

ORISSA

IN-OR

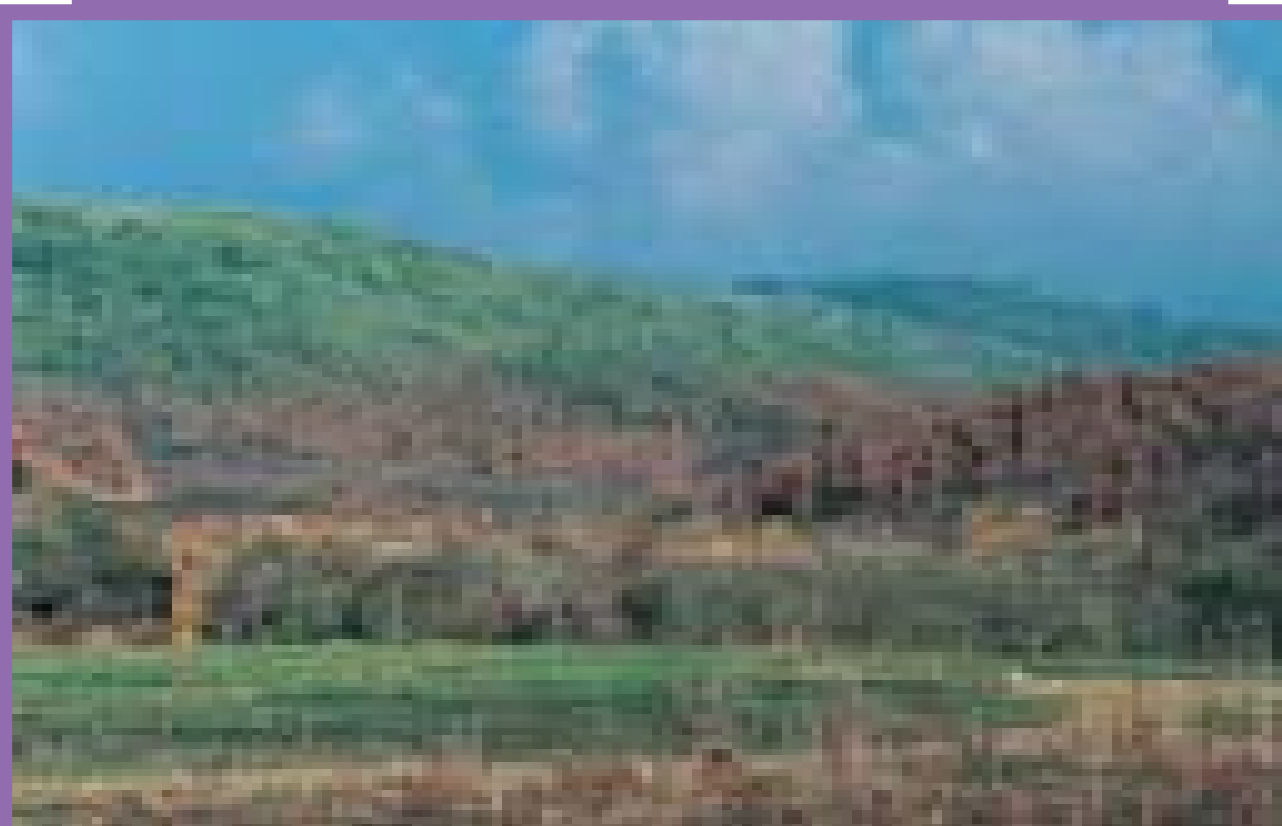


Photo: Juscelino Pereira

Forests, grasslands, wetlands and coasts of Orissa supports 475 species of birds.

Orissa (17° 47' - 22° 34' North and 81° 22' - 87° 29' East) can be divided into four distinct physiographic regions namely, Northern Plateau, Eastern Ghats, Central Tableland and Coastal Plains. The north of the State is bounded by Jharkand, the southeast by Andhra Pradesh, the west by Madhya Pradesh, and the east by the Bay of Bengal. The prominent rivers flowing through the State are Mahanadhi, Brahmani and Baitarani. With a length of 853 km, the Mahanadi is the one of the largest rivers of the Indian subcontinent. Orissa has a geographical area of 1,55,707 sq. km, which constitutes about 4.7% of the land area of the country. The State is divided into 30 administrative districts.

The total length of the coastline in Orissa is about 430 km. The rivers of Orissa form deltas on the coast, such as Chilika and Bhitarkanika (Anon. 1992). Chilika is a largest brackish water lagoon that sprawls along the east coast of India. In Chilika there are several islands located in and around the lagoon covering an area of 223 sq. km. The major islands are Kalijai, Barakuda, Ghantasila, Chadhelihaga and Nalabana (IBA Site) (Patnaik 2000). Chilika Lake covers an area of 1,165 sq. km. It is an estuarine lagoon with a maximum waterspread area of 906 sq. km in summer and 1,165 sq. km in winter. The pear-shaped lagoon is about 64.5 km long and its width varies from 5 km to 20 km. It is connected to the sea by a 35 km long narrow outer channel.

