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PRELIMINARY SURVEY OF AVIFAUNAL DIVERSITY IN AND AROUND PATNA PAKSHI VIHAR BIRD SANCTUARY

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ABSTRACT

Birds are an essential part of the environment. They are essential to maintaining ecological harmony. The main objective of the present survey is focused on the assessment of the avifaunal diversity of Patna Pakshi Vihar bird sanctuary. According to the results, between November 2021 and December 2022, a total of 160 bird species from 45 different families were spotted. The Anatidea family was the most numerous among the area's bird records, followed by the scolopacidae and the Ardeidae. Birds were also categorized as either permanent inhabitants, short-distance migrants, or seasonal visitors based on the time of year they were seen. In order to learn more about the birds in the area, researchers utilized both line transects and the point count approach.

Keywords: Patna Pakshi Vihar, Avifauna diversity, point, line transect method etc.

INTRODUCTION

Birds stand out among other vertebrates because of their high visibility and widespread distribution [1]. They are beautiful creatures of nature, having wings, feathers, etc. Among all the groups of vertebrates present in the world. Birds are most attractive with different colorations, melody songs, and euphony calls.

Birds are essential parts of the ecosystem. They are essential to maintaining ecological harmony. Birds provide different kinds of services like pollination, nutrients cycling, and help in seed dispersal. The population of birds decreases day by day as a result of global warming [2] or anthropogenic activities [3]. The bird population is also declining due to land-use patterns changes [4]. According to recent data, nearly sixteen million birds are being destroyed annually [5].

The Indian subcontinent is incredibly diverse since it is a component of the huge Oriental biogeographical area. The Indian region harbours an incredibly rich avifauna. According to [6], many known living bird species found across the globe vary anywhere from 9800 to 10,050. Out of these, 13% of the world's bird fauna are located in the Indian subcontinent [7]. Communities of birds in both temperate and tropical forests have been studied relatively effectively [8-9]. The composition and diversity of birds vary at every 1000m altitude due to precipitation changes [10].

Numerous ecological surveys of India's birds have been completed [11-14] etc. None of these studies, however, used Patna Vihar Sanctuary, a highly vulnerable ecosystem in Uttar Pradesh, as a study unit. Moreover, in the Patna Pakshi Vihar region of district Etah, a comprehensive survey of bird diversity has not been conducted. To that end, it is proposed here that the avifauna of Patna Pakshi Vihar be the subject of research. The present study is the first study of its kind undertaken in the Patna Pakshi Vihar region of Etah district to document the avian Diversity with particular reference to the breeding biology of House sparrow.

Study Area

The data for this analysis came from November 2021 to December 2022 at Patna Pakshi Vihar bird sanctuary in Etah district of U.P. The Patna Bird Sanctuary is located at a latitude of 27° 63'N and a longitude of 78.67°E in Jalesar, Etah district. It has a lentic lake which serves as a significant wintering site for migratory birds. It is a key avian biodiversity hotspot that supports a diverse range of bird species. The most favorable habitat for the bird is the Sanctuary's wetland and forest habitat.

