

Baseline survey of birds at proposed
Navi Mumbai International Airport
(NMIA) area

TRI-MONTHLY REPORT JULY-SEPTEMBER, 2013



Bombay Natural History Society

Baseline survey of birds at proposed Navi Mumbai International Airport (NMIA) area

TRI-MONTHLY REPORT JULY-SEPTEMBER, 2013

Principal Investigator

Asad R. Rahmani

Co-investigator

Sujit S. Narwade

Research fellows

Mr. Mrugank Prabhu

Ms. Parveen Shaikh

BOMBAY NATURAL HISTORY SOCIETY



© **BNHS 2013**: All rights reserved. This publication shall not be reproduced either in full or in part in any form, either in print or electronic or any other medium, without the prior written permission of the Bombay Natural History Society.

Address of the BNHS

Bombay Natural History Society,
Hornbill House, S.B. Singh Road,
Mumbai 400 001, Maharashtra, India.

Tel.: (91-22) 2282 1811

Fax: (91-22) 2283 7615

Email – info@bnhs.org

Cover design and page layout: Mr. Gopi Naidu, BNHS

Recommended citation

Narwade, S.S., M.V. Prabhu, P.A. Shaikh & A. R. Rahmani (2013): Baseline survey of birds at NMIA area. Tri-monthly report July-September, 2013. Submitted to CIDCO, Navi Mumbai, Maharashtra by BNHS, India. Pp 32.

CONTENTS

Summary	1
Introduction	2
Study Area	3
Methodology	5
Observation	6
Conclusion	14

Baseline Survey of Avian fauna at and around proposed Navi Mumbai International Airport (NMIA)

Summary

The avifaunal surveys were carried out between July 2013 and September 2013, in 10 kilometre radius of the proposed Navi Mumbai International Airport (NMIA), Navi Mumbai, Maharashtra, India. This report is primarily focussed on the observations of this survey conducted during the three months of monsoon. A few Juveniles of some of the birds were observed at different sites of the study area in September 2013. It indicates that study area is breeding ground for some of the species. In monsoon water puddles in a few open grassland and adjoining areas were seen utilized by the majority of the water birds. The water levels in the main wetlands was high, therefore big flocks and congregation of birds was not observed until end of September..

Keywords: Navi Mumbai International Airport, Avifauna, monsoon, Wetland.

Abbreviations used

- 1) NMIA - Navi Mumbai International Airport
- 2) BNHS - Bombay Natural History Society
- 3) JNPT - Jawaharlal Nehru Port Trust
- 4) EIA - Environmental Impact Assessment
- 5) DPS NRI complex – Delhi Public school and Non Residential Indian Complex
- 6) Habitats: **P** - Paddy field, **GS** - Mixed habitat of Grassland and Shrub land, **RS** - Rocky Seashore, **W** - Wetland, **MD** - Mudflats, **MC** - Mangrove and Creeks, **NH** - Near human habitation, **F** - forest
- 7) Threat categories: **EN** - Endangered, **VU** - Vulnerable, **NT** - Near threatened
- 8) Type of movements: **R** - Resident, **M** – Migratory
- 9) TSC- Training Ship Chanakya
- 10) NSPS - Nhava Sheva Police Station

1. Introduction

1.1 Background

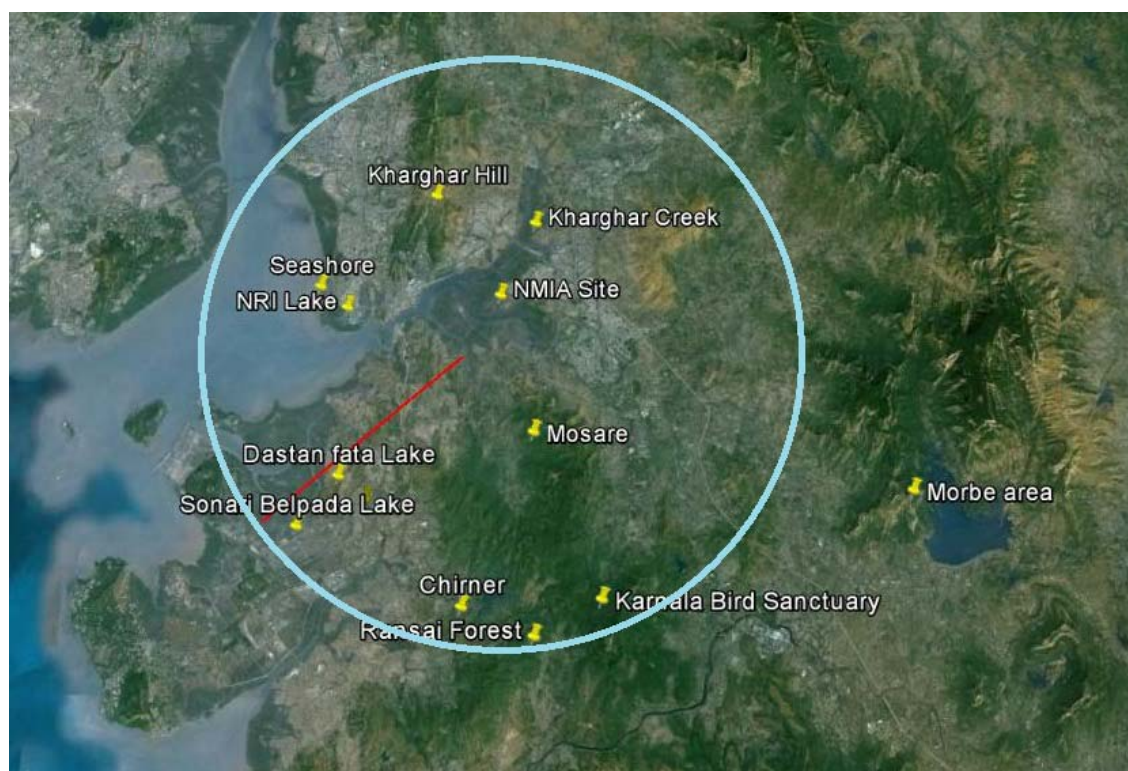
Navi Mumbai, a city on the west coast of Maharashtra, India, was developed in 1972 as a twin city of Mumbai. Navi Mumbai lies on the mainland on the eastern shore of Thane Creek. The city limits stretch from Airoli near Thane in the north, to Uran in the south. The City and Industrial Development Corporation (CIDCO) looked after the development and maintenance of the city, and prepared the developmental plan covering 95 villages from Thane and Raigad district.