The climate is generally hot and humid. The temperature ranges from 20 °C to 41 °C. Precipitation is mainly during the northeast tropical monsoon (September-December). The mean annual rainfall of the State ranges from 1,200 mm to 1,600 mm. The coastal area is highly prone to periodical cyclones. The most recent cyclone was in July 2001, affecting nearly 0.5 million people.

Orissa is an agricultural State with over 76% of its people dependent on farming for their livelihood. The major crops are rice, pulses, oil-seeds, jute, sugarcane, coconut and turmeric. The total population is 31.66 million of which 86% is rural. The tribal population is 22%. The population density is 297 persons per sq. km (Ministry of Environment and Forests 1999; Forest Survey of India 2001).

Vegetation

In Orissa four major forest types can be identified, namely Tropical Semi-Evergreen, Tropical Moist Deciduous, Tropical Dry Deciduous and Littoral-Swamp Forest. The Eastern Ghats (400 m to 1672 m) to the north fall in the districts of Sambalpur and Bolangir (Gandhamardan hills), Mayurbhanj and Kalahandi (Khondmal hills), Phulbhani and Koraput (Palakonda, Antikonda, Burrakonda ranges). The vegetation in the Eastern Ghats can be classified into Evergreen Forests, Tropical Semi-Evergreen Forests, Tropical Moist Deciduous Forests, Southern Tropical Dry Deciduous Forests, Northern Mixed Dry Deciduous Forests, Dry Savannah Forest and Tropical Dry Evergreen Scrub. The mangroves and estuaries are important natural breeding places of threatened animals such as the Estuarine Crocodile *Crocodylus porosus* and sea turtles.

The state government initiated forest plantations in 1950 to stop soil erosion in the coastal belt. Thus, all along the coast, the State has planted *Casuarina* sp. Later, in 1962, the Forest Development Corporation undertook large-scale plantation of commercial species such as *Tectona grandis*, *Eucalyptus* sp, *Dalbergia sissoo*, *Salmalia malbaricum* and *Acacia catechu* in various parts of the State. About 1.83 million ha, have been brought under plantation after 1947 (Ministry of Environment and Forests 1999, Forest Survey of India 2001).

The State has a geographical area of 1,55,707 sq. km, and the total forest cover is 47,033 sq. km (Forests Survey of India 2001). The protected areas constitute 10.37% of the total forest area. There are 18 wildlife sanctuaries and two national parks in the State, constituting 4.48% under PA network (Rodgers *et al.* 2000). Of these sanctuaries, three, Karlapat, Debrigarh and Hadagar are located in the Eastern Ghats. Simlipal is the only Biosphere Reserve of Orissa. Simlipal was declared a Biosphere Reserve by the Government of India due to its vast biodiversity and rich natural heritage (Mohanty *et al.* 2002). The Simlipal hills (part of the Eastern Ghats) were once connected with the Himalayas, but gradually disrupted, thereby isolating species geographically. Correspondingly, there are some birds and fish found in the Eastern Ghats that are only known in the Himalayas and southern Assam hills. Tree Sparrow *Passer montanus*, Pale-capped Pigeon *Columba punicea*, Abbot's Babbler *Malacocinla abbotti* and Little Spider Hunter *Arachnothera longirostra* (Ripley *et al.* 1985) are the best avian examples showing discontinuous distribution.

The fauna of the State is diverse and is documented by several workers. Nineteen species of amphibians and 110 species of reptiles have been reported in the State (Acharjyo 1998; Dutta 1990; Dutta 1997; Dutta and Acharjyo 1997; Dutta and Ahmed 1989; Dutta and Mohanty-Hejmadi 1993; Murthy 1987). The mammalian fauna is also diverse, with almost all the large and smaller mammals of central India found here, including Leopard *Panthera pardus*, Tiger *Panthera tigris*, Indian Fox *Vulpes bengalensis*, Wild Dog *Cuon alpinus*, Ratel or Honey Badger *Mellivora capensis*, Fishing Cat *Felis viverrina*, Four-horned Antelope *Tetracerus quadricornis*, Gaur *Bos gaurus*, Sambar *Cervus unicolor* and Chital *Axis axis*.

About 210 species of migratory and resident birds have been recorded on Chilika Lake and its environs (Dev 1988; Mohapatra and Hussian 1988, Balachandran *et al.* 2002a, 2002b, 2003). The lake perhaps supports the largest concentration of migratory waterfowl in India. About 250 species of fish are estimated to occur in the Chilika Lake. Bhitarkanika (17,500 ha), located on the eastern side of the State, has about 218 species of birds (Pandav 1996; Kar, 1991). It is one of the most famous IBAs of the State. It also holds a significant population of Estuarine crocodile. On its eastern side, about 35 km of seashore is called the Gahirmatha Coast (Scott 1989; Kar and Bustard 1990).

