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## Blooming Faunal Diversity of Nawabganj Bird Sanctuary, Unnao, Uttar Pradesh, India

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### ABSTRACT

A study of faunal diversity in Nawabganj Bird Sanctuary was done during January 2013 to December 2013. This Sanctuary has an area of 224.60 hectares. The state and nature of the habitat plays a crucial role in diversity and population composition of fauna in study area. For their basic needs, food, roosting and breeding etc., various fauna prefer this site. According to this study Nawabganj Bird Sanctuary is an ideal wetland. The result includes 150 species of birds belonging to 17 orders and 46 families, 10 orders of insects with 61 species, 12 species of fishes belonging to 5 families, 16 species of reptiles, 3 species of amphibians belonging to 14 families, 4 species of mollusks belonging to 3 orders, 3 species of annelids belonging to 3 orders and 12 species of mammals belonging to 10 families from Nawabganj Bird Sanctuary. All these faunal species depend on the wetland flora and fauna and nearby agriculture fields.

### 1) INTRODUCTION

Nawabganj Bird Sanctuary (NBS) is situated in Tehseel Nawabganj of District Unnao at National Highway- 25. Nawabganj Bird Sanctuary is about 45 Km from Lucknow at Lucknow-Kanpur National Highway. This bird sanctuary is established in year 1984 under Wild Animal Protection Law 1972. The main aim of establishment of NBS is the protection and conservation of residential as well as migratory birds' species in wild. NBS also have a lake (wetland) which is a good habitat for various flora and fauna. Wetlands are defined as land transitional between terrestrial and aquatic ecosystem where the water table is usually at or near the surface or the land is covered by shallow water [1].

Faunal diversity including both invertebrates and vertebrates are considered as bio-indicators of well flourished and stable wetland ecosystems and form a strong link in many aquatic food chains that affect a wetland ecosystem directly or indirectly. Hussain et al., [2] has explored the avifaunal profile of Chilka Lake in Orissa to know the status and diversity of avifauna. According to Urfi et al., [3] faunal diversity specially water birds attract people towards the wetlands and also a good bio-indicators. Monitoring of faunal diversity is useful for studying a variety of environmental problems. Brinson and Malvárez [4] observed the status and threats of wetland and determined the different factors responsible for losses and degradation of its diversity. Few reasons for the loss of biodiversity are diversions and damming of river flows, disconnecting flood plain wetlands from flood flows,

eutrophication, contamination, grazing, harvests of plants and animals, global warming, invasions of exotics, the practices of filling, dyking and draining etc.

Deshkar et al; [5] found that the wetlands influence congregation of migratory or residential species of birds, the variation in bird aggregation. They also discussed that various abiotic parameters play an important role to make up the density as well as diversity of fauna. Balapure et al., [6] carried out survey and made observations on the occurrence and diversity of water birds, family wise percentage composition and spatial variation in species richness in Barna reservoir from March 2009 to February 2011. Talmale et al., [7] observed the avian diversity of Singhori Wildlife Sanctuary of Raisen District.

Singh et al. [8] highlighted the faunal diversity during rainy season in reclaimed sodic land and also pointed that faunal diversity is an indicator of soil amelioration. Mohan et al., surveyed and monitored the avian diversity of Jajiwal pond. A detail account of Hemiptrans population of Durgavati Wildlife Sanctuary, Damoh, Madhya Pradesh had been done by Chandra et al., [9]. NBS is a protected area that has a variety of flora and fauna. This study site abode a number of migratory as well as residential birds and many invertebrates' species so this site is a suitable area for study of faunal diversity.

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## 2) MATERIAL AND METHODS

**Study Area:** Nawabganj Bird Sanctuary (NBS) is about 45 Km from Lucknow geographically located at 26° 34' N and 80°40' (Fig.1 A & B). The average rainfall is about < 1,000 mm per annum and the temperature ranges from 1° C to 48° C, humidity is about 94%.NBS extends over 224.60 hectare area. There is a canal near the sanctuary which is a permanent water source for wildlife. NBS Lake has scenic beauty and is a tourist place that has a great economic value. It is a protected area and favourable place for residential as well as migratory birds for the breeding and feeding purposes.



Fig: 1A Layout Map of Study Area



Fig: 1B Map of Study Area

(Source: Google map)

Ecological survey of annelids, insects, mollusks, fishes, amphibians, reptiles, birds and mammals were carried out twice in each month from January 2013 to December 2013. Faunal population was observed and monitored twice in a day (morning and evening time). Observations and monitoring were done with the aid of an Olympus 10x50 binocular and photography was done with 60 D SLR Cannon camera.

**Identification of Invertebrates:** The invertebrates include annelids, butterflies, dragonflies, spiders and mollusks that were identified up to species and order level. The line transects and quadrat- grid methods were used for studying invertebrates. Insects were collected by net and insect trappers. The invertebrates were collected by Direct Searching, Hand Collecting, Sweep Sampling and Beat Sampling methods and identified using Sebastian, and Peter [10], Singh[11], Balmer [12], Kehimkar [13], Subramanian [14], Apte [15], Oliver [16], Subba Rao [17].

### Identification of Vertebrates:

**Fishes:** Net was used for survey of fishes. Transect of 1 to 100 meter was taken for fishes study. The species were identified using Heda [18], Daniels Ranjit [19], Fishes of U.P. and Bihar by Gopalji Srivastava [20].

**Amphibians and Reptiles:** Amphibians and Reptiles were observed by visual encounter or sighting. The species were identified using Daniel [21], Gururaja [22], Daniels Ranjit [23], Whitaker, and Captain [24].

**Birds:** Birds were monitored using “Line Transect” and “Point Count Methods” in a pre-defined area. A line transect of 1-100 meter was prepared and the birds were monitored on both the sides of transect by close end transect up to 2 Km. without stopping. The birds were identified using standard field guide books of Ali & Ripley [25], Grimmett et al., [26] and Salim Ali [27]. Following assumptions were used to drive the abundance of each species [28].

A=Abundant, C= Common, U= Uncommon and O= Occasional

Status of species is classified in to Resident(R), Local Movement (LM) and Winter Visitor (VW) from Central Asian Countries is included in Migrants.

**Mammals:** observation and identification of mammals by visual encounter and vocal identification. The species were identified using Menon, V. [29], Roberts, T. J. [30].

## 3) RESULTS AND DISCUSSION

NBS and its lake are very wealthy in terms of floral diversity as well as faunal diversity. The forest in NBS has Babul (*Acacia nilotica*), Safeda (*Eucalyptus*), Arjun tree (*Terminalia arjuna*), Gurhal (*Hibiscus rosa-sinensis*), Neem (*Azardiachta indica*), Jungle Jalebi (*Pithecello biumdulce*), *Baugainvillia*, khair (*Acacia catechu*), Kadamba (*Anthocephalus cadamba*) and Bamboo. It is also infested with vegetation like Jal khumbhi (*Eichornia crassppes*), Water chest nut (*Trapa natans*),Jussiaea (*Jussiaea repens*),Water meal (*Wolfia globosa*),Sacred lotus (*Nelumbo nucifera*), Water lily (*N. pubescens*), Coon tail (*Ceratophyllum demersum*),Hydrilla (*Hydrilla verticillata*), Cyprus (*Cyprus alopecuroides*), Pond weed (*Potamogeton nodasus*),Patera cuttail (*Typha lotifolia*),Big duck weed (*Spirodela polyrhiza*), Gerga grass (*Zizania acuatica*), Water spinach (*Ipomea aquatic*) and Smart weed (*Polygonum limbatum*) are common water weeds species in Nawabganj Bird Sanctuary.

**Invertebrates:** The invertebrate identified during study belong to the Order Ephenuroptera, Odonata, Orthoptera, Mantodea, Phasmida, Hemiptera, Coleoptera, Diptera, Lepidoptera and Hymenoptera of Phylum Insecta. In mollusks, only 4 species of 3 orders (Architaenioglossa, Hygrophila and Unionoida) were reported while 3 species of 3 orders (Haplotaxida, Hirudinida and Arhynchobdellida) were reported from Phylum Annelida. The species of insects,

mollusks and annelids identified at Nawabganj Bird Sanctuary are shown in Table 1. Diversity and structure of the arthropods in central Panama exposed arthropods abundance [31] in this area. Nine species of mollusks in sodic land of Uttar Pradesh suggested that soil arthropods and earthworm could improve the restoration and conservation of biodiversity [8].

**Table 1: Invertebrates Species Reported In Nawabganj Bird Sanctuary**

S. No	Order	Common name of Species	Scientific name of Species		
1.	Ephemeroptera	May-fly	<i>Caenis sps.</i>		
2.	Odonata (Dragonfly)	Asiatic Blood tail	<i>Lathrecista asiatica</i>		
		Ruddy Meadow Skimmer	<i>Neurothemis intermedia</i>		
		Rusty Darner	<i>Anaciaeschna jaspidea</i>		
		Little Blue Marsh Hawk	<i>Orthetrum laucum</i>		
		Common Hooktail	<i>Paragomphus lineatus</i>		
		Ditch Jewel	<i>Brachythemis cotaminata</i>		
		Common Club-Tail	<i>Ictinogomphus rapax</i>		
		Blue Darner	<i>Anaximmaculifrons</i>		
		Fulvous Forests Skimmer	<i>Neurothemis fulvia</i>		
		Pied Paddy Skimmer	<i>Neurothemis tullia</i>		
		Blue-tailed Green Darner	<i>Anax guttatus</i>		
		Trumpet tail	<i>Acisoma panorpoides</i>		
		Coral-tailed Cloud Wings	<i>Tholymis tillarga</i>		
		Granite Ghost	<i>Bradinopyga geminata</i>		
		Coromandel Marsh Dart	<i>Ceragrana caromandelianum</i>		
		(Damsely)	Yellow Bush-Dart	<i>Copera marginipes</i>	
			Blue Grass Dartless	<i>Pseudagrion microcephalum</i>	
			Golden Dartless	<i>Ichnura aurora</i>	
		3.	Orthoptera	Super-throated grasshopper	<i>Cyrtacanthacris tatarica</i>
				Short-horned grasshopper	<i>Shistocerca sp.</i>
Common Indian grasshopper	<i>Acrida exaltata</i>				
Silent slanted-face grasshopper	<i>Acrida cinerea</i>				
4.	Mantodea	Praying Mantis	<i>Sphodromantis viridis</i>		
5.	Phasmida	Indian Walking Stick	<i>Carausius morosus</i>		
6.	Hemiptera	Lantern Bug	<i>Zanna affinis</i>		
		Water Spider	<i>Gerris sp.</i>		
7.	Coleoptera	Water Hyacinth Weevil	<i>Neochitina eichhorinae</i>		
8.	Diptera	Mosquito	<i>Aedes sp. female</i>		
		Bee-Fly	<i>Anastoechus</i>		

9.	Lepidoptera (Butterfly)		<i>barbatus</i>	
		Common Jay	<i>Graphium doson</i>	
		Common Mormon	<i>Papilio polytes</i>	
		Common Raven	<i>Papilio castor</i>	
		Lime Butterfly	<i>Papilio demoleus</i>	
		Common Rose	<i>Astrophaneura aristolochiae</i>	
		Great Jay	<i>Graphium euryplus</i>	
		Small Grass Yellow	<i>Eurema brigitta</i>	
		Common Grass Yellow	<i>Eurema hecabe</i>	
		Tree Yellow	<i>Gandoca harina</i>	
		Common Emigrant	<i>Catapsilia Pomona</i>	
		Common Gull	<i>Cepora nerissa</i>	
		Painted Sawtooth	<i>Prioneris sita</i>	
		Common Jezebel	<i>Delias eucharis</i>	
		Tailless Line Blue	<i>Prosotas dubiosa indica</i>	
		Dark Grass Blue	<i>Zizeeria karsandra</i>	
		Blue Tiger	<i>Tirumala limniace</i>	
		Striped Tiger	<i>Danaus genutia</i>	
		Plain Tiger	<i>Danaus chrysippus</i>	
		Common Evening Brown	<i>Melanities leda</i>	
		Common Lasear	<i>Pantoporia hordonia</i>	
		Common Castor	<i>Aridine merione</i>	
		Blue Pansy	<i>Junonia orithiya</i>	
		Grey Pansy	<i>Junonia atlites</i>	
		Lemon Pansy	<i>Junonia lemonias</i>	
		Peacock Pansy	<i>Junonia almana</i>	
		Great Eggfly	<i>Hypolimnas bolina</i>	
		Danaid Eggfly	<i>Hypolimnas misippus</i>	
Pioneer	<i>Belenois aurota</i>			
10.	Hymenoptera	Vespid wasp	<i>Polistes hebraeus</i>	
		Honey bee	<i>Apis indica</i>	
		Weaver ant	<i>Oecophylla smaragdina</i>	
11.	(Mollusks ) Architaenioglossa	Apple snail	<i>Ampullariidae</i>	
		Hygrophila	Ram's horn snail	<i>Plonorbis plonorbis</i>
			Great Pond snail	<i>Lymnaea stagnalis</i>
Unionoida	Unio	<i>Lamellidens marginalis</i>		
12.	(Annelids ) Haplotaxida	Common Earthworm	<i>Pheretima posthuma</i>	
		Hirudinida	Cattle leach	<i>Hirudinaria granulosa</i>
	Arhynchobdellida	Indian leach	<i>Haemadipsa sylvestris</i>	

The highest butterfly diversity was found in month of February and August-September due to availability of food in the form of flower nectar of plants such as common milk-weed (*Asclepias syriaca*), Butterfly bush (*Buddleja*), Marigold (*Calendula officinalis*) and Oregano (*Oreganum*) and their breeding season. The insect (all insects) diversity was observed minimum in May because of windy conditions. The diversity of mollusks and annelids was more in monsoon season. 28 species were reported from order Lepidoptera and

single species from orders Ephemeroptera, Mantodea, Phasmida, Coleoptera, Architaenioglossa, Unionoidea, Haplotaenidia and Arhynchobdellida (Fig. 2). Hence, Lepidoptera was found to be most dominant order followed by Odonata with 18 species, Orthoptera with 4 species, Hymenoptera with 3 species, Hemiptera, Diptera and Hygrophila each with 2 species (Fig. 3).

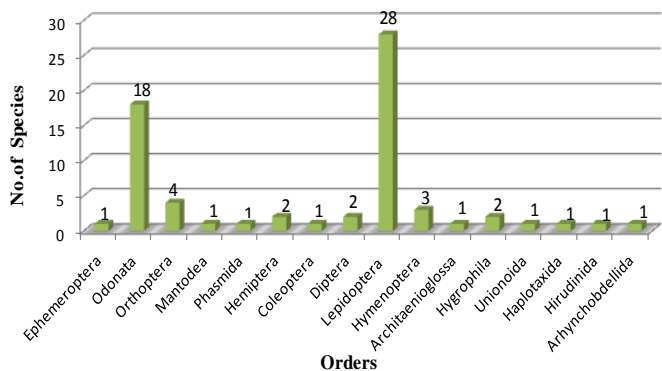


Fig:-2 Invertebrates species diversity under different order in Nawabganj Bird Sanctuary.

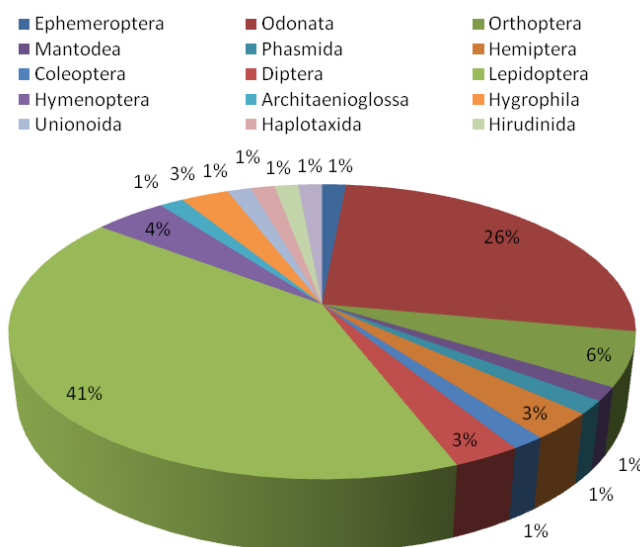


Fig:-3 Different order of invertebrates (%) in NBS.

**Vertebrates**

**Fishes:** Total 12 species of fishes were observed in NBS belonging to Cyprinidae, Chandidae, Bagridae, Clariidae and Heteropneustidae families. Maximum number of species (6) was of family Cyprinidae followed by family Chandidae with 3 species while least species (1) belonged from the families of Bagridae, Clariidae, Heteropneustidae.

**Amphibians and Reptiles:** Overall 3 species of amphibians were recorded in NBS; belong to Bufonidae and Dicoglossidae families. A total of 16 species of reptiles were observed in NBS and belong to 12 families. According to the study conducted by Kanaujia and Kumar, [32], a total of 25 species of amphibians and 64 species of reptiles have been observed from Uttar Pradesh.

**Mammals:** 14 species of mammals were reported belonging to 10 families.

Fishes, reptiles and mammals diversity also had reported by Kumar and Srivastava; [33] from Sandi Bird Sanctuary, Hardoi.

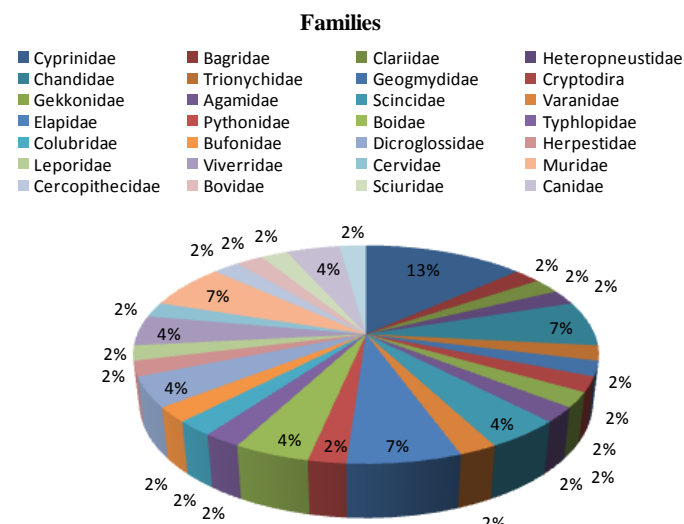


Fig:-5 Family wise percentage composition of vertebrates in NBS.

Recorded vertebrate (excluding birds) species of Fishes, Reptiles and Amphibians and Mammals in NBS are shown in Table.2. Maximum 6 species of family Cyprinidae and minimum 1 species reported from families Bagridae, Clariidae, Heteropneustidae, Trionychidae, Geogmydidae, Cryptodira, Gekkonidae, Agamidae, Varanidae, Pythonidae,

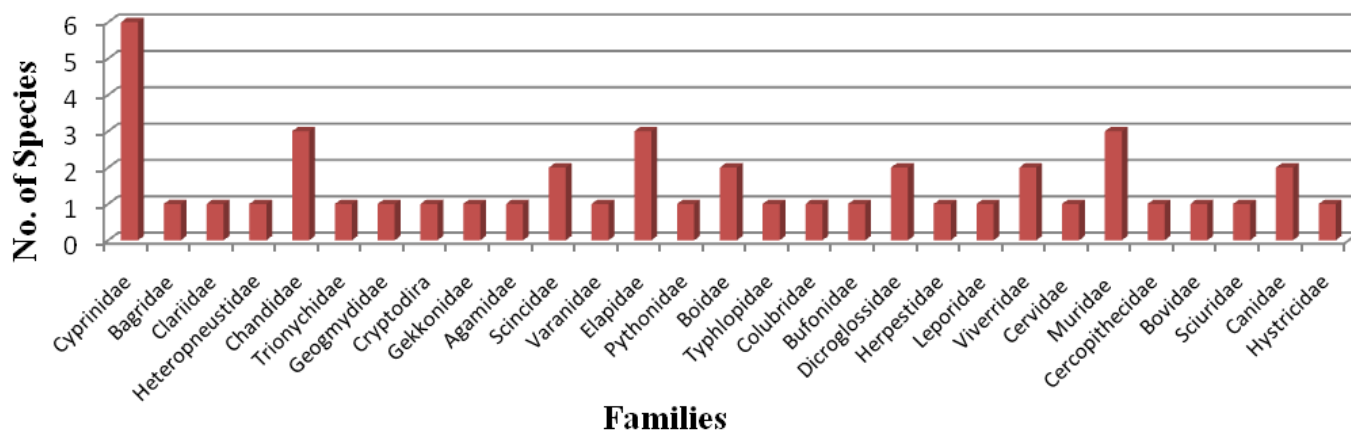


Fig:-4 Family wise species composition of vertebrate in NBS.

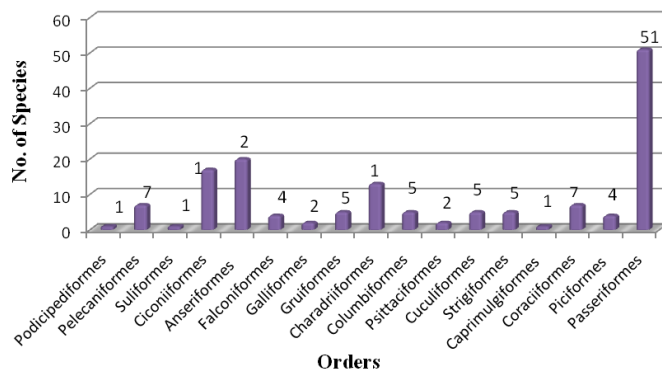


Typhlopidae, Colubridae, Bufonidae, Herpestidae, Leporidae, Cervidae, Cercopithecidae, Bovidae, Sciuridae and Hystricidae (Fig.4). Family Cyprinidae was the most dominant family having 6species followed by Chandidae, Elapidae, Muridae with 3 species, Boidae, Dicroglossidae, Viverridae, Canidae with 2 species and minimum of families Bagridae, Clariidae, Heteropneustidae, Trionychidae, Geogmydidae, Cryptodira, Gekkonidae, Agamidae, Varanidae, Pythonidae, Typhlopidae, Colubridae, Bufonidae, Herpestidae, Leporidae, Cervidae, Cercopithecidae, Bovidae, Sciuridae and Hystricidae1 species (Fig.5).

**Table 2: Vertebrates (excluding birds) Species identified In Nawabganj Bird Sanctuary**

S. No	Family	Common name of Species	Scientific name of Species
<b>Fishes</b>			
1.	Cyprinidae	Catla	<i>Catla- catla</i>
		Naini (Cauvery white carp)	<i>Cirrhinus cirrhosus</i>
		Mrigal	<i>Cirrhinus mrigala</i>
		Rohu	<i>Labeo rohita</i>
		Karonch	<i>Labeo calbasu</i>
		Silver Karp	<i>Hypophthalmichthys molitrix</i>
2.	Bagridae	Tengra	<i>Sperata seenghala</i>
3.	Clariidae	Magur	<i>Clarias batrachus</i>
4.	Heteropneustidae	Singhi (Stinging catfish)	<i>Heteropneustes fossilis</i>
5.	Chandidae	Elongated Glass perchlet(Channa)	<i>Chanda nama</i>
		Striped or banded snakeheads	<i>Channa striatus</i>
		Saur	<i>Channa punctatus</i>
<b>Reptiles and Amphibians</b>			
1.	Trionychidae	Indian Narrow-Headed Soft Shell Turtle	<i>Chitra indica</i>
2.	Geogmydidae	Indian Tent Turtle	<i>Pangshura tentoria</i>
3.	Cryptodira	Indian Flap Shell Turtle	<i>Lissemys punctata</i>
4.	Gekkonidae	Northern House Gecko	<i>Hemidactylus flaviviridis</i>
5.	Agamidae	Common Garden Lizard	<i>Calotos versicolor</i>
6.	Scincidae	Common Brahminy Skink	<i>Eutropis carinata</i>
		Snake Skink	<i>Lygosoma punctatus</i>
7.	Varanidae	Common Indian Monitor	<i>Varanus bengalensis</i>
8.	Elapidae	Common Krait	<i>Bangarus caeruleus</i>
		Russell,s Viper	<i>Daboia arusseli</i>
		Spectailed Cobra	<i>Naja naja</i>
9.	Pythonidae	Reticulated Python	<i>Python reticulatus</i>
10.	Boidae	Red Sand Boa	<i>Eryx johni</i>
		Common Sand Boa	<i>Gongylophis conicus</i>
11.	Typhlopidae	Brahminy Warm Snake	<i>Ramphotyphlops braminus</i>
12.	Colubridae	Common Smooth-Scaled Water Snake	<i>Enhydryis enhydryis</i>
13.	Bufonidae	Common Indian Toad	<i>Duttaphrynus melanostictus</i>
14.	Dicroglossidae	Skipper Frog	<i>Euphlyctis</i>

			<i>cyanophlyctis</i>
		Indian Bullfrog	<i>Haplobatrachus tigerinus</i>
<b>Mammals</b>			
1.	Herpestidae	Indian Grey Mongoose	<i>Herpestes edwardsii</i>
2.	Leporidae	Indian Hare	<i>Lepus nigricollis</i>
3.	Viverridae	Small Indian Civet	<i>Viverricula indica</i>
		Asian Palm Civet	<i>Paradoxurus hermaphroditus</i>
4.	Cervidae	Spotted Dear	<i>Axis axis</i>
5.	Muridae	Black Rat	<i>Rattus rattus</i>
		Little Indian Field Mouse	<i>Mus booduga</i>
		Greater Bandicot Rat	<i>Bandicota indica</i>
6.	Cercopithecidae	Rhesus Macaque	<i>Macaca mulatta</i>
7.	Bovidae	Nilgai	<i>Boselaphus tragocamelus</i>
8.	Sciuridae	India Palm Squirrel	<i>Funambulus palmarum</i>
9.	Canidae	Bengal Fox	<i>Vulpes bengalensis</i>
		Jackal	<i>Canis aureus indicus</i>
10.	Hystricidae	Indian Porcupine (Sahi)	<i>Hystrix indica</i>



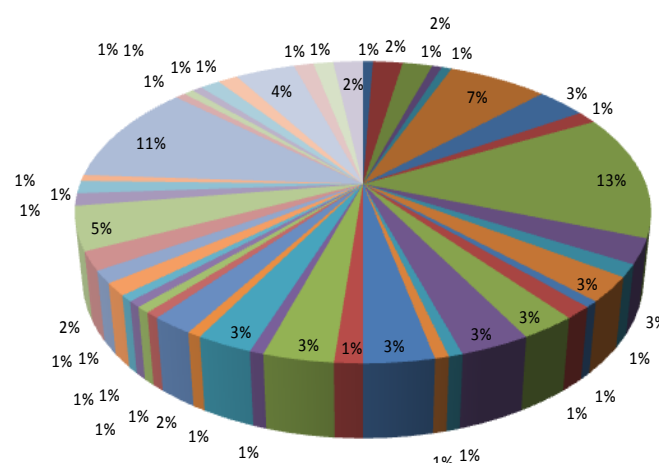
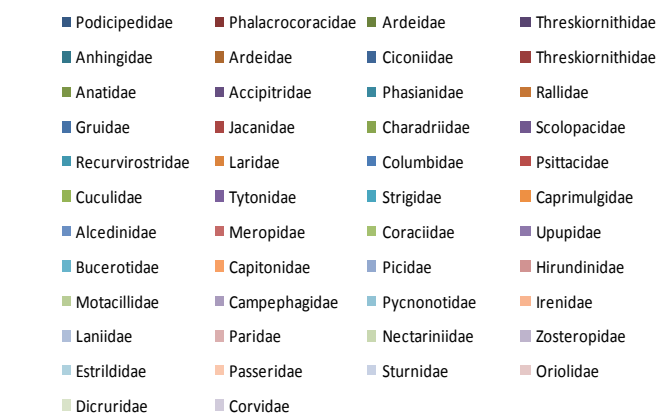
**Fig.6:-Order wise species composition of birds in NBS, Unnao.**

**Birds:-**A total of 150 species of birds, belong to 17 orders and 46 families were recorded from NBS. (Table.3). During study, 63 species of wetland birds and 38 species of winter visitors were recorded. Order Passeriformes is rich with 51 species, Anseriformes and Ciconiiformes with 20 and 15 species respectively (Fig.6). Abundance of these birds stated that 84 species are common, 13 uncommon and 25 species are occasionally observed in NBS area. Family wise percentage composition of birds of NBS has been calculated (Fig.7).

Similar studies have been done in a number of protected areas. 167 species of birds belonging to 16 orders and 39 families were reported from Kole wetland [34]. Similar observation with 173 species was done by Talmale et al., [7]. National Chambal Sanctuary in Madhya Pradesh is a good habitat for water birds and other fauna [35]. Sur Sarovar Bird Sanctuary is also a suitable territory for water birds [36]. A study on Birds biodiversity with special reference to migratory birds' movement has done in Sandi Bird Sanctuary, Hardoi [33]. A close relation between aquatic food plants and their consumer birds have been explained by Jha [37].

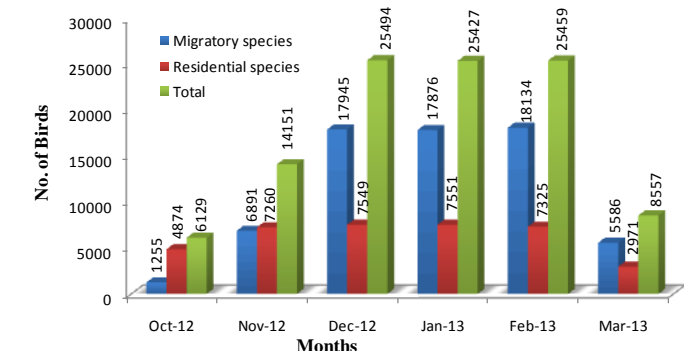
Highest number of birds was recorded during the month of January-February and lowest in June and July. Cattle Egret, Asian Open bill, Little Cormorant, Pond Heron, Little Egret,

Purple Moorhen, Common Coot, Lesser Whistling- Duck, white –breasted Water hen, Bronzed- wing Jacana, Pheasant-Tailed Jacana, Red -wattled Lapwing, Common Teal were the most abundant species in NBS.



**Fig. 7:-Family wise (%) composition of birds in NBS**

Number of residential as well as migratory birds in different month from October 2012 to March 2013 has been shown in the table.4. Maximum 25,494 birds were observed in December 2012, followed by 25,459 in February 2013, 25,427in January 2013, 14,151in November 2012, 8,557 in March 2013 and minimum 6,129 birds in October 2012 at NBS. (Fig.8) Source: Forest Department Unnao [38].



**Fig. 8:- No. of birds in different month from October 2012 to March 2013**

NBS is a conserved and protected area and there is no disturbance or anthropogenic activities in NBS so it supports rich floral diversity which help in various behavioral (feeding, roosting, breeding and hiding) and daily routine activities. Many migratory birds come for breeding purposes because of

many suitable habitats in NBS area. There have been no studies on the floral diversity of NBS. However the studies conducted by K.K. Jha in Sandi Bird Sanctuary suggest that the rich floral of a place aids in supporting and flourishing fauna of any region [37].

**Table-4.Number of migratory and residential Birds of Nawabganj Bird Sanctuary in 2012-2013**

Year 2012-2013				
S.No.	Month	Migratory species	Residential species	Total
1.	October 2012	1255	4874	6129
2.	November 2012	6891	7260	14151
3.	December 2012	17945	7549	25494
4.	January 2013	17876	7551	25427
5.	February 2013	18134	7325	25459
6.	March 2013	5586	2971	8557

(Source: forest Department Nawabganj Unnao)

#### 4) CONCLUSION

It can be concluded that NBS has variety of flora and fauna. Since, there is no published faunal checklist prior to this; the present work can form the baseline for further research and comparative studies. This wetland has a number of species of mollusks, amphibians, reptiles and fishes. In NBS, maximum bird’s density and species richness is observed in January-February. About 150 species of migratory as well as residential birds are reported from the study area. There are many winter migratory birds as NBS is suitable for breeding and feeding during the cold winter months as compared to their native places from where they come. The study presents the evidence that show healthy ecological status of NBS as it formulates the birds and other faunal population. Weed infestation is the major threats to faunal diversity of NBS. The present study exhibit the value of NBS as a feeding ground for the migratory and residential species of birds and other faunal diversity.

#### Acknowledgement

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**Table 3: List of Birds Reported from Nawabganj Bird Sanctuary**

S.No.	Order/Family/Scientific Name	Common Name	Status	Abund.
	<b>Order :Podicipediformes</b> <b>Family: Podicipedidae</b>			
1.	<i>Tachybaptus ruficollis</i>	Little Grebe	R	A
	<b>Order: Pelecaniformes</b> <b>Family :Phalacrocoracidae</b>			
2.	<i>Phalacrocorax carbo</i>	Great Cormorant	R/LM	C
3.	<i>Phalacrocorax niger</i>	Little Cormorant	R	A
4.	<i>Phalacrocorax fuscicollis</i>	Indian Cormorant	R	C
	<b>Family :Ardeidae</b>			
5.	<i>Nycticorax nycticorax</i>	Black Crowned Night Heron	R/LM	U
6.	<i>Ixobrychus flavicollis</i>	Black bittern	LM	O
7.	<i>Ixobrychus sinensis</i>	Yellow bittern	R/LM	C
	<b>Family: Threskiornithidae</b>			
8.	<i>Threskiornis melanocephalus</i>	Black- headed Ibis	WV	C
	<b>Order: Suliformes</b> <b>Family:Anhingidae</b>			
9.	<i>Anhinga melanogaster</i>	Darter	R/LM	C
	<b>Order:Ciconiiformes</b> <b>Family: Ardeidae</b>			
10.	<i>Egretta garzetta</i>	Little Egret	R	A
11.	<i>Casmerodius albus</i>	Large Egret	R	C
12.	<i>Mesophoyx intermedia</i>	Median Egret	R	C
13.	<i>Bubulcus ibis</i>	Cattle Egret	R	A
14.	<i>Ardea cinerea</i>	Grey Heron	R/LM	O
15.	<i>Ardea purpurea</i>	Purple Heron	R/LM	C
16.	<i>Ardeola grayii</i>	Indian Pond Heron	R	A
17.	<i>Butorides striatus</i>	Little Green Heron	LM	O
18.	<i>Ixobrychus cinnamomeus</i>	Chestnut Bittern	R	C
19.	<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	R	O
	<b>Family: Ciconiidae</b>			
20.	<i>Mycteria leucocephala</i>	Painted Stork	R/LM	O
21.	<i>Anastomus oscitans</i>	Asian Open bill-Stork	R/LM	A
22.	<i>Ciconia nigra</i>	Black Stork	WV	O
23.	<i>Ciconia episcopus</i>	White-necked Stork	WV	O
24.	<i>Ephippiorhynchus asiaticus</i>	Black- necked Stork	WV	O
	<b>Family:Threskiornithidae</b>			
25.	<i>Plegadis falcinellus</i>	Glossy Ibis	WV	U
26.	<i>Pseudibis papillosa</i>	Black Ibis	WV	O
	<b>Order:Anseriformes</b> <b>Family:Anatidae</b>			
27.	<i>Dendrocygna javanica</i>	Lesser whistling duck	R	A
28.	<i>Anser indicus</i>	Bar headed goose	WV	O
29.	<i>Tadorna ferruginea</i>	Brahminy shelduck	WV	C
30.	<i>Sarkidiornis melanotos</i>	Comb duck	WV	C
31.	<i>Nettapus coromandelianus</i>	Cotton teal	WV	C
32.	<i>Anas platyrhynchos</i>	Mallard	R/LM	C
33.	<i>Anas poecilorhyncha</i>	Spot-billed duck	R/LM	C
34.	<i>Anas clypeata</i>	Northern shoveller	WV	A
35.	<i>Anas acuta</i>	Northern pintail	WV	A
36.	<i>Anas querquedula</i>	Garganey	WV	C
37.	<i>Anas crecca</i>	Common Teal	WV	O
38.	<i>Rhodonessa rufina</i>	Red crested Pochard	WV	C
39.	<i>Aythya fuligula</i>	Tufted Pochard	WV	O
40.	<i>Aythya ferina</i>	Common Pochard	WV	U
41.	<i>Anas strepera</i>	Gadwall	WV	C
42.	<i>Nettapus coromandelianus</i>	Cotton Pygmy Goose	LM	O
43.	<i>Anas penelope</i>	Eurasian Wigeon	WV	C
44.	<i>Anser anser</i>	Greyleg Goose	WV	C
45.	<i>Tadorna ferruginea</i>	Ruddy Shelduck	WV	O
46.	<i>Aythya nyroca</i>	Ferruginous Pochard	WV	U
	<b>Order:Falconiformes</b>			



	<b>Family:Accipitridae</b>			
47.	<i>Elanus caeruleus</i>	Black -shouldered Kite	R	C
48.	<i>Milvus migrans</i>	Black Kite	R	C
49.	<i>Neophron percnopterus</i>	Egyptian Vulture	R/LM	U
50.	<i>Accipiter badius</i>	Shikra	R	C
	<b>Order:Galliformes</b>			
	<b>Family:Phasianidae</b>			
51.	<i>Gallus gallus</i>	Red jungle fowl	R	C
52.	<i>Pavo cristatus</i>	Indian peafowl	R	C
	<b>Order:Gruiformes</b>			
	<b>Family:Rallidae</b>			
53.	<i>Amauromis phoenicurus</i>	White-breasted Waterhen	R	C
54.	<i>Porphyrio porphyrio</i>	Purple Moorhen	R	A
55.	<i>Gallinule chloropus</i>	Common Moorhen	R	A
56.	<i>Fulica atra</i>	Common Coot	R/LM	A
	<b>Family: Gruidae</b>			
57.	<i>Grus antigone</i>	Sarus Crane	R	C
	<b>Order:Charadriiformes</b>			
	<b>Family:Jacanidae</b>			
58.	<i>Hydrophasianus chirurgus</i>	Pheasant-tailed Jacana	R	C
59.	<i>Metopidius indicus</i>	Bronzed-winged Jacana	R	A
	<b>Family:Charadriidae</b>			
60.	<i>Charadrius dubius</i>	Little Ringed Plover	WV	C
61.	<i>Charadrius hiaticula</i>	Ringed Plover	WV	C
62.	<i>Vanellus malabaricus</i>	Yellow- wattled Lapwing	R/LM	U
63.	<i>Vanellus indicus</i>	Red -wattled Lapwing	R	C
	<b>Family:Scolopacidae</b>			
64.	<i>Tringa glareola</i>	Wood Sandpiper	WV	O
65.	<i>Tringa ochropus</i>	Green Sandpiper	WV	C
66.	<i>Actitis hypoleucos</i>	Common Sandpiper	WV	C
67.	<i>Tringa totanus</i>	Common Redshank	WV	C
68.	<i>Tringa nebularia</i>	Common Greenshank	WV	C
	<b>Family:Recurvirostridae</b>			
69.	<i>Himantopus himantopus</i>	Black –winged Stilt	R/VW	C
	<b>Family:Laridae</b>			
70.	<i>Sterna aurantia</i>	River Tern	R/LM	O
	<b>Order: Columbiformes</b>			
	<b>Family:Columbidae</b>			
71.	<i>Columba livia</i>	Blue Rock Pigeon	R	O
72.	<i>Streptopelia chinensis</i>	Spotted Dove	R	C
73.	<i>Streptopelia tranquebarica</i>	Red Collared Dove	R/LM	C
74.	<i>Streptopelia decaocta</i>	Eurasian Collared- Dove	R	C
75.	<i>Treron phoenicoptera</i>	Yellow- legged Green- Pigeon	R/LM	O
	<b>Order:Psittaciformes</b>			
	<b>Family: Psittacidae</b>			
76.	<i>Psittacula eupatria</i>	Alexandrine Parakeet	R	C
77.	<i>Psittacula krameri</i>	Rose-ringed Parakeet	R	C
	<b>Order:Cuculiformes</b>			
	<b>Family: Cuculidae</b>			
78.	<i>Eudynamis scolopacea</i>	Asian Koel	R/LM	C
79.	<i>Phaenicophaeus leschenaultii</i>	Sirkeer Malkoha	R	C
80.	<i>Centropus sinensis</i>	Greater Coucal	R	C
81.	<i>Cuculus micropterus</i>	Indian Cuckoo	R	C
82.	<i>Cuculus canorus</i>	Common Cuckoo	R	C
	<b>Order:Strigiformes</b>			
	<b>Family: Tytonidae</b>			
83.	<i>Tyto alba</i>	Barn Owl	R	U
	<b>Family:Strigidae</b>			
84.	<i>Bubo bubo</i>	Eurasian Eagle-Owl	R	C
85.	<i>Athenebrama</i>	Spotted Owlet	R	U
86.	<i>Glaucidium radiatum</i>	Jungle Owlet	R	C
87.	<i>Glaucidium cuculoides</i>	Asian- barred Owlet	R/LM	C
	<b>Order:Caprimulgiformes</b>			
	<b>Family: Caprimulgidae</b>			
88.	<i>Caprimulgus asiaticus</i>	Common Indian Nightjar	R	C

	<b>Order: Coraciiformes</b> <b>Family: Alcedinidae</b>			
89.	<i>Alcedo atthis</i>	Small Blue Kingfisher	R	C
90.	<i>Halcyon smyrnensis</i>	White breasted Kingfisher	R	C
91.	<i>Ceryle rudis</i>	Lesser Pied Kingfisher	R/LM	C
	<b>Family: Meropidae</b>			
92.	<i>Merops orientalis</i>	Small Bee-eater	R	A
	<b>Family: Coraciidae</b>			
93.	<i>Coracias benghalensis</i>	Indian Roller	R	C
	<b>Family: Upupidae</b>			
94.	<i>Upupa epops</i>	Common Hoopoe	R	C
	<b>Family: Bucerotidae</b>			
95.	<i>Ocyeros birostris</i>	Indian Grey Hornbill	R	C
	<b>Order: Piciformes</b> <b>Family: Capitonidae</b>			
96.	<i>Megalaima zeylanica</i>	Brown-headed Barbet	R	O
97.	<i>Megalaima haemacephala</i>	Coppersmith Barbet	R	C
	<b>Family: Picidae</b>			
98.	<i>Dendrocopos nanus</i>	Brown-capped pygmy Woodpecker	R	C
99.	<i>Dinopium benghalense</i>	Lesser Golden-backed Woodpecker	R	O
	<b>Order: Passeriformes</b> <b>Family: Hirundinidae</b>			
100.	<i>Riparia paludicola</i>	Plain Martin	R/LM	C
101.	<i>Hirundo rustica</i>	Common Swallow	R/WV	A
102.	<i>Hirundo smithii</i>	Wire-tailed Swallow	WV	A
	<b>Family: Motacillidae</b>			
103.	<i>Dendronanthus indicus</i>	Forest Wagtail	WV	O
104.	<i>Motacilla alba</i>	White Wagtail	R/LM	C
105.	<i>Motacilla maderaspatensis</i>	Large Pied Wagtail	R	C
106.	<i>Motacilla flava</i>	Yellow Wagtail	WV	C
107.	<i>Motacilla cinerea</i>	Grey Wagtail	WV	O
108.	<i>Anthus rufulus</i>	Paddy-field Pipit	R	C
109.	<i>Anthus trivialis</i>	Eurasian Tree Pipit	R/LM	C
	<b>Family: Campephagidae</b>			
110.	<i>Coracina macei</i>	Large Cuckoo-Shrike	R	C
111.	<i>Tephrodornis pondicerianus</i>	Common Woodshrike	R	C
	<b>Family: Pycnonotidae</b>			
112.	<i>Pycnonotus cafer</i>	Red-vented Bulbul	R	A
113.	<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	R	A
	<b>Family: Irenidae</b>			
114.	<i>Aegithina tiphia</i>	Common Iora	R	C
	<b>Family: Laniidae</b>			
115.	<i>Lanius schach</i>	Rufous-backed Shrike	R	C
	<b>Subfamily: Turdinae</b>			
116.	<i>Copsychus saularis</i>	Oriental Magpie-Robin	R	A
117.	<i>Saxicoloides fulicata</i>	Indian Robin	R	A
118.	<i>Phoenicurus ochruros</i>	Black Redstart	R/WV	C
119.	<i>Saxicola torquata</i>	Common Stonechat	LM	O
120.	<i>Saxicola caprata</i>	Pied Bushchat	R	C
121.	<i>Cercomela fusca</i>	Indian Chat	R/LM	C
	<b>Subfamily: Timaliinae</b>			
122.	<i>Chrysomma sinense</i>	Yellow-eyed Babbler	R	C
123.	<i>Turdoides caudatus</i>	Common Babbler	R	A
124.	<i>Turdoides striatus</i>	Jungle Babbler	R	C
	<b>Subfamily: Sylviinae</b>			
125.	<i>Prinia socialis</i>	Ashy Prinia	R	C
126.	<i>Prinia inornata</i>	Plain Prinia	R	C
127.	<i>Acrocephalus agricola</i>	Paddyfield Warbler	R/WV	U
128.	<i>Orthotomus sutorius</i>	Common Tailorbird	R	C
	<b>Subfamily: Muscicapinae</b>			
129.	<i>Cyornis tickelliae</i>	Tickell's Blue Flycatcher	R	O
	<b>Subfamily: Monarchinae</b>			
130.	<i>Terpsiphone paradisi</i>	Asian Paradise-Flycatcher	R	U

	<b>Family :Paridae</b>			
131.	<i>Parus major</i>	Great Tit	R	C
	<b>Family: Nectariniidae</b>			
132.	<i>Nectarinia asiatica</i>	Purple Sunbird	R	A
	<b>Family: Zosteropidae</b>			
133.	<i>Zosterops palpebrosos</i>	Oriental White-eye	R	A
	<b>Family: Estrildidae</b>			
134.	<i>Lonchura malabarica</i>	White- throated Munia	R	C
135.	<i>Lonchura punctulata</i>	Spotted Munia	R	A
	<b>Family: Passeridae</b> <b>Subfamily: Passerinae</b>			
136.	<i>Passer domesticus</i>	House Sparrow	R	C
	<b>Subfamily: Ploceinae</b>			
137.	<i>Ploceus philippinus</i>	Baya Weaver	R	O
	<b>Family: Sturnidae</b>			
138.	<i>Sturnus pagodarum</i>	Brahminy Starling	R	C
139.	<i>Sturnus roseus</i>	Rosy Starling	WV	U
140.	<i>Sturnus contra</i>	Asian Pied Starling	R	C
141.	<i>Sturnus malabaricus</i>	Chestnut-tailed Starling	R/LM	U
142.	<i>Acridotheres tristis</i>	Common Myna	R	A
143.	<i>Acridotheres fuscus</i>	Jungle Myna	R	A
	<b>Family: Oriolidae</b>			
144.	<i>Oriolus oriolus</i>	Eurasian Golden Oriole	R	C
145.	<i>Oriolus xanthornus</i>	Black- headed Oriole	R	C
	<b>Family: Dicuridae</b>			
146.	<i>Dicurus macrocercus</i>	Black Drongo	R	A
147.	<i>Dicurus paradiseus</i>	Greater Racket- tailed Drongo	R	C
	<b>Family: Corvidae</b>			
148.	<i>Dendrocitta vagabunda</i>	Indian Treepie	R	C
149.	<i>Corvus splendens</i>	House Crow	R	A
150.	<i>Corvus macrorhynchos</i>	Jungle Crow	R	U
<b>Legend</b> -R=Resident, WV=Winter Visitor, LM=Local Movement, M=Migrant, A=Abundant, C=Common, U=Uncommon O=Occasional				