1.2. Brief description of the proposed airport project

The existing airport at Mumbai is fast reaching a saturation level and the scope for further enhancement of passenger and cargo handling facilities, aircraft maintenance and city side facilities are limited. Hence, the need for a second airport adjoining Mumbai has become inescapable and imperative. CIDCO, Navi Mumbai proposed to set up a new international airport at Navi Mumbai, Maharashtra. The land requirement of the project is about 1160 hectares (2867 acres) to accommodate two parallel runways for independent operations. The Ministry of Environment and Forests (MoEF) has given conditional clearance to this project in 2010. One of the conditions (condition no. xxxi provided under specific conditions) is that an avifaunal study should be carried out in consultation with the BNHS.



Wire-tailed Swallow



Map of study sites in the 10km radius from the proposed Navi Mumbai International Airport

3. STUDY AREA

Location and description

The proposed NMIA site is accessible from Mumbai-Pune Highway via Navi Mumbai and is surrounded by 10 villages, namely *Kombad Bhuje*, *Ganeshpuri*, *Ulve*, *Mulgaon*, *Vaghiliwada*, *Owle*, *Pargaon*, *Kopar*, *Koli*, and *Chinchpada*.

The selected study sites

The survey was concentrated in the following areas around proposed NMIA site between July and September, 2013.

3.1 Forest areas

The forest areas of Chirner, Mosare, Ransai, Patnoli and Karnala Bird Sanctuary were surveyed. All the forest areas are the mixed deciduous types and the major tree species found here are Jamun *Syzygium cumuni*, Goose Berry *Zizipus mauritiana*, Banyan *Ficus bengalensis*, Teak *Tectona grandis*, Red Silk Cotton *Bombax ceiba* and Anjan *Hardwickia binata*.

The forest patches of Chirner, Mosare, Ransai and Patnoli are mosaic of different land-use-patterns such as forest, grassland, agriculture and plantation. Chirner forest was seen interspersed by patches of Mango orchards, Teak and Cashew plantations. Karnala Bird Sanctuary is a protected area and the mixed deciduous type forest here is the most suitable habitat for the forest dwelling birds. The anthropogenic activities such as stone quarrying, agriculture and industrial development was observed in large scale at Chirner.

3.2 Grasslands

We selected two land-filled wetlands near Belpada and Nhava Sheva of Uran which have naturally transformed over the period of time into open grassland-cum-shrubland habitats.

3.3 Mangrove areas

The stretches of mangroves adjoining Kharghar and Panvel creeks, Belpada village and area opposite to Nhava-Sheva Police station were surveyed.

3.4 Wetlands

The wetlands near Belpada, TS Chanakya, Jasai and behind NRI complex of Palm Beach road were found providing suitable habitat for many birds. Mudflats at seashore and creeks of Panvel and Kharghar were also surveyed.



SUJIT NARWADE

Belpada grassland in monsoon

4. METHODOLOGY

The areas were surveyed using the binoculars (Nikkon Monarch 10x X 42x) and a digital SLR (Cannon 550D, Cannon 400 mm fix lens). The birds were identified by referring to Ali & Ripley (1983), Grimmett *et al.* (1998) and Rasmussen & Anderton (2012). The list of birds was arranged by family using Manakadan & Pittie (2001) as the key, and Rasmussen & Anderton (2012) was followed for the nomenclature.

Birds were counted using the estimated blocks method as mentioned by Bibby *et.al* (2000). The total count method was used to estimate the number of congregating water birds and waders. Transect method was deployed for the mangroves and the open areas to count the birds perching and sheltering in mangroves and associated plants. Quantitative data of maximum individuals observed at respective study sites from July to September has been recorded and provided in this report.



Black-headed Ibis

5. OBSERVATIONS

5.1 Birds in forest areas

Birds such as Brown-headed Barbet *Megalaima zeylanica*, European Golden Oriole *Oriolus oriolus*, Purple-rumped Sunbird *Leptocoma zeylonica*, Black Drongo *Dicrurus macrocercus* and Common Iora *Aegithina tiphia* were often heard and commonly observed in all the forest patches of the study area.

5.1.1 Karnala Bird Sanctuary

Indian Pygmy Woodpecker *Dendrocopos nanus*, Heart-spotted Woodpecker *Hemicircus canente*, Yellow-fronted Pied Woodpecker *Dendrocopos mahrattensis* and Common Flameback *Dinopium javanense* were observed foraging in this forest area. Indian Pygmy Woodpecker *Dendrocopos nanus* was more frequently observed as compared to the other species of its family. The male and female of Asian Paradise Flycatcher *Terpsiphone paradisi* were often observed feeding on insects. Orange-headed Thrush *Zoothera citrina* was observed feeding on the insects in the leaf litter on the ground. Heart-spotted Woodpecker *Hemicircus canente* was observed only once.

Black-backed Dwarf Kingfisher *Ceyx erithaca* is a breeding migrant from southern India and is observed during monsoon in this area. It was observed feeding and resting in the thickets of lianas; the woody climbers.

Common Woodshrike *Tephrodornis pondicerianus*, Black Drongo *Dicrurus macrocercus*, and Black-naped Blue Monarch *Hypothymis azurea* were often observed in the mix hunting-parties.

5.1.2 Ransai: Common forest dwelling species like Coppersmith Barbet *Megalaima haemacephala*, Rufous Treepie *Dendrocitta vagabunda* and Purple-rumped Sunbird *Leptocoma zeylonica* were commonly heard and observed at this site.

5.1.3 Chirner: Red Spurfowl *Galloperdix spadicea*, Little Green Bee-eater *Merops orientalis*, Common Iora *Aegithina tiphia* and Small Minivet *Pericrocotus cinnamomeus* were frequently observed in the plantations adjoining the forest areas.

Other species like Black-naped Blue Monarch *Hypothymis azurea*, Asian Paradise Flycatcher *Terpsiphone paradisi*, Rufous Treepie *Dendrocitta vagabunda* were seen occasionally.

5.1.4 Mosare: Tawny-bellied Babbler *Dumetia hyperythra*, Red-vented Bulbul *Pycnonotus cafer* and Little Green Bee-eater *Merops orientalis* were frequently sighted in the forest patches. Black-backed Dwarf Kingfisher *Ceyx erithaca*, Black-naped Blue Monarch *Hypothymis azurea*, Rufous Treepie *Dendrocitta vagabunda* were also observed. Common Snipe *Gallinago gallinago* was observed on the edges of the paddy fields in this study area.

Crested Serpent-eagle *Spilornis cheela* and Common Kestrel *Falco tinnunculus* were often observed in flight in this area.



MRUGANK PRABHU

Asian Paradise Flycatcher at Karnala Bird Sanctuary



MRUGANK PRABHU

Black-backed Dwarf Kingfisher at Mosare

5.2 Birds in grasslands

The grasslands of Belpada and Nhava Sheva had temporarily transformed into marshland, dotted with plenty of puddles, because of the rains. Eastern Cattle Egret *Bubulcus coromandus*, Little Egret *Egretta garzetta*, Intermediate Egret *Egretta intermedia* and Indian Pond-heron *Ardeola grayii* were observed in these puddles.

At one occasion, thirty one individuals of Asian Openbill *Anastomus oscitans* were observed at the Belpada grassland. About forty individuals of Heuglin's Gull *Larus heuglini* and over sixteen individuals of Eurasian Curlew *Numenius arquata* were observed roosting in the grasslands near Nhava sheva police station (NSPS) which were seen moving to the adjoining mudflats in the mangroves when disturbed by fishermen activity or because of presence of stray dogs. A group of about 25 Indian Spot-billed Duck *Anas poecilorhyncha* was observed resting in the grasslands of Belpada. A group of approximately 130 Eurasian Spoonbills were observed resting in the Belpada Grassland when the water levels in the nearby wetlands were very high. Forty three individuals of Glossy Ibis *Plegadis falcinellus* were observed foraging in the grassland of Belpada.

The species like Zitting Cisticola *Cisticola juncidis*, Rufous-backed Long-tailed Shrike *Lanius schach: erythronotus group*, Tricoloured Munia *Lonchura malacca* were observed regularly while the migratory species such as Common Stonechat *Saxicola torquata* were seen at the end of monsoon season. Common Kingfisher *Alcedo atthis* and White-throated Kingfisher *Halcyon smyrnensis* were occasionally seen here.

A flock of about 15-20 individuals of 'Indian Baya or the Weaver Bird *Ploceus p. philippinus* were observed building nests. A pair of Scaly-breasted Munia *Lonchura punctulata* was observed nesting in the shrubs in the grasslands. Over 20 individuals of Red-wattled Lapwing *Vanellus indicus* along with juveniles were observed congregating on the mud road along the side of Belpada grassland.

Raptors such as Black Kite *Milvus migrans migrans/govinda* and Western Marsh Harrier *Circus aeruginosus* were observed soaring in the sky in these grassland areas.



SUJIT NARWADE

Grassland become pool of shallow waters and majority of water birds seen here



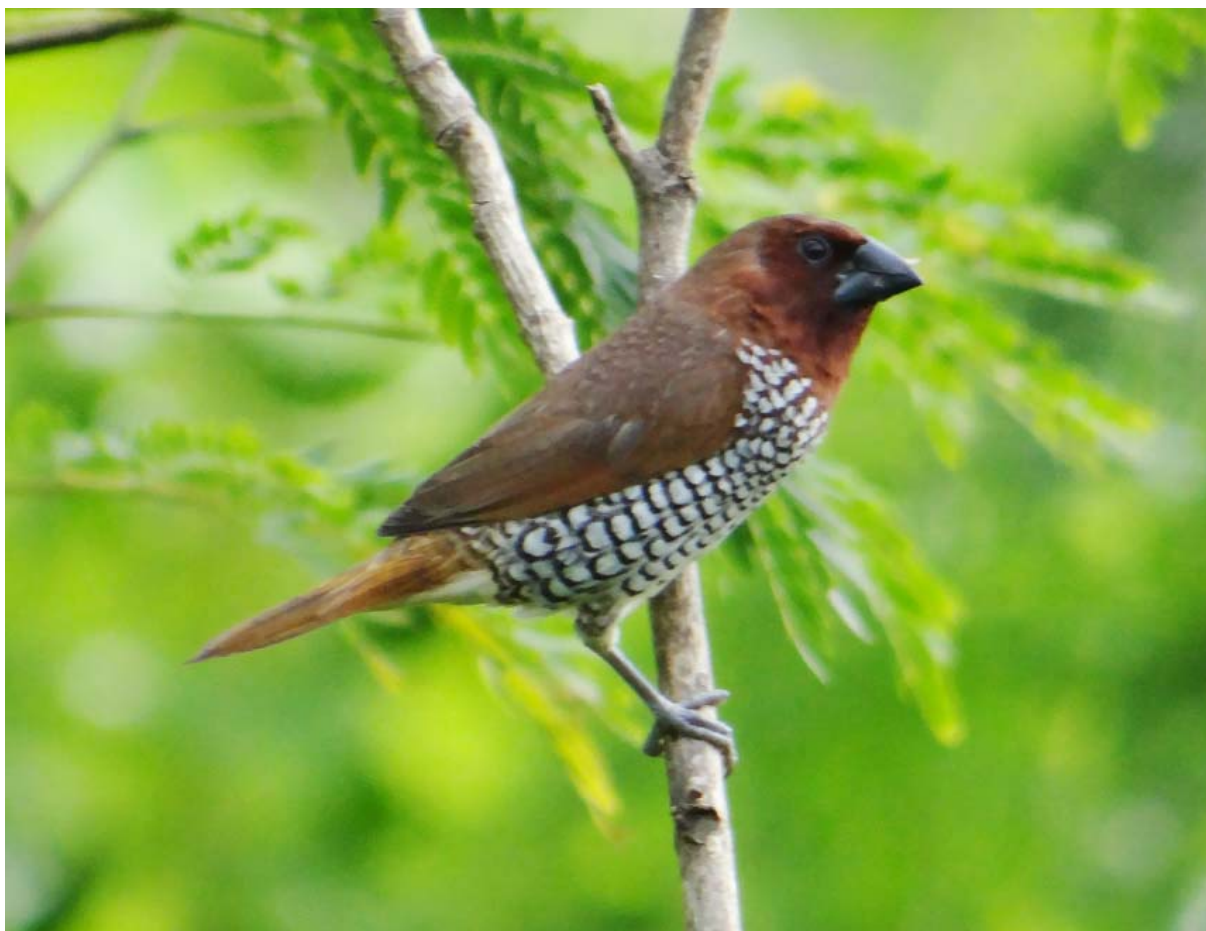
SUJIT NARWADE

Common Stonechat one of the early arrivals of winter migrant



SUJIT NARWADE

Malabar Lark at Belpada Grassland



SUJIT NARWADE

Scaly-breasted Munia



SUJIT NARWADE

Red-wattled Lapwing



SUJIT NARWADE

Common Kingfisher waiting for a prey

5.3 Birds in the mangroves and associated plants

The resident water-bird species such as Little Cormorant *Phalacrocorax niger*, Eastern Cattle Egret *Bubulcus coromandus*, Little Egret *Egretta garzetta*, Purple Heron *Ardea purpurea*, Grey Heron *Ardea cinerea* were observed very commonly in all the mangroves of the study area. Little Cormorant *Phalacrocorax niger* was observed roosting in the mangroves at the proposed NMIA site. Ashy Prinia *Prinia socialis* and Plain Prinia *Prinia inornata* were often heard and observed while flying from one bush to the other. Indian Reed Warbler *Acrocephalus stentoreus* was more often heard than observed in the thick mangroves areas. Yellow-eyed Babbler *Chrysomma sinense* was seen perching on the mangroves and associated plants.

Tricoloured Munia *Lonchura malacca*, Scaly-breasted Munia *Lonchura punctulata* and White-eared Bulbul *Pycnonotus leucotis* were observed at all the mangrove-areas, often foraging, flying and perching. The small flocks of Red Avadavat *Amandava amandava* were observed foraging and resting on the mangrove-associated plants. White-throated Kingfisher *Halcyon smyrnensis* was very common in the mangroves.

Ruddy-breasted Crake *Porzana fusca* is a very shy species and was observed in the vegetation on the fringes of Panvel Creek.

Black Drongo *Dicrurus macrocercus*, White-browed Fantail *Rhipidura aureola*, Asian Pied Starling *Gracupica contra* and Coppersmith Barbet *Megalaima haemacephala* were observed perching on the mangroves and the associated plants.

Black Kite *Milvus migrans migrans/govinda* was seen as a very common species throughout the study area and was observed scavenging and foraging at garbage dumps. Little Green Bee-eater *Merops orientalis* was observed feeding on insects such as dragon-flies and butterflies.

A flock of about 73 individuals of Common Redshank *Tringa tetanus* was observed foraging and resting in the mangroves of Belpada.



MIRUGANK PRABHU

Flock of Common Redshank in Mangroves



SUJIT NARWADE

Plain Prinia one of the commonest bird seen during monsoon

5.4 Bird in the Wetland Areas

The overwintering population of birds like Whiskered Tern *Chlidonias hybridus*, Common Sandpiper *Actitis hypoleucos*, Eurasian Curlew *Numenius arquata*, Whimbrel *Numenius phaeopus*, Greater Black-headed Gull *Ichthyaelus ichthyaelus* and Common Greenshank *Tringa nebularia* were observed at the wetland areas. Amongst migratory species, the earliest visitors were Black-tailed Godwit *Limosa limosa*, observed in a flock of about 650 individuals on the 23rd of September 2013. More than 50 individuals of Eurasian Curlew *Numenius arquata* were observed resting in the wetland behind TS Chanakya of Palm Beach Road area.

Indian Spot-billed Duck *Anas poecilorhyncha*, along with a few juveniles was observed at the wetland near NRI complex. A breeding pair of Pheasant-tailed Jacana *Hydrophasianus chirurgus* was observed nesting at Belpada where two juveniles were observed later on. The chicks and juveniles of Eurasian Coot *Fulica atra*, White-breasted Waterhen *Amaurornis phoenicurus*, Purple Swampphen *Porphyrio [porphyrio] poliocephalus* and Lesser-whistling duck *Dendrocygna javanica* were observed at Belpada, indicating that the area is a suitable breeding site for these birds.

A few individuals of Painted stork *Mycteria leucocephala*, Little Egret *Egretta garzetta* and Indian Pondheron *Ardeola grayii* were observed resting on the trees near the edges of the wetland behind NRI complex.

5.5 Birds at garbage dumps

Black Kite *Milvus migrans migrans/govinda*, Common Myna *Acridotheres tristis*, Brahminy Kite *Haliastur indus*, Asian Pied Starling *Gracupica contra*, Eastern Cattle Egret *Bubulcus coromandus*, and House Crows *Corvus splendens* were observed feeding on the garbage dumps at Belpada and Kharghar creeks and were commonly observed during the survey. A group of Jungle Mynas *Acridotheres tristis* was observed feeding on the garbage dumps at Kharghar creek and Belpada areas along with a flock of 30-35 Barn Swallow *Hirundo rustica* and Wire-tailed Swallow *Hirundo smithi*.

6. CONCLUSION

Though very few migratory bird species were recorded during the monsoons, between July and September, the resident, overwintering and the migratory population of water birds were observed in the study area. The overwintering and early-migratory populations of the flocking water-bird species were seen congregating in shallow water pools in the grasslands and paddy fields near human habitation. This suggests that birds may get attracted towards temporary water pools formed during the monsoons in the vast open patch of land for the proposed airport.



MRUGANK PRABHU

Black-tailed Godwit were observed foraging at Jashkar wetland



MRUGANK PRABHU

Few Eurasian Curlews were observed over wintering in the study area



SUJIT NARWADE

Asian Openbill at Belpada



SUJIT NARWADE

An Osprey was observed frequently perching at Belpada area



MRUGANK PRABHU

Mix flock of terns congregating at NRI



SUJIT NARWADE

Flock of 30 to 40 Heuglin's gull was seen in area opposite to NSPS



SUJIT NARWADE

Nest of a Peasant-tailed Jacana at Belpada lake



MRUGANK PRABHU

Juvenile and adult Peasant-tailed jacana at Belpada



SUJIT NARWADE

Garbage Dump attracts many birds



SUJIT NARWADE

Jungle Myna was seen feeding on garbage dump in monsoon only



SUJIT NARWADE

Large number of Stray dogs are threat to the birds in study area



SUJIT NARWADE

Swallows on garbage dump



SUJIT NARWADE

Plastic waste was seen accumulated in mangrove areas



SUJIT NARWADE

Rapid developmental activities were seen at Karanjade area opposite to proposed airport



SUJIT NARWADE

Water level of lakes usually maintained by the local fishermen

List of birds observed during survey carried out in July-September 2013

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
Family Podicipedidae						
1	Little Grebe <i>Tachybaptus ruficollis</i>	W	IV	LC	R	Dastan Phata, DPS Lake, Belapur pond
Family Phalacrocoracidae						
2	Little Cormorant <i>Phalacrocorax niger</i>	W	IV	LC	R	All wetland areas
Family Ardeidae						
3	Eastern Cattle Egret <i>Bubulcus coromandus</i>	W/P	IV	LC	R	All wetland areas
4	Intermediate Egret <i>Egretta intermedia</i>	W/P	IV	LC	R	All wetland areas
5	Great Egret <i>Egretta alba</i>	W	IV	LC	R	All wetland areas
6	Little Egret <i>Egretta garzetta</i>	W/P/C	IV	LC	R	All wetland areas
7	Grey Heron <i>Ardea cinerea</i>	W/C	IV	LC	R	All wetland areas
8	Indian Pond-heron <i>Ardeola grayii</i>	W	IV	LC	R	All wetland areas
9	Purple Heron <i>Ardea purpurea</i>	W/C	IV	LC	R	All wetland areas
10	Western Reef-heron <i>Egretta gularis</i>	W/MD	IV	LC	M	Dastan Phata, Nere, Sonari-Belpada
11	Black-crowned Night-heron <i>Nycticorax nycticorax</i>	W	IV	LC	R	Kharghar Creek, Panvel Creek
12	Striated Heron <i>Butorides striata</i>	W	IV	LC	R	Uran
Family Ciconiidae						
13	Painted Stork <i>Mycteria leucocephala</i>	W	IV	NT	R	Sonari-Belpada, Kopar, wetlands at Palm Beach Road
14	Asian Openbill <i>Anastomus oscitans</i>	W	IV	LC	R	Dastan Phata
Family Threskiornithidae						
15	Black-headed Ibis <i>Threskiornis melanocephalus</i>	W/C	IV	NT	R	All wetlands and mangroves
16	Eurasian Spoonbill <i>Platalea leucorodia</i>	W	I	LC	R	Jasai, Sanjivani School, Sonari-Belpada
17	Glossy Ibis <i>Plegadis falcinellus</i>	W	IV	LC	M	Karal
Family Anatidae						
18	Indian Spot-billed Duck <i>Anas poecilorhyncha</i>	W/C	IV	LC	R	All
19	Garganey <i>Anas querquedula</i>	W	IV	LC	M	Sonari-Belpada
20	Northern Shoveller <i>Anas clypeata</i>	W/C	IV	LC	M	Kharghar Creek

Annexure: List of birds observed during survey carried out in July-September 2013

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
21	Lesser Whistling-duck <i>Dendrocygna javanica</i>	W	IV	LC	R	Dastan Phata, Belapur pond, Sonari-Belpada, Palm Beach road
22	Cotton Teal <i>Nettapus coromandelianus</i>	W	IV	LC	R	Dastan Phata, Belapur pond
Family Accipitridae						
23	Black-winged Kite <i>Elanus caeruleus</i>	All	I	LC	R	All areas
24	Black Kite <i>Milvus migrans migrans/govinda</i>	All	I	LC	R	All areas
25	Shikra <i>Accipiter badius</i>	All	I	LC	R	All areas
26	Western Marsh Harrier <i>Circus aeruginosus</i>	W	I	LC	M	All areas
27	Crested Serpent-eagle <i>Spilornis cheela</i>	F	I	LC	R	Ransai, Mosare
Family Falconidae						
28	Common Kestrel <i>Falco tinnunculus</i>	GS	IV	LC	R	Chirner road
Family Pandionidae						
29	Osprey <i>Pandion haliaetus</i>	W/C	I	LC	R	Kharghar Creek, Sonari-Belpada
Family Phasianidae						
30	Rain Quail <i>Coturnix coromandelica</i>	P	-	LC	R	Chirner
31	Red Spurfowl <i>Galloperdix spadicea</i>	F	-	LC	R	Kharghar hills
32	Indian Peafowl <i>Pavo cristatus</i>	F	I	LC	R	Nere
33	Painted Francolin <i>Francolinus pictus</i>	GS	-	LC	R	Taloja
34	Grey Francolin <i>Francolinus pondicerianus</i>	GS	-	LC	R	Taloja
Family Turnicidae						
35	Yellow-legged buttonquail <i>Turnix tanki</i>	P	-	LC	R	Chirner
Family Rallidae						
36	Purple Swamphen <i>Porphyrio porphyrio</i>	W	IV	LC	R	Dastan Phata, Pargaon
37	Common Moorhen <i>Gallinula chloropus</i>	W	IV	LC	R	Belapur pond, Dastan Phata
38	Eurasian Coot <i>Fulica atra</i>	W	IV	LC	R	Belapur pond, Dastan Phata
Family Jacanidae						
39	Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	W	IV	LC	R	Belapur pond, Dastan Phata
40	Bronze-winged Jacana <i>Metopidius indicus</i>	W	IV	LC	R	Belapur pond, Dastan Phata

Annexure: List of birds observed during survey carried out in July-September 2013

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
Family Rostratulidae						
41	Greater Painted Snipe <i>Rostratula benghalensis</i>	W	IV	LC	R	Sonari-Belpada, Dastan Phata
Family Charadriidae						
42	Red-wattled Lapwing <i>Vanellus indicus</i>	ALL	IV	LC	R	All areas
43	Lesser Sand Plover <i>Charadrius mongolus</i>	W/MD	IV	LC	M	All mudflats in study area
44	Pacific Golden-Plover <i>Pluvialis fulva</i>	W/MD	IV	LC	M	Behind TS Chanakya, Panvel Creek
45	Grey Plover <i>Pluvialis squatarola</i>	W/MD	IV	LC	M	Sonari-Belpada, wetlands of Palm Beach Road area
Family Scolopacidae						
46	Common Snipe <i>Gallinago gallinago</i>	W	IV	LC	R	Sonari-Belpada, Dastan Phata
47	Common Redshank <i>Tringa tetanus</i>	W/MC	IV	LC	M	All (congregation at Kharghar Creek)
48	Common Sandpiper <i>Tringa hypoleucos</i>	W/MC		LC	R	All wetlands
49	Common Greenshank <i>Tringa nebularia</i>	W/RS	IV	LC	M	Seashore of Palm Beach Road, Sonari-Belpada
50	'Western' Black-tailed Godwit <i>Limosa limosa</i>	W	IV	LC	M	Sonari-Belpada, Sanjivani School
51	Eurasian Curlew <i>Numenius arquata</i>	W	IV	LC	M	Behind NRI Complex
52	Little Stint <i>Calidris minuta</i>	W	IV	LC	M	All wetland areas
53	Curlew Sandpiper <i>Calidris ferruginea</i>	W	IV	LC	M	Sonari-Belpada, Dastan Phata, Sanjivani school (congregation of 2,000 birds behind NRI xComplex)
54	Broad-billed Sandpiper	W	IV	LC	M	Belpada, NRI Lake, TS Chanakya.
55	Whimbrel <i>Numenius phaeopus</i>	W	IV	LC		Sonari-Belpada
Family Recurvirostridae						
56	Black-winged Stilt <i>Himantopus himantopus</i>	W	IV	LC	R	All wetland areas
Family Laridae						
57	Gull-billed Tern <i>Gelochelidon nilotica</i>	W	IV	LC	M	All wetland areas
58	Caspian Tern <i>Sterna caspia</i>	W/C	IV	LC	M	Wetlands of Kamothe, Panvel, Palm Beach Road
59	Whiskered Tern <i>Chlidonias hybridus</i>	W/C	IV	LC	M	Wetlands of Palm Beach Road, Panvel Creek

Annexure: List of birds observed during survey carried out in July-September 2013

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
60	Heuglin's Gull <i>Larus fuscus heuglini</i>	W	IV	LC	M	Airoli
61	Great Black-headed Gull <i>Ichthyaeetus ichthyaeetus</i>	W	IV	LC	M	Sea shore
Family Columbidae						
62	Laughing Dove <i>Streptopelia senegalensis</i>	All	IV	LC	R	All areas
63	Spotted Dove <i>Streptopelia chinensis</i>	All	IV	LC	R	All areas
64	Rock Pigeon <i>Columba livia</i>	All/NH		LC	R	All areas
Family Cuculidae						
65	Asian Koel <i>Eudynamis scolopaceus</i>	All	IV	LC	R	All areas
66	Common Hawk-cuckoo <i>Hierococcyx varius</i>	All	IV	LC	R	Mosare, Ransai
67	Indian Cuckoo <i>Cuculus micropterus</i>	F	-	LC	R	Chirner, Ransai, Mosare
Family Alcedinidae						
68	White-throated Kingfisher <i>Halcyon smyrnensis</i>	All	IV	LC	R	All areas
69	Common Kingfisher <i>Alcedo atthis</i>	W	IV	LC	R	All areas
70	Black-backed Dwarf Kingfisher <i>Ceyx erithaca</i>	F	IV	LC	M	Ransai
Family Meropidae						
71	Little Green Bee-eater <i>Merops orientalis</i>	All		LC	R	All areas
Family Capitonidae						
72	Coppersmith Barbet <i>Megalaima haemacephala</i>	F	IV	LC	R	Mosare, Ransai
73	Brown-headed Barbet <i>Megalaima zeylonica</i>	F	IV	LC	R	Mosare, Ransai
Family Picidae						
74	Common Flameback <i>Dinopium javanense</i>	F	IV	LC	R	Ransai
75	Yellow-fronted Pied Woodpecker <i>Dendrocopos mahrattensis</i>	F	IV	LC	R	Mosare, Nere
76	Heart-spotted Woodpecker <i>Hemicircus canente</i>	F	IV	LC	R	Karnala

Annexure: List of birds observed during survey carried out in July-September 2013

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
77	Indian Pygmy Woodpecker <i>Dendrocopos nanus</i>					
Family Alaudidae						
78	Malabar Lark <i>Galerida malabarica</i>	ALL	IV	LC	R	All areas
Family Motacillidae						
79	Paddyfield Pipit <i>Anthus rufulus</i>	ALL	IV	LC	R	All areas
Family Hirundinidae						
80	Wire-tailed Swallow <i>Hirundo smithii</i>	All		LC	R	All areas
81	Barn Swallow <i>Hirundo rustica</i>	W		LC	R	All areas
Family Campephagidae						
82	Common Woodshrike <i>Tephrodornis pondicerianus</i>	F	IV	LC	R	Mosare
83	Small Minivet <i>Pericrocotus cinnamomeus</i>	F	IV	LC	R	Mosare
Family Irenidae						
84	Common Iora <i>Aegithina tiphia</i>	F	IV	LC	R	Ransai
85	Gold-fronted Leafbird <i>Chloropsis aurifrons</i>	F	IV	LC	R	Ransai, Mosare
Family Pycnonotidae						
86	Red-vented Bulbul <i>Pycnonotus cafer</i>	All	IV	LC	R	All areas
87	Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	F/MC	IV	LC	R	All areas
88	White-eared BulbulMC <i>Pycnonotus leucotis</i>	IV	LC	R		All areas
Family Laniidae						
89	'Rufous-backed' Long-tailed Shrike <i>Lanius schach erythronotus group</i>	All		LC	R	All areas
90	Southern Grey Shrike <i>Lanius meridionalis</i>	GS		LC	R	Chirner road
Family Muscicapidae						
91	Yellow-eyed Babbler <i>Chrysomma sinense</i>	F	IV	LC	R	Chirner

Annexure: List of birds observed during survey carried out in July-September 2013

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
92	Orange-headed Thrush <i>Zoothera citrina</i>	F	IV	LC	R	Ransa
93	Jungle Babbler <i>Turdoides striatus</i>	F	IV	LC	R	Ransai, Mosare, Patnoli
94	Oriental Magpie-robin <i>Copsychus saularis</i>	All	IV	LC	R	All areas
95	Indian Black Robin <i>Saxicoloides fulicatus</i>	All	IV	LC	R	All areas
96	Common Stonechat <i>Saxicola torquatus</i>	All	IV	LC	M	All areas
97	Zitting Cisticola <i>Cisticola juncidis</i>	MC	IV	LC	R	Kopar
98	Plain Prinia <i>Prinia inornata</i>	All	IV	LC	R	All areas
99	Ashy Prinia <i>Prinia socialis</i>	All	IV	LC	R	All areas
100	Indian Reed-warbler <i>Acrocephalus [stentoreus] brunescens</i>	MS	IV	LC	M	All creeks and mangrove areas
101	White-browed Fantail <i>Rhipidura albicollis</i>	MC	IV	LC	M	Khargahr Creek
102	Asian Paradise Flycatcher <i>Terpsiphone paradisi</i>	F	IV	LC		Ransai, Karnala, Morbe, Chirner
103	Black-naped Blue Monarch <i>Hypothymis azurea</i>	F	IV	LC		Karnala, Morbe
Family Nectariniidae						
104	Purple Sunbird <i>Cinnyris asiatica</i>	All	IV	LC	R	Uran
105	Purple-rumped Sunbird <i>Leptocoma zeylonica</i>	GS	IV	LC	R	Uran
106	Indian Silverbill <i>Euodice malabarica</i>	P	IV	LC	R	All areas
107	Red Avadavat <i>Amandava amandava</i>	W/MC	IV	LC	R	Sonari-Belpada, TS Chanakya
108	Tricoloured Munia <i>Lonchura Malacca</i>	MC	IV	LC	R	Kharghar Creek, TS Chanakya
109	Scaly-breasted Munia <i>Lonchura punctulata</i>	MC/F	IV	LC	R	Kharghar Creek, TS Chanakya, Mosare
Family Passeridae						
110	House Sparrow <i>Passer domesticus</i>	All	IV	LC	R	All areas
111	Yellow-throated Sparrow <i>Petronia xanthocollis</i>	F/GS	IV	LC	R	Uran, Mosare
112	Baya Weaver <i>Ploceus philippinus</i>	All	IV	LC	R	All areas
Family Sturnidae						
113	Asian Pied Starling <i>Gracupica contra</i>	GS	IV	LC	R	All areas
114	Common Myna <i>Acridotheres tristis</i>	All	IV	LC	R	All areas
115	Jungle Myna <i>Acridotheres fuscus</i>	All	IV	LC	R	Mosare

Annexure: List of birds observed during survey carried out in July-September 2013

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
Family Oriolidae						
116	European Golden Oriole <i>Oriolus oriolus</i>	All	IV	LC	R	All areas
Family Dicuridae						
117	Black Drongo <i>Dicrurus macrocercus</i>	All	IV	LC	R	All areas
118	White-bellied Drongo <i>Dicrurus caerulescens</i>	F	IV	LC	R	Ransai, Patnoli
Family Corvidae						
119	House Crow <i>Corvus splendens</i>	NH	V	LC	R	All areas
120	Jungle Crow <i>Corvus macrorhynchos</i>	All	IV	LC	R	All areas
121	Rufous Treepie <i>Dendrocitta vagabunda</i>	F	IV	LC	R	Mosare

REFERENCES

Ali, S. and S.D. Ripley (1987): Compact edition of Handbook of the Birds of India and Pakistan Bombay: Oxford University Press.

Bibby, C.J., N.D. Burgess, D.A. Hill, S.H. Mustoe and S. Lambton (2000): Bird Census Techniques, 2nd Edn. American Press, London.

Grimmett, R., C. Inskipp and T. Inskipp (1998): Birds of the Indian Subcontinent. Oxford University Press, Oxford. Second Edition. 528 pp.

Manakadan, R. and A. Pittie (2001): Standardised common and scientific names of the birds of the Indian Subcontinent. *Buceros (ENVIS News-letter)* 6(1): i–ix, 1–37.

Rassmusen, P.C. and Anderton, J.C. (2012). Birds of South Asia - The Ripley Guide. 2 vols. Smithsonian Institution and Lynx Edicions, Washington, D.C. and Barcelona.