The Orissa coast is known for the world's largest rookery of Olive Ridley Sea Turtles. There are three mass nesting beaches of the Olive Ridges: Gahirmatha coast, Devi and Rushikulya river mouth (Kar 2000). There are eight species of sea turtles in the world, of which four are known to occur in the coastal areas of Orissa: Olive Ridley *Lepidochelys olivacea*, Hawksbill *Eutmochelys imbricata*, Leatherback *Desmochelys coriacea* and Green *Chelonia mydas*. Although four species found in the State the confirmed nesting of only one species, the Olive Ridley, is known so far (Dash and Kar 1990).



Orissa coast is known for the world's largest rookery of Olive Ridley Sea Turtles *Lepidochelys olivacea*.

Courtesy: Elvish Pandav

IBAs in Orissa

IBA site codes	IBA site names	IBA criteria
IN-OR-01	Bhitarkanika Wildlife Sanctuary	A1, A4ii
IN-OR-02	Chandka-Dampara Wildlife Sanctuary	A1, A3, A4ii
IN-OR-03	Chilika Lake and Wildlife Sanctuary	A1, A4i, A4iii
IN-OR-04	Mangal Jodi	A1, A4i, A4iii
IN-OR-05	Satkosia Gorge Wildlife Sanctuary	A1, A3
IN-OR-06	Simlipal National Park	A1, A3
IN-OR-07	Sunabeda Wildlife Sanctuary	A1, A3

Number of IBAs and IBA criteria

A1= Threatened species; A2 = Restricted Range species; A3= Biome species; A4=Congregatory species

IN-OR



AVIFAUNA

The bird life in Orissa is very rich, with 475 species reported till now (Biswajit Mohanty *pers. comm.* 2003). Among the Critically Endangered species, the Oriental White-backed Vulture *Gyps bengalensis* and Long-billed Vulture *G. indicus* are present in the State. Birds such as the Great Indian Bustard *Ardeotis nigriceps* and Lesser Florican *Sypheotides indica* were found earlier but there is no recent record (Rahmani and Manakadan 1990). The Greater Spotted Eagle *Aquila clanga*, Pallas’s Fish-Eagle *Haliaeetus leucoryphus*, Lesser Kestrel *Falco naumanni*, Sarus Crane *Grus antigone*, Wood Snipe *Gallinago nemoricola*, Bristled Grass-Warbler or Grassbird *Chaetornis striatus*, Green Munia *Amandava formosa*, are found in some IBAs. In Orissa, we find 12 out of 57 Vulnerable species listed for India by BirdLife International (2001). A brief description is given later. Fourteen of the 52 Near Threatened bird species occur in Orissa. For 19 species, the IBAs and protected areas of Orissa are highly important for survival.

List of threatened birds with IBA site codes

Critically Endangered		
Oriental White-backed Vulture	<i>Gyps bengalensis</i>	IN-OR-01, 02, 05, 06, 07
Long-billed Vulture	<i>Gyps indicus</i>	IN-OR-01, 02, 05, 06, 07
Vulnerable		
Spot-billed Pelican	<i>Pelecanus philippensis</i>	IN-OR-01, 03, 04
Lesser Adjutant	<i>Leptoptilos javanicus</i>	IN-OR-01, 03
Baer’s Pochard	<i>Aythya baeri</i>	IN-OR-01, 03
Pallas’s Fish-Eagle	<i>Haliaeetus leucoryphus</i>	IN-OR-01, 03
Greater Spotted Eagle	<i>Aquila clanga</i>	IN-OR-01, 06
Lesser Kestrel	<i>Falco naumanni</i>	IN-OR-01
Indian Skimmer	<i>Rynchops albicollis</i>	IN-OR-01, 03, 05
Purple Wood-Pigeon	<i>Columba punicea</i>	IN-OR-02, 06
Bristled Grass-Warbler	<i>Chaetornis striatus</i>	IN-OR-05
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>	IN-OR-02
Green Munia	<i>Amandava formosa</i>	IN-OR-06
Near Threatened		
Darter	<i>Anhinga melanogaster</i>	IN-OR-01
Painted Stork	<i>Mycteria leucocephala</i>	IN-OR-01
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	IN-OR-01
Oriental White Ibis	<i>Threskiornis melanocephalus</i>	IN-OR-01
Black-bellied Tern	<i>Sterna acuticauda</i>	IN-OR-01

THREATENED BIRDS OF ORISSA

Oriental White-backed Vulture *Gyps bengalensis* Critically Endangered

This species has been reported in the Bhitarkanika Wildlife Sanctuary (Pandav 1996), Sambalpur, north of Mahanadi and south of Mahanadi (Ball 1878). It has been reported in five IBAs but is likely to be present in more areas.

Long-billed Vulture *Gyps indicus* Critically Endangered

This Critically Endangered species has been reported in the Bhitarkanika Wildlife Sanctuary (Pandav 1996) and Simlipal (Rahmani and Prakash 2000). It has also been reported in the same five IBAs as the earlier noted species but appears to be much more widespread despite a massive decline in recent years.

Forest Owllet *Heteroglaux blewitti* Critically Endangered

This Critically Endangered species was reported from Khariar (Khariar) and Sambalpur (Ball 1877, 1878), but there is no recent record. Proper surveys have not been conducted in recent years so it is likely to occur in the State even now.

