

FAUNAL DIVERSITY OF KHIJADIYA LAKE AND BIRD SANCTUARY, GUJARAT

AN AVIAN COMMUNITY PERSPECTIVE

SANJEEV KUMAR

 **ખોજડીયા પક્ષી અભયારણ**
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**Faunal Diversity of Khijadiya Lake and
Bird Sanctuary, Gujarat
An Avian Community Perspective**

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1. INTRODUCTION

On the southern coast of Gulf of Kachchh in the Saurashtra region of Gujarat lies a small wetland ecosystem with multitude of ecotones so intricately merged that it creates a unique wetland ecosystem complex known as Khijadiya Lake and Bird Sanctuary in the Jamnagar district of Gujarat. Unlike many other wetland environment where bird sanctuaries have been created, Khijadiya is no exception but houses combinations of seasonal freshwater shallow lakes, intertidal mudflats, creeks, salt-pans, saline land, mangrove scrub and above all sparsely occupied human habitation around it.

The Khijadiya Lake and the Bird Sanctuary forms a part of wetland ecosystem of Gujarat state which has 36% of the total wetland area of the country. The state of Gujarat has few unique wetlands in its four different regions (Table 1). The area of Kachchh is geographically the largest region with highest percentage of total wetlands followed by Saurashtra with only 9.56 % of the wetland areas. Out of the 831 wetlands in the state, 438 are coastal and 393 are inland wetlands (including 231 small and big reservoirs).

Table 1 : Wetlands in different regions of Gujarat

Region	No. of Wetland	Area (km ²)*	% Area Wetland
North Gujarat	159	1,107	4.08
Kachchh	258	21,772	80.12
Saurashtra	352	2,598	9.56
South Gujarat	62	1,698	6.24
Total	831	27,175	100

(Modified from Pandey and Teli, 2005)

**Wetlands smaller than 56 ha are not included in the table*

Gujarat has 2,092 km² area under inland wetlands and that of the coastal wetlands has been 25,083 km² (Pandey and Teli, 2005). Thus, the inland and coastal wetlands cover 7.7% and 92.3% of the total wetland area respectively (Table 2). This indicates that the large area is under wetland in the state and encompasses almost all kinds of habitat in its region with largest coastline of the country falling in the category of coastal wetlands. Area up to six meter deep of the coast and the mangrove zone are the most important habitat of the wetland in the Gujarat state.

Table 2 : Inland and Coastal Wetlands in Gujarat

Inland Wetlands	Area (km ²)	Coastal Wetlands	Area (km ²)
Natural lake	154	Mangroves	1,031
Water logged	289	Coral reefs	130
Reservoirs	1,394	Mudflat	21,954
Tanks/ponds	198	Salt pans	460
Marshland	57	Other	1,508
Total	2,092	Total	25,083

Saurashtra has mostly coastal wetlands, whereas north Gujarat has all categories of wetlands except marsh/swamp vegetation. The north Gujarat's proximity to the Gulf of Kachchh and its desertic conditions has helped in the formation of mudflats. A large area is under mudflats. South Gujarat is bestowed with rivers Tapi, Narmada and the Mahi. Wetlands are mostly reservoirs and mudflats.

There are 21 important wetlands in Gujarat as per Directory of Indian wetlands, Khijadiya Lake and Bird Sanctuary is one of them (Hussain and Roy, 1993). The name of the wetlands, their area and the important biodiversity is given in Table 3.

Table 3 : List of Important Wetlands in Gujarat and their significance

Wetland Area (ha)	Important Biodiversity
Ajwa Lake (200-300)	■ Wintering Waterfowls (Duck - <i>Fulica atra</i>) ■ Marsh Crocodile ■ Rich aquatic vegetation: <i>Ammania baccifera</i>, <i>Chara</i>, <i>Potamogeton</i>, <i>Nymphaea</i> etc
Wetlands of Central and Eastern Saurashtra (more than 1000 wetlands) (About 2800) ha	■ Wintering Waterfowls ■ Variety of sedges and grasses formed a broad margin with extensive reed-beds, now absence of vegetation at most places
Fadvel Tank*	■ Waterfowls (Pintails, Whistling Teals, Ducks and Waders) ■ Rich in <i>Pandanus fascicularis</i>
Falzar Dam Reservoir (290)	■ Migratory Waterfowl (Demoiselle Crane, Common Crane, Dalmatian Pelicans).

Wetland Area (ha)	Important Biodiversity
Southern Gulf of Kachchh (735000): Marine National Park (16289) and Marine Sanctuary (45592)	■ Coral reefs fauna, invertebrates, fishes, birds, reptiles and mammals. ■ Best Mangroves.
Hamirsar Tank*	■ Migratory Waterfowl: <i>Anas poecilorhyncha</i>, <i>A. clypeata</i>, <i>Aythya ferina</i>. ■ Waders: <i>Charadrius mongolus</i>, <i>C. dubius</i>, <i>Tringa totanus</i>, <i>T. hypoleucos</i>. ■ Rare species: <i>Phalaropus lobatus</i> and <i>Vanellus leucurus</i>. ■ Neem and old Banyan trees.
Wetlands of Kachchh Peninsula (5 ha to 1000 ha in a region of 1500,000)	■ Migratory Waterfowl mainly Anatidae. ■ <i>Tamarix dioica</i>, <i>Salvadora sp.</i> <i>Calotropis procera</i>, <i>Typha</i>.
Kaneval Reservoir (1500)	■ Wintering Waterfowls holds significance when Nalsarovar dries. ■ Aquatic vegetation: <i>Typha</i>.
Kankavati Dam (435)	■ Wintering Waterfowl, especially Demoiselle crane.
Gulf of Khambhat (At least 30,000 ha of wetlands; total area 400,000)	■ Waterbirds and reptiles. ■ Trees of <i>Avicennia marina</i>.
Khijadiya Lakes (1000) Khijadiya Bird Sanctuary (604.9)	■ Wintering Waterfowls. ■ Endemic <i>Cyperus dwarakensis</i> and <i>Tephrosia jamnagarensis</i>.
Khijadiya Lakes (1000) Khijadiya Bird Sanctuary (604.9)	■ Wintering Waterfowls. ■ Endemic <i>Cyperus dwarakensis</i> and <i>Tephrosia jamnagarensis</i>.
Nalsarovar Lake (11500) Nalsarovar Bird Sanctuary (12082)	■ Wide variety of Waterfowl, Indian Wild Ass, Nilgai and Blackbuck. ■ <i>Chara</i>, <i>Nymphaea</i>, <i>Tephrosia purpurea</i>, <i>Salvadora sp.</i>, <i>Prosopis sp.</i>, <i>Acacia nilotica</i>.
Nanda Islands (5000)	■ Migratory birds, Indian Wild Ass.

Wetland Area (ha)	Important Biodiversity
	■ <i>Prosopis juliflora</i>, <i>Salvadora oleoides</i>, <i>S. persica</i>, <i>Capparis aphylla</i> and <i>Melia azadirachta</i>.
Pariej Reservoir (500)	■ Wintering Waterfowls. ■ Holds significance when Nalsarovar dries. ■ Aquatic vegetation: <i>Typha</i>.
Pavagadh Lake (100)	■ Wintering Waterfowls, Marsh crocodiles. ■ Rich aquatic vegetation: <i>Ammania baccifera</i>, <i>Chara</i>, <i>Potamogeton</i>, <i>Nymphaea</i> etc.
Great Rann of Kachchh Chinkara, (700,000)	■ Important refuge of Indian Wild Ass, Wolf and Avian species. ■ <i>Acacia nilotica</i>, <i>Capparis sp.</i>, <i>Salvadora persica</i>, <i>Tamarix dioica</i>, <i>Avicennia alba</i>, <i>Cenchrus ciliaris</i>, <i>C. setigerus</i>, <i>Panicum antidotale</i>, <i>Dichanthium annulatum</i>.
Little Rann of Kachchh (495,300) <i>Acacia</i>	■ Indian Wild Ass, Nilgai, Chinkara, Blackbuck, Wintering waterfowls. ■ Xerophytic shrubs and thorny scrubland, <i>nilotica</i>, <i>Prosopis spicigera</i>, <i>Salvadora persica</i> and <i>S. oleoides</i>, <i>Tamarix dioica</i>, <i>Suaeda fruticosa</i>, <i>Salsola barysoma</i>, <i>Haloxylon salicornicum</i>, <i>Cenchrus setigerus</i>, <i>C. ciliaris</i>, <i>C. rotundus</i>, <i>Sporobolus marginatus</i>.
Wetlands of Sabarkanta (16594) and Banaskanta District (8369)	■ Avian species. ■ Teak, Mango, <i>Prosopis juliflora</i>, <i>Acacia arabica</i>, <i>Melia azadirachta</i>, <i>Salvadora persica</i>, <i>S. oleoides</i>, <i>Capparis aphylla</i>, <i>Zizypus sp.</i>
Sapda Dam (193)	■ Wintering Waterfowl, especially Demoiselle crane.
Surendranagar Reservoir (3856)	■ Data Deficient.
Vadhwana Lake (400)	■ Wintering Waterfowls. ■ Rich aquatic vegetation: <i>Ammania baccifera</i>, <i>Polygonum plebeium</i>, <i>Chara</i>, <i>Nymphaea</i>, <i>Wolffia</i>.

* = Data Deficient

State Government of Gujarat through the State Forest Department has taken initiative to conserve the wetlands that are important from biodiversity viewpoint. Seven such wetlands have been given protection under the Wildlife (Protection), Act, 1972. The wetlands which are being protected by the State Forest Department, Gujarat as Sanctuaries/National Parks are:

- Nalsarovar Bird Sanctuary (Freshwater Lake)
- Thol Bird Sanctuary (Irrigation Reservoir)
- Khijadiya Bird Sanctuary (Fresh water-cum-coastal wetland)
- Porbandar Bird Sanctuary (Brackish water, natural wetland)
- Marine National Park and Sanctuary (Coastal wetland)
- Little Rann of Kachchh (Seasonal freshwater-cum-saline water wetland)
- Great Rann of Kachchh (Seasonal freshwater-cum-saline water wetland)

Similarly, in order to conserve Indian wetlands, the Ministry of Environment and Forest, New Delhi has identified number of wetlands throughout the country for conservation under National Wetland Conservation and Management Programme (NWCMP) and National Lake Conservation Programme (NLCP). At present there are 115 wetlands (Appendix-1) designated under the NWCMP and 42 wetlands under NLCP (Appendix-2). Khijadiya Lake and Bird Sanctuary is one of them in Gujarat State identified for conservation under NWCMP. There are no wetlands so far identified by MoEF under National Lake Conservation Programme (NLCP) from Gujarat state. List of important wetlands of Gujarat under NWCMP is given below in table 4:

Table 4 : List of wetlands of Gujarat under National Wetland Conservation and Management Programme (NWCMP)

State	Total Number	Name of Important Wetland	Total Area (ha)
Gujarat	8	Nalsarovar	1270875
		Great Rann of Kachchh	
		Thol Bird Sanctuary	
		Khijadiya Lake and Bird Sanctuary	
		Little Rann of Kachchh	
		Pariej	
		Wadhvana	
		Nani Kakrad (Navsari)	

Khijadiya Lake complex is an important wetland and a rich congregative bird area especially for the winter migrants. It supports variety of other faunal elements housed in a mosaic of intricately woven niches in diverse habitats and in close proximity to each other that it influences the faunal components to share the benefit of ecosystem more intensively. Hence it needs further protection and conservation under NLCP so that its undisturbed pristine environment can be judiciously utilized for ecofriendly tourism and biodiversity enhancement by creating general awareness to the people about existing biodiversity.

Waterfowl concentration in Gujarat during winters is one of the highest in the country as the area falls on the Indo-Asian flyway migratory route of birds. Migratory birds from Europe and Asia pass through the western part of the country to the Indian subcontinent and utilize the varied habitats in Gujarat. Many species continue to stay in Gujarat for the entire winter season and some move on to the Deccan plateau. During their return again in March and April, the migratory birds tend to stay at these wetlands for sometime before their departure from the country to their native places.

Gujarat has five important bird sanctuaries, Khijadiya is one of them Israel and Sinclair (1989) and Java (1991). The other bird sanctuaries are Nalsarovar Bird Sanctuary, Thol, Porbandar and Ganga Great Indian Bustard Sanctuary. However there are 17 Important Bird Areas (IBA sites) in Gujarat including Khijadiya Bird Sanctuary identified as sites of international importance for the conservation of birds and their habitat Islam and Rahmani (2004) (Appendix 3).

The Khijadiya Bird Sanctuary is also considered an important site for ecological research and education. As stated earlier, Khijadiya is a seasonal wetland adjoining coastal wetland. High conservation value of the wetland area can be promptly realized from the fact that it is a distinct wetland complex harbouring incredible diversity of ecosystem in a relatively small area of nearly six sq. km representing a mosaic of several types of wetlands, including freshwater shallow lakes, inter-tidal mudflats, creeks, salt pans, saline land and mangrove scrubs. *Cyperus dwarakensis* and *Tephrosea jamnagarensis* are also the endemic plants of the area found in the region of this wetland ecosystem. Dense cover of *Prosopis chilensis* in a portion of the lake provides shelter to some reptiles, mammals and roosting and nesting sites for some birds.

The importance of this ecosystem was long realized as a congregative bird area and therefore the project entitled "Faunal Survey of Important Congregative Bird Areas (Khijadiya Bird Sanctuary and Marine National Park and Sanctuary), Gujarat" was conceived and initiated to study the faunal diversity of Khijadiya Lake and Bird Sanctuary, Gujarat with especial reference to its avian community. The project was undertaken as part of the annual plan of research work for the years 2005 - 2008 at the Desert Regional Centre, Zoological Survey of India, Jodhpur and assigned to Dr. Sanjeev Kumar, Scientist - C under

the approved projects on Fauna of Freshwater Ecosystem. The project was primarily aimed to identify and record congregating avian diversity in this region and also report the diversity of other faunal groups including vast assemblage of freshwater and marine faunal elements found in the various bird congregating zones of the protected area. In all, five extensive surveys were undertaken to study mainly the avian diversity and other faunal components of the region.

The present document entitled "Faunal Diversity of Khijadiya Lake and Bird Sanctuary, Gujarat - An Avian Community Perspective" is an out come of the studies undertaken to work out the faunal diversity with special reference to its avian community and ecology of the wetland of national significance and an important bird sanctuary of the Gujarat state in India. The project report envisages the biotic potential of the wetland as avian community habitat including waterfowls and also other faunal diversity component of the ecosystem.

2. STUDY AREA

2.1 Khijadiya Lake And Bird Sanctuary

Khijadiya Lake and Bird Sanctuary is located at 22°31'27" N latitude and 70° 07'17" E longitude at a distance of about 12 kms north-east of Jamnagar city on the southern coast of Gulf of Kachchh in the Saurashtra region of the western state of Gujarat. Khijadiya sanctuary is basically a two non-linked man made reservoirs compositely forming a wetland complex due to two reclamation bunds built up to arrest salinity ingress from the sea-side and also to prevent freshwater from draining into the sea. The sanctuary and its surrounding environment represent a mosaic of ecosystems largely comprises of freshwater wetlands, brackish water impoundments, mangroves, salt pans, intertidal mudflats, a creek, surrounding agricultural land and the large area as wasteland with *Prosopis* dominant vegetation.

Bio-geographically, the sanctuary falls in 4B Gujarat-Rajwara biotic province of the semi-arid biogeographical zone. The forests of the area are of "5/DS 1-Dry Deciduous Scrub" type.

Khijadia Bird Sanctuary of Jamnagar, Gujarat occupies an area of 604.86 hectare revenue wasteland adjoining the coastal wetland. A revenue wasteland of the Khijadiya wetlands covering an area of 182.90 ha was declared as a sanctuary under section 18 of the Wildlife (Protection) Act, 1972 vide Govt. of Gujarat, Forest and Environment Deptt. Notifications No. AKH-81-WLP-1081-102123/P dated 27-5-1081 and again another area of 421.96 ha was added to it vide notification No. AKH-209182-WLP-1081 / 10213-42 dated 6-11-1982.

The Khijadiya Bird Sanctuary actually consists of two seasonal non-interlinked freshwater wetlands located, little apart from each other separated by reclamation dams/ earthen bunds due to which it is also referred as Khijadiya Lake Complex. This Khijadiya

Lake Complex thus not only includes the two lakes but also has extensive marshes on the southern shore of the Gulf of Kachchh. A creek and salt-pans adjoining the freshwater wetland complex have direct bearing on the ecosystem of Khijadiya wetlands. The rivers draining into the sea pass through Khijadiya Sanctuary and bring lot of silt, causing silting of the freshwater lakes which has lead to the reduction in the water storage capacity of the lakes. This area experiences shortage of water during low rainfall and during good rainfall the excess water overflows into the sea. The sanctuary is bounded on the north by seashore, east by Jambuda village, south by Dhunav, Khijadiya and Jambuda villages and west by Jamnagar village land (Plate 1). The Khijadiya Bird Sanctuary and its surrounding environs are shown in map 1 and 2.

Area of Khijadiya Lake and Bird Sanctuary, Distt., Jamnagar, Gujarat : Map 1.

Area: 182.40 ha	}	605 ha. + Surrounding area of Khijadiya Lake i.e. land area under water spread
Area: 421.96 ha		

**Table 5 : List of major avian congregation sites at
Khijadiya Bird Sanctuary with GPS data**

Bird Congregation Site (s)	GPS Coordinates (WGS 84)
Khijadiya village side	N 22°31.017' E 70°09.299'
Khijadiya Central area	N 22°31.376' E 70°08.166'
Dhunava side	N 22°30.522' E 70°05.801'
Jambuda side	N 22°32.566' E 70°10.482'
Khijadiya West	N 22°30.381' E 70°05.838'
Khijadiya Salt works (Salt Pans) and Salt Marsh and Creeks	N 22°32.407' E 70°10.342'

2.2 History

Earlier Khijadiya Bird Sanctuary was a seacoast and the marshy revenue wasteland of the villages Khijadiya, Jambuda and Dhunvav of Jamnagar district. To prevent salinity ingress and to reclaim the land, the erstwhile ruler of Navanagar State in 1920 and subsequently Govt. of Gujarat in 1956 constructed a reclamation bund along the coast to store waters of the Ruparel and Kalindi Rivers. This resulted into restriction of freshwater flow of small rivers and salt-water inflow during high tides. Before construction of the earthen bunds prior to independence, part of the sanctuary was intertidal zone of the Gulf of Kachchh. The

sanctuary area is just above high tide level and the tidal water reaches up to boundary of the sanctuary. The boundary of marine sanctuary extends in the freshwater lake area of the Khijadiya Sanctuary and also constitutes the boundary of the sanctuary towards the Gulf of Kachchh. Thus gradually over the years variety of vegetational types grew and wildlife built-up especially the birds and in particular waterfowl started flocking and roosting in the region.

2.3 Climate

Climatic conditions vary greatly in the state of Gujarat. Gujarat, being located on the Tropic of Cancer, falls in the sub-tropical climatic zone and a large part of the state lies between 35°C and 45°C isotherms. The rainfall in the state is moderate. It forms a transitional zone between the heavy monsoon area of Konkan in the south and the arid areas of Rajasthan in the north. On the basis of climate, Gujarat is divisible into the following five regions.

Sub-humid	South Gujarat (South of Narmada)
Moderately humid	Central Gujarat (between Narmada and Sabarmati)
Humid and sultry	South facing coastal region of Saurashtra
Dry	Regions of Central Gujarat north of Ahmedabad and parts of Central Saurashtra
Arid and semi arid	North Gujarat and Kachchh

The various seasons of the year are: Monsoon (middle of June to middle of October), winter (November to February) and summer (March to June). From March onwards the temperature starts rising till it reaches the maximum, as high as 45°C in some parts of the state. January is the coldest month of the year in all parts of the state, with maximum temperature never exceeding 30°C and the minimum temperature remaining around 8°C to 10°C.

Gujarat receives much of its rainfall from the southwest monsoon during the period between June and September, its maximum intensity being in the months of July and August. The southern most portion (part of Valsad district) receives annual rainfall as high as 2000 mm. The rainfall gradually decreases northward and in the extreme northwest is as low as 300 mm. From the point of view of annual rainfall, the state is divisible into the following four major zones.

The Khijadiya Lake and Bird Sanctuary area is characterized by very hot summers and severely cold winters. The temperature varies from 6°C to 45°C. The monsoon period is mainly from June-July upto September. Though the area fall under 400 to 800 mm rainfall,

Rainfall above 1000 mm	Districts of Valsad, Dangs, Surat and the eastern parts of Bharuch
Rainfall between 800 mm and 1000 mm	Districts of Vadodara, Panchmahals, Kheda and Southern parts of Ahmedabad
Rainfall between 400 mm and 800 mm	Northern part of Ahmedabd district and whole of Saurashtra
Rainfall less than 400 mm	Districts of Kachchh, Banaskantha and western part of Sabarkantha

the annual rainfall is less than 400 mm in this area. Rainfall is erratic and scanty due to which frequent drought conditions arise.

The relative humidity in all parts of the state is low, though in the coastal areas it is moderately high. Relative humidity of the Khijadiya Lake and Bird Sanctuary area varies from 20 % to 70 %.

Winds are generally light to moderate, increasing in intensity during the late summer and monsoon seasons. High wind is experienced at the sanctuary which blows mainly from north-east to north-west direction from October to April (most of the year). South-west winds blows during monsoon and chilly wind direction keeps on changing in winters from southwest to southeast. Coastal areas experience stronger winds.

2.4 Geology

The geological evolution of Gujarat initiated sometime in the Triassic with the breaking up of the Gondwanaland. Subsequent geological history is related to the Mesozoic and Cenozoic tectonism - northward drift of the Indian sub-continent and breaking up of the western continental margin.

The structural set up of Gujarat is controlled by two major Pre-Cambrian orogenic trends *i.e.* NE-SW Aravalli trend and ENE-WSW Satpura trend. The tectonic boundary dividing the Indian shield into a southern peninsular block and the northern foreland block, is the Narmada-Son lineament. A series of parallel extension faults opened up the Cambay basin and the Western Continental Shelf. The Aravalli trend in its SW extremity splays out into three components. The main NE-SW trend continues across the Cambay graben into Saurashtra as a south westerly plunging arch. Further, it extends across the continental shelf and divides into a northern Kachchh-Saurashtra and southern Bombay-Kerala shelves. The northern branch of Aravalli-Delhi trend swings E-W and resumes into the Kachchh region across the Cambay basin. The third southern most component swings anti-clockwise and

tends to merge with the Satpura trend. Re-activated movements along these trends gave rise to three important basins: the Kachchh, Cambay and Narmada. While the Pre-Cambrian tectonic trends control their tectonic styles, these peri-continental rift basins in the western margin of Indian craton provided ideal sites for the Mesozoic and Cenozoic sedimentation. The Saurashtra peninsular remained as a horst, founded between the three intersecting rift trends. The rocks of Gujarat belong to formations ranging in age from the oldest Pre-Cambrian to the Recent. Graphically, however, the record is incomplete as the rocks of Paleozoic era are totally absent. The sedimentary and volcanic rocks rest over the south western extended Proterozoic rocks of Rajasthan and Post-Triassic. The major geological events of Gujarat thus are confined to Mesozoic and Cenozoic eras.

The important rock formations of the state are Pre-cambrian, Archaeans and Aravallis. The Aravallis are composed of highly metamorphosed quartzites, conglomerate, slates and lime stones. Besides, Jurassic sandstone is fairly widespread in Kachchh and in the north-eastern part of Kathiawar. The cretaceous sandstone is observed as outcrops in parts of Wadhwan (Kathiawar) and Sabarkantha. The Kathiawar Peninsular is mostly covered with Eocene basaltic flows having trappean characteristics.

Tertiary rocks are mainly exposed along the coastal region of Surat, Bharuch and south-east of Kathiawar and Kachchh. The gypsiferous clay, the Dwarka beds are located along the western coast of Kathiawar. The large alluvial tract spreading from Surat to Banaskantha is of estuarine, aeolian and marine origin which is the result of an extensive Pleistocene sedimentation. Based upon the tectonic features and resulting geomorphic disposition, the following broad morpho-tectonic units can be formulated:

- The Banaskantha-Sabarkantha-Panchmahals Vadodara metamorphic and igneous terrain-craton;
- The Deccan Trap plateaus:
 - (a) Amba-Dungar (Vadodara) - Rajpipla (Bharuch) - Dangs region,
 - (b) Saurashtra craton;
- The Kachchh area;
- Mehsana- Ahmedabad- Bharuch- Surat Khambhat Graben;
- Rift systems of Narmada and Tapi rivers.

The peninsula of Saurashtra forms a rocky tableland fringed by coastal plains, a major portion of which is occupied by the Deccan lava flows. The Central part is made up of an undulating plain broken by hills and considerably dissected by various rivers that flow in all directions.

The highlands provide a zig-zag outline and a rugged topography, vaguely forming three almost parallel elevated areas striking ENE-WSW connected by a NNE-SSW ridge. The

eastern fringe of Saurashtra is a low-lying ground marking the site of the former sea connection between the Gulfs of Kachchh and Khambhat.

Altitudinally the table-land varies from 300-600 m. An elevated strip of ground connecting the highlands of Rajkot and Girnar forms the major water divide of Saurashtra. The alluvial plains of the rivers Shetrunji and Bhadar form the most fertile part of this peninsula.

Saurashtra basin, Gujarat, consists of mostly Mesozoic and Cenozoic rocks (Biswas and Deshpande, 1983; Merh, 1995), and stratigraphically the sequence begins with Cretaceous to be followed upward by the Deccan volcanics, Tertiary and the Quaternary. The area is largely covered and prominently exposed by the Deccan Trap (basaltic rocks), the thickness varies from few hundreds to thousands of meters. Traps are underlain by thick Mesozoic sediments (100- 4000 m), which can form potential source rocks. Deccan Trap volcanicity during Late Cretaceous may have generated the requisite thermal conditions and acted as a catalyst in Mesozoic hydrocarbon-generation process. Sedimentation in marine intertonguing environments is considered to have been favorable phenomena for hydrocarbon generation and entrapment. The basin is bounded by three intersecting rift trends, Delhi (NE-SW), Narmada (ENE-WSW) and Dharwar (NNW-SSE). Integrated geophysical studies show that two of the sub-basins of Saurashtra, namely Jamnagar and Dwarka, have significant sediment thicknesses below the Deccan traps and can be considered for future hydrocarbon research.

2.5 Soil

The soil texture varies throughout the Khijadiya Lake and Bird Sanctuary. The soil texture of Khijadiya freshwater wetland was richer than that of Jambuda freshwater wetland. It had less gravel, coarse sand and comparatively more fine sand, silt and clay with increased water holding capacity. The former has high amount of silt and clay making the soil fertile. Thus good vegetation exists towards Khijadiya freshwater wetland. Jambuda freshwater wetland has low water-holding capacity due to the presence of higher percentage of gravel and coarse sand. Vegetation is thus sparse and dominated by *Sudea fruticosa* and *Prosopis chliensis*.

2.6 Catchment and Drainage

The Saurashtra region has low hills, alternating with tiny alluvial basins. The two masses of hills in the central and southern belts of this region give rise to almost a perfect radial drainage pattern. Drainage is parallel right along the coast.

At Khijadiya Lake and Bird sanctuary, the gross catchment area at reclamation bund side is 362.44 sq. km and optimum water yield from the catchment area is 6679.00 MCF in a normal annual rainfall year. The freshwater lakes constitute a watershed of the rivers Ruparel

and Kalindi. Water flows in the river Ruparel and Kalindi by a small nullah from the higher slopes. The two seasonal streams flow from south to north and drains into sanctuary area and bring lot of silt. The siltation in turn has led to reduction of water storage capacity of the lakes. Not been having a perennial river, the freshwater wetlands faces water scarcity in the summer months and the water is retained till the month of March only. The southern part of the Khijadiya wetland towards Dhunvav and Khijadiya side normally found to be 4-5 feet which at places is over 6 feet. Towards the eastern side at Jambuda the water depth on an average remains 2-3 feet.

2.7 Physico-chemical Parameters

Physico-chemical analysis of water reveals that the Khijadiya Lake and Bird Sanctuary has freshwater as well as saline nature. The chlorides concentration value ranges from 30 mg/l to a maximum of 285 mg/l. The maximum chloride value was observed in September and January. Thus the chloride values keeps changing. This may be attributed to the discharge of sewage waste in the water or the proximity of the saline water of the Arabian Sea and salt works may be an important factor responsible for the increase in chloride content. Still the low values of chlorides indicate its pristine environment which needs protection from getting polluted due to increasing human settlement and the salt works activities.

Dissolved oxygen is essential for biological activities. It varies from 12-18 mg/l. This again indicates that the fresh water of Khijadiya Lake is an ideal place for the wintering waterfowl and other existing biodiversity of the lake environs. The Carbon dioxide (CO₂) values at Khijadiya freshwater lake varies from 0 to 30 mg/l. which varies with the respiratory activity of the microbes.

The total hardness is low at Khijadiya Lake which varies from 2-10 mg/l. pH value of the lake has been found to be 7.5 indicating no salt water contamination. Salinity of the Khijadiya marshes and salt water has been found to be very high ranging from 38 ppt in the creek to maximum 49 ppt in the salt water.

3. REVIEW OF LITERATURE

The review of literature reveals that very little work has been done on biodiversity of Khijadiya Lake and Bird Sanctuary, Gujarat. Most of the work has been on flora and fauna of Gujarat which includes references of the Saurashtra region in general and Jamnagar district in particular. Biodiversity of Gujarat has been documented by Pilo and Pathak (1996). The flora of Gujarat have been worked out by Chatterjee (1940), Santapau and Janardhana (1966), Champion and Seth (1968), Malhotra and Wadhwa (1973), Shaw (1978), Bole and Pathak (1988), Singh (2001a and b). The fauna of Gujarat including Jamnagar district has been reported by Ali (1958), Abdul (1962 and 1963), George *et al.* (1963), Kushlan (1976),

Patel and Chhaya (1979), Parasharya (1984), Parvez (1991), Patel (1993), Balachandran (1995), Mukherjee (1995), Khacher (1996), Vyas (1996, 1998), Singh and Tatu (2000), Singh (2001a), ZSI (2000 and 2004), Jani and Parasharya (2007) and Kumar (2009). The research works exclusively on Khijadiya Bird Sanctuary are mainly by Asari and Jani (2001 and 2002) and Pandey and Teli (2005).

4. MATERIAL AND METHODS

A total of six major congregation sites were surveyed in the PA. The avian diversity was recorded using random method, line transect and point count method. Birds were identified based on physical features with the help of field guides and reference books (Ali and Ripley, 1987; Grimmett *et al.*, 1998). Specific details were observed with the help of Nikon Travelite IV 10 x 40 and Nikon-Pentavision 7x - 15x 35 zoom (291 ft/1000 yds at 7x or 97 M/1000 M at 7x) field binoculars.

Field data sheets were prepared to record all the relevant information pertaining to habitat, type of ecology, vegetation, topographical features, point and area co-ordinates, species diversity and population, threats and disturbances etc. Collection of different faunal groups was also made from the sub-localities of congregative bird sites of the PA. Water samples were taken with the help of St. Johns water sampler (Kumar, 1992) for measuring various biological parameters. Major vertebrate groups were observed and recorded in the field using 10 x 50 field monocular with the help of field guides and reference books (Alfred *et al.*, 2006 and Prater, 1971). Apart from direct sightings, the high tidal and the coastal area were also surveyed to find out any dead specimens, skeleton or skull that may have come by floating with tides. The dead body and skeletal parts were also carefully observed and the measurements were taken.

Tide tables for a period from January - December, 2006-2007 for the southern coast of Gulf of Kachchh from Dwarka to Navlakhi in the Jamnagar district, Gujarat were procured. The coastal zone of the marine area was approached during low tide to observe and collect the fauna. Some of the creek and tidal zones were approached by boat and worked out during hours of low tide when maximum coastal zone area gets exposed. The avian congregation was observed during both low and high tide when congregation of species builds up and moves towards seaward side as the tide recedes. The saltpans and kyars of the salt manufacturing industrial units adjoining Khijadiya wetlands were also explored to record the avian and other faunal diversity associated with the wetland environs.

Photographs were taken wherever possible on digital format using Nikon D70s SLR camera with the help of DX SWM ED IF Aspherical ϕ 67 Nikon AF S Nikkor lens 18-70 mm zoom 1:3.5-4.5 G ED; ϕ 62 ? - 1.5 m, Nikon AF Nikkor lens 70-300 mm zoom 1:4-5.6 G and Analogue Canon EOS 300 camera with the help of ϕ 58mm Macro lens EF 100mm 1:2.8

USM. Video photography was also made on VHS movie format using NV-M3500 Panasonic camera of Wide X140 digital zoom lens. Garmin (etrex) made navigational Global Positioning System (GPS) handset was used to record the coordinates (WGS 84 format) of different study sites of the PA. The land area of the PA along with accessible coastline was approached by Jeep: Gypsy/Armada on motorable tracks and inundated areas were approached by boat. The earthen bunding tracks were also used to investigate the area of the wetland along with walk in the marshlands and creeks. The dense juliflora thickets were inspected when lake became almost dry with water isolated in patches especially for the reptiles, avian diversity of passerines and mammals. Permission to survey the PA's for a period of 3 years (2005-2008) was obtained from Shri Pradeep Khanna, Addl. Principal Chief Conservator Forest and CWLW, Gujarat state vide letter no. WLP/41/32/C/2031-33 dated 10-11-2005 and subsequently approvals and sanctions for surveys were also taken vide letter no. WLP/26/A/2091-92/2007-08 dated 5-10-2007 and endorsement by Shri Dilip S. Narve, IFS, Conservator of Forests, Marine National Park, Jamnagar, Gujarat, dated 13-12-2007.

5. FLORA

The Khijadiya Lake and Bird sanctuary supports a plethora of floral species. The surrounding area is mostly degraded wasteland with cultivated lands on the landward side and the intertidal seacoast towards seaward side including the marine sanctuary and the salt areas. The seaward side also has good mangrove cover of *Avicennia marina* species particularly around the creeks. The vegetation cover on the landward side is scrubby and dominated by *Prosopis chilensis* and most of the area is under cultivation of cotton, jowar, cereals, peanuts and millet crops through out the year.

About 183 species of terrestrial and hydrophytic macrophytic grasses, herbs, shrubs and trees have been recorded from the area (Pandey and Teli, 2005). A total of 28 tree species; 12 shrubs; 124 species of herbs and 19 species of climbers belonging to 59 families are recorded from the Khijadiya Bird Sanctuary Area and its vicinity mainly found on bunds and mounds of Khijadiya and Jambuda waterbodies (Appendix 4). Most of them are common weeds but many holds medicinal value. It was observed that the vegetation profile changes in the Khijadiya Bird Sanctuary. The vegetation is mainly emergent type. Dense and sparse vegetation was found in and around the open water bodies near Khijadiya and Dhunav side. Vegetation is mainly scattered on Jambuda side. The mud creeks and salt marshes opposite to the Khijadiya freshwater body was dominated with mangrove vegetation mainly represented by *Avicennia marina*, *Salicornia sp.*, *Suaeda nudiflora*, *Suaeda fruticosa* with scattered patches of *Aeluropus lagopoides* near salt marshes. Endemic mangrove species *Urochondra setulosa* was observed in few patches on drying ground. Submerged flora consists mainly of white lotus flowers (*Nymphaea stellata*) dominated in Khijadiya Lake.

Reeds and sedges provide excellent resting, roosting, nesting and feeding sites for avian faunal diversity of the area. Among the tree species *Prosopis chilensis/juliflora* had outnumbered *Acacia nilotica* and found to be an important tree for heronry formation of nesting birds especially black-necked storks and other aquatic and terrestrial birds like herons, painted storks, spoonbills, cormorants, darters, cattle egrets, baya weavers, sunbirds etc. due to its canopy spread and thorny nature. Some of the plants species have taken the status of invasive species such as *Parthenium* sp. Besides angiosperms, algae belonging to Chlorophyceae viz. *Chara* sp., *Nitella* sp., and *Spirogyra* sp., blue - green algae represented by *Ocellularia* sp.; Pteridophyta *Marselia* sp. (Marseliaceae) and fungi *Agaricus* sp. (Agaricaceae) were also observed.

6. FAUNA

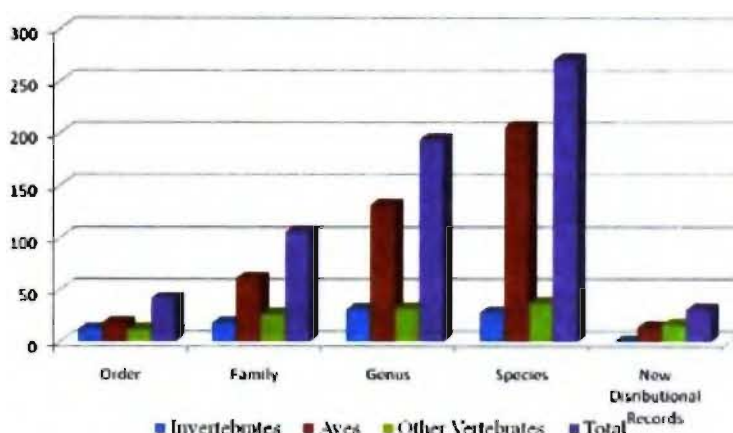
The typical freshwater and marine habitat of the Khijadiya Lake and Bird Sanctuary supports a diversity of invertebrate and vertebrate fauna being mainly dominated by avian species specially winter migrants coming to this protected area from far of regions. Khijadiya wetland ecosystem is an important priority site for conservation of avian diversity in India. The Khijadiya represents a rare or unusual habitat types in the biogeographic region with complex of high quality wetland habitats supporting an assemblage of rare or threatened species or subspecies of birds. It has special value offering habitat for breeding and wintering to many waterfowl species. It also supports large population i.e. >20,000 waterfowl and may be 1% individuals in the biogeographical population of many waterfowl species.

About 255 species of invertebrates and vertebrates have been reported earlier from the Khijadiya Bird Sanctuary (Pandey and Teli, 2005). Several species of zooplanktons, four species of crustaceans and twenty four species of butterflies are the invertebrates recorded from the Khijadiya Lake and Bird Sanctuary during the present study. Among vertebrates eight species of fishes, three species of amphibians, twelve species of reptiles, two hundred and six species of aves and fourteen species of mammals have been recorded from Khijadiya Lake and Bird Sanctuary under the present study (Table 6).

Table 6 : Faunal diversity of Khijadiya Lake and Bird Sanctuary, Gujarat

Groups	Order	Family	Genera	Species	New Disributional Records
Zooplankton	9	9	14	–	–
Crustacea	2	2	4	4	-
Lepidoptera	1	7	13	24	-
Pisces	4	6	7	8	3
Amphibia	1	2	3	3	3
Reptilia	2	9	10	12	5
Aves	18	61	131	206	14
Mammalia	5	10	12	14	6

In all 271 species of invertebrates and vertebrates excluding species of zooplanktons belongs to 42 orders, 106 families and 194 genera. The most dominant faunal group worked out was aves represented by 206 species which are described here. 31 species are found to have new distributional record from Khijadiya Lake and Bird Sanctuary (Fig. 1).

**Fig. 1 : Faunal Diversity Record from Khijadiya Lake and Bird Sanctuary, Gujarat**

6.1 Invertebrate Fauna

Invertebrates so far recorded include species of zooplanktons, arthropods: crustaceans, spiders, mites and insects; annelids: polychate worms; mollusca: gastropods etc. The lake harbours zooplanktons represented by Protozoa: *Amoeba* sp., *Balantidium* sp., *Opalina* sp., *Paramecium* sp., *Paranema* sp., *Euglena*; Coelenterata: *Hydria* sp., *Obelia* sp.; Crustacea: *Cyclops* sp.; Porifera: *Spongilla* sp.; Echinodermata: *Cetopterus* larvae, *Doloraria* and *Tornaria* and Annelida: *Nereis* sp.

Crustaceans are represented by four species of prawn shrimps belonging to order: Decapoda and family: Penaeidae viz. *Parapenaopsis styliifera* (M. Edw., 1837), *Metapenaeus affinis* (H.M. Edw., 1837), *Metapenaeus kutchensis* George and Rao, 1963 (not recorded during present survey), *Penaeus semisulcatus* de Haan, 1844 and one species of brine shrimp belonging to order: Anostraca and family: Artemiidae represented by *Artemia salina* (Linnaeus, 1758). Classification based on Chanda and Roy (2004) and Kumar (2005 a).

Insects were represented by grasshoppers, crickets, moths and butterflies. Butterflies are represented by 24 species mainly belonging to 13 genera under 7 families and suborder: Rhopalocera of order Lepidoptera viz. Pieridae: *Catopsilia crocale* (Cramer, 1775), *Catopsilia pomona* (Fabricius, 1775), *Catopsilia florella* (Fabricius, 1775), *Catopsilia pyranthe* (Linnaeus, 1758), *Colotis amata*, *Colotis etrida* (Boisduval, 1836), *Colotis eucharis* (Fabrius, 1775), *Colotis danae* (Fabricius, 1775), *Colotis vestalis* (Butler, 1876), *Ixias marianne* (Cramer, 1779), *Ixias pyrene* (Linnaeus, 1764), *Eurema hecabe* Linnaeus, 1758; Papilionidae: *Papilio demoleus* Linnaeus, 1758, *Papilio polytes romulus* Craver, 1775, *Graphium agamemnon* Linnaeus, 1758, *Polydorous hector* Linnaeus, 1758; Nymphalidae: *Castalius rosimon* (Fabricius, 1775), *Junonia orithya* (Linnaeus, 1764), *Junonia almanae* (Linnaeus, 1758), *Junonia lemonias* (Linnaeus, 1758); Pieridae: *Colias erate* (Esper, 1805); Hesperidae: *Taractrocera maevius* (Fabricius, 1793); Danaidae: *Danias chrysippus* (Linnaeus, 1758) and Acraeidae: *Acraea violae* (Fabricius, 1775). Classification followed that of Talbot (1986 and 1987). The Khijadiya Lake and Bird Sanctuary still holds large number of invertebrate faunal elements of arthropods: crustaceans, spiders, mites and insects; annelids: polychate worms; mollusca and echinoderms etc. yet to be identified from this unique wetland ecosystem which is supporting the vast avian diversity including winter migrants and waterfowls.

6.2 Vertebrate Fauna

6.2.1 PISCES : FISHES – Among ichthyofauna, brackish and marine coastal waters fishes are represented by five species belonging to one order, four families and four genera viz. *Aphanius dispar* (Rüppell, 1829) (Brackish waters), *Eleutheronema tetradactylus* (Shaw, 1804) (Sandy shores and Muddy estuaries), *Boleophthalmus dentatus* Valenciennes, 1837 (Coastal waters), *Liza carinata* (Valenciennes, 1836) (Coastal waters), *Liza melinoptera* (Valenciennes, 1836) (Shallow coastal waters, lagoons, estuaries). The three species of freshwater fishes belonging to two orders and two families under three genera viz. **Puntius sarana sarana* (Hamilton, 1822), **Labeo calbasu* (Hamilton, 1822) and **Mystus gulio* (Hamilton, 1822) have also been recorded. The *Puntius sarana sarana* has been earlier recorded from Wankaleswar River, Godhra, Panchmahal, Narmada River and Rajpipla in Gujarat. *Labeo calbasu* though found in many wetlands of Gujarat but known from Kheda and Nalsarovar whereas *Mystus gulio* is earlier reported from Niruma Dam, Lakhatrana,

Bhuj; Nikashi Canal, Narmada and Anand. The species marked with *asterisk are new records from the area. (Appendix 5). Classification followed that of Talwar and Jhingram (1991).

6.2.2 AMPHIBIA : FROGS AND TOADS – Amphibian fauna of Khijadiya Lake and Bird Sanctuary, Gujarat has not been studied so far. Three species of frogs and toads viz. **Hoplobatrachus tigerinus* (Daudin, 1803), **Euphlyctis hexadactylus* (Lesson, 1834) and **Duttaphrynus stomaticus* Lutken, 1862 are recorded from Khijadiya Sanctuary during the present study. *Hoplobatrachus tigerinus* is earlier reported from Kutch, Banaskantha, Mahesana, Sabarkantha, Jamnagar, Rajkot, Ahmedabad, Bhavnagar, Amreli, Junagadh, Kheda, Surat, Vadodara and Dangs in Gujarat. *Euphlyctis hexadactylus* is reported earlier from Jamnagar, Surat, Navsari, Bulsar, Dangs and Bharuch. The known distribution of *Duttaphrynus stomaticus* is from Banaskantha, Sabarkantha, Mahesana, Jamnagar, Rajkot, Vadodra, Bharuch, Valsad, Kheda, Bhavnagar and Amreli. All species marked with *asterisk are new records from the sanctuary (Appendix 6). More intensive surveys shall further enrich the amphibian fauna from this wetland as well as Gujarat. Classifications followed are that of Boulenger (1920), Parker (1934), Daniel (1963), Chanda (2002) and Dinesh *et al.* (2009).

6.2.3 REPTILIA : TURTLES, LIZARDS and SNAKES – Reptiles are represented by one species of turtle **Lissemys punctata punctata* (Lacepede, 1788); six species of lizards viz. **Hemidactylus brooki* Gray 1845, **Hemidactylus leschenaultii* Dumeril and Bibron, 1836, **Hemidactylus flaviviridis* Ruppell 1835, *Calotes versicolor* (Daudin 1802), *Eutropis carinata* (Schneider 1801), *Varanus bengalensis* (Linnaeus 1758); five species of snakes viz. *Eryx johnii* (Russell, 1801), *Ptyas mucosus* (Linnaeus 1758), **Xenochrophis piscator* (Schneider 1799), *Naja naja oxiana* (Eichwald, 1831) and *Echis carinatus* (Schneider 1801) (Plate 2). One species of turtle, three species of reptiles and one species of snake marked with *asterisk are new records from Khijadiya Lake and Bird Sanctuary (Appendix 7). All the reptilian species recorded as new records are widely distributed throughout Gujarat but first time reported from Khijadiya. The classification followed is that of Sharma (1998) for testudines. Tikader and Sharma (1992) for lizards and Sharma (2002 and 2003) for snakes.

6.2.4 AVES : BIRDS – The avian diversity component of the protected area is the most precious element of faunal diversity of the ecosystem. The Khijadiya Lake and the Bird Sanctuary is located in the western-most part of the country and falls on the traditional route of the migratory birds. Consequently, the sanctuary supports a variety of migratory birds including the waterfowls. This is an extremely important staging and wintering area for a wide variety of waterfowls. So far 207 species of birds were reported by earlier workers from the wetland complex including over 90 species of waterfowls. It is a well-known breeding ground of the *Tachybaptus ruficollis* (Great Crested Grebe), which otherwise is migratory and uncommon in the Gujarat State. The Khijadiya Lake and many areas in the

adjacent Marine National Park and Sanctuary are now important breeding sites for *Ephippiorhynchus asiaticus* (Black-necked Stork) also. Many other avian species are also known to breed in the area.

During the present studies 206 species of passeriformes and non-passeriformes are reported and listed under table 7. The species marked with * sign are reported for the first time as new records from the study area and their distribution known from Gujarat is given under systematic account. Fifteen species of aves viz. 5 species of Anatidae - *Anser anser* (Linnaeus, 1758), *Marmaronetta angustirostris* (Menetries, 1832), *Rhodenessa rufina* (Pallas, 1773), *Aythya nyroca* (Guldenstadt, 1770) and *Aythya baeri* (Radde, 1863); 2 species of Accipitridae - *Sarcogyps calvus* (Scopoli, 1786) and *Aquila clanga* Pallas, 1811; 1 species of Gruidae - *Grus antigone* (Linnaeus, 1758); 3 species of Rallidae - *Amaurornis akool* (Sykes, 1832), *Porzana porzana* (Linnaeus, 1766) and *Gallicrex cinerea* (Gmelin, 1789); 1 species of Scolopacidae - *Lymnocyptes minimus* (Brunnich, 1764) and 3 species of Laridae - *Larus minutus* Pallas, 1776, *Sterna saundersi* Hume, 1877 and *Sterna acuticauda* J.E. Gray, 1831 reported by earlier workers were not recored during the present survey. Thus a total of 221 species of aves are now known from the Khijadiya Lake and Bird Sanctuary, Gujarat. The systematic account of 206 species of birds recorded during the present study is given in details along with observation localities, field identification characters, distribution, status, habit and habitat and remarks. Field photographs of 132 species of birds out of 206 have been placed in plates 3 - 18. Classification followed is that of Manakadan and Pittie (2001).

SYSTEMATIC ACCOUNT OF AVIAN DIVERSITY OF KHIJADIYA LAKE AND BIRD SANCTUARY, GUJARAT

I Order PODICIPEDIFORMES

1. Family PODICIPEDIDAE : GREBES

1. *Tachybaptus ruficollis* (Pallas, 1764) - Little Grebe

1884. *Podiceps capensis* Salvadori, *Ann. Mus. Civ. Genova* (2), I: 252. Type locality: Shoa, Africa.

1987. *Podiceps ruficollis capensis* Salvadori, Ali and Ripley Compact Hand Book No. 5 (1): 6-8.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 23 cm. A small tail-less bird with rounded head and short, pointed, thick and straight bill. Cheeks and lower throat chestnut, cap and back of neck greyish black with upper throat black in breeding conditions otherwise winter plumage sides of head and fore neck pale rufous, cap darker, upper throat white. Iris reddish brown to deep-red. Bill in adult black. Legs and feet greenish black. Sexes alike.

Distribution: Common throughout India.

Status: Resident but show local migration due to non-availability of food and water.

Habit and Habitat: An excellent diver seen in all types of inland waters with or without floating vegetation or reeds, irrigation reservoirs, village tanks, ponds, moats of ancient forts, even flooded roadside ditches and borrow-pits. Food consists mainly of fish, frogs, tadpoles, crustacean, molluscs, aquatic insects, etc.

Remarks: Sighted mostly in pairs with small groups of 2-6 birds at a time. Found breeding in the reed beds.

2. *Podiceps cristatus* (Linnaeus, 1758) - Great Crested Grebe

1758. *Colymbus cristatus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 35. Type-locality: Sweden.

1987. *Podiceps cristatus cristatus* (Linnaeus), Ali and Ripley Compact Hand Book No. 3 (1): 3-5.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of a duck about 50 cm in length with long slender neck and straight pointed dark pinkish-brown bill, head ornamented with backward pointing tufts above and a frill or ruff of black chestnut feathers below in breeding plumage. In winter, head ornamentation reduced or absent, white above eye conspicuous. Iris red with an orange narrow inner ring. Legs and feet greenish.

Distribution: Found in Ladakh, Kashmir, Assam, Manipur, Rajasthan, Gujarat and Orissa.

Elsewhere: The Palaearctic region-Europe to China, Japan and Nepal.

Status: Migratory. Winter visitor to India from Sind.

Habit and Habitat: An excellent diver. Food mainly consists of fish, tadpole, frogs, water insects, etc with some vegetable matter. Found in aquatic habitat of jheels and littoral waters with reeds.

Remarks: Breeding was recorded at three different places in the lake area. Sighted generally in pairs and small groups of 4-6.

3. *Podiceps nigricollis* Brehm, 1831 - Black-necked Grebe

1831. *Podiceps nigricollis* Brehm, *Handb. Naturg. Vog. Deutschl.*,: 963. Type-locality: E. Germany.

1987. *Podiceps nigricollis nigricollis* Brehm, Ali and Ripley Compact Hand Book No. 4 (1): 5-6.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 33 cm. smaller than duck with slightly upturned needle-like bluish bill. Head and neck black, tufts of golden brown feathers on sides of head during breeding plumage. Head and neck dark greyish black with white of throat extending around nape in winter. Iris reddish-brown. Legs and feet blackish.

Distribution: Found in Punjab, Uttar Pradesh, Gujarat and Maharashtra.

Elsewhere: Baluchistan, Sind, Nepal, Pakistan, in the Palaearctic region from Europe to China and Japan.

Status: Migratory. Winter visitor to India.

Habit and Habitat: Found in aquatic habitats with reed beds along with little grebes. Prefers shallow to open waters and salt kyars. Food mainly consists of fish, tadpoles, shrimps, aquatic insects, etc.

Remarks: Observed in fluctuating numbers since they are locally shifting within or outside the ecosystem.

II Order PELECANIFORMES

2. Family PELECANIDAE : PELICANS

4. *Pelecanus onocrotalus* Linnaeus, 1758 - Great White Pelican

1758. *Pelecanus onocrotalus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 132. Type-locality: Africa, Asia.

1987. *Pelecanus onocrotalus* Linnaeus, Ali and Ripley Compact Hand Book No. 20 (1): 27-29.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks, Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 183 cm. white with black primaries; bill bluish and pouch yellow to orange; feathers of forehead end in a point. Iris red to crimson. Legs and feet pale creamy grey. Sexes alike but females slightly smaller.

Distribution: During winter from Punjab to Assam, Uttar Pradesh, Rajasthan, Gujarat, Andhra Pradesh and Tamil Nadu.

Elsewhere: Hungary to lakes of central Asia, south to Iraq and Persian Gulf. Wintering in Myanmar, Malaysia to E. China, Temperate and tropical America, Africa, Asia, Europe, Australia.

Status: Resident and Migratory. Resident in part of India. Mainly winter visitor to Northern India.

Habit and Habitat: Gregarious in nature. Generally seen in pairs or large groups in fresh and brackish waters. Found in large freshwater lakes, brackish lagoons. Food consists mainly of fish.

Remarks: Breeds in Great Rann of Kachchh. Oil obtained from pelican's fat is highly valued for rheumatism and similar ailments. Mostly seen in large flocks and seldom alone. A flock size of > 200 pelicans were observed at a time.

5. *Pelecanus philippensis* Gmelin, 1789 - Spot-billed Pelican

1789. *Pelecanus philippensis*, *Syst. Nat.*, 1 (2): 571 (Philippines= Manila)

1987. *Pelecanus philippensis philippensis* Gmelin, Ali and Ripley Compact Hand Book No. 21(1): 29-30.

Observation localities: Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 152 cm. General colouration grey, no black in wings, bill pinkish flesh with blue spots, pouch dull purple. Iris white to pale yellow. Legs and feet blackish-brown. Sexes alike.

Distribution: Throughout India. Gujarat: Great and Little Rann of Kutch, Saurashtra: Jamnagar.

Elsewhere: Pakistan, Sri Lanka.

Status: Migratory with local migratory movements.

Habit and Habitat: Gregarious in nature. Generally seen in pairs or small groups in fresh and brackish waters. Throughout the day it remains active in water at night roosts on nearby trees. Food consists mainly of fish.

Remarks: New distributional record from the area. Seen in pair along with darters, waders and Dalmatian Pelicans in Khijadiya salt works area.

6. *Pelecanus crispus* Bruch, 1832 - Dalmatian Pelican

1832. *Pelecanus crispus* Bruch, *Isis*, Col. 1109. Type locality: Dalmatia.

1987. *Pelecanus philippensis crispus* Bruch, Ali and Ripley Compact Hand Book No. 22 (1): 30-31.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 183 cm. Upper plumage whitish with tip of primaries black, bill and pouch yellow to orange with feathers of forehead ending in a transverse concave line. Iris white. Legs and feet greyish black. Sexes alike.

Distribution: Throughout India.

Elsewhere: S.E. Europe, Asia minor, Iran, N. China, S.E. Mongolia, N. Africa.

Status: Migratory. Winter visitor to India.

Habit and Habitat: Gregarious in nature. Generally seen in pairs or small groups in fresh water lakes and brackish lagoons. Food consists mainly of fish. Breeds in S.E. Europe, Asia, Iran, N. China, S.E. Mongolia.

Remarks: Observed singly, in pairs and in small flock size of > 20 pelicans at a time.

3. Family PHALACROCORACIDAE : CORMORANTS and SHAGS

7. *Phalacrocorax niger* (Vieillot, 1817) Little Cormorant

1817. *Hydrocorax niger* Vieillot, *Nouv. Dict. Hist. Nat.*, 8: 88. Type-locality: East Indies=Bengal.

1987. *Phalacrocorax niger* (Vieillot), Ali and Ripley Compact Hand Book No. 28 (1): 41-42.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Black with a bluish or greenish sheen. Scattered silky white plumes on fore crown and sides of head present in adult breeding while absent in non-breeding adult, yellow gular skin absent. Iris green. Bill horny brown blacked at tip. Sexes alike.

Distribution: Found throughout India except in Himalayas.

Elsewhere: Pakistan, Sri Lanka, Myanmar, Thailand, Indochina, Malaysia, Indonesia, Greater Sunda Islands.

Status: Resident and Migratory with local migration depending on water conditions.

Habit and Habitat: Solitary or 2-3 sighted at a time in freshwater and estuaries. When not in water perches on trees, rocks, with wings and tail spread open. Food mainly fish, frog, crustaceans.

Remarks: Very large population seen congregating on juliflora trees surrounded by water at Khijadiya Jambuda Lake. Breeding colonies seen in the area.

8. *Phalacrocorax fuscicollis* Stephens, 1826 - Indian Shag

1826. *Phalacrocorax fuscicollis* Stephens, In Shaw's *Gen. Zool.*, 13 (1): 91. Type-locality: Bengal.

1987. *Phalacrocorax fuscicollis* Stephens, Ali and Ripley Compact Hand Book No. 27 (1): 39-41.

Observation localities: Khijadiya Lake, Khijadiya Jambuda Lake and Salt Marsh and Creeks.

Field identification characters: Size of about 63 cm. Glistening bronze-black above and shiny jet black below. Throat speckled, head and neck black, yellow gular skin, head not crested with pure white tufts of feathers on each side of neck behind ear-coverts and few white specks on head. Iris green or blue-green. Bill dark brown. Legs and feet black. Sexes alike.

Distribution: Throughout India except in Himalaya.

Elsewhere: Myanmar south to Tenasserim, Sri Lanka and W. Pakistan.

Status: Resident and Migratory with local migration depending on water conditions.

Habit and Habitat: Found in jheels, rivers, tidal estuaries, irrigation tanks, etc. alone or in company of other cormorants. Food mainly consists of fish.

Remarks: Seen in flocks of 12-20. Found in nest building process.

9. *Phalacrocorax carbo* (Linnaeus, 1758) - Great Cormorant

1801. *Pelecanus sinensis* Shaw, *Nat. Misc.*, 13: pl. 529. Type-locality: China.

1987. *Phalacrocorax carbo sinensis* (Shaw), Ali and Ripley Compact Hand Book No. 26 (1): 37-39.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Salt Marsh and Creeks.

Field identification characters: Size of about 80 cm. Largest, glossy black above and below, flanks white with yellow gular skin. Head, crest and neck more or less mixed with silky white feathers. Facial skin and throat white. White oval thigh patches seen at rest as well as in flight in adult breeding. Iris green. Bill dark horny brown. Legs and feet black. Sexes alike.

Distribution: Throughout India.

Elsewhere: Sri Lanka, Holland through central and southern Europe to central Asia, Myanmar, Thailand, Malaysia, China, North America, northern Africa and Australia.

Status: Resident and Migratory with local migration depending on water conditions.

Habit and Habitat: Usually found singly or in flock of 2-8 in tidal lagoons, salt pans, jheels irrigation reservoirs. Food is mainly fish.

Remarks: Fewer population groups were recorded from the P.A. However found in nest building process.

4. Family ANHINGIDAE : DARTER

10. *Anhinga melanogaster* Pennant, 1769 - Darter

1769. *Anhinga melanogaster* Pennant, *Indian Zool.*, 13: 12. Type-locality: Sri Lanka (=Sri Lanka) and Java.

1987. *Anhinga rufa melanogaster* Pennant, Ali and Ripley Compact Hand Book No. 29 (1): 43-45

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 90 cm. A black water bird with white chin, longer slender snake like neck, narrow head and straight, pointed stiletto-shaped brown bill. Black above, shining black below, back and wings longitudinally streaked and speckled with silver-grey. Tail long, stiff and fan shaped. Iris inner ring white, outer yellow. Legs and feet black. Sexes alike.

Distribution: Throughout India.

Elsewhere: Myanmar, Thailand, Malaysia, Celebes, Africa, Madagascar and Middle East.

Status: Resident and Migratory with local migration depending on water and food availability.

Habit and Habitat: Inland waters, swamps, jheels, rivers, irrigation reservoirs, village ponds, etc. Food is mainly fish.

Remarks: Found actively engaged in nest building process.

III Order CICONIIFORMES

5. Family ARDEIDAE : HERONS, EGRETS and BITTERNs

11. *Egretta garzetta* (Linnaeus, 1766) - Little Egret

1766. *Ardea garzetta* Linnaeus, *Syst. Nat.*, ed. 12, 1: 237. Type-locality: 'Oriente'=northeast Italy.

1987. *Egretta garzetta garzetta* (Linnaeus), Ali and Ripley Compact Hand Book No. 49 (1): 72-74.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 63 cm. Snow white small bird with black yellow bill. A drooping nuchal crest of two long narrow plumes present during breeding season. Iris yellow. Legs and feet yellow. Sexes alike.

Distribution: Throughout India.

Elsewhere: Nepal, S. and E. Europe, N. and E. Africa, Middle East, Iran, Afghanistan, Myanmar, Malaysia, east to China, Hainan and Japan.

Status: Resident with local migration depending on water conditions and on food.

Habit and Habitat: Gregarious, found in flocks on the edge of water, inland waters, sometimes in tidal estuaries, mudflats and backwaters. Food mainly consists of fish, frogs, crustaceans, water insects, etc.

Remarks: Seen frequently migrating between sanctuary area and adjacent Marine National Park.

12. *Egretta gularis* (Bosc, 1792) - Western Reef-Egret

1832. *Ardea (Leptorodas) schistacea* Hemprich and Ehrenberg, *Symb. Phys. Aves*, p. 12, pl. 6. Type-locality: Red Sea.

1987. *Egretta gularis schistacea* (Hemprich and Ehrenberg), Ali and Ripley Compact Hand Book No. 50 (1): 74-76.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 63 cm. Adult seen in two phase pure white and slaty grey with glistening white throat and upper foreneck. Iris yellow. Bill brown above and yellow at base. Legs and feet greenish black. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Sri Lanka, Laccadive Islands, Coasts of Red Sea, Gulf of Aden and Persian Gulf.

Status: Resident and Migratory.

Habit and Habitat: Found near sandy and rocky seashores, tidal lagoon and mudflats and mangrove swamps. Food consists of mainly fish and frog.

Remarks: Seen singly or in pairs or in small scattered groups of 2-4.

13. *Ardea cinerea* Linnaeus, 1758 - Grey Heron

1758. *Ardea cinerea* Linnaeus, *Syst. Nat.*, ed. 10, 1: 143. Type-locality: Europe, restricted to Sweden.

1843. *Ardea rectirostris* Gould *Proc. Zool. Soc. London*, 22. Type-locality: India.

1987. *Ardea cinerea rectirostris* Gould, Ali and Ripley Compact Hand Book No. 36 (1): 55-56.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 75 cm. dark grey above with long-legs and long neck. Iris golden yellow, bill, legs and feet bright orange-yellow (breeding) and dark horny brown bill and greenish brown, marked with yellowish on the joints (non-breeding). Sexes alike but females smaller with crest and pectoral plumes less developed.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Sri Lanka, Maldives Islands, Middle East, Myanmar, Thailand, Malaysia, E. Siberia, E. China, Japan, Formosa, Hainan.

Status: Resident and Migratory, casual winter visitor.

Habit and Habitat: Mainly solitary, sometimes in small groups but nesting gregarious. Food mainly fish and frog. Also feeds on molluscs, crustaceans, aquatic insects, small rodents and young birds.

Remarks: Subspecies recorded from the region is *Ardea cinerea rectirostris*.

14. *Ardea purpurea* Linnaeus, 1766 - Purple Heron

1834. *Ardea purpurea* var. *manilensis* Meyen, *Nova Acta Acad. Caes. Leop. Carol.*, 16, suppl.: 102-103.
Type-locality: Philippines.

1987. *Ardea purpurea manilensis* Meyen, Ali and Ripley Compact Hand Book No. 37 (1): 57-59.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 70 cm. Upper parts dark purple or purplish slaty, blackish on wing and tail. Crown and crest slaty black, long thin chestnut neck boldly striped with black. Chin and throat white from below, rest of underparts slaty black and rich chestnut. Iris yellow. Bill dark yellow. Legs and feet reddish brown. Sexes alike but females smaller with crest and pectoral plumes less developed.

Distribution: Throughout India.

Elsewhere: Myanmar, Thailand, China, Ryukyu, Philippines, Greater Sunda Islands and Celebes, races in Europe, Madagascar and Ussuriland.

Status: Resident and Migratory and also a local migrant.

Habit and Habitat: Solitary, mainly crepuscular, keeping to dense reed cover. Food mainly fish and frog. Also feeds on molluscs, crustaceans, aquatic insects, small rodents and young birds.

Remarks: Mostly observed wading in the shallow regions singly.

15. *Casmerodius albus* (Linnaeus, 1758) - Large Egret

1758. *Ardea alba* Linnaeus, *Syst. Nat.*, ed. 10, 1: 144. Type-locality: Sweden.

1831. *Ardea alba modesta* J.E. Gray, *Zool. Misc.*, 19. Type-locality: India.

1987. *Ardea alba alba* Linnaeus, Ali and Ripley Compact Hand Book No. 45 (1): 68-69.

1987. *Ardea alba modesta* J.E. Gray, Ali and Ripley Compact Hand Book No. 46 (1): 69-71.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 75 cm. A large snowy-white bird with long slender neck and head. Bill pointed, black with yellow base. Legs long, black. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Myanmar, China, Malaysia, Sri Lanka, Maldives, Japan, Australia. Breeds in SE Europe, Asia to SE Siberia, N. China, N. Japan.

Status: Resident and Migratory. Also a winter visitor.

Habit and Habitat: Solitary near marshes, jheels, tidal estuaries. Food consists mainly of fish, frogs, crustaceans, water insects.

Remarks: Commonly sited species in the region.

16. *Mesophoyx intermedia* (Wagler, 1829) - Median Egret

1829. *Ardea intermedia* Wagler, Isis von Oken, col. 659. Type-locality: Java.

1987. *Egretta intermedia intermedia* (Wagler), Ali and Ripley Compact Hand Book No. 47, 48 (1): 71-72.

Observation localities: Khijadiya Village side and Khijadiya Lake.

Field identification characters: Size of about 45 cm. Smaller than large egret. Decomposed filamentous plumes present on back as well as breast in breeding season. Iris yellow. Bill black with base yellow. Legs and feet black. Sexes alike.

Distribution: Throughout India.

Elsewhere: Sri Lanka, Myanmar, Thailand, Malaysia, East to China and Japan, South to Greater Sunda Islands and Philippines.

Status: Resident and Migratory also show local movements.

Habit and Habitat: Jheels, marshes, inundations, coastal backwaters, tidal estuaries and mangrove swamps. Food mainly consists of fish, frogs, crustaceans, water insects, etc. Colonial breeder.

Remarks: Seen singly or in group of 2-4. Always observed at the disturbed sites of the wetland.

17. *Bubulcus ibis* (Linnaeus, 1758) - Cattle Egret

1783. *Cancroma coromanda* Boddaert, Table Pl. enlum., 54. Type-locality: Coromandel (=Eastern Coast, South India).

1987. *Bubulcus ibis coromandus* (Boddaert), Ali and Ripley Compact Hand Book No. 44 (1): 66-68.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 51 cm. Snow white bird with yellow bill. In breeding season with golden buff on head, neck and back. Iris golden yellow. Legs and feet black. Sexes alike.

Distribution: Throughout India.

Elsewhere: Myanmar, Malaysia, S. China, Korea, S. Japan, Formosa, Hainan, Philippines, Sunda Islands, Celebes.

Status: Resident and Migratory also show local movements. Migrate in Himalayas to lower elevations during winter.

Habit and Habitat: Gregarious. Roosts on trees. Food mainly insects.

Remarks: Mostly seen singly, in pairs or in groups of 12-15 often with grazing cattle. Heronaries found in the area.

18. *Ardeola grayii* (Sykes, 1832) - Indian Pond-Heron

1832. *Ardea grayii* Sykes, *Proc. Zool. Soc. London*: 158. Type-locality: Dukhun (=Deccan, Peninsular India).

1987. *Ardeola grayi grayi* (Sykes), Ali and Ripley Compact Hand Book No. 42 (1): 63-64.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 46 cm. Head and neck dark brown streaked with yellowish buff with chin and throat white, upper breast white, streaked with brown (non-breeding). Head and neck light yellowish brown with browner crown. Upper breast ashy brown. Iris lemon yellow with greenish yellow orbital skin. Bill greenish yellow with blue base. Legs and feet dull green.

Distribution: Throughout India.

Elsewhere: Sri Lanka, Persian Gulf to Myanmar and Malaysia.

Status: Resident, shifting locally with drought and flood conditions.

Habit and Habitat: Solitary while feeding but gregarious at roosting. Food mainly consists of frogs, fish, crustaceans, water beetles and other insects.

Remarks: Observed throughout the PA. It is an important prey bird in the food web serving as prey of raptors.

19. *Butorides striatus* (Linnaeus, 1758) - Little Green Heron

1857. *Ardea chloriceps* 'Hodgs.'=Bonaparte, *Consp. Gen. Av.*, 2: 129. Type-locality: Nepal (Restricted to Hitura, Chisapani Garhi district).

1987. *Butorides striatus javanicus* (Horsfield), Ali and Ripley Compact Hand Book No. 38 (1): 59-61.

Observation localities: Khijadiya Village side and Khijadiya Jambuda Lake.

Field identification characters: Size about 46 cm. Smaller than pond heron. Dark grey or slaty grey or metallic green on neck, breast and abdomen. Iris bright lemon-yellow. Bill upper mandible dark horny brown, lower sage green. Legs and feet yellowish leaf green.

Distribution: Throughout India.

Elsewhere: Sri Lanka, Myanmar, Thailand, Malaysia, Indonesia, Philippines, Sunda Islands, Celebes. South America, Africa, Islands of Indian Ocean, Eastern Asia south to Australia and S. Pacific Islands.

Status: Resident.

Habit and Habitat: Found in mangrove forest along shores. Food consists of fish, shrimps, frogs, crabs and insects.

Remarks: Found at most obscure sites in the wetland.

20. *Nycticorax nycticorax* (Linnaeus, 1758) Black-crowned Night-Heron

1758. *Ardea nycticorax* Linnaeus, *Syst. Nat.*, ed. 10, 1: 142. Type-locality: Southern Europe.

1987. *Nycticorax nycticorax nycticorax* (Linnaeus), Ali and Ripley Compact Hand Book No. 52 (1): 78-80.

Observation localities: Khijadiya Village side, Khijadiya Lake and Khijadiya Dhunvav.

Field identification characters: Size of about 58 cm. A stocky white and black bird with stout black bill which is greenish yellow at base. Fore head white with a white streak over eyes. Crest black, drooping. Sides of body grey. Iris blood-red. Legs and feet green. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Nepal, Sri Lanka, Central and southern Europe, south to Africa, Middle East, Myanmar, Thailand, Malaysia, China, Japan.

Status: Resident with local movements.

Habit and Habitat: Gregarious, crepuscular and nocturnal seen near jheels, tanks, streams and ponds, estuaries, tidal creeks, coastal lagoons and backwaters. Food consists mainly of fish, frogs and aquatic insects.

Remarks: Sighted at dusk. Breeding recorded in the area.

21. *Ixobrychus cinnamomeus* (Gmelin, 1789) - Chestnut Bittern

1789. *Ardea cinnamomea* Gmelin, *Syst. Nat.*, 1 (2): 643. Type-locality: China.

1987. *Ixobrychus cinnamomeus* (Gmelin), Ali and Ripley Compact Hand Book No. 56 (1): 84-86.

Observation localities: Khijadiya Village side and Khijadiya Jambuda Lake.

Field identification characters: Size of about 38 cm. Smaller than pond heron. Crown and crest chestnut cinnamon. Below chin and throat whitish with a dark median stripe down fore neck including crown and bushy crest, chestnut-cinnamon. Wing quills chestnut. Chin

and throat whitish with a dark median stripe down foreneck. A patch of black and chestnut buff-edged feathers on each side of upper breast largely concealed by the elongated breast feathers, rest of underparts pale chestnut. Iris yellow, orange or pinky red. Bill greenish yellow or light orange-yellow. The culmen blackish and base of the mandibles rosy red. Legs and feet yellowish green.

Distribution: Throughout India.

Elsewhere: Sri Lanka, Nepal, Myanmar, Thailand, Malaysia, Philippines, Sunda Islands, Celebes, China and Ryukyu Island.

Status: Resident and Migratory with local migratory movements due to availability of water.

Habit and Habitat: Mainly solitary and crepuscular. Affects reed-beds in inland swamps and swamps, inundated standing paddy fields. Food mainly consists of fish, frogs, molluscs, insects, etc.

Remarks: Rare and only seen in the reeds.

22. *Dupetor flavicollis* (Latham, 1790) - Black Bittern

1790. *Ardea flavicollis* Latham, *Index Orn.*, 2: 701. Type-locality: India.

1987. *Ixobrychus flavicollis flavicollis* (Latham), Ali and Ripley Compact Hand Book No. 58 (1): 88-90.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size about 58 cm, largely black and rufous-buff with a conspicuous buff and white cheek patch. Looks like pond heron, mainly black with a conspicuous buff and white cheek patch. Iris golden brown to red. Bill reddish horny, paler and yellowish at tip, legs and feet dark brown.

Distribution: Throughout India.

Elsewhere: Sri Lanka, Myanmar, Thailand, Malaysia, China, Greater Sunda Islands, Celebes and Australia.

Status: Resident with local shifting depending on water. Also partly migratory.

Habit and Habitat: Mainly solitary, crepuscular and nocturnal. Affects reedy inland swamps and overgrown seepage nullahs in jungle, tidal mangroves. Food mainly consists of fish, frogs, molluscs, insects, etc.

Remarks: Sighted in swampy reed beds of Khijadiya Dhunvav.

6. Family CICONIIDAE : STORKS

23. *Mycteria leucocephala* (Pennant, 1769) - Painted Stork

1769. *Tantalus leucocephalus* Pennant, *Indian Zool.*,: 11, pl. 10. Type-locality: Sri Lanka.

1987 *Mycteria leucocephala* (Pennant), Ali and Ripley Compact Hand Book No. 60 (1): 93-95.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 93 cm. A long legged, long necked bird with long heavy yellow bill slightly decurved at tip and yellow face. Plumage white with metallic greenish black above with a black band across breast and rose-pink near tail. Wings and tail-quills black. Iris straw yellow, grey-brown in immature. Legs and feet brown or fleshy brown. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Sri Lanka, Nepal, Myanmar, Thailand, N. Malaya, SW China.

Status: Resident and Migratory, shifting locally with water conditions.

Habit and Habitat: Gregarious. Food mainly consists of fish, reptiles, frogs, crustaceans and insects.

Remarks: Common throughout the Khijadiya Lake and Bird Sanctuary. Generally seen in pairs or in groups of 4-12 or more. Found in nest building process.

24. *Anastomus oscitans* (Boddaert, 1783) - Asian Openbill-Stork

1783. *Ardea oscitans* Boddaert, *Table Pl. enlum*: 55. Type-locality: Pondicherry, India.

1987. *Ardea oscitans* (Boddaert), Ali and Ripley Compact Hand Book No. 61 (1): 95-98.

Observation localities: Salt Marsh and Creeks.

Field identification characters: Size of about 81 cm. Large bird, but a small stork, white with glistening purplish black or greenish black mantle, wings and tail. Iris almost white, grey or pale brown. Bill dull greenish horny, redder beneath. Orbital skin and naked lores black. Legs and feet dull. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Sri Lanka, Myanmar, Thailand and China.

Status: Resident shifting locally with water conditions. Some local migratory movements also recorded.

Habit and Habitat: Found in inland waters, jheels and marshes. Food mainly consists of molluscs, crabs, frogs, etc.

Remarks: Seen singly or in pairs and sometimes large congregations.

25. *Ephippiorhynchus asiaticus* (Latham, 1790)-Black-necked Stork

1790. *Mycteria asiatica* Latham, *Index Orn.*, 2: 670. Type-locality: India.

1987. *Ephippiorhynchus asiaticus asiaticus* (Latham), Ali and Ripley Compact Hand Book No. 66 (1): 104-105.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 135 cm. A large black and white bird with massive black bill and long coral red legs. Iris in male dark brown and female lemon yellow. Naked skin of gular pouch and eyelids dull purple.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Sri Lanka, Myanmar, Malaysia, Thailand, China and some races in Australia.

Status: Resident. Widespread but sporadic and nowhere abundant.

Habit and Habitat: Found in shallow waters. Food mainly fish, frogs, reptiles, crabs.

Remarks: Generally seen solitary or in pairs. Found breeding on *P. chilensis* with a pair of chicks.

7. Family THRESKIORNITHIDAE : IBISES and SPOONBILLS

26. *Plegadis falcinellus* (Linnaeus, 1766) - Glossy Ibis

1766. *Tantalus falcinellus* Linnaeus, *Syst. Nat.*, ed. 12: 241. Type-locality: Austria and Italy.

1987. *Plegadis falcinellus falcinellus* (Linnaeus), Ali and Ripley Compact Hand Book No. 71 (1): 114-115.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 52 cm. A small black ibis with feathered head and slender downcurved bill. Above rich dark chestnut or maroon-brown, heavily glossed with green and purple on head, neck, chin, throat, lower back and rump. Tail black glossed with green and purple. Below chestnut. Under tail-coverts deep purple. Sexes alike.

Distribution: Uttar Pradesh, Gangetic Plain, Madhya Pradesh, Deccan, Rajasthan, Gujarat, Orissa, W. Bengal, Assam and Manipur.

Elsewhere: West Pakistan, Nepal, S. Europe, the Mediterranean and Middle east countries, Baluchistan, Afghanistan, Turkestan, Myanmar, Africa, Madagascar and parts of southern North America.

Status: Partly resident and nomadic, partly winter visitor.

Habit and Habitat: Gregarious. Food consists of molluscs, crustaceans, worms and insects. Possibly also tadpoles and small frogs.

Remarks: Seen in small groups of 2-4, 10-14 or even upto 40-50. Breeding recorded near and outside PA.

27. *Threskiornis melanocephalus* (Latham, 1790) - Oriental White Ibis

1790. *Tantalus melanocephalus* Latham, *Index Orn.*, 2: 709. Type-locality: India.

1987. *Threskiornis aethiopica melanocephala* (Latham), Ali and Ripley Compact Hand Book No. 69 (1): 110-112.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 75 cm. A large white bird with naked black head and neck, long black down curved curlew like bill. Iris red-brown. Legs and feet glossy black. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Bangladesh, Myanmar, Sri Lanka and sometimes from China to Japan.

Status: Resident, nomadic and local migratory depending on water conditions.

Habit and Habitat: Gregarious, found with other birds like storks and spoonbills. Food mainly consists of fish, frog, molluscs, insects, worms, etc. Nests on moderate size trees *Acacia*, *Prosopis*, *Barringtonia*, etc or shrubs *Zizyphus* sp. and *Capparis horrida*.

Remarks: 8-10 birds seen at a time. Breeding near and outside PA at high elevation points.

28. *Pseudibis papillosa* (Temminck, 1824)-Black Ibis

1824. *Ibis papillosa* Temminck, *PL. Col., livr.* 51, pl. 304. Type-locality: India.

1987. *Pseudibis papillosa papillosa* (Temminck), Ali and Ripley Compact Hand Book No. 70 (1): 112-113.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 68 cm. Glossy black bird with green to dull blackish green slender downcurved curlew like bill, a small white patch near shoulder of wing and brick-red legs. Iris brownish yellow to bright orange-red. Sexes alike.

Distribution: Gujarat, Rajasthan, Gangetic Plain, Peninsular India south to Mysore, Bengal and Assam.

Elsewhere: Nepal, Pakistan, Arakan, Myanmar, Thailand and China.

Status: Resident.

Habit and Habitat: Seen on drier margins of the water bodies. Food mainly consists of frogs, fish, earthworms and insects.

Remarks: Commonly seen foraging in flocks of 3-4 or 8-12 sometime even more upto 22.

29. *Platalea leucorodia* Linnaeus, 1758 Eurasian Spoonbill

1849. *Platalea major* Temminck and Schlegel, in *Siebold, Fauna Jap., Aves*: 119, pl. 73. Type-locality: Japan.

1987. *Platalea leucorodia major* Temminck and Schlegel, Ali and Ripley Compact Hand Book No. 72 (1): 116-118.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Salt Marsh and Creeks.

Field identification characters: Size of about 60 cm. A white bird distinctly identified by presence of black and yellow spatula shaped bill, long neck and long black legs. Iris dark brown to crimson brown. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Sri Lanka, China, Japan, Syria, Egypt and Formosa.

Status: Partly resident and nomadic and partly migratory.

Habit and Habitat: Gregarious in nature. Seen in shallow waters. Food mainly consists of fish, tadpoles, frogs, molluscs, crustaceans and aquatic insects.

Remarks: Seen alone and in large flocks weening in water and found in breeding plumage.

IV Order PHOENICOPTERIFORMES

8. Family PHOENICOPTERIDAE : FLAMINGOS

30. *Phoenicopus ruber* Linnaeus, 1758 - Greater Flamingo

1811. *Phoenicopus roseus* Pallas, *Zoogr. Russo-Asiat.*, 2: 207. Type-locality: Mouth of River Volga, southern Russia.

1987. *Phoenicopus roseus* Pallas, Ali and Ripley Compact Hand Book No. 73 (1): 118-120.

Observation localities: Khijadiya Lake, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 140 cm. A tall rosy white bird with bright scarlet and black wings and massive pink bill sharply down curved from about half its

length. Iris lemon yellow. Legs and feet variable pink. Sexes alike females smaller than males.

Distribution: Throughout India rare in Bengal and Assam.

Elsewhere: Pakistan, S. France, S. Spain, N and E. Africa, Middle East, Caspian region to W. Siberia, south through Afghanistan.

Status: Resident, nomadic and locally migratory. Also a winter visitor.

Habit and Habitat: Highly gregarious. Feeds in shallow waters usually brackish and even concentrated brine with head immersed. Food mainly chironomid larvae, small mollusc, crustaceans and seeds.

Remarks: Found feeding in deeper waters. Keeps on shifting regularly from one place to another.

31. *Phoenicopterus minor* (Geoffroy, 1798) - Lesser Flamingo

1798. *Phoenicopterus minor* Geoffroy, *Bull. Soc. Phil. Paris*, 1: 98. Type-locality: East Africa.

1987. *Phoeniconaias minor* (Geoffroy), Ali and Ripley Compact Hand Book No. 74 (1): 121-122.

Observation localities: Khijadiya Lake, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 90-105 cm. Smaller than greater flamingo more pinkish and dark lake red coloured bill with black tip. Iris red. Legs and feet red. Sexes more or less alike. Females smaller without crimson on back or breast.

Distribution: NW India, Rajasthan, Gujarat, Maharashtra, Andhra Pradesh and Orissa.

Elsewhere: Pakistan.

Status: Migratory.

Habit and Habitat: Restricted to salt and brackish lakes and tidal lagoons. Food consists mainly of algae, diatoms and insects larvae.

Remarks: Always sighted along with flocks of greater flamingos.

V Order ANSERIFORMES

9. Family ANATIDAE : SWANS, GEESE and DUCKS

32. *Dendrocygna javanica* (Horsfield, 1821) - Lesser Whistling-Duck

1821. *Anas javanica* Horsfield, *Trans. Linn. Soc. London*, 13: 199, pl. 1. Type-locality: Java.

1987. *Dendrocygna javanica* (Horsfield), Ali and Ripley Compact Hand Book No. 88 (1): 138-139.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 42 cm. A small pale brown and maroon-chestnut coloured bird with uniform chestnut upper tail coverts. Iris dark brown. Bill slaty grey to black. Eyelids bright yellow. Legs and feet grey. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Sri Lanka, Myanmar, China, Malaysia, Thailand, S. Vietnam, Ryukyu Island, SW. Borneo, Sumatra and Java.

Status: Resident moving locally with drought and food.

Habit and Habitat: Common around weedy, lotus covered water bodies or in open sea or backwater lagoons. Food mainly aquatic weeds and sometimes fish, frogs, snails, worms, etc.

Remarks: Seen in flocks of 5-6.

33. *Tadorna ferruginea* (Pallas, 1764) - Brahminy Shelduck

1764. *Anas (ferruginea)* Pallas, *Vroeg, Cat. d' Ois., Adumbr.*, 5. Type-locality: Tartary, U.S.S.R.

1987. *Tadorna ferruginea* (Pallas), Ali and Ripley Compact Hand Book No. 90 (1): 141-144.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake.

Field identification characters: Size of about 66 cm. A large orangish-brown bird with paler head and neck, a prominent metallic green speculum on wing with a white patch in front of it, wings black and tail. Iris rich brown. Bill, legs and feet black. Male with a narrow black collar round the base of neck in breeding season. Female with pale whitish head and without collar.

Distribution: Throughout India.

Elsewhere: Sri Lanka, Pakistan, Nepal, Bangladesh, S. Spain, SE Europe, near east Caspian sea, across Asia to Transbaikalia, south to Himalayas and SW China and Nile valley.

Status: Migratory. Winter visitor. Breeds in Ladakh.

Habit and Habitat: Grazes on dry river banks and grassy lake margins. Omnivorous feeds on grains, tender shoots and tubers, crustaceans, molluscs, aquatic insects, reptiles, etc.

Remarks: The pairs were seen in proximity with medium to large flocks.

34. *Sarkidiornis melanotos* (Pennant, 1769) - Comb Duck

1769. *Anser melanotos* Pennant, *Ind. Zool.*, 12, pl. 11 Type-locality: Sri Lanka.

1987. *Sarkidiornis melanotos melanotos* (Pennant), Ali and Ripley Compact Hand Book No. 115 (1): 192-194.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 76 cm. A large perching bird with difference in male and female. Male upper back, glossed with blue-green and purple. Lower back grey. Head and neck white, speckled with black. A black fleshy knob or comb present on base of bill at forehead which becomes swollen in breeding season. Female without comb, smaller and duller in appearance. Underparts mottled with brown and lacking demi-collar on upper breast and band near tail. Iris dark brown. Bill black. Legs and feet plumbeous.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Bangladesh, Africa from Gambia and Sudan south to the Cape and Madagascar, Myanmar and SE China.

Status: Resident with local movements.

Habit and Habitat: A good walker and perches freely on branches of trees during daytime. Mainly vegetarian feeding on corms, shoots and seeds of aquatic and marsh plants and grains of wild and cultivated rice. Also sometimes water insects and their larvae, occasionally frogs and fish.

Remarks: Generally seen in groups of 2-4. Occasionally visits the margins especially in the noon hours.

35. *Nettapus coromandelianus* (Gmelin, 1789) - Cotton Teal

1789. *Anas coromandelianus* Gmelin, *Syst. Nat.*, 1(2): 522. Type-locality: Coromandel, India.

1987. *Nettapus coromandelianus coromandelianus* (Gmelin), Ali and Ripley Compact Hand Book No. 114 (1): 190-192.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 33 cm. Smallest duck with a short stubby goose-like bill. Crown blackish brown, back blackish glossed with purple and green. Face, neck and upper parts white, with a prominent black collar round base of neck and white wing-bar. Eclipse male present with upperparts darker and wingbar prominent as in breeding dress. Female duller and browner. White wing-bar less prominent. A dark line through eyes. Iris of male reddish-brown, female iris brown. Legs and feet blackish brown or black.

Distribution: Throughout India.

Elsewhere: Nepal, Sri Lanka and Maldive Islands.

Status: Resident but show local migratory movements.

Habit and Habitat: Common in jheels, village tanks and ponds, shallow lagoons. Food mainly consists of shoots, corms, seeds of aquatic plants, grains of cultivated and wild rice, etc. Also feeds on crustacean, worms and insects and their larvae.

Remarks: Sighted in groups of 2-4 but seen only at Khijadiya Lake.

36. *Anas strepera* Linnaeus, 1758 - Gadwall

1758. *Anas strepera* Linnaeus, *Syst. Nat.*, ed. 10, 1: 125. Type-locality: Sweden.

1987. *Anas strepera strepera* Linnaeus, Ali and Ripley Compact Hand Book No. 101 (1): 163-165.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 51 cm. Aquatic bird with distinctive male, female and eclipse male. Male dark brown and grey with white belly and very black tail end. Dark and light crescentic markings on breast almost forming a pectoral band. Eclipse male like female but greyer and less heavily marked above. Female duller and smaller. Iris dark brown. Legs and feet orange-yellow.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka, Europe, Asia and western North America. In Eurasia breeding from Iceland to Kamchatka, south to England, Holland, Germany, Central Russia, Caspian, Seistan and Transbaikalia. Wintering south to northern Africa, Ethiopia and S. China.

Status: Winter migrant.

Habit and Habitat: Gregarious. Food mainly consists of seeds, shoots, tubers of marsh plants and aquatic weeds and grains of wild and cultivated rice. Also feeds on insects, worms, molluscs, etc.

Remarks: Usually keeps in small flocks of 2-6 but migrates to other areas by the end of winters (January) from Khijadiya environs.

37. *Anas penelope* Linnaeus, 1758 - Eurasian Wigeon

1758. *Anas penelope* Linnaeus *Syst. Nat.*, ed. 10, 1: 126. Type-locality: Sweden.

1987. *Anas penelope* Linnaeus, Ali and Ripley Compact Hand Book No. 103 (1): 167-169.

Observation localities: Khijadiya Jambuda Lake.

Field identification characters: Size of about 49 cm. Aquatic bird with distinctive male, female and eclipse male. Breeding male mainly grey in appearance with head and neck chestnut or bright rusty red with a distinctive cream coloured patch on fore crown. Eclipse male reddish brown, marked and vermiculated with black. Female much smaller and like eclipse male with less reddish brown and less vermiculated. Iris brown. Bill bluish-grey. Legs and feet greyish-green.

Distribution: Northern India, W. Bengal, Rajasthan, Gujarat, Assam, Manipur and Orissa.

Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka, Sind, Europe, Asia, breeding in

temperate regions north to the Arctic circle and beyond from Iceland and Scotland to Kamchatka. Winters in Britain and south to the Nile Valley. Abyssinia, S. China and Japan.

Status: Winter migrant.

Habit and Habitat: Gregarious. Seen in grassy edges of jheels and in paddy fields. Food mainly corms, seeds and shoots of marsh and aquatic plants and wild cultivated rice. Also water insects and their larvae, molluscs.

Remarks: Commonly seen in flocks of 4-8 but only in Khijadiya Jambuda Lake.

38. *Anas platyrhynchos* Linnaeus, 1758 - Mallard

1758. *Anas platyrhynchos* Linnaeus, *Syst. Nat.*, ed. 10, 1: 125. Type-locality: Sweden.

1987. *Anas platyrhynchos* Linnaeus, Ali and Ripley Compact Hand Book No. 100 (1): 160-163.

Observation localities: Khijadiya Jambuda Lake.

Field identification characters: Size of about 61 cm. Grey above and below with glistening metallic dark green head and neck separated from chestnut breast by narrow white collar. Rump, tail coverts and two upcurled central tail-feathers black. Speculum metallic purplish blue bordered in front and behind by narrow black and white bands, bill yellow green. Female brown and buff, streaked and spotted with black. Iris brown. Legs orange.

Distribution: Uttar Pradesh, Bihar, Bengal, Assam, Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Orissa and Kashmir (Breeds).

Elsewhere: Pakistan, Nepal, Bangladesh, Holarctic region, Europe, Asia, Africa, Myanmar, China, Japan.

Status: Winter visitor.

Habit and Habitat: Gregarious. Common in reedy jheels, marshes. Food consists mainly of corms, seeds and shoot of grasses and other aquatic plants, molluscs, tadpoles, fish spawn, worms.

Remarks: Seen in small flocks of 2-6 birds flocking near the submerged mud islands in Khijadiya Jambuda Lake.

39. *Anas poecilorhyncha* J.R. Forster, 1781 - Spot-billed Duck

1781. *Anas poecilorhyncha* J.R. Forster, *Indian Zool.*, 23, pl. 13, F. 1. Type-locality: Sri Lanka (=Sri Lanka).

1987. *Anas poecilorhyncha poecilorhyncha* J.R. Forster, Ali and Ripley Compact Hand Book No. 97 (1): 157-159.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 61 cm. A large clumsy duck with buff grey scaly pattern and dark brown plumage, size that of the domestic duck. Iris brown. Bill black yellow tipped with orangish-red at base of bill on each side of fore-head. Legs and feet deep coral-red. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Sri Lanka, Nepal and Russia.

Status: Resident and Migratory with local migration.

Habit and Habitat: Affects freshwater lakes, saline water, marshes and wet cultivated fields, forages among weedy, submerged aquatic vegetation, marginal reeds in shallow waters. Food consists mainly of aquatic insect, worms, molluscs, etc.

Remarks: Generally keep in pairs or in groups of 6-12 and sometimes more than 50 sighted at a time. Day population changes with the local shifting to and from near by wetlands. Breeding in the area and widely distributed throughout.

40. *Anas clypeata* Linnaeus, 1758 - Northern Shoveller

1758. *Anas clypeata* Linnaeus, *Syst. Nat.*, ed. 10, 1: 124. Type-locality: Sweden.

1987. *Anas clypeata* Linnaeus, Ali and Ripley Compact Hand Book No. 105 (1): 172-174.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 51 cm. Easily identified from far due to presence of broad, shovel-shaped bill and orange legs. Breeding male with head and neck glossy metallic green, a pale blue patch on wing-shoulder and a white bar between it and metallic green speculum, breast white, bill orange-black. Eclipse male like female somewhat darker and largely retaining bright coloured wing of breeding male. Female mottled dark brown and buff with greyish-blue shoulder patch, faint green speculum bordered above and below with white and bright orange-brown bill. Iris of male yellow, orange, orange-red; female with brown or orange-brown iris. Legs and feet orange, orange-brown or orange-red.

Distribution: Throughout India.

Elsewhere: Winters as far as south as E. Africa, Persian Gulf, Sri Lanka, Myanmar, S. China, Japan, Hawaii, Lower California, Mexico, Honduras, Florida, Pakistan, Bangladesh, Sri Lanka, Nepal. Breeds in Europe, Asia and North America.

Status: Common winter visitor, becoming resident.

Habit and Habitat: Generally seen swimming in waters, basking on dry island or near shoreline. Food mainly consists of crustaceans, molluscs, water insects and larvae, fish spawn, worms and also vegetable matter.

Remarks: Seen in small groups of male and female separately with other aquatic ducks such as teals, pintails etc.

41. *Anas acuta* Linnaeus, 1758 - Northern Pintail

1758. *Anas acuta* Linnaeus, *Syst. Nat.*, ed. 10, 1: 126. Type-locality: Sweden.

1987. *Anas acuta* Linnaeus, Ali and Ripley Compact Hand Book No. 93 (1): 149-151.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 56-74 cm. Body of male elongated, neck slender, tail long-pointed with pin like central tail feathers. A white band running down either side of neck, broadening into white breast and belly. Speculum metallic bronze green. Eclipse male more or less like female. Female mottled brown and buff with pointed but pin less tail. Prominent speculum absent. Iris dark brown tinged with red. Bill light to dark plumbeous. Legs and feet dark grey or blackish.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka, Africa, Myanmar, Siam and S. China. Breeds in Europe, Asia and N. America.

Status: Migratory. Winter visitor.

Habit and Habitat: Crepuscular and nocturnal feeder. Seen in reedy vegetation of jheels, brackish lagoons and estuaries. Feeds on vegetable matter-grass, corms, shoots and seeds of aquatic plants and wild cultivated rice. Sometimes molluscs, worms, water insects and larvae.

Remarks: Seen in flocks of 10-16 during noon hours on exposed land margins. Otherwise found dabbling in pairs.

42. *Anas querquedula* Linnaeus, 1758 - Garganey

1758. *Anas querquedula* Linnaeus, *Syst. Nat.*, ed. 10, 1: 126. Type-locality: Sweden.

1987. *Anas querquedula* Linnaeus, Ali and Ripley Compact Hand Book No. 104 (1): 169-172.

Observation localities: Khijadiya Jambuda Lake.

Field identification characters: Size of about 41 cm. Breeding male with head and neck pinkish-brown streaked with white, eyebrows broad white. Eclipse male like female but with fully coloured male wing. Female heads brown with conspicuous white eyebrows,

white throat and a distinct dark line from bill through eye to nape. Iris dark brown. Bill brownish black. Legs and feet dark grey.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Nepal and Sri Lanka.

Status: Migratory.

Habit and Habitat: Found in every type of aquatic habitat- jheels, marshes, tanks, coastal backwaters and lagoons. Food mainly consists of seeds and tender shoots of marsh plants, grasses and sedges and grains of wild and cultivated rice. Also feeds on water insects, larvae, worms, molluscs, etc.

Remarks: Sighted only in Khijadiya Jambuda Lake throughout the study in flocks of 10-14 or sometimes less in numbers but conspicuous due to their association with coots.

43. *Anas crecca* Linnaeus, 1758 - Common Teal

1758. *Anas crecca* Linnaeus, *Syst. Nat.*, ed. 10, 1: 126. Type-locality: Sweden.

1987. *Anas crecca crecca* Linnaeus, Ali and Ripley Compact Hand Book No. 94 (1): 151-153.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 38 cm. Male with chestnut head and broad metallic green band running backward from in front of eye to nape. A tricoloured wing bar (speculum)-black, metallic green, buff. Eclipse male with female like head with crown and nape blackish brown. Female mottled dark and light brown with black and green wing speculum. Iris brown. Bill black. Legs and feet light bluish or olive-grey to deep slaty blue or dark olive plumbeous.

Distribution: Throughout India.

Elsewhere: Winters as far as N. Africa, Nile Valley, Somaliland, Persia, China, Philippines, Russia, Pakistan, Bangladesh, Nepal, Sri Lanka and Maldives Islands. Breeds in Europe and Asia from Iceland to China, Manchuria and Kurile Islands and Japan.

Status: Migratory.

Habit and Habitat: Seen in marshes, Jheels mainly freshwater. Food mainly consists of shoots, tubers and seeds of aquatic plants and grains of wild and cultivated rice.

Remarks: Sighted only in Khijadiya Lake throughout the study in flocks of 10-20.

44. *Aythya ferina* (Linnaeus, 1758) - Common Pochard

1758. *Anas ferina* Linnaeus, *Syst. Nat.*, ed. 10, 1: 126. Type-locality: Sweden.

1987. *Aythya ferina* (Linnaeus), Ali and Ripley Compact Hand Book No. 108 (1): 180-182.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 48 cm. Head and neck chestnut-red. Upper back and breast black. A dull grey speculum on wing. Eclipse male with dull head breast replaced with brown. Female with head, neck and breast rufous brown. Iris yellow or reddish yellow. Bill base and tip black. Legs and feet variable slaty blue.

Distribution: Winter visitor to NW India, Assam, Manipur, Mysore.

Elsewhere: Pakistan, Bangladesh, Nepal, Myanmar and S. China. Breeds in British Isles, S. Scandinavia, Russia through W. Siberia to Lake Baikal, south to Holland, Germany, Balkana, Black Sea, Kirghiz Steppes and Yarkand.

Status: Migratory.

Habit and Habitat: A food bird. Food mainly consists of rhizomes, buds, shoots and seeds of aquatic plants. Also feeds on crustacean, molluscs, water insects and larvae, worms, tadpoles and fish.

Remarks: Seen singly or in pairs.

45. *Aythya fuligula* (Linnaeus, 1758) - Tufted Pochard

1758. *Anas fuligula* Linnaeus, *Syst. Nat.*, ed. 10, 1: 128. Type-locality: Sweden.

1987. *Aythya fuligula* (Linnaeus), Ali and Ripley Compact Hand Book No. 111 (1): 185-187.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 43 cm. Aquatic bird with contrasting black and white plumage, head, neck, breast, back, tail and vent jet black with flanks and side of body white. Eclipse male with upperparts dull brown dusted with white, lower breast with crescentic white moulting. Female dark brown instead of black. Iris bright yellow. Bill greyish blue to dull dark plumbeous. Legs and feet dark greyish.

Distribution: North India, Gujarat, Assam, Manipur, Sikkim, Madhya Pradesh, Orissa and Mysore.

Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka, Maldives Islands. Nile Valley, Persian Gulf, S. China and Philippines. Breeds in Europe and Asia from Iceland and the British Isles to the Commander Islands (Pacific), south to Central Europe, Balkans, Kirghiz Steppes, Lake Baikal, the Amur and Sakhalin.

Status: Winter Migrant.

Habit and Habitat: Found in open and deep waters. Food consists of both animal and vegetable matter.

Remarks: Seen in Khijadiya Lake in groups of 2-4 birds.

VI Order FALCONIFORMES

10. Family ACCIPITRIDAE : EAGLES, KITES and HARRIERS

46. *Elanus caeruleus* (Desfontaines, 1789) - Black-shouldered Kite

1790. *Falco vociferous* Latham, *Index Orn.*, 1: 46. Type-locality: Coromandel Coast, India.

1987. *Elanus caeruleus vociferous* (Latham), Ali and Ripley Compact Hand Book No. 124 (1): 212-214.

Observation localities: Khijadiya Village side and Khijadiya Dhunvav.

Field identification characters: Size of about 33 cm. A grey and white bird with black shoulder patch. Crown, nape, back, rump and upper tail-coverts pale ashy grey, rest of head and neck, underparts and tail pure white. Tip of wing when closed black. Iris crimson to yellow-brown. Bill black. Legs and feet deep yellow.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka and Laccadives Islands.

Status: Resident.

Habit and Habitat: Forest bird found near riverian tamarisk and *Prosopis* jungle and semi-desert areas, grasslands with cultivation. Food mainly consists of insects, lizards, field rats and mice, frogs and snakes.

Remarks: Often sighted perching on electric wires.

47. *Milvus migrans* (Boddaert, 1783) - Black Kite

1783. *Falco migrans* Boddaert, *Table Pl. enlum.*, 28, pl. 472. Type-locality: restricted to France, apud Hartert, ex Daubenton.

1987. *Milvus migrans migrans* (Boddaert), Ali and Ripley Compact Hand Book No. 132 (1): 226-227.

1987. *Milvus migrans govinda* Sykes, Ali and Ripley Compact Hand Book No. 133 (1): 227-229.

Observation localities: Khijadiya Lake and Khijadiya Dhunvav.

Field identification characters: Size of about 61 cm. A large brown hawk easily identified due to its fork tail conspicuous in flight. Head and neck whitish with black shaft streaks. Upperparts pale brown, under parts more rufous. Iris brown. Bill black. Legs and feet pale yellow.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Myanmar, Malaysia, Africa. Breeds from Spain, S. France, Germany and Finland south to NW Africa, SE Europe, Asia Minor, Kirghiz steppes and NE Baluchistan.

Status: Resident.

Habit and Habitat: Nests on tall tree, near human settlements. Omnivorous, food consists of lizards, rodents, insects especially, grasshoppers, locuts, winged termites, small birds and garbage.

Remarks: Ocassionally seen in search of prey.

48. *Haliastur indus* (Boddaert, 1783) - Brahminy Kite

1783. *Falco indus* Boddaert, *Table Pl. enlum.*; 25. Type-locality: Pondicherry, South India.

1987. *Haliastur indus indus* (Boddaert), Ali and Ripley Compact Hand Book No. 135 (1): 230-232.

Observation localities: Khijadiya Lake and Khijadiya Dhunvav.

Field identification characters: Size of about 48 cm. Rusty red to deep chestnut hawk with head, neck, upper back and breast white. Abdomen brown. Iris brown. Bill bluish, horny cere yellow, culmen and tip pale yellow. Legs and feet dull yellow to greenish yellow.

Distribution: Throughout India.

Elsewhere: Nepal, Sri Lanka, Myanmar east to S. China, south to Tenasserim, N. Thailand, central Vietnam.

Status: Resident with some local movements governed by monsoon and water conditions.

Habit and Habitat: A hawk found associated with aquatic habitat, near tidal creeks, fishing villages, docks, rivers, jheels, inundated rice-fields and flooded areas. Food mainly consists of fish, frogs, land and strand crabs, lizards, snakes, winged termites, frogs, small birds.

Remarks: A sizeable population observed in the Khijadiya environment.

49. *Haliaeetus leucoryphus* (Pallas, 1771) - Pallas's Fish-Eagle

1771. *Aquila leucorypha* Pallas, *Reise Versch. Prov. Russ. Reichs*, 1: 454. Type-locality: Lower Ural River.

1987. *Haliaeetus leucoryphus* (Pallas), Ali and Ripley Compact Hand Book No. 174 (1): 289-292.

Observation localities: Khijadiya Lake and Khijadiya Dhunvav.

Field identification characters: Size of about 76-84 cm. A large dark brown eagle with pale golden brown head and neck and a broad white subterminal band across rounded tail conspicuous in flight. Iris greyish yellow to yellow. Bill dark slaty black. Legs and feet dull white, yellowish white or dull yellow.

Distribution: N. India in the Himalayas from Kashmir, Himachal Pradesh, Punjka, Nepal through the Gangetic Plain east to Assam, Gujarat, Rajasthan, Orissa.

Elsewhere: Pakistan, S. Russia through C. Asia to Transbaikalia and south to the Persian Gulf, N. India and N. Myanmar.

Status: Resident and partly migratory.

Habit and Habitat: Generally seen near large rivers, tidal creeks, inland lakes and jheels perched on a mound or a tree top. Food mainly consists of fish, amphibians, reptiles, aquatic birds.

Remarks: Mostly seen hovering in creek area and marshy land.

50. *Circus aeruginosus* (Linnaeus, 1758) - Western Marsh-Harrier

1758. *Falco aeruginosus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 91. Type-locality: Europe, Sweden.

1987. *Circus aeruginosus aeruginosus* (Linnaeus), Ali and Ripley Compact Hand Book No. 193 (1): 324-326.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Heavily built harrier in comparison to other harriers, dark brown with pale rufous head, neck and breast and rufous below. Tail silvery grey, silvery grey wings with black tip. Iris dull golden to brown.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka, Maldives Islands, Africa, Malaya Peninsula, S. China, Japan, Philippines. Breeds in S. Sweden and Denmark east to Yenesei, south to the Mediterranean, Turkestan and Mongolia.

Status: Winter visitor.

Habit and Habitat: Near marshy habitat. Food consists mainly of frogs, fish, rodents, birds and insects.

Remarks: Frequently seen in search of prey mostly hunting wading birds.

51. *Circus cyaneus* (Linnaeus, 1766) - Hen Harrier

1766. *Falco cyaneus* Linnaeus. *Syst. Nat.*, ed. 12, 1: 126. Type-locality: Europe=England.

1987. *Circus cyaneus cyaneus* (Linnaeus), Ali and Ripley Compact Hand Book No. 189 (1): 317-319.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 46-54 cm. Darker ashy grey above extending over chin, throat and upper breast. Iris bright orange-yellow in male and yellow in female. Bill horny black. Legs and feet pale chrome-yellow.

Distribution: Northern India: Gilgit, Kashmir, Punjab, Rajasthan, Gujarat, Himachal Pradesh east to Assam and Sikkim.

Elsewhere: Pakistan, Nepal, Mediterranean, NE Africa, Myanmar, China and Japan. Breeds in Europe north to the Arctic Circle and in Asia south of the Tundra east probably to the Lena River, south to the Pyrenees, Italy, Turkestan and Tibet.

Status: Uncommon Winter Visitor or passage migrant

Habit and Habitat: Associated with aquatic marshy habitat. Food consists of lizards, young rodents, small birds and insects.

Remarks: Occasional seen in the adjoining areas of the lake with forest.

52. *Circus macrourus* (S.G. Gmelin, 1770) - Pallid Harrier

1770. *Falco macrourus* S. G. Gmelin, *Reise d. Russl.* 1: 48. Type-locality: Voronezh, southern Russia.

1987. *Circus macrourus* (S. G. Gmelin), Ali and Ripley Compact Hand Book No. 190 (1): 319-321.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 46-51 cm. A slender, elegant pale grey and pure white hawk with black wing tips. Black transverse wing-bar across secondaries absent. Iris greenish-yellow. Bill horny black. Legs and feet pale chrome-yellow.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka, Maldives, Africa from Sudan to Cape Province and Myanmar. Breeds from the Baltic Sea provinces east to Tarabagatai and the Tian Shans, south to Rumania, S. Russia and Ferghana.

Status: Common Winter Visitor.

Habit and Habitat: Mostly grassy swampy areas and scrublands. Food consists mainly of frogs, lizards, mice, rats, birds and insects.

Remarks: Occasional seen singly in adjoining areas of the lake with forest.

53. *Circus pygargus* (Linnaeus, 1758) - Montagu's Harrier

1758. *Falco pygargus* Linnaeus. *Syst. Nat.*, ed. 10, 1: 89. Type-locality: Europe=England.

1987. *Circus pygargus* (Linnaeus), Ali and Ripley Compact Hand Book No. 191 (1): 321-323.

Observation localities: Khijadiya Jambuda Lake.

Field identification characters: Size of about 46-49 cm. A slender, elegant dark ashy grey hawk with black wing tips. Black transverse wing-bar across secondaries easily

distinguishes the bird from other harriers. Iris greenish-yellow. Bill horny black. Legs and feet pale chrome-yellow.

Distribution: Throughout India.

Elsewhere: Sri Lanka, Maldives, Palestine to S. Africa and Sri Lanka. Breeds in Europe and Asia to Turkestan, Altai and NW Mongolia, south to Spain, NW Africa, Italy and Rumania.

Status: Winter Visitor.

Habit and Habitat: Mostly grassy swampy areas and scrublands. Food consists mainly of frogs, lizards, mice, rats, birds and insects.

Remarks: Generally seen singly.

54. *Accipiter badius* (Gmelin, 1788) - Shikra

1788. *Falco badius* Gmelin, *Syst. Nat.*, 1 (1): 280. Type-locality: Sri Lanka.

1824. *Falco dussumieri* Temminck, Pl. Col. Livr. 52, text to pl. 308, 336. Type-locality: India.

1987. *Accipiter badius dussumieri* (Temminck), Ali and Ripley Compact Hand Book No. 138 (1): 235-237.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of male 31 cm and female 36 cm. Small short and rounded - winged hawk. Adult ashy-blue above, closely barred rusty brown breast with a median grey stripe on throat and a long multi banded tail. Young dark brown, tail with more than four bars, below white with vertical streaks and spots. Females are larger and darker than males. Iris golden or orange-yellow.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal and Sri Lanka.

Status: Resident.

Habit and Habitat: Generally seen in open wooded habitat perching on a tree. Food consists of mammals, lizards, small birds and insects.

Remarks: Very common throughout along the forested margin of the lake.

11. Family PANDIONIDAE : OSPREY

55. *Pandion haliaetus* (Linnaeus, 1758) - Osprey

1758. *Falco haliaetus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 91. Type-locality: Europe-Sweden.

1987. *Pandion haliaetus haliaetus* (Linnaeus), Ali and Ripley Compact Hand Book No. 203 (1): 336-338.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size of about 56 cm. Above dark brown with some white streaking on the slightly tufted head. Below pure white with a conspicuous broad brown-streaked band across upper breast. A black band runs backward from behind eyes. Females larger than males. Iris yellow or golden yellow. Bill black. Legs and feet pale greenish or yellowish. Sexes alike but females larger.

Distribution: Throughout India.

Elsewhere: Baluchistan, Sri Lanka, Nepal, Maldives, S. Africa, Myanmar, Thailand, Malay Peninsula, Philippines and Sunda Islands. Breeds in Europe, Asia from Scotland and Lapland east to Kamohatka and Japan, south to Spain, N. Africa, Mediterranean islands, Greece, Red Sea coasts, S. Arabia and S. China.

Status: Mainly winter visitor also resident.

Habit and Habitat: Seen perched on dead trees standing in waters, rocks or islands. Food exclusively fish.

Remarks: Observed throughout the winter season singly.

12. Family FALCONIDAE : FALCONS

56. *Falco tinnunculus* Linnaeus, 1758 - Common Kestrel

1758. *Falco tinnunculus* Linnaeus, *Syst. Nat.* ed. 10, 1: 90. Type-locality: Europe=Sweden.

1987. *Falco tinnunculus tinnunculus* Linnaeus, Ali and Ripley Compact Hand Book No. 222 (1): 365-366.

1987. *Falco tinnunculus objurgatus* (Baker), Ali and Ripley Compact Hand Book No. 224 (1): 368-369.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size of about 36 cm. Small falcon with pointed wings and rounded tail. Adult male with upperparts deeper or more brick-red, lacking the characteristics faint grey wash or bloom. Top of head duller, darker grey. Adult female richer brick-red above, heavily barred. Iris brown. Bill slaty blue, black at tip, yellow at gape and base. Cere and orbital skin yellow. Legs and feet yellow to range-yellow.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Nepal, Myanmar, SE China, Sri Lanka. Breeds in India, Pakistan, Japan, NE China, SE Tibet, east Central Asia, Europe and Szechuan.

Status: Winter visitor and resident.

Habit and Habitat: Seen in grasslands, hills and plains semi-desert. Food consists mainly of insects, frogs, lizards, small rodents and sometimes small birds.

Remarks: Often seen chasing smaller birds for prey.

57. *Falco chicquera* Daudin, 1800 - Red-headed Falcon

1800. *Falco chicquera* Daudin, *Traité d'Orn.*, 2: 121. Type-locality: Bengal.

1987. *Falco chicquera chicquera* Daudin Ali and Ripley Compact Hand Book No. 219 (1): 359-360.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 31-36 cm. Grey-white falcon with a diagnostic chestnut head. Iris brown. Bill dark with black tip, greenish yellow on basal half, cere and orbital skin yellow. Legs and feet yellow, claws black.

Distribution: Throughout India.

Elsewhere: Pakistan and Sri Lanka.

Status: Resident.

Habit and Habitat: Deciduous plains and plateau. Food mainly small birds.

Remarks: Both male and female seen together.

58. *Falco jugger* J.E. Gray, 1834 - Laggar Falcon

1834. *Falco jugger* J.E. Gray, *Hardwicke's Ill. Ind. Zool.* 2: pl. 26. Type-locality: India.

1987. *Falco biarmicus jugger* J.E. Gray, Ali and Ripley Compact Hand Book No. 208 (1): 344-346.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks, Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 43-46 cm. Upper parts dark and ashy brown. Crown and nape whitish. A narrow but distinct moustachial stripe running down front in front and below eyes. Below white or whitish with longitudinal light. Iris dark brown. Bill bluish slaty, darker at tip. Legs and feet yellow. Sexes alike but female slightly larger.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh and Nepal.

Status: Resident as well as Migratory.

Habit and Habitat: Seen perched on poles or tree tops. Food mainly rats, bats, lizards, small birds and insects.

Remarks: Generally keeps in pairs.

VII Order GALLIFORMES

13. Family PHASIANIDAE : PHEASANTS, PARTRIDGES, QUAILS

59. *Francolinus pondicerianus* (Gmelin, 1789) - Grey Francolin

1789. *Tetrao pondicerianus* Gmelin, *Syst. Nat.* 1(2): 760. Type-locality= Pondicherry, India.

1987. *Francolinus pondicerianus pondicerianus* (Gmelin), Ali and Ripley Compact Hand Book No. 246 (2): 31-33.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 33 cm. Greyish brown, rufous and chestnut above, mottled, barred and vermiculated with buff and black. Below pale buff and rufous. A prominent yellowish rufous throat patch enclosed within a black gular loop. Iris hazel-brown. Bill dusky plumbeous, paler and fleshy at base. Legs and feet dull red.

Distribution: Throughout India. Chiefly western peninsular India, Rajasthan, Gujarat, Madhya Pradesh, Maharashtra to Kerala.

Elsewhere: Sri Lanka, Southern Afghanistan, southern Iran and eastern Arabia.

Status: Resident.

Habit and Habitat: Seen in dense thorn bushes such as *Capparis* or *Zizyphus*. Food mainly consists of weed seeds, cereal grains, shoots of grass and crop plants, berries and drupes and also insects.

Remarks: Subspecies found in the region is *Francolinus pondicerianus pondicerianus* (Gmelin). Commonly keeps in groups of 6-8.

60. *Pavo cristatus* (Linnaeus, 1758) - Indian Peafowl

1758. *Pavo cristatus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 156. Type-locality: 'Indian oriental, Zeylona' (=India).

1987. *Pavo cristatus* Linnaeus, Ali and Ripley Compact Hand Book No. 311 (2): 123-126.

Observation localities: Khijadiya Village side and Khijadiya Jambuda Lake.

Field identification characters: Size of male about 92-122 cm and that of female 86 cm. Male with fan shaped crest of spatula tipped wire like feathers together with the glistening blue neck and breast and sweeping metallic bronze-green train. Females smaller than males similarly crested but without sweeping train. Head and nape rufous-brown rest of upper parts brown, breast buffy brown glossed with green, abdomen white. Iris dark hazel brown. Bill dark horny brown, claws blackish.

Distribution: Practically throughout India.

Elsewhere: Introduced and well established in Pakistan, Sri Lanka,

Status: Resident.

Habit and Habitat: Roosts at night on tall trees. Food consists mainly of seeds, grain, lentils, groundnuts, tender shoots of crops, flower-buds, berries and drupes, centipedes, scorpions, lizards, small snakes and insects.

Remarks: Keeps in small flocks of 3-6 hens with a cock.

VIII Order GRUIFORMES

14. Family GRUIDAE : CRANES

61. *Grus virgo* (Linnaeus, 1758) - Demoiselle Crane

1758. *Ardea virgo* Linnaeus, *Syst. Nat.*, ed. 10, 1: 141. Type-locality: 'In Oriente' =India.

1987. *Anthropoides virgo* (Linnaeus), Ali and Ripley Compact Hand Book No. 326 (2): 146-148.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 76 cm. Small grey crane with black head and neck and conspicuous white ear-tufts behind eyes. Lower neck with long, pointed black feathers falling over breast. Elongated sickle-shaped brownish grey secondaries drooping over tail. Iris red-brown to crimson or red. Bill pale greenish with red tip. Legs and feet black. Sexes alike.

Distribution: Northwestern and west-central portions of the subcontinent diffusing eastward, occasionally Assam and Mysore.

Elsewhere: Bhutan, Bangladesh, Nepal, NE Africa, to the white and Blue Niles and Ethiopia, Middle East, Myanmar and China. Breeds in SE Europe and the greater part of C. Asia, N. Mongolia and Algeria.

Status: Winter Visitor.

Habit and Habitat: Fields of winter crops, paddy stubbles, sandy river beds, and flat open margins of aquatic bodies. Food consists mainly of wheat, gram and paddy.

Remarks: Usually cranes congregate in the agriculture fields adjacent to the Khijadiya and shallow margins of Jambuda waterspread in large number sometimes > 150.

62. *Grus grus* (Linnaeus, 1758) - Common Crane

1894. *Grus lilfordi* Sharpe, *Cat. Bds. Brit. Mus.*, 23: 250. Type-locality: Jhelum River near Jelalpur, Punjab.

1987. *Grus grus lilfordi* Sharpe, Ali and Ripley Compact Hand Book No. 320 (2): 136-138.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 140 cm. A large tall bird with black flight feathers, long-neck and legs. Head and upper neck blackish with a dull red naked patch on nape. A prominent broad white band running from behind eye down sides of slaty-black upper neck. Tail concealed by a mass of drooping curly brownish grey plumes. Iris orange-red to red-brown. Bill green paler and yellow towards tip. Legs and feet black.

Distribution: Rajasthan, Gujarat, Punjab, Uttar Pradesh, Bihar, Orissa, West Bengal, Assam, Madhya Pradesh and Andhra Pradesh.

Elsewhere: Pakistan, Nepal, China and Hainan Islands. Breeds in Transbaikalia on Tarei-nor and the Onon and Argun Rivers, probably from the basin of the Yenisey eastward and Myanmar.

Status: Winter Visitor.

Habit and Habitat: Affects fields of winter crops, sandy river-beds, etc. Food mainly consists of shoots of grass and cereal crops, tubers, grain, insects and small reptiles.

Remarks: Seen in flocks of 20-45 or more feeding in agriculture fields.

15. Family RALLIDAE : RAILS, CRAKES, MOORHENS and COOTS

63. *Amaurornis phoenicurus* (Pennant, 1769) - White-breasted Waterhen

1769. *Gallinula phoenicurus* Pennant, *Indian Zool.*, 10, pl. 9. Type-locality: Sri Lanka.

1987. *Amaurornis phoenicurus phoenicurus* (Pennant), Ali and Ripley Compact Hand Book No. 343, 344 (2): 169-172.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 32 cm. A dark slaty grey stub-tailed bird with prominent white facial mask and underparts. Iris crimson. Bill green, legs and feet dull chrome yellow or yellowish green. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Sri Lanka, Myanmar, Thailand, S. China, Malay Peninsula south to about the latitude of Malacca, Cambodia, Formosa and Hainan.

Status: Resident.

Habit and Habitat: Affects reedy marshland, edges of inundated rice-fields, rain filled ponds and roadside ditches, village tanks and their neighbourhood. Food mainly consists of seeds, grain and vegetable matter. Also feeds on insects and molluscs.

Remarks: Seen in pairs in juliflora thickets, grassy clumps and ditches.

64. *Porphyrio porphyrio* (Linnaeus, 1758) - Purple Moorhen

1801. *Gallinula poliocephala* Latham, *Index Orn.*, suppl.: 68. Type-locality: India.

1987. *Porphyrio porphyrio poliocephalus* (Latham), Ali and Ripley Compact Hand Book No. 349 (2): 178-180.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 43 cm. A purple blue rail with long red legs and enormous toes. The bald red forehead running back from the short heavy red bill and white patch under the stumpy tail. Iris deep blood red in male and brown-red in females. Sexes alike.

Distribution: Rare in Kashmir, Assam, Manipur and south throughout the Peninsula.

Elsewhere: Sri Lanka, Pakistan, Baluchistan and Bangladesh.

Status: Resident with local migration.

Habit and Habitat: Affects dense reed-beds around large swamps and jheels. Food mainly consists of seeds, grain and vegetable matter. Also feeds on insects and molluscs.

Remarks: Generally seen in pairs in small groups of 6-18. Breeding in the area in reeds.

65. *Gallinula chloropus* (Linnaeus, 1758) - Common Moorhen

1801. *Gallinula poliocephala* Latham, *Index Orn.*, suppl.: 68. Type-locality: India.

1987. *Porphyrio porphyrio poliocephalus* (Latham), Ali and Ripley Compact Hand Book No. 347 (2): 175-177.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 32 cm. Black, slaty grey and brown above, closed wings with a diagnostic white border. Forehead with bright red frontal shield. Below slaty grey, paler and whitish on centre of abdomen. Iris red. Bill green. Legs long greenish. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka, Southern Tibet, S.E. China, Japan, Myanmar, Thailand, Central Malay Peninsula, Cambodia, Hainan, Formosa and the Ryukyu Islands.

Status: Resident.

Habit and Habitat: Seen in swampy jheels with bed of sedges and bushes, lotus and other floating vegetation. Food mainly seeds, fruits of water plants, molluscs, insects, amphibians and fish.

Remarks: Generally keeps in pairs. Breeding in the area at Jambuda Lake in reeds.

66. *Fulica atra* Linnaeus, 1758 - Common Coot

1758. *Fulica atra* Linnaeus, *Syst. Nat.*, ed. 10(1): 152. Type-locality: Europe = Sweden.

1987. *Fulica atra atra* Linnaeus, Ali and Ripley Compact Hand Book No. 350 (2): 180-183.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 42 cm. Slaty brown tailless aquatic bird with stout pointed ivory-white bill and flat, rounded, horny shield covering forehead. Iris reddish-brown. Legs and feet dull greenish. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka, Sudan, Arabia, Java and Celebes. Breeds in Europe, Asia, Africa, China, Azores and Iceland.

Status: Mainly migratory.

Habit and Habitat: Gregarious. Seen in rush-bordered weedy jheels and tanks with expanses of open waters. Abundant in winter. Food consists mainly of vegetable matter, shoots of aquatic plants and rice. Also feeds on insects, molluscs and fish.

Remarks: Sighted in small flocks of 4-8 birds. Breeding in reeds in the area.

IX Order CHARADRIIFORMES

16. Family JACANIDAE : JACANAS

67. *Hydrophasianus chirurgus* (Scopoli, 1786) - Pheasant-tailed Jacana

1786. *Tringa chirugus* Scopoli, *Del Flor. et Faun. Insubr., fasc. 2*: 92. Type-locality: 'In nova Guiana' = Luzon ex Sonnerat.

1987. *Hydrophasianus chirurgus* (Scopoli), Ali and Ripley Compact Hand Book No. 358 (2): 199-201.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 31 cm. Pale brown and white with a black necklace on upper breast in winter plumage. It becomes a striking white and chocolate brown rail-like marsh bird with enormous spidery toes and pointed sickle shaped pheasant tail. Iris brown. Bill slaty blue. Legs and feet pale bluish plumbeous. Sexes alike female slightly larger.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Sri Lanka, Myanmar, Thailand, S. China, Formosa, Malay Peninsula, Java, Cambodia and Philippine Islands.

Status: Resident.

Habit and Habitat: Found mainly in lotus, trapa, water hyacinth and other floating vegetation covered jheels, tanks and ponds. Food mainly seeds, roots, aquatic insects and molluscs.

Remarks: Sighted singly. Breeding in the area.

68. *Metopidius indicus* (Latham, 1790) - Bronze-winged Jacana

1790. *Parra indica* Latham, *Index Orn.*, 2: 765. Type-locality: India.

1987. *Metopidius indicus* (Latham), Ali and Ripley Compact Hand Book No. 359 (2): 201-203.

Observation localities: Khijadiya Lake.

Field identification characters: Size of male 28 cm and that of female 31 cm. A large legged bird with enormous spidery toes. Head, neck and breast glossy black. Back and wings metallic green bronze. A broad white stripe from eye to nape. Iris brown. Bill greenish yellow. Legs and feet dull green. Sexes alike females slightly larger.

Distribution: Throughout India except western Punjab.

Elsewhere: Nepal, Bangladesh, Myanmar, Thailand, Vietnam, Cambodia, Malay Peninsula, Java and Sumatra.

Status: Resident.

Habit and Habitat: Found in aquatic wetlands with floating vegetation. Food mainly seeds, roots, aquatic insects and molluscs.

Remarks: Seen singly or in pairs, becomes gregarious in winters. Breeding recorded. Breeds in raft of weedy grasses mainly *Hydrilla* and *Eichhornia*.

17. Family ROSTRATULIDAE : PAINTED SNIPES

69. *Rostratula benghalensis* (Linnaeus, 1758) - Greater Painted-Snipe

1758. *Rallus benghalensis* Linnaeus, *Syst. Nat.*, ed. 10, 1: 153. Type-locality: Asia.

1987. *Rostratula benghalensis benghalensis* (Linnaeus), Ali and Ripley Compact Hand Book No. 429 (2): 325-328.

Observation localities: Khijadiya Jambuda Lake.

Field identification characters: Size of about 25 cm. A skulking rail with long, slender straight snipe-like brownish downcurved bill greenish at base. Iris brown. Legs and feet yellowish green. Female metallic olive bronze-green above with buff and blackish streaks and markings. Males dull without chestnut and black on neck and breast.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Sri Lanka, Africa, Egypt, Madagascar, S. Asia, China, Japan, Philippines, Borneo, Sumatra and Java.

Status: Resident.

Habit and Habitat: Marshes interspersed with deep pools and muddy patches. Food consists mainly of insects, molluscs and seeds.

Remarks: Recorded in present survey from Khijadiya Jambuda Lake seen singly probing beak in muddy shallow waters.

18. Family HAEMATOPODIDAE : OYSTERCATCHER

70. *Haematopus ostralegus* Linnaeus, 1758 - Eurasian Oystercatcher

1758. *Haematopus ostralegus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 152. Type-locality: Europe and America = Oland.

1987. *Haematopus ostralegus ostralegus*, Linnaeus Ali and Ripley Compact Hand Book No. 360 (2): 203-204.

Observation localities: Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 42 cm. A black and white shore bird with stout bare purple or purple-red legs and long straight laterally compressed orange-red bill, snipe-like but blunt or truncated at tip. Iris reddish- orange. Sexes alike.

Distribution: Wular lake, Kashmir and Gujarat in India.

Elsewhere: Pakistan, Sri Lanka and Africa. Breeds in Europe, south to N. Spain, Black and Caspian Sea.

Status: Winter Visitor.

Habit and Habitat: Commonly seen along sandy and rocky sea shores and offshore islands along with other waders. Food consists of marine molluscs, sand worms and crustaceans.

Remarks: Flocks seen along with sand plovers probing into the exposed area with small muddle pools of water.

19. Family CHARADRIIDAE : PLOVERS, DOTTERELS and LAPWINGS

71. *Pluvialis squatarola* (Linnaeus, 1758) - Grey Plover

1758. *Tringa squatarola* Linnaeus, *Syst. Nat.*, ed. 10, 1: 149. Type-locality: Europa=Sweden.

1987. *Pluvialis squatarola* (Linnaeus), Ali and Ripley Compact Hand Book No. 371 (2): 220-221.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 31 cm. Forehead and lores white speckled with black, sides of head and neck white streaked with brown. Rump, upper tail coverts and tail white narrowly barred with brown. Rest of upper parts dark brown scalloped with pale brownish grey. Below fore neck, breast and flanks streaked and spotted with brown, rest of under parts white. Iris dark brown. Bill black. Legs and feet dusky grey. Sexes alike.

Distribution: Kashmir, Uttar Pradesh, Bihar, Assam, Rajasthan, Gujarat, Madhya Pradesh, Deccan down the western side of the peninsula and upto eastern coast. Andaman and Nicobar Islands.

Elsewhere: Sri Lanka, Pakistan, Laccadive, Maldiv Islands, Africa, Madagascar, Myanmar, Thailand and Malaya. Breeds on the Arctic tundra of Europe and Asia from the Kanin Peninsula to E. Siberia, Kolguev, Great Lyakov and Wrangel Islands.

Status: Winter Visitor.

Habit and Habitat: Gregarious. Common on sandy seashore between the tide marks and mudflats by lagoons, estuaries and tidal creeks. Food mainly insects, molluscs and crustaceans.

Remarks: Seen in large flocks of 16-24 birds.

72. *Charadrius hiaticula* Linnaeus, 1758 - Common Ringed Plover

1915. *Aegialitis hiaticula* tundra Lowe, *Bull. Brit. Orn. Cl.*, 36: 7

1987. *Charadrius hiaticula tundra* (Lowe), Ali and Ripley Compact Hand Book No. 378 (2): 230-231.

Observation localities: Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 19 cm. Larger bird with a double collar on hind neck, black pectoral band and bold black and white head markings. Prominent white wing-bar in flight. Iris brown. Bill orange-yellow at base, black at tip. Legs and feet orange-yellow. Sexes alike.

Distribution: Gilgit, Delhi, Gujarat in India.

Elsewhere: Maldiv Islands, coasts and islands of NE Mediterranean and the coasts of E. Africa. Breeds on the Arctic tundras of northern Scandinavia, Finland, N. Russia and N. Siberia to the Chuchchi Peninsula.

Status: Winter Visitor.

Habit and Habitat: Banks of rivers, streams and tanks, wet grazing grounds, seashore between tidemarks and tidal mudflats and estuaries. Food consists of mainly insects.

Remarks: Rare. Keeps in pairs or small flocks of 4-8 birds.

73. *Charadrius dubius* Scopoli, 1786 - Little Ringed Plover

1789. *Charadrius curonicus* Gmelin, *Syst. Nat.*, 1 (2): 692. Type-locality: Kurland.

1880. *Aegialitis jerdoni* Legge. *Proc. Zool. Soc. London*: 39. Type-locality: Sri Lanka and India.

1987. *Charadrius dubius curonicus* Gmelin, Ali and Ripley Compact Hand Book No. 379 (2): 231.

1987. *Charadrius dubius jerdoni* (Legge), Ali and Ripley Compact Hand Book No. 380 (2): 231-234.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 17 cm. A plover with thick round black and white patterned head, bare yellowish legs and short black horny bill, yellow at base of lower mandible. Fore-head white, forecrown black, separated from the sandy brown by a thin white line running back over eyes and ear-coverts from above. Chin, throat and foreneck white narrowing on sides of neck into the white collar, black nuchal collar continuing down into a pectoral band across upper breast. Rest of underparts white. White wing bar absent. Iris brown. Legs and feet dusky yellowish-brown. Sexes alike.

Distribution: Throughout India.

Elsewhere: Myanmar, Thailand, West Pakistan, Europe, N. Asia, NW Africa, Egypt, N. China, New Guinea, Sunda Islands, N. Japan and Islands of Madeira. Breeds in West Pakistan and Kashmir to higher elevations above 1500 m.

Status: Winter Visitor and Resident.

Habit and Habitat: Seen along sandy shores, banks of rivers, streams and tanks, wet grazing grounds, the seashore between tidemarks and tidal mudflats and estuaries. Food consists of insects, worms and crabs.

Remarks: Keeps in pairs or small groups of 6-12.

74. *Charadrius alexandrinus* Linnaeus, 1758 - Kentish Plover

1758. *Charadrius alexandrines* Linnaeus, *Syst. Nat.*, ed. 10, 1: 150. Type-locality: Egypt, ex Hasselquist.

1987. *Charadrius alexandrines alexandrines* Linnaeus, Ali and Ripley Compact Hand Book No. 381 (2): 235-237.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake.

Field identification characters: Size of about 17 cm. Adult male and female in winter non-breeding plumage with blackish yellow legs, narrower brownish stripe through eye, white forehead continued unbroken as supercilium, a small dark patch on each side of upper breast and a complete pectoral band which easily distinguishes it from juvenile Little Ringed Plover. Adult breeding male with bright rufous crown and more contrasting head markings. White collar on hind neck not separated from back by a black band as in Little Ringed Plover. Iris brown. Bill black.

Distribution: Throughout India. Breeds in Bihar and Gujarat.

Elsewhere: Pakistan, Nepal, Sri Lanka, Maldives and Laccadive islands, Africa, S. China, Japan, Formosa and the Sunda Islands. Breeds on Canary the Canary, Madeira, Azores and Cape Verde Islands, south coast of England and the greater part of Europe and C. Asia from Sweden and Latvia east to Korea, south to the northern Sahara, Egypt, Arabia and Sind.

Status: Resident and winter visitor to parts of India.

Habit and Habitat: Seen along sandy shores, banks of rivers, streams and tanks, wet grazing grounds, the seashore between tidemarks and tidal mudflats and estuaries. Food consists of insects, worms and crabs.

Remarks: Keeps in pairs or small groups of 6-10.

75. *Charadrius mongolus* Pallas, 1776 - Lesser Sand Plover

1829. *Charadrius atrifrons* Wagler, *Isis von Oken*, col. 650. Type-locality: Bengal.

1987. *Charadrius mongolus atrifrons* Wagler, Ali and Ripley Compact Hand Book No. 384 (2): 238-241.

Observation localities: Khijadiya Lake, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size about 19 cm. Head thick round, bill short black. Iris dark brown. Legs bare greenish-grey and feet fleshy grey-yellowish. Sexes alike in summer breeding.

Distribution: Ladakh, Lahul, Sikkim, N. Bihar, Assam, Manipur, Rajasthan, Gujarat and round the entire Peninsula to W. Bengal.

Elsewhere: Bangladesh, Nepal, Kirghiz steppes and Tibet. Breeds in Ladakh, Lahul and Spiti, Kirghiz steppes and Tibet.

Status: Migratory. Winter Visitor to most part of India.

Habit and Habitat: Gregarious. Seen on tidal mudflats or the shiny wet sand left by the receding tide. Food consists of crabs, sandhoppers and marine worms.

Remarks: Keeps in large flocks of 10-18 birds.

76. *Charadrius leschenaultii* Lesson, 1826 - Greater Sand Plover

1826. *Charadrius leschenaultia* Lesson, *dict. Sci. Nat. ed. Levrault*, 42: 36. Type-locality: Pondicherry, India.

1987. *Charadrius leschenaultia* Lesson, Ali and Ripley Compact Hand Book No. 374 (2): 226-227.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav.

Field identification characters: Size of about 22 cm. Forehead and supercilia white with a broad band from lores under eye to ear-coverts, rest of upper parts ashy brown in winter non-breeding plumage. In breeding plumage crown, hindneck and sides of neck becomes rufous, pale supercilia is absent, forehead black with a white spot on each side. Female with black of head replaced with blackish speckling. Sexes alike in winter.

Distribution: Gujarat, Maharashtra, Kerala, Madras, Andhra Pradesh, Orissa, W. Bengal, Rajasthan, Andaman and Nicobar Islands.

Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka, Maldives, N. Baluchistan, Kirghiz Steppes, NW Mongolia, across Asia from Transcaspia to Korea, S. Africa, Myanmar, Thailand, Malaysia, Australia south to Iran and possibly Red Sea. Breeds in Kirghiz Steppes and NW Mongolia.

Status: Winter Visitor.

Habit and Habitat: Gregarious. Found on sandy sea beaches between the tide marks, mud flats, salt pans and estuaries. Food consists of crabs, marine worms and insects.

Remarks: Keeps in small flocks of 6-10 birds.

77. *Vanellus malabaricus* (Boddaert, 1783) - Yellow-wattled Lapwing

1783. *Charadrius malabaricus* Boddaert, *Table Pl. enlum.*, 53. Type-locality: Malabar Coast (ex Daubenton, pl. 880).

1987. *Vanellus malabaricus* (Boddaert), Ali and Ripley Compact Hand Book No. 370 (2): 218-219.

Observation localities: Khijadiya Village side and Khijadiya Dhunvav.

Field identification characters: Size of about 26-28 cm with yellow wattles, supercilium white, dark cap and brown breast-band. Iris white to silver-grey or pale lemon yellow. Bill black, yellow or greenish yellow at base and gape. Legs and feet bright yellow. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Nepal and Sri Lanka.

Status: Migratory to some parts in winter. Resident with local movements.

Habit and Habitat: Seen near open dry ground, barren wastelands, stubbles and fallow fields in drier biotope, found in areas much far from muddy shores. Food mainly consists of insects.

Remarks: Keeps in small groups of 6-8 birds.

78. *Vanellus indicus* (Boddaert, 1783) - Red-wattled Lapwing

1783. *Tringa indica* Boddaert, *Table Pl. enlum.*,: 150. Type-locality: Goa (Western Coast of India).

1987. *Vanellus indicus indicus* (Boddaert), Ali and Ripley Compact Hand Book No. 366 (2): 212-214.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 32-35 cm with black cap and breast. Iris red-brown to red. Bill red with tip black, wattle red. Legs and feet greenish yellow to bright yellow. Sexes alike.

Distribution: Throughout India.

Elsewhere: Eastern, Transcaspia, Iraq, SW Iran, S. Arabia, Afghanistan, N. Baluchistan, Pakistan, Bangladesh and Bhutan.

Status: Widespread resident.

Habit and Habitat: Seen in open flat ground near water. Food consists mainly of insects, molluscs and vegetable matter.

Remarks: Generally keeps in pairs of 2-4 but seen in flocks of 12-14 almost throughout the wetland. Breeding in the area.

79. *Vanellus leucurus* (Lichtenstein, 1823) - White-tailed Lapwing

1823. *Charadrius leucurus* Lichtenstein in *Eversmann's Reise von Orenburg nach Buchara*: 137. Type-locality: Between the Kuwan and Jan Daria, Turkestan.

1987. *Vanellus vanellus* (Lichtenstein), Ali and Ripley Compact Hand Book No. 362 (2): 206-208.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size of about 26-29 cm with very long yellow legs, blackish bill, head plain, tail all white, lacking black band. Iris blood red. Sexes alike.

Distribution: Northwest India: Punjab, Rajasthan, Gujarat, Uttar Pradesh, Madhya Pradesh, N. Bihar and Mysore, W. Bengal.

Elsewhere: Bangladesh, Pakistan, Nepal, Kirghiz Steppes, Transcaspia, Syria, Iraq, Iran, Egypt and Sinai.

Status: Migratory. Winter Migrant to India.

Habit and Habitat: Gregarious. Seen in association with other birds in aquatic vegetation near freshwater marshes and marshy lake edges. Food mainly consists of insects, crustaceans and mollusc.

Remarks: Keeps in small flocks of 2-4 birds.

20. Family SCOLOPACIDAE : SANDPIPERS, STINTS,
SNIPES, GODWITS and CURLEWS

80. *Gallinago gallinago* (Linnaeus, 1758) - Common Snipe

1758. *Scolopax gallinago* Linnaeus, *Syst. Nat.*, ed. 10, 1: 147. Type-locality: in Europa=Sweden.

1987. *Gallinago gallinago gallinago* (Linnaeus), Ali and Ripley Compact Hand Book No. 409 (2): 287-290.

Observation localities: Khijadiya Dhunvav, Khijadiya Jambuda Lake.

Field identification characters: Size of about 25-27 cm with dark brown and buff stripes on head, warm buff colouration to breast and prominent mantle and scapular stripes, typically, buff supercilium contrasts with white cheek-stripe and bulges less in front of eye. Iris dark brown. Bill yellowish. Legs and feet olive green. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal and Sri Lanka. Breeds in Europe and Asia from Scandinavia to eastern Siberia, north to lat. 66°30' to 70°, South to the British Isles, Pyrenees, the Alps, Balkan States, Caucasus, Kirghiz Steppes, the Pamirs, Transbaikalia, the Amur River, Hokkaido and the Kurile Is. Winters in the southern parts of its breeding range, Mediterranean region, Egypt, E. Africa south to Kenya, Persia, China, Japan and Greater Sunda Is.

Status: Resident and partly winter migrant.

Habit and Habitat: Marshes, flooded paddy stubbles, muddy edges of rivers and pools. Food mainly consists of aquatic invertebrates.

Remarks: Generally seen singly or in small groups of 2-3 birds.

81. *Limosa limosa* (Linnaeus, 1758) - Black-tailed Godwit

1758. *Scolopax limosa* Linnaeus, *Syst. Nat.*, ed. 10, 1: 147. Type-locality: Europa=Sweden.

1987. *Limosa limosa limosa* (Linnaeus), Ali and Ripley Compact Hand Book No. 389 (2): 249-251.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Salt Marsh and Creeks.

Field identification characters: Size of about 36-44 cm. White wing-bars and white tail-base with black tail band. Long-limbed, long necked, long billed bird which easily distinguishes it from Bar-tailed Godwit. During breeding blackish barring appears on underparts and belly becomes white. Non-breeding plumage is more uniform on upperparts and breast than Bar-tailed. Juvenile has cinnamon underparts and cinnamon fringes to dark-centred upperparts. Iris dark brown. Bill reddish. Legs and feet greenish. Sexes alike.

Distribution: Abundant in northern India, Rajasthan, Gujarat, Bihar, Orissa, W. Bengal and rare in S. India.

Elsewhere: Sri Lanka, Vagrant in the Maldivian Island. Breeds locally in northern and central Europe and W. Asia east to W. Turkestan. On migration over the greater part of Europe and western Asia. Winters chiefly in the Mediterranean countries south to tropical Africa.

Status: Widespread winter visitor

Habit and Habitat: Gregarious. Seen mainly in freshwater, marshes, tidal creeks, estuaries. Food consists mainly of molluscs, crustaceans, worms, seeds of grass and marsh plants.

Remarks: Seen in medium flocks of 8-12 birds.

82. *Limosa lapponica* (Linnaeus, 1758) - Bar-tailed Godwit

1758. *Scolopax lapponica* Linnaeus *Syst. Nat.*, ed. 10, 1: 147. Type-locality: Lapland.

1987. *Limosa lapponica lapponica* (Linnaeus), Ali and Ripley Compact Hand Book No. 391 (2): 252-254.

Observation localities: Khijadiya Lake and Khijadiya Dhunvav.

Field identification characters: Size of about 36 cm. Breeding female has pale chestnut underpart, although many as non-breeding. Non-breeding has dark streaking on breast and streaked appearance to upperparts. Juvenile similar to non-breeding but with buff wash to underparts and buff edges to mantle/scapulars. Iris brown. Bill pinkish. Legs and feet greyish. Sexes alike.

Distribution: Mainly NW India, Maharashtra, Bihar and Punjab.

Elsewhere: Pakistan, Sri Lanka and Maldivian Islands. Breeds in N. Europe and N. Asia from N. Scandinavia east probably to the Taimyr Peninsula. Winters south to the coasts of tropical Africa, Makran Coast and Persian Gulf.

Status: Widespread winter visitor.

Habit and Habitat: Especially a salt water species affecting sea coast, tidal creeks, estuaries, lagoons mudflats and shallow salt pans. Food consists mainly of insects, molluscs and marine worms.

Remarks: Seen along with black-tailed Godwit in flock of 2-4 birds.

83. *Numenius phaeopus* (Linnaeus, 1758) - Whimbrel

1758. *Scolopax phaeopus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 146. Type-locality: Europa=Sweden.

1987. *Numenius phaeopus phaeopus* (Linnaeus), Ali and Ripley Compact Hand Book No. 385 (2): 242-244.

Observation localities: Khijadiya Jambuda Lake.

Field identification characters: Size of about 43 cm. Smaller than both curlews with shorter dark horny brown bill, fleshy pink at base of lower mandible. Distinctive head pattern, with whitish supercilium and crown-stripe, dark eye-stripe and dark sides of crown. Iris hazel to dark brown. Legs and feet greenish grey. Sexes alike.

Distribution: Western India and sparingly along the entire seaboard south to Kerala, Andaman, Nicobar Islands, West Bengal, Uttar Pradesh, Bihar, Madhya Pradesh and also up in the Western Ghats.

Elsewhere: Myanmar, Pakistan, Nepal, Bangladesh, Sri Lanka, Africa, Madagascar, Arabia, Laccadive and Maldive Islands. Breeds in northern Scandinavia, Lapland, Finland, northern Russia and W. Siberia to Tobolsk and upper Irtysh.

Status: Widespread winter visitor.

Habit and Habitat: Estuaries, tidal creeks and mangroves. Food mainly consists of molluscs and crustaceans.

Remarks: Seen in small flocks of 4-8 birds.

84. *Numenius arquata* (Linnaeus, 1758) - Eurasian Curlew

1758. *Scolopax arquata* Linnaeus, *Syst. Nat.*, ed. 10, 1: 145. Type-locality: Europe=Sweden.

1987. *Numenius arquata orientalis* C. L. Brehm, Ali and Ripley Compact Hand Book No. 388 (2): 246-248.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Salt Marsh and Creeks.

Field identification characters: Size of about 58 cm. Large size and long curved bill. Plain head, underwing-coverts are white and rump/back mainly white, white ground colour to belly and vent, lower parts finely streaked. Iris brown. Bill dark brown. Legs and feet pale grey to bluish grey. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Sri Lanka, Myanmar, Pakistan, Nepal, Maldives and Laccadive Islands. Breeds in Baikal, Siberia, Africa, India, Sri Lanka, Myanmar.

Status: Widespread winter visitor.

Habit and Habitat: Mainly to coasts, estuaries, tidal creeks and mangroves. Food consists of molluscs, crustaceans, mudskippers, insects and occasionally berries.

Remarks: Seen singly or in small groups of 4-8 birds.

85. *Tringa erythropus* (Pallas, 1764) - Spotted Redshank

1764. *Scolopax erythropus* Pallas, in *Vroeg's Cat., Adumbr.*,: 6. Type-locality: Holland.

1987. *Tringa erythropus* (Pallas), Ali and Ripley Compact Hand Book No. 392 (2): 255-257.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 33 cm. Bill black, red at base. Bill and legs longer than Common Redshank, upperwing comparatively uniform. Non-breeding plumage is paler grey above and whiter below than Common. Underparts black in breeding plumage. Juvenile has grey barring on underparts. Iris brown. Legs and feet red. Sexes alike.

Distribution: Throughout India.

Elsewhere: West Pakistan, Nepal, Africa, Myanmar, China, Japan and Malay States and Borneo. Breeds in Scandinavia north of the Arctic Circle, N. Russia south to Moscow, Kazan and Orenburg and in N. Asia east to Kamchatka.

Status: Widespread winter visitor.

Habit and Habitat: Mainly fresh waters also coastal waters. Food consists mainly of molluscs, crustaceans, worms, aquatic insects and larvae.

Remarks: Seen in groups of 2-4 birds feeding in deep waters.

86. *Tringa totanus* (Linnaeus, 1758) - Common Redshank

1758. *Scolopax totanus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 145. Type-locality: Europa=Sweden.

1987. *Tringa totanus totanus* (Linnaeus), Ali and Ripley Compact Hand Book No. 393, 394 (2): 257-259.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 28 cm. Orange-red at base of bill, orange-red legs and broad white trailing edge to wing. Non-breeding plumage is grey-brown above with grey breast. Neck and underparts heavily streaked in breeding plumage, upperparts with variable dark brown and cinnamon markings. Juvenile has brown upperparts with buff spotting and fringes. Iris brown, Bill black, orange-reddish on basal third. Legs and feet orange with black claws. Sexes alike.

Distribution: Throughout India, Breeds in Kashmir and Ladakh.

Elsewhere: Nepal, Myanmar, Malay States. S. China, Philippines, Sunda Islands, Celebes, Sri Lanka, Maldives Islands, Scandinavia to W. Siberia and in C. and E. Asia east to Transbaikalia and W. Kansu.

Status: Migratory. Widespread winter visitor becoming resident.

Habit and Habitat: Solitary. Seen in river banks, jheels margin, coastal waters, tidal creeks, salt pans and estuaries. Food consists of mollusc, crustaceans, worms, aquatic insects and larvae.

Remarks: Sighted singly with other waders.

87. *Tringa stagnatilis* (Bechstein, 1803) - Marsh Sandpiper

1803. *Totanus stagnatilis* Bechstein *Orn. Taschenb. Deutschl.*, 2: 292, pl. 29. Type-locality: Germany.

1987. *Tringa stagnatilis* (Bechstein), Ali and Ripley Compact Hand Book No. 395 (2): 259-261.

Observation localities: Khijadiya Jambuda Lake and Salt Marsh and Creeks.

Field identification characters: Size of about 25 cm. smaller and daintier than common Greenshank with proportionately longer legs and finer bill. Upperparts are grey and foreneck and underparts white in non-breeding plumage. In breeding plumage foreneck and breast streaked and upperparts blotched and barred. Juvenile has dark-streaked upperparts with buff fringes. Iris brown. Bill dark horny brown to blackish. Legs and feet greenish-yellow. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Sri Lanka, Africa, Arabia, Myanmar, China, Sunda Islands and the Moluccas to Australia. Breeds in SE Europe, C. and S. Russia and across middle Asia south of Lat. 65° at least as far east as Transbaikalia, south to Tukestan and N. Mongolia.

Status: Widespread winter visitor

Habit and Habitat: Mainly freshwater wetlands. Affects swampy edges of freshwater ponds and jheels, inundated paddy fields, etc. to a lesser extent brackish lagoons and tidal mudflats. Food consists mainly of worms, molluscs, crustaceans and insects.

Remarks: Seen in small flocks of 6-8 birds.

88. *Tringa nebularia* (Gunner, 1767) - Common Greenshank

1767. *Scolopax nebularia* Gunnerus in *Leem, Beskr. Finm. Lapper*: 251. Type-locality: Trondhjem, Norway.

1987. *Tringa nebularia* (Gunnerus), Ali and Ripley Compact Hand Book No. 396 (2): 261-263.

Observation localities: Khijadiya Lake, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 30-36 cm. Legs stout, long, green; bill stout, dark horny, long, slightly upturned and brownish-black at tip. Upperparts grey and foreneck and underparts white in non-breeding plumage. In breeding plumage, foreneck and breast streaked, upper-parts untidily streaked, no wing bar, forehead, lower back, rump and faintly barred tail white. Juvenile has dark-streaked upperparts with fine buff or whitish fringes. Iris brown. Bill. Legs and feet yellowish green. Sexes alike.

Distribution: Throughout Indian subcontinent, Andaman and Nicobar Islands.

Elsewhere: Pakistan, Nepal, Sri Lanka and Maldives Islands.

Status: Widespread winter visitor.

Habit and Habitat: Marshes, margins of ponds, lagoons and mudflats. Food consists mainly of molluscs, crustaceans, insects, worms and tadpoles.

Remarks: Seen singly or in small groups of 4-6 birds.

89. *Tringa ochropus* Linnaeus, 1758 - Green Sandpiper

1758. *Tringa ochropus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 149. Type-locality: Europa=Sweden.

1987. *Tringa ochropus* Linnaeus, Ali and Ripley Compact Hand Book No. 397 (2): 263-265.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size of about 21-24 cm. Head and neck ashy brown, rest of upperparts dark brown glossed with bronze-green. Rump and tail more or less pure white, the latter faintly barred with blackish. Upperwing dark without wing-bar. Iris brown. Bill dull greenish. Legs greenish. Sexes alike.

Distribution: Throughout India.

Elsewhere: Nepal, Pakistan, Bangladesh, Bhutan, Sri Lanka, British Isles, Mediterranean region, Africa south to Angola and Kenya and southern Asia, Hainan, Taiwan and the Philippines, Myanmar, Borneo. Breeds in northern Europe and Asia, north to the Arctic Circle south to Transcaspia, Turkestan, NW Mongolia and the Amur River.

Status: Migratory. Winter visitor to India.

Habit and Habitat: Mainly fresh water jheels, village tanks, puddles and streams. Food consists of molluscs, crustaceans, aquatic insects and worms.

Remarks: Sighted singly or in pairs.

90. *Tringa glareola* Linnaeus, 1758 - Wood Sandpiper

1758. *Tringa glareola* Linnaeus, *Syst. Nat.*, ed. 10, 1: 149. Type-locality: Europa=Sweden.

1987. *Tringa glareola* Linnaeus, Ali and Ripley Compact Hand Book No. 398 (2): 265-266.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 18-21 cm. A slim sandpiper with heavily spotted under parts, prominent white supercilium and streaked breast ending in breastband, white rump and upperwing dark without wing-bar. Legs yellow. Adult breeding has heavily streaked breast and barred flanks. Adult non-breeding has more uniform grey-brown upper parts, spotted whitish. Iris brown. Bill blackish brown, olive at base. Legs and feet pale green. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka, Maldives Islands, Asia, Africa, Japan, Philippines and Malay Archipelago to Australia. Breeds in N. Europe and N. Asia east to the Amur River, Kamchatka and northern Kurile Islands.

Status: Widespread winter visitor.

Habit and Habitat: Marshes, village tanks, fresh water lakes, wet paddy fields, mudflats and tidal creeks. Food consists of insects, crustaceans and worms.

Remarks: Sighted in small flocks of 8-10 birds.

91. *Xenus cinereus* (Guldenstadt, 1774) - Terek Sandpiper

1774. *Scolopax cinerea* Guldenstädt, *Novi Comm. Sci. Petropol.*, 19: 437, pl. 19. Type-locality: Europa = Sweden.

1987. *Tringa terek* (Latham), Ali and Ripley Compact Hand Book No. 400 (2): 269-270.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 24 cm. Bill long, slender and upturned, yellowish-black at base. Adult breeding in summer has blackish V-shaped scapular lines. Winter non-breeding plumage is greyish brown with conspicuous white forehead and supercilia. Iris brown. Legs short yellowish and feet dull yellow to bright orange-yellow. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Bangladesh, Sri Lanka, E. Africa, Madagascar, Mauritius, Myanmar, Malay Archipelago, Australia and Tasmania. Breeds in N. Russia to Siberia east to Kolyma River, south from southern Urals to Lake Baikal and beyond.

Status: Widespread winter visitor.

Habit and Habitat: Seen mainly in coastal wetlands. Also along seashore, mangrove swamps, tidal creeks and mudflats and coastal lagoons. Rarely at inland fresh water and that chiefly on migration and near the sea coast. Food consists of small molluscs, crustaceans and insects.

Remarks: Keeps in small groups of 8-10.

92. *Actitis hypoleucos* Linnaeus, 1758 - Common Sandpiper

1758. *Tringa hypoleucos* Linnaeus, *Syst. Nat.*, ed. 10, 1: 149. Type-locality: Europa=Sweden.

1987. *Tringa hypoleucos* Linnaeus, Ali and Ripley Compact Hand Book No. 401 (2): 271-273.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 19-21 cm. A small sandpiper with olive-brown upper parts strongly contrasting with white under parts, long tail projecting well beyond closed wings and constant bobbing action when feeding. Adult breeding has irregular dark streaking and barring on upper parts. Adult non-breeding has irregular dark streaking and barring on upper parts with less distinct breast pattern. Iris dark brown. Bill horny brown, greenish-grey at base of lower mandible. Legs and feet greenish grey.

Distribution: Throughout India. Breeds in Ladakh, Kashmir and Garhwal.

Elsewhere: Baluchistan, Bangladesh, Pakistan, Nepal, Sri Lanka, Africa, Sri Lanka, S.E. Asia north to S. China, Taiwan, the Philippines, Malay Archipelago to Australia, Maldives and Laccadive Islands. Breeds throughout Europe and Asia of the Tundra, south to N. Spain, N. Italy, S. Russia, Iran, Mongolia, Manchuria and Japan.

Status: Migratory as well as Resident. Winter visitor to India.

Habit and Habitat: Village tanks, banks of streams, rivers, canals, lakes, ditches, puddles, tidal creeks, mangroves and coastal wetlands. Food consists mainly of insects, crustaceans and worms.

Remarks: Seen in small flocks of 2-4 birds.

93. *Arenaria interpres* (Linnaeus, 1758) - Ruddy Turnstone

1758. *Tringa interpres* Linnaeus, *Syst. Nat.*, ed. 10, 1: 148. Type-locality: Europa=Sweden.

1987. *Arenaria interpres interpres* (Linnaeus), Ali and Ripley Compact Hand Book No. 402 (2): 274-276.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 22 cm. A brown and white wader with short conical black bill and orange legs. In breeding plumage has complex black and white neck and breast pattern and much chestnut-red on upperparts, duller and less strikingly patterned in non-breeding plumage. Juvenile has buff fringes to upperparts and blackish breast. Iris brown. Legs and feet orange-red. Sexes alike.

Distribution: Winter visitor to entire seaboard of India, Andaman and Nicobar Islands.

Elsewhere: Pakistan, Sri Lanka, Maldives, Laccadive Islands, coasts of southern Asia, Myanmar, Malay Peninsula and Archipelago. Breeds in arctic coasts and Tundras from Scandinavia eastward across Siberia, locally to Alaska.

Status: Widespread winter visitor

Habit and Habitat: Rocky coasts and tidal mudflats. Very rare in fresh waters.

Remarks: Seen in small flocks of 8-10 birds.

94. *Calidris alba* (Pallas, 1764) - Sanderling

1764. *Trynga (alba)* Pallas in *Vroeg's Cat. Adumbr.*: 7. Type-locality: Coast of the North Sea.

1987. *Calidris alba* (Pallas), Ali and Ripley Compact Hand Book No. 414 (2): 298-300.

Observation localities: Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 20 cm. Stocky, with short bill and very broad white wing-bar. Adult breeding usually shows some rufous on sides of head, breast and upperparts. Non-breeding is pale grey above and very white below. Juvenile chequered black and white above. Iris brown. Bill, legs and feet black. Sexes alike in summer.

Distribution: Along the western coastline of India, rare on Kerala coast. On the eastern side tolerably abundant around Pt. Calimere and along the Coromandel and Orissa coasts.

Elsewhere: British Isles, the North Sea, India, Malay Archipelago, China, Japan and Australia. South to S. Africa and Madagascar, Laccadive Islands, Maldives. A holarctic species. In Palaearctic region breeds on Spitzbergen and the arctic coasts and islands of Siberia from the Taimyr Peninsula to the mouth of the Lena River.

Status: Migratory. Widespread winter visitor.

Habit and Habitat: Sandy beaches. Feeds on small crustaceans and molluscs.

Remarks: Seen in mixed flocks of dunlins, curlews, sandpipers, etc. in small flocks of 4-6 birds.

95. *Calidris minuta* (Leisler, 1812) - Little Stint

1812. *Tringa minuta*, Nachträge zu Bechstein's Naturg. Deutschl.: 74. Type-locality: Hanau am Main, Germany.

1987. *Calidris minuta* (Leisler), Ali and Ripley Compact Hand Book No. 416 (2): 301-303.

Observation localities: Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of 13-15 cm. Adult breeding has pale mantle, rufous wash to face, neck sides, breast and rufous fringes to upperpart feathers. Non-breeding has untidy, mottled/streaked appearance with grey breast sides. Juveniles has whitish mantle, greyish nape, prominent white supercilium which typically splits above eye and rufous fringes to upperparts. Iris brown. Bill black. Legs and feet blackish brown. Sexes alike.

Distribution: Throughout coasts of India including Andaman Islands. On passage recorded in Rajasthan, over entire Gangetic Plain, Assam and peninsular India.

Elsewhere: Laccadive and Maldiv Islands, Nepal and Baluchistan.

Status: Migratory. Widespread winter visitor.

Habit and Habitat: Marshy areas, estuaries, tidal creeks, freshwater and coastal wetlands. Food consists of small molluscs, crustaceans, insects and worms.

Remarks: Seen in large flocks of more than 50 birds scattered here and there while feeding.

96. *Calidris temminckii* (Leisler, 1812) - Temminck's Stint

1812. *Tringa temminckii* Leisler, Nachträge zu Bechstein's Naturg. Deutschl.,: 64. Type-locality: Hanau am Main, Germany.

1987. *Calidris temminckii* (Leisler), Ali and Ripley Compact Hand Book No. 417 (2): 303-305

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 13-15 cm. More elongated than little with more horizontal posture. Legs yellowish. In all plumage, lacks mantle V and is usually rather uniform, with complete breast-band and indistinct supercilium. Adult breeding has irregular dark markings on upperparts and juveniles regular buff fringes. Iris brown. Bill black. Legs and feet yellowish-green. Sexes alike.

Distribution: Throughout India.

Elsewhere: Nepal, Sri Lanka, the Mediterranean region, N.E. Africa, Iraq, Persia, Myanmar, Malaya Peninsula, China and Japan, Laccadive and Maldive Islands. Breeds from N. Norway east to the Chukchi Peninsula but not north of lat. 72° at the mouth of the Yenisey, nor north of 76° on the Taimyr Peninsula; Kolguev and Vaigach Islands; exact southern limits not determined but extends into the Alpine zone of N. Europe and Asia. Migrates through Europe and Asia.

Status: Migratory. Widespread winter visitor.

Habit and Habitat: Freshwater and coastal wetlands. Food consists mainly of small molluscs, crustaceans, worms and insects.

Remarks: Seen in mixed flocks often with little stint.

97. *Calidris alpina* (Linnaeus, 1758) - Dunlin

1758. *Tringa alpina* Linnaeus, *Syst. Nat.*, ed. 10, 1: 149. Type-locality: Lapland.

1987. *Calidris alpina alpina* (Linnaeus), Ali and Ripley Compact Hand Book No. 420, 421 (2): 308-310.

Observation localities: Khijadiya Jambuda Lake.

Field identification characters: Size of about 19 cm. Greyish brown above with dark mottling, dark centre to rump, short legs and downcurved black bill. Adult breeding has black belly. Adult non-breeding darker grey-brown, with less distinct supercilium. Iris dark brown. Legs and feet black. Sexes alike.

Distribution: Seaboard of NW India, sparse inland as occasional visitor or passage migrant, throughout northern and peninsular India from Kashmir to Kerala and east to Assam, uncommon east of Bihar, and a straggler south of central coastal Maharashtra and the Deccan.

Elsewhere: Pakistan, Bangladesh, Sri Lanka, Maldives. Breeds in Iceland, the Faeroes, Mediterranean region, NE Africa, Europe and SW Asia from N. Scandinavia to the Yalmal Peninsula, Kolguev and Vaigach Islands, northern Nova Zemlya and Spitzbergen, southern breeding limits south to Pskov, the upper Volga and the lower Ob.

Status: Migratory. Widespread winter visitor.

Habit and Habitat: Mainly seashores, tidal mudflats, creeks, coastal wetlands, river banks and flooded fields. Food consists of small molluscs, crabs, worms, sandhoppers, insects especially chironomi larvae and seeds.

Remarks: Sighted in flocks of 2-4 birds.

98. *Calidris ferruginea* (Pontoppidan, 1813) - Curlew Sandpiper

1764. *Scolopax testacea* Pallas in *Vroeg's Cat. Adumbr.*, : 5. Type-locality: Holland.

1987. *Calidris testacea* (Pallas), Ali and Ripley Compact Hand Book No. 422 (2): 310-312.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 20 cm. White rump. More elegant than Dunlin and with longer more downcurved black bill and longer legs. Adult breeding has chestnut-red head and under-parts. Adult non-breeding paler grey than Dunlin, with more distinct supercilium. Juvenile has strong supercilium, buff wash to breast and buff fringes to upperparts. Iris brown. Legs and feet greyish black. Sexes alike.

Distribution: The entire seaboard of India.

Elsewhere: Pakistan, Bangladesh, Sri Lanka, Europe and Asia, Africa, Madagascar, Myanmar, Maldiv Islands, Malaya Archipelago and Australia. Breeds in N. Asia at the mouth of the Yenisey, W. Taimyr, Cape Bolschoi Baranov and on the New Siberian Islands.

Status: Migratory. Widespread winter visitor.

Habit and Habitat: Mainly coastal wetlands, seashores, tidal mudflats, creeks, salt pans, marshes, also inland waters. Food consists of small molluscs, crabs, worms, sandhoppers, insects especially chironomid larvae and seeds.

Remarks: Seen in large flocks of 10-12.

99. *Philomachus pugnax* (Linnaeus, 1758) - Ruff and Reeve

1758. *Tringa pugnax* Linnaeus, *Syst. Nat.*, ed. 10, 1: 148. Type-locality: Southern Sweden.

1987. *Philomachus pugnax* (Linnaeus), Ali and Ripley Compact Hand Book No. 426 (2): 318-321.

Observation localities: Khijadiya Lake.

Field identification characters: Size of male 26-32 cm. Female slightly shorter in size from 20-25 cm. Distinctive shape, with long neck, small head and short, slightly downcurved bill. Non-breeding birds typically have black and chestnut markings on upperparts. Iris brown. Bill dark brown. Colour of legs variable.

Distribution: Throughout India in winter.

Elsewhere: Pakistan, Sri Lanka, Africa south to Cape Province, Myanmar, China, Maldiv islands. Has occurred casually on the eastern Atlantic islands, N. America and Lesser Antilles. Breeds in N. Europe and Asia from Nordkapp east across the tundra to the Kolyma, Belgium, Bavaria, Hungary, steppes of S. Russia and W. Siberia, Minussinsk and the upper Amur.

Status: Migratory. Widespread winter visitor and passage migrant.

Habit and Habitat: Gregarious. Freshwater wetlands, estuaries, inundation marshes and intertidal mudflats. Food consists mainly of molluscs, insects, crabs, worms, vegetable matter, grass and weed seeds.

Remarks: Small flocks of 4-8 birds seen in the area. Male is known as Ruff and female as Reeve.

21. Family RECURVIROSTRIDAE : IBISBILL, AVOCETS and STILTS

100. *Himantopus himantopus* (Linnaeus, 1758) Black-winged Stilt

1758. *Charadrius himantopus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 151. Type-locality: Southern Europe.

1987. *Himantopus himantopus himantopus* (Linnaeus), Ali and Ripley Compact Hand Book No. 430 (2): 329-331.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Salt Marsh and Creeks.

Field identification characters: Size of about 25 cm. Slender appearance, long pinkish legs and fine straight bill. Upperwing black and legs extend a long way behind tail in flight. Juvenile has browner upperparts with buff fringes. Iris bright red. Bill black. Legs and feet crimson. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Nepal, Maldives, Sri Lanka, the Mediterranean region, about the mouth on the Danube, steppes of S. Russia, S. Asia east to China and S. Arabia, Malay States, Egypt, Africa, south of Sahara and Madagascar.

Status: Resident with local movements.

Habit and Habitat: Gregarious. Freshwater wetlands, brackish marshes, tidal mudflats, lagoons and salt pans. Food consists of mollusc, worms, aquatic insects and small seeds of sedges and marsh plants.

Remarks: Often seen with other waders singly or in small groups of 2-4 with juveniles. Breeding in the area.

101. *Recurvirostra avosetta* Linnaeus, 1758 - Pied Avocet

1758. *Recurvirostra avosetta* Linnaeus, *Syst. Nat.*, ed. 10, 1: 151. Type-locality: Europa australiore=Italy.

1987. *Recurvirostra avosetta* Linnaeus, Ali and Ripley Compact Hand Book No. 432 (2): 332-334.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 46 cm. Distinctive black and white patterned marsh bird with slender black upcurved bill and long pale blue legs and feet. Juvenile has brown and buff mottling on mantle and scapulars. Iris reddish brown. Sexes alike.

Distribution: Common in NW India, less common in Kashmir and over the rest of India.

Elsewhere: N. Baluchistan, Pakistan, Nepal, Sri Lanka Africa and S. China. Breeds from Holland eastward through the region of the Black and Caspian Sea, Kirghiz, Steppes, the upper Yenisey and Transbaikalia, south to the Mediterranean countries, Persia, Turkestan and N. China, breeds also in various parts of tropical and southern Africa, possibly in Madagascar.

Status: Migratory. Widespread winter visitor and passage migrant.

Habit and Habitat: Jheels, swamps, shores, tidal creeks, mudflats, alkaline and brackish ponds and coastal wetlands. Food consists of small molluscs, crabs and insects.

Remarks: Keeps in pairs and in small groups of 4-8 birds.

22. Family PHALAROPODIDAE : PHALAROPES

102. *Phalaropus lobatus* (Linnaeus, 1758) - Red-necked Phalarope

1758. *Tringa tobata* [sic] Linnaeus, *Syst. Nat.*, ed. 10, 1: 148. Type-locality: Europa=Sweden.

1987. *Phalaropus lobatus* (Linnaeus), Ali and Ripley Compact Hand Book No. 428 (2): 323-325

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 19 cm. A delicate built sandpiper with fine bill. Adult breeding has white throat and red stripe down side of grey neck. Adult non-breeding has darker grey upperparts than red with white edges to mantle and scapular feathers, forming fairly distinct lines. Juvenile has dark grey upperparts with orange-buff mantle and scapular lines. Iris dark brown. Bill dark horny brown orange at base. Legs and feet dull brown or fleshy brown. Sexes alike, males comparatively smaller.

Distribution: Common offshore along the coast line of NW India and in small numbers and patchily more or less off the entire coastline of peninsular India to East India, Delhi, Rajasthan, Bihar, Karnataka and Gujarat.

Elsewhere: Pakistan, Bangladesh, Sri Lanka, Baluchistan. Breeds in Iceland, Spitzbergen, Faroes, Scandinavia, N. Russia and across northwestern Indian Ocean, off the coasts of Peru and West Africa, between New Guinea and the Bismarck Archipelago and in the Banda Sea.

Status: Migratory. Widespread winter visitor.

Habit and Habitat: Affects shallow water, jheels and inland ponds. Food consists of plankton, insects and especially larvae, crustaceans, mollusca and worms.

Remarks: Seen in small flocks of 4-6 birds twice.

103 *Phalaropus fulicaria* (Linnaeus, 1758) - Red Phalarope

1758. *Tringa fulicaria* Linnaeus *Syst. Nat.*, ed. 10, 1: 148. Type-locality: Europa=Sweden.

1987. *Phalaropus fulicarius* (Linnaeus), Ali and Ripley Compact Hand Book No. 427 (2): 322-323.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 20 cm. Bulkier with stout, horny, pale yellowish-orange bill and yellow legs. Adult breeding has red neck and underparts and white face patch. Adult non-breeding has more upperparts evenly fringed with buff. Iris dark brown.

Distribution: Gujarat, West Bengal.

Elsewhere: West coast of Africa and coast of Chile. Breeds locally on the arctic coasts and islands of the Holarctic region.

Status: Migratory. Winter visitor.

Habit and Habitat: Affects shallow water, jheels and inland ponds. Food consists of plankton, insects and especially larvae, crustaceans, mollusca and worms.

Remarks: Observed 2-3 birds only twice.

23. Family DROMADIDAE : CRAB-PLOVERS

104. *Dromas ardeola* Paykull, 1805 - Crab-Plover

1805. *Dromas ardeola* Paykull, Kongl. *Vet-Acad. Nya Handl.* 26: 182, 188, pl. 8. Type-locality: India.

1987. *Dromas ardeola* Paykull, Ali and Ripley Compact Hand Book No. 434 (2): 337-338.

Observation localities: Khijadiya Dhunvay, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 41 cm. Black and white plumage with stout black bill, yellowish at extreme base and very long blue-grey legs with feet greenish-yellow, claws black. Juvenile washed out version of adult. Iris and orbital skin yellow. Sexes alike.

Distribution: Throughout India.

Elsewhere: Myanmar, Central Vietnam, Hainan Islands, Pakistan, Bangladesh, Nepal, Sri Lanka.

Status: Migratory, Resident and also widespread winter visitor.

Habit and Habitat: Largely crepuscular. Essentially riverain, affecting rocky beds, salt pans, intertidal mudflats, coral reefs and coastal rocks. Food consists of crabs and shellfish.

Remarks: Keeps in small parties of 20-50 birds.

24. Family BURHINIDAE : STONE PLOVERS/THICK-KNEES

105. *Burhinus oediconemus* (Linnaeus, 1758) - Stone-Curlew

1865. *Oediconemus indicus* Salvadori, *Atti Soc. Ital. Sci. Nat. Milano*, 8: 381. Type-locality: India.

1987. *Burhinus oediconemus indicus* (Salvadori), Ali and Ripley Compact Hand Book No. 436 (3): 2-4.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size of about 41 cm. Sandy-brown and streaked plover with thick head, bill black, base of bill yellow, striking yellow eye and long yellow legs. Iris yellow, eyelid brown. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, South-west and central Thailand, Cambodia.

Status: Widespread resident with local migration.

Habit and Habitat: Crepuscular and nocturnal. Desert stony hills, open dry forest and fields. Food consists mainly of insects, worms, slugs, small reptiles, mice and some seeds.

Remarks: Seen in small groups of 2-4.

106. *Esacus recurvirostris* (Cuvier, 1829) - Great Stone-Plover

1829. *Oediconemus recurvirostris* Cuvier, *R?gme Anim*, ed. 2, 1: 500. Type-locality: Nepal.

1987. *Esacus magnirostris recurvirostris* (Cuvier), Ali and Ripley Compact Hand Book No. 437 (3): 5-6.

Observation localities: Khijadiya Jambuda Lake.

Field identification characters: Size of about 51 cm. A thick headed massive plover with upturned black and yellow bill and white forehead and goggle eyes with white spectacles.

Distribution: Throughout India. Elsewhere: Pakistan, Bangladesh, Nepal, Sri Lanka, Myanmar, central Vietnam and Hainan Island.

Status: Widespread resident.

Habit and Habitat: Crepuscular and nocturnal. Essentially riverain, rocky beds of large

rivers and lakes, coastal wetlands, stony banks. Food consists mainly of crabs, molluscs, insects and frogs.

Remarks: Seen in pairs or small groups of 4-6 birds at a time.

25. Family GLAREOLIDAE : COURSERS and PRATINCOLES

107. *Cursorius coromandelicus* (Gmelin, 1789) - Indian Courser

1789. *Charadrius coromandelicus* Gmelin, *Syst. Nat.*, 1 (2): 692 Type-locality: Coromandal Coast.

1987. *Cursorius coromandelicus* (Gmelin), Ali and Ripley Compact Hand Book No. 440 (3): 9-11.

Observation localities: Khijadiya Dhunvay, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 26 cm. Grey-brown upperparts and orange under-parts with dark belly, chestnut crown and dark eye-stripe. Iris dark brown. Bill black. Legs and feet ivory white. Juvenile has brown barring on chestnut brown underparts. Sexes alike.

Distribution: Patchily distributed throughout India except Assam, Manipur.

Elsewhere: W. Pakistan, Bangladesh, Nepal, Sri Lanka and Jaffna Peninsula.

Status: Widespread resident as well as Migratory.

Habit and Habitat: Terrestrial and Cursorial. Open dry country and dry river beds. Food consists mainly of insects and their larvae.

Remarks: Keeps in pairs.

108. *Glareola pratincola* (Linnaeus, 1766) - Collared Pratincole

1766. *Hirundo pratincola* Linnaeus, *Syst. Nat.*, ed. 12, 1: 345. Type-locality: Shores of southern Europe and in Austria.

1987. *Glareola pratincola*, Ali and Ripley Compact Hand Book No. 442 (3): 12-13.

Observation localities: Khijadiya Jambuda Lake.

Field identification characters: Size of about 23 cm. Head and back olive-brown above, legs short, wings long narrow with white trailing edge to secondaries, when closed at rest reaching tip of pronounced forked black tail. Iris umber brown. Bill blackish at tip of both mandibles, pale yellow at gape and base as far as nostrils. Legs and feet pale yellowish white with a fleshy tinge. Sexes alike.

Distribution: India: Rajasthan, Uttar Pradesh, Gujarat, Ratnagiri, Coimbatore.

Elsewhere: Sri Lanka, Africa. Breeds sparingly in W. Pakistan, islands in Mediterranean

and Black Seas, eastward through Mesopotamia (Iraq) and S. Persia to NW India, also from Caspian Sea to Turkestan.

Status: Widespread resident and also winter visitor.

Habit and Habitat: Gregarious. Dry bare ground around rivers, tidal creeks and grazing land around wetlands. Food consists mainly of insects.

Remarks: Seen in flocks of 10-12.

109. *Glareola lactea* Temminck, 1820 - Small Pratincole

1820. *Glareola lactea* Temminck, *Man. d'Orn.*, ed. 2, 2: 503. Type-locality: Bengal.

1987. *Glareola lactea* Temminck, Ali and Ripley Compact Hand Book No. 444 (3): 15-17.

Observation localities: Khijadiya Dhunvav and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 17 cm. Body colouration sandy-grey with square-ended tail. White panel across secondaries, blackish underwing coverts and black tail band in flight. Adult breeding has black lores and buff wash to throat. Non-breeding lacks these features and has streaked throat. Iris dark brown. Bill black, red at base and more yellow on gape. Legs and feet dark blackish-brown. Sexes alike.

Distribution: Throughout India.

Elsewhere: West Pakistan, Nepal, Bangladesh and Sri Lanka.

Status: Widespread resident.

Habit and Habitat: Gregarious and crepuscular in nature. Seen around large rivers, coastal swamps and lakes with sand or shingle banks. Food consists mainly of insects.

Remarks: Generally keeps in flocks of 8-10 birds.

26. Family LARIDAE : GULLS and TERNS

110. *Larus heuglini* Bree, 1876 - Heuglin's Gull

1876. *Larus heuglini* Bree, *Bds. Eur.*, ed. 2, 5: 58. Type-locality: Zeyla, Somaliland.

1987. *Larus argentatus heuglini* Bree, Ali and Ripley Compact Hand Book No. 450 (3): 26-27.

Observation localities: Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 60 cm. Darkest gull, adult with darker grey upperparts than yellow-legged, head more heavily streaked in non-breeding plumage than in that species. Juvenile and first year told from yellow-legged by dark inner primaries and darker under wing-coverts, usually broader dark tail-band and dark greater covert bar. Iris white to yellow, orbital ring bright vermilion. Bill bright yellow. Legs and feet bright yellow. Sexes alike.

Distribution: Northern Indian Ocean coasts east to the Makran coast and western India to Bombay, rarely to Kerala.

Elsewhere: West Pakistan, Sri Lanka, Nepal, Red Sea, the north Somali coast, Persian Gulf, Arctic coast. Breeds in northern Siberia, Taimyr Peninsula, Khatanga, Baraba and Kirghiz Steppes.

Status: Widespread winter visitor.

Habit and Habitat: Gregarious and a scavenger at sea coasts and inland waters, harbours, fishing jetties. Food consists mainly of fish, molluscs, crabs and insects.

Remarks: Seen in small groups of 4-6 birds.

111. *Larus cachinnans* Pallas, 1811 - Yellow-legged Gull

1925. *Larus argentatus mongolicus* Sushkin, Bds. Russian Altai etc.: 63. Type-locality: Lake Uriugnoor, NW Mongolia.

1987. *Larus argentatus mongolicus* Sushkin, Ali and Ripley Compact Hand Book No. 451 (3): 27-28.

Observation localities: Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 60 cm. Much larger and broader-winged Gull with paler grey upperparts and legs and feet usually pinkish but sometimes yellow and hence more preferably should be called as pinklegged Gull. Juvenile and first year told from Heuglins by paler inner primaries and much paler underwing coverts with dark barring, diffusely barred tail, dark greater-covert bar and lack of distinct mask and patch of mottling on breast help separate it from juvenile Pallas's; brown mottling on mantle best distinction from first-winter Pallas's. Iris white to yellow. Bill bright yellow with a vermillion patch near tip of lower mandible. Sexes alike.

Distribution: Northern Indian Ocean coasts east to the Makran coast and western India to Bombay.

Elsewhere: West Pakistan, China. Breeds on the lakes of central Asia from southeastern Russia Altai and Dzungaria across NW. Mongolia to Lake Baikal.

Status: Widespread winter visitor.

Habit and Habitat: Coasts and inland waters. Food consists mainly of fish, molluscs, crabs and insects.

Remarks: Seen in small flocks of 4-6 birds.

112. *Larus ichthyaetus* Pallas, 1773 - Pallas's Gull

1773. *Larus ichthyaetus* Pallas, *Reise russ. Reichs*, 2: 713. Type-locality: Caspian Sea.

1987. *Larus ichthyaetus* Pallas, Ali and Ripley Compact Hand Book No. 453 (3): 29-31.

Observation localities: Khijadiya Dhunvav, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 66-72 cm. Largest among gulls with angular head, gently sloping forehead and crown peaking behind eye. Adult breeding has black hood with bold white eye-crescents and white tips to primaries contrasting with black subterminal marks. Iris hazel brown. Bill large yellow with red tip and black subterminal band. Legs and feet bright yellow. Sexes alike.

Distribution: Coasts of India except Andaman.

Elsewhere: Pakistan, Sri Lanka, Baluchistan, Nepal, the eastern Mediterranean, Red Sea, Persian Gulf, Myanmar, Tibet. Breeds in S. Russia from the Crimera, Sea of Azov and the Sarpa Steppes eastward to NW, Mongolia and the Irtysh.

Status: Widespread winter visitor.

Habit and Habitat: Generally solitary in nature found along coasts and inland lakes and large rivers. Food mainly fish and crabs.

Remarks: Seen singly along with other gulls.

113. *Larus brunnicephalus* Jerdon, 1840 - Brown-headed Gull

1840. *Larus brunnicephalus* Jerdon, *Madras Jour. Lit. and Sci.*, 12: 225. Type-locality: West coast of Indian peninsula.

1987. *Larus brunnicephalus* Jerdon, Ali and Ripley Compact Hand Book No. 454 (3): 31-33.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 46 cm. A medium sized gull with more rounded wing-tips and broader bill. Adult has broad black wing-tips and white patch on outer primaries and primary coverts, underside to primaries largely black and underwing coverts greyer. In breeding plumage, hood paler brown. Juvenile and first winter have broad black wing-tips contrasting with white patch on primary coverts and base of primaries. Iris reddish-brown to yellowish brown. Bill orange-red to deep blood-red. Legs and feet deep blood-red. Sexes alike.

Distribution: Ladakh (Breeds), Rajasthan (Sambhar Lake), Salt lakes near Kolkata, Manipur and sea coasts throughout India except Andaman and Nicobar Islands.

Elsewhere: Pakistan, Nepal, Sri Lanka, Maldives or Laccadive Islands, coasts of southern Asia from the Gulf of Aden to Tenasserim and in the Gulf of Siam. Breeds on the inland lakes of the high plateau of central Asia from Chinese Turkestan to S. Mongolia.

Status: Widespread winter visitor and passage migrant.

Habit and Habitat: Gregarious in habit. Generally seen along coasts, lagoons, tidal creeks, estuaries and large inland salt lakes. Food consists mainly of fish, prawns, insects, earthworms and shoots.

Remarks: Seen in 4-8 birds in mixed flocks with other gulls in different stages of plumages. Sometime sighted in large groups of 20-35 birds.

114. *Larus ridibundus* Linnaeus, 1766 - Black-headed Gull

1766. *Larus ridibundus* Linnaeus, *Syst. Nat.*, ed. 12, 1: 225. Type-locality: European seas=England.

1987. *Larus ridibundus ridibundus* Linnaeus, Ali and Ripley Compact Hand Book No. 455 (3): 33-35.

Observation localities: Khijadiya Dhunvav and Salt Marsh and Creeks.

Field identification characters: Size of about 43 cm. A medium sized gull with finer bill and narrower and more pointed wings. Distinctive white flash on primaries/primary coverts of upper-wing, black on wing-tips and upperwings is much less extensive than in Brown-headed in all plumage. Bill blackish-red and hood uniform dark brown in breeding plumage. In non-breeding and first winter plumage, bill tipped black and head largely white with dark ear-covert patch. Iris dark brown. Legs and feet deep red. Sexes alike.

Distribution: Coasts of India, Rajasthan (Sambhar Lake), Bihar, Assam.

Elsewhere: Coasts of Pakistan, Bangladesh, Maldives, Sri Lanka, Nepal, Azores, Gambia, Southern shores of the Mediterranean, Nile Valley, Persian Gulf, China, Japan, Philippines. Breeds in Europe and Asia.

Status: Widespread winter visitor and passage migrant.

Habit and Habitat: Gregarious. Seen along coasts and large inland lakes and rivers. Food consists mainly of fish, prawns, insects, molluscs and earthworms.

Remarks: Keeps in flocks of 6-8.

115. *Larus genei* Breme, 1839 - Slender-billed Gull

1839. *Larus genei* Breme, *Rev. Zool.*,: 321. Type-locality: Sardinia.

1987. *Larus genei* Br?me, Ali and Ripley Compact Hand Book No. 456 (3): 35-37.

Observation localities: Salt Marsh and Creeks.

Field identification characters: Size of about 43 cm. Like blackheaded gull in size and wing pattern. Head white throughout year, although may show grey ear-covert spot in winter. Body above and below pure white, mantle pale pearl grey, long neck and longer, absence of brown spot on ear-coverts and brighter red legs and feet. Iris pale yellow. Eyelids bright red. Bill deep crimson red. Sexes alike.

Distribution: Gujarat, Maharashtra.

Elsewhere: Nepal, Sind, Mediterranean, coast of NW Africa Red Sea. Breeding in Black Sea and Caspian sea, Azov Sea, Persian Gulf, Makran coast and Sind.

Status: Widespread winter visitor.

Habit and Habitat: Seen near coastal waters. Food consists of mainly fish.

Remarks: Keeps in large flocks of 12-18 birds.

116. *Gelochelidon nilotica* (Gmelin, 1789) - Gull-billed Tern

1789. *Sterna nilotica* Gmelin, *Syst. Nat.*, 1 (2): 606. Type-locality: Egypt.

1987. *Gelochelidon nilotica nilotica* (Gmelin), Ali and Ripley Compact Hand Book No. 460 (3): 42-44.

Observation localities: Khijadiya Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 38 cm. A pale pearl-grey and white tern with deep forked tail. Bill stout black. Iris black-brown. Legs and feet black. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Sri Lanka, Maldives, Europe, Asia, Africa, Persia, Africa, Persian Gulf and Sunda Islands.

Status: Winter migrant.

Habit and Habitat: Gregarious, seen near coastal mudflats, backwaters, tidal creeks, salt pans, large inland jheels and rivers. Food consists mainly of crabs, prawns, frogs and insects.

Remarks: Keeps singly or in twos and threes or small scattered flocks.

117. *Sterna caspia* Pallas, 1770 - Caspian Tern

1770. *Sterna caspia* Pallas, *Novi Comm. Acad. Sci. Petropol.* 14 (1): 582, pl. 22. Type-locality: Caspian Sea.

1987. *Hydroprogne caspia caspia* (Pallas), Ali and Ripley Compact Hand Book No. 462 (3): 45-47.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 51 cm. The largest of terns recognized by its size and large, stout coral-red bill. Iris dark brown. Legs and feet black. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Sri Lanka and Maldives Islands. Breeds in Europe, Asia, Africa, N. America and Sunda Islands.

Status: Winter migrant.

Habit and Habitat: Seen near sea coasts, tidal mudflat, estuaries and backwaters and lakes. Food consists mainly of fish, prawns and crabs.

Remarks: Keeps singly or in pairs.

118. *Sterna aurantia* J.E. Gray, 1831 - River Tern

1831. *Sterna aurantia* J.E. Gray, in *Hardwicke's Ill. Ind. Zool.*, 1 (5): pl. 69, f. 2. Type-locality: India.

1987. *Sterna aurantia* J.E. Gray Ali and Ripley Compact Hand Book No. 463 (3): 48-49.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks, Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 38-46 cm. Slender, pale grey above, white below with long pointed wings deeply forked tail; bill pointed. In winter crown and nape flecked and streaked with black. Iris brown. Bill (summer) bright deep yellow (winter) less bright yellow with darker tip. Legs and feet red. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Bangladesh and Nepal.

Status: Resident.

Habit and Habitat: Seen near sand banks, large rivers, estuaries and tanks. Food consists mainly of fish.

Remarks: Keeps singly or in pairs and sometimes small flocks.

119. *Sterna bengalensis* Lesson, 1831 - Lesser Crested Tern

1831. *Sterna bengalensis* Lesson, *Traite d'Oren., livr.*, 8: 621. Type-locality: Coasts of India.

1987. *Sterna bengalensis bengalensis* Lesson, Ali and Ripley Compact Hand Book No. 479 (3): 69-70.

Observation localities: Khijadiya Lake, Khijadiya Jambuda Lake and Salt Marsh and Creeks.

Field identification characters: Size of about 43 cm. Small tern with crown and nuchal crest wholly black down to eyes in summer. Iris dark brown. Bill black, tip horn-brown. Legs and feet black. Sexes alike.

Distribution: Occurs along the western and eastern coasts of India, Andaman and Nicobar Islands.

Elsewhere: Pakistan, Laccadives and Maldives Islands, Asia, Sumatra, Java and Celebes.

Status: Migratory.

Habit and Habitat: Seen near offshore waters and considerable distances out at sea. Food mainly consists of fishes and prawns.

Remarks: Keeps singly or in small flocks of 4-8 birds. Sub species *Sterna bengalensis bengalensis* Lesson seen in the region.

120. *Sterna hirundo* Linnaeus, 1758 - Common Tern

1876. *Sterna tibetana* Saunders, *Proc. Zool. Soc. London*: 649. Type-locality: Tibet.

1987. *Sterna hirundo tibetana* Saunders, Ali and Ripley Compact Hand Book No. 465 (3): 51-52.

Observation localities: Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 36 cm. Grey tern with darker brown above and below, tail forked. Iris brown. Bill (summer) bright deep yellow; (winter) less bright yellow with a darker tip. Legs and feet red. Sexes alike.

Distribution: Gangetic plains, less common to scarce in the Peninsula. Breeds in lakes of Ladakh.

Elsewhere: Turkestan, Tibet (breeds) and Malaya.

Status: Winter visitor and also resident.

Habit and Habitat: Found near larger rivers and jheels, tidal creeks and estuaries. Food consists mainly of fish.

Remarks: Keeps singly or in groups of 4-6.

121. *Sterna albifrons* Pallas, 1764 - Little Tern

1764. *Sterna albifrons* Pallas, in *Vroeg's Cat., Adumbr.*: 6. Type-locality: Holland.

1987. *Sterna albifrons albifrons* Pallas, Ali and Ripley Compact Hand Book No. 475 (3): 64-65.

Observation localities: Khijadiya Jambuda Lake.

Field identification characters: Size of about 23 cm. Adult with velvety black cap, white forehead and orange-yellow bill and feet. In winter the black cap mixed with white, feet red, bill becomes blackish. Iris brown. Sexes alike.

Distribution: Northern India east to Assam, NW India, Gujarat, peninsular India south to Kerala and Rameswaram.

Elsewhere: Pakistan, Nepal, Sri Lanka, Africa, Laccadive and Maldiv Islands. Breeds in Europe and western Asia.

Status: Winter migrant.

Habit and Habitat: Seen near tidal creeks, coastal lagoons and salt pans, rivers and freshwater jheels. Food consists mainly of small fish and crustaceans.

Remarks: Keeps singly or in pairs.

122. *Chlidonias hybridus* (Pallas, 1811) - Whiskered Tern

1826. *Viralva indica* Stephens, in *Shaw's Gen. Zoll.*, 13 (1): 169. Type-locality: Cawnpore, India.

1987. *Chlidonias hybridus indicus* (Stephens), Ali and Ripley Compact Hand Book No. 458 (3): 39-41.

Observation localities: Khijadiya Lake, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 25 cm. A slender, graceful silvery grey and white bird with long narrow pointed wings and slightly forked grey tail, usually seen in flight over water. Iris dark grayish brown or brown. Bill dark reddish brown to red. Legs and feet dark red, claws black. Sexes alike.

Distribution: Kashmir, northern India, Assam (Breeds)

Elsewhere: Pakistan, Bangladesh, Nepal and Sri Lanka.

Status: Migratory as well as Resident.

Habit and Habitat: Gregarious. Seen near inland jheels, marshes and flooded paddyfields, also coastal laggons, tidal mudflats and estuaries. Food consists mainly of insects.

Remarks: Keeps in flocks of 2-4.

123. *Chlidonias leucopterus* (Temminck, 1815) - White-winged Black Tern

1815. *Sterna leucoptera* Temminck, *Man. d'Orn.*,: 483.

1987. *Chlidonias leucoptera* (Temminck), Ali and Ripley Compact Hand Book No. 459 (3): 41-42.

Observation localities: Khijadiya Dhunvav and Salt Marsh and Creeks.

Field identification characters: Size of about 23 cm. Small sized grey tern, forehead white, underparts dark sooty grey. Tail pure white. Iris dark brown. Bill black tinged crimson, black-brown tinged orange at gape. Legs and feet bright red. Sexes alike.

Distribution: Assam, West Bengal, Madhya Pradesh, Maharashtra, Andamans and Gujarat.

Elsewhere: Pakistan, Bangladesh, Sri Lanka, Myanmar, China, Malay Archipelago to Australia, Africa and Persian Gulf. Breeds in SE Europe and C. Asia from Hungary and Galicia, C. Russia, Siberia, Transbaikalia, Amurland, Turkestan and Mongolia.

Status: Winter migrant.

Habit and Habitat: Gregarious. Seen near inland jheels, marshes and flooded paddyfields, coastal lagoons, tidal mudflats and estuaries. Food consists of insects, tadpoles, crabs and fish.

Remarks: Keeps in flocks of 4-8.

27. Family RYNCHOPIDAE : SKIMMERS

124. *Rynchops albigollis* Swainson, 1838 - Indian Skimmer

1837. *Rynchops albigollis* Swainson, *Anim. in Menag.*: 360 (India)

1987. *Rynchops albigollis* Swainson, Ali and Ripley Compact Hand Book No. 484 (3): 75-76.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Salt Marsh and Creeks.

Field identification characters: Size of about 40 cm. Blackish-brown above, glistening white below with compressed knife like orange-yellow bill with lower mandible projecting well beyond upper. Iris brown. Legs bright red. Sexes alike.

Distribution: Northern India east to Assam, Andhra Pradesh, Rajasthan and Gujarat.

Elsewhere: Pakistan, Bangladesh, Myanmar and China.

Status: Resident, nomadic and local migratory.

Habit and Habitat: Seen on sandbanks in rivers in close-packed flocks. Food consists of mainly fish.

Remarks: Keeps singly or in small groups of 2-4 birds.

X Order COLUMBIFORMES

28. Family PTEROCLIDIDAE : SANDGROUSE

125. *Pterocles exustus* Temminck, 1825 - Chestnut-bellied Sandgrouse

1909. *Pterolurus exustus erlangeri* Neumann, *Orn. Monatsb.*, 17: 154. Type-locality: El Hota, Lahej, southern Arabia.

1987. *Pterolurus exustus erlangeri* (Neumann), Ali and Ripley Compact Hand Book No. 487 (3): 82-84.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size of about 28 cm. Pin-tailed with dark underwing, blackish-chestnut belly and black breast line. Female has buff banding across upperwing-coverts. Male upperparts sandy grey and buff. Iris dark brown, eyelids and orbital skin greenish yellow. Bill horny plumbeous. Feet and claws greyish brown.

Distribution: Throughout peninsular India, eastwards to Bengal, southward to Madurai and Tirunelveli, Jammu, unrecorded in Himalayas, Assam.

Elsewhere: Pakistan, SW Arabia, Iraq, S. Palestine, E. Africa and Sri Lanka.

Status: Widespread resident.

Habit and Habitat: Seen near barren plains and plateau, dry stubbles, sun-baked ploughed and fallow land and sparsely scrubbed stony semi-desert. Food consists mainly of weed and grass seeds.

Remarks: Keeps in small groups of 3-5 or flocks of 10-28 birds.

29. Family COLUMBIDAE : PIGEONS and DOVES

126. *Columba livia* Gmelin, 1789 - Blue Rock Pigeon

1844. *Columba intermedia* Strickland, *Ann. and Mag. Nat. Hist.*, 13: 39.

1987. *Columba livia intermedia* Strickland, Ali and Ripley Compact Hand Book No. 517 (3): 125-127.

Observation localities: Khijadiya Village side and Khijadiya Jambuda Lake.

Field identification characters: Size of about 33 cm. Grey tail with blackish terminal band and broad black across greater coverts and tertials/secondaries. Iris orange. Bill brownish-black. Legs and feet magenta. Sexes alike.

Distribution: Throughout India, unrecorded in parts of northwest and northeast.

Elsewhere: Pakistan, Bangladesh, Transcaspia, Turkestan, S. Persia.

Status: Widespread resident.

Habit and Habitat: Seen near wild birds found around water, cliffs and ruins. Food consists of grains, moong dal, pulses, groundnuts, weed seeds, small tubers and green shoots.

Remarks: Keeps in pairs or in flocks of 12-16 birds.

127. *Streptopelia senegalensis* (Linnaeus, 1766) - Little Brown Dove

1789. *Columba cambayensis* Gmelin, *Syst. Nat.*, 1 (2): 779 ('Cambaya', ie. Gulf of Cambay, NW. India)

1987. *Streptopelia senegalensis cambayensis* (Gmelin), Ali and Ripley Compact Hand Book No. 541(3): 155-157.

Observation localities: Khijadiya Village side, Khijadiya Lake and Khijadiya Dhunvav.

Field identification characters: Size of about 27 cm. Slim, small with fairly long tail. Brownish-pink head and underparts, uniform upperparts and black stippling on upper breast. Iris brown. Bill brownish black. Legs and feet magenta. Sexes alike.

Distribution: Almost throughout India, unrecorded in the northeast.

Elsewhere: Pakistan and Bangladesh.

Status: Widespread resident.

Habit and Habitat: Seen near dry cultivation and scrub-covered hills. Food consists mainly of grains and seeds.

Remarks: Generally keeps in pairs.

128, *Streptopelia decaocto* (Frivaldszky, 1838) - Eurasian Collared-Dove

1758. *Columba risoria* Linnaeus, *Syst. Nat.*, ed. 10, 1: 65. Type-locality: India.

1987. *Streptopelia decaocto decaocto* (Frivaldszky), Ali and Ripley Compact Hand Book No. 534 (3): 147-149.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake

Field identification characters: Size of about 32 cm. Male has blue-grey head with black half-collar, pinkish maroon upperparts and pink underparts. Compared with Eurasian Collared female has darker buffish-grey underparts, darker fawn-brown upperparts, greyer underwing-coverts and is much smaller and more compact. Iris lake red to crimson. Bill brownish black. Legs and feet dark pinkish red. Sexes alike.

Distribution: Almost throughout India except Andaman and Nicobar Islands.

Elsewhere: Sri Lanka, SE Europe, Asia, Japan, Iraq, Persia and Great Britain.

Status: Widespread resident.

Habit and Habitat: Seen near light woodland and trees in open country. Food consists mainly of grain and seeds.

Remarks: Keeps in pairs.

XI Order PSITTACIFORMES

30. Family PSITTACIDAE : PARAKEETS

129. *Psittacula krameri* (Scopoli, 1769) - Rose-ringed Parakeet

1915. *Palaeornis krameri borealis* (Neumann), *Orn. Monatsb.*, 23: 178. Type-locality: Assam.
 1987. *Psittacula krameri borealis* (Neumann), Ali and Ripley Compact Hand Book No. 549 (3): 169-171.
 1987. *Psittacula krameri manillensis* (Bechstein), Ali and Ripley Compact Hand Book No. 550 (3): 171-172.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 42 cm. Green head and blue-green tip to tail. Male has black chin stripe and pink collar. Iris yellowish. Bill both mandibles coral-red or lower blackish-red. Legs and feet greenish-slaty.

Distribution: Throughout India.

Elsewhere: Sri Lanka, Myanmar, China, Pakistan, Bangladesh and Nepal.

Status: Widespread resident.

Habit and Habitat: Seen near forest, wooded areas and cultivation. Food consists of fruits, cereals and seeds.

Remarks: Keeps in large flocks of 6-12 or even more.

XII Order CUCULIFORMES

31. Family CUCULIDAE : CUCKOOS and COUCALS

130. *Clamator jacobinus* (Boddaert, 1783) - Pied Crested Cuckoo

1783. *Cuculus jacobinus* Boddaert, *Table Pl. enlum.*, 53. Type-locality: Coromandel Coast.
 1786. *Cuculus serratus* Sparrman, *Mus. Carls., fasc. 1* no. 3 and pl. Type-locality: Cape of Good Hope = Cape Peninsula, Cape Province, S. Africa.
 1987. *Clamator jacobinus serratus* (Sparrman), Ali and Ripley Compact Hand Book No. 570 (3): 194-197.
 1987. *Clamator jacobinus jacobinus* (Boddaert), Ali and Ripley Compact Hand Book No. 571 (3): 197-198.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 33 cm. A slender black and white bird with crest and long tail. Upperparts browner, underparts more buffish on juvenile. Iris brown. Bill horny black. Legs and feet slaty grey. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Sri Lanka, Bangladesh, Nepal, Pakistan and Africa.

Status: Widespread resident and partial migrant.

Habit and Habitat: Seen near forest, well-wooded areas, also bushes in semi-desert, gardens, groves, precincts of towns and villages. Food consists of mainly insects, molluscs.

Remarks: Generally keeps in pairs.

131. *Eudynamys scolopacea* (Linnaeus, 1758) - Asian Koel

1758. *Cuculus scolopaceus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 111. Type-locality: Malabar.

1987. *Eudynamys scolopacea scolopacea* (Linnaeus), Ali and Ripley Compact Hand Book No. 590 (3): 227-230.

Observation localities: Khijadiya Village side, Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 43 cm. Male greenish-black, with green bill. Female is spotted and barred with white. Iris crimson. Legs and feet plumbeous.

Distribution: Almost throughout India except Assam.

Elsewhere: Sri Lanka, Nepal, Bhutan, Maldives and Laccadive Islands.

Status: Mainly resident.

Habit and Habitat: Arboreal. Seen in open woodland, gardens and cultivation. Food consists of mainly fruits and berries of *Ficus*, *Zizyphus*, insects and molluscs.

Remarks: Keeps in pairs or male and female seen nearby.

132. *Centropus sinensis* (Stephens, 1815) - Greater Coucal

1815. *Polophilus sinensis* Stephens in *Shaw's Gen. Zool.*, 9 (1): 51. Type-locality: 'Said to inhabit China=Ning Po, China.

1987. *Centropus sinensis sinensis* (Stephens), Ali and Ripley Compact Hand Book No. 600 (3): 240-242.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 48 cm. A large glossy black bird with bright uniform chestnut wings and black underwing-coverts. Tail long black. Juvenile is heavily barred. Iris bright crimson. Bill, legs and feet black. Sexes alike females slightly larger.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Bhutan, China.

Status: Widespread resident.

Habit and Habitat: Sedentary. Seen near tall grassland, habitation, scrub and groves. Food consists mainly of earthworms, insects, lizards and rodents.

Remarks: Sighted in pairs.

XIII Order STRIGIFORMES

32. Family TYTONIDAE : BARN OWLS

133. *Tyto alba* (Scopoli, 1769) - Barn Owl

1929. *Tyto alba stertens* Hartert, *Nov. Zool.*, **35**: 98. Type-locality: Cachar.

1987. *Tyto alba stertens* Hartert, Ali and Ripley Compact Hand Book No. **606** (3): 250-251.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size of about 36 cm. Owl with large round head and a conspicuous ruff of stiff feathers surrounding a comically pinched heart-shaped white monkey-like facial disc. Above golden buff and grey finely stippled with black and white. Iris deep brown. Bill white. Legs and feet brown.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Sri Lanka, Nepal and Myanmar.

Status: Resident.

Habit and Habitat: Crepuscular and nocturnal. Neighbourhood of cultivation and human habitations, ruins of ancient forts, crumbling archaeological structures, caves and buildings. Food consists mainly of small birds, rats and mice.

Remarks: It is a new record. Sub-species *Tyto alba stertens* reported. Sighted once on the village side of Khijadiya Bird Sanctuary.

33. Family STRIGIDAE : OWLS

134. *Athene brama* (Temminck, 1821) - Spotted Owlet

1831. *Noctua indica* Franklin, *Proc. Zool. Soc. London*: 115. Type-locality: Uttar Pradesh.

1987. *Athene brama indica* (Franklin), Ali and Ripley Compact Hand Book No. **650** (3): 299-301.

1987. *Athene brama brama* (Temminck), Ali and Ripley Compact Hand Book No. **652** (3): 302.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 21 cm. White spotting on upperparts, including crown and diffuse brown spotting or barring on underparts. Pale facial discs and nuchal collar. Iris pale to deep golden yellow. Bill greenish horny. Legs and feet yellowish-green. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Nepal, Pakistan, Bangladesh, Iran and Bhutan.

Status: Widespread resident.

Habit and Habitat: Mainly crepuscular and nocturnal. Seen near habitation, cultivation, groves of ancient trees, ruins and cavities in ravines and earth cliffs. Food consists mainly of insects, lizards, rodents and small birds.

Remarks: Keeps in pairs.

XIV Order CAPRIMULGIFORMES

34. Family CAPRIMULGIDAE : NIGHTJARS

135. *Caprimulgus asiaticus* Latham, 1790 - Common Indian Nightjar

1790. *Caprimulgus asiaticus* Latham, *Index Orn.*, 2: 588 Type-locality: India-Bombay.

1987. *Caprimulgus asiaticus asiaticus* Latham, Ali and Ripley Compact Hand Book No. 680 (4): 21-23.

Observation localities: Khijadiya Village side and Khijadiya Lake.

Field identification characters: Size of about 24 cm. A small sized nightjar, narrowly but distinctly black-streaked above. Iris brown. Bill horny brown, legs and feet pinkish brown. Sexes alike.

Distribution: Almost throughout India. Gujarat: Kutch: Bhuj, Khari Ropar, Meta-no-Madh, Khadir, Bela and Pacchem Islands; Jamnagar: Dwarka, Baroda: Golana, Cambay.

Elsewhere: Pakistan, Bhutan, Nepal, Bangladesh, Myanmar, Thailand and China.

Status: Resident.

Habit and Habitat: Crepuscular and nocturnal. Seen near scrub jungle, fallow land with *Euphorbia* hedges and thickets. Food mainly insects.

Remarks: It is a new record. Sub-species *Caprimulgus asiaticus asiaticus* recorded. Seen singly or in pair.

XV APODIFORMES

35. Family APODIDAE : SWIFTS

136. *Apus apus* (Linnaeus, 1758) - Common Swift

1870. *Cypselus pekinensis* Swinhoe, *Proc. Zool. Soc. London*: 435. Type-locality: Pekin. China.

1987. *Apus apus pekinensis* (Swinhoe), Ali and Ripley Compact Hand Book No. 696 (4): 43-45.

Observation localities: Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 17 cm. A swift with long narrow, bow-shaped wings and moderately forked tail. Uniformly dark brown or sooty black with whitish chin and throat and a few pale crescentic marks on belly. Sexes alike.

Distribution: Northern India, Assam, Andamans and Gujarat: Baroda, Rajpipla and Saurashtra.

Elsewhere: Baluchistan, Maldives, Cyprus, Asia, Persia, Turkestan, NW Mongolia, S. Manchuria, Palestine, Africa.

Status: Migratory. Winter visitor.

Habit and Habitat: Spend hours in flight near water body. Food consists mainly of insects.

Remarks: It is a new record. Sub-species *Apus apus pekinensis* recorded. Seen in small parties flying over the wetland area.

137. *Apus affinis* (J.E. Gray, 1830) - House swift

1830. *Cypselus affinis* J.E. Gray, in Gray and Hardwicke's III. *Ind. Zool.*, 1(2), pl. 35, f. 2. Type-locality: Ganges.

1987. *Apus affinis affinis* (J.E. Gray), Ali and Ripley Compact Hand Book No. 703 (4): 51-54.

Observation localities: Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 15 cm. A small sized smoky black bird with conspicuous white rump, white throat, short square tail and long narrow sickle-shaped wings. Iris brown. Bill horny black. Mouth pink. Legs and feet pinky brown. Sexes alike.

Distribution: Throughout India with variation in the sub-specific level. Gujarat: Ajwa, Bodeli (Baroda), Cambay, Rajpipla, Bhavnagar and Saurashtra.

Elsewhere: Pakistan.

Status: Resident with local migration in winters.

Habit and Habitat: Gregarious. Seen near urban habitations, buildings, forts. Food consists mainly of insects especially air-borne midges, bugs, beetles, ants.

Remarks: It is a new record. Sub-species *Apus affinis affinis* reported from the study area. Keeps in small groups.

XVI Order CORACIIFORMES

36. Family ALCEDINIDAE : KINGFISHERS

138. *Alcedo atthis* (Linnaeus, 1758) - Small Blue Kingfisher

1788. *Alcedo bengalensis* Gmelin, *Syst. Nat.*, 1 (1): 450. Type-locality: Bengal.

1987. *Alcedo atthis benghalensis* Gmelin, Ali and Ripley Compact Hand Book No. 723 (4): 76-79.

Observation localities: Khijadiya Village side, Khijadiya Lake and Khijadiya Dhunvav.

Field identification characters: Size of about 18 cm. Orange ear-coverts. Greenish-blue on head, scapulars and wings and turquoise line down back. Iris blood red. Bill black. Legs and feet coral-red. Sexes alike.

Distribution: Northern sub-continent including the Himalayan terrain, Sikkim, Assam, Manipur, Andaman and Nicobar Islands.

Elsewhere: Pakistan, Bhutan and Bangladesh.

Status: Widespread resident and also Migratory.

Habit and Habitat: Seen near fresh waters in open country also mangroves and seashore in winter. Food consists of mainly fish and aquatic insects.

Remarks: Keeps singly or in pairs.

139. *Halcyon smyrnensis* (Linnaeus, 1758) - White-breasted Kingfisher

1783. *Alcedo fusca* Boddaert, *Table Pl. enlum.*,: 54. Type-locality: Malabar Coast ex Daubenton, Pl. enlum. no. 894.

1987. *Halcyon smyrnensis fusca* (Boddaert), Ali and Ripley Compact Hand Book No. 736 (4): 90-92.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 28 cm. White throat and centre of breast, brown head and most of underparts and turquoise upperparts. White wing patch. Iris brown. Bill brownish orange-red. Legs and feet dusky orange to coral-red. Sexes alike.

Distribution: Throughout India.

Elsewhere: Nepal and Sri Lanka.

Status: Widespread resident.

Habit and Habitat: Seen near wet cultivated fields, forest edges, gardens and freshwater and coastal wetlands. Food mainly consists of small animals, insects, scorpions, centipedes, frogs, lizards, mice and birds.

Remarks: Keeps singly or in pairs.

140. *Halcyon pileata* (Boddaert, 1783) - Black-capped Kingfisher

1783. *Alcedo pileata* Boddaert, *Table Pl. enlum.*,: 41. Type-locality: China, ex Daubenton.

1987. *Halcyon pileata* (Boddaert), Ali and Ripley Compact Hand Book No. 739 (4): 94-96.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake.

Field identification characters: Size of about 30 cm. Easily identified due to its deep coral red bill, black cap, white collar, purplish-blue upperparts and pale orange underparts. White wing patch seen in flight. Iris dark brown. Legs and feet dark red. Sexes alike.

Distribution: Uttar Pradesh, Bihar, Andhra Pradesh, Rajasthan, Assam, Manipur, Maharashtra, Gujarat and Kerala.

Elsewhere: Bangladesh, Sri Lanka, Myanmar, Thailand, Malay Peninsula, China, Korea, Hainan, Philippine and Indonesian islands.

Status: Resident and Migratory with local movements.

Habit and Habitat: Seen near mangrove swamps and coastal wetlands. Food consists mainly of fish, frogs, crabs and insects.

Remarks: Keeps singly or in pairs.

141. *Ceryle rudis* (Linnaeus, 1758) - Lesser Pied Kingfisher

1851. *Ceryle leucomelanura* Reichenbach, *Handb. spec. Orn.*, 21, pl. ccix b, f. 3488. Type-locality: Sri Lanka.

1987. *Ceryle rudis leucomelanura* Reichenbach, Ali and Ripley Compact Hand Book No. 719 (4): 71-72.

Observation localities: Khijadiya Dhunvav and Salt Marsh and Creeks.

Field identification characters: Size of about 31 cm. Smaller than crested with white supercilium, white patches on wings and black band (s) across breast. Female has single breast-band (double in male). Iris brown. Bill brownish black. Legs feet and claws brownish-black.

Distribution: Throughout India.

Elsewhere: Nepal, Bhutan, Pakistan, Bangladesh, Afghanistan, Myanmar, Vietnam and Thailand.

Status: Widespread resident.

Habit and Habitat: Seen near still fresh waters, slow-moving rivers and streams, also tidal creeks and pools. Food mainly fish, frogs and aquatic insects.

Remarks: Keeps singly or in pairs.

37. Family MEROPIDAE : BEE-EATERS

142. *Merops orientalis* Latham, 1801 - Small Bee-eater

1952. *Merops orientalis* Latham, *Index Orn., Suppl.*, : xxxiii Type locality: India: Pondicherry.

1987. *Merops orientalis orientalis* Latham, Ali and Ripley Compact Hand Book No. 750 (4): 109-111.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 21 cm. A slender grass green bird with reddish brown on head and hind neck, central pair of tail feathers projecting as blunt pins beyond tail. Iris crimson. Bill black, long, slender, curved. Legs and feet yellowish brown. Sexes alike.

Distribution: Throughout India.

Elsewhere: Nepal and Bhutan.

Status: Resident.

Habit and Habitat: Seen perching on telephone wires or electric poles near open country interspersed with light forest and cultivation, less tied up with the presence of water, ponds and jheels. Food consists mainly of insects especially bees, wasp and dragonflies.

Remarks: Keeps in small flock of 2-6 at a time or more.

143. *Merops persicus* Pallas, 1773 - Blue-cheeked Bee-eater

1773. *Merops persicas* Pallas, *Reise Russ Reich*, 2: 708 Type-locality: Shores of Caspian Sea.

1987. *Merops superciliosus persicus* Pallas, Ali and Ripley Compact Hand Book No. 747 (4): 104-106.

Observation localities: Khijadiya Dhunvav and Khijadiya Jambuda Lake

Field identification characters: Size of about 31 cm. Bright green with slender slightly curved, horny, black bill and projecting pin feathers in the tail. A pale chestnut patch on throat, a broad black streak from base of bill backward through eye to ear-coverts and conspicuous white and blue-green cheek-patch below it. Iris reddish brown to deep crimson. Legs and feet dark brown. Sexes alike.

Distribution: Rajasthan, Gujarat, Punjab, Delhi.

Elsewhere: Pakistan, Palestine, Iran, Transcaspia and W. Turkestan, south to Egypt, Iraq, Arabia, Nile Valley, Africa.

Status: Resident as well as Migratory.

Habit and Habitat: Seen near water, jheels and tanks and sandy sea-shores. Food consists mainly of insects mainly bees, wasp and dragonflies.

Remarks: Generally keeps in pairs or small flocks.

38. Family CORACIIDAE : ROLLERS

144. *Coracias garrulus* Linnaeus, 1758 - European Roller

1902. *Coracias garrulus semenowi* Loudon and Tschudi, 1902, *Orn. Jahrb.*, 13: 148 Type-locality: Transcaspia.
1987. *Coracias garrulus semenowi* Loudon and Tschudi, Ali and Ripley Compact Hand Book No. 754 (4): 114-116.

Observation localities: Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 31 cm. A brightly coloured bird, blue and brownish rufous above, breast and underparts uniformly light blue, big head and stout black bill. Iris pale brown to hazel brown. Legs and feet dull yellow. Sexes alike.

Distribution: Kashmir, Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Mysore.

Elsewhere: Baluchistan, Pakistan, Arabia, Africa, Transcaspia, Turkestan and western Tien Shan south to Iran.

Status: Migratory.

Habit and Habitat: Seen perched on a low branch or telegraph wires near open cultivation, gardens, groves of mango and other trees, light deciduous forest. Food consists of mainly insects, frogs and lizards.

Remarks: Generally sighted singly.

145. *Coracias benghalensis* (Linnaeus, 1758) - Indian Roller

1758. *Corvus benghalensis* Linnaeus, *Syst. Nat.*, ed. 10, 1: 106.
1987. *Coracias benghalensis benghalensis* (Linnaeus), Ali and Ripley Compact Hand Book No. 755 (4): 116-119.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 31 cm. A striking blue bird with big head, crow-like beak, rufous-brown coloured breast and pale blue abdomen and vent. Iris brown. Bill brownish black. Legs and feet dirty brownish yellow. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Bhutan, Nepal, Eastern Arabia, Iran and Iraq.

Status: Resident.

Habit and Habitat: Seen perched on a low branch or telephone wires near open cultivation, gardens, groves of mango and other trees, light deciduous forest. Food consists mainly of insects, frogs, lizards and rodents.

Remarks: Sighted singly or in pairs.

39. Family UPUPIDAE : HOOPOES

146. *Upupa epops* Linnaeus, 1758 - Common Hoopoe

1758. *Upupa epops* Linnaeus, *Syst. Nat.*, ed. 10, 1: 117. Type-locality: Sweden.

1987. *Upupa epops epops* Linnaeus, Ali and Ripley Compact Hand Book No. 763 (4): 124-127.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 31 cm. A typical fawn coloured bird with black and white zebra markings on back, wings and tail. A black tipped crest present. Iris brown. Bill long slender gently decurved. Legs and feet brownish-grey. Sexes alike.

Distribution: Kashmir, Punjab, Ladakh, Himachal Pradesh, Uttar Pradesh, Rajasthan, Gujarat, Madhya Pradesh and Bihar.

Elsewhere: Africa, Arabia. Breeds in Europe and Asia, Africa, Palestine, Iraq, Iran, Atlai, Mediterranean islands and England.

Status: Resident and also summer migratory.

Habit and Habitat: Seen near open country, cultivation, light forest, habitations, and deciduous biotope. Food consists mainly of insects.

Remarks: Keeps singly or in pairs.

XVII Order PICIFORMES

40. Family CAPITONIDAE : BARBETS

147. *Megalaima haemacephala* (P.L.S. Muller, 1776) - Coppersmith Barbet

1788. *Bucco indicus* Latham, *Index Orn.*, 1(1): 205. Type-locality: India.

1987. *Megalaima haemacephala indica* (Latham), Ali and Ripley Compact Hand Book No. 792 (4): 163-165.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 17 cm. A small grass-green barbet with yellow throat, crimson breast and fore-head and green-streaked yellowish underparts. Iris brown, eyelids coral-red. Bill dark horny, brownish-black. Legs and feet coral-red with black claws. Sexes alike.

Distribution: Throughout India. Gujarat: Amreli, Ajwa, Bodeli, Dabka (Baroda), Cambay, Deesa (Palanpur), Rajpipla, Surat and Kutch.

Elsewhere: Pakistan, Bangladesh, Nepal, Bhutan, Southern Yunnan, northern Malaya, Thailand, China, Philippines and Indonesian islands.

Status: Resident with local migratory movements.

Habit and Habitat: Woody country side, roadsides groves of trees near villages and cultivation and in urban gardens and compounds. Food consists mainly of drupes and berries of banyan, peepul and other wild figs. Sometimes feeds on moths and flying termites.

Remarks: It is a new record. Sub-species *Megalaima haemacephala indica* (Latham) reported from the study area. Generally seen singly or in pairs.

41. Family PICIDAE : WOODPECKERS

148. *Dinopium benghalense* (Linnaeus, 1758) - Lesser Golden-backed Woodpecker

1758. *Picus benghalense* Linnaeus, *Syst. Nat.*, ed. 10, 1: 113. Type-locality: Benghala=Chandernagor=W. Bengal, India.

1987. *Dinopium benghalense benghalense* (Linnaeus), Ali and Ripley Compact Hand Book No. 819 (4): 197-199.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 29 cm. Male golden yellow and black with crown and occipital crest crimson above and white streaked with black from below. Chin, throat and sides head black, finely streaked and stippled with white. Female similar to male but with fore crown black, stippled with white like the throat and only the occipital crest crimson. Iris reddish brown. Bill horny black. Legs and feet greyish.

Distribution: Throughout India. Gujarat: Baroda, Cambay, Mahesana, Palanpur, Rajpipla, Surat, Bhavnagar and Junagadh: Sasan Gir.

Elsewhere: Pakistan, Bangladesh, Nepal, Bhutan and Sri-Lanka.

Status: Resident with local movements based on the availability of food and nesting sites.

Habit and Habitat: Seen near wooded areas, light forest, groves of trees. Food consists mainly of insects and their larvae.

Remarks: It is a new record. Keeps in pairs.

XVIII Order PASSERIFORMES

42. Family PITTIDAE : PITTAS

149. *Pitta brachyura* (Linnaeus, 1766) Indian Pitta

1766. *Corvus brachyurus* Linnaeus, *Syst. Nat.*, ed. 12, 1: 158. Type-locality: Moluccas=Ceylon).

1987. *Pitta brachyura brachyura* (Linnaeus), Ali and Ripley Compact Hand Book No. 867 (4): 252-253.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size of about 19 cm. A dark green, bright blue, black and white coloured bird with crimson-pink abdomen, vent and under tail-coverts. Breast and abdomen buff coloured and under wing-coverts with a large white patch conspicuous in flight. Iris brown. Bill brown with orange tinge. Legs and feet pinkish flesh colour. Sexes alike.

Distribution: Throughout India. Gujarat: Junagadh: Sasan Gir.

Elsewhere: Pakistan, Bangladesh and Sri Lanka.

Status: Resident with seasonal migration.

Habit and Habitat: Seen in scrub forest, semi-cultivation and patches of light deciduous and evergreen forest. Food consists mainly of insects, grubs and worms.

Remarks: It is a new record. Sub-species *Pitta brachyura brachyura* (Linnaeus) reported from the study area. Keeps in pairs.

43. Family ALAUDIDAE : LARKS

150. *Eremopterix nigriceps* (Gould, 1839) - Black-crowned Sparrow-Lark

1867. *Pyrhulauda affinis* Blyth, *Ibis* : 185 Type-locality: Madras.

1987. *Eremopterix nigricep affinis* (Blyth), Ali and Ripley Compact Hand Book No. 879 (5): 10-12.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 13 cm. Male has brownish-black crown, nape and underparts. Female has stout bill, rather uniform head and upper-parts and dark grey underwing-coverts; probably inseparable from female. Ashy-crowned. Iris brown. Bill pale horny. Legs and feet pale whitish-brown.

Distribution: NW India, Punjab, Haryana, Rajasthan and Gujarat.

Elsewhere: Pakistan, Baluchistan, S. Iraq, Arabia, Somalia, Ethiopia, Egypt and Sudan.

Status: Resident.

Habit and Habitat: Seen near sandy deserts. Food consists mainly of insects, grass and weed seeds.

Remarks: Keep in scattered groups.

151. *Eremopterix grisea* (Scopoli, 1786) - Ashy-crowned Sparrow-Lark

1786. *Alauda grisea* Scopoli, Del. *Flor. et. Fauna. Insubr.*, 2: 95. Type-locality: Gingee, S. Arcot Dist., India.

1987. *Eremopterix grisea* (Scopoli), Ali and Ripley Compact Hand Book No. 878 (5): 9-10.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 13 cm. A small thick billed lark without crest. Male has grey crown and nape and brownish-black under-parts. Female has stout greyish bill, rather uniform head and upperparts and dark grey underwing-coverts; probably inseparable from female black-crowned. Iris yellowish-brown. Bill pale horny grey. Legs and feet brownish.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh and Sri Lanka.

Status: Resident.

Habit and Habitat: Seen near open dry scrub and dry cultivation. Food consists mainly of insects, grass and weed seeds.

Remarks: Sighted in pairs or small parties or flocks of 50 or more.

152. *Ammomanes phoenicurus* (Franklin, 1831) - Rufous-tailed Finch-Lark

1831 *Mirafrja phoenicura* Franklin, *Proc. Zool. Soc. London*: 19.

1987. *Ammomanes phoenicurus phoenicurus* (Franklin), Ali and Ripley Compact Hand Book No. 882 (5): 14-16.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 16 cm. Dusky grey-brown upperparts, rufous-orange underparts, prominent dark streaking on throat and breast and rufous orange uppertail-coverts and tail, with dark terminal bar. Iris hazel brown. Bill horny brown. Legs and feet brown. Sexes alike.

Distribution: Throughout India.

Elsewhere: N. Pakistan and S. Nepal.

Status: Resident.

Habit and Habitat: Cultivation, open dry scrub. Food consists of mainly insects, grass and weed seeds.

Remarks: Congregate in large flocks on dry gravel bed of the lake.

153. *Calandrella brachydactyla* (Leisler, 1814) - Greater Short-toed Lark

1832. *Alauda dukhumensis* Sykes, *Proc. Zool. Soc.*, London: 93. Type-locality: Dukhun.

1987. *Calandrella cinerea dukhumensis* (Sykes), Ali and Ripley Compact Hand Book No. 886 (5): 21-22.

Observation localities: Khijadiya Village side, Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 15 cm. More rufescent-brown above and on flanks, buffish underparts, pale supercilium, tail blackish with two outer pairs of feathers white. Iris brown. Bill horny brown. Legs and feet fleshy brown. Sexes alike.

Distribution: Throughout India. Breeds in Ladakh.

Elsewhere: Pakistan and Tibet.

Status: A winter visitor.

Habit and Habitat: Gregarious. Seen near open stony grass-lands, cultivated fields and dry mudflats in coastal areas. Food consists of mainly grass and weed seeds, insects and molluscs.

Remarks: Keeps in groups of 12-20 birds.

154. *Galerida cristata* (Linnaeus, 1758) - Common Crested Lark

1831. *Alauda chendoola* Franklin, *Proc. Zool. Soc.* London: 119.

1987. *Galerida cristata chendoola* (Franklin), Ali and Ripley Compact Hand Book No. 899 (5): 37-39.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav.

Field identification characters: Size of about 18 cm. Large size with very prominent crest, sandy upperpart and well-streaked breast; broad, rounded wings, rufous-buff underwing-coverts and outer tail feathers. Iris brown. Bill horny greyish-white. Legs and feet brownish. Sexes alike.

Distribution: Kashmir, Punjab, Haryana, Delhi, Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan and Gujarat.

Elsewhere: Nepal and Pakistan.

Status: Resident.

Habit and Habitat: Seen near desert, semi-desert, dry cultivation and coastal mudflats. Food consists of mainly grains, weed seeds and insects.

Remarks: Sighted in pairs or small flocks of 4-12.

155. *Alauda gulgula* Franklin, 1831 - Eastern Skylark1831. *Alauda gulgula* Franklin, *Proc. Zool. Soc. London*: 119.1987. *Alauda gulgula gulgula* Franklin, Ali and Ripley Compact Hand Book No. 907 (5): 46-48.**Observation localities:** Khijadiya Dhunvav.

Field identification characters: Size about 16 cm. Variable in colouration and prominence of streaking on upperparts and underparts. Buffish-white outer tail feathers and indistinct rufous wing panel. Variation in races seen. Iris brown. Bill upper mandible horny brown, lower pink. Legs, feet and claws light brown. Sexes alike.

Distribution: Peninsular India, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Madhya Pradesh, Orissa, Bihar, West Bengal and Assam.

Elsewhere: Sri Lanka, Nepal, Bangladesh and Myanmar.

Status: Migratory with local movements.

Habit and Habitat: Seen near grassland, cultivation and coastal mudflats. Food consists mainly of weed seeds, root bulbs and insects.

Remarks: Sighted in pairs or small flocks of 4-6 birds at a time.

44. Family HIRUNDINIDAE : SWALLOWS

156. *Hirundo rustica* Linnaeus, 1758 - Common Swallow1758. *Hirundo rustica* Linnaeus *Syst. Nat.*, ed. 10, 1: 191. Type-locality: Sweden.1987. *Hirundo rustica rustica* Linnaeus, Ali and Ripley Compact Hand Book No. 916 (5): 57-60.**Observation localities:** Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 18 cm. Glossy-blue above, pale pinkish from below with deeply forked tail. Forehead, chin and throat chestnut. Iris dark brown. Bill, legs and feet black. Sexes alike.

Distribution: Throughout India. Breeds in Ladakh, Kashmir, Himachal Pradesh, Garhwal and Kumaon.

Elsewhere: Pakistan, Nepal, Bangladesh, Sri Lanka, Europe and Western Asia. Also breeds in Baluchistan and Nepal.

Status: Winter visitor.

Habit and Habitat: Gregarious. Seen near cultivation, habitation, lakes and rivers. Food consists mainly of insects.

Remarks: Fly in flocks and seen perching in 12-20 on electric wires.

157. *Hirundo tahitica* Gmelin, 1789 - House Swallow

1844. *Hirundo domicola* Jerdon, *Madras Jour. Lit. Sci.*, 13: 173. Type-locality: Nilgiri Hills.

1987. *Hirundo tachitica domicola* Jerdon, Ali and Ripley Compact Hand Book No. 919 (5): 61-62.

Observation localities: Khijadiya Village side and Khijadiya Jambuda Lake.

Field identification characters: Size of about 13 cm. Forehead chestnut, rest of upper parts black with metallic green gloss, rufous throat, breast-band absent, dingy underparts and underwing-coverts and blackish under-tail coverts with whitish fringes, tail-streamers absent. Iris brown. Bill brownish black. Legs and feet horny brown. Sexes alike.

Distribution: SW Indian hills, Andamans.

Elsewhere: Sri Lanka.

Status: Resident.

Habit and Habitat: Sedentary. Seen near grassy hills, rivers and habitation. Food consists mainly of insects.

Remarks: Keeps in small flocks.

158. *Hirundo smithii* Leach, 1818 - Wire-tailed Swallow

1825. *Hirundo (irundo) filifera* Stephens in *Shaw's Gen. Zool.*, 13: 78. Type-locality: India, ex Latham.

1987. *Hirundo smithii filifera* Stephens Ali and Ripley Compact Hand Book No. 921 (5): 63-64.

Observation localities: Khijadiya Village side and Khijadiya Jambuda Lake.

Field identification characters: Size of about 14 cm. Glossy steelic blue above with chestnut crown, glistening white underparts and underwing-coverts and fine filamentous projections to outer tail feathers (often broken or difficult to see). Juvenile has brownish cast to blue upperparts and dull brownish crown. Iris brown. Bill blackish-brown. Legs and feet blackish brown. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Bhutan, Baluchistan, Russia, Turkestan, Afghanistan, Myanmar, N. Thailand, Laos and central Vietnam.

Status: Widespread resident.

Habit and Habitat: Open country and cultivation near fresh waters. Food consists mainly of insects.

Remarks: Seen perching on electric wires and low branches of *P. chilensis* hanging over water in flocks of 2-10

45. Family MOTACILLIDAE : WAGTAILS

159. *Motacilla alba* Linnaeus, 1758 - White Wagtail

1832. *Motacilla dukhunensis* Sykes, *Proc. Zool. Soc. London*: 91. Type-locality: Dukhun.
1987. *Motacilla alba dukhunensis* Sykes, Ali and Ripley Compact Hand Book No. 1885 (9): 288-291.
1987. *Motacilla alba personata* Gould, Ali and Ripley Compact Hand Book No. 1886 (9): 291-292.
1987. *Motacilla alba alboides* Hodgson, Ali and Ripley Compact Hand Book No. 1887 (9): 292-293.

Observation localities: Khijadiya Dhunvav and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 18 cm. Black, white and grey bird with a long tail which it constantly wags up and down. Plumage colour variable. Non-breeding and first winter mantle colour generally grey. Iris brownish-black. Legs and feet brownish-black. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Afghanistan, Turkestan, Sri Lanka, Eurasia from the Chukchi Peninsula, Japan and China west to Morocco, the British Isles and Iceland and winters from the southern parts of the breeding range south to the Congo, Kenya, Arabia, China and the Philippines. Breeds in Siberia, Tibet, Afghanistan and Turkestan.

Status: Winter visitor and Resident.

Habit and Habitat: Seen near open country in the vicinity of rivers, streams, tanks, flooded lawns and open grounds. Food consists mainly of insects, molluscs and oat grains.

Remarks: Keeps in flocks of 6-18. Subspecies

160. *Motacilla maderaspatensis* Gmelin, 1789 - Large Pied Wagtail

1789. (*Motacilla*) *maderaspatensis* Gmelin, *Syst. Nat.*, 1: 961.
1987. *Motacilla maderaspatensis* Gmelin, Ali and Ripley Compact Hand Book No. 1891 (9): 296-298.

Observation localities: Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 21 cm. A large black-white wagtail. Black from above with a white supercilium from lores to nape and a large white band on wing. Throat and breast from below black, rest of underparts white. Iris dark brown. Bill black. Legs and feet blackish. Sexes alike but females duller.

Distribution: Throughout India.

Elsewhere: Bangladesh and Sri Lanka.

Status: Common resident.

Habit and Habitat: Seen near aquatic habitats. Food consists mainly of insects.

Remarks: Sighted in flocks of 4-8 birds.

161. *Motacilla citreola* Pallas, 1776 - Citrine Wagtail

1776. *Motacilla citreola* Pallas, *Reise Russ. Reichs*, 3: 696 Type-locality: Siberia.

1987. *Motacilla citreola citreola* Pallas, Ali and Ripley Compact Hand Book No. 1881 (9): 282-283.

1987. *Motacilla citreola calcarata* Hodgson, Ali and Ripley Compact Hand Book No. 1883 (9): 284-285.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size of about 17 cm. Head rich lemon-yellow above, back grey. First winter has grey upperparts, supercilium white to yellow which continues around ear coverts. Iris very dark brown. Bill, legs and feet black. Sexes more or less alike.

Distribution: Throughout India.

Elsewhere: Afghanistan, Pakistan, Baluchistan, Iran, Myanmar, Tibet, China and Bangladesh. Breeds in Siberia from the Pechora River east to the Khatanga River and south to Transbaikalia, Iran, Tibet and Mongolia.

Status: Winter visitor and Resident.

Habit and Habitat: Seen near sedges and grassy margins of lakes, streams, water-meadows, bogs, marshes and irrigated ploughed land. Food consists mainly of insects and small molluscs.

Remarks: Keeps in flocks of 4-8 birds.

162. *Motacilla flava* Linnaeus, 1758 - Yellow Wagtail

1863. *Budytes taivana* Swinhoe, *Proc. Zool. Soc. London*: 274, 334 Type-locality: Formosa.

1987. *Motacilla flava beema* (Sykes), Ali and Ripley Compact Hand Book No. 1876 (9): 278-279.

1987. *Motacilla flava lutea* (Gmelin), Ali and Ripley Compact Hand Book No. 1877 (9): 279-280.

1987. *Motacilla flava melanogrisea* (Homeyer), Ali and Ripley Compact Hand Book No. 1878 (9): 280.

1987. *Motacilla flava taiva* (Swinhoe), Ali and Ripley Compact Hand Book No. 1880 (9): 281.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 17 cm. Yellowish bird with broad yellow supercilium. Head colour varies from grey to black or yellow. Deep yellow from below. First winter plumage brownish with yellowish white underparts with narrow supercilium which does not continue around ear-coverts. Iris brown. Bill horny pale brown. Legs, feet and claws blackish brown, Sexes alike.

Distribution: Throughout India.

Elsewhere: Winters in Bangladesh, Taiwan, China, Malaysia, Indonesia, Africa. Breeds in Siberia, Sakhalin Islands, Central Palaerctic and Mongolia.

Status: Winter vagarant and Resident.

Habit and Habitat: Seen foraging on grassy ground especially along aquatic habitat. Food consists mainly of insects.

Remarks: Keeps singly or in small flocks of 2-8 birds.

163. *Motacilla cinerea* Tunstall, 1771 - Grey Wagtail

1771. *Motacilla cinerea* Tunstall, *Orn. Brit.*,: 2. Type-locality: England.

1987. *Motacilla caspica caspica* (Gmelin), Ali and Ripley Compact Hand Book No. 1884 (9): 285-288.

Observation localities: Khijadiya Dhunvav, Salt Marsh and Creeks and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 17 cm. Head and back grey above with white supercilium in summer males. Upper tail coverts greenish yellow. Wings dark brown with whitish margins to tertials seen as a prominent V mark on back. Throat black from below with a white malar streak. Rest of under parts bright yellow. Tail blackish-brown with outer edges white. Male in winter buffish and with indistinct V mark. Females buffish with paler underparts. Iris brown. Bill horny grey. Legs and feet brownish flesh.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Baluchistan, Nepal, Bhutan, Sri Lanka, Bangladesh, Mediterranean region, Africa south to Congo and Kenya, the Middle East, Turkestan, Taiwan, China, Indonesia including west Irian and Philippines. Breeds in mountainous regions of the Palaearctic from Kamchatka, Japan, Kansu and probably Szechuan west to the British Isles and Morocco.

Status: Winter visitor.

Habit and Habitat: Seen near mountain streams with rocky banks and boulders, rocky pools in dry stony river beds. Food consists mainly of insects.

Remarks: Keeps singly or in small flocks of 2-4 birds.

46. Family CAMPEPHAGIDAE : WOOD SHRIKE

164. *Tephrodornis pondicerianus* (Gmelin, 1789) - Common Woodshrike

1789. *Muscicapa pondiceriana* Gmelin, *Syst. Nat.*, 1: 939. Type-locality: Coromandel.
1987. *Tephrodornis pondicerinus pallidus* Ticehurst, Ali and Ripley Compact Hand Book No. 1069 (6): 10-11.
1987. *Tephrodornis pondicerinus pondicerinus* (Gmelin), Ali and Ripley Compact Hand Book No. 1070 (6): 11-12.

Observation localities: Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size about 16 cm. Smaller than large wood shrike, ashy brown, with broad white supercilium and white tail sides. Iris greenish brown, bill horny brown, legs and feet bluish. Sexes alike female with eye-streak paler.

Distribution: Throughout India.

Elsewhere: Nepal, Pakistan, Sri Lanka and Thailand.

Status: Resident.

Habit and Habitat: Seen near open broadleaved forest, secondary growth, gardens and well-wooded areas. Food consists mainly of insects and spiders.

Remarks: Keeps singly or in pairs.

47. Family PYCNONOTIDAE : BULBULS

165. *Pycnonotus leucotis* (Gould, 1836) - White-eared Bulbul

1836. *Ixos leucotis* Gould, 1836. *Proc. Zool. Soc. London*: 6 Type-locality: Karachi, Sind.
1987. *Pycnonotus leucogenys leucotis* Gould, Ali and Ripley Compact Hand Book No. 1123 (6): 81-83.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake

Field identification characters: Size of about 20 cm. A grey brown-bird with crestless black head, black throat and a large white cheek-patch, tail dark brown tipped white. Iris brown. Bill black. Legs and feet bluish grey. Sexes alike.

Distribution: Punjab, Rajasthan, Uttar Pradesh, Madhya Pradesh and Gujarat.

Elsewhere: Afghanistan, Iran, Iraq, Saudi Arabia and Pakistan.

Status: Widespread Resident.

Habit and Habitat: Seen near semi-desert scrub, gardens and coastal mangroves. Food consists mainly of berries, insects and flower nectar.

Remarks: Keeps singly or in pairs.

166. *Pycnonotus cafer* (Linnaeus, 1766) - Red-vented Bulbul

1766. *Turdus cafer* Linnaeus *Syst. Nat.*, ed. 12, 1: 295. Type-locality: Cape of Good Hope=Pondichery fide Stresemann.

1987. *Pycnonotus humayuni* Deignan, Ali and Ripley Compact Hand Book No. 1127 (6): 86-87.

1987. *Pycnonotus cafer cafer* (Linnaeus), Ali and Ripley Compact Hand Book No. 1128 (6): 87-89.

Observation localities: Khijadiya Village side, Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 20 cm. A brown bird with tufted black head, black throat and scale-like markings on back and breast. White rump, scarlet vent and white tipped blackish tail. Iris brown. Bill black. Legs and feet brownish-black. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Sri Lanka and Nepal.

Status: Resident.

Habit and Habitat: Seen near light scrub, gardens, secondary jungle and light deciduous forest wherever green patches occur. Food consists mainly of fruits and berries and insects.

Remarks: Keeps singly or in pairs and at times in small groups of 4-6 birds.

48. Family IRENIDAE : IORAS

167. *Aegithina tiphia* (Linnaeus, 1758) - Common Iora

1922. *Aegithina tiphia humei* Baker, *Fauna Brit. Ind.*, Bds., I: 342. Type-locality: Raipur, M.P.

1987. *Aegithina tiphia humei* Baker, Ali and Ripley Compact Hand Book No. 1099 (6): 50-52.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size of about 14 cm. Male black and yellow bird with two white wing bars across the wings. Female yellowish green with greenish brown wings instead of black with two wing bars. Iris pale yellow. Bill bluish. Legs and feet plumbeous.

Distribution: Throughout India with sub-species variation. Gujarat: Saurashtra, Baroda, Navsari, Palanpur, Rajpipla, Ahmedabad: Nalsarovar.

Status: Resident with erratic movements during non-breeding seasons.

Habit and Habitat: Seen near open forests, edges and scrub jungle. Food consists mainly of insects and spiders.

Remarks: It is a new record. Sub-species *Aegithina tiphia humei* recorded. Keeps in pairs with other hunting birds.

49. Family LANIIDAE : SHRIKES

168. *Lanius cristatus* Linnaeus, 1758 - Brown Shrike

1758. *Lanius cristatus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 93. Type-locality: Benghala.

1987. *Lanius cristatus cristatus* Linnaeus, Ali and Ripley Compact Hand Book No. 949 (5): 98-100.

Observation localities: Khijadiya Village side, Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 19 cm. Upperparts dark rufous-brown, forehead and supercilium white (lacking clear contrast between crown and mantle and between mantle and tail) also thicker bill and more graduated tail. Iris brown. Bill horny, brown, paler at gape and base of lower mandible. Legs and feet plumbeous or bluish grey. Sexes alike.

Distribution: Throughout India.

Elsewhere: Nepal, Bhutan, Bangladesh, Myanmar, Thailand, Malay Peninsula and China. Breeds in Siberia from Tomsk to the Kolyma R. and Kamchatka south to N. Mongolia and N. Amurland.

Status: Widespread winter visitor.

Habit and Habitat: Seen near open semi-desert country, sparse scrub jungle, edges of desert cultivation and thorn dry deciduous forest. Food consists mainly of insects, lizards and rodents.

Remarks: Generally keeps singly or widely separated pairs.

169. *Lanius vittatus* Valenciennes, 1826 - Bay-backed Shrike

1826. *Lanius vittatus* Valenciennes, *Dict. Sci. Nat. ed. Levrault*, 40: 227. Type-locality: Pondicherry.

1987. *Lanius vittatus vittatus* Valenciennes, Ali and Ripley Compact Hand Book No. 940 (5): 85-87.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 18 cm. Adult has black forehead and mask contrasting with pale grey crown and nape, deep maroon mantle, whitish rump and white patch at base of primaries. Juvenile told from juvenile long-tailed by smaller size and shorter tail, more uniform greyish/buffish base colour to upperparts pale rump and more intricately patterned wing-coverts and tertials (with buff fringes and dark subterminal crescents and central marks) and primary coverts are prominently tipped with buff. First year like washed out version of adult, lacks black forehead. Iris brown. Bill dark horny black. Legs and feet horny black. Sexes alike.

Distribution: Throughout India except Assam.

Elsewhere: Pakistan and Nepal.

Status: Widespread resident.

Habit and Habitat: Seen near open dry scrub, wooded and well-watered habitat and bushes in cultivation. Food consists mainly of insects, lizards, rodents and small birds.

Remarks: Generally keeps singly.

170. *Lanius meridionalis* Temminck, 1820 - Southern Grey Shrike

1832. *Collurio lahtora* Sykes, *Proc. Zool. Soc. London*: 86. Type-locality: Dukhun.

1987. *Lanius excubitor lahtora* (Sykes), Ali and Ripley Compact Hand Book No. 933 (5): 79-81.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 25 cm. Silver-grey in appearance with a broad black band from forehead and bill backward across eye to ear-coverts. Lacks black forehead and has pale grey mantle. Wings black with broad white band at base of secondaries, white rump. Iris dark brown. Bill hooked, horny black. Legs and feet blackish-brown. Sexes alike.

Distribution: Mainly distributed in India in Punjab, Rajasthan, Gujarat, Bombay Deccan south to Mysore, Madhya Pradesh, Maharashtra, Andhra Pradesh, Bihar, W. Bengal and Tamil Nadu.

Elsewhere: Pakistan, Baluchistan and Bangladesh.

Status: Resident and Vagrant Migrant.

Habit and Habitat: Seen near open semi-desert country, sparse scrub jungle, edges of desert cultivation and thorn dry deciduous forest. Food consists mainly of insects, lizards and rodents.

Remarks: Keeps singly or in widely separated pairs.

50. Family MUSCICAPIDAE

1. Subfamily TURDINAE : ROBINS and WHEATERS

171. *Luscinia svecica* (Linnaeus, 1758) - Bluethroat

1758. *Motacilla svecica* Linnaeus, *Syst. Nat.*, ed. 10, 1: 187. Type-locality: Sweden.

1987. *Erithacus svecicus svecicus* (Linnaeus), Ali and Ripley Compact Hand Book No. 1644 (8): 217-218.

1987. *Erithacus svecicus pallidogularis* (Zarudny), Ali and Ripley Compact Hand Book No. 1645 (8): 218-220.

Observation localities: Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 15 cm. White supercilium and rufous tail sides. Male has variable blue, black and rufous patterning to throat and breast (patterning obscured by whitish fringes in flesh plumage). Female is less brightly coloured but usually with blue and rufous breast-bands. First winter female may have just black submoustachial stripe and band of black spotting across breast. Iris brown. Bill, legs and feet blackish-brown.

Distribution: Himalayas, central and Coastal India.

Elsewhere: Iran, Bangladesh, Pakistan. Breeds in Eurasia from Scandinavia to Chukotsky Peninsula and western Alaska, southern Urals and Transcaspia to Kirghizstan and Tadzhikistan.

Status: Winter visitor. Widespread in winter.

Habit and Habitat: Seen in scrub vegetation and tall grass along streams. Food consists mainly of insects.

Remarks: Keeps singly. Rarely sighted.

172. *Copsychus saularis* (Linnaeus, 1758) - Oriental Magpie Robin

1758. *Gracula saularis* Linnaeus, *Syst. Nat.*, 1: 109. Type-locality: Asia=Bengal.

1987. *Copsychus saularis saularis* (Linnaeus) Ali and Ripley Compact Hand Book No. 1661 (8): 239-242.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 20 cm. A long-tailed black and white robin with white wing patch and glossy blue-black head from above. Tail black with white on sides. Throat and breast blue-black with rest of underparts white. Females slaty grey above and grey on throat and breast. Iris brown. Bill black. Legs and feet slaty brownish-black.

Distribution: Throughout India except Assam and extreme south including Andaman and Nicobar Islands.

Elsewhere: Pakistan and Nepal.

Status: Widespread resident.

Habit and Habitat: Seen near gardens, groves and open broad leaved forest and human habitation. Food consists of mainly insects, molluscs, annelids, centipedes and small lizards.

Remarks: Keeps singly or in pairs.

173. *Saxicoloides fulicata* (Linnaeus, 1776) - Indian Robin

1766. *Motacilla fulicata* Linnaeus, *Syst. Nat.* ed. 12: 336.

1790. *Sylvia cambaiensis* Latham, *Index, Orn.*, 2: 554. Type-locality: Guzerat, India

1987. *Saxicoloides fulicata cambaiensis* (Latham), Ali and Ripley Compact Hand Book No. 1717 (9): 60-62.

1987. *Saxicoloides fulicata fulicata* Linnaeus, Ali and Ripley Compact Hand Book No. 1720 (9): 62-64.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 19 cm. Male glossy black with white wing patch. Head and back brownish or glossy-black from above. Female brownish above without white wing patch, greyish underparts. Rusty-reddish vent and black tail in all plumages. Iris brown. Bill slender blackish. Legs and feet brownish-black.

Distribution: Northwestern India, Rajasthan, Gujarat, Uttar Pradesh, Bihar, Madhya Pradesh and Himalayan Foothills.

Elsewhere: Pakistan and Nepal.

Status: Resident.

Habit and Habitat: Seen with tail cocked-up in dry stony areas with scrub, lantana bushes, cultivation edges and human habitation. Food consists mainly of insects.

Remarks: Males of two sub-species have been seen one with upper parts of head brownish-grey (*cambaiensis*) and other with upper parts glossy black (*fulicata*). Sub-species *cambaiensis* was more abundant in comparison to sub-species *fulicata* which was occasionally sighted. Keeps in pairs.

174. *Phoenicurus ochruros* (Gmelin, 1774) - Black Redstart

1818. *Oenanthe rufiventris* Vieillot, *Nouv. Dict. d'Hist. Nat.*, nouv. ed., 21: 431.

1987. *Phoenicurus ochruros phoenicuroides* (Moore), Ali and Ripley Compact Hand Book No. 1671 (8): 253-255.

1987. *Phoenicurus ochruros rufiventris* (Vieillot), Ali and Ripley Compact Hand Book No. 1672 (8): 255-256.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 15 cm. Male has black or dark grey upperparts, black breast and rufous underparts. Female has dusky brown underparts with orange-buff wash to flanks and vent. Iris brown. Bill blackish brown; gape and mouth yellow. Legs and feet blackish-brown.

Distribution: Almost throughout India.

Elsewhere: Europe, China, Bhutan, Nepal, Bangladesh and Baluchistan. Breeds in Pakistan, Tibetan, Mountain and Himalayas.

Status: Migratory. Widespread in winter.

Habit and Habitat: Generally seen in scrub, stony ground, cultivation, gardens, meadows and plantations. In summers desolate rocky country and boulder-strewn ground above timber-line. Food mainly consists of insects especially beetles.

Remarks: Keeps singly with opposite pair nearby.

175. *Oenanthe xanthoprymna* (Hemprich and Ehrenberg, 1833) - Rufous-tailed Wheatear

1871. *Saxicola kingi* Hume, *Ibis*: 29 Type-locality-Jodhpur.

1987. *Oenanthe xanthoprymna kingi* (Hume), Ali and Ripley Compact Hand Book No. 1707 (9): 42-44.

Observation localities: Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 16 cm. Head and back pale grey from above, supercilium dull whitish-grey, rump rusty, central tail with a broad blackish-brown terminal band, upper tail coverts and base of tail paler, whitish pink from below. Iris dark brown. Bill, legs and feet black. Sexes alike.

Distribution: Rajasthan, Gujarat, Uttar Pradesh and Himachal Pradesh.

Elsewhere: Pakistan, Iraq and Armenia. Breeds in northern Afghanistan, north of Quetta.

Status: Winter visitor.

Habit and Habitat: Generally seen in semi-desert, flat, stony and sandy land with sparse *Capparis* and other xerophytic bushes, sand dunes on the edge of desert, rocky hillsides, arid rock slopes near aquatic habitat. Food consists of insects and seeds.

Remarks: Keeps singly.

176. *Oenanthe deserti* (Temminck, 1825) - Desert Wheeler

1825. *Saxicola deserti* Temminck, Pl. col. (60), pl. 359, fig. 2. Type-locality: Egypt.

1987. *Oenanthe deserti deserti* (Temminck), Ali and Ripley Compact Hand Book No. 1710 (9): 47-48.

Observation localities: Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 15 cm. Sandy-brown upperparts with largely black tail and contrasting white rump. Male has black throat (partly obscured when fresh). Female has blackish centres to wing-coverts and tertials in fresh plumage and largely black wings when worn.

Distribution: North and central Peninsular India, south to northern Maharashtra and Andhra Pradesh.

Elsewhere: Pakistan.

Status: Migratory. Winter visitor.

Habit and Habitat: Seen near semi-desert, canal irrigated desert cultivation. Breeds in NW Himalayas and on barren plateau winters in barren semi-desert. Food consists of insects and seeds.

Remarks: Keeps singly or in pairs.

177. *Oenanthe isabellina* (Temminck, 1829) - Isabelline Wheatear

1829. *Saxicola isabellina* Temminck, *Pl. Col.* (79), pl. 472, fig. 1. Type locality-Nubia, Africa.

1987. *Oenanthe isabellina* Temminck, Ali and Ripley Compact Hand Book No. 1706 (9): 40-42.

Observation localities: Khijadiya Dhunvav and Khijadiya Jambuda Lake

Field identification characters: Size of about 16 cm. Rather plain sandy-brown and buff with pale supercilium. Head and bill look rather large and legs long. Tail shorter with more white at base and sides. Iris dark brown. Bill legs and feet black. Sexes alike.

Distribution: Plains of north and northwestern India including N. Gujarat, Uttar Pradesh and Maharashtra.

Elsewhere: Pakistan, Baluchistan, Arabia, Africa, Tanzania and Maldives Islands. Breeds in Baluchistan, Turkey, Lake Baikal, Manchuria and Kansu.

Status: Migratory. Winter Visitor.

Habit and Habitat: Seen near sandy semi-desert, wastelands. Food consists of insects and seeds.

Remarks: Keeps singly or in pairs.

2. Subfamily TIMALIINAE : BABBLERS

178. *Turdoides caudatus* (Dumont, 1823) - Common Babbler

1823. *Cossyphus caudatus* Dumont, *dict. sci. nat.* (ed. Levrault) 29: 268. Type-locality: India.

1987. *Turdoides caudatus caudatus* (Dumont), Ali and Ripley Compact Hand Book No. 1254 (6): 215-216.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 23 cm. Adult brownish, dark streaked upper parts, cross-barred tail, unstreaked whitish throat and breast centre. Iris brown. Bill fleshy brown. Legs and feet are yellow. Sexes alike.

Distribution: Almost throughout India, unrecorded in most of N.E. and E. India.

Elsewhere: Pakistan and Sri Lanka.

Status: Widespread resident.

Habit and Habitat: Seen near dry thorn scrub, low bushes, grass clumps, gardens, cultivation, in plains and low hills. Food consists of insects, seeds and pollens.

Remarks: Keeps in flocks of 6-20 birds.

179. *Turdoides malcolmi* (Sykes, 1832) - Large Grey Babbler

1832. *Timalia malcolmi* Sykes, *Proc. Zool. Soc. London*: 88. Type-locality: Dukhun=Poona, India.

1987. *Turdoides malcolmi* (Sykes), Ali and Ripley Compact Hand Book No. 1258 (6): 220-222.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 28 cm. A large, pale grey babbler with darker grey mottling on upper parts and prominent white sides to tail, graduated tail, unmottled pinkish-grey throat and breast, pale grey forehead and dark grey lores. Sexes alike.

Distribution: Punjab, Uttar Pradesh, Rajasthan, Gujarat, peninsula to Tamil Nadu.

Elsewhere: Pakistan and W. Nepal.

Status: Resident.

Habit and Habitat: Gregarious. Seen near open dry scrub, gardens and cultivation. Food mainly insects, seeds and berries.

Remarks: Keeps in small parties of 5-12 birds.

180. *Turdoides striatus* (Dumont, 1823) - Jungle Babbler

1847. *Malacocircus orientalis* Jerdon, III. *Orn. text to pl.* 19. Type locality-Carnatic=Karnataka.

1920. *Crateropus terricolor sindianus* Ticehurst, *Bull. Brit. Orn. Cl.*, 40: 156. Type locality-Karachi, Sind.

1987. *Turdoides striatus sindianus* (Ticehurst), Ali and Ripley Compact Hand Book No. 1261 (6): 224-226.

1987. *Turdoides striatus orientalis* (Jerdon), Ali and Ripley Compact Hand Book No. 1262 (6): 226-228.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 25 cm. A stocky grey-brown to ashy-grey babbler with stout yellow bill, uniform tail, variable dark mottling and streaking on throat and breast. Iris white. Legs and feet dull yellow. Sexes alike.

Distribution: Most of Peninsula India, Punjab, Rajasthan, Gujarat, Madhya Pradesh and Himalayan foothills.

Elsewhere: Pakistan.

Status: Widespread resident.

Habit and Habitat: Gregarious. Seen near deciduous forest, cultivation, gardens and plantations. Food consists mainly of insects.

Remarks: Keeps in flocks of 6-12.

3. Subfamily SYLVIINAE : WARBLERS and PRINIAS

181. *Prinia gracilis* (Lichtenstein, 1823) - Graceful Prinia

1844. *P. (rinia) lepida* Blyth, *Jour. Asiat. Soc. Bengal*, 13: 376. Type-locality: Indus territories (=Sind).

1987. *Prinia gracilis lepida* Blyth, Ali and Ripley Compact Hand Book No. 1508 (6): 49-51.

Observation localities: Khijadiya Jambuda Lake.

Field identification characters: Size of about 13 cm. Pale brown above with streaked upperparts. Tail long graduated. Iris yellow to brown. Fine bill brownish in winter and black in summer. Legs and feet pale flesh. Sexes alike.

Distribution: Himalayan foothills, Rajasthan Gujarat, Punjab and Gangetic Plain east through Bihar.

Elsewhere: Pakistan, Baluchistan, Iran, Afghanistan, Egypt and Somalia.

Status: Resident.

Habit and Habitat: Seen near tall grass and sandy semi-desert scrublands especially by wetlands. Food consists of insects and vegetable matter.

Remarks: Keeps in pairs or small groups of 4-6.

182. *Acrocephalus dumetorum* Blyth, 1849 - Blyth's Reed-Warbler

1849. *Acrocephalus dumetorum* Blyth, *Jour. Asiat. Soc. Bengal.*, 18: 815. Type-locality: Calcutta, India.

1987. *Acrocephalus dumetorum* Blyth, Ali and Ripley Compact Hand Book No. 1556 (8): 109-111.

Observation localities: Khijadiya Village side, Khijadiya Lake and Khijadiya Dhunvav.

Field identification characters: Size of about 14 cm. Above olive brown to olive-grey with uniform wings. Supercilium indistinct barely apparent behind eye. Iris brown. Bill long, upper mandible grey-black, lower light brown. Legs feet and claws greyish. Sexes alike.

Distribution: Northwest India, the western Himalayas, Madhya Pradesh, Bihar, south through Peninsula to Kanyakumari, east to West Bengal, Assam, Nagaland and Manipur.

Elsewhere: Bhutan, Nepal, Sri Lanka, Bangladesh, Myanmar, Pakistan. Breeds in central Eurasia from Lake Baikal west to southern Finland and south to Iran.

Status: Widespread winter visitor and passage migrant.

Habit and Habitat: Seen near bushes and trees at edges of forest, cultivation and in wooded areas. Food consists of mainly insects.

Remarks: Keeps in group of 2-4 birds.

183. *Acrocephalus stentoreus* (Hemprich and Ehrenberg, 1833) - Indian Great Reed-Warbler

1839. *A. (grobates) brunnescens* Jerdon, *Madras Jour. Lit. Sci.* **10**: 269. Type-locality: Carnatic, near Trichinopoly.

1987. *Acrocephalus stentoreus brunnescens* Jerdon, Ali and Ripley Compact Hand Book No. **1550** (8): 101-104.

Observation localities: Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 19 cm. A plain olive-brown reed warbler with whitish supercilium, throat white from below. Iris brown. Upper mandible of bill blackish-brown, lower skin colour. Legs and feet brownish. Sexes alike.

Distribution: Kashmir, Punjab, Uttar Pradesh, Kerala, Bengal, Gujarat, Madhya Pradesh, Tamil Nadu and sporadically elsewhere in India.

Elsewhere: Pakistan, Baluchistan and Russia.

Status: Winter visitor.

Habit and Habitat: Found in reed beds and tall grasses around lakes, ponds and coastal swamps. Food consists mainly of insects.

Remarks: Keeps singly or in pairs.

184. *Orthotomus sutorius* (Pennant, 1769) - Common Tailorbird

1790. *Sylvia guzurata* Latham, *Index Orn.*,: 554. Type-locality: Guzerat=Gujarat, India.

1987. *Orthotomus sutorius guzuratus* (Latham), Ali and Ripley Compact Hand Book No. **1535** (8): 81-83.

Observation localities: Khijadiya Lake and Khijadiya Dhunvav.

Field identification characters: Size of about 13 cm. Adult with rufous forehead, greenish upperparts and whitish underparts including undertail-coverts. Bill pale downcurved, upper mandible of bill brown, lower dark flesh. Iris orange. Legs and feet brownish. Sexes alike.

Distribution: Throughout India except parts of the north east.

Elsewhere: Pakistan.

Status: Widespread resident.

Habit and Habitat: Seen near bushes in gardens, cultivation edges, orchards and forest edges. Food consists of mainly insects.

Remarks: Keeps singly or in pairs.

185. *Sylvia curruca* (Linnaeus, 1758) - Common Lesser Whitethroat

1933. *Sylvia curruca blythi* Ticehurst and Whistler, Ibis: 556. Type-locality-Cawnpore=Kanpur.

1987. *Sylvia curruca blythi* Ticehurst and Whistler, Ali and Ripley Compact Hand Book No. 1567 (8): 126-127.

Observation localities: Khijadiya Village side, Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size of about 12 cm. Brownish-grey upperparts, grey crown with darker ear-coverts, blackish bill and dark grey legs and feet. Iris pale yellowish brown. Bill bluish grey with black tip. Legs and feet dark brown.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Iran, Syria, Egypt, Sudan, South Arabia and Africa. The species ranges west to the British Isles. Breeds in central Siberia from Lake Baikal to the Ob River.

Status: Widespread winter visitor.

Habit and Habitat: Seen moving in low scrub forests and undergrowth. Food mainly consists of insects.

Remarks: Keeps singly.

186. *Sylvia hortensis* (Gmelin, 1789) - Orphean Warbler

1847. *C. (urruca) jerdoni* Blyth, Jour. Asiat. Soc. Bengal, 16: 439. Type-locality: Southern India.

1987. *Sylvia hortensis jerdoni* (Blyth), Ali and Ripley Compact Hand Book No. 1565 (8): 122-124.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 15 cm. Adult male with blackish crown, pale grey mantle, blackish tail and pale iris. Female with dark grey cap, tail black white tipped outer feathers largely white and conspicuous in flight. Iris grey-white. Bill dark brown. Legs and feet olive-brown to grey.

Distribution: Indus valley, Punjab, Uttar Pradesh east and south Bihar, south through Deccan to Karnataka and Tamil Nadu. A common passage migrant to northwestern India and the western Himalayas.

Elsewhere: Baluchistan and Pakistan.

Status: Winter visitor and passage migrant.

Habit and Habitat: Seen near low bush covered hillsides, scrub and groves. Food consists mainly of insects, nectar and seeds.

Remarks: Keeps singly.

4. Subfamily MONARCHINAE : PARADISE FLYCATCHERS

187. *Terpsiphone paradisi* (Linnaeus, 1758) Asian Paradise-Flycatcher

1758. *Corvus paradisi* Linnaeus, *Syst. Nat.*, ed. 10, 1: 107.

1987. *Terpsiphone paradisi paradisi* (Linnaeus), Ali and Ripley Compact Hand Book No. 1461 (7): 218-220.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 20 cm. with streamers 50 cm. Male with black head and crest, white or rufous upperparts and long tail-streamers. Female with reduced crest and without streamers. Iris brown. Bill dark bluish grey. Legs and feet greyish.

Distribution: Indian peninsula from Kathiawar, western Rajasthan, Madhya Pradesh to southern peninsula to Kerala and east through lower West Bengal.

Elsewhere: Bangladesh.

Status: Widespread resident partly migrant.

Habit and Habitat: Usually seen near well watered and shady well-wooded areas, gardens and scrubs. Food consists of mainly insects.

Remarks: Keeps in pairs.

5. Subfamily RHIPIDURINAE : FAINTAIL-FLYCATCHERS

188. *Rhipidura aureola* Lesson, 1830 - White-browed Fantail-Flycatcher

1830. *Rhipidura aureola* Lesson *Trait? d'Orn.*,: 290 (Bengal).

1987. *Rhipidura aureola aureola* Lesson, Ali and Ripley Compact Hand Book No. 1451 (7): 207-210.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 17 cm. A smoky brown bird with broad white supercilium, forehead and white underparts. Crown and ear-coverts black. Back dark grey brown. Wings also dark grey-brown with two rows of white spots. Tail blackish, outer rectrices white, others except central pair tipped with white. Throat black from below, chin and sides of throat whitish. Iris dark brown. Bill, legs and feet brownish black.

Distribution: From Indus river east along the Himalayan foothills to lowlands east of the Brahmaputra. South in Sind to Karachi and through Gujarat to Madhya Pradesh, southwestern and central Maharashtra eastward to Orissa.

Elsewhere: Pakistan and Bangladesh.

Status: Widespread resident and subject to migratory movements in winter.

Habit and Habitat: Generally seen near open deciduous forest and secondary growth. Affects forest, groves of mango, babool, etc., tamarisks along canals, fallow land with sparse scattered bushes. Food consists mainly of insects.

Remarks: Keeps singly or in pairs.

51. Family PARIDAE : TITS

189. *Parus major* Linnaeus, 1758 - Great Tit

1939. *Parus major stupae* Koelz, *Biol. Soc. Washington*, **52**: 61. Type-locality: Sanchi, Bhopal.

1987. *Parus major stupae* Koelz, Ali and Ripley Compact Hand Book No. **1794** (9): 169.

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 13 cm. Crown black, cheeks white whitish patch on nape, back grey. Wings brown with a white wing bar. Throat black continued as a broad band down the middle of the underparts. Iris dark brown. Bill black. Legs and feet plumbeous. Sexes alike.

Distribution: Rajasthan, Gujarat: Palanpur, Rajpipla, Surat Dangs, Madhya Pradesh, Maharashtra, Karnataka, Andhra Pradesh and Tamil Nadu.

Status: Resident.

Habit and Habitat: Seen in deciduous forests, groves. Food consists of insects, seeds, flowers and berries.

Remarks: Sub-species *Parus major stupae* Koelz reported from the study area. It is a new record. Keeps singly.

52. Family DICAEDIDAE : FLOWERPECKERS

190. *Dicaeum agile* (Tickell, 1833) - Thick-billed Flowerpecker

1833. *Fringilla agilis* Tickell, *Jour. Asiat. Soc. Bengal*, **2**: 578. Type-locality: Borabhum and Dholbhum.

1987. *Dicaeum agile agile* (Tickell), Ali and Ripley Compact Hand Book No. **1892, 1894** (10): 2-4.

Observation localities: Khijadiya Lake.

Field identification characters: Small bird of about 9 cm. Bill short horny, breast grey above and below greyish-white with faint brown-streaks on breast. A narrow white terminal band on tail and rump green. Iris orange-brown. Bill horny grey. Legs and feet dark slate. Sexes alike.

Distribution: Almost throughout India. Gujarat: Ahmedabad: Nalsarovar, Mahesana, Rajpipla, Surat, Dangs, Junagadh: Sasan Gir.

Elsewhere: Myanmar, Bhutan, China, Malaysia, Lesser Sunda and Philippine islands.

Status: Resident and Migratory.

Habit and Habitat: Seen on large flowering or fruiting trees and shrubs. Dry to moist or semi-evergreen forest. Food consists mainly of figs of peepul and banyan.

Remarks: It is a new record. Subspecies *Dicaeum agile agile* (Tickell) is reported. It keeps singly or in pairs.

53. Family NECTARINIIDAE : SUNBIRDS

191. *Nectarinia asiatica* (Latham, 1790) - Purple Sunbird

1790. *Certhia asiatica* Latham, *Index Orn.*, 1: 288. Type-locality: Gurgaon, India.

1987. *Nectarinia asiatica asiatica* (Latham), Ali and Ripley Compact Hand Book No. 1917 (10): 35-38.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 10 cm. Male metallic purple. Female has uniform yellowish under parts with faint supercilium and darker mask. Eclipse male (non-breeding) similar to female with a black broad stripe running down the breast. Iris dark brown. Bill, legs and feet brownish black.

Distribution: Throughout India.

Elsewhere: Sri Lanka, Pakistan, Bangladesh and Nepal.

Status: Widespread resident with local migration.

Habit and Habitat: Generally seen near open deciduous forest, groves, scrub land and gardens. Food consists mainly of insects and spiders and largely flower nectar.

Remarks: Keeps in pairs. Subspecies *Nectarinia asiatica asiatica* (Latham) is reported.

54. Family ZOSTEROPIDAE : WHITE-EYES

192. *Zosterops palpebrosus* (Temminck, 1824) - Oriental White-eye

1824. *Sylvia palpebrosa* Temminck, *PL. Col. D'Ois.* 49, pl. 293, fig. 3 Type-locality: Bengale= W. Bengal, India.

1987. *Zosterops palpebrosus palpebrosus* Temminck, Ali and Ripley Compact Hand Book No. 1933 (10): 57-59.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 10 cm. Adult yellow olive above with a very distinct white eye-ring, lores and a patch under eye blackish. Throat and under tail coverts bright yellow from below, breast greyish white, belly whitish. Iris yellowish brown. Bill black. Legs and feet plumbeous grey to grey-brown. Sexes alike.

Distribution: Throughout India. Gujarat: Baroda, Mahesana, Palanpur, Rajpipla, Surat Dangs, Amreli, Ahmedabad: Nalsarovar.

Elsewhere: Myanmar, Tibet, Szechuan, Yunnan, China, Malaysia, Sunda Islands, Borneo, Pakistan, Bangladesh, Nepal and Laccadive Islands.

Status: Resident with local migration.

Habit and Habitat: Generally seen near forests, gardens, orchards, groves and mangroves. Food consists of insects, berries, seeds and nectar.

Remarks: It is a new record. Keeps in pairs. Subspecies *Zosterops palpebrosus palpebrosus* Temminck is recorded.

55. Family : EMBERIZIDAE

6. Subfamily EMBERIZINAE : BUNTINGS

193. *Emberiza buchanani* Blyth, 1845 - Grey-necked Bunting

1845. *Emberiza buchanani* Blyth, *Jour. Asiat. Soc. Bengal*, 13: 957 Type-locality: Indian Peninsula.
1987. *Emberiza buchanani buchanani* Blyth, Ali and Ripley Compact Hand Book No. 2050 (10): 219-221.

Observation localities: Khijadiya Lake and Khijadiya Dhunvav.

Field identification characters: Size of about 15 cm. Male with grey head, eye-ring white. Rest of upper part brown with darker streaks on back. Throat rufous from below with indistinct moustachial streak. Female similar but duller with more noticeable moustachial streaks. Iris brown. Bill pale brownish. Legs and feet brownish flesh.

Distribution: Western and Central India. Gujarat: Bhuj, Kutch, Baroda, Mahesana, Palanpur, Kodinar, Amreli, Jamnagar: Dwarka, Uttar Pradesh, Maharashtra, Andhra Pradesh and Karnataka.

Elsewhere: Pakistan and Afghanistan.

Status: Migratory. Winter visitor.

Habit and Habitat: Gregarious. Seen in stony sparsely scrubbed country. Food consists mainly of seeds.

Remarks: It is a new record. Subspecies *Emberiza buchanani buchanani* Blyth is reported. It keeps in pairs.

56. Family ESTRILDIDAE : MUNIAS

194. *Lonchura malabarica* (Linnaeus, 1758) - White-throated Munia

1758. *Loxia malabarica* Linnaeus, *Syst. Nat.*, ed. 10, 1: 175. Type-locality: India.

1987. *Lonchura malabarica malabarica* (Linnaeus), Ali and Ripley Compact Hand Book No. 1966 (10): 105-107.

Observation localities: Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake.

Field identification characters: Size about 10 cm. Adult has white rump and uppertail-coverts, black tail with elongated central feathers and rufous buff barring on flanks. Juvenile has buffish underparts, lacks flank barring and has shorter tail. Iris brownish black. Bill slaty blue or greyish black. Legs, feet and claws pale brownish or greyish pink. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Arabia, Africa, Pakistan, Bangladesh, Sri Lanka and Nepal.

Status: Resident.

Habit and Habitat: Gregarious usually seen in near dry cultivation, grassland and thorn scrub. Food consists of grasses seeds and small insects.

Remarks: Keeps in large flocks of 12-20 birds.

57. Family PASSERIDAE : SPARROWS and WEAVERS

7. Subfamily PASSERINAE : SPARROWS

195. *Passer domesticus* (Linnaeus, 1758) - House Sparrow

1835. *Passer indicus* Jardine and Selby, *Ill. Orn.* 3, pl. 118. Type-locality: India.

1987. *Passer domesticus indicus* Jardine and Selby, Ali and Ripley Compact Hand Book No. 1938 (10): 63-66.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt Marsh and Creeks, Khijadiya Salt works (Salt Pans).

Field identification characters: Size about 15 cm. Male has grey crown, black throat and upper breast, chestnut nape and brownish mantle. Female has buffish supercilium and unstreaked greyish-white under-parts. Iris brown. Bill in male dark brown, black in breeding; female with pale brown bill. Legs and feet brownish.

Distribution: Throughout India.

Elsewhere: Pakistan, Bangladesh, Baluchistan, Nepal, Sri Lanka, Arabia to Myanmar, South Africa, Zanzibar, Comoro and Mascarene islands, Mediterranean region to Lapland and east to Manchuria and the Amur region.

Status: Resident with local migration.

Habit and Habitat: Habitation, cultivation and forest edge. Food consists mainly of seeds and insects.

Remarks: Generally keeps in pairs and in flocks of 16-22.

196. *Petronia xanthocollis* (Burton, 1838) - Yellow-throated Sparrow

1838. *Fringilla xanthocollis* Burton, *Cat. Bds. Mus. Fort Pitt, Chatham*: 23. Type-locality: Baluchistan.

1987. *Petronia xanthocollis xanthocollis* (Burton), Ali and Ripley Compact Hand Book No. 1949 (10): 80-82.

Observation localities: Khijadiya Village side, Khijadiya Lake and Khijadiya Jambuda Lake.

Field identification characters: Size about 14 cm. Adult with unstreaked brownish-grey head and upperparts and prominent wing-bars. Male and some females have yellow on throat. Male with chestnut lesser coverts and white wing-bars; lesser coverts brown and wing-bars buff in female. Iris brown. Bill of breeding male black, bill in female and non-breeding male pale brown. Legs and feet greyish brown. Sexes more or less alike.

Distribution: Throughout India.

Elsewhere: Pakistan and Nepal.

Status: Resident with local migration.

Habit and Habitat: Gregarious. Seen near open dry forest, hedges, thorn scrub and trees at the edge of cultivation and riverside forest. Food consists mainly of seeds and insects.

Remarks: Keeps in flocks of 12-18 birds.

8. Subfamily PLOCEINAE : WEAVERS

197. *Ploceus philippinus* (Linnaeus, 1766) - Baya Weaver

1766. *Loxia Philippines* Linnaeus, *Syst. Nat.*, ed. 12, 1: 305. Type-locality: Philippines, error=Sri Lanka.

1987. *Ploceus philippinus philippinus* (Linnaeus), Ali and Ripley Compact Hand Book No. 1957 (10): 88-92.

Observation localities: Khijadiya Dhunvav.

Field identification characters: Size of about 15 cm. Male non-breeding similar to female but darker more boldly streaked above, supercilium and breast very pale yellow.

Male breeding with yellow crown, rest of upperparts dark brown streaked with yellow on back, throat and ear-coverts dark brown. Iris brown. Bill in breeding male very dark horny, in female and non-breeding male horny brown. Legs and feet also horny brown in male and comparatively paler in females.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Sri Lanka and Nepal.

Status: Common resident subject to seasonal movements.

Habit and Habitat: Gregarious. Seen near cultivation, paddy fields, grasslands and scrub with scattered trees and mangroves. Food mainly consists of seeds and insects.

Remarks: Keeps in flocks of 12-20 birds. Subspecies *Ploceus philippinus philippinus* (Linnaeus) is recorded.

58. Family STURNIDAE : MYNAS and STARLINGS

198. *Sturnus pagodarum* (Gmelin, 1789) - Brahminy Starling

1789. *Turdus pagodarum* Gmelin, *Syst. Nat.*, 1: 816.

1987. *Sturnus pagodarum* (Gmelin) Ali and Ripley Compact Hand Book No. 994 (5): 160-162.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 22 cm. Adult has black crest with glossy black forehead and rufous-orange sides of head and underparts. Bill yellow with blue base, blue or yellow skin behind eye. Iris bluish white. Legs, feet and claws, lemon-yellow. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Bangladesh and Sri Lanka.

Status: Widespread resident.

Habit and Habitat: Generally seen in dry, well-wooded areas, cultivated areas, grassland and thorn scrub. Food consists mainly of insects, fruits and nectar.

Remarks: Keeps in pairs.

199. *Sturnus roseus* (Linnaeus, 1758) - Rosy Starling

1758. *Turdus roseus* Linnaeus, *Syst. Nat.*, ed. 10, 1: 171. Type-locality: Lapland, Switzerland.

1987. *Sturnus roseus* (Linnaeus), Ali and Ripley Compact Hand Book No. 996 (5): 163-166.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav and Khijadiya Jambuda Lake.

Field identification characters: Size of about 23 cm. Identified easily due to its black and rosy pink colour. Adult has blackish head with shaggy crest, pinkish mantle and underparts and blue-green gloss to wings. In non-breeding and first winter plumage much duller than shown, pink of plumage partly obscured by buff fringes, black by greyish fringes. Juvenile mainly sandy-brown, with stout yellowing bill and broad pale fringes to wing feathers. Iris brown. Bill horny brown, yellow at gape and on basal half of lower mandible. Legs, feet and claws horny brown. Sexes alike.

Distribution: India eastward to Bihar, straggling into W. Bengal, Assam and southward throughout the Peninsula.

Elsewhere: Pakistan and Sri Lanka. Breeds in Europe and SW Asia.

Status: Migratory. Winter visitor to India.

Habit and Habitat: Semi-desert with low thorny vegetation, cultivation and damp grassland. Food consists of insects berries, flower-nectar, fruits and cereal grains.

Remarks: Keeps singly or in small flocks of 6-12 birds.

200. *Acridotheres tristis* (Linnaeus, 1766) - Common Myna

1766. *Paradisea tristis* Linnaeus, *Syst. Nat.*, ed. 12, 1: 167. Type-locality: Pondicherry, South India.

1987. *Acridotheres tristis tristis* (Linnaeus), Ali and Ripley Compact Hand Book No. 1006 (5): 177-180.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size about 23 cm. Adult dark brown with yellow orbital skin, glossy black head, a naked patch below and behind eye, white tail-tip. A large white patch on the wing conspicuous in flight. Juvenile duller. Iris brown or reddish mottled with white; orbital skin bright yellow. Bill yellowish, base of lower mandible brownish green. Legs, feet and claws yellow. Sexes alike.

Distribution: Throughout India.

Elsewhere: Pakistan, Nepal, Bhutan, Sri Lanka, Russia Turkestan, Afghanistan, SE Persian Baluchistan, Myanmar, peninsular Thailand, China, Australia, New Zealand, Hawaii, South Africa, Islands in the Indian Ocean, also in the Atlantic and Pacific.

Status: Resident.

Habit and Habitat: Found in reed beds, habitation and cultivation. Food mainly consists of fruit, grain, insects and grubs, refuse dump, small animals and flower nectar.

Remarks: Generally seen in pairs or small groups of 2-6 birds. Subspecies *Acridotheres tristis tristis* (Linnaeus) is reported. It is an important pollinator.

201. *Acridotheres ginginianus* (Latham, 1790) - Bank Myna

1790. *Turdus ginginianus* Latham *Index Orn.*, 1: 362. Type-locality: Gingee, South Arcot, Tamil Nadu.

1987. *Acridotheres ginginianus* (Latham), Ali and Ripley Compact Hand Book No. 1008 (5): 181-183.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 21 cm. Adult is bluish-grey with blackish cap. Orange-red orbital patch, orange-yellow bill and tufted forehead easily distinguish it from other mynas. Wing patch, underwing-coverts and tail-tip orange-buff. Juveniles duller and browner than adult. Iris orange-red. Legs, feet and claws yellow. Sexes alike.

Distribution: Widespread in Plains of northern and Central India from the Himalayas to Assam, from NW to W. Bengal, south to central Maharashtra and northern Orissa including Madhya Pradesh.

Elsewhere: Pakistan and Bangladesh.

Status: Resident.

Habit and Habitat: Gregarious in habit. Seen near cultivation, damp grassland and habitation. Food consists mainly of insects, fruit and flower nectar.

Remarks: Keeps in flocks of 6-10 birds.

59. Family ORIOLIDAE : ORIOLES

202. *Oriolus oriolus* (Linnaeus, 1758) - Eurasian Golden Oriole

1832. *Oriolus kundoo* Sykes, *Proc. Zool. London*: 87. Type-locality: Dukhun = Deccan, Peninsular India.

1987. *Oriolus oriolus kundoo* Sykes, Ali and Ripley Compact Hand Book No. 953 (5): 103-04

Observation localities: Khijadiya Lake.

Field identification characters: Size of about 25 cm. Adult male with golden-yellow body with glossy black wings and tail and a conspicuous black streak from lores through and behind eye. Adult female duller and greener yellow with underparts paler (whitish) and streaked with dull brown. Iris crimson. Bill flesh pink, horny brown. Legs and feet slaty blue.

Distribution: Almost throughout India. Gujarat: Kutch, Baroda, Mahesana, Surat Dangs, Amreli and Dhari.

Elsewhere: N. Baluchistan, Nepal, Bangladesh, Pakistan, Afghanistan, Pamirs, Tien Shan and Turkestan.

Status: Resident, varies with locality and season between resident with local movements, seasonal visitor, local and extralimital passage migrant.

Habit and Habitat: Open forest, groves, well-wooded country, deciduous and semi-evergreen forest and gardens with large trees, groves and orchards. Food consists mainly of insects and fruits.

Remarks: It is a new record. Keeps in pairs. Subspecies *Oriolus oriolus kundoo* Sykes is recorded.

60. Family DICRURIDAE : DRONGOS

203. *Dicrurus macrocercus* Vieillot, 1817 - Black Drongo

1817. *Dicrurus macrocercus* Vieillot, *Nouv. Dict. d' Hist. Nat., nouv. ed.*, 9: 588, based on 'Le Drongolon' of Levaillant. Type-locality: South Africa.

1987. *Dicrurus adsimilis macrocerus* Vieillot, Ali and Ripley Compact Hand Book No. 963 (5): 117-118.

Observation localities: Khijadiya Village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Salt Marsh and Creeks.

Field identification characters: Size of about 31 cm. Adult glossy blue-black with white rectal spot and deeply forked tail. Tail-fork may be lost during moult. First winter has black underparts with bold whitish fringes. Juveniles has uniform dark brown upperparts and underparts. Iris blood red to deep crimson. Bill, legs, feet and claws black. Sexes alike.

Distribution: Throughout peninsular India south of a line from Kachchh eastward through Madhya Pradesh, Orissa to southwest Bengal.

Status: Widespread resident with some seasonal migration.

Habit and Habitat: Open deciduous forest, around habitation and open cultivation. Food consists of mainly insects and lizards.

Remarks: Keeps in pairs.

61. Family CORVIDAE : CROWS

204. *Dendrocitta vagabunda* (Latham, 1790) - Indian Treepie

1790. *Coracias vagabunda* Latham, *Index Orn.* 1: 171. Type-locality: Galkund, Surat dangs, Gujarat.

1987. *Dendrocitta vagabunda pallid*, (Blyth), Ali and Ripley Compact Hand Book No. 1031 (5): 217-218.

1987. *Dendrocitta vagabunda vagabunda* Ali and Ripley Compact Hand Book No. 1032 (5): 218-220.

Observation localities: Khijadiya Lake and Khijadiya Dhunvav.

Field identification characters: Size of about 30 cm. Adult slaty-grey hood, buffish

underparts and rump, pale grey wing coverts and whitish subterminal tail-band. Juvenile has brown hood. Iris orange-brown to brownish-red. Bill dusky plumbeous. Legs and feet dusky plumbeous. Sexes alike.

Distribution: Almost throughout India.

Elsewhere: Pakistan, Nepal, Bangladesh, Myanmar, Thailand and China.

Status: Widespread resident.

Habit and Habitat: Open wooded country, garden with trees and bushes. Food mainly consists of insects.

Remarks: Keeps singly or in pairs.

205. *Corvus splendens* Vieillot, 1817 - House Crow

1817. *Corvus splendens* Vieillot, *Nouv. Dict. d' Hist. Nat.*, 8: 44. Type-locality: Bengal.

1987. *Corvus splendens splendens* Vieillot, Ali and Ripley Compact Hand Book No. 1049 (5): 244-247.

Observation localities: Khijadiya Village side, Khijadiya Dhunvav, Khijadiya Jambuda Lake and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 43 cm. Forehead, crown and throat glossy black with pale-grey nape, neck, upper breast and upper back. Iris brown. Bill black. Legs and feet black. Sexes alike.

Distribution: Throughout India.

Elsewhere: Myanmar, Zanzibar, Aden and Mauritius.

Status: Resident with seasonal migration in northern cold-winter areas.

Habit and Habitat: A good scavenger. Seen roosting on trees. Omnivorous. Food consists of nectar, grains, groundnuts, fruits, flower nectar, insects, eggs and young birds, lizards, rodents, fish and stale food *i.e.* practically everything.

Remarks: Pairs are seen together.

206. *Corvus macrorhynchos* Wagler, 1827 - Jungle Crow

1832. *Corvus culminates* Sykes, *Proc. Zool. Soc. London*: 96. Type-locality: Dukhun=Poona=Pune, Maharashtra.

1987. *Corvus macrorhynchos culminates* Sykes, Ali and Ripley Compact Hand Book No. 1057 (5): 256-258.

Observation localities: Khijadiya Village side, Khijadiya Jambuda Lake, and Khijadiya Salt works (Salt Pans).

Field identification characters: Size of about 48 cm. Adult entirely glossy black without pale collar of house crow and heavy black bill. Iris brown. Sexes alike.

Distribution: Almost throughout India except the arid zone of northwest India, the Himalayas and eastern India.

Elsewhere: Sri Lanka.

Status: Resident.

Habit and Habitat: Seen in deciduous forests, as a regular prowler of birds nests, human habitation, forest edges. Omnivorous, food consists of almost everything.

Remarks: Keeps singly or in pairs. Congregates only when feed on caracas.

RESULTS AND DISCUSSION

The Khijadiya Lake and Bird Sanctuary is a major bird congregating site and an important Bird area in Gujarat, India harbouring almost all categories of birds during certain period of time in a year. The diversity of species in such a small area is the result of high productive value of this ecosystem and multiplicity of various saline and fresh water niches. The wetland and wetland dependant species are represented by 43.72 percentages whereas passerines represents only 9.77 percentages as compared to India.

This wetland is known for the distinct presence of Indain Skimmer as they are found in sizeable numbers. The lake area gets inundated by large size birds such as pelicans, flamingos, storks, cranes and raptors which express their presence by occupying major area of the ecosystem. Among dabbling ducks the seasonal winter migrants are the major attraction of the wetland. Among passerines, the magnificent Asian Paradise-Flycatcher, Lesser Golden-backed Woodpecker, Common Iora, Great Tit, Thick-billed Flowerpecker, Oriental White-eye, Grey-necked Bunting and Eurasian Golden Oriole are some of the species inhabiting the woody and thickly planted forests and indicate that the environs of Khijadiya is rich in its biodiversity and can sustain very good population of avian fauna in times to come.

The juxta position of the Khijadiya with Marine National Park and Sanctuary in Gujarat is an advantage to the migrating population of aves in order to share and depend on the resources in terms of availability of food, roosting and nesting sites and material in this biotic province. They remain confined to this region irrespective of the fluctuation in the local abiotic conditions of the two protected areas. The abundance of food comprising of fishes, frogs, insects, molluscs, crabs, crustaceans, soil arthropods, rodents and birds besides seeds, berries, nectar of flowers forms a complex but rich food web and chain to different feeding guilds of avian diversity. It is an important priority site for conservation of bird fauna in India and need urgent and special attention so that it can be declared as first Ramsar site in Gujarat state.

A total of 206 species of birds are recorded from six congregative bird sites in Khijadiya Lake and Bird Sanctuary area belonging to 18 orders, 61 families and 8 subfamilies under 131 genera (Table 7). The six congregative bird localities identified in Khijadiya Lake and Bird Sanctuary, Gujarat are Khijadiya village side, Khijadiya Lake, Khijadiya Dhunvav, Khijadiya Jambuda Lake, Salt marshes and Creeks and Khijadiya salt works (Salt Pans). Locality wise distribution of each species along with residential status is given in Table 7. Perusal of the table reveals that out of 206 avian species recorded during the present study 124 species are commonly found, 28 species are very common or abundant and 54 species are uncommon or rarely sighted. 103 are wetland birds, 33 species wetland dependant and 70 species as terrestrial passerine birds (Fig. 2). Out of 136 wetland and wetland dependant birds, 63 species are winter migrants (M), 40 species are resident as well as migratory (RM) and 33 residents (R) (Fig. 3). Wetland species recorded locality wise are shown in Fig. 4 and 5. Scolopacidae was the most dominant family followed by Anatidae, Laridae, Ardeidae and Charadriidae.

Wetland dependant species recorded from Khijadiya Lake and Bird Sanctuary is shown in Fig. 6. Among the wetland dependant avian species, family Acciptridae was most dominant followed by Alcedinidae and Coraciidae.

Maximum number of avian species was recorded from Khijadiya Dhunvav locality represented by 133 species followed by Khijadiya Jambuda Lake represented by 132 species and Khijadiya Lake with 126 species. 69 species were recorded from Khijadiya village side and 51 species and 47 species from Khijadiya salt works (Salt Pans) and Salt marshes and Creeks respectively (Fig. 7). Locality wise-distribution of each species under different family along with residential and abundance status is given in Table 7.

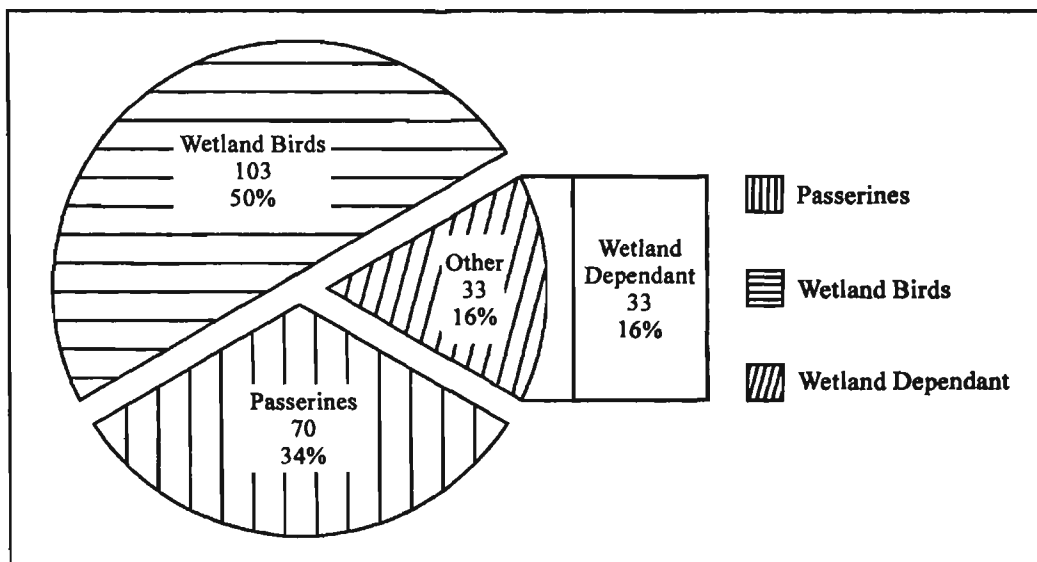


Fig. 2 : Avian Species Composition at Khijadiya Bird Sanctuary 2006-2007

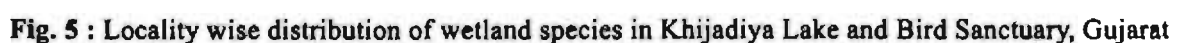
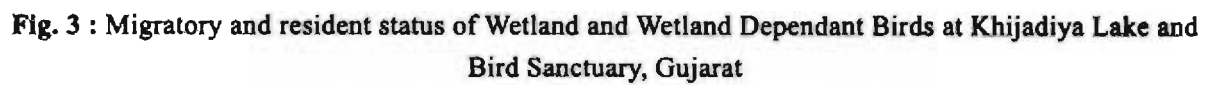


Table 7 : A checklist of birds of Khijadiya Lake and Bird Sanctuary, Gujarat

Serial Number	New Records	Systematic List		Residential status	Abundance status		Khijadiya village side	Khijadiya Lake	Khijadiya Dhunav	Khijadiya Jambuda Lake	Salt Marshes and Creeks	Khijadiya Salt Works (Salt Pans)
1	2	3		4	5	6	7	8	9	10	11	12
		I Order PODICIPEDIFORMES										
		1 Family PODICIPEDIDAE										
1		<i>Tachybaptus ruficollis</i> (Pallas, 1764)	Little Grebe (5)	R	C	W	+	+	+	+		
2		<i>Podiceps cristatus</i> (Linnaeus, 1758)	Great Crested Grebe (3)	M	UC	W		+		+		
3		<i>Podiceps nigricollis</i> Brehm, 1831	Black-necked Grebe (4)	M	UC	W		+		+		
		II Order PELECANIFORMES										
		2 Family PELECANIDAE										
4		<i>Pelecanus onocrotalus</i> Linnaeus, 1758	Great White Pelican (20)	RM	C	W	+	+	+	+	+	+
5	*	<i>Pelecanus philippensis</i> Gmelin, 1789	Spot-billed Pelican (21)	M	UC	W						+
6		<i>Pelecanus crispus</i> Bruch, 1832	Dalmatian Pelican (22)	M	C	W		+	+	+	+	+
		3 Family PHALACROCORACIDAE										
7		<i>Phalacrocorax niger</i> (Vieillot, 1817)	Little Cormorant (28)	RM	C	W	+	+	+	+		+
8		<i>Phalacrocorax fuscicollis</i> Stephens, 1826	Indian Shag (27)	RM	C	W		+		+	+	

1	2	3		4	5	6	7	8	9	10	11	12
9		<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	Great Cormorant (26)	RM	UC	W	+		+	+	+	
		4 Family ANHINGIDAE										
10		<i>Anhinga melanogaster</i> Pennant, 1769	Darter (29)	RM	C	W		+	+	+		
		III Order CICONIIFORMES 5 Family ARDEIDAE										
11		<i>Egretta garzetta</i> (Linnaeus, 1766)	Little Egret (49)	R	C	W	+	+	+	+		+
12		<i>Egretta gularis</i> (Bosc, 1792)	Western Reef-Egret (50)	RM	C	W		+	+	+	+	+
13		<i>Ardea cinerea</i> Linnaeus, 1758	Grey Heron (36)	RM	C	W	+	+	+	+	+	+
14		<i>Ardea purpurea</i> Linnaeus, 1766	Purple Heron (37)	RM	C	W	+	+	+	+	+	+
15		<i>Casmerodius albus</i> (Linnaeus, 1758)	Large Egret (45-46)	RM	C	W		+	+	+		
16		<i>Mesophoyx intermedia</i> (Wagler, 1829)	Median Egret (47, 48)	RM	UC	W	+	+				
17		<i>Bubulcus ibis</i> (Linnaeus, 1758)	Cattle Egret (44)	RM	C	WD	+	+	+	+		
18		<i>Ardeola grayii</i> (Sykes, 1832)	Indian Pond-Heron (42)	R	C	W	+	+	+	+	+	+
19		<i>Butorides striatus</i> (Linnaeus, 1758)	Little Green Heron (38)	R	UC	W	+			+		
20		<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	Black-crowned Night-Heron (52)	R	C	W	+	+	+			
21		<i>Ixobrychus cinnamomeus</i> (Gmelin, 1789)	Chestnut Bittern (56)	RM	UC	W	+			+		
22		<i>Dupetor flavicollis</i> (Latham, 1790)	Black Bittern (58)	RM	UC	W			+			

1	2	3	4	5	6	7	8	9	10	11	12
		6 Family CICONIIDAE									
23		<i>Mycteria leucocephala</i> (Pennant, 1769)	Painted Stork (60)	RM	VC	W	+	+	+	+	+
24		<i>Anastomus oscitans</i> (Boddaert, 1783)	Asian Openbill-Stork (61)	R	C	W				+	
25		<i>Ephippiorhynchus asiaticus</i> (Latham, 1790)	Black-necked Stork (66)	R	C	W		+	+	+	+
		7 Family THRESKIORNITHIDAE									
26		<i>Plegadis falcinellus</i> (Linnaeus, 1766)	Glossy Ibis (71)	RM	C	W	+		+		+
27		<i>Threskiornis melanocephalus</i> (Latham, 1790)	Oriental White Ibis (69)	R	C	W	+	+	+	+	
28		<i>Pseudibis papillosa</i> (Temminck, 1824)	Black Ibis (70)	R	C	W	+		+		+
29		<i>Platalea leucorodia</i> Linnaeus, 1758	Eurasian Spoonbill (72)	RM	C	W	+	+	+	+	
		IV Order PHOENICOPTERIFORMES									
		8 Family PHOENICOPTERIDAE									
30		<i>Phoenicopterus ruber</i> Linnaeus, 1758	Greater Flamingo (73)	RM	C	W		+		+	+
31		<i>Phoenicopterus minor</i> (Geoffroy, 1798)	Lesser Flamingo (74)	M	C	W		+		+	+
		V Order ANSERIFORMES									
		9 Family ANATIDAE									
32		<i>Dendrocygna javanica</i> (Horsfield, 1821)	Lesser Whistling- Duck (88)	R	UC	W		+			

1	2	3	4	5	6	7	8	9	10	11	12
33		<i>Tadorna ferruginea</i> (Pallas, 1764)	Brahminy Shelduck (90)	M	VC	W		+	+	+	
34		<i>Sarkidiornis melanotos</i> (Pennant, 1769)	Comb Duck (115)	R	C	W		+			
35		<i>Nettapus coromandelianus</i> (Gmelin, 1789)	Cotton Teal (114)	R	C	W		+			
36		<i>Anas strepera</i> Linnaeus, 1758	Gadwall (101)	M	C	W		+	+	+	
37		<i>Anas penelope</i> Linnaeus, 1758	Eurasian Wigeon (103)	M	C	W				+	
38		<i>Anas platyrhynchos</i> Linnaeus, 1758	Mallard (100)	M	C	W				+	
39		<i>Anas poecilorhyncha</i> J.R. Forester, 1781	Spot-billed Duck (97)	RM	VC	W	+	+	+	+	
40		<i>Anas clypeata</i> Linnaeus, 1758	Northern Shoveller (105)	M	VC	W		+	+	+	
41		<i>Anas acuta</i> Linnaeus, 1758	Northern Pintail (93)	M	VC	W		+		+	
42		<i>Anas querquedula</i> Linnaeus, 1758	Garganey (104)	M	C	W				+	
43		<i>Anas crecca</i> Linnaeus, 1758	Common Teal (94)	M	C	W		+			
44		<i>Aythya ferina</i> (Linnaeus, 1758)	Common Pochard (108)	M	C	W		+		+	
45		<i>Aythya fuligula</i> (Linnaeus, 1758)	Tufted Pochard (111)	M	C	W		+			
		VI Order FALCONIFORMES 10 Family ACCIPITRIDAE									
46		<i>Elanus caeruleus</i> (Desfontaines, 1789)	Black-shouldered Kite (124)	R	UC		+		+		
47		<i>Milvus migrans</i> (Boddaert, 1783)	Black Kite (132, 133)	R	C			+	+		
48		<i>Haliastur indus</i> (Boddaert, 1783)	Brahminy Kite (135)	R	C	WD		+	+		

1	2	3		4	5	6	7	8	9	10	11	12
49		<i>Haliaeetus leucoryphus</i> (Pallas,1771)	Pallas's Fish-Eagle (174)	RM	UC	WD		+	+			
50		<i>Circus aeruginosus</i> (Linnaeus, 1758)	Western Marsh-Harrier (193)	M	C	WD		+	+	+	+	+
51		<i>Circus cyaneus</i> (Linnaeus, 1766)	Hen Harrier (189)	M	C	WD		+	+	+		
52		<i>Circus macrourus</i> (S.G. Gmelin,1770)	Pallid Harrier (190)	M	C	WD		+	+	+		
53		<i>Circus pygargus</i> (Linnaeus, 1758)	Montagu's Harrier (191)	M	C	WD				+		
54		<i>Accipiter badius</i> (Gmelin, 1788)	Shikra (138)	R	VC		+	+	+	+		+
		11 Family PANDIONIDAE										
55		<i>Pandion haliaetus</i> (Linnaeus, 1758)	Osprey (203)	RM	C	WD			+			
		12 Family FALCONIDAE										
56		<i>Falco tinnunculus</i> Linnaeus, 1758	Common Kestrel (222, 224)	RM	C	WD			+			
57		<i>Falco chicquera</i> Daudin, 1800	Red-headed Falcon (219)	R	C	WD		+				
58		<i>Falco jugger</i> J.E. Gray, 1834	Laggar (208)	RM	C	WD		+				
		VII Order GALLIFORMES 13 Family PHASIANIDAE										
59		<i>Francolinus pondicerianus</i> (Gmelin, 1789)	Grey Francolin (246)	R	VC		+		+	+		
60		<i>Pavo cristatus</i> (Linnaeus, 1758)	Indian Peafowl (311)	R	VC		+			+		

1	2	3		4	5	6	7	8	9	10	11	12
		VIII Order GRUIFORMES										
		14 Family GRUIDAE										
61		<i>Grus virgo</i> (Linnaeus, 1758)	Demoiselle Crane (326)	M	VC	W	+		+		+	+
62		<i>Grus grus</i> (Linnaeus, 1758)	Common Crane (320)	M	VC	W	+		+		+	+
		15 Family RALLIDAE										
63		<i>Amaurornis phoenicurus</i> (Pennant, 1769)	White-breasted Waterhen (343, 344)	R	C	W	+	+	+	+		
64		<i>Porphyrio porphyrio</i> (Linnaeus, 1758)	Purple Moorhen (349)	R	VC	W		+		+		
65		<i>Gallinula chloropus</i> (Linnaeus, 1758)	Common Moorhen (347)	R	C	W		+		+		
66		<i>Fulica atra</i> Linnaeus, 1758	Common Coot (350)	M	C	W		+	+	+		
		IX Order CHARADRIIFORMES										
		16 Family JACANIDAE										
67		<i>Hydrophasianus chirurgus</i> (Scopoli, 1786)	Pheasant-tailed Jacana (358)	R	C	W		+				
68		<i>Metopidius indicus</i> (Latham, 1790)	Bronze-winged Jacana (359)	R	C	W		+				
		17 Family ROSTRATULIDAE										
69		<i>Rostratula benghalensis</i> (Linnaeus, 1758)	Greater Painted-Snipe (429)	R	UC	W				+		
		18 Family HAEMATOPODIDAE										
70		<i>Haematopus ostralegus</i> Linnaeus, 1758	Eurasian Oystercatcher (360)	M	VC	W			+	+	+	+

1	2	3	4	5	6	7	8	9	10	11	12
		19 Family CHARADRIIDAE									
71		<i>Pluvialis squatarola</i> (Linnaeus, 1758)	Grey Plover (371)	M	C	W		+	+	+	+
72		<i>Charadrius hiaticula</i> Linnaeus, 1758	Common Ringed Plover (378)	M	UC	W			+	+	+
73		<i>Charadrius dubius</i> Scopoli, 1786	Little Ringed Plover (380)	RM	VC	W	+		+		+
74		<i>Charadrius alexandrinus</i> Linnaeus, 1758	Kentish Plover (381)	RM	VC	W		+	+	+	
75		<i>Charadrius mongolus</i> Pallas, 1776	Lesser Sand Plover (384)	M	VC	W		+		+	+
76		<i>Charadrius leschenaultii</i> Lesson, 1826	Greater Sand Plover (374)	M	VC	W	+	+	+		
77		<i>Vanellus malabaricus</i> (Boddaert, 1783)	Yellow-wattled Lapwing (370)	RM	UC	W	+		+		
78		<i>Vanellus indicus</i> (Boddaert, 1783)	Red-wattled Lapwing (366)	R	VC	W	+		+		+
79		<i>Vanellus leucurus</i> (Lichtenstein, 1823)	White-tailed Lapwing (362)	M	UC	W			+		
		20 Family SCOLOPACIDAE									
80		<i>Gallinago gallinago</i> (Linnaeus, 1758)	Common Snipe (409)	RM	C	W			+	+	
81		<i>Limosa limosa</i> (Linnaeus, 1758)	Black-tailed Godwit (389)	M	C	W		+	+	+	+
82		<i>Limosa lapponica</i> (Linnaeus, 1758)	Bar-tailed Godwit (391)	M	C	W		+	+		

1	2	3		4	5	6	7	8	9	10	11	12
83		<i>Numenius phaeopus</i> (Linnaeus, 1758)	Whimbrel (385)	M	C	W				+		
84		<i>Numenius arquata</i> (Linnaeus, 1758)	Eurasian Curlew (388)	M	C	W	+	+	+		+	
85		<i>Tringa erythropus</i> (Pallas, 1764)	Spotted Redshank (392)	M	UC	W		+		+		
86		<i>Tringa totanus</i> (Linnaeus, 1758)	Common Redshank (393, 394)	RM	VC	W		+	+	+	+	+
87		<i>Tringa stagnatilis</i> (Bechstein, 1803)	Marsh Sandpiper (395)	M	C	W				+	+	
88		<i>Tringa nebularia</i> (Gunner, 1767)	Common Greenshank (396)	M	C	W		+		+		+
89		<i>Tringa ochropus</i> Linnaeus, 1758	Green Sandpiper (397)	M	C	W			+			
90		<i>Tringa glareola</i> Linnaeus, 1758	Wood Sandpiper (398)	M	C	W		+	+	+		
91		<i>Xenus cinereus</i> (Guldenstadt, 1774)	Terek Sandpiper (400)	M	UC	W		+				
92		<i>Actitis hypoleucos</i> Linnaeus, 1758	Common Sandpiper (401)	RM	C	W		+		+		
93		<i>Arenaria interpres</i> (Linnaeus, 1758)	Ruddy Turnstone (402)	M	C	W	+	+	+	+		
94		<i>Calidris alba</i> (Pallas, 1764)	Sanderling (414)	M	C	W			+	+		+
95		<i>Calidris minuta</i> (Leisler, 1812)	Little Stint (416)	M	VC	W			+	+		+
96		<i>Calidris temminckii</i> (Leisler, 1812)	Temminck's Stint (417)	M	VC	W		+	+	+		
97		<i>Calidris alpina</i> (Linnaeus, 1758)	Dunlin (420, 421)	M	C	W				+		
98		<i>Calidris ferruginea</i> (Pontoppidan, 1813)	Curlew Sandpiper (422)	M	C	W		+				
99		<i>Philomachus pugnax</i> (Linnaeus, 1758)	Ruff and Reeve (426)	M	UC	W		+				

1	2	3	4	5	6	7	8	9	10	11	12
		21 Family RECURVIROSTRIDAE									
100		<i>Himantopus himantopus</i> (Linnaeus, 1758)	Black-winged Stilt (430)	R	VC	W	+	+	+	+	+
101		<i>Recurvirostra avosetta</i> Linnaeus, 1758	Pied Avocet (432)	M	VC	W		+	+	+	+
		22 Family PHALAROPODIDAE									
102		<i>Phalaropus lobatus</i> (Linnaeus, 1758)	Red-necked Phalarope (428)	M	UC	W		+			
103		<i>Phalaropus fulicaria</i> (Linnaeus, 1758)	Red Phalarope (427)	M	UC	W		+			
		23 Family DROMADIDAE									
104		<i>Dromas ardeola</i> Paykull, 1805	Crab-Plover (434)	RM	C	W			+	+	+
		24 Family BURHINIDAE									
105		<i>Burhinus oedicnemus</i> (Linnaeus, 1758)	Stone-Curlew (436)	R	C	WD			+		
106		<i>Esacus recurvirostris</i> (Cuvier, 1829)	Great Stone-Plover (437)	R	C	WD				+	
		25 Family GLAREOLIDAE									
107		<i>Cursorius coromandelicus</i> (Gmelin, 1789)	Indian Courser (440)	RM	C	WD			+	+	+
108		<i>Glareola pratincola</i> (Linnaeus, 1766)	Collared Pratincole (442)	RM	UC	WD				+	
109		<i>Glareola lactea</i> Temminck, 1820	Small Pratincole (444)	R	UC	WD			+		+

1	2	3	4	5	6	7	8	9	10	11	12
		26 Family LARIDAE									
110		<i>Larus heuglini</i> Bree, 1876	Heuglin's Gull (450)	M	C	W				+	+
111		<i>Larus cachinnans</i> Pallas, 1811	Yellow-legged Gull (451)	M	UC	W				+	+
112		<i>Larus ichthyaetus</i> Pallas, 1773	Pallas's Gull (453)	M	C	W			+	+	+
113		<i>Larus brunnicephalus</i> Jerdon, 1840	Brown-headed Gull (454)	M	C	W		+	+	+	+
114		<i>Larus ridibundus</i> Linnaeus, 1766	Black-headed Gull (455)	M	C	W			+	+	
115		<i>Larus genei</i> Brème, 1839	Slender-billed Gull (456)	M	UC	W				+	
116		<i>Gelochelidon nilotica</i> (Gmelin, 1789)	Gull-billed Tern (460)	M	UC	W		+		+	+
117		<i>Sterna caspia</i> Pallas, 1770	Caspian Tern (462)	M	C	W		+	+	+	+
118		<i>Sterna aurantia</i> J.E. Gray, 1831	River Tern (463)	R	C	W		+	+	+	+
119		<i>Sterna bengalensis</i> Lesson, 1831	Lesser Crested Tern (479)	M	UC	W		+		+	+
120		<i>Sterna hirundo</i> Linnaeus, 1758	Common Tern (465)	RM	C	W			+	+	
121		<i>Sterna albifrons</i> Pallas, 1764	Little Tern (475)	M	C	W				+	
122		<i>Chlidonias hybridus</i> (Pallas, 1811)	Whiskered Tern (458)	RM	UC	W		+		+	+
123		<i>Chlidonias leucopterus</i> (Temminck, 1815)	White-winged Black Tern (459)	M	UC	W			+	+	
		27 Family RYNCHOPIDAE									
124		<i>Rynchops albicollis</i> Swainson, 1838	Indian Skimmer (484)	R	C	W		+	+	+	+

1	2	3	4	5	6	7	8	9	10	11	12
		X Order COLUMBIFORMES 28 Family PTEROCLIDIDAE									
125		<i>Pterocles exustus</i> Temminck, 1825 Chestnut-bellied Sandgrouse (487)	R	UC				+			
		29 Family COLUMBIDAE									
126		<i>Columba livia</i> Gmelin, 1789 Blue Rock Pigeon (517)	R	VC		+			+		
127		<i>Streptopelia senegalensis</i> (Linnaeus, 1766) Little Brown Dove (541)	R	C		+	+	+			
128		<i>Streptopelia decaocto</i> (Frivaldszky, 1838) Eurasian Collared-Dove (534)	R	C		+	+	+	+		
		XI Order PSITTACIFORMES 30 Family PSITTACIDAE									
129		<i>Psittacula krameri</i> (Scopoli, 1769) Rose-ringed Parakeet (549, 550)	R	C		+	+	+	+		
		XII Order CUCULIFORMES 31 Family CUCULIDAE									
130		<i>Clamator jacobinus</i> (Boddaert, 1783) Pied Crested Cuckoo (570, 571)	RM	C			+	+	+		
131		<i>Eudynamys scolopacea</i> (Linnaeus, 1758) Asian Koel (590)	R	C		+	+		+		
132		<i>Centropus sinensis</i> (Stephens, 1815) Greater Coucal (600)	R	C		+	+	+	+		

1	2	3		4	5	6	7	8	9	10	11	12
		XIII Order STRIGIFORMES										
		32 Family TYTONIDAE										
133	*	<i>Tyto alba</i> (Scopoli, 1769)	Barn Owl (606)	R	UC				+			
		33 Family STRIGIDAE										
134		<i>Athene brama</i> (Temminck, 1821)	Spotted Owlet (650, 652)	R	UC			+		+		
		XIV Order CAPRIMULGIFORMES										
		34 Family CAPRIMULGIDAE										
135	*	<i>Caprimulgus asiaticus</i> Latham, 1790	Common Indian Nightjar (680)	R	C		+	+				
		XV Order APODIFORMES										
		35 Family APODIDAE										
136	*	<i>Apus apus</i> (Linnaeus, 1758)	Common Swift (696)	M	C	WD			+	+		
137	*	<i>Apus affinis</i> (J.E. Gray, 1830)	House Swift (703)	R	UC	WD			+	+		
		XVI Order CORACIIFORMES										
		36 Family ALCEDINIDAE										
138		<i>Alcedo atthis</i> (Linnaeus, 1758)	Small Blue Kingfisher (723)	RM	C	WD	+	+	+			
139		<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	White-breasted Kingfisher (736)	R	VC	WD		+		+		
140		<i>Halcyon pileata</i> (Boddaert, 1783)	Black-capped Kingfisher (739)	RM	UC	WD		+	+	+		

1	2	3		4	5	6	7	8	9	10	11	12
141		<i>Ceryle rudis</i> (Linnaeus, 1758)	Lesser Pied Kingfisher (719)	R	C	WD			+		+	
		37 Family MEROPIDAE										
142		<i>Merops orientalis</i> Latham, 1801	Small Bee-eater (750)	R	VC		+	+	+	+		
143		<i>Merops persicus</i> Pallas, 1773	Blue-cheeked Bee-eater (747)	RM	C	WD			+	+		
		38 Family CORACIIDAE										
144		<i>Coracias garrulus</i> Linnaeus, 1758	European Roller (754)	M	UC	WD			+	+		
145		<i>Coracias benghalensis</i> (Linnaeus, 1758)	Indian Roller (755)	R	C	WD	+	+	+	+		
		39 Family UPUPIDAE										
146		<i>Upupa epops</i> Linnaeus, 1758	Common Hoopoe (763)	RM	C		+		+	+		
		XVII Order PICIFORMES 40 Family CAPITONIDAE										
147	*	<i>Megalaima haemacephala</i> (P.L.S. Muller, 1776)	Coppersmith Barbet (792)	R	UC			+				
		41 Family PICIDAE										
148	*	<i>Dinopium benghalense</i> (Linnaeus, 1758)	Lesser Golden-backed Woodpecker (819)	R	UC			+				

1	2	3	4	5	6	7	8	9	10	11	12
		XVIII Order PASSERIFORMES									
		42 Family PITTIDAE									
149	*	<i>Pitta brachyura</i> (Linnaeus, 1766)	Indian Pitta (867)	R	UC			+			
		43 Family ALAUDIDAE									
150		<i>Eremopterix nigriceps</i> (Gould, 1839)	Black-crowned Sparrow-Lark (879)	R	C		+	+	+		
151		<i>Eremopterix grisea</i> (Scopoli, 1786)	Ashy-crowned Sparrow-Lark (878)	R	C		+	+	+		
152		<i>Ammomanes phoenicurus</i> (Franklin, 1831)	Rufous-tailed Finch-Lark (882)	R	C		+				
153		<i>Calandrella brachydactyla</i> (Leisler, 1814)	Greater Short-toed Lark (886)	M	C		+	+	+		
154		<i>Galerida cristata</i> (Linnaeus, 1758)	Common Crested Lark (899)	R	C		+	+	+		
155		<i>Alauda gulgula</i> Franklin, 1831	Eastern Skylark (907)	M	C			+			
		44 Family HIRUNDINIDAE									
156		<i>Hirundo rustica</i> Linnaeus, 1758	Common Swallow (916)	M	C				+	+	
157		<i>Hirundo tahitica</i> Gmelin, 1789	House Swallow (919)	R	C		+		+		
158		<i>Hirundo smithii</i> Leach, 1818	Wire-tailed Swallow (921)	R	C	WD	+		+		
		45 Family MOTACILLIDAE									
159		<i>Motacilla alba</i> Linnaeus, 1758	White Wagtail (1885-1887)	RM	C	WD		+			+

1	2	3	4	5	6	7	8	9	10	11	12
160		<i>Motacilla maderaspatensis</i> Gmelin, 1789	Large Pied Wagtail (1891)	R	C	WD				+	+
161		<i>Motacilla citreola</i> Pallas, 1776	Citrine Wagtail (1881, 1883)	RM	VC	WD		+			
162		<i>Motacilla flava</i> Linnaeus, 1758	Yellow Wagtail (1876-78, 1880)	RM	VC	WD	+	+		+	+
163		<i>Motacilla cinerea</i> Tunstall, 1771	Grey Wagtail (1884)	M	C	WD		+		+	+
		46 Family CAMPEPHAGIDAE									
164		<i>Tephrodornis pondicerianus</i> (Gmelin, 1789)	Common Woodshrike (1069, 1070)	R	C			+	+		
		47 Family PYCNONOTIDAE									
165		<i>Pycnonotus leucotis</i> (Gould, 1836)	White-eared Bulbul (1123)	R	UC		+	+	+	+	
166		<i>Pycnonotus cafer</i> (Linnaeus, 1766)	Red-vented Bulbul (1127, 1128)	R	C		+	+	+		
		48 Family IRENIDAE									
167	*	<i>Aegithina tiphia</i> (Linnaeus, 1758)	Common Iora (1099)	R	UC			+			
		49 Family LANIIDAE									
168		<i>Lanius cristatus</i> Linnaeus, 1758	Brown Shrike (949)	M	C		+	+		+	
169		<i>Lanius vittatus</i> Valenciennes, 1826	Bay-backed Shrike (940)	R	C		+		+	+	
170		<i>Lanius meridionalis</i> Temminck, 1820	Southern Grey Shrike (933)	RM	C		+		+		

1	2	3	4	5	6	7	8	9	10	11	12
		50 Family MUSCICAPIDAE									
		1 Subfamily TURDINAE									
171		<i>Luscinia svecica</i> (Linnaeus, 1758)	Bluethroat (1644, 1645)	M	UC		+		+		
172		<i>Copsychus saularis</i> (Linnaeus, 1758)	Oriental Magpie-Robin (1661)	R	UC		+		+	+	
173		<i>Saxicoloides fulicata</i> (Linnaeus, 1776)	Indian Robin (1717, 1720)	R	C		+	+	+	+	+
174		<i>Phoenicurus ochruros</i> (Gmelin, 1774)	Black Redstart (1671, 1672)	M	UC			+	+	+	
175		<i>Oenanthe xanthopyrna</i> (Hemprich and Ehrenberg, 1833)	Rufous-tailed Wheatear (1707)	M	C				+	+	
176		<i>Oenanthe deserti</i> (Temminck, 1825)	Desert Wheatear (1710)	M	C				+	+	
177		<i>Oenanthe isabellina</i> (Temminck, 1829)	Isabelline Wheatear (1706)	M	C				+	+	
		2 Subfamily TIMALIINAE									
178		<i>Turdoides caudatus</i> (Dumont, 1823)	Common Babbler (1254)	R	C			+	+	+	
179		<i>Turdoides malcolmi</i> (Sykes, 1832)	Large Grey Babbler (1258)	R	C		+	+	+	+	
180		<i>Turdoides striatus</i> (Dumont, 1823)	Jungle Babbler (1261, 1262)	R	VC		+	+	+	+	
		3 Subfamily SYLVIINAE									
181		<i>Prinia gracilis</i> (Lichtenstein, 1823)	Graceful Prinia (1508)	R	C					+	
182		<i>Acrocephalus dumetorum</i> Blyth, 1849	Blyth's Reed-Warbler (1556)	RM	UC		+	+	+		

1	2	3		4	5	6	7	8	9	10	11	12
183		<i>Acrocephalus stentoreus</i> (Hemprich and Ehrenberg, 1833)	Indian Great Reed- Warbler (1550)	M	UC				+	+		
184		<i>Orthotomus sutorius</i> (Pennant, 1769)	Common Tailorbird (1535)	R	C			+	+			
185		<i>Sylvia curruca</i> (Linnaeus, 1758)	Common Lesser Whitethroat (1567)	M	UC		+	+		+		
186		<i>Sylvia hortensis</i> (Gmelin, 1789)	Orphean Warbler (1565)	M	UC			+	+	+		
		4 Subfamily MONARCHINAE										
187		<i>Terpsiphone paradisi</i> (Linnaeus, 1758)	Asian Paradise-Flycatcher (1461)	RM	UC	WD		+				
		5 Subfamily RHIPIDURINAE										
188		<i>Rhipidura aureola</i> Lesson, 1830	White-browed Fantail- Flycatcher (1451)	RM	UC			+	+	+		
		51 Family PARIDAE										
189	*	<i>Parus major</i> Linnaeus, 1758	Great Tit (1794)	R	UC			+				
		52 Family DICAEDIDAE										
190	*	<i>Dicaeum agile</i> (Tickell, 1833)	Thick-billed Flowerpecker (1892, 1894)	RM	UC			+				
		53 Family NECTARINIIDAE										
191		<i>Nectarinia asiatica</i> (Latham, 1790)	Purple Sunbird (1917)	R	C		+	+	+	+		

1	2	3		4	5	6	7	8	9	10	11	12
		54 Family ZOSTEROPIDAE										
192	*	<i>Zosterops palpebrosus</i> (Temminck, 1824)	Oriental White-eye (1933)	R	C			+	+	+		
		55 Family EMBERIZIDAE 6 Subfamily EMBERIZINAE										
193	*	<i>Emberiza buchanani</i> Blyth, 1845	Grey-necked Bunting (2050)	M	UC			+	+			
		56 Family ESTRILDIDAE										
194		<i>Lonchura malabarica</i> (Linnaeus, 1758)	White-throated Munia (1966)	R	C			+	+	+		
		57 Family PASSERIDAE 7 Subfamily PASSERINAE										
195		<i>Passer domesticus</i> (Linnaeus, 1758)	House Sparrow (1938)	R	C		+	+	+	+	+	+
196		<i>Petronia xanthocollis</i> (Burton, 1838)	Yellow-throated Sparrow (1949)	R	UC		+	+		+		
		8 Subfamily PLOCEINAE										
197		<i>Ploceus philippinus</i> (Linnaeus, 1766)	Baya Weaver (1957)	R	UC	WD			+			
		58 Family STURNIDAE										
198		<i>Sturnus pagodarum</i> (Gmelin, 1789)	Brahminy Starling (994)	R	C		+		+	+		

1	2	3	4	5	6	7	8	9	10	11	12
199		<i>Sturnus roseus</i> (Linnaeus, 1758)	Rosy Starling (996)	M	C		+	+	+		
200		<i>Acridotheres tristis</i> (Linnaeus, 1766)	Common Myna (1006)	R	C		+	+	+		+
201		<i>Acridotheres ginginianus</i> (Latham, 1790)	Bank Myna (1008)	R	C		+	+	+		+
		59 Family ORIOLIDAE									
202	*	<i>Oriolus oriolus</i> (Linnaeus, 1758)	Eurasian Golden Oriole (953)	R	UC		+				
		60 Family DICRURIDAE									
203		<i>Dicrurus macrocercus</i> Vieillot, 1817	Black Drongo (963)	R	C		+	+	+	+	
		61 CORVIDAE									
204		<i>Dendrocitta vagabunda</i> (Latham, 1790)	Indian Treepie (1031, 1032)	R	C		+	+			
205		<i>Corvus splendens</i> Vieillot, 1817	House Crow (1049)	R	C		+	+	+		+
206		<i>Corvus macrorhynchos</i> Wagler, 1827	Jungle Crow (1057)	R	C		+		+		+

Legends for the abbreviations used in the table

+ = Locality from were recorded during present studies

* = New record

Number with parenthesis after common name are those given in CHBI (Ali and Ripley 1987)

Residential status

R = Resident

M = Migratory

Abundance Status

C = Common

UC = Uncommon

VC = Very Common

Habitat

W = Wetland

WD = Wetland Dependant

Family-wise distribution of avian species in comparison to Indian subcontinent with percentage representation of species in Khijadiya Lake and Bird Sanctuary is given in Table 8.

Table 8 : Family wise avian species recorded from Khijadiya Lake and Bird Sanctuary, Gujarat in comparison to Indian subcontinent

Avian Families	Number of Avian species		Percentage representation in Khijadiya Lake and Bird Sanctuary
	Indian Subcontinent	Khijadiya Lake and Bird Sanctuary 2005-2008	
Podicipedidae	05	03	60
Pelecanidae	03	03	100
Phalacrocoracidae	04	03	75
Anhingidae	01	01	100
Ardeidae	21	12	57
Ciconiidae	09	03	33.33
Threskiornithidae	04	04	100
Phoenicopteridae	02	02	100
Anatidae	44	14	31.88
Accipitridae	57	09	15.78
Pandionidae	01	01	100
Falconidae	13	03	23
Phasianidae	48	02	4.1
Gruidae	06	02	33.33
Rallidae	17	04	23.52
Jacaniidae	02	02	100
Rostratulidae	01	01	100
Haematopodidae	01	01	100
Charadriidae	19	09	47.36
Scolopacidae	41	20	48.78
Recurvirostridae	03	02	66.66
Phalaropodidae	02	02	100

Avian Families	Number of Avian species		Percentage representation in Khijadiya Lake and Bird Sanctuary
	Indian Subcontinent	Khijadiya Lake and Bird Sanctuary 2005-2008	
Dromadidae	01	01	100
Burhinidae	03	02	66.66
Glareolidae	06	03	50
Laridae	37	14	37.83
Rynchopidae	01	01	100
Pteroclididae	09	01	11.11
Columbidae	31	03	9.76
Psittacidae	15	01	6.66
Cuculidae	24	03	12.5
Tytonidae	03	01	33.33
Strigidae	30	01	3.33
Caprimulgidae	09	01	11.11
Apodidae	16	02	12.5
Alcedinidae	12	04	33.33
Meropidae	06	02	33.33
Coraciidae	03	02	66.66
Upupidae	01	01	100
Capitonidae	10	01	10
Picidae	35	01	2.85
Pittidae	06	01	16.66
Alaudidae	24	06	25
Hirundinidae	15	03	20
Motacillidae	20	05	25
Campephagidae	17	01	5.88
Pycnonotidae	20	02	1
Irenidae	06	01	16.66

Avian Families	Number of Avian species		Percentage representation in Khijadiya Lake and Bird Sanctuary
	Indian Subcontinent	Khijadiya Lake and Bird Sanctuary 2005-2008	
Laniidae	11	03	27.22
Muscicapidae			
Turdinae	90	07	7.77
Timaliinae	121	03	.247
Sylviinae	108	06	5.55
Monarchinae	02	01	50
Rhipidurinae	03	01	33.33
Paridae	15	01	20
Dicaeidae	09	01	11.11
Nectariniidae	14	01	7.14
Zosteropidae	02	01	50
Emberizidae			
Emberizinae	20	01	5
Estrildidae	08	01	12.5
Passeridae			
Passerinae	15	02	13.33
Ploceinae	04	01	25
Sturnidae	20	04	20
Oriolidae	05	01	20
Dicruridae	09	01	11.11
Corvidae	24	03	12.5

Forty species so far reported from Khijadiya Lake and Bird Sanctuary fall under various conservation status given in Table 9. Six species marked with - sign were not recorded during the present survey.

Table 9 : Conservation Status of Birds recorded from Khijadiya Lake and Bird Sanctuary, Gujarat.

Name Of Species	Wildlife (Protection) Act 1972	ZSI Red Data Book 1994	GEC 1996	CITES (2002)	Bird Life International- 2004	IUCN
<i>Pelecanus philippensis</i>					Vulnerable	Near Threatened
<i>Pelecanus crispus</i>		Vulnerable	Vulnerable		Conservation Dependant	Vulnerable
<i>Phalacrocorax fuscicollis</i>			Vulnerable			
<i>Anhinga melanogaster</i>	Schedule IV		Vulnerable		Near Threatened	Near Threatened
<i>Butorides striatus</i>			Vulnerable			
<i>Mycteria leucocephala</i>					Near Threatened	Near Threatened
<i>Anastomus oscitans</i>	Schedule IV					
<i>Ephippiorhynchus asiaticus</i>			Endangered		Near Threatened	Near Threatened
<i>Threskiornis melanocephalus</i>	Schedule IV				Near Threatened	Near Threatened
<i>Pseudibis papillosa</i>	Schedule IV					
<i>Platalea leucorodia</i>	Schedule-I, Part -III	Endangered	Engangered	Appendix II		
<i>Phoenicopterus ruber</i>				Appendix II		

Name Of Species	Wildlife (Protection) Act 1972	ZSI Red Data Book 1994	GEC 1996	CITES (2002)	Bird Life International- 2004	IUCN
<i>Phoenicopiterus minor</i>				Appendix II	Near Threatened	Near Threatened
<i>Sarkidiornis melanotos</i>				Appendix II		
<i>Marmaronetta angustirostris</i> -						Vulnerable
<i>Aythya nyroca</i> -					Near Threatened	Near Threatened
<i>Aythya baeri</i> -					Vulnerable	Endangered
<i>Haliastur indus</i>	Schedule I, Part III		Vulnerable			
<i>Haliaeetus leucoryphus</i>			Vulnerable			Vulnerable
<i>Sarcogyps calvus</i> -					Near Threatened	Critical
<i>Circus aeruginosus</i>	Schedule I, Part III					
<i>Circus macrourus</i>						Near Threatened
<i>Aquila clanga</i> -					Vulnerable	Vulnerable
<i>Falco chicquera</i>	Schedule I, Part III					
<i>Falco jugger</i>			Endangered			Near Threatened

Name Of Species	Wildlife (Protection) Act 1972	ZSI Red Data Book 1994	GEC 1996	CITES (2002)	Bird Life International- 2004	IUCN
<i>Pavo cristatus</i>	Schedule I, Part III		Vulnerable			
<i>Grus antigone</i> -					Vulnerable	Vulnerable
<i>Grus virgo</i>				Appendix II		
<i>Grus grus</i>				Appendix II		
<i>Vanellus malabaricus</i>	Schedule IV					
<i>Limosa limosa</i>						Near Threatened
<i>Numenius arquata</i>						Near Threatened
<i>Tringa erythropus</i>			Vulnerable			
<i>Tringa nebularia</i>			Vulnerable			
<i>Calidris minuta</i>			Endangered			
<i>Larus brunnicephalus</i>	Schedule IV					
<i>Sterna acuticauda-</i>						Near Threatened
<i>Rynchops albicollis</i>	Schedule I	Endangered			Vulnerable	Vulnerable
<i>Coracias benghalensis</i>						Near Threatened

At Khijadiya Lake and Bird Sanctuary, nesting and breeding of some 19 species of wetland birds has been recorded during the survey based on observation of nest, nest building process or the sighting of chicks swimming/accompanying the parent. The breeding of wetland avian species recorded are viz. *Tachybaptus ruficollis*, *Podiceps cristatus*, *Phalacrocorax niger*, *Phalacrocorax fuscicollis*, *Phalacrocorax carbo*, *Anhinga melanogaster*, *Bubulcus ibis*, *Nycticorax nycticorax*, *Mycteria leucocephala*, *Ephippiorhynchus asiaticus*, *Plegadis falcinellus*, *Threskiornis melanocephalus*, *Platalea leucorodia*, *Anas poecilorhyncha*, *Porphyrio porphyrio*, *Gallinula chloropus*, *Fulica atra*, *Hydrophasianus chirurgus*, *Himantopus himantopus*. Film has also been shot on fourteen nesting and breeding avian species.

The major habitats influencing the avian faunal diversity of the sanctuary are the open shore, open water, open water with vegetation, *Prosopis* scrub, cropland and the coastal habitat. The wetland avian diversity is solely depended on the open shore, open water and the open water with vegetation habitats. *Prosopis chilensis* cover is a very prominent habitat in the vicinity of Khijadiya sanctuary. Increase in the *Prosopis* cover has been recorded in the environs of the sanctuary in recent past. The *Prosopis* cover plays a vital role to support the heronary of many wetland avian species such as cormorants, egrets, storks, ibises etc. to nest and breed in this region. The adjacent cropland area of sanctuary is being utilized by local farmers for cultivation which attract migratory cranes for feeding. On the northern side of the Khijadiya freshwater lake, there are several coastal wetlands like salt marsh, mangroves, mudflats and creek. All these coastal wetlands are fed by the Gulf of Kachchh and many species of waterfowl like flamingos, gulls and terns take advantage of both freshwater and coastal wetlands. Some glimpses of habitat and diversity are shown in plate 1 to 4.

MAMMALIA: MAMMALS – Mammals: hedgehog, porcupine, Indian hare, fox, jackal, wolf, jungle cat, mongoose, squirrel and blue bull etc. are found in the sanctuary and its adjuncts. Fourteen species of mammals are commonly seen in the area viz. *Hemiechinus micropus* (Blyth, 1846)*; *Canis aureus* Linnaeus, 1758; *Canis lupus* Linnaeus, 1758; *Vulpes bengalensis* (Shaw, 1800); *Felis chaus* Schreber, 1777; *Herpestes edwardsii* (E. Geoffrey Saint-Hilaire, 1818); *Herpestes javanicus* (E. Geoffrey Saint-Hilaire, 1818)*; *Viverricula indica* (Desmarest, 1804)*; *Sus scrofa* Linnaeus, 1758*; *Boselaphus tragocamelus* (Pallas 1766); *Funambulus pennantii* Wroughton, 1905; *Meriones hurrianae* (Jordon, 1867)*; *Tatera indica* (Hardwicke, 1807)* and *Lepus nigricollis* Cuvier, 1823 (Plate 2). The list of mammals recorded along with conservation status is given in Appendix 8. The classification and conservation status is followed after Prater (1971) and Alfred, *et al.* (2002 and 2006). The six species marked with *asterisk are new records from Khijadiya Bird Sanctuary.

7. THREATS AND CONSERVATION

Gujarat ranks second in the top industrialized state in India. It is inevitable that the effect of this do not fall on this area also whatsoever may be the status given to this region for the biodiversity conservation purposes. Some of the biological upcoming threats to the Khijadiya Lake and Bird Sanctuary are salinity, recurring drought, grazing, disturbances by ship breaking industry, spread of *Prosopis chilensis*/*Prosopis juliflora*, illegal lopping, over exploitation of water for agriculture, saltworks industries and poaching especially of birds.

Salinity

The fluctuation in the influx of sea water into the freshwater area holds the potential of increasing salinity of the area. It may also gradually lead to soil degradation and thereby change in faunal diversity affecting the productivity of the area. In year 2007, after heavy rains the breach in the main earthen bund created problems of such nature and later the bund was reconstructed and raised.

Recurring Drought

The area experiences low and some times very little rainfall. The inundated area under freshwater almost becomes dry in such low rainfall periods which affect the population abundance of the existing faunal elements and also the wintering avian diversity including waterfowls. During drought conditions, the birds migrate to nearby local water bodies or to other places in Gujarat. Detailed systematic studies are required to combat such recurring conditions so that biota of the area can be conserved. The riverine water which drains into this region should be allowed to flow so that the wetlands of this protected area gets completely filled during rainy season. Since the area falls in the arid region, the evapotranspiration is very high and by the beginning of the winter months water level becomes very low which sometimes does not sustain good population of waterfowls as well as other migrating species in the region.

Grazing

The grazing in the area by ever increasing livestock in unmanaged condition during breeding season of avifauna is a threat to the area as it leads to the destruction of the green cover and reduction in the food availability to the wildlife. However controlled or limited grazing is beneficial to the freshwater wetland as it removes the biomass of invasive species which otherwise spread in the area very fast but are major food of the cattle. A systematic scientific study on controlled and managed grazing is required.

Disturbances by Ship Breaking Industry

In the near vicinity of KBS lies the big industrial establishment of ship breaking industry adjacent to Sachana, a human settlement which has main connecting link by a road through the central part of Khijadiya Bird sanctuary. This road route should be blocked so that human

and vehicular trespass can be avoided. It is a direct interference and hindrance to the free living wildlife of the sanctuary.

Spread of Invasive Species

The exotic invasive species *Prosopis chilensis/Prosopis juliflora* is spreading very fast and the most dominant species in the area. The spread of *Prosopis* in some of the areas especially on both side of the main trail inside the sanctuary hinders in the sighting of the avian diversity whereas in the interior areas it is serving as good breeding site especially for Black-necked stork which was found breeding on it through out the study period. Infact, it is the most preferred tree by many wetland birds including waterfowl's as heronry tree. Proper lopping should be done in a way to shape the crown of *Prosopis chilensis* so that it provides ample space for large wetland birds to breed in the area. Its utility may be enhanced many fold to the ecosystem for various purposes including biodiversity conservation.

Illegal Lopping

The near by inhabitants lop and fell the trees and other vegetation found in the Khijadiya Lake and Bird Sanctuary for various purposes. This disturbs the habitat especially during the breeding season of birds depriving them of their roosting, nesting sites and food availability. The local people require awareness programme about the importance of breeding of the birds and they should be involved into the conservation activities. The lopping should be done in such a way that it provides a better roosting and nesting site to birds especially larger aquatic winter migrants which are regularly breeding in the area. The proper scientific lopping may bring benefit to the breeding avian diversity on one hand and fulfill the requirements of the fodder, fuel for the local inhabitants and green cover to the area on the other hand.

Over exploitation of water for agriculture

Ever increasing and uncontrolled over utilization of rain water accumulated at Khijadiya wetlands harnessed by farmers for agriculture leads to reduction in water level of the lake affecting avian diversity especially during the drought year. The farmers are withdrawing water with the help of pumps which requires regular monitoring and some regulatory mechanism. Otherwise the villagers may exert direct influence on the wetland and cause disturbance to the vast avian diversity and other wildlife of the sanctuary.

Saltworks Industries

Some of the saltworks are situated in the near vicinity of the freshwater wetlands of Khijadiya Bird Sanctuary near the salt marshes and creeks. Their activities are upcoming threats to the area. No regulatory mechanism exists in monitoring their activities in the area. Due to activities related to salt industries such as vehicular trespass, human settlement and pollution in terms of discharge of human waste are some of the problems which develops

severity in an ecosystem where proximity of wildlife get affected very easily and results in to disease and mortality of the rare taxa found in the region. At this stage, the problem is an upcoming threat at Khijadiya but may develop into serious problem as it has happened in case of Sambhar salt Lake, Rajasthan (Kumar, 2005 b).

Vehicular traffic

Movement of heavy vehicles for saltworks and as a link passage to the villages in the near by area creates disturbance to the wetland and the sanctuary area. It creates aversion to waders and other aquatic birds congregating on the wet margins of the wetland. In order to combat such disturbance they have to leave their feeding niches and frequently migrate to other wetlands of the region. Thus their population dwindles in the wetland. Emission of exhaust, noise pollution and repeated human induced interference are some of the threats generally undermined by the management authorities but affects the ecosystem severely. The result of such avoidance leads to non productive nature of the habitat such as absence and discontinuity of roosting, feeding and breeding of many species from the area.

Poaching

At present the area is still free from poaching activities and it should be further monitored for future as the ever-increasing human population around the Khijadiya Bird sanctuary may lead to poaching activities in the near future. The passage through the sanctuary area to Sachana village is a major threat and exposing the existing wildlife to the bypasser who becomes eventually poacher since they are repeatedly exposed to the huge population of birds seen during winter and invites trouble to the sanctuary as well as to the biota of the area. The escape from the area also becomes easier for the poachers.

Tourism and nature camps

The area holds vast potential for development of eco-tourism especially for bird watching. Its unique habitat of freshwater and saline makes it important from educational point of view where at a time both freshwater and marine biological diversity can be observed. At present forest department holds nature education camps for the school children to sensitize them about the conservation needs of the wetland. It needs further landscaping and management in the forms of development of trails and camouflaging of watch towers with well equipped viewing equipments. The trained manpower is prerequisite for any such ecotourism activity which may yield better results in promoting scientific temper among the masses. Since, it is very near to Jamnagar city and due to easy accessibility the ecotourism can be enhanced in this region to educate people about the wetland biota and its conservation needs. Development of a local weather station and an interpretation centre can make Khijadiya Lake and Bird Sanctuary an ideal place for naturalists, researchers and tourists.

Conservation

Various threats discussed above are some of the major issues to be dealt by adopting management plan for the wetland and the sanctuary area. The wetland needs landscaping of different habitat and restructuring of some of the areas with construction of bets for birds to stay in more secure places within the protected area. Plantation of some of the tree species such as *Acacia nilotica*, *Azadiracta indica*, *Ficus bengalensis*, *Tamarindus indica*, *Mangifera indica*, *Salvadora* spp. *Prosopis cineraria*, *Capparis decidua*, *Dalbergia sisso* and Bamboo spp. should also be attempted to enhance the potential of the area for congregation of avian diversity. Plantation of mangroves should be taken up in the coastal areas of Khijadiya Lake and Bird Sanctuary. The open electric wires in the area should be made underground to reduce the mortality of larger birds when landing or passing through the area. Demarcation of boundary of the protected area under the title Khijadiya Lake and Bird Sanctuary should be marked by fencing the area so that protective mechanism can be strenghtend by the State Forest Department and the activities of the nearby inhabitants can be controlled by proclamation of the rules under which such protection to the area is given.

8. SUMMARY

Located virtually on the tropic of cancer, the climate in and around the Khijadiya wetlands are semi-arid to arid type. The area is generally hot with maximum temperature ranging from 28-34°C. In general the rainfall is erratic and inadequate with an average of 400 mm precipitates in less than 14 to 21 days per year but during the present study period, the rainfall was about 760 mm spread over >38 days. Freshwater wetland of Khijadiya and Dhunvav is deeper than that of Jambuda. It is found that the biodiversity thrives well at all the six localities. The sanctuary encompasses combination of freshwater man-induced wetland ecosystem and freshwater marsh ecosystem. Both these ecosystem are ecologically inter-linked and also influenced by other adjacent brackish/saline water ecosystems like creeks, salt-pans, salt-marsh, inter-tidal mudflats etc. which is around but outside the sanctuary area. This complex of wetland ecosystems in and adjacent to the PA supports a plethora of floral and faunal species. As far as fauna is concerned, the sanctuary supports a variety of terrestrial and aquatic animal species.

In the present study, several species of zooplanktons, 4 species of crustacean, 24 species of butterflies, 8 species of fishes, 3 species of amphibians, 12 species of reptiles, 206 species of aves and 14 species of mammals have been recorded from the area. In all 271 species of invertebrates and vertebrates are recorded from the Khijadiya Lake and Bird Sanctuary belonging to 42 orders, 106 families and 194 genera. 31 species are found to have new distributional record from Khijadiya Lake and Bird Sanctuary.

New Records from Khijadiya Lake and Bird Sanctuary, Gujarat

PISCES	<i>Apus apus</i> (Linnaeus, 1758)
<i>Puntius sarana sarana</i> (Hamilton, 1822)	<i>Apus affinis</i> (J.E. Gray, 1830)
<i>Labeo calbasu</i> (Hamilton, 1822)	<i>Megalaima haemacephala</i> (P.L.S. Muller, 1776)
<i>Mystus gulio</i> (Hamilton, 1822)	<i>Dinopium benghalense</i> (Linnaeus, 1758)
AMPHIBIA	<i>Pitta brachyura</i> (Linnaeus, 1766)
<i>Hoplobatrachus tigerinus</i> (Daudin, 1803)	<i>Aegithina tiphia</i> (Linnaeus, 1758)
<i>Euphlyctis hexadactylus</i> (Lesson, 1834)	<i>Parus major</i> Linnaeus, 1758
<i>Duttaphrynus stomaticus</i> Lutken, 1862	<i>Dicaeum agile</i> (Tickell, 1833)
REPTILIA	<i>Zosterops palpebrosus</i> (Temminck, 1824)
<i>Lissemys punctata punctata</i> (Lacepede, 1788)	<i>Emberiza buchanani</i> Blyth, 1845
<i>Hemidactylus brooki</i> Gray 1845	<i>Oriolus oriolus</i> (Linnaeus, 1758)
<i>Hemidactylus leschenaultii</i> Dum. and Bib., 1836	MAMMALS
<i>Hemidactylus flaviviridis</i> Ruppell 1835	<i>Hemiechinus micropus</i> (Blyth, 1846)
<i>Xenochrophis piscator</i> (Schneider 1799)	<i>Herpestes javanicus</i> (E.G.S. Hilaire, 1818)
AVES	<i>Viverricula indica</i> (Desmarest, 1804)
<i>Pelecanus philippensis</i> Gmelin, 1789	<i>Sus scrofa</i> Linnaeus, 1758
<i>Tyto alba</i> (Scopoli, 1769)	<i>Meriones hurrianae</i> (Jordon, 1867)
<i>Caprimulgus asiaticus</i> Latham, 1790	<i>Tatera indica</i> (Hardwicke, 1807)

The most dominant faunal group represented by 206 species of aves belongs to 18 orders, 61 families and 8 subfamilies under 131 genera forms the major component of the biodiversity of the Khijadiya wetlands is described here. The avian community of Khijadiya has various attributes of their dependence on diverse habitats available within and outside the Khijadiya Lake complex. Out of these 206 species recorded during the present study,

103 are wetland birds, 33 species wetland dependant and 70 species as terrestrial passerine birds. Out of 136 wetland and wetland dependant birds, 63 species are winter migrants, 40 species are resident as well as migratory and 33 residents. Scolopacidae was the most dominant family followed by Anatidae, Laridae, Ardeidae and Charadriidae among the wetland birds. Among the wetland dependant avian species, family Acciptridae was most dominant followed by Alcedinidae and Coraciidae. In all six localities were surveyed. Maximum number of avian species was recorded from Khijadiya Dhunvav locality represented by 133 species followed by Khijadiya Jambuda Lake represented by 132 species and Khijadiya Lake with 126 species. 69 species were recorded from Khijadiya village side and 51 species and 47 species from Khijadiya salt works (Salt Pans) and Salt marshes and Creeks respectively. 124 species are commonly found, 28 species are very common or abundant and 54 species are uncommon or rarely sighted. Forty eight species of vertebrate faunal elements (34 species of aves, 14 species of mammals) recorded during the present survey from Khijadiya Lake and Bird Sanctuary fall under various conservation status. Threats to the faunal diversity of the protected area are also discussed in detail.

The lake and the sanctuary are still in its pristine environment. The Khijadiya Lake should be conserved under national wetland conservation programmes such as National Lake Conservation Programme so as to make it more suitable habitat for the congregation of wintering waterfowls gradually attaining magnitude as wetland of international importance (Ramsar site).

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11. APPENDICES

11.1 Appendix 1: List of important wetlands under National Wetland Conservation and Management Programme (NWCMP)

State	Number of Wetlands	Area (ha)
Andhra Pradesh	1	90100
Assam	2	4504
Bihar	3	11490
Chandigarh	1	148
Gujarat	8	1270875
Himachal Pradesh	5	15736
Haryana	2	288
Jammu and Kashmir	7	117325
Jharkhand	2	98965
Karnataka	7	4250
Kerala	5	213229
Madhya Pradesh	12	359814
Maharashtra	3	40298
Manipur	1	26600
Mizoram	2	285
Orissa	4	122580
Punjab	3	5648
Rajasthan	1	24000
Sikkim	6	164
Tamil Nadu	3	46283
Tripura	1	240
Uttar Pradesh	9	12083
Uttaranchal	1	800
West Bengal	5	553090

**11.2 Appendix 2 : List of important wetlands under
National Lake Conservation Programme (NLCP)**

State	Lake
Andhra Pradesh	Banjara Lake, Hyderabad
Jammu and Kashmir	Dal Lake, Srinagar
Karnataka	Vengaiahnkere Lake, Bangalore
	Nagavara Lake, Bangalore
	Jarganahalli Bellandur Lake, Bangalore
	Lal Bagh, Bangalore
	Kotekere Lake, Belgaum
	Bhishma Lake, Gadag
	Sharanabhasveshwara Akkamahadevi Lake, Haveri
	Chanapatna Lake, Hasan
	Kundwad Lake, Karnataka
	Davengere, Karnataka
	Kote Tavarekere Lake, Chikmagalur
Kerala	Veli Akkulum, Thiruvananthapuram
Madhya Pradesh	Rani Talab, Rewa
Maharashtra	Powai Lake, Mumbai
	Thane Lakes (9)
	Mahalaxmi Lake, Vadagaon
	Rankala, Kolhapur
Orissa	Bindusagar, Bhubneshwar
Rajasthan	Mansagar, Jaipur
Tamil Nadu	Ooty,
	Kodaikanal
Tripura	Agartala Lakes (3)
Uttaranchal	Nanital District (4 Lakes)
	Nainital Lake
West Bengal	Rabindra Sarovar, Kolkata
	Mirik

11.3 Appendix 3 : List of Important Bird Areas (IBAs) of Gujarat

IBA Ste Codes	IBA Site Names	IBA Criteria
IN-GJ-01	Banni Grassland and Chhari Dhand	A1, A4i, A4iii
IN-GJ-02	Bhal Area	A1
IN-GJ-03	Charakla Salt Pans	A1, A4i, A4iii
IN-GJ-04	Flamingo City	A1, A4i, A4iii
IN-GJ-05	Gir National Park and Wildlife Sanctuary	A1, A3
IN-GJ-06	Kaj Lake	A1, A4i
IN-GJ-07	Khijadiya Wildlife Sanctuary	A1, A4i, A4iii
IN-GJ-08	Marine National Park and Wildlife Sanctuary	A1, A4i, A4iii, A4iv
IN-GJ-09	Nalsarovar Bird Sanctuary	A1, A4i, A4iii, A4iv
IN-GJ-10	Naliya Grassland (Lala Bustard Wildlife Sanctuary)	A1
IN-GJ-11	Rampura Grassland	A1
IN-GJ-12	Salt pans of Bhavnagar	A1, A4iii
IN-GJ-13	Thol Lake Wildlife Sanctuary	A1, A4i, A4iii
IN-GJ-14	Velavadar National Park	A1, A4ii
IN-GJ-15	Wetlands of Kheda	A1, A4ii
IN-GJ-16	Wild Ass Wildlife Sanctuary	A1, A3, A4i, A4iii
IN-GJ-17	Bhaskarapra	A1, A4iii

A1 = Globally Threatened Species

A3 = Biome-Restricted Assemblage

A4 = Congregation

A4i = Site known or thought to hold, on a regular basis, > 1% of a biogeographic population of a congregatory waterbird species. For the thresholds of this criterion, relevant flyway populations are combined to produce biogeographic population estimates.

A4ii = Site known or thought to hold, on a regular basis, > 1% of the global population of a congregatory seabird or terrestrial species. This category covers non-water bird or terrestrial birds or sea birds.

- A4iii = Site known or thought to hold, on a regular basis, > 20,000 waterbirds or > 10,000 pairs of seabirds of one or more species. Use of this criterion is discouraged where data quality permits A4i and A4ii to be used.
- A4iv = Site known or thought to be a 'bottleneck site' where at least 20,000 storks (Ciconiidae), raptors (Accipitriformes and Falconiformes) or cranes (Gruidae) pass regularly during spring or autumn migration.

11.4 Appendix 4 : Flora of Khijadiya Bird Sanctuary, Gujarat

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Nymphaea stellata</i> Willd.	Nymphaeaceae	Aquatic	Herb	Common in Open waters as floating vegetation
<i>Cocculus hirsutus</i> (L.) Diels	Menispermaceae	Terrestrial	Climber	Common near water logged area
<i>Cocculus pendulus</i> (Forst.) diels	Menispermaceae	Terrestrial	Climber	Common near water logged area
<i>Tinospora cordifolia</i> (Willd.)	Menispermaceae	Terrestrial	Climber	Common in shaded forest area
<i>Argemone mexicana</i>	Papaveraceae	Terrestrial	Herb	Common in drying moist ground, wasteland
<i>Cadaba fruticosa</i> (L.) Druce	Capparaceae	Terrestrial	Shrub	Hedges, revenue area
<i>Capparis decidua</i> (Forsk.) Edgew.	Capparaceae	Terrestrial	Shrub	Common horticulture plant
<i>Cleome gyanandra</i> L.	Capparaceae	Terrestrial	Herb	Common in plains, wastelands, grazing lands
<i>Cleome viscosa</i> L.	Capparaceae	Terrestrial	Herb	Common in plains, wastelands, grazing lands
<i>Maerua oblongifolia</i> (Forsk.) A. Rich.	Capparaceae	Terrestrial		Common in open areas

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Portulaca oleracea</i> L.	Portulacaceae	Terrestrial	Herb	Common weed
<i>Portulaca quadrifida</i> L.	Portulacaceae	Terrestrial	Herb	Common weed
<i>Tamarix dioica</i> Roxb.	Tamaricaceae	Terrestrial nr. Water	Tree	Common on moist ground
<i>Tamarix</i> sp.	Tamaricaceae	Terrestrial nr. Water	Tree	Common on moist ground
<i>Bergia suffruticosa</i> (Del.) Fenzl.	Elatinaceae	Terrestrial	Herb	Common weed
<i>Abutilon glaucum</i> (Cav.) Sw.	Malvaceae	Terrestrial	Herb	Common weed
<i>Sida ovata</i> Forsk.	Malvaceae	Terrestrial	Herb	Common weed
<i>Melochia chorchorifolia</i>	Sterculiaceae	Terrestrial	Herb	Common weed
<i>Corchorus aestuans</i> L.	Tiliaceae	Terrestrial	Herb	Common weed
<i>Corchorus depressus</i> (L.) Stocks	Tiliaceae	Terrestrial	Herb	Common weed
<i>Triumfetta rotundifolia</i> Lam.	Tiliaceae	Terrestrial	Herb	Common weed
<i>Fagonia cretica</i> L.	Zygophyllaceae	Terrestrial	Herb	Common weed
<i>Tribulus terrestris</i> L.	Zygophyllaceae	Terrestrial	Herb	Common weed
<i>Biophytum sensitivum</i> (L.) DC	Oxalidaceae	Terrestrial	Herb	Common weed
<i>Aegle marmelos</i> (L.) Corr.	Rutaceae	Terrestrial	Tree	Natural and Planted
<i>Citrus limon</i> (L.) Burm.	Rutaceae	Terrestrial	Tree	Planted
<i>Ailanthus excelsa</i> Roxb.	Simaroubaceae	Terrestrial	Tree	Planted
<i>Balanites aegyptiaca</i> (L.) Del.	Balanitaceae	Terrestrial	Tree	Natural
<i>Azadirachta indica</i> A. Juss.	Meliaceae	Terrestrial	Tree	Planted

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Maytenus emarginatus</i> (Willd.) D.Hou.	Celastraceae	Terrestrial	Shrub	Common in wastelands
<i>Zizyphus mauritiana</i> Lam.	Rhamnaceae	Terrestrial	Tree	Natural and Planted
<i>Zizyphus nummularia</i> (Burm. F.) W. and A.	Rhamnaceae	Terrestrial	Shrub	Natural and Planted
<i>Cayratia carnosa</i> (Lam.) Gagnep	Vitaceae	Terrestrial	Climber	Natural in forested areas, moist areas
<i>Cardiospermum halicacabum</i> L.	Sapindaceae	Terrestrial	Climber	Natural in forested areas, moist areas
<i>Sapindus emarginatus</i> Vahl.	Sapindaceae	Terrestrial	Tree	Naturalized and planted
<i>Moringa oleifera</i> Lam.	Moringaceae	Terrestrial	Tree	Naturalized and planted
<i>Abrus precatorius</i> L.	Fabaceae	Terrestrial nr. water	Climber	Natural in forested areas, moist places
<i>Aeschynomene indica</i> L.	Fabaceae	Terrestrial nr. water	Herb	Common weed in moist places
<i>Alysicarpus procumbens</i> (Roxb.)	Fabaceae	Terrestrial	Herb	Common in plains
<i>Alysicarpus vaginalis</i> (L.) DC.	Fabaceae	Terrestrial	Herb	Common weed in plains
<i>Canavalia ensiformis</i> (L.) DC.	Fabaceae	Terrestrial	Climber	Natural in forested areas, moist places
<i>Crotolaria medicaginea</i> Lam.	Fabaceae	Terrestrial	Herb	Common weed in plains
<i>Desmodium triflorum</i> (L.) DC.	Fabaceae	Terrestrial	Herb	Common weed
<i>Goniogyna hirta</i> (Willd.) Ali	Fabaceae	Terrestrial	Herb	Common weed

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Indigofera astragalina</i> DC.	Fabaceae	Terrestrial	Herb	Common weed
<i>Indigofera cordifolia</i> Heyne ex Roth	Fabaceae	Terrestrial	Herb	Common weed
<i>Rhynchosia minima</i> (L.) DC.	Fabaceae	Terrestrial	Climber	Common in hedges, forest undergrowth
<i>Sesbania sesban</i> (L.) Merr.	Fabaceae	Terrestrial	Shrub	Natural and Planted food plant
<i>Taverniera cuneifolia</i> (Roth.) Arn.	Fabaceae	Terrestrial	Herb	Common weed
<i>Tephrosia purpurea</i> (L.) Pers	Fabaceae	Terrestrial	Herb	Common weed
<i>Tephrosia strigosa</i> (Dalz.)	Fabaceae	Terrestrial	Herb	Common weed
<i>Tephrosia villosa</i> (L.) Pers.	Fabaceae	Terrestrial	Herb	Common weed
<i>Cassia auriculata</i> L.	Caeslapiniaceae	Terrestrial	Shrub	Common in wastelands
<i>Cassia fistula</i> L.	Caeslapiniaceae	Terrestrial	Tree	Planted in plains
<i>Cassia pumila</i> Lam.	Caeslapiniaceae	Terrestrial	Herb	Common in forested areas
<i>Cassia siamea</i> Lam.	Caeslapiniaceae	Terrestrial	Tree	Planted
<i>Cassia tora</i> L.	Caeslapiniaceae	Terrestrial	Herb	Common weed
<i>Delonix regia</i> (Boj.) Raf.	Caeslapiniaceae	Terrestrial	Tree	Planted
<i>Parkinsonia aculeate</i> L.	Caeslapiniaceae	Terrestrial	Tree	Planted
<i>Tamarindus indica</i> L.	Caeslapiniaceae	Terrestrial	Tree	Planted
<i>Acacia nilotica</i> (L.) Del.	Mimosaceae	Terrestrial	Tree	Natural and Planted
<i>Leucaena leucocephala</i> (Lam.) de Wit.	Mimosaceae	Terrestrial	Tree	Planted

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Pithecellobium dulce</i> (Roxb.) Blh.	Mimosaceae	Terrestrial	Tree	Planted
<i>Prosopis chilensis</i> (Molina) Stuntz. (Syn. <i>P. juliflora</i>)	Mimosaceae	Terrestrial	Tree	Very common in all areas especially coastal
<i>Prosopis cineraria</i> (L.) Druce (Syn. <i>P. spicigera</i>)	Mimosaceae	Terrestrial	Tree	Common in plains, forests mostly planted
<i>Terminalia catappa</i> L.	Combretaceae	Terrestrial	Tree	Planted
<i>Ammania baccifera</i> L.	Lythraceae	Terrestrial nr. water	Herb	Common weed
<i>Citrullus colocynthis</i> (L.) Schrad.	Cucurbitaceae	Terrestrial	Climber	Common weed
<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Terrestrial	Climber	Common weed
<i>Cucumis callosus</i> (Rottl.) Cogn.	Cucurbitaceae	Terrestrial	Climber	Common weed
<i>Mukia maderaspatana</i> (L.) M. Roem	Cucurbitaceae	Terrestrial nr. Water	Climber	Common weed
<i>Trichosanthes cucumerina</i> L.	Cucurbitaceae	Terrestrial	Climber	Common weed
<i>Glinus lotoides</i> L.	Molluginaceae	Terrestrial	Herb	Common weed
<i>Mollugo pentaphylla</i> L.	Molluginaceae	Terrestrial nr moist areas	Herb	Common weed
<i>Sesuvium sesuvioides</i> (Fenzl.)	Aizoaceae	Terrestrial	Herb	Common weed in coastal areas mud flats
<i>Trianthema portulacastrum</i> L.	Aizoaceae	Terrestrial	Herb	Common weed

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Zaleya govindia</i> Buch.– Ham.	Aizoaceae	Terrestrial	Herb	Common weed in coastal area
<i>Borreria stricta</i> (L.f.) K. Schum	Rubiaceae	Terrestrial nr water	Herb	Common weed in moist places
<i>Oldenlandia</i> sp.	Rubiaceae	Terrestrial nr water	Herb	Common weed grass
<i>Blumea</i> sp.	Asteraceae	Terrestrial	Herb	Common weed
<i>Echinops echinatus</i> Roxb.	Asteraceae	Terrestrial	Herb	Common weed
<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Terrestrial	Herb	Common
<i>Launaea procumbens</i> (Roxb.)	Asteraceae	Terrestrial	Herb	Common weed
<i>Launaea sarmentosa</i> (Willd.) Alst.	Asteraceae	Terrestrial	Herb	Common weed along sea coast
<i>Parthenium hysterophorus</i> L.	Asteraceae	Terrestrial	Herb	Common invasive weed
<i>Sphaeranthus indicus</i> L.	Asteraceae	Terrestrial nr. water	Herb	Common
<i>Tridax procumbens</i> L.	Asteraceae	Terrestrial	Herb	Common weed
<i>Vernonia cinerea</i> (L.) Less	Asteraceae	Terrestrial	Herb	Common weed
<i>Xanthium strumarium</i> L.	Asteraceae	Terrestrial	Herb	Common weed
<i>Salvadora persica</i> L.	Salvadoraceae	Terrestrial	Tree	Common in coastal areas
<i>Catharanthus roseus</i> (L.) G. Don.	Apocynaceae	Terrestrial	Herb	Common and planted
<i>Nerium indicum</i> Mill.	Apocynaceae	Terrestrial	Shrub	Common and planted
<i>Calotropis gigantea</i> (L.) R. Br.	Apocynaceae	Terrestrial	Shrub	Common weed

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Oxystelma secamone</i> (L.) Karst.	Apocynaceae	Aquatic		Common swamps and lakes
<i>Pentatropis capensis</i> (L.f.) Bullock	Apocynaceae	Terrestrial nr. water		Common in coastal areas
<i>Pergularia daemia</i> (Forsk.) Chiov.	Apocynaceae	Terrestrial		Common in hedges, forest undergrowth
<i>Enicostema hyssopifolium</i> (Willd.) Verdoon	Gentianaceae	Terrestrial	Herb	Common in fields
<i>Cordia gharaf</i> (Forsk.) E. and A.	Ehretiaceae	Terrestrial	Tree	Common, planted
<i>Coldenia procumbens</i> L.	Boraginaceae	Terrestrial nr. Water	Herb	Common drying ground
<i>Heliotropium curassavicum</i> L.	Boraginaceae	Terrestrial nr. Water	Herb	Common in coastal areas
<i>Heliotropium ovalifolium</i> Forsk.	Boraginaceae	Terrestrial nr. Water	Herb	Common in moist ground
<i>Convolvulus microphyllus</i> (Roth.)	Convolvulaceae	Terrestrial	Herb	Common in fields
<i>Cressa cretica</i> L.	Convolvulaceae	Terrestrial nr. Water	Herb	Common in moist ground
<i>Evolvulus alsinoides</i> (L.) L.	Convolvulaceae	Terrestrial	Herb	Common in fields
<i>Hewittia sublobata</i> (L.f.) O. Ktze.	Convolvulaceae	Terrestrial	Herb	Common in fields
<i>Ipomoea aquatica</i> Forsk.	Convolvulaceae	Aquatic	Herb	Common floating
<i>Ipomoea fistulosa</i> Mart. Ex Choisy	Convolvulaceae	Terrestrial	Herb	Common as weed
<i>Ipomoea pes-carpea</i> (L.) Sw.	Convolvulaceae	Terrestrial / Aquatic	Climber	Common as weed in coastal areas

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Merremia gangetica</i> (L.) Cufod.	Convolvulaceae	Terrestrial nr. Water	Herb	Common in moist ground
<i>Rivea hypocrateriformis</i> Choisy	Convolvulaceae	Terrestrial	Climber	Common in forest undergrowth
<i>Capsicum annum</i> L.	Solanaceae	Terrestrial	Herb	Commonly cultivated
<i>Datura innoxia</i> Mill.	Solanaceae	Terrestrial	Herb	Common weed
<i>Lycopersicon lycopersicum</i> (L.)	Solanaceae	Terrestrial	Herb	Commonly cultivated
<i>Physalis minima</i> L.	Solanaceae	Terrestrial	Herb	Common in plains, forest undergrowth as weed
<i>Solanum xanthocarpum</i> Schrad. and Wedl.	Solanaceae	Terrestrial	Herb	Common weed
<i>Glossostigma diandrum</i> (L.) O. Ktze.	Scrophulariaceae	Terrestrial nr. Water	Herb	On the margins / banks
<i>Pedaliium murex</i> L.	Pedaliaceae	Terrestrial	Herb	Common weed
<i>Lepidagathis trinervis</i> Wall. Ex Nees	Acanthaceae	Terrestrial	Herb	Common weed
<i>Avicennia marina</i> (Forsk.) Vierh.	Avicenniaceae	Aquatic	Tree	Common mangrove
<i>Boerhavia</i> sp.	Nyctaginaceae	Terrestrial	Herb	Common as weed
<i>Boerhavia spectabilis</i> Willd.	Nyctaginaceae	Terrestrial		Common as weed
<i>Achyranthes aspera</i> L.	Amaranthaceae	Terrestrial	Herb	Common planted
<i>Aerva lanata</i> (L.) Juss.	Amaranthaceae	Terrestrial	Herb	Common plains, weed
<i>Achyranthes aspera</i> L.	Amaranthaceae	Terrestrial	Herb	Common as weed
<i>Aerva lanata</i> (L.) Juss.	Amaranthaceae	Terrestrial	Herb	Common as weed
<i>Amaranthus spinosus</i> L.	Amaranthaceae	Terrestrial	Herb	Common as weed

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Amaranthus viridis</i> L.	Amaranthaceae	Terrestrial	Herb	Common as weed
<i>Celosia argentea</i> L.	Amaranthaceae	Terrestrial	Herb	Common
<i>Digera muricata</i> (L. Mart.)	Amaranthaceae	Terrestrial	Herb	Common weed
<i>Pupalia lappacea</i> (L.) Juss	Amaranthaceae	Terrestrial	Herb	Common weed
<i>Salicornia brachiata</i> Roxb.	Chenopodiaceae	Terrestrial	Herb	Common in coastal areas, mudflats
<i>Salsola baryosma</i> (R. and S. Dandy)	Chenopodiaceae	Terrestrial nr water	Herb	Common in coastal areas, mudflats
<i>Suaeda fruticosa</i> (L.) Forsk.	Chenopodiaceae	Along sea coast	Herb	Common in coastal areas, mudflats
<i>Suaeda nudiflora</i> (Willd.) Moq.	Chenopodiaceae	Along sea coast	Herb	Common in coastal areas, mudflats
<i>Polygonum plebeium</i> R. Br.	Polygonaceae	Terrestrial nr. Water	Herb	Common
<i>Aristolochia bracteolata</i> Lam	Aristolochiaceae	Terrestrial	Herb	Common
<i>Acalypha ciliata</i> Forsk.	Euphorbiaceae	Terrestrial	Herb	Common as weed
<i>Euphorbia hirta</i> L.	Euphorbiaceae	Terrestrial	Herb	Common as weed
<i>Euphorbia orbiculata</i> H.B. and K.	Euphorbiaceae	Terrestrial	Herb	Common as weed
<i>Euphorbia thymifolia</i> L.	Euphorbiaceae	Terrestrial	Herb	Common as weed
<i>Euphorbia tirucalli</i> L.	Euphorbiaceae	Terrestrial	Herb	Common as hedges
<i>Phyllanthus fraternus</i> Webster	Euphorbiaceae	Terrestrial	Herb	Common as weed

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Phyllanthus urinaria</i> L.	Euphorbiaceae	Terrestrial	Herb	Common as weed
<i>Ficus benghalensis</i> L.	Moraceae	Terrestrial	Tree	Common as planted shade tree and natural
<i>Ficus racemosa</i> L.	Moraceae	Terrestrial	Tree	Common as planted shade tree and natural
<i>Ficus religiosa</i> L.	Moraceae	Terrestrial	Tree	Common as planted shade tree and natural
<i>Hydrilla verticillata</i> (L.f.) Royle	Hydrocharitaceae	Aquatic	Herb	Submerged
<i>Vallisneria spiralis</i> L.	Hydrocharitaceae	Aquatic	Herb	Submerged
<i>Aloe barbadensis</i> Mill	Liliaceae	Terrestrial	Shrub	Common in wastelands
<i>Asparagus racemosus</i> L.	Liliaceae	Terrestrial	Climber	Cultivated and wild
<i>Commelina benghalensis</i> L.	Commelinaceae	Terrestrial	Herb	Common as weed
<i>Commelina diffusa</i> Burm. F.	Commelinaceae	Terrestrial	Herb	Common
<i>Phoenix sylvestris</i> (L.) Roxb.	Arecaceae	Terrestrial	Tree	Common in wastelands
<i>Najas</i> sp.	Najadaceae	Aquatic	Herb	Common submerged plant
<i>Bulboschoenus maritimus</i> (Linn.) Palla	Cyperaceae	Aquatic	Herb	Common emergent plant
<i>Bulbostylis barbata</i> (Rottb.) Cl.	Cyperaceae	Aquatic	Herb	Common emergent plant
<i>Cyperus bulbosus</i> Vahl.	Cyperaceae	Terrestrial	Herb	Among grasses
<i>Cyperus compressus</i> L.	Cyperaceae	Terrestrial	Herb	Among grasses

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Cyperus iria</i> L.	Cyperaceae	Terrestrial	Herb	Among grasses
<i>Cyperus pangorei</i> Rott.	Cyperaceae	Terrestrial nr. Water	Herb	Among grasses
<i>Cyperus rotundus</i> L.	Cyperaceae	Terrestrial nr. Water	Herb	Among grasses
<i>Fimbristylis</i> sp.	Cyperaceae	Terrestrial nr. Water	Herb	As emergent plant
<i>Scirpus grossus</i> L. f.	Cyperaceae	Terrestrial nr. Water	Herb	As emergent plant
<i>Aeluropus lagopoides</i> (L.)	Poaceae	Along seacoast	Herb	On mudflats
<i>Aristida adscensionis</i> L.	Poaceae	Terrestrial nr. Water	Herb	Common in waterlogged areas
<i>Bothriochloa pertusa</i> (L.) A. Camus	Poaceae	Terrestrial	Herb	Common weed among grasses
<i>Cenchrus setigerus</i> Vahl.	Poaceae	Terrestrial	Herb	Common weed among grasses
<i>Chloris barbata</i> Sw.	Poaceae	Terrestrial	Herb	Common weed among grasses
<i>Chloris virgata</i> Sw.	Poaceae	Terrestrial	Herb	Common weed among grasses
<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Terrestrial	Herb	Common weed among grasses
<i>Dactyloctenium aegyptium</i> (L.) P. Beauv.	Poaceae	Terrestrial	Herb	Common weed among grasses
<i>Dichanthium annulatum</i> (Foirsk.) Stapf	Poaceae	Terrestrial	Herb	Common weed among grasses
<i>Digitaria adscendens</i> (H. B. and Henrard)	Poaceae	Terrestrial	Herb	Common weed among grasses

Plant Species Name	Family	Habitat	Plant Kind	Status
<i>Dinebra retroflexa</i> (Vahl.) Panz.	Poaceae	Terrestrial	Herb	Common weed among grasses
<i>Echinochloa colonum</i> (L.) Link.	Poaceae	Terrestrial	Herb	Common weed
<i>Eragrostis pilosa</i> (L.) P. Beauv	Poaceae	Terrestrial	Herb	Common weed
<i>Melanocenchris jacquemontii</i> J. and S.	Poaceae	Terrestrial	Herb	Common weed
<i>Oplismenus Myanmarinii</i> (Retz.)	Poaceae	Terrestrial	Herb	Common in shaded places
<i>Paspaladium geminatum</i> (Forsk.)	Poaceae	Terrestrial nr water bodies	Herb	Common near water bodies and floating
<i>Saccharum spontaneum</i> L.	Poaceae	Terrestrial nr water bodies	Herb	Common near water bodies and floating
<i>Setaria tomentosa</i> (Roxb.) Kunth	Poaceae	Terrestrial	Herb	Common in hedges, forest undergrowth
<i>Sporobolus tremulus</i> (Willd.) Kunth	Poaceae	Terrestrial	Herb	Common near water bodies and floating
<i>Urochondra setulosa</i> (Trin.) Hubb.	Poaceae	Terrestrial	Herb	Common on sandy saline area along sea coast. Endemic to Gujarat.

11.5 Appendix 5 : List of Fishes of Khijadiya Bird Sanctuary, Gujarat

SYSTEMATIC ACCOUNT

Class OSTEICHTHYES

Order CYPRINIFORMES

Family CYPRINIDAE

* *Puntius sarana sarana* (Hamilton, 1822) Olive Barb

* *Labeo calbasu* (Hamilton, 1822) Orange-fin Labeo

Order SILURIFORMES

Family BAGRIDAE

* *Mystus gulio* (Hamilton, 1822) Long-whiskered Catfish

Order CYPRINODONTIFORMES

Family CYPRINODONTIDAE

Aphanius dispar (Rüppell, 1829) Toothcarp

Order PERCIFORMES

Family POLYNEMIDAE

Eleutheronema tetradactylus (Shaw, 1804) Four Thread Tassel Fish

Family GOBIIDAE

Boleophthalmus dentatus Valenciennes, 1837 Mudskipper

Family MUGILIDAE

Liza carinata (Valenciennes, 1836) Keeled Mullet

Liza melinoptera (Valenciennes, 1836) Otomebora Mullet

11.6 Appendix 6 : List of Amphibia of Khijadiya Bird Sanctuary, Gujarat

SYSTEMATIC ACCOUNT

Class AMPHIBIA

Order ANURA

Family DICROGLOSSIDAE

* *Hoplobatrachus tigerinus* (Daudin, 1803) Indian Bull Frog

* *Euphlyctis hexadactylus* (Lesson, 1834) Pond Frog

Family BUFONIDAE

* *Duttaphrynus stomaticus* Lutken, 1862 Marbled Toad

Family BUFONIDAE

* *Duttaphrynus stomaticus* Lutken, 1862 Marbled Toad

11.7 Appendix 7 : List of Reptiles of Khijadiya Bird Sanctuary, Gujarat**SYSTEMATIC ACCOUNT**

Class REPTILIA

Order TESTUDINES

Family TRIONYCHIDAE

* *Lissemys punctata punctata* (Lacepede, 1788), North Indian Flap-Shelled Turtle

Class SQUAMATA

Order SAURIA

Family GEKKONIDAE

* *Hemidactylus brooki* Gray, 1845 Spotted House Gecko

* *Hemidactylus leschenaultii* Dumeril and Bibron, 1836 Common Bark Gecko

* *Hemidactylus flaviviridis* Ruppell, 1835 Yellow Bellied House Gecko

Family AGAMIDAE

Calotes versicolor (Daudin, 1802) Indian Garden Lizard

Family SCINCIDAE

Eutropis carinata (Schneider, 1801) Common Indian Skink

Family VARANIDAE

Varanus bengalensis (Linnaeus, 1758) Indian Monitor

Suborder SERPENTES

Family BOIDAE

Eryx johnii (Russell, 1801) Indian Sand Boa

Family COLUBRIDAE

Ptyas mucosus (Linnaeus, 1758) Indian Rat Snake

* *Xenochrophis piscator* (Schneider, 1799) Checkered Keelback

Family ELAPIDAE

Naja naja oxiana (Eichwald, 1831) Oxus Cobra

Family VIPERIDAE

Echis carinatus (Schneider, 1801) Saw-scaled Viper

11.8 Appendix 8 : List of Mammals of Khijadiya Bird Sanctuary, Gujarat

SYSTEMATIC ACCOUNT

Class MAMMALIA

Order INSECTIVORA

Family ERINACEIDAE

Subfamily ERINACEINAE

* *Hemiechinus micropus* (Blyth, 1846) Indian Hedgehog

Status: CAMP: LR1c (Nationally); DD (Globally).

Order CARNIVORA

Family CANIDAE

Canis aureus Linnaeus, 1758 Asiatic Jackal

Status: IWPA: Schedule II, Part II; CAMP: LR1c (Nationally); CITES: Appendix III.

Canis lupus Linnaeus, 1758 Wolf

Status: IWPA: Schedule I, Part I; RDB; VU: CITES: Appendix I; CAMP: LRnt (Nationally); DD (Globally).

Vulpes bengalensis (Shaw, 1800) Indian Fox

Status: IUCN: DD; IWPA: Schedule II, Part II; CITES: Appendix III; CAMP: LRnt (Nationally); DD (Globally).

Family FELIDAE

Subfamily FELINAE

Felis chaus Schreber, 1777 Jungle Cat

Status: IWPA: Schedule II, Part II; CITES: Appendix II; CAMP: LRnt (Nationally); DD (Globally).

Family HERPESTIDAE

Subfamily HERPESTINAE

Herpestes edwardsii (E. Geoffrey Saint-Hilaire, 1818) Indian Gray Mongoose

Status: IWPA: Schedule IV; CITES: Appendix III; CAMP: LR1c (Nationally); DD (Globally).

* *Herpestes javanicus* (E. Geoffrey Saint-Hilaire, 1818) Small Indian Mongoose

Status: IWPA: Schedule IV; CAMP: LR1c (Nationally); DD (Globally).

Family VIVERRIDAE

Subfamily VIVERRINAE

* *Viverricula indica* (Desmarest, 1804) Small Indian Civet

Status: IWPA: Schedule II, Part II; CITES: Appendix III; CAMP: LRnt (Nationally), DD (Globally).

Order ARTIODACTYLA

Family SUIDAE

Subfamily SUINAE

* *Sus scrofa* Linnaeus, 1758 Wild Boar

Status: IWPA: Schedule III; CAMP: LR1c (Nationally); DD (Globally).

Family BOVIDAE

Subfamily BOVINAE

Boselaphus tragocamelus (Pallas 1766) Blue Bull

Status: IUCN: LRcd; IWPA: Schedule III; CAMP: LR1c (Nationally); DD (Globally).

Order RODENTIA

Sub order SCIUROGNATHI

Family SCIURIDAE

Subfamily SCIURINAE

Funambulus pennantii Wroughton, 1905 Northern Palm Squirrel

Status: IWPA: Schedule IV; CAMP: LR1c (Nationally); DD (Globally).

Family MURIDAE

Subfamily GERBILLINAE

* *Meriones hurrianae* (Jordon, 1867) Indian Desert Gerbil

Status: IWPA: Schedule V; CAMP: LR1c (Nationally); DD (Globally).

* *Tatera indica* (Hardwicke, 1807) Indian Gerbil

Status: IWPA: Schedule V; CAMP: LR1c (Nationally); DD (Globally).

Order LAGOMORPHA

Family LEPORIDAE

Lepus nigricollis Cuvier, 1823 Indian Hare

Status: IWPA: Schedule IV; CAMP: LR1c (Nationally); DD (Globally).

Abbreviations used in the text: Lrnt=Lower Risk Near Threatened; LR1c = Lower Risk Least Concern; VU = Vulnerable, EN = Endangered; CR = Critically Endangered; DD = Data Deficient; IWPA = Indian Wildlife (Protection) Act, 1972; CITES = Convention on International Trade in Endangered Species of Wild Fauna and Flora; CAMP=Conservation Assessment and Management Plan of Biodiversity Conservation Prioritization Project; IUCN=International Union for Conservation of Nature and Natural Resources.

Plate 1. Habitat diversity of Khijadiya Lake & Bird Sanctuary, Gujarat



Plate 2. Vertebrate Faunal diversity of Khijadiya Lake & Bird Sanctuary, Gujarat



Plate 3. Avian diversity of Podicipediformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Plate 4. Avian diversity of Pelecaniformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Plate 5. Avian diversity of Ciconiiformes from Khijadiya Lake & Bird Sanctuary, Gujarat

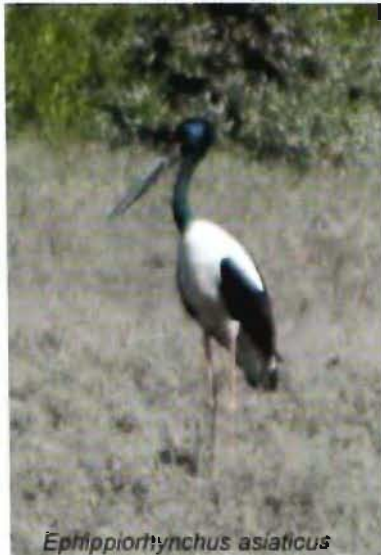


Plate 6. Avian diversity of Ciconiiformes & Phoenicopteriformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Platalea leucorodia



Pseudibis papillosa



Plegadis falcinellus



Threskiornis melanocephalus



Phoenicopiterus ruber

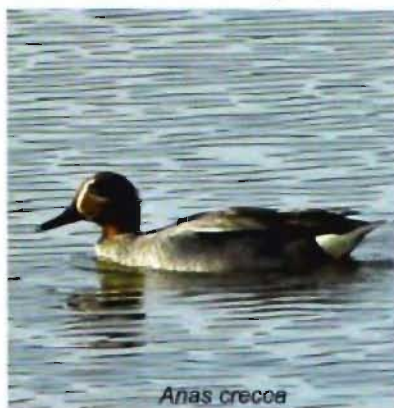


Phoenicopiterus minor

Plate 7. Avian diversity of Anseriformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Anas crecca



Anas crecca



Anas platyrhynchos



Anas acuta



Anas clypeata



Anas poecilorhynchos



Anas platyrhynchos



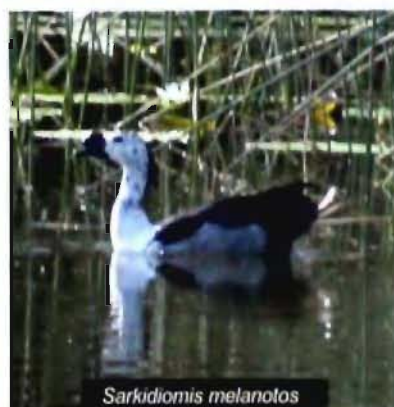
Anas penelope



Anas strepera



Nettion coromandelianus



Sarkidiornis melanotos



Tadorna feruginea

Plate 8. Avian diversity of Falconiformes from Khijadiya Lake & Bird Sanctuary, Gujarat

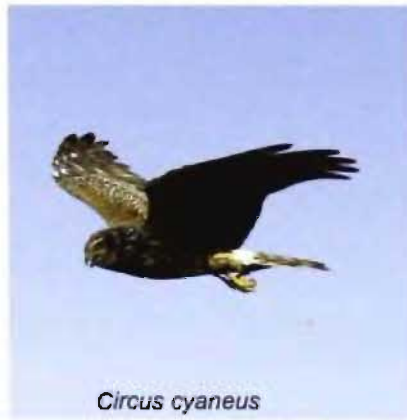


Plate 9. Avian diversity of Galliformes & Gruiformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Plate 10. Avian diversity of Charadriiformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Plate 11. Avian diversity of Charadriiformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Plate 12. Avian diversity of Charadriiformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Sterna aurantia



Gelochelidon nilotica



Larus genei



Larus ridibundus



Larus brunnicephalus



Larus ichthyaetus



Glareola lactea



Glareola pratincola



Charadrius coromandicus



Burhinus oedicnemus



Esacus recurvirostris



Dromas ardeola

Plate 13. Avian diversity of Columbiformes, Psittaciformes & Cuculiformes from Khijadiya Lake & Bird Sanctuary



Plate 14. Avian diversity of Strigiformes, Caprimulgiformes, Apodiformes & Coraciiformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Plate 15. Avian diversity of Coraciiformes & Piciformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Plate 16. Avian diversity of Passeriformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Plate 17. Avian diversity of Passeriformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Terpsiphone paradisi



Rhipidura aureola



Orthotomus sutorius



Turdoides malcolmi



Turdoides caudatus



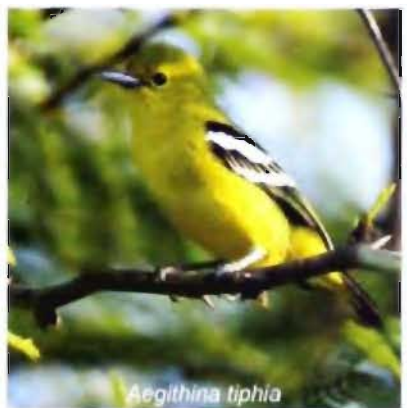
Phoenicurus ochruros



Saxicoloides fulcata



Lanius meridionalis



Aegithina tithia



Pycnonotus cafer



Pycnonotus leucotis

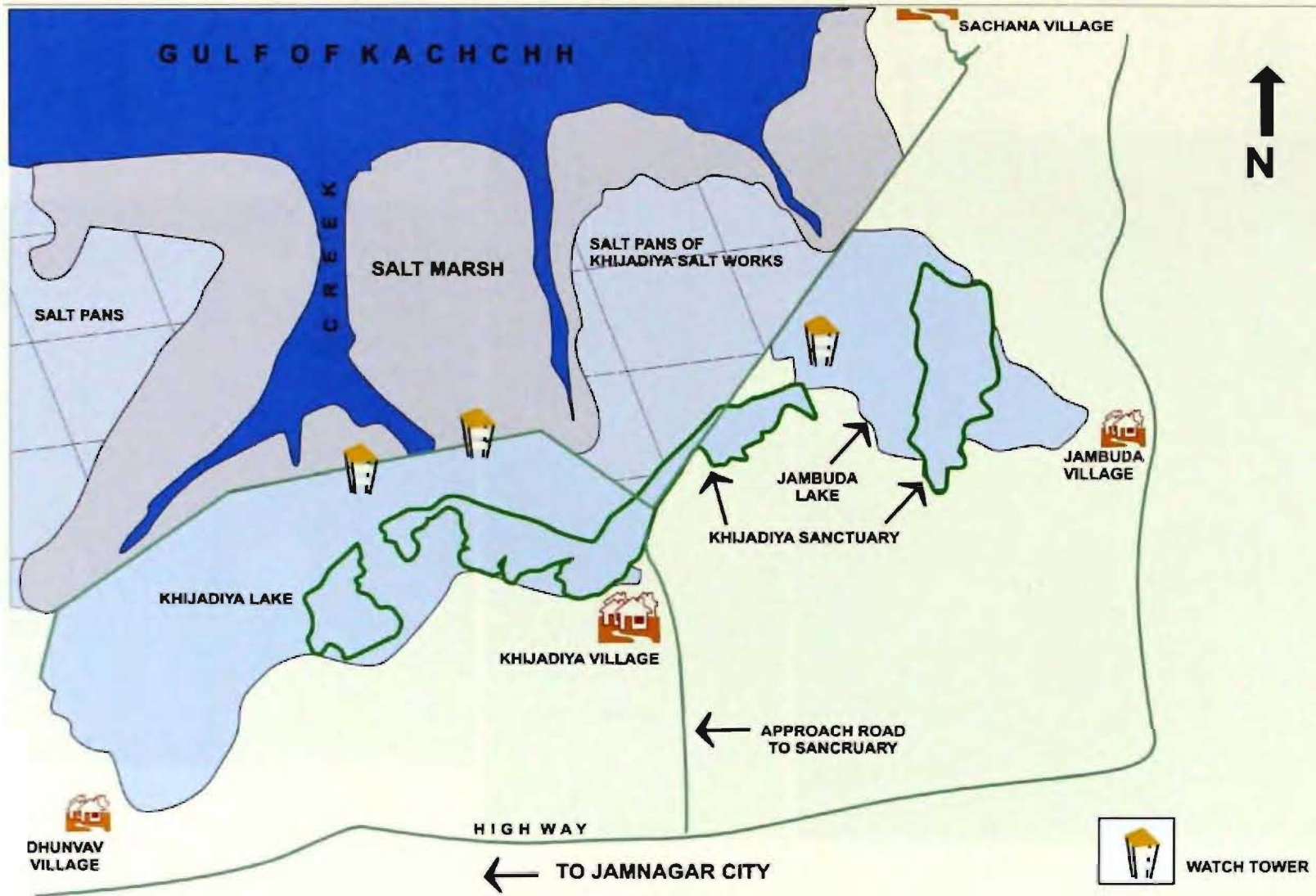


Tephrodornis pondicerianus

Plate 18. Avian diversity of Passeriformes from Khijadiya Lake & Bird Sanctuary, Gujarat



Map 1 : Map of Khijadiya Lake and Bird Sanctuary, Gujarat



Map 2. Digital map showing location of Khijadiya Lake and Bird Sanctuary, Gujarat