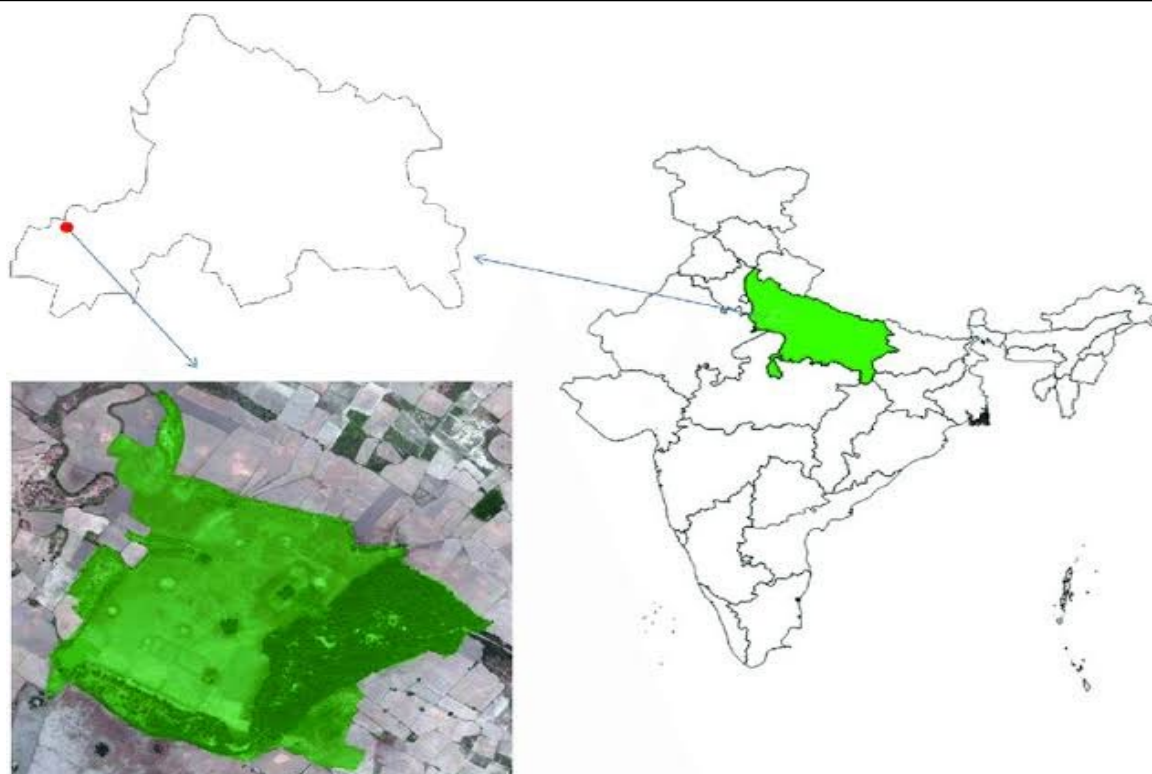


Fig. 1: Location map of study area.

METHODOLOGY

In order to record the avian diversity, direct and indirect methods were used to collect the data from the study area.

Once a month, sometimes twice, visits were undertaken from dawn 'til dusk to collect data directly.

Wildlife personnel and local residents were contacted to gather inferential data about the birds' current and historical state.

1. For credentials and classification of birds, colorful plates of [15-18] have been used.

Line transect and point count method [19-21], were applied during the survey.

In the summer, avian surveys were undertaken from 6:30 am to 9:30 am, and from 4:30 pm to 6:30 pm in the evening. In the winter, they were conducted from 7:00 am to 10:30 am, and from 3:30 pm to 5:30 pm.

Binoculars were used for the observation, while Canon cameras with 300mm zoom lenses and Sony D.V. cameras were used for the photography.

Checklist of Birds Found at Patna Pakshi Vihar, BIRD SANCTUARY

<i>Common Name</i>	<i>Zoological name</i>	<i>Order</i>	<i>Family</i>	<i>IUCN STATUS</i>
<i>Bar-headed goose</i>	<i>Anser indicus</i>	<i>Anseriformes</i>	<i>Anatidae</i>	<i>LC</i>
<i>Graylag goose</i>	<i>Anser anser</i>	<i>Anseriformes</i>	<i>Anatidae</i>	<i>LC</i>
<i>Garganey</i>	<i>Spatula querquedula</i>	<i>Anseriformes</i>	<i>Anatidae</i>	<i>LC</i>
<i>Northern shoveler</i>	<i>Spatula clypeata</i>	<i>Anseriformes</i>	<i>Anatidae</i>	<i>LC</i>
<i>Gadwall</i>	<i>Mareca strepera</i>	<i>Anseriformes</i>	<i>Anatidae</i>	<i>LC</i>
<i>Eurasian wigeon</i>	<i>Mareca penelope</i>	<i>Anseriformes</i>	<i>Anatidae</i>	<i>LC</i>
<i>Indian spot-billed duck</i>	<i>Anas poecilorhyncha</i>	<i>Anseriformes</i>	<i>Anatidae</i>	<i>LC</i>

<i>Green-winged teal</i>	<i>Anas carolinensis</i>	<i>Anseriformes</i>	<i>Anatidae</i>	LC
<i>Indian peafowl</i>	<i>Pavo cristatus</i>	<i>Galliformes</i>	<i>Phasianidae</i>	LC
<i>Gray francolin</i>	<i>Francolinus pondicerianus</i>	<i>Galliformes</i>	<i>Phasianidae</i>	LC
<i>Oriental turtle dove</i>	<i>Streptopelia orientalis</i>	<i>Columbiformes</i>	<i>Columbidae</i>	LC
<i>Spotted dove</i>	<i>Spilopelia chinensis</i>	<i>Columbiformes</i>	<i>Columbidae</i>	LC
<i>Laughing dove</i>	<i>Spilopelia senegalensis</i>	<i>Columbiformes</i>	<i>Columbidae</i>	LC
<i>Greater coucal</i>	<i>Centropus sinensis</i>	<i>Cuculiformes</i>	<i>Cuculidae</i>	LC
<i>Asian koel</i>	<i>Eudynamys scolopaceus</i>	<i>Cuculiformes</i>	<i>Cuculidae</i>	LC
<i>Eurasian moorhen</i>	<i>Gallinula chloropus</i>	<i>Gruiformes</i>	<i>Rallidae</i>	LC
<i>White-breasted waterhen</i>	<i>Amaurornis phoenicurus</i>	<i>Gruiformes</i>	<i>Rallidae</i>	LC
<i>Sarus crane</i>	<i>Grus antigone</i>	<i>Gruiformes</i>	<i>Gruidae</i>	Vulnerable
<i>Red-wattled lapwing</i>	<i>Vanellus indicus</i>	<i>Charadriiformes</i>	<i>Charadriidae</i>	LC
<i>Little ringed plover</i>	<i>Charadrius dubius</i>	<i>Charadriiformes</i>	<i>Charadriidae</i>	LC
<i>Pheasant-tailed jacana</i>	<i>Hydrophasianus chirurgus</i>	<i>Charadriiformes</i>	<i>Jacanidae</i>	LC
<i>Ruff</i>	<i>Calidris pugnax</i>	<i>Charadriiformes</i>	<i>Scolopecidae</i>	LC
<i>Temminck's stint</i>	<i>Calidris temminckii</i>	<i>Charadriiformes</i>	<i>Scolopecidae</i>	LC
<i>Little stint</i>	<i>Calidris minuta</i>	<i>Charadriiformes</i>	<i>Scolopecidae</i>	LC
<i>Common sandpiper</i>	<i>Actitis hypoleucos</i>	<i>Charadriiformes</i>	<i>Scolopecidae</i>	LC
<i>Green sandpiper</i>	<i>Tringa ochropus</i>	<i>Charadriiformes</i>	<i>Scolopecidae</i>	LC
<i>Common greenshank</i>	<i>Tringa nebularia</i>	<i>Charadriiformes</i>	<i>Scolopecidae</i>	LC
<i>Marsh sandpiper</i>	<i>Tringa stagnatilis</i>	<i>Charadriiformes</i>	<i>Scolopecidae</i>	LC
<i>Wood sandpiper</i>	<i>Tringa glareola</i>	<i>Charadriiformes</i>	<i>Scolopecidae</i>	LC
<i>Common redshank</i>	<i>Tringa totanus</i>	<i>Charadriiformes</i>	<i>Scolopecidae</i>	LC
<i>River tern</i>	<i>Sterna aurantia</i>	<i>Charadriiformes</i>	<i>Laridae</i>	Vulnerable
<i>Black-necked stork</i>	<i>Ephippiorhynchus asiaticus</i>	<i>Ciconiiformes</i>	<i>Ciconiidae</i>	Near Threatned
<i>Oriental darter</i>	<i>Anhinga melanogaster</i>	<i>Suliformes</i>	<i>Anhingidae</i>	Near Threatned
<i>Painted stork</i>	<i>Mycteria leucocephala</i>	<i>Ciconiiformes</i>	<i>Ciconiidae</i>	Near Threatned
<i>Little cormorant</i>	<i>Microcarbo niger</i>	<i>Suliformes</i>	<i>Phalacrocoracidae</i>	LC
<i>Great cormorant</i>	<i>Phalacrocorax carbo</i>	<i>Suliformes</i>	<i>Phalacrocoracidae</i>	LC

Indian cormorant	<i>Phalacrocorax fuscicollis</i>	<i>Suliformes</i>	<i>Phalacrocoracidae</i>	LC
Gray heron	<i>Ardea cinerea</i>	<i>Pelecaniformes</i>	<i>Ardeidae</i>	LC
Purple heron	<i>Ardea purpurea</i>	<i>Pelecaniformes</i>	<i>Ardeidae</i>	LC
Cattle egret	<i>Bubulcus ibis</i>	<i>Pelecaniformes</i>	<i>Ardeidae</i>	LC
Indian pond heron	<i>Ardeola grayii</i>	<i>Pelecaniformes</i>	<i>Ardeidae</i>	LC
Black-headed ibis	<i>Threskiornis melanocephalus</i>	<i>Pelecaniformes</i>	<i>Threskinorithidae</i>	Near Threatenad
Red-naped ibis	<i>Pseudibis papillosa</i>	<i>Pelecaniformes</i>	<i>Threskinorithidae</i>	LC
Eurasian spoonbill	<i>Platalea leucorodia</i>	<i>Pelecaniformes</i>	<i>Threskinorithidae</i>	LC
Black-winged kite	<i>Elanus caeruleus</i>	<i>Accipitriformes</i>	<i>Accipitride</i>	LC
Egyptian vulture	<i>Neophron percnopterus</i>	<i>Accipitriformes</i>	<i>Accipitride</i>	Endangered
Oriental honey buzzard	<i>Pernis ptilorhynchus</i>	<i>Accipitriformes</i>	<i>Accipitride</i>	LC
Geater spotted eagle	<i>Clanga clanga</i>	<i>Accipitriformes</i>	<i>Accipitride</i>	Vulnerable
Booted eagle	<i>Hieraaetus pennatus</i>	<i>Accipitriformes</i>	<i>Accipitride</i>	LC
Bonelli's eagle	<i>Aquila fasciata</i>	<i>Accipitriformes</i>	<i>Accipitride</i>	LC
Shikra	<i>Accipiter badius</i>	<i>Accipitriformes</i>	<i>Accipitride</i>	LC
Black kite	<i>Milvus migrans</i>	<i>Accipitriformes</i>	<i>Accipitride</i>	LC
Eurassian hoopoe	<i>Upupa epops</i>	<i>Bucerotiformes</i>	<i>Upupidae</i>	LC
Indian grey hornbill	<i>Ocyrceros birostris</i>	<i>Bucerotiformes</i>	<i>Bucerotidae</i>	LC
Whit-throated kingfisher	<i>Halcyon smyrnersis</i>	<i>Coraciiformes</i>	<i>Alcedinidae</i>	LC
Asian green bee-eater	<i>Merops orient alis</i>	<i>Coraciiformes</i>	<i>Meropidae</i>	LC
Brown-headed barbet	<i>Megalaima zeylanice</i>	<i>Piciformes</i>	<i>Megalaimidae</i>	LC
Eurasian kestrel	<i>Falco tinnunculus</i>	<i>Falconiformes</i>	<i>Falconidae</i>	LC
Peregrine falcon	<i>Falco peregrines</i>	<i>Falconiformes</i>	<i>Falconidae</i>	Vulnerable
Rose-ringed Parakeet	<i>Psittacula krameri</i>	<i>Psittaciformes</i>	<i>Psittaculidae</i>	LC
Black drongo	<i>Dicrurus macrocercus</i>	<i>Passeriformes</i>	<i>Dicruridae</i>	LC
Long-tailed shrike	<i>Lanius schach</i>	<i>Passeriformes</i>	<i>Laniidae</i>	LC
Rufous treepie	<i>Dendrocitta vagabunda</i>	<i>Passeriformes</i>	<i>Corvidae</i>	LC
House crow	<i>Corvus splendens</i>	<i>Passeriformes</i>	<i>Corvidae</i>	LC
Large-billed crow	<i>Corvus</i>	<i>Passeriformes</i>	<i>Corvidae</i>	LC