Greater Adjutant *Leptoptilos dubius* Endangered

This species is not genuinely documented in the State but there are records from little-known localities, and unconfirmed records, of discernible breeding of the species at Chilika (Baker 1922–1930, BirdLife International 2001, “Vagrant” 1868) but there is no recent record.

Great Indian Bustard *Ardeotis nigriceps* Endangered

More than a century ago the species was accounted for in Sambalpur, at Burga (Ball 1876), and also reported from south of the Mahanadi River in the early 1870s (Ball 1878). Then it was reported to be present in the early 1970s (Dharmakumarsinhji 1972).

Spot-billed Pelican *Pelecanus philippensis* Vulnerable

This species is globally threatened and has been reported from various parts of the State in the Asian Waterfowl Census (BirdLife International 2001). It is listed from Ghodahada (Ghodahad) Dam, Bhitarkanika Wildlife Sanctuary, Cuttack district (Kar 1991, Pandav 1996); Dhulianali dam–Manpur, Chilika lake, and breeding (recorded as “pelicans”, but presumably, is this species), (“Vagrant” 1868,

Hussain *et al.* 1984, Johnson *et al.* 1993), at Kalijai (Sect. 6), at Nalaban (Nalban, Nalabana) Sanctuary, and at Satpada, Bhetanai Haja, Ongaito lake, Kanhei nala, Mukundadev Sagar, Pachi Cherugu Girisola, Mari tank, Singipur (Singpur), Jagannath Sagar, Badabandha Puduni and Balimela (BirdLife International 2001).

Lesser Adjutant *Leptoptilos javanicus* **Vulnerable**

The Lesser Adjutant has been reported from Sambalpur, north of the Mahanadi (Ball 1878), Bhitarkanika Wildlife Sanctuary (Kar 1991, Pandav 1996), and Jaypur (Ball 1878).

Baer's Pochard *Aythya baeri* **Vulnerable**

This Vulnerable bird has been reported once from Chilika Lake (BirdLife International 2001).

Pallas's Fish-Eagle *Haliaeetus leucoryphus* **Vulnerable**

Kar (1991) has reported it from the Bhitarkanika Wildlife Sanctuary but Pandav (1996) mentions that this record is unconfirmed. Half a century ago the species was reportedly breeding on rocky islets at Chilika Lake ("Vagrant" 1868). It is probably a rare visitor to the State (Hussain *et al.* 1984).

Greater Spotted Eagle *Aquila clanga* **Vulnerable**

This species has been reported from the State in the districts of Sambalpur and Sonapur (Ball 1878); Bauda (Ball 1878). We do not have recent published records.

Lesser Kestrel *Falco naumanni* **Vulnerable**

Around the 1950s, this species was seen in a "large (migratory?) swarm" (>300) at Balasore (Ali and Ripley 1987), after which in 1969, four were individuals sighted in Durgapur (Gauntlett 1986).

Sarus Crane *Grus antigone* **Vulnerable**

This species was a rare winter visitor to the State and the only record is from Sambalpur, north of the Mahanadi, (Ball 1878). There is no recent record of Sarus from Orissa (B. C. Choudhury *pers. comm.* 2003).

Wood Snipe *Gallinago nemoricola* **Vulnerable**

This species was a rare winter visitor to Orissa and an old record of the species was from Russelkonda of Ganjam district, ("Vagrant" [McMaster] 1868; Hume and Marshall 1879–1881). There is no recent record.

Spoon-billed Sandpiper *Eurynorhynchus pygmeus* **Near Threatened**

During studies conducted by the Bombay Natural History Society at Chilika, this species was seen (Hussain *et al.* 1984, Mohapatra and Hussain 1988, Hussain 1991). Later, Acharya and Kar (1996) also recorded it from the Nalabana Island (part of Chilika Lake). In the winter of 2001-2002, up to 200 were reported from Chilika but later this report proved to be mistaken identity.

Indian Skimmer *Rynchops albicollis* **Vulnerable**

This species have been seen in "a large flock consisting of skimmers and terns", on the Mahanadi River (Ball 1876, 1878) and thought to be resident (D'Abreu 1935). Recently the species was reported from Bhitarkanika Wildlife Sanctuary (Kar 1991), but not by Pandav (1996) suggesting that the record was either overlooked or retracted (BirdLife International 2001).

Purple-wood or Pale-capped Pigeon *Columba punicea* **Vulnerable**

This northeastern bird was reportedly seen in the Simlipal hills of Mayurbhanj at an elevation of about 600–900 m (Jayakar 1967), and also in the Chandaka Dampara Sanctuary (Chandka Game Sanctuary), and near Bhubaneswar (Jayakar 1967).

Bristled Grass-Warbler *Chaetornis striatus* **Vulnerable**

According to BirdLife International (2001), the record of this species from Orissa is very old and there are no recent records. It was reported from the Sambalpur district, on both banks of the Mahanadi River (Ball 1875, 1878) and from Kalahandi (Ball 1877).

Green Munia *Amandava formosa* **Vulnerable**

This species is not very common in the State. It has been reported from the Koraput district (Majumdar 1988); also Whistler and Kinnear (1931–1937) had collected two birds from Jaypur, from the Eastern Ghats at an elevation of 900 m.



