

Baseline Survey of Birds at the Proposed Navi Mumbai International Airport (NMIA) Area

Report on seasonal surveys covering seasonal
variation in population of birds with note on surveys
conducted during January-March 2014

TRI-MONTHLY REPORT



Bombay Natural History Society



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Summary

The field visits were conducted between January and March 2014, in the study area of approximately 10 kilometre radius from the proposed site of Navi Mumbai International Airport (NMIA). Through this trimonthly report, we are reporting seasonal changes in the species composition, and changes in the population of the resident and the migratory birds at various sites in the study area observed in the year 2013. A separate account on monthly variation in the population of birds is given on the basis of surveys conducted during January to March 2014.

Keywords: Navi Mumbai International Airport, Avifauna, population variation, tide timing, water level, congregatory bird species,

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) 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
- 6) Threat categories: EN – Endangered, VU – Vulnerable, NT – Near threatened
- 7) Type of movements: R – Resident, M – Migratory

Chapter I

Introduction

According to the Government of Maharashtra, Chhatrapati Shivaji International Airport at Mumbai is fast reaching the saturation level and the scope for further enhancement of passenger and cargo handling facilities, aircraft maintenance and the city-side facilities is limited (EIA report, CIDCO, Navi Mumbai). The need for a second airport for Mumbai has become inescapable and imperative.

The city and Industrial Development Corporation of Maharashtra Limited (CIDCO) proposed to set up a new international airport at Navi Mumbai in Maharashtra. The proposed Navi Mumbai International Airport (NMIA) is located near Panvel, between the National Highway 48 (NH48) and Aamra Marg in Raigad district. The total area demarcated for the airport is 2,054 hectare; including approximately 1,615 hectare as the Airport Zone and the remaining for the off-site infrastructure such as diversion, training of rivers, approach roads, etc.

Environmental Impact Assessment (EIA) was carried out for NMIA by the Centre of Environment Science and Engineering at Indian Institute of Technology Bombay (IIT-Bombay), reported 58 species of birds from 21 locations in the 10-kilometre radius area of the proposed airport site. The area comprised creeks, rivers and mangroves which serve as a good habitat for a variety of congregating bird species. Karnala Bird Sanctuary is located in close proximity of the proposed NMIA site.

The Ministry of Environment and Forests (MoEF), Government of India has granted a conditional clearance to this project. One of the conditions (condition no. xxxi provided under specific conditions) is that an avifaunal study should be carried out in consultation with the Bombay Natural History Society (BNHS). The BNHS survey was designed to document the bird diversity and species-composition at various survey-sites in the 10 kilometre radius-area of NMIA.

Chapter II

Study area

Survey sites in the 10 kilometre radius area of the proposed site of NMIA were divided by us into five blocks as mentioned below, however, excluding the industrial areas and the areas with dense human habitations.

1. The proposed site of NMIA: Data was collected from wetlands, creeks, paddy fields, mangrove covered areas, mudflats, open scrub-land and shrub-land. The study area included Kombadbhuja, Ulve, Dungi, Pargaon, Chinchpada and Kopar; the villages adjacent to the proposed NMIA site, and the creeks at Gadhi, Ulve, Kalamboli and Panvel.
2. North-west: This block includes the land primarily covered with grass and shrubs, the seashore parallel to Palm Beach Road and a part of Airoli Creek, and the water bodies around NRI Complex, DPS School on Palm Beach Road, Belapur Pond and a portion of Parsik Hills.
3. North-east: This block includes Taloja, Panvel, Tembhode, Kewale, Nere and Pali villages, which is a hilly area interspersed with paddy fields, human habitations and grasslands.
4. South-west or Uran-Jawaharlal Nehru Port Trust (JNPT) area: This block includes small wetlands, and mangroves areas near the villages such as Jasai, Sonari, Belpada, Karal, Gawhan, Uran, Jaskhar and Funde.
5. South-east: This block primarily consists of reserve-forest patches adjoining villages such as Mosare, Patnoli and Ransai. The southern-moist, mixed-deciduous forest patch was recently added to Karnala Bird Sanctuary, NH17 (National Highway number 17) cuts through this sanctuary.

For the study of seasonal variations in bird population, the BNHS survey team focussed on the following areas to collect data about temporal and special variation in the population of some congregating bird species.

1. **Belpada Lake:** It is located in the southwest direction of the proposed NMIA site near Sonari-Belpada village. This lake near the campus of Speedy Services was observed being used by the birds for roosting. It is surrounded by grass/shrub land from three sides and the boundary wall of



A flock of Whiskered Terns at Belpada Lake

Speedy Services on the fourth side. This wetland, once connected to the sea by water channels, is isolated and its water level is not dependent on the tidal cycle, therefore, it dries up in the summer. This lake is reachable from Panvel-JNPT road, and is about 2-3 km from Jasai village and about 500 metres from the toll plaza towards Speedy Container Yard.

2. Panvel Creek and NMIA site: Waders are usually seen on a rock-bed, exposed during a low-tide, in Panvel Creek at the proposed site of NMIA near Kopar and Pargaon villages. This site is of mixed habitat and includes mangroves, open scrubland/shrub land, complex of smaller wetlands created by backwater, paddy fields as well as creeks of Gadhi, Ulve, Kalamboli and Panvel. Roosting of birds was mainly seen in area of about 40 hectares as shown in the map.



SUJIT NARWADE

Land filling activities at the proposed site of NMIA



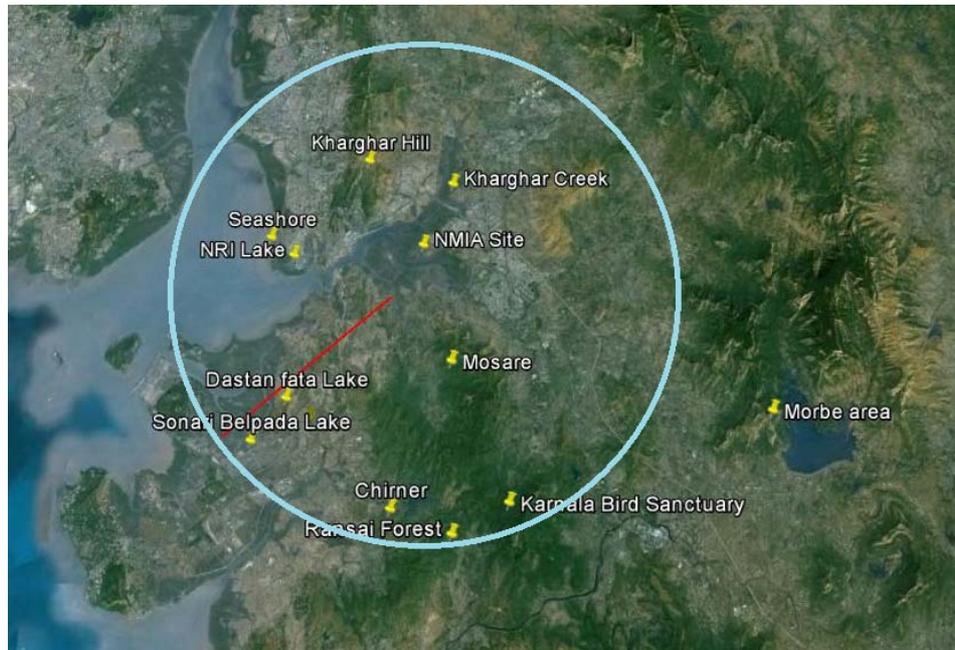
SUJIT NARWADE

Land filling activities near Panvel creek at the proposed site of NMIA

3. Kharghar Creek: Located between the harbour-line railway stations Kharghar and Mansarovar, the creek can be reached by road via Sion-Panvel Highway. The mangroves adjoining the creek were surveyed for the study of population of small birds. As this study area comprised a large portion covered by the mangroves it was important to know the status of smaller birds that may pose a threat to flight safety in future.



10 kilometre radius area around the proposed site of NMIA, marked over a map



Selected Study sites in the 10 kilometre radius area around the proposed site of NMIA, marked over a satellite image of the area

4. **NRI Wetland:** This site lies in the northwest direction of the proposed site of NMIA. It includes wetland spread across 19 hectares, surrounded by grass, shrubs and mangroves. Water level in this wetland is controlled mainly by the tide level and the activities of the local fisherman. During a high tide, the water enters the wetland and is retained by small check dams created by the fishermen. Mangroves cover the wetland from three sides and the fencing wall of NRI complex on one side with a thin stretch of grass and vegetation in between. The vegetation on the borders of the wetland makes it undisturbed and an enclosed habitat for birds to roost. This wetland lies behind NRI Complex, followed by a stretch of mangroves, and finally reaches the seashore. We observed a majority of water birds preferred to congregate in this area during early-winter and summer. This wetland is also used as a stopover site by a number of migratory birds during the early-winter season.

5. **TSC Wetland:** Spread over 15 hectares, this wetland lies behind Training Ship Chanakya Maritime Institute and followed by a stretch of paddy fields, shrub land and the mangroves, and finally it reaches the seashore. The water level in the wetland is primarily controlled by the local fisherman, as by the tidal cycles. A majority of water birds preferred to congregate in this area during the summer months. Birds use this site for resting during the high tide. We observed that the migratory birds used this area as a stopover site during winter migration cycles.

6. **Uran-JNPT Area:** There are many small wetlands scattered across the Uran-JNPT area, flocked by waders during low tides. The wetlands near village Dongri and Funde were used by birds for resting and foraging. During late-winters, a majority of these wetlands were observed to have dried completely. Tide dependent movement of birds was observed. Many birds were seen resting during low tide also foraging in shallow water.

7. **Wetland at Jaskhar and Nhava Sheva Police Station:** The Jashkar wetland is adjacent to human habitation and the grassland on west of Nhava Sheva Police station was a temporary wetland during monsoon and overwintering population of few migratory birds was seen here. Birds were often observed resting at this site during high tide.



Golden-fronted Leafbird feeding on a fruit in Karnala Bird Sanctuary

8. **Forest areas:** We surveyed the forest areas in Chirner, Mosare, Ransai, Patnoli and Karnala Bird Sanctuary. The forest in these areas is of the mixed-deciduous type, dominated by Jamun *Syzygium cumuni*, Goose Berry *Zizipus mauritiana*, Banyan *Ficus bengalensis*, Teak *Tectona grandis*, Red Silk Cotton *Bombax ceiba* and Anjan *Hardwickia binata*. The land-use pattern includes forest, grassland, agriculture and plantation in Chirner, Mosare, Ransai and Patnoli. Chirner forest was seen interspersed by the patches of Mango orchards, and Teak and Cashew plantations. Karnala Bird Sanctuary a protected area and a mixed deciduous forest provides the most suitable habitat for the forest dwelling birds.



MIRJANK PRABHU

Grey-breasted Prinia, Karnala Bird Sanctuary

Chapter III

Methodology

Multiple site-surveys were conducted between December 2013 and March 2014. We used binoculars (Nikon Monarch 10x X 40x) for correct bird identification and a digital SLR-camera (Cannon 550D, Cannon with 400 mm fixed-focus lens) for documentation of bird-species and observations at each survey site. Photographs of the unidentified birds were maintained for further studies. The bird species were recorded (sighting or call) on the field, and direct observations were made by walking along roads, hills, forest-paths, wetlands, mangroves and creek areas.

The birds were identified by referring to Ali & Ripley (1983), Grimmett *et. al* (1998) and Rasmussen & Anderton (2012). The list of birds was arranged family-wise following Manakadan & Pittie (2001), and Rasmussen & Anderton (2012) was followed for the nomenclature. A GPS device was used to collect accurate geographical coordinates. The birds were counted using the Estimated-block Method (Bibby, *et.al* 2000) for different species according to the congregation size during roosting time. Transects were laid in habitats such as forests, open lands, grassland, mangrove patches and agricultural lands. The Total Count Method was used to estimate the count of congregating water-birds and waders during High Tide Wetland Surveys (Koffijberg *et. al* 2003, Donal and Clark, 1991). The observations were recorded continuously for two hours before and after high tide for each wetland. Every site was visited at least once in a month.

To understand the population variations, the quantitative data collected across the study area during January to March 2014 was compared with the data between January and March 2013, and presented through graphs. In the study area, we found that site-specific avifaunal diversity is highly dynamic and depends on various factors including water level, seasonal variations and daily tidal-level changes. Seasonal changes in the species diversity at the selected sites was noted to be influenced by the presence the migratory species and changes in the water level during monsoons and summer. We monitored sites regularly in summer (from April to May), monsoon (from June to September) and winter (from October to March) during April 2013 to March 2014; the period under consideration for this report.

A few sites were used for feeding by wintering birds, and for resting by some species during a high tide, resulting in spatial and temporal fluctuations in the species composition. For better understanding of the species variation at different sites we have presented the comparative data for the resident and the migratory bird species.

Chapter IV

Results

- A) Seasonal variation in the species composition and bird population during January 2013 to March 2014.

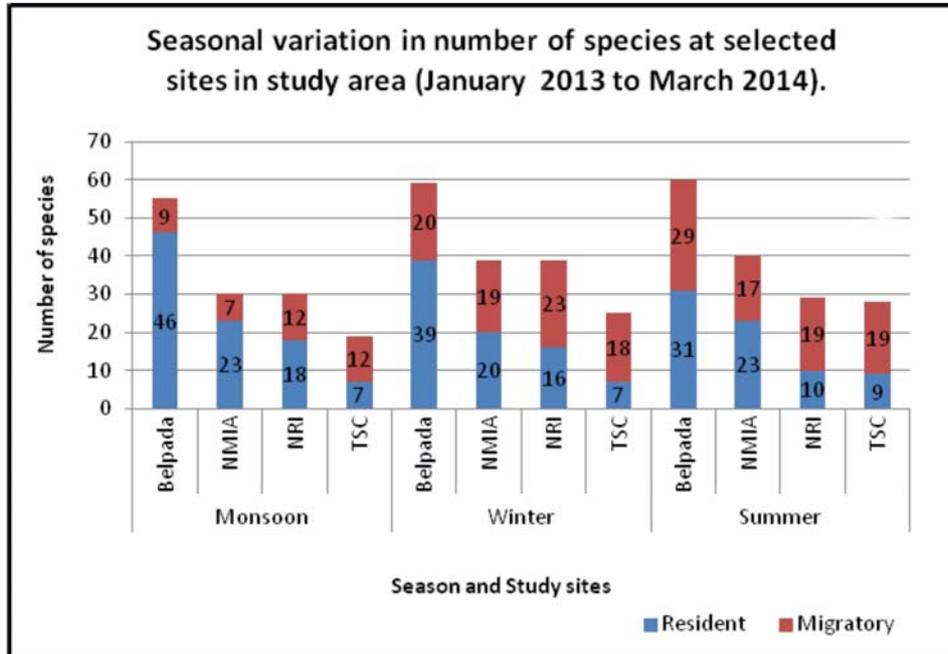


Figure 1: Seasonal variation in the number of species at the selected sites in the study area (January 2013 to March 2014)

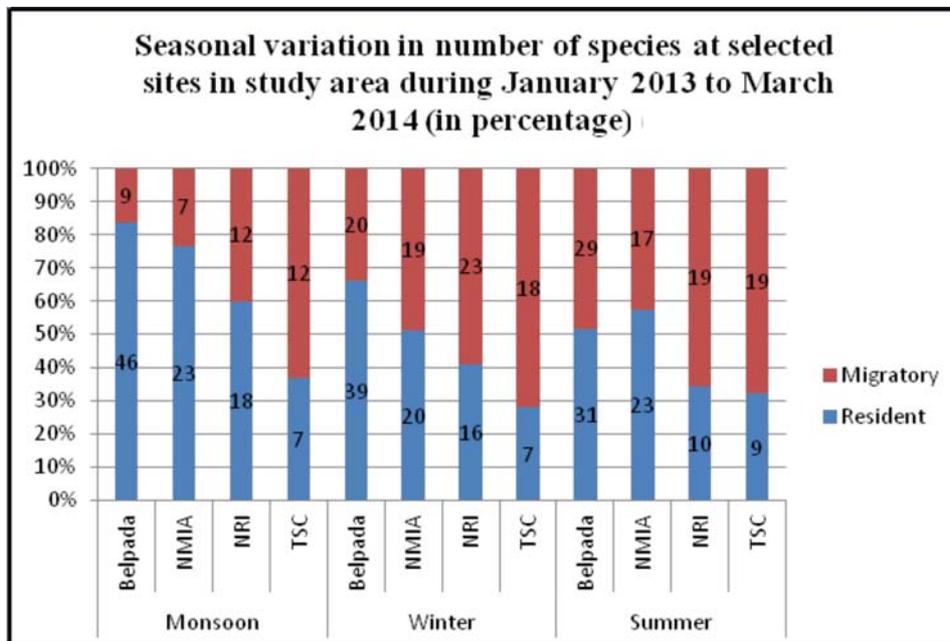


Figure 2: Seasonal variation in the number of species – percentage – at the selected sites in the study area (January 2013 to March 2014)

1. Summer (April and May 2013)

Belpada Lake – During the summer, 60 bird species were recorded from here. Of the 60 bird species, 31 were resident and 29 species were migratory. We counted 1,438 birds during a single visit to the lake in April 2013. The lake dried after April, therefore, very few water birds were seen thereafter.

NMIA site – Forty species of birds were recorded here, of which 23 were resident and 17 were migratory; especially the wader species. NMIA site holds maximum avifaunal diversity in summer – compared to monsoon and winter – because most other wetlands in the study area dry up before or during summer season. We counted over 937 individuals of birds during a visit to this site in April 2013.

NRI Wetland – Of the 29 species recorded here 10 were resident species and 19 were migratory. Water level in this wetland was controlled by the local fishermen. The water was occasionally drained completely to restore a fresh supply of sea-water during the following high-tide. Changes in the water level were observed to be adversely related to the change in the species diversity. We counted 4,538 birds during a visit to the lake in April 2013. Majority of birds were waders such as Little Stint *Calidris minuta*, Lesser Sandplover *Charadrius mongolus*, Greater Sandplover *Charadrius leschenaultii*, Grey Plover *Pluvialis squatarola*, Curlew Sandpiper *Calidris ferruginea*, etc.



A mixed flock of Black-tailed Godwit, Terns and Gulls at NRI Wetland

TSC Wetland – Of the 28 species that were recorded here, 19 species were migratory and 9 were resident. This site shows maximum avifaunal diversity in summer when compared to winter and monsoon. Diversity of migratory birds at this site was very high during late summer i.e. in April and May. The large numbers of migratory birds were seen using this site as a stopover site during arrival and departure period of the migratory season. We counted 9,850 individuals of birds during a visit to this site in April 2013.

2. Monsoon (June to September 2013)

Belpada Lake comprises an inland wetland, grasslands and mangroves. The water level was observed to be the lowest in April; subsequently it dried up. Nine species of migratory birds and 46 species of resident birds were recorded during Monsoon at this site. Migratory species such as Common Redshank *Tringa totanus* and Black-tailed Godwit *Limosa limosa* were observed in flocks of 30-40 birds, mostly in September 2013 i.e. late monsoon. The water level during monsoon was approximately 1.5 metres, hence, the birds were observed utilising temporary water pools formed by the rain water in open areas like adjoining grasslands at the study site. We counted 477 birds during a visit in July 2013. Purple Swamphen *Porphyrio porphyrio*, Pheasant-tailed Jacana *Hydrophasianus chirurgus*, Spot-billed Duck *Anas poecilorhyncha*, and Eurasian Coot *Fulica atra* were seen congregating in this wetland during the monsoon.

NMIA site comprises mudflats, mangroves and grassland. The mudflats along the creek are often used by migratory birds for foraging during low-tide. Twenty three resident bird species and seven migratory species were recorded at this site during the monsoon in 2013. Birds such as Indian Reed Warbler *Acrocephalus stentoreus*, Plain Prinia *Prinia inornata*, and Ashy Prinia *Prinia socialis* were observed breeding in the mangroves and the associated plants. Egrets were seen foraging in the paddy fields at the proposed NMIA site. Migratory birds were observed at this site during late monsoon in 2013. We counted 261 birds during a visit in July 2013.

NRI Lake was observed to be a tide-dependent wetland, created by the local fishermen for fishing. The wetland is bordered by small shrubs and the mangroves vegetation towards the seashore. Eighteen resident bird species and 12 migratory species were recorded during monsoon at this site in 2013. During early monsoons i.e. from June to August, the water level at this wetland was about two metres. Due to the higher water level, very few bird species were seen at this wetland during early monsoons. Most of the observations documented at this wetland were during the late monsoon period in September 2013. We counted 273 birds during a visit to the lake in July 2013.



A flock of Eurasian Curlew and juvenile Lesser Flamingos at NRI Wetland

At TSC Wetland, during the monsoon of 2013 we recorded 19 species of which seven were resident and 12 were migratory. The migratory species were seen during the late-monsoon; in September 2013. We counted 786 birds during a visit in July 2013.

3. Winter (October 2013 to December 2013)

At Belpada Lake, 20 migratory and 39 resident bird species were observed during the winter of 2013. The species diversity was observed to be higher during the winters primarily due to the wintering birds at this site. Though the number of resident species was more, population of the migratory species was higher. We observed migratory bird species in huge flocks and large congregations at Belpada Lake. We counted 1,536 birds, mainly migratory ducks, during a visit to the lake in October 2013.



A flock of Painted Stork foraging at Belpada Lake

During the winter, of the 39 bird species seen at the proposed site of NMIA, 20 were resident and 19 were migratory. The migratory birds were observed foraging on the mudflats along the creek during low-tide. We counted 445 birds during a visit in October 2013.

At NRI Wetland, we recorded 23 migratory and 16 resident bird species. During winter, the water level at NRI Wetland was lower compared to the water level during monsoons, therefore, many birds used it as a resting site during high-tide periods in winters. We observed a sharp increase in the species diversity at this site during the winter. We counted 2,471 birds in a visit to the lake in October 2013.

We observed about 18 migratory bird species at TSC Wetland. Only nine resident species were recorded in this area, of which seven resident species were observed during the winter months. Most of the area adjacent to TSC Wetland is scrub land. The wetland is disturbed by anthropogenic activities. This wetland was observed to be used as a stopover site by migratory birds. We observed about 40,000 birds during October 15 to October 20 in 2013. Later, we saw about 10,000 birds at this site throughout the winter.



PARVEEN SHAIKH

Juveniles of Greater Flamingo foraging along with Lesser Flamingos at NRI Wetland

B) Bird movements

During the study period, we observed that the birds used different sites in different seasons. Tidal cycles and concurrent water levels in the wetlands were found to be influential factors, besides others such as climatic factors, for bird movements. The bird movements were observed to be resulting into seasonal variation in species abundance at the roosting and foraging sites. The roosting sites such as wetlands near DPS, NRI, and the proposed NMIA site, Sonari-Belpada and TSC and adjoining mangroves held considerably large populations of birds in the study area. During the study period between October 2013 and March 2014, about 10,000 birds, primarily waders including Lesser Sand Plover *Charadrius mongolus*, Greater Sand Plover *Charadrius leschenaulti*, Curlew Sandpiper *Calidris ferruginea*, Little Stint *Calidris minuta* were observed flying in flocks across these sites and open creeks and mudflats along the seashore, for foraging.. It was also observed that bird congregation’s occurred in shallow waters and the population of the congregating birds at different roosting sites changed with seasons.

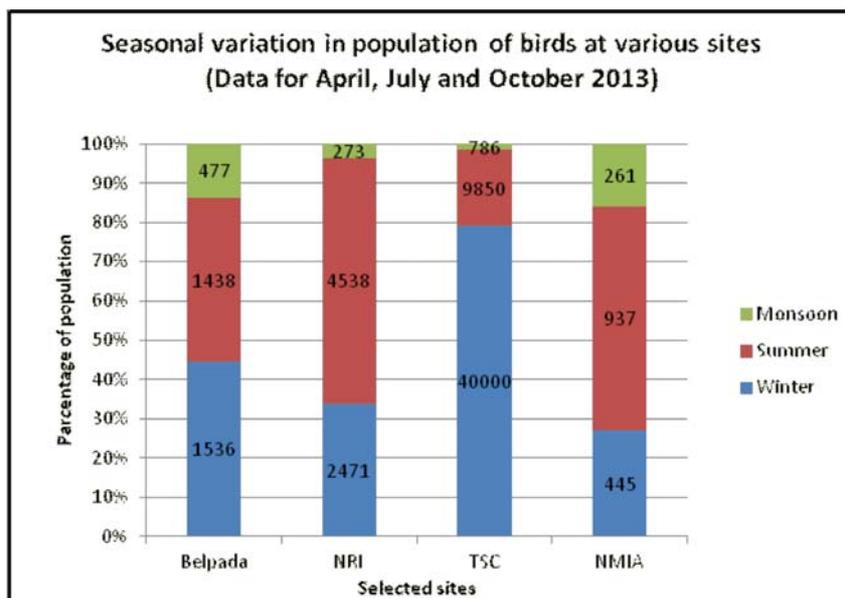


Figure 3: Seasonal variation in the population of birds at various sites (April, July and October 2013)



A flock of terns and waders at Belpada Lake

C) A comparative account of significant population variation of the selected bird species (January to March in 2013 and 2014)

1. Painted Stork *Mycteria leucocephala* is a near threatened (NT) species as per the International Union for Conservation of Nature (IUCN) Red List. According to Abdulali (1981) it was an uncommon flocking species and (Prasad, 2003) noted it as a local migrant in Mumbai.

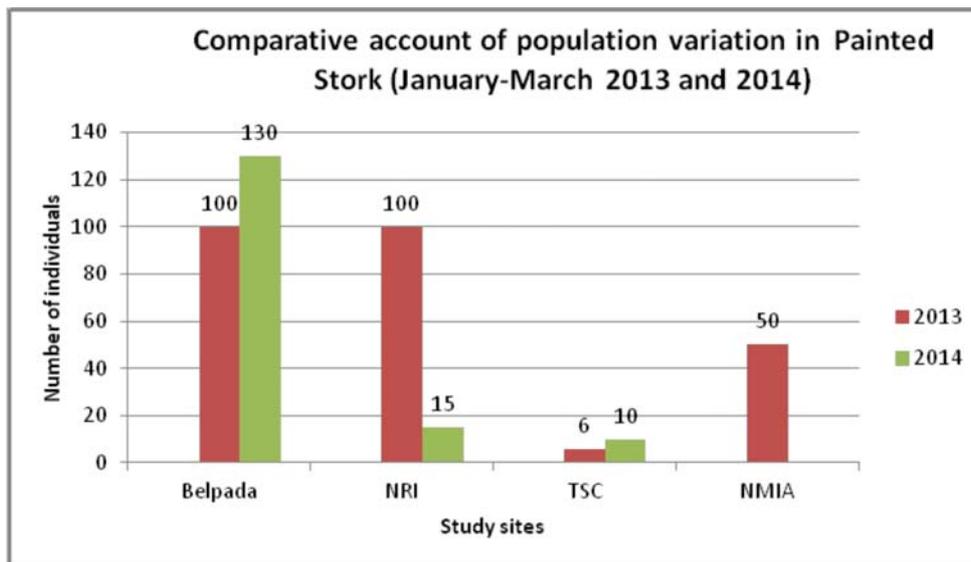


Figure 4: A comparative account of population variation in Painted Stork

We observed this species roosting in large numbers at Belpada Lake and NRI Lake and foraging in wetlands, mudflats and on the seashore. In 2013 this species was observed at NRI Wetland and TSC Wetland. We observed about 100 individuals at Belpada Lake in 2013, and about 130 in 2014. Bird-count at NRI Wetland during January to March period was 100 individuals in 2013 and 10 individuals in 2014. This sudden fall indicates local movement of population at various sites. This local movement across different sites was found to be associated with the water level in the particular wetland. At NMIA site 45 birds were observed.

2. Eurasian Spoonbill *Platalea leucorodia* is a common resident bird, and was documented as an occasional, local migrant and a flocking species (Abdulali, 1981). It was recorded to be breeding in Deccan Maharashtra between January and May (Prasad, 2003). It was also observed in mixed flock with Painted Storks *Mycteria leucocephala* (Sarkar, 2011).

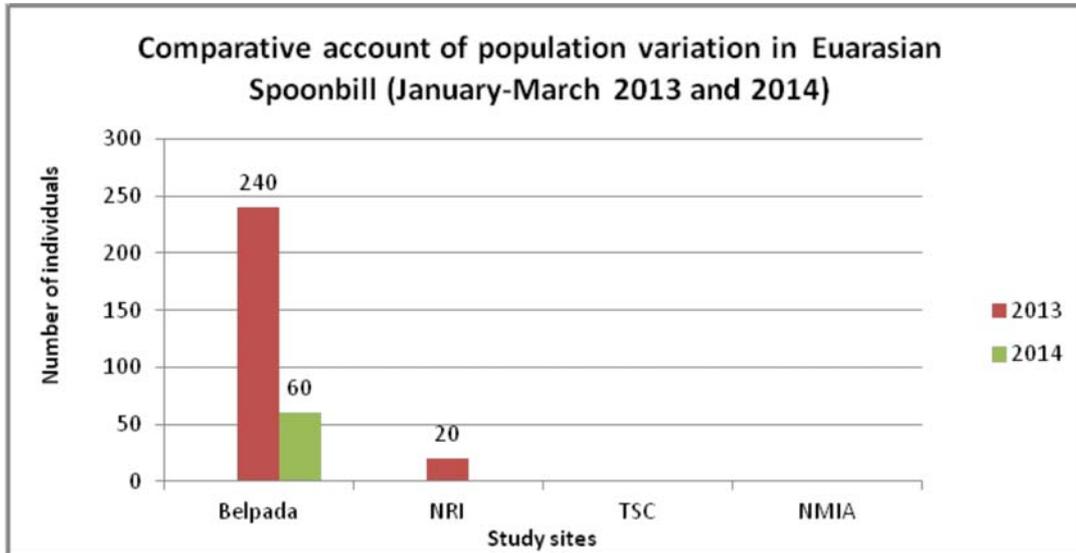


Figure 5: A comparative account of population variation in Eurasian Spoonbill

We mostly observed this species feeding; walking and sweeping the partly-open bill from side to side at Belpada Lake and NRI Wetland. It was often observed in compact flocks of 30-40 individuals at Belpada Lake. These birds occupied the lake in 2013 and 2014, however, it was observed at NRI Wetland only in 2013. The population witnessed fluctuation during 2013 and this year. About 240 individuals were seen at Belpada Lake between January to March 2013 and we observed only 60 individuals during January to March 2014

3. Lesser Flamingo *Phoeniconaias minor* – It is a near threatened (NT) species as per the International Union for Conservation of Nature (IUCN) Red List.

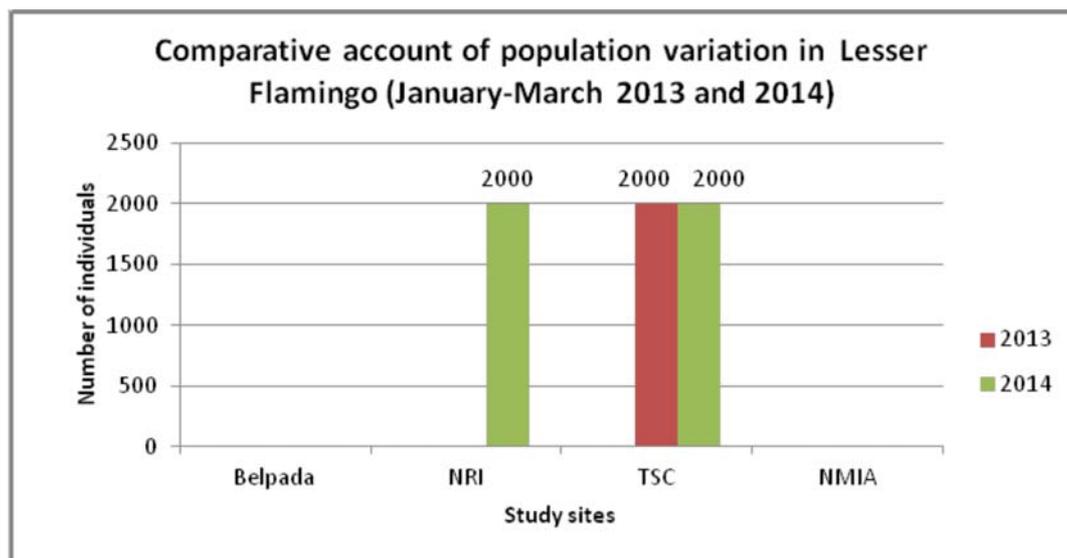


Figure 6: A comparative account of population variation in Lesser Flamingo

Earlier in Mumbai and adjoining regions, it was reported as stray or vagrant and a flocking species (Abdulali, 1981). It was recorded in large numbers and regular near Mumbai (Prasad, 2003) and between 2000 and 2002 there were records from Sewri, Uran, and Thane creek of flocks of up to 3,000 birds (Monga, 2003). Thousands of Flamingos were sighted on the mudflats of Sewri during low tide in the April in 1984 (Sowrirajan, 1994). A flock of about 20,000 individuals of Greater and Lesser Flamingo was sighted at Sewri (Woodward, 2007).

This species was observed at TSC Wetland, on the seashore and NRI Wetland. During January to March 2013 we reported about 600 individuals at TSC wetland but in 2014 we observed over 6,000 individuals at TSC and NRI wetlands. The population was observed to have increased manifold in year 2014, with over 50 per cent of the population comprising juveniles.



A congregation of Lesser Flamingos, NRI Wetland

4. Northern Pintail *Anas acuta* – It is a winter migrant species. According to Abdulali (1981) it was a flocking species and Prasad (2003) recorded it from Borivali; a northern suburb of Mumbai, where it was mostly seen in salt-pans and open water bodies at Mahul (Verma *et. al.* 2004). Abdulali & Ali (1981) reported this bird in small numbers in Mumbai area.

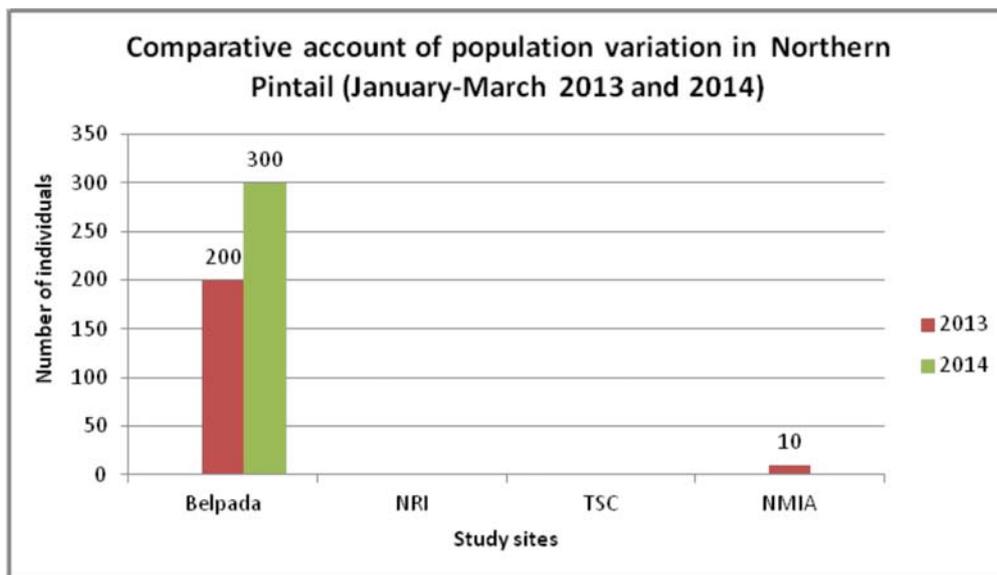


Figure 7: A comparative account of population variation in Northern Pintail

We observed this duck-species at Belpada Lake as well as a few individuals resting at NMIA creek. During January to March period, we saw about 200 individuals in 2013 and 300 individuals in 2014 at Belpada Lake.

5. Common Teal *Anas crecca* – It is a migratory species, earlier it was reported from Mumbai region as a flocking species (Abdulali, 1981). It was seen throughout the Western Maharashtra and adjoining areas (Prasad, 2003) and it was mostly reported from salt-pans and open water bodies at Mahul (Verma *et. al.* 2004).

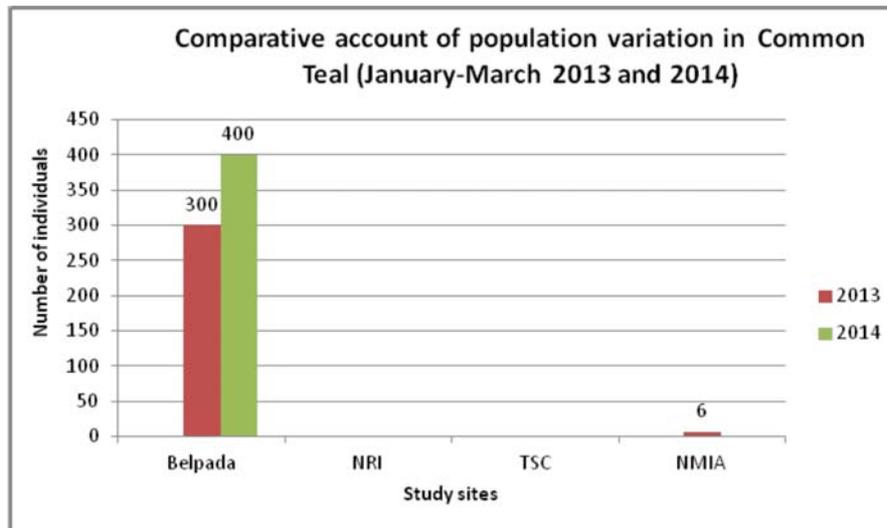


Figure 8: A comparative account of population variation in Common Teal

We observed this duck-species at Belpada Lake and a few individuals resting at NMIA creek. We reported 300 individuals from Belpada Lake during January to March 2013 and about 400 individuals during the same period in 2014.

6. Northern Shoveler *Anas clypeata* – It is a winter migrant species, according to earlier records from Mumbai and adjoining areas, it is a flocking species (Abdulali, 1981), recorded in very small numbers around Mumbai during 2000-02 (Prasad, 2003), however seen regularly near wetlands at Uran in 2008 (Sarkar, 2011).

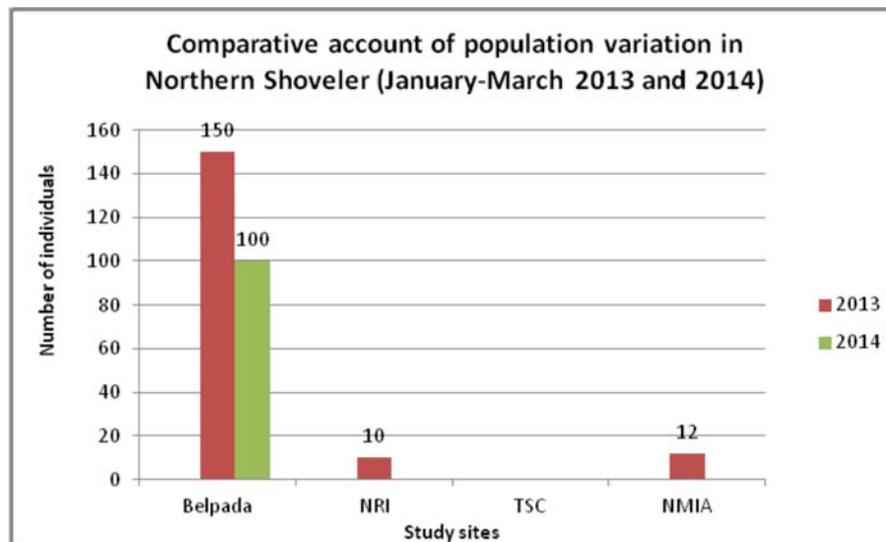


Figure 9: A comparative account of population variation in Northern Shoveller

We observed this duck-species at Belpada Lake and a few individuals resting at NMIA creek and NRI Wetland . In 2013, we documented about 150 individuals during January to March but in this year, we observed only 100 individuals. At the proposed site for NMIA and NRI Wetland, we observed this species only in 2013.

7. Eurasian Curlew *Numenius arquata* – It is a winter migrant and a near threatened (NT) species as per the International Union for Conservation of Nature (IUCN) Red List. Earlier reported in Mumbai and adjoining areas, as an occasional migrant and a flocking species (Abdulali, 1981). It was recorded as a common winter visitor along the west coast (Prasad, 2003), apparently some birds are present in the Konkan all year round (Keswal, 1886) and seen in the marsh, salt pans and creeks at Mahul (Verma *et. al.* 2004).

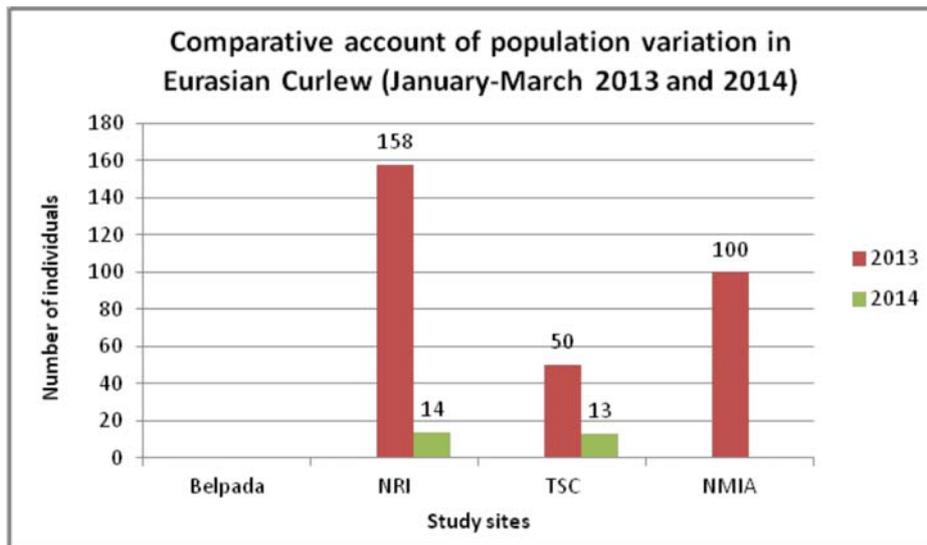


Figure 10: A comparative account of population variation in Eurasian Curlew

This species was commonly observed at NRI and TSC wetlands during high tide and on the seashore during a low tide. These birds were present in the study area during winter, and some overwintering birds were seen throughout the year; especially in the mangroves and mudflats at Uran. About 100 birds were seen at the proposed NMIA site and more than 150 individuals were recorded from NRI Wetland during January to March period in 2013. About 20 individuals were seen at TSC and NRI wetlands in 2014 during the January to March period.

8. Pied Avocet *Recurvirostra avosetta* – It is a winter migrant. From Mumbai and adjoining areas, it was previously reported as a winter migrant (Abdulali, 1981). It was an occasional and flocking species (Prasad, 2003) and common along the coast; rare inland and seen in open water bodies at Mahul (Verma *et. al.* 2004). About 100-200 individuals were consistently sighted in Uran area by Sarkar (2011).

We observed this species at Belpada Lake, the proposed site of NMIA and NRI Wetland. They were always seen in flocks of about 30-35 individuals, scattered all over the area and continuously foraging in shallow waters. We have documented fluctuations in its population throughout the study period. During January to March 2013 approximately 200 individuals were reported, and in 2014 the number was as low as 5 to 10 individuals.

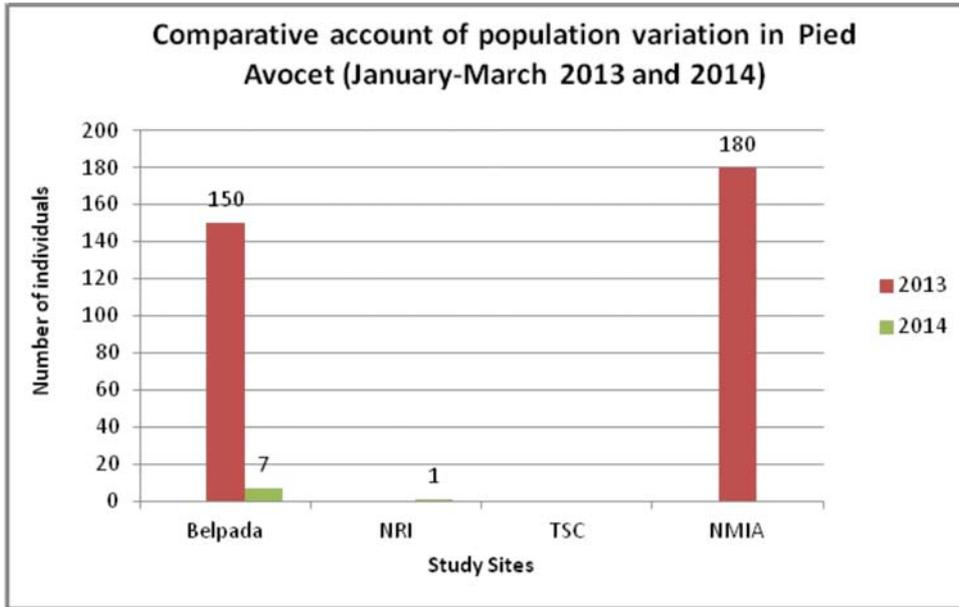


Figure 11: A comparative account of population variation in Pied Avocet

9. Gull-billed Tern *Gelochelidon nilotica* – It is a winter migrant bird in study area. Previous records from Mumbai and adjoining areas mentioned it as a local migrant, and common flocking species (Abdulali, 1981). It was common species of the west coast (Prasad, 2003) but the population was apparently declining near Mumbai (Monga, 2001) and was usually seen in the marsh, salt pans and creek at Mahul (Verma *et. al.* 2004).

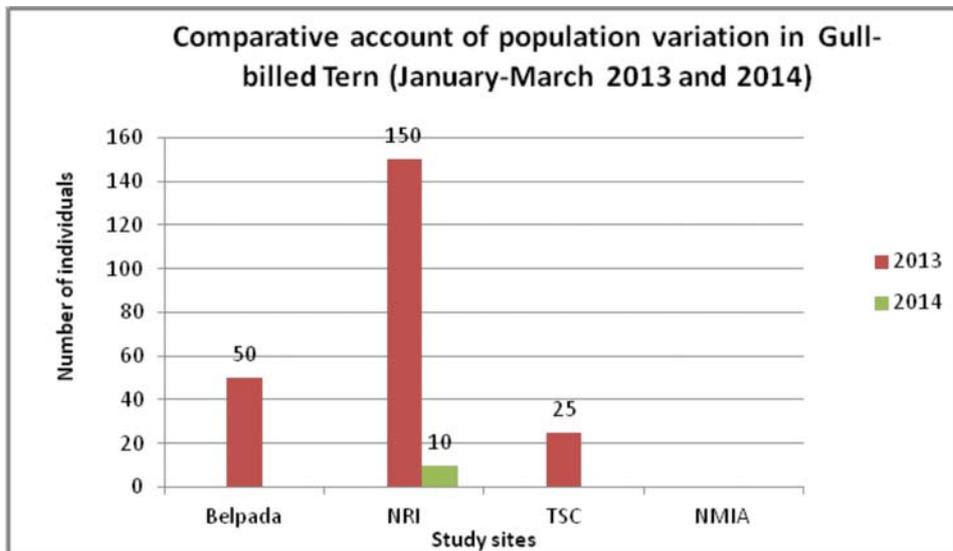


Figure 12: A comparative account of population variation in Gull-billed Tern

We observed this species commonly in the study area. These birds were mainly observed foraging on the seashore as well as all at the wetlands in the study area. They were seen roosting along with other waders, primarily at NRI Wetland, Belpada Lake and the TSC wetland. Between January and March period in 2013 around 150 birds were seen at NRI Wetland, about 50 individuals at Belpada Lake and around 25 at TSC Wetland, however, for the same period in 2014, about 10 birds were seen only at NRI Wetland.

10. Caspian Tern *Sterna caspia* - It is a winter migrant and previously recorded from Mumbai and adjoining areas as an occasional visitor (Abdulali, 1981), common on the coast; uncommon inland (Prasad, 2003) and mainly seen at Mahul Creek (Verma *et. al.* 2004).

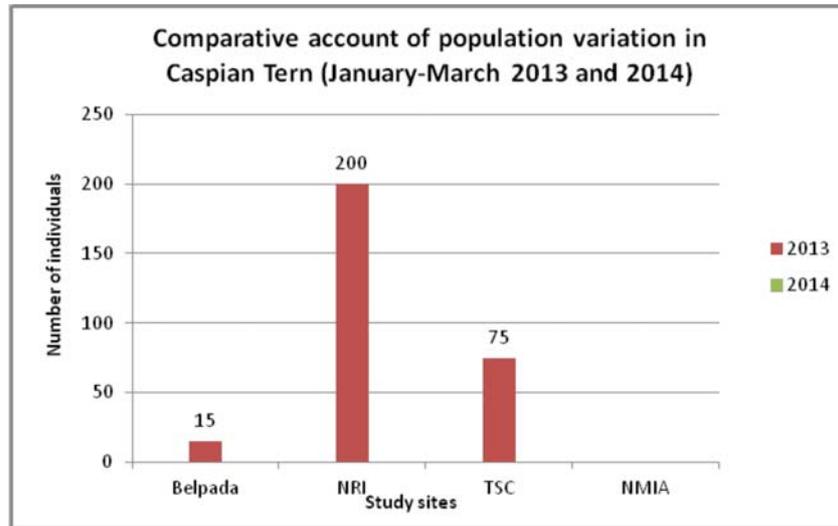


Figure 13: A comparative account of population variation in Caspian Tern

We commonly observed this species throughout the study area, foraging primarily on the seashore and at the major water bodies. These birds were observed roosting at NRI Wetland, Belpada Lake and the TSC Wetland, along with other waders. Around 200 birds were recorded from NRI Wetland during January to March in 2013. A few small flocks were recorded at TSC Wetland and Belpada Lake. During the January to March 2014, no bird was found in the study area.

11. Brown-headed Gull *Larus brunnicephalus* - It was earlier recorded in Mumbai and adjoining areas as a common flocking species (Abdulali, 1981). It is common on the coast; fairly uncommon inland (Prasad, 2003) and seen at Mahul creek (Verma *et. al.* 2004).

This is a common winter migrant and observed in almost all the wetlands of the study area. About 200 birds were seen at NRI Wetland between January and March in 2013 and only 15 individuals were seen at NRI Wetland during same period in 2014.

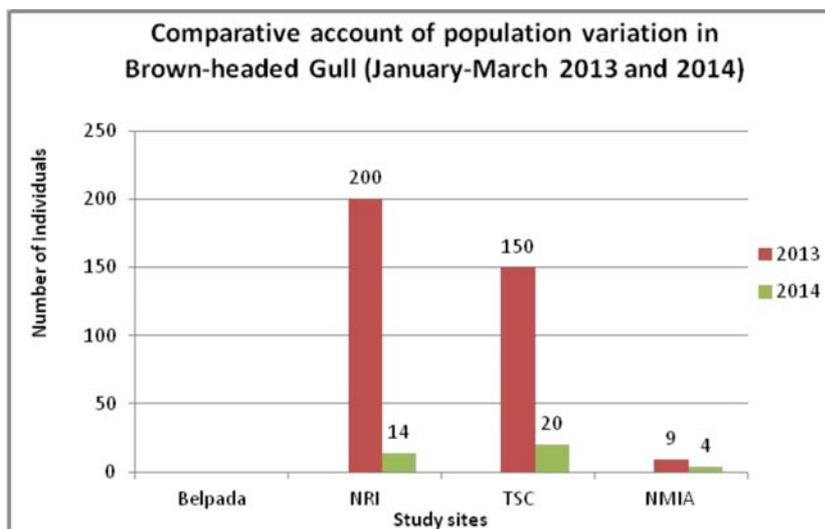


Figure 14: A comparative account of population variation in Brown-headed Gull

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Stone quarrying activities were observed at some sites during surveys in the study area

Annexure I: List of birds observed in the study area

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
3.	Great Cormorant <i>Phalacrocorax carbo</i>	W	IV	LC	R	Ulve
4.	Indian Shag <i>Phalacrocorax fuscicollis</i>	W	IV	LC	R	All wetland areas
Family Ardeidae						
5.	Eastern Cattle Egret <i>Bubulcus coromandus</i>	W/P	IV	LC	R	All wetland areas
6.	Intermediate Egret <i>Egretta intermedia</i>	W/P	IV	LC	R	All wetland areas
7.	Great Egret <i>Egretta alba</i>	W	IV	LC	R	All wetland areas
8.	Little Egret <i>Egretta garzetta</i>	W/P/C	IV	LC	R	All wetland areas
9.	Grey Heron <i>Ardea cinerea</i>	W/C	IV	LC	R	All wetland areas
10.	Indian Pond-heron <i>Ardeola grayii</i>	W	IV	LC	R	All wetland areas
11.	Purple Heron <i>Ardea purpurea</i>	W/C	IV	LC	R	All wetland areas
12.	Western Reef-heron <i>Egretta gularis</i>	W/MD	IV	LC	M	Dastan Phata, Nere, Sonari-Belpada
13.	Black-crowned Night-heron <i>Nycticorax nycticorax</i>	W	IV	LC	R	Kharghar Creek, Panvel Creek
14.	Striated Heron <i>Butorides striata</i>	W	IV	LC	R	Uran
15.	Chestnut Bittern <i>Ixobrychus cinnamomeus</i>	W	IV	LC	R	Ballaleshwar Lake
Family Ciconiidae						
16.	Painted Stork <i>Mycteria leucocephala</i>	W	IV	NT	R	Sonari-Belpada, Kopar, NRI, TSC wetlands at Palm Beach Road
17.	Asian Openbill <i>Anastomus oscitans</i>	W	IV	LC	R	Dastan Phata
18.	Woolly-necked Stork <i>Ciconia episcopus</i>	W	IV	LC	R	Dastan Phata, Mosare
19.	Black Stork <i>Ciconia nigra</i>	W	IV	LC	M	Ransai dam
Family Threskiornithidae						
20.	Black-headed Ibis <i>Threskiornis melanocephalus</i>	W/C	IV	NT	R	All wetlands and mangroves
21.	Eurasian Spoonbill <i>Platalea leucorodia</i>	W	I	LC	R	Jasai, Sanjivani School, Sonari-Belpada
22.	Glossy Ibis <i>Plegadis falcinellus</i>	W	IV	LC	M	Karal
Family Phoenicopteridae						
23.	Greater Flamingo <i>Phoenicopterus roseus</i>	W	I	LC	M	Sonari-Belpada, NRI
24.	Lesser Flamingo <i>Phoeniconaias minor</i>	W	I	NT	M	Wetlands and Seashore of Palm Beach Road
Family Anatidae						
25.	Greylag Goose <i>Anser anser</i>	W	IV	LC	M	Sonari-Belpada
26.	Ruddy Shelduck <i>Tadorna ferruginea</i>	W	IV	LC	M	Jasai, Sanjivani School, Sonari-Belpada
27.	Northern Pintail <i>Anas acuta</i>	W	IV	LC	M	Sonari-Belpada
28.	Common Teal <i>Anas crecca</i>	W	IV	LC	M	Sonari-Belpada
29.	Indian Spot-billed Duck <i>Anas poecilorhyncha</i>	W/C	IV	LC	R	All
30.	Mallard <i>Anas platyrhynchos</i>	W	IV	LC	M	NRI

Annexure I: List of birds observed in the study area

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
31.	Garganey <i>Anas querquedula</i>	W	IV	LC	M	Sonari-Belpada
32.	Northern Shoveller <i>Anas clypeata</i>	W/C	IV	LC	M	Kharghar Creek, Belpada
33.	Comb Duck <i>Sarkidiornis melanotos</i>	W	IV	LC	R	Dastan Phata
34.	Lesser Whistling-duck <i>Dendrocygna javanica</i>	W	IV	LC	R	Dastan Phata, Belapur pond, Sonari-Belpada, Palm Beach road
35.	Cotton Teal <i>Nettapus coromandelianus</i>	W	IV	LC	R	Dastan Phata, Belapur pond
36.	Gadwall <i>Anas strepera</i>	W	IV	LC	M	Belpada
37.	Eurasian Wigeon <i>Anas penelope</i>	W	IV	LC	M	Belpada
Family Accipitridae						
38.	Black-winged Kite <i>Elanus caeruleus</i>	All	I	LC	R	All areas
39.	Black Kite <i>Milvus migrans migrans/govinda</i>	All	I	LC	R	All areas
40.	Brahminy Kite <i>Haliastur indus</i>	W/P	I	LC	R	Sonari-Belpada, Dastan Phata
41.	Black-eared Kite <i>Milvus (migrans lineatus)</i>	W	I	LC	M	Sonari-Belpada
42.	Shikra <i>Accipiter badius</i>	All	I	LC	R	All areas
43.	White-eyed Buzzard <i>Butastur teesa</i>	F	I	LC	R	Jasai, Uran
44.	Oriental Honey-buzzard <i>Pernis ptylorhynchus</i>	F	I	LC	R	Mosare
45.	Common Buzzard <i>Buteo buteo</i>	F	I	LC	R	Ransai, Chirner
46.	Long-legged Buzzard <i>Buteo rufinus</i>	F	I	LC	R	Mosare
47.	Western Marsh Harrier <i>Circus aeruginosus</i>	W	I	LC	M	All areas
48.	Crested Serpent-eagle <i>Spilornis cheela</i>	F	I	LC	R	Ransai, Mosare
49.	Changeable Hawk-eagle <i>Nisaetus cirrhatus</i>	F	I	LC	R	Ransai
50.	Short-toed Eagle <i>Circaetus gallicus</i>	GS	I	LC	R	Chirner road
51.	Booted Eagle <i>Hieraetus pennatus</i>	F	I	LC	M	Mosare
52.	Greater Spotted Eagle <i>Aquila clanga</i>	F	I	LC	M	Sonari-Belpada, Mosare
53.	Indian Spotted Eagle <i>Aquila pomarina</i>	W	I	VU	R	Sonari-Belpada
54.	White-bellied Sea-eagle <i>Haliaeetus leucogaster</i>	W	I		R	Uran
Family Falconidae						
55.	Common Kestrel <i>Falco tinnunculus</i>	GS	IV	LC	R	Chirner road
56.	Peregrine Falcon (Shaheen) <i>Falco peregrinus perigrinator</i>	W	IV	LC	R	Uran
Family Pandionidae						
57.	Osprey <i>Pandion haliaetus</i>	W/C	I	LC	R	Kharghar Creek, Sonari-Belpada
Family Phasianidae						
58.	Rain Quail <i>Coturnix coromandelica</i>	P	-	LC	R	Chirner
59.	Red Spurfowl <i>Galloperdix spadicea</i>	F	-	LC	R	Kharghar hills
60.	Jungle Bush-quail <i>Perdica asiatica</i>	F	-	LC	R	Ransai, Chirner Road
61.	Indian Peafowl <i>Pavo cristatus</i>	F	I	LC	R	Nere
62.	Painted Francolin <i>Francolinus pictus</i>	GS	-	LC	R	Taloja
63.	Grey Francolin <i>Francolinus pondicerianus</i>	GS	-	LC	R	Taloja

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Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
Family Turnicidae						
64.	Barred Buttonquail <i>Turnix suscitator</i>	P	-	LC	R	Chirner
65.	Yellow-legged buttonquail <i>Turnix tanki</i>	P	-	LC	R	Chirner
Family Gruidae						
66.	Demoiselle Crane <i>Grus virgo</i>	W		LC	M	Belpada
Family Rallidae						
67.	White-breasted Waterhen <i>Amaurornis phoenicurus</i>	W/C	IV	LC	R	Dastan Phata, Pargaon
68.	Purple Swampphen <i>Porphyrio porphyrio</i>	W	IV	LC	R	Dastan Phata, Pargaon
69.	Common Moorhen <i>Gallinula chloropus</i>	W	IV	LC	R	Belapur pond, Dastan Phata
70.	Eurasian Coot <i>Fulica atra</i>	W	IV	LC	R	Belapur pond, Dastan Phata
71.	Slaty-breasted Rail <i>Gallirallus striatus</i>	W/C	IV	LC	R	Kharghar Creek, Panvel Creek
72.	Ruddy-breasted Crake <i>Porzana fusca</i>	W/C	IV	LC	R	Kharghar Creek, Panvel Creek
73.	Brown Crake <i>Porzana akool</i>	W/C	IV	LC	R	Chirner, Uran
Family Jacanidae						
74.	Bronze-winged Jacana <i>Metopidius indicus</i>	W	IV	LC	R	Belapur pond, Dastan Phata
75.	Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	W	IV	LC	R	Belapur pond, Dastan Phata
Family Rostratulidae						
76.	Greater Painted Snipe <i>Rostratula benghalensis</i>	W	IV	LC	R	Sonari-Belpada, Dastan Phata
Family Charadriidae						
77.	Red-wattled Lapwing <i>Vanellus Indicus</i>	ALL	IV	LC	R	All areas
78.	Lesser Sand Plover <i>Charadrius mongolus</i>	W/MD	IV	LC	M	All mudflats in study area
79.	Greater Sand Plover <i>Charadrius leschenaulti</i>	W/MD	IV	LC	M	Behind NRI Complex
80.	Little Ringed Plover <i>Charadrius dubius</i>	W/MD	IV	LC	R	All wetlands
81.	Pacific Golden-Plover <i>Pluvialis fulva</i>	W/MD	IV	LC	M	TS Chanakya, Panvel Creek
82.	Kentish Plover <i>Charadrius alexandrinus</i>	W/MD	IV	LC	M	All wetlands
83.	Grey Plover <i>Pluvialis squatarola</i>	W/MD	IV	LC	M	Sonari-Belpada, wetlands of Palm Beach Road area
Family Scolopacidae						
84.	Common Snipe <i>Gallinago gallinago</i>	W	IV	LC	R	Sonari-Belpada, Dastan Phata
85.	Common Redshank <i>Tringa totanus</i>	W/MC	IV	LC	M	All (congregation at Kharghar Creek)
86.	Wood Sandpiper <i>Tringa glareola</i>	W/MC	IV	LC	M	All wetlands
87.	Common Sandpiper <i>Tringa hypoleucos</i>	W/MC	IV	LC	R	All wetlands
88.	Common Greenshank <i>Tringa nebularia</i>	W/RS	IV	LC	M	Seashore of Palm Beach Road, Sonari-Belpada
89.	Terek Sandpiper <i>Xenus cinereus</i>	W/MC	IV	LC	M	Kharghar Creek, Kopar
90.	Green Sandpiper <i>Tringa ochropus</i>	W/MC	IV	LC	M	Sonari-Belpada
91.	Marsh Sandpiper <i>Tringa stagnatilis</i>	W	IV	LC	M	All wetlands (more at Belpada)
92.	'Western' Black-tailed Godwit <i>Limosa limosa</i>	W	IV	LC	M	Sonari-Belpada, Sanjivani School

Annexure I: List of birds observed in the study area

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
93.	Eurasian Curlew <i>Numenius arquata</i>	W	IV	LC	M	NRI Lake
94.	Ruddy Turnstone <i>Arenaria interpres</i>	RS	IV	LC	M	TSC lake
95.	Temminck's Stint <i>Calidris temminckii</i>	W	IV	LC	M	All (Large congregation at NRI lake)
96.	Little Stint <i>Calidris minuta</i>	W	IV	LC	M	All wetland areas
97.	Curlew Sandpiper <i>Calidris ferruginea</i>	W	IV	LC	M	Sonari-Belpada, Dastan Phata, Sanjivani school (congregation of 2,000 birds behind NRI Complex)
98.	Broad-billed Sandpiper <i>Limicola falcinellus</i>	W	IV	LC	M	Belpada, NRI Lake, TS Chanakya
99.	Ruff <i>Philomachus pugnax</i>	W	IV	LC	M	Sonari-Belpada, Dastan Phata
100.	Dunlin <i>Calidris alpina</i>	W	IV	LC	M	Seashore of Palm Beach Road
101.	Whimbrel <i>Numenius phaeopus</i>	W	IV	LC		Sonari-Belpada
Family Recurvirostridae						
102.	Black-winged Stilt <i>Himantopus himantopus</i>	W	IV	LC	R	All wetland areas
103.	Pied Avocet <i>Recurvirostra avosetta</i>	W	IV	LC	M	Jasai, NRI area
Family Laridae						
104.	Gull-billed Tern <i>Gelochelidon nilotica</i>	W	IV	LC	M	All wetland areas
105.	Caspian Tern <i>Sterna caspia</i>	W/C	IV	LC	M	Wetlands of Kamothe, Panvel, Palm Beach Road
106.	Saunders' Tern <i>Sterna saundersi</i>	W/C	IV	LC	M	Wetlands of Palm Beach Road
107.	Whiskered Tern <i>Chlidonias hybridus</i>	W/C	IV	LC	M	Wetlands of Palm Beach Road, Panvel Creek
108.	River Tern <i>Sterna aurantia</i>	W/C	IV	LC	M	Wetlands of Sonari-Belpada, Palm Beach Road, Panvel Creek
109.	White-cheeked Tern <i>Sterna repressa</i>	W	IV	LC	M	Jasai
110.	Slender-billed Gull <i>Larus genei</i>	W	IV	LC	M	NRI, TS Chanakya
111.	Brown-headed Gull <i>Larus brunnicephalus</i>	W	IV	LC	M	All wetland areas (more than 200 at DPS lake)
112.	Common Black-headed Gull <i>Larus ridibundus</i>	W	IV	LC	M	All wetland areas
113.	Heuglin's Gull <i>Larus fuscus heuglini</i>	W	IV	LC	M	Airoli
114.	Great Black-headed Gull <i>Ichthyaeetus ichthyaeetus</i>	W	IV	LC	M	Sea shore
Family Rynchopidae						
115.	Indian Skimmer <i>Rynchops albicollis</i>	W	IV	VU	R	NRI area
Family Columbidae						
116.	Rock Pigeon <i>Columba livia</i>	All/NH		LC	R	All areas
117.	Yellow-footed Green-pigeon <i>Treron phoenicoptera</i>	F	IV	LC	R	Ransai
118.	Grey-fronted Green Pigeon <i>Treron affinis</i>	F	IV	LC	R	Karnala
119.	Laughing Dove <i>Streptopelia senegalensis</i>	All	IV	LC	R	All areas
120.	Eurasian Collared-dove <i>Streptopelia decaocto</i>	GS	IV	LC	R	Uran

Annexure I: List of birds observed in the study area

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
121.	Spotted Dove <i>Streptopelia chinensis</i>	All	IV	LC	R	All areas
Family Psittacidae						
122.	Rose-ringed Parakeet <i>Psittacula krameri</i>	All	IV	LC	R	All areas
123.	Plum-headed Parakeet <i>Psittacula cyanocephala</i>	F	IV	LC	R	Ransai
Family Cuculidae						
124.	Asian Koel <i>Eudynamis scolopaceus</i>	All	IV	LC	R	All areas
125.	Greater Coucal (Southern Coucal) <i>Centropus sinensis</i>	All	IV	LC	R	All areas
126.	Common Hawk-cuckoo <i>Hierococcyx varius</i>	All	IV	LC	R	Mosare, Ransai
127.	Jacobin Cuckoo <i>Clamator jacobinus</i>	F	IV	LC	M	Chirner, Karnala
128.	Indian Cuckoo <i>Cuculus micropterus</i>	F	IV	LC	R	Chirner, Ransai, Mosare
Family Cuculidae						
129.	Blue-faced Malkoha <i>Phaenicophaeus viridirostris</i>	All	IV	LC	R	Mosare
130.	Sirkeer Malkoha <i>Phaenicophaeus leschenaulti</i>	All	IV	LC	R	Mosare
Family Tytonidae						
131.	Common Barn-Owl <i>Tyto alba</i>	NH	IV	LC	R	All areas
Family Strigidae						
132.	Spotted Owlet <i>Athene brama</i>	F/NH	IV	LC	R	Mosare, Ransai, Chiner, Karnala
133.	Indian Eagle-owl <i>Bubo bengalensis</i>	NH	IV	LC	R	Jasai
Family Caprimulgidae						
134.	Indian Little Nightjar <i>Caprimulgus asiaticus</i>	A/GS	IV	LC	R	Ransai
135.	Indian Jungle Nightjar <i>Caprimulgus indicus</i>	F	IV	LC	R	Ransai
Family Apodidae						
136.	Little Swift <i>Apus affinis</i>	NH		LC	R	All areas
137.	Asian Palm-swift <i>Cypsiurus balasiensis</i>	F/NH		LC	R	All areas
Family Alcedinidae						
138.	Lesser Pied Kingfisher <i>Ceryle rudis</i>	W	IV	LC	R	Kopar, Chirner
139.	White-throated Kingfisher <i>Halcyon smyrnensis</i>	All	IV	LC	R	All areas
140.	Common Kingfisher <i>Alcedo atthis</i>	W	IV	LC	R	All areas
141.	Black-capped Kingfisher <i>Halcyon pileata</i>	W/F	IV	LC	R	Ransai
142.	Black-backed Dwarf Kingfisher <i>Ceyx erithaca</i>	F	IV	LC	M	Ransai

Annexure I: List of birds observed in the study area

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
Family Meropidae						
143.	Little Green Bee-eater <i>Merops orientalis</i>	All		LC	R	All areas
144.	Blue-tailed Bee-eater <i>Merops philippinus</i>	F/MC		LC	R	Kharghar Creek, Mosare, Belpada
145.	Blue-cheeked Bee-eater <i>Merops persicus</i>	GS/W		LC	R	Belpada & Uran
Family Coraciidae						
146.	Indian Roller <i>Coracias benghalensis</i>	All	IV	LC	R	All areas
147.	European Roller <i>Coracias garrulus</i>	All	IV	LC	M	Uran
Family Upupidae						
148.	Common Hoopoe <i>Upupa epops</i>	MC/GS		LC	M	All areas
Family Bucerotidae						
149.	Indian Grey Hornbill <i>Ocyrceros birostris</i>	F	I	LC	R	Mosare, Ransai
Family Capitonidae						
150.	Coppersmith Barbet <i>Megalaima haemacephala</i>	F	IV	LC	R	Mosare, Ransai
151.	Brown-headed Barbet <i>Megalaima zeylonica</i>	F	IV	LC	R	Mosare, Ransai
152.	White-cheeked Barbet <i>Megalaima viridis</i>	F	IV	LC	R	Patnoli, Chirner
Family Pittidae						
153.	Indian Pitta <i>Pitta brachyura</i>	F	IV	LC	R	Mosare
Family Picidae						
154.	Eurasian Wryneck <i>Jynx torquilla</i>	F	IV	LC	R	Mosare
155.	Rufous Woodpecker <i>Celeus brachyurus</i>	F	IV	LC	R	Patnoli, Chirner
156.	Black-rumped Flameback <i>Dinopium benghalense</i>	F	IV	LC	R	Ransai
157.	Common Flameback <i>Dinopium javanense</i>	F	IV	LC	R	Ransai
158.	Yellow-fronted Pied Woodpecker <i>Dendrocopos mahrattensis</i>	F	IV	LC	R	Mosare, Nere
159.	Heart-spotted Woodpecker <i>Hemicircus canente</i>	F	IV	LC	R	Karnala
160.	Indian Pygmy Woodpecker <i>Dendrocopos nanus</i>	F	IV	LC	R	Karnala
Family Alaudidae						
161.	Ashy-crowned Finch-lark <i>Eremopterix griseus</i>	GS	IV	LC	R	Uran
162.	Rufous-tailed Lark <i>Ammomanes phoenicura</i>	All	IV	LC	R	All areas
163.	Malabar Lark <i>Galerida malabarica</i>	ALL	IV	LC	R	All areas

Annexure I: List of birds observed in the study area

Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
Family Motacillidae						
164.	Citrine Wagtail <i>Motacilla citreola</i>	W/M	IV	LC	M	All areas
165.	Yellow Wagtail <i>Motacilla flava</i>	W/M	IV	LC	M	All areas
166.	Grey Wagtail <i>Motacilla cinerea</i>	W	IV	LC	M	All areas
167.	White Wagtail <i>Motacilla alba</i>	W	IV	LC	M	All areas
168.	White-browed Wagtail <i>Motacilla maderaspatensis</i>	W	IV	LC	R	All areas
169.	Tree Pipit <i>Anthus trivialis</i>	P/GS	IV	LC	M	All areas
170.	Paddyfield Pipit <i>Anthus rufulus</i>	ALL	IV	LC	R	All areas
Family Hirundinidae						
171.	Wire-tailed Swallow <i>Hirundo smithii</i>	All	IV	LC	R	All areas
172.	Barn Swallow <i>Hirundo rustica</i>	W	IV	LC	R	All areas
Family Campephagidae						
173.	Common Woodshrike <i>Tephrodornis pondicerianus</i>	F	IV	LC	R	Mosare
174.	Large Cuckoo-shrike <i>Coracina macei</i>	F	IV	LC	R	Patnoli
175.	Black-headed Cuckoo-shrike <i>Coracina melanoptera</i>	F	IV	LC	R	Ransai
176.	Small Minivet <i>Pericrocotus cinnamomeus</i>	F	IV	LC	R	Mosare
177.	Orange Minivet <i>Pericrocotus flammeus</i>	F	IV	LC	R	Ransai
Family Irenidae						
178.	Common Iora <i>Aegithina tiphia</i>	F	IV	LC	R	Ransai
179.	Gold-fronted Leafbird <i>Chloropsis aurifrons</i>	F	IV	LC	R	Ransai, Mosare
Family Pycnonotidae						
180.	Red-vented Bulbul <i>Pycnonotus cafer</i>	All	IV	LC	R	All areas
181.	Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	F/MC	IV	LC	R	All areas
182.	White-eared Bulbul <i>Pycnonotus leucotis</i>	MC	IV	LC	R	All areas
183.	White-browed Bulbul <i>Pycnonotus luteolus</i>	F	IV	LC	R	Chirner
Family Laniidae						
184.	Bay-backed Shrike <i>Lanius vittatus</i>	All	IV	LC	R	All areas
185.	'Rufous-backed' Long-tailed Shrike <i>Lanius schach erythronotus group</i>	All	IV	LC	R	All areas
186.	Southern Grey Shrike <i>Lanius meridionalis</i>	GS	IV	LC	R	Chirner road
Family Muscipidae						
187.	Orange-headed Thrush <i>Zosterops citrina</i>	F	IV	LC	R	Ransai
188.	Jungle Babbler <i>Turdoides striatus</i>	F	IV	LC	R	Ransai, Mosare, Patnoli
189.	Tawny-bellied Babbler <i>Turdoides hyperythra</i>	F	IV	LC	R	Mosare, Patnoli

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Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
190.	Yellow-eyed Babbler <i>Chrysomma sinense</i>		F	IV	LC	R Chirner
191.	Indian Scimitar-babbler <i>Pomatorhinus (schisticiceps horsfieldii)</i>	F	IV	LC	R	Chirner, Mosare
192.	Puff-throated Babbler <i>Pellorneum ruficeps</i>	F	IV	LC	R	Mosare, Patnoli
193.	Brown-cheeked Fulvetta <i>Alcippe poioicephala</i>	F	IV	LC	R	Ransai
194.	Black Redstart <i>Phoenicurus ochruros</i>	GS	IV	LC	M	Mosare
195.	Malabar Whistling-thrush <i>Myophonus horsfieldi</i>	F	IV	LC	M	Ransai
196.	Oriental Magpie-robin <i>Copsychus saularis</i>	All	IV	LC	R	All areas
197.	Common Stonechat All <i>Saxicola torquatus</i>	IV	LC	M		All areas
198.	Pied Bushchat <i>Saxicola caprata</i>	All	IV	LC	R	Uran
199.	Isabelline Wheatear <i>Oenanthe isabellina</i>	GS	IV	LC	M	TS Chanakya
200.	Indian Black Robin <i>Saxicoloides fulicatus</i>	All	IV	LC	R	All areas
201.	White-rumped Shama <i>Copsychus saularis</i>	F	IV	LC	R	Ransai
202.	Bluethroat <i>Luscinia svecica</i>	MC	IV	LC	M	Sonari-Belpada, Kharghar Creek, Pargaon
203.	Blue Rock-hrush <i>Monticola solitaries</i>	GS	IV	LC	M	Uran
204.	Zitting Cisticola <i>Cisticola juncidis</i>	MC	IV	LC	R	Kopar
205.	Plain Prinia <i>Prinia inornata</i>	All	IV	LC	R	All areas
206.	Ashy Prinia <i>Prinia socialis</i>	All	IV	LC	R	All areas
207.	Grey-breasted Prinia <i>Prinia hodgsonii</i>	All	IV	LC	R	Mosare
208.	Indian Reed-warbler <i>Acrocephalus (stentoreus bruniscens)</i>	MS	IV	LC	M	All creeks and mangrove areas
209.	Common Tailorbird <i>Orthotomus sutorius</i>	All	IV	LC	R	All areas
210.	Lesser Whitethroat <i>Sylvia curruca</i>	GS	IV	LC	M	Uran
211.	Red-breasted Flycatcher <i>Ficedula parva</i>	GS/F	IV	LC	M	Nere
212.	Asian Brown Flycatcher <i>Muscicapa dauurica</i>	MC	IV	LC	M	Kopar
213.	White-browed Fantail <i>Rhipidura albicollis</i>	MC	IV	LC	M	Khargahr Creek
214.	Grey-headed Canary-flycatcher <i>Culicicapa ceylonensis</i>	F	IV	LC		Ransai
215.	Asian Paradise Flycatcher <i>Terpsiphone paradise</i>	F	IV	LC		Ransai, Karnala, Morbe, Chirner
216.	Tickell's Blue Flycatcher <i>Cyornis tickelliae</i>	F	IV	LC		Ransai, Karnala, Morbe
217.	Black-naped Blue Monarch <i>Hypothymis azurea</i>	F	IV	LC		Karnala, Morbe
Family Paridae						
218.	Great Tit <i>Parus major</i>	NH	IV	LC	R	Uran

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Sr. no.	Common/scientific names	Habitat	WPA schedule	IUCN status	R/M	Sites
Family Dicaeidae						
219.	Thick-billed Flowerpecker <i>Dicaeum agile</i>		F	IV	LC	R Ransai, Karnala, Chirner, Morbe
Family Nectariniidae						
220.	Purple Sunbird <i>Cinnyris asiatica</i>	All	IV	LC	R	Uran
221.	Purple-rumped Sunbird <i>Leptocoma zeylonica</i>	GS	IV	LC	R	Uran
222.	Small Sunbird <i>Leptocoma minima</i>	F	IV	LC	R	Ransai
223.	Vigors' Sunbird <i>Aethopyga vigorsii</i>	F	IV	LC	R	Ransai
Family Emberizidae						
224.	Red-headed Bunting <i>Emberiza bruniceps</i>	GS	IV	LC	M	Pargaon
225.	Black-headed Bunting <i>Emberiza melanocephala</i>	GS	IV	LC	M	Pargaon, Kharghar Creek
Family Fringillidae						
226.	Common Rosefinch <i>Carpodacus erythrinus</i>	GS	IV	LC	M	Mosare
Family Estrildidae						
227.	Indian Silverbill <i>Euodice malabarica</i>	P	IV	LC	R	All areas
228.	Red Avadavat <i>Amandava amandava</i>	W/MC	IV	LC	R	Sonari-Belpada, TS Chanakya
229.	Tricoloured Munia <i>Lonchura malacca</i>	MC	IV	LC	R	Kharghar Creek, TS Chanakya
230.	Scaly-breasted Munia <i>Lonchura punctulata</i>	MC/F	IV	LC	R	Kharghar Creek, TS Chanakya, Mosare
231.	White-rumped Munia <i>Lonchura striata</i>	F	IV	LC	R	Mosare
Family Passeridae						
232.	House Sparrow <i>Passer domesticus</i>	All	IV	LC	R	All areas
233.	Baya Weaver <i>Ploceus philippinus</i>	All	IV	LC	R	All areas
234.	Black-breasted Weaver <i>Ploceus benghalensis</i>	All	IV	LC	R	All areas
235.	Yellow-throated Sparrow F/GS <i>Petronia xanthocollis</i>	IV	LC	R		Uran, Mosare
Family Sturnidae						
236.	Rosy Starling <i>Sturnus roseus</i>	All	IV	LC	M	Sonari-Belpada, Nhava, Kharghar Creek, Pargaon, Kopar
237.	Brahminy Starling <i>Temenuchus pagodarum</i>	GS	IV	LC	R	Uran
238.	Grey-headed Starling <i>Sturnia malabarica</i>	GS	IV	LC	R	Behind TS Chanakya
239.	Malabar White-headed Starling <i>Temenuchus blythii</i>	GS	IV	LC	R	Behind TS Chanakya
240.	Asian Pied Starling <i>Gracupica contra</i>	GS	IV	LC	R	All areas
241.	Common Myna <i>Acridotheres tristis</i>	All	IV	LC	R	All areas
242.	Jungle Myna <i>Acridotheres fuscus</i>	All	IV	LC	R	Mosare

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Family Oriolidae						
243.	European Golden Oriole <i>Oriolus oriolus</i>	All	IV	LC	R	All areas
244.	Black-headed Oriole <i>Oriolus xanthornus</i>	F	IV	LC	R	Ransai
245.	Black-naped Oriole <i>Oriolus chinensis</i>	F	IV	LC	M	Ransai
Family Dicruridae						
246.	Black Drongo <i>Dicrurus macrocercus</i>	All	IV	LC	R	All areas
247.	Ashy Drongo <i>Dicrurus leucophaeus</i>	F	IV	LC	R	Ransai
248.	Bronzed Drongo <i>Dicrurus aeneus</i>	F	IV	LC	M	Karnala
249.	White-bellied Drongo <i>Dicrurus caerulescens</i>	F	IV	LC	R	Ransai, Patnoli
250.	Greater Racket-tailed Drongo <i>Dicrurus paradiseus</i>	F	IV	LC	R	Ransai, Patnoli, Karnala
Family Corvidae						
251.	House Crow <i>Corvus splendens</i>	NH	V	LC	R	All areas
252.	Jungle Crow <i>Corvus macrorhynchos</i>	All	IV	LC	R	All areas
253.	Rufous Treepie <i>Dendrocitta vagabunda</i>	F	IV	LC	R	Mosare



SUJIT NARWADE

The new tar road bifurcating the Belpada Lake will affect the visiting wintering birds

Annexure II

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