categories declined in 2011 as compared to 2010. It was observed that this was the result of the above mentioned problems. The population of water birds is on the decline as shown by recent studies. (Hussain, 1991; Arun Kumar *et al*., 2003).

Anthropogenic factors cause the degradation of wetland ecosystem which leads to the destruction of habitat of waterbirds. (Manikannan, R. *et al.*, 2011). Since Sringar lake is located in the midst of agricultural fields, focus should be on conservation education and awareness programmes for the local farmers, fishing community and visitors to the lake.

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APPENDIX I

Birds recorded in and around Sringar Lake during 2010-2011

Average Population = Addition of total number of individuals (of a species) found in each month/12

RESIDENT SPECIES

Sr. No.	Name of the Bird	Zoological name	Average population in 2010	Average population in 2011	Status
1	Purple Swamp hen	Porphyrio porphyrio	3	4	R
2	Common Moorhen	Gallinula chloropus	1	1	R
3	White-breasted waterhen	Amaurornis phoenicurus	2	2	R
4	Purple heron	Ardea purpurea	4	3	R
5	Indian Pond heron	Ardeola grayii	6	5	R
6	Pheasat-tailed jacana	Hydrophasianus chirurgus	3	3	R
7	Bronze-winged jacana	Metopidius indicus	2	2	R
8	Little Grebe	Tachybaptus ruficollis	3	3	R
9	Common kingfisher	Alcedo atthis	1	1	R
10	White-throated kingfisher	Halcyon smyrnensis	1	1	R
11	Pied Kingfisher	Ceryle rudis	1	1	R
12	Little Cormorant	Phalacrocorax niger	7	6	R
13	Great Cormorant	Phalacrocorax carbo	2	2	R
14	Little egret	Egretta garzetta	8	7	R
15	Cattle egret	Bubulcus ibis	10	8	R
16	Intermediate egret	Mesophoyx intermedia	3	2	R
17	Cotton pygmy-goose	Nettapus coromandelianus	6	4	R
18	Red-wattled lapwing	Vanellus indicus	4	3	R
19	Wire-tailed swallow	Hirundo smithii	12	10	R
20	Blue-winged leafbird	Chloropsis cochinchinensis	1	1	R
21	Asian Openbill	Anastomus oscitans	1	1	R
22	Sarus Crane	Grus antigone	2	0	R

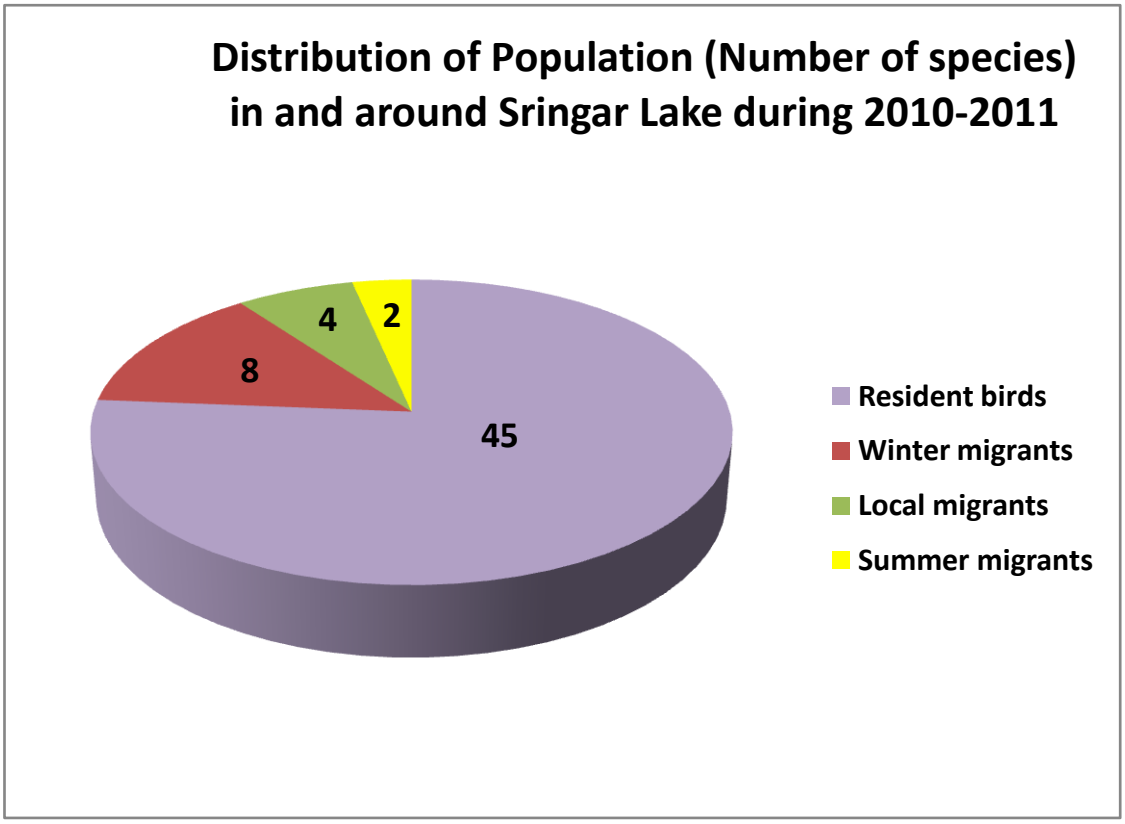
MIGRANTS

Sr. No.	Name of the Bird	Zoological name	Average population in 2010	Average population in 2011	Status
1	Common Coot	Fulica atra	4	3	LM
2	Black-headed Ibis	Threskiornis meloanocephalus	9	7	LM
3	Grey Heron	Ardea cinerea	1	1	LM
4	Darter	Anhinga melanogaster	1	1	LM
5	Greylag Goose	Anser anser	40	38	WM
6	Gadwall	Anas strepera	3	3	WM
7	Northern Pintail	Anas acuta	8	6	WM
8	Wood Sandpiper	Tringa glareola	4	4	WM
9	Northern Shoveler	Anas clypeata	6	5	WM
10	Eurasian Wigeon	Anas Penelope	8	6	WM
11	Chestnut-tailed Starling	Sturnus malabaricus	5	5	WM
12	Garganey	Anas querquedula	6	5	WM
13	Pied cuckoo	Clamator jacobinus	2	2	SM
14	Rosy Starling	Sturnus roseus	35	35	SM

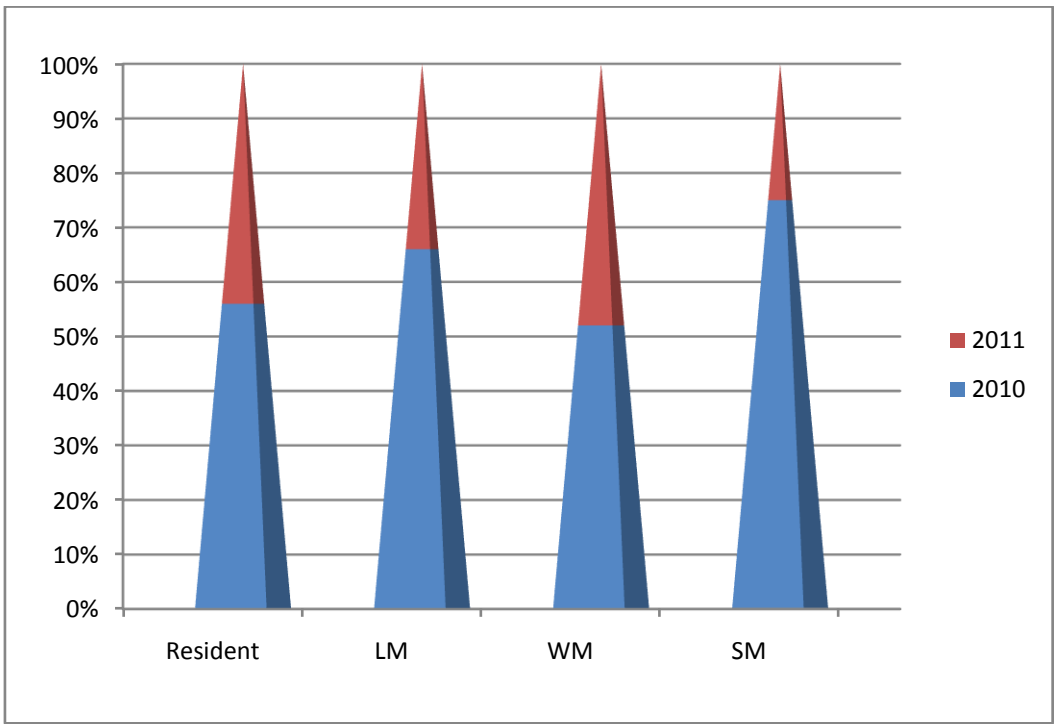
AROUND THE LAKE

Sr. No.	Name of the Bird	Zoological name	Average population in 2010	Average population in 2011	Status
1	Ashy prinia	Prinia socialis	1	1	R
2	Indian Silver bill	Lonchura malabarica	6	5	R
3	Green bee-eater	Merops orientalis	4	5	R
4	Black drongo	Dicrurus macrocercus	4	3	R
5	Laughing dove	Streptopelia senegalensis	8	9	R
6	Red-vented bulbul	Pycnonotus cafer	7	7	R
7	Long-tailed Shrike	Lanius schach	1	1	R
8	Brahminy Starling	Sturnus pagodarum	6	8	R
9	House Sparrow	Passer domesticus	13	12	R
10	Ashy-crowned Sparrow Lark	Eremopterix grisea	2	1	R
11	House Crow	Corvus splendens	7	6	R
12	Indian Robin	Saxicoloides fulicata	2	2	R
13	Oriental Magpie Robin	Copsychus saularis	2	2	R
14	Jungle Babbler	Turdoides striatus	6	6	R
15	Asian Pied starling	Sturnus contra	8	7	R
16	Common mynah	Acridotheres tristis	4	4	R
17	Common Iora	Aegithina tiphia	1	1	R
18	Asain Koel	Eudynamys scolopacea	2	2	R
19	Black-rumped flameback	Dinopium benghalense	1	1	R
20	White-browed Bulbul	Pycnonotus luteolus	1	1	R
21	Rose-ringed Parakeet	Psittacula krameri	4	4	R
22	Spotted Dove	Streptopelia chinensis	2	2	R
23	Eurasian Golden Oriole	Oriolus oriolus	1	1	R

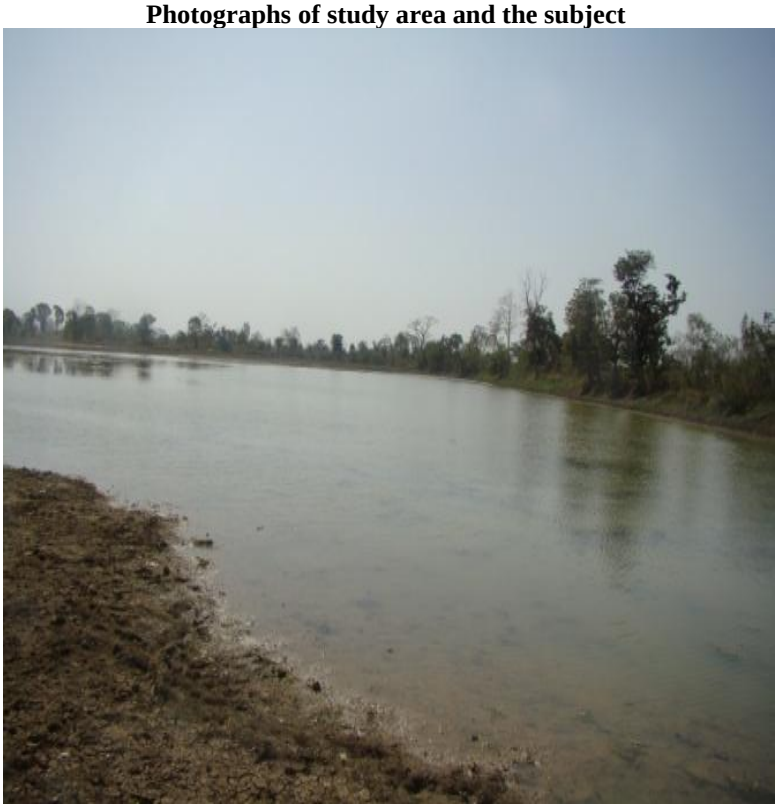
APPENDIX II



APPENDIX III
Comparison of average population in 2010-2011



APPENDIX IV
Photographs of study area and the subject



1. Sringar lake

2. The Nymphea blooms

3. Flocks of Greylag Goose

4. Pair of Sarus Crane

5. Rosy Starling

6. Migrants in the lake