Spoon-billed Sandpiper is a winter visitor to India, often seen near intertidal mudflats.

Photo: Shripaee Watarabe/BirdLife International

THREATS AND CONSERVATION ISSUES

In general, as with the other States, anthropogenic pressures have a major impact on the general wildlife and avifauna. In Orissa however, natural processes also cause several types of degradation. For example, the State is located in the cyclone-prone zone and hence cyclones and heavy winds are common. The result is erosion and heavy destruction in general. In addition, rivers and rivulets bring in large amounts of silt.

The supercyclone in 1999 resulted in massive destruction of mature trees in the coastal districts apart from causing a huge loss to the avian population. According to government estimates, at least 900,00,000 trees were lost. This has resulted in severe shortage of roosting and nesting area for the birds of the coastal districts. Food is also in short supply since many of the fruiting trees like ficus, jamun, etc have been lost. It will take time for the restoration of the local ecology so that the birds will get back their natural surroundings. The problem is compounded by the operation of nearly 140 sawmills in these districts which source the timber from trees like mango, jackfruit, etc located in the private lands of villagers of the coastal districts. The timber is mostly converted into plywood which is sent out of the state (Biswajit Mohanty *pers. comm.* 2004).

Weed infestation is another major issue that adversely affects avian life. According to satellite data (1973-1993) weed coverage of Chilika Lake has increased from 20 sq. km to 398 sq. km. However, the opening of the new mouth at Chilika lake has resulted in considerable reduction in fresh water weeds including Water Hyacinth.

Pollution is yet another factor that causes nutrient loading in the lagoon. Oil and oil spills from motorboats also cause significant damage to Chilika. Motorboats have been introduced in Chilika lake about 15 years ago. They use noisy outboard diesel engines which scare the birds. The state government is also planning to open up several remote islands in Chilika to tourist lodges and resorts. Since these islands served as breeding grounds for terns, etc., it is feared that their nesting and breeding may be adversely affected.



Courtesy: Bivash Parabay

Threats to IBAs

A=Agriculture intensification/expansion; B=Dams/Dykes; C=Disturbance to Birds; D=Firewood Collection;
E=Industrialisation/Urbanisation; F=Unsustainable exploitation; G=Others; H=Natural Events

The coastal ecosystem of Orissa and its diverse habitats are very much threatened by problems of erosion, siltation, pollution, flooding, salt water intrusion, cyclones, storm surges, casuarina plantations, artificial lighting, over-fishing, changing land use, sea use patterns and overall increasing human settlements (Kar 2000).

Poaching is another problem which continues in the state. Except for the Chilika lake where poaching has been controlled, the migratory waterfowl which visit other reservoirs and water bodies fall prey to hunters. Snares, guns and poisons are used to trap or kill them for the market. Apart from migratory waterfowl, junglefowl and Grey Francolin are also trapped for food.

There is a flourishing trade in the live pet bird trade. Parakeets (*Alexandrine Psittacula eupatria*, Rose-ringed *Psittacula krameri* and Blossom-headed *Psittacula roseata*), Munias *Estrildidae*, Mynas *Sturnidae*, Hill Mynas *Gracula religiosa* and Grey Hornbills *Ocyrceros birostris* are the species traded. The trade is quite open and visible in the major cities of Cuttack, Bhubaneswar, Puri, Sambalpur, Berhampur and Rourkela.

Illegal aquaculture farms in Bhattarkanika and Chilika (both Ramsar sites) in Coastal Regulation Zone areas, affect bird habitat and feeding grounds. Heavy usage of antibiotics and feed upsets the local food chain. Besides, watchers in the prawn farms also regularly shoot birds (especially cormorants) with catapults and guns to scare them away since they are treated as a threat to the prawns which are farmed.

Many waterbodies in the coastal districts which served as important wintering grounds for migratory waterfowl are now increasingly being drained and illegally converted into paddy fields. Replacement of natural coastal vegetation in the coast by casuarinas has also led to a shortage of nesting areas for the local birds.

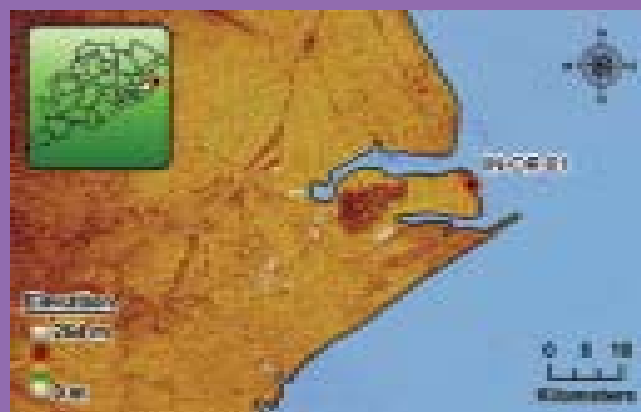
The farmers in many coastal districts who have crop fields close to waterbodies often see their crop being decimated by hordes of waterfowl. There is no compensation scheme run by the state government to make up the loss of the farmers. To protect their crops, they poison or shoot the birds.

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OR-01

BHITARKANIKA WILDLIFE SANCTUARY AND NATIONAL PARK



IBA Site Code	: IN-OR-01
State	: Orissa
District	: Kendrapara
Coordinates	: 20° 45' 00" N, 86° 59' 56" E
Ownership	: State
Area	: 81,700 ha
Altitude	: 0 - 50 m
Rainfall	: 1,200 mm
Temperature	: 10 °C to 40 °C
Biogeographic Zone	: Coasts
Habitats	: Mangroves, Tropical Moist Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A4ii (>1% biogeographic population)
PROTECTION STATUS: National Park, established in April 1988

GENERAL DESCRIPTION

Bhitarkanika Wildlife Sanctuary (67,200 ha) and Bhitarkanika National Park (14,500 ha), located on the eastern coast, together represent one of India's finest mangrove forests. The area was declared as a Wildlife Sanctuary in 1975 to protect the Estuarine or Saltwater crocodile *Crocodylus porosus* (Kar and Bustard 1981, 1990) but later it was also found to be a haven for birds (Pandav 1996).

The Sanctuary has a coastline of 35 km on its eastern side known as the Gahirmatha coast, and is surrounded by the rivers Brahmani, Baitarani and their tributaries on the other three sides. The area is laden with alluvial silt brought down by the rivers and deposited in deltaic areas by regular tidal inundation.

The vegetation is characterised by vast stretches of *Phoenix paludosa*. Pure formations of tree species such as *Heritiera fomes*, *Excoecaria agallocha*, *Avicennia officinalis* and *A. marina* occur in the Sanctuary. Other dominant tree species are *Sonneratia apetala*, *Amoora cucullata*, *Cynometra iripa*, *Rhizophora mucronata* and *R. apiculata*.

AVIFAUNA

Nearly 220 species of birds have been recorded from this area (Kar 1991, Pandav 1996). Bhitarkanika Wildlife Sanctuary is one of the few protected areas in India which has six sympatric species of kingfishers: Pied *Ceryle rudis*, Common *Alcedo atthis*, Brown-winged *Halcyon amauropterus*, White-throated *Halcyon smyrnensis*, Black-capped *H. pileata* and Collared *Todiramphus chloris*. Stork-billed Kingfisher *Halcyon capensis* was also recorded from this IBA (Mr. Anup Nayak pers. comm. to Bishwajit Mohanty).

The Brown-winged and Collared kingfishers, along with the Mangrove Whistler *Pachycephala grisola* are mainly restricted to mangroves in India. In the Indian subcontinent, the Mangrove Whistler is otherwise found only in the Sunderbans of West Bengal and Bangladesh, and in a narrow zone fringing the shore in the Andaman and Nicobar Islands (Ali and Ripley 1987).

According to Pandav (1996), fifty-seven species of winter visitors are recorded, with the highest numbers between November and February. The Northern Pintail *Anas acuta* is the most abundant migratory waterfowl. Occurrence of more than 3,000 Black-tailed Godwit *Limosa limosa* is also notable. The Wetlands International (2002) estimate of 1% biogeographical population of this bird is

1000 individuals, so Bhitarkanika holds about 3% of the total population of this species.

Eighty-two species are reported breeding, including the Near Threatened Black-necked Stork *Ephippiorhynchus asiaticus*. Breeding colonies of Asian Openbill *Anastomus oscitans*, Intermediate Egret *Mesophoyx intermedia*, Little Egret *Egretta garzetta*, Grey Heron *Ardea cinerea*, Purple Heron *Ardea purpurea*, Black-crowned Night-heron *Nycticorax nycticorax*, Little Cormorant *Phalacrocorax niger*, Darter *Anhinga melanogaster* and Oriental White Ibis *Threskiornis melanocephalus* are located on Bhitarkanika Island in the Sanctuary. This breeding colony of water birds is listed as one amongst the top five heronries in India (Subramanya 1996). A survey of the heronry in July and August, 1993, revealed 9,910 nests on 5,500 trees, with the majority of nests, i.e. 7,800, belonging to the Asian Openbill (Pandav 1996). The next most abundant was the Intermediate Egret. Grey Heron had 200 nests, and Oriental Darter, 192 nests. This is the largest known breeding colony of this Near Threatened species, perhaps equal to the one in Keoladeo National Park at Bharatpur (another IBA). The Painted Stork *Mycteria leucocephala* also breeds here, but in small numbers. Pandav (1996) could locate only 28 nests on tall trees of *Sonneratia apetala* and *Xylocarpus moluccensis*, away from the main heronry.

Beside many waterbirds, upto 20 Lesser Adjutants *Leptoptilos javanicus* are seen in this IBA.



Photo: Otto Fflister

The Lesser Adjutant *Leptoptilos javanicus* was also observed nesting, its total population was estimated to be 20 (Pandav 1996). Anup Nayak (in litt. 2003) has mentioned sighting a flock of more than 50 Indian Skimmer *Rynchops albicollis* in Bhitarkanika in January 2003.

Three species recorded during the survey, but not on the checklist of birds of Orissa prepared by the State Forest Department (Dani 1992), and hence considered new sight records for Orissa, are Eurasian Oystercatcher *Haematopus ostralegus*, Pintail Snipe *Gallinago stenura* and Chestnut-capped Babbler *Timalia pileata*. The Eurasian Oystercatcher is a common winter visitor to the west coast of India, but is uncommon on the east coast (Ali and Ripley 1987). A group of 19 Eurasian Oystercatchers was seen in the intertidal zones of the Gahirmatha coast during December and January. Pintail Snipe, a winter visitor to India, occurs in northeast India, but is more common in southern India and in the Andaman and Nicobar Islands (Ali and Ripley 1987). In Bhitarkanika, this snipe was seen along the marshy edges of the pools in winter. The southernmost limit of the Chestnut-capped Babbler in India was Calcutta (Ali and Ripley 1987). Small parties of 8-10 birds were observed in the *Phoenix paludosa* bushes of the mangrove forest (Pandav 1996).

Critically Endangered	
Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Vulnerable	
Spot-billed Pelican	<i>Pelecanus philippensis</i>
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Baer's Pochard	<i>Aythya baeri</i>
Pallas's Fish-Eagle	<i>Haliaeetus leucorhynchus</i>
Greater Spotted Eagle	<i>Aquila clanga</i>
Lesser Kestrel	<i>Falco naumanni</i>
Indian Skimmer	<i>Rynchops albicollis</i>
Near Threatened	
Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Oriental White Ibis	<i>Threskiornis melanocephalus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

OTHER KEY FAUNA

Bhitarkanika WLS and NP harbour the highest density of Saltwater Crocodile *Crocodylus porosus* in India. It also has the distinction of having the world's largest known breeding ground of the Olive Ridley Sea Turtle *Lepidochelys olivacea* at Gahirmatha, located on its eastern boundary (Das and Kar 1990). Leopard *Panthera pardus*, and Wild Boar *Sus scrofa* are the other larger animals in the sanctuary. Water monitor *Varanus salvator* and King Cobra *Ophiophagus hannah* are also found.

LAND USE

- ☐ Tourism and recreation
- ☐ Nature conservation and research

THREATS AND CONSERVATION ISSUES

- ☐ Brackish water prawn culture ponds
- ☐ Agriculture
- ☐ Disturbance to birds
- ☐ Bangladeshi Immigrants

With the recent changes in land use pattern all along the Orissa coast (evident after 1993), the coastal wetlands and the agricultural fields adjoining wetlands are increasingly being converted into brackish water prawn culture ponds. The wetland adjoining the mangrove forest of Bhitarkanika harbours a good population of migratory waterfowl, and the conversion of coastal wetlands around Bhitarkanika has resulted in a loss of wintering ground for these birds.

Due to the conversion of agricultural fields to prawn culture ponds, the Asian Openbills are losing feeding ground. In the near future, this may affect the breeding behaviour of these birds and may be detrimental for their survival in the long run (Pandav 1996).

It has been alleged by NGOs working in Orissa that the large number of Bangladeshi immigrants living and operating around Bhitarkanika WLS are adversely affecting the Park and could threaten the survival of the Estuarine Crocodiles. While the government estimates their number at about 2,000, the Wildlife Society of Orissa has said that there are at least 15,000 in and around Bhitarkanika. Two hundred mechanised boats reportedly fish illegally in the creeks here, which is the main home for the crocodiles as well. Large-scale mangrove depletion too is attributed to this large immigrant population.

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Bivash Pandav and Biswajit Mohanty

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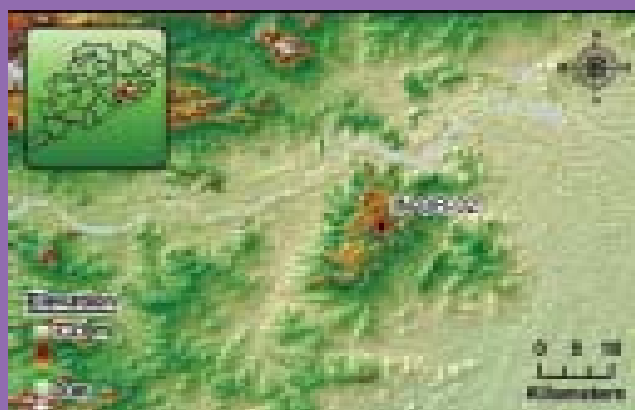
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OR-02

CHANDAKA-DAMPARA WILDLIFE SANCTUARY



IBA Site Code	: IN-OR-02
State	: Orissa
District	: Khurda, Cuttack
Coordinates	: 20° 21' 00" N, 85° 40' 12" E
Ownership	: State
Area	: 17,595 ha
Altitude	: 40 - 202 m
Rainfall	: 1,345 mm
Temperature	: 15 °C to 45 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A3 (Biome-12: Indo-Malayan Tropical Dry Zone), A4ii (1% biogeographic population)

PROTECTION STATUS: Wildlife Sanctuary, established in December 1982

GENERAL DESCRIPTION

Chandaka was declared a sanctuary for the Asian Elephant *Elephas maximus*. It covers major portions of Chankada and Dampara ranges of Puri Forest Division, and forms a compact and contiguous forest tract. The reserve lies to the west of the Cuttack-Khurda road between Barang and Chhatabar, c. 20 km from Bhubaneswar, the capital of Orissa. The ground is generally undulating, interrupted by small hills. The northeastern and central portions are generally flat. The highest peak is 202 m (Mishra, undated).

There is no perennial stream or river in the Sanctuary, as its topography is such that water drains away rapidly. The situation is further aggravated by deforestation and overgrazing. Kumarkhunti reservoir (100 ha) is the only water reservoir inside the Sanctuary that sustains wildlife during the summer.

AVIFAUNA

Kumarkhunti reservoir used to hold breeding populations of about 5,000 Asian Openbill *Anastomus oscitans* on the bamboo along the shores, but for the past four years the storks are not nesting as the trees have died due to excessive deposition of uric acid from the guano. But with the planting of new trees, the storks are likely to return for breeding. Wetlands International (2002) estimates 125,000 as the breeding population of the Asian Openbill in South Asia, which means that before the birds abandoned the nesting colony, about 4% of the biogeographical population used to breed at this site.

Besides the two widely distributed *Gyps* vultures, the globally threatened Purple Wood-Pigeon *Columba punicea* and Broad-tailed Grass-Warbler *Schoenicola platyura* have also been reported by the participants of the BNHS-IBA workshops.

The site lies in Biome-11 (Indo-Malayan Tropical Dry Zone). Of the 59 species listed in Biome-11 from India, 25 have been found at this IBA site, proving it a good representative of Biome-11 species. Three species occurring in Biome-10 (Indian Peninsula Tropical Moist Forest) are also reported from here, but need further confirmation. They are the Small Green-billed Malkoha *Phaenicophaeus viridirostris*, Indian Scimitar Babbler *Pomatorhinus horsfieldii* and Loten's Sunbird *Nectarinia lotenia*.

Critically Endangered

Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

Vulnerable

Purple Wood-Pigeon	<i>Columba punicea</i>
Broad-tailed Grass-Warbler	<i>Schoenicola platyura</i>

Biome-12: Indo-Malayan Tropical Dry Zone

White-eyed Buzzard	<i>Butastur teesa</i>
Rain Quail	<i>Coturnix coromandelicus</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Yellow-legged Green-Pigeon	<i>Treron phoenicoptera</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocyrceros birostris</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>
Lesser Golden-backed Woodpecker	<i>Dinopium benghalense</i>
Red-winged Bush-Lark	<i>Mirafra erythroptera</i>
Bengal Bush-Lark	<i>Mirafra assamica</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
White-browed Bulbul	<i>Pycnonotus luteolus</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Rufous-bellied Babbler	<i>Dumetia hyperythra</i>
Jungle Babbler	<i>Turdoides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Bank Myna	<i>Acridotheres ginginianus</i>
White-bellied Drongo	<i>Dicrurus caeruleus</i>

OTHER KEY FAUNA

Not much is known about other wildlife of this area, except that it holds a population of about 70 Asian Elephant. Other mammals recorded include Wild Dog *Coun alpinus*, Leopard *Panthera*

Plum-headed Parakeet *Psittacula cyanocephala* is commonly seen in Chandaka-Dampara.



Photo: Ajit Deshmukh

pardus, Spotted Deer *Axis axis*, Barking Deer *Muntiacus muntjak*, Sloth Bear *Melursus ursinus*. Pythons and Monitor Lizards also occur here in good numbers.

LAND USE

- q Tourism and recreation
- q Nature conservation and research

THREATS AND CONSERVATION ISSUES

- q Agricultural intensification and expansion industrialisation
- q Urbanisation
- q Forest fires
- q Man-Animal Conflict

Chandaka holds a population of 65-70 elephants. The Sanctuary is like an island for these pachyderms, which sometimes go out into the surrounding villages and raid crops. This causes much conflict with the villagers. Elephant proof trenches, masonry walls and electric fencing is being presently carried out. Moreover, elephants regularly stray out of the Sanctuary and enter the outskirts of Bhubaneswar city, damaging farms and houses. This has also resulted in an increase in human casualties in the last 5 years. Rapid growth of the city borders and urbanisation results in conflict with the elephants. The five villages located inside the Sanctuary have converted the valleys and plains into

paddy fields, resulting in acute shortage of fodder for the resident elephants. At least 5,000 cows, mostly feral, graze inside the Sanctuary further add to the competition for the grass (Biswajit Mohanty *pers. comm.* 2004).

There are 5 villages inside the Sanctuary and 22 on the fringes. Around 562 families have already been shifted out, but there is still pressure for fuel wood on the Sanctuary.

Forest fires used to be a major cause of concern, but few were witnessed in 2001.

Awareness among the local people for wildlife is needed and *Wild Orissa*, an NGO, is attempting the construction of an Environmental Interpretation Centre at Godibari.

KEY CONTRIBUTORