



SURVEY OF AVIFAUNAL DIVERSITY IN SIX DIFFERENT PONDS AT TIRUNELVELI DISTRICT, TAMILNADU, INDIA

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Abstract:

"Birds as best indicators at wetland function or as a measure of success in wetland management, restoration and creation". In a wetland, multiple of habitats are available in a small area which attracts different species of water fowls. A preliminary survey of wetland birds were conducted in March 2017. Six selected wetlands were surveyed in Tirunelveli District, Tamil Nadu, India. Species diversity and total number of birds were calculated. Totally 2,675 birds belonging to 132 species and 26 families under 15 orders were recorded. Of the total wetland birds recorded, 86% were least concern and 10% were near threatened species, 2 % not recognized species and 2% vulnerable species were recorded. The study also revealed that the wetland harbors plenty of resident as well as few migratory birds. Hence this study was taken up to assess the status of wetlands and this site could be protected for these birds.

Key Words: Wet Lands, Diversity, Migratory Birds & Conservation Threats

Introduction:

Wetlands cover 4-6% at the earth's surface and are considered to be one of the most productive ecosystems on earth surfaces (WWF / ICUN 1988, Maltby 1991, Wetlands International Africa 2009). Globally many wetlands are under threat (Finlayson and Moser 1991, Cowan 1995, Davies and Day 1998, Terpstra 2003). Wetlands were lost in the 20th century, mainly to agriculture and urbanization. At the same time loss of water bird habitats through direct and indirect human interferences has led to a decline in several bird population, Natural wetlands provide important functions that are essential to the functioning of biotic communities and maintaining quality of the environment (*Noble and Hemesns 1978*). These include flood control, sedimentation and nutrient retention, and food chain support (*Maltby 1991*). Water birds as top tropic organisms in wetlands, are intricately linked to these system and are dependent on these system for survival and in particular for the provision of food, nesting material, breeding and roosting habitats (*Dennis and Tarbotton 1993*). Generally wetlands are used by host of different species which either exploit them throughout the year (resident species) or for only part of the year (migrant and nomadic species). Thus, wetland sites whether at a local scale or a global or fly way scale form important habitat chains for water birds which are mobile and able to use a variety of different sites throughout the year. Monitoring of wetland birds provides valuable information and also essential tool for developing awareness to the conservation of wetland birds. Hence this, study was conducted to analyze the diversity of wetland birds and to identify the consequences of direct and indirect human interferences. This might be helpful to improve the habitat, pave the way for future research and formulation of an effective strategy for conservation of important wetlands in Tirunelveli.

Materials and Methods:

The study area is located in Tirunelveli district Tamilnadu, India. The study was carried out in six different ponds namely Nainarkulam (8°43'59.5"N 77°41'30.5"E), Rajavallipuram (8°47'28.75"N 77°45'00.85"E), Pathamadai (8°39'46.71"N 77°35'31.04"E), Pirancheri (8°39'24.37"N 77°37'37.39"E), Senthimangalam (8°45'02.35"N 77°43'20.86"E), Veppankulam (8°45'39.39"N 77°41'45.47"E). Six wetlands were surveyed in Tirunelveli, for a period of one month. Birds were observed from 6 a.m to 11a.m by using olympus binoculars (10 x 50) and photos were taken by using cannon camera (EOS 1100D) . The recorded species were identified using the books of "Birds of the Indian subcontinent" by (*Richard Grimmett, et al.,2007*) and Field Guide wetland birds of Tamil Nadu (*Ganesh,et .al., 2014*). The bird population was estimated by direct counting method. In this method, a suitable vantage point is selected and all visible birds are counted. Another method "total count" was used wherever possible by walking around the wetlands. Data were analyzed by using the Shannon-wiener function formula; species diversity $H = -\sum (P_i \cdot \ln P_i)$.

And also some threats were observed in the study area. The check list was prepared based on the field work conducted in six different ponds in Tirunelveli.

Result:

Total number of birds recorded were given in Figure 1 and the list of birds which were encountered during the study period and their IUCN status in Figure 2 and their migratory status in Figure 3. Total number of birds observed in the study period were given in Table 1. Lists of bird species with common name, scientific

name, family, ICUN status and migratory status of identified wetland birds in the study area were given in Table 2.

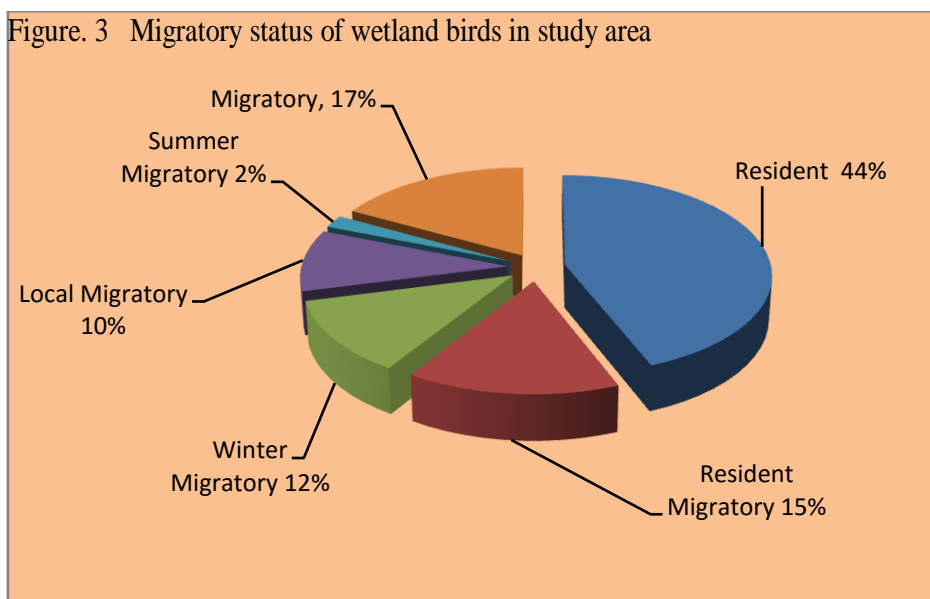
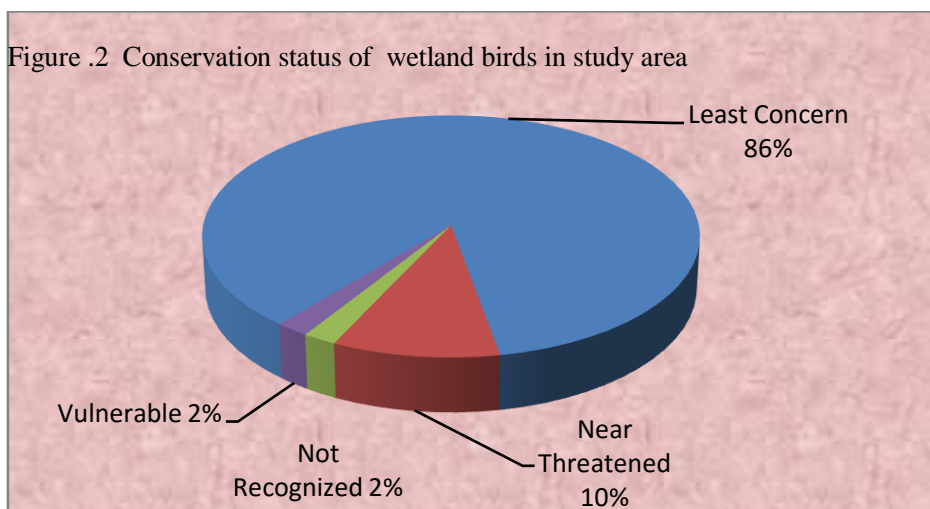
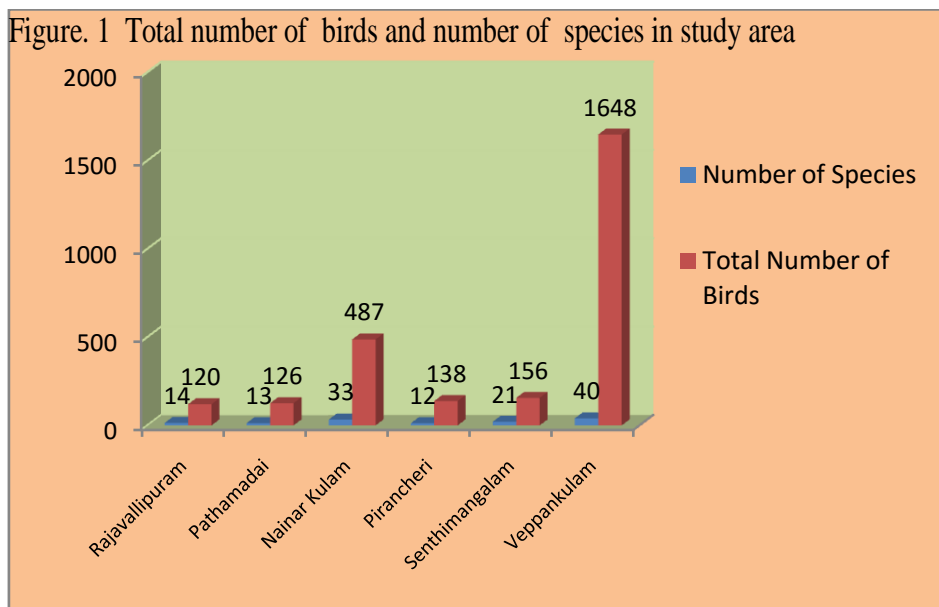


Table 1: Total number of birds observed in the study area

Name of the Pond	Number of birds species	Total number of birds	Number of families	H-Diversity
Rajavallipuram	14	120	8	2.11
Pathamadai	13	126	7	2.01
Nainarkulam	33	487	22	2.83
Pirancheri	12	138	10	2.15
Senthimangalam	21	156	13	2.67
Veppankulam	40	1648	19	2.99

Table 2: Identified bird species from the study area

S.No	Order	Family	Scientific Name	Common Name	No. of Species	IUCN Status	MS	
1	Accipitriformes	Accipitridae	<i>Milvus migrans</i>	Black kite	2	LC	R	
2			<i>Haliastur indus</i>	Brahminy kite	1	LC	R	
3			<i>Milvus migrans</i>	Black eagle	5	LC	M	
4	Anatidae		<i>Sarkidiornis melanotos</i>	Comb duck	50	LC	WM	
5			<i>Anas poecilonrhyncha</i>	Indian spot-billed duck	250	LC	R	
6			<i>Anas clypeata</i>	Northern shoveler	30	LC	M	
7			<i>Spatula querquedula</i>	Garganey	50	LC	WM	
8	Charadriiformes	Recurvirostridae	<i>Himantopus himantopus</i>	Black-winged stilt	321	LC	R	
9		Jacanidae	<i>Hydrophasianus chirurgus</i>	Pheasant-tailed Jacana	8	LC	R	
10			<i>Metopidiu indicus</i>	Bronze-winged jacana	7	LC	R	
11		Sternidae	<i>Sterna aurantia</i>	River Tern	4	NT	RM	
12		Scolopacidae	<i>Tringa ochropus</i>	Green snad piper	9	LC	M	
13			<i>Tringa stagnatils</i>	Marsh sand piper	2	LC	M	
14			<i>Tringa glareola</i>	wood sand piper	86	LC	M	
15		Charandriidae		<i>Vanellus indicus</i>	Red wattled lapwing	83	LC	R
16				<i>Charadrius dubius</i>	Little ringed plover	9	LC	WM
17				<i>Vanellus malabaricus</i>	Yellow-wattled lapwing	12	LC	SM
18	Ciconiiformes	Ciconiidae	<i>Mycteria leucocephala</i>	Painted stork	105	NT	RM	
19			<i>Anastomus oscitans</i>	Asian spoon bill	14	LC	LM	
20			<i>Ciconia episcopus</i>	Woolly necked stork	6	VU	M	
21		Mero pidae	<i>Merops philippinus</i>	Blue-tailed bee eater	37	LC	RM	
22		Alcedinidae	<i>Halcyon smyrnensis</i>	White throated king fisher	24	LC	R	
23	<i>Ceryle rudis</i>		Ppied king fisher	5	LC	R		
24	Gruic formes	Rallidae	<i>Amaurornis phoenicurus</i>	white breasted waterhen	4	LC	R	
25			<i>Porphyrio poliocephalus</i>	Gray headed swaphen	175	NR	R	
26			<i>Fulica alra</i>	Eurarcan coot	120	LC	M	
27	Pelecaniformes	Ardeidae	<i>Ardea purpurea</i>	Purpleheron	8	LC	LM	
28			<i>Ardea moderta</i>	Great Egret	7	LC	R	
29			<i>Egretta garzetta</i>	Little Egret	27	LC	R	
30			<i>Babulcusibs coromandus</i>	Cattle Egret	216	LC	R	
31			<i>Ardeola grayii</i>	Indian pond heron	118	LC	R	
32			<i>Ardea cinerea</i>	Gray heron	12	LC	WM	
33		Threskiornithidae	<i>Threskiornis melancephalus</i>	Black headed Ibis	27	NT	R	
34			<i>Pseudibis papillosa</i>	Red naped Ibis	47	LC	R	
35			<i>Platalea leucorodia</i>	Eurarian spoonbill	89	LC	M	
36			<i>Plegadis falcinellus</i>	Glossy Ibis	170	LC	RM	
37	Pelecanidae	<i>Pelecanus philippensis</i>	Spot billed pelican	74	NT	M		
38	Passeriforms	Motacillidae	<i>Motacillia flava</i>	western yellow wag tail	18	LC	WM	
39			<i>Motacilla alba</i>	White wag tail	11	LC	RM	
40		Corvidae	<i>corvus splendens</i>	House crow	50	LC	R	
41		Hirundinidae	<i>Hirundo rustica</i>	Bran swallow	59	LC	RM	
42		Dicruridae	<i>Dicrurus macro cirus</i>	Black Drongo	26	LC	R	
43		Sturnidae	<i>Acridotheres tristis</i>	Common myna 75	75	LC	R	
44	Suliforms	Phalacrocoracidae	<i>Phalacrocora fuscicdlis</i>	Indian carmornant	29	LC	RM	
45			<i>Micro carboniger</i>	Little carmonant	23	LC	RM	

46			<i>Anhinga melanogaster</i>	Oriental darter	5	NT	LM
47	Apodiformes	Apodidae	<i>Halcyon smyrnensis</i>	Asian plum swift	84	LC	LM
48	Cypseliformes	Coraciidae	<i>Coracias benghalensis</i>	Indian roller	7	LC	R
49	Psittaciformes	Psittaculidae	<i>Psittacula kramerci</i>	Rose ringed parakeet	20	LC	R
50	Passeriformes	Nectarinidae	<i>Cinnyris aridicus</i>	Purple sunbird	7	LC	R
51	Podicipedi formes	Podicipedidae	<i>Tachybapus ruficollis</i>	Little grebe	25	LC	LM
52	Phenicopteriformes	Phoenicopteridae	<i>Phoenicopus roseus</i>	Greater flamingo	22	LC	WM

(R – Resident; M- Migrant; RM – Resident Migrant; LC – Local Migrant; WM – Winter Migrant; SM – Summer Migrant ; LC – Least Concern; NT – Near Threatened; NR – Not Recognized ; VU – Vulnerable species)

Discussion:

Six wetlands were surveyed in Tirunelveli district, During the study period 2,675 birds belonging to 132 species and 26 families under 15 orders were recorded. From the study area total number of birds and their diversity were calculated. In the present study maximum diversity of birds were recorded in Veppankulam (2.99) followed by Nainarkulam (2.83), Senthimangalam (2.67) Pirancheri (2.15) Rajavallipuram (2.11) and minimum diversity in Pathamadai (2.01). The study also revealed that total wetland birds recorded 86% Least Concern (LC) and 10% were near threatened (NT) species, which includes, painted stork (*mycteria leucocephala*) spot billed pelican (*pelecanus philipinenses*), Black headed Ibs (*Threskiornis melanocephalus*). Rivertern (*sterna curantia*), Oriental Darter (*Anhinga melanogaster*), and 2% not recognized (Gray headed swaphen) and 2% vulnerable species (*woolly necked stork*) The above threatened species protected status under the schedule IV of Indian wild life protection Act, 1972. (Arora k.ForestLaw. 2003) and others are least concerned.

Residential status of wetland birds also observed in the study area. Resident birds (R) were found as the most predominant with 44% followed by the Resident migratory (RM) 15%, Migratory 17%, Winter migratory 12 %, Local migratory 10% and Summer migratory 2% (SM). From the study plenty of resident as well as few migratory birds arrival and departure from the wetland was found here because of adequate food and shelter. The wetland birds are in general heterogeneous in their feeding habits (*Alis and Ripley* 1987). In the present study it was noted that habitat was richly supported by different aquatic fauna like fishes, water plants and planktons. These supplied the primary feed and the irrigated agricultural fields around the pond were also noted to be rich in feed. In Pathamadai lowest diversity of birds were found because of shortage of feed. The rich diversity of birds documented in Veppankulam during the present study may be because of availability of varied sources of feed as well as foraging.

Conclusion and Suggestion:

In a wetland ecosystem this area is important for the breeding and roosting birds and several other taxa of fauna and flora. Besides human activities such as sewage discharge, throwing of domestic garbage, weed infestation were some of the threats found in the wetland. The present study proved that, if the present ecological characteristics of this wetland continues, the birds would be unable to inhabit this habitat in the future. Unfortunately there are no laws till date to protect urban wetlands in particular, and we highlight here urgent need for the policy to conserve urban wetlands and related ecosystem (Jeyapraba, 2017). This area being one of the main habitats of wetland birds so, it should be maintain properly, which would be attract more number of bird species.

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