	<i>macrorhynchos</i>			
Crested lark	<i>Galerida cristata</i>	Passeriformes	Alaudidae	LC
Ashy prinia	<i>Prinia socialis</i>	Passeriformes	Cisticolidae	LC
Plain prinia	<i>Prinia inornata</i>	Passeriformes	Cisticolidae	LC
Red-vented bulbul	<i>Pycnonotus cafer</i>	Passeriformes	Pycnonotidae	LC
Red-whiskered bulbul	<i>Pycnonotus jocusus</i>	Passeriformes	Pycnonotidae	LC
Common chiffhaff	<i>Phylloscopus collybita</i>	Passeriformes	Phycnonotidae	LC
Greenish warbler	<i>Phylloscopus trochiloides</i>	Passeriformes	Phylloscopidae	LC
Lesser whitethroat	<i>Sylvia curruca</i>	Passeriformes	Sylviidae	LC
Large grey babbler	<i>Turdoides malcolmi</i>	Passeriformes	Leiothrichidae	LC
Jungle Babbler	<i>Turdoides striata</i>	Passeriformes	Leiothrichidae	LC
Asian Pied myna	<i>Gracupica contra</i>	Passeriformes	Sturnidae	LC
Common myna	<i>Acridotheres tristis</i>	Passeriformes	Sturnidae	LC
Bank myna	<i>Acridotheres ginginiarius</i>	Passeriformes	Sturnidae	LC
Indian robin	<i>Saxicoloides fulicatus</i>	Passeriformes	Muscicapidae	LC
Oriental magpie- robin	<i>Copsychus saularis</i>	Passeriformes	Muscicapidae	LC
Bluethroat	<i>Luscinia svecica</i>	Passeriformes	Muscicapidae	LC
Taiga flycatcher	<i>Ficedola albicilla</i>	Passeriformes	Muscicapidae	LC
Siberian stonechat	<i>Saxicolas maurus</i>	Passeriformes	Muscicapidae	LC
Pied bush chat	<i>Saxicole caprata</i>	Passeriformes	Muscicapidae	LC
Purple sunbird	<i>Cinnyris asiaticus</i>	Passeriformes	Nectariniidae	LC
Indian silverbill	<i>Euodice malabarica</i>	Passeriformes	Estrididae	LC
House sparrow	<i>Passer domesticus</i>	Passeriformes	Passeridae	LC
White wagtail	<i>Motacilla alba</i>	Passeriformes	Motacillidae	LC
Common pochard	<i>Aythya ferina</i>	Anseriformes	Anatidae	Vulnerable
Little grebe	<i>Tachybaptus ruficollis</i>	Podicipediformes	Podicipedidae	LC
Rock pigeon	<i>Columba livia</i>	Columbiformes	Columbidae	LC
Eurasian coot	<i>Fulica atra</i>	Gruiformes	Rallidae	LC
Indian roller	<i>Coracias benghalensis</i>	Coraciiformes	Coraciidae	LC
Booted warbler	<i>Iduna caligata</i>	Passeriformes	Acrocephalidae	LC
Common babbler	<i>Turdoides caudata</i>	Passeriformes	Leiothrichidae	LC
Baya weaver	<i>Ploceus philippinus</i>	Passeriformes	Ploceidae	LC
Tree pipit	<i>Anthus trivialis</i>	Passeriformes	Motacillidae	LC

Lesser whistling duck	<i>Dendrocygna javanica</i>	Anseriformes	Anatidae	LC
Yellow-wattled lapwing	<i>Vanellus malabaricus</i>	Charadriiformes	Charadriidae	LC
White-tailed lapwing	<i>Vanellus leucurus</i>	Charadriiformes	Charadriidae	LC
Spotted owlet	<i>Athene brama</i>	Strigiformes	Strigidae	LC
Yellow-eyed babbler	<i>Chrysomma sinense</i>	Passeriformes	Paradoxornithidae	LC
Brown rock chat	<i>Cercomela fusca</i>	Passeriformes	Muscicapidae	LC
Citrine wagtail	<i>Motacilla citreola</i>	Passeriformes	Motacillidae	LC
Red-crested pochard	<i>Netta rufina</i>	Anseriformes	Anatidae	LC
Black redstart	<i>Phoenicurus ochruros</i>	Passeriformes	Muscicapidae	LC
Common kingfisher	<i>Alcedo atthis</i>	Coraciiformes	Alcedinidae	LC
Pied kingfisher	<i>Ceryle rudis</i>	Coraciiformes	Alcedinidae	LC
Little swift	<i>Apus affinis</i>	Apodiformes	Apodidae	LC
Indian spotted eagle	<i>Clanga hastata</i>	Accipitriformes	Accipitridae	Vulnerable
Eurasian wryneck	<i>Jynx torquilla</i>	Piciformes	Picidae	LC
Ashy drongo	<i>Dicrurus leucophaeus</i>	Passeriformes	Dicruridae	LC
Indian bush lark	<i>Mirafra erythroptera</i>	Passeriformes	Alaudidae	LC
Oriental skylark	<i>Alauda gulgula</i>	Passeriformes	Alaudidae	LC
Ruddy shelduck	<i>Tadorna ferruginea</i>	Anseriformes	Anatidae	LC
Kashmir flycatcher	<i>Ficedula subrubra</i>	Anseriformes	Muscicapidae	Vulnerable
Mallard	<i>Anas platyrhynchos</i>	Anseriformes	Anatidae	LC
Black-hooded oriole	<i>Oriolus xanthornus</i>	Passeriformes	Oriolidae	LC
Kentish plover	<i>Charadrius alexandrinus</i>	Charadriiformes	Charadriidae	LC
Small minivet	<i>Pericrocotus cinnamomeus</i>	Passeriformes	Campephagidae	LC
Blue-throated flycatcher	<i>Cyornis rubeculoides</i>	Passeriformes	Musciacapidae	LC
Blue rock thrush	<i>Monticola solitarius</i>	Passeriformes	Musciacapidae	LC
Pied cuckoo	<i>Clamator jacobinus</i>	Cuculiformes	Cuculidae	LC
Black bittern	<i>Ixobrychus flavicollis</i>	Eelecaniformes	Ardeidae	LC
Falcated duck	<i>Anas falcate</i>	Anseriformes	Anatidae	Near Threatened
Glossy ibis	<i>Plegadis falcinellus</i>	Pelecaniformes	Threskiornithidae	LC
Yellow-throated	<i>Petronia</i>	Passeriformes	Passridae	Lc

<i>sparrow</i>	<i>xanthocollis</i>			
<i>Grey Wagtail</i>	<i>Motacilla cinerea</i>	<i>Passeriformes</i>	<i>Motacillidae</i>	LC
<i>Spotted redshank</i>	<i>Tringa erythropus</i>	<i>Charadriiformes</i>	<i>Scolopacidae</i>	LC
<i>Steppe eagle</i>	<i>Aquila nipalensis</i>	<i>Accipitriformes</i>	<i>Accipitridae</i>	Endangered
<i>Cotton pygmy goose</i>	<i>Nettapus coromandelianus</i>	<i>Anseriformes</i>	<i>Anatidae</i>	LC
<i>Greater flamingo</i>	<i>Phoenicopterus roseus</i>	<i>Phoenicopteriformes</i>	<i>Phoenicopteridae</i>	LC
<i>Brown boobook</i>	<i>Ninox scotulata</i>	<i>Strigiformes</i>	<i>Strigidae</i>	LC
<i>Jungle myna</i>	<i>Acridotheres fuscus</i>	<i>Passeriformes</i>	<i>Sturnidae</i>	LC
<i>Common Shelduck</i>	<i>Tadorna tadorna</i>	<i>Anseriformes</i>	<i>Anatidae</i>	LC
<i>Crested bunting</i>	<i>Melophus lathami</i>	<i>Passeriformes</i>	<i>Emberizidae</i>	LC
<i>Red-headed bunting</i>	<i>Emberiza bruniceps</i>	<i>Passeriformes</i>	<i>Emberizidae</i>	LC
<i>Rosy Starling</i>	<i>Pastor roseus</i>	<i>Passeriformes</i>	<i>Sturnidae</i>	LC
<i>Straited heron</i>	<i>Butorides straita</i>	<i>Pelecaniformes</i>	<i>Ardeidae</i>	LC
<i>Bay-backed shrike</i>	<i>Lanius vittatus</i>	<i>Passeriformes</i>	<i>Laniidae</i>	LC
<i>Bengal bush lark</i>	<i>Mirafra assamica</i>	<i>Passeriformes</i>	<i>Alaodidae</i>	LC
<i>Black-headed gull</i>	<i>Chroicocephalus ridibundus</i>	<i>Charadriiformes</i>	<i>Laridae</i>	LC
<i>Osprey</i>	<i>Pandium haliaetus</i>	<i>Accipitriformes</i>	<i>Pandionidae</i>	LC
<i>Straited Babbler</i>	<i>Turdoides earlei</i>	<i>Passeriformes</i>	<i>Leiothrichidae</i>	LC
<i>European straling</i>	<i>Sturnus vulgaris</i>	<i>Passeriformes</i>	<i>Sturnidae</i>	LC
<i>Brown crane</i>	<i>Zapornia akool</i>	<i>Gruiformes</i>	<i>Rallidae</i>	LC
<i>Watercock</i>	<i>Gallix cinerea</i>	<i>Gruiformes</i>	<i>Rallidae</i>	LC
<i>Yellow bittern</i>	<i>Ixobrychus sinensis</i>	<i>Pelecaniformes</i>	<i>Ardeidae</i>	LC
<i>Tricolored munia</i>	<i>Lonchura malacca</i>	<i>Passeriformes</i>	<i>Estrilidae</i>	LC
<i>Streaked weaver</i>	<i>Ploceus manyar</i>	<i>Passeriformes</i>	<i>Ploceidae</i>	LC
<i>Desert wheatear</i>	<i>Oenanthe deserti</i>	<i>Passeriformes</i>	<i>Muscicapidae</i>	LC
<i>Delicate prinia</i>	<i>Prinia lepida</i>	<i>Passeriformes</i>	<i>Cisticolidae</i>	LC
<i>Rosy pipit</i>	<i>Anthus roseatus</i>	<i>Passeriformes</i>	<i>Motacillidae</i>	LC
<i>Tawny pipit</i>	<i>Anthus compestris</i>	<i>Passeriformes</i>	<i>Motacillidae</i>	LC
<i>Eared Grebe</i>	<i>Podiceps nigricollis</i>	<i>Podicipediformes</i>	<i>Podicipedidae</i>	LC
<i>Common snipe</i>	<i>Gallinago gallinago</i>	<i>Charadriiformes</i>	<i>Scolopaeidae</i>	LC
<i>Cinereous tit</i>	<i>Parus cinereus</i>	<i>Passeriformes</i>	<i>Paridae</i>	LC
<i>River lapwing</i>	<i>Vanellus duvaucelii</i>	<i>Charadriiformes</i>	<i>Charadriidae</i>	Near Threatened
<i>Eurassian hooby</i>	<i>Falco subbuteo</i>	<i>Falconiformes</i>	<i>Falconidae</i>	LC
<i>Northern lapwing</i>	<i>Vanellus vanellus</i>	<i>Charadriiformes</i>	<i>Charadriidae</i>	Near Threatened

RESULTS AND DISCUSSIONS

From the present study it has been revealed that a total of 160 species of birds belonging to 45 families and 25 orders were recorded during the survey. Maximum species of birds belonging to the family anatidae followed by scolopacidae and ardeidae. Moreover, one critically endangered and 3 endangered 2 vulnerable species were also reported during the survey.

This is the first stage carried out in Patna Pakshi Vihar bird sanctuary and if these birds are seen regularly in a given place, it's likely because the climate, food supply, and nesting opportunities are ideal for these species. From direct and indirect methods, it has been observed urbanization and anthropogenic activities have depleted the sanctuary, forest habitat and wetland, resulting in a drop in bird population.

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CONCLUSION

Biodiversity conservation is increasingly essential in the face of rapid environmental changes and human-induced habitat modifications. From the recent studies it has been estimated that Patna Pakshi Vihar Sanctuary, has a rich potential for diverse bird species, and requires effective conservation strategies to ensure the maintenance and growth of its avian populations. Preserve and restore wetland regions inside the sanctuary as they are important habitats for a variety of bird species, particularly migratory birds.

Preserving the habitats within the sanctuary is the first and most fundamental conservation measure. This involves strict regulation against deforestation, pollution, and other detrimental activities within and around the sanctuary. The diversity of habitat types in the sanctuary, from wetlands to forest patches, should be maintained to support a variety of bird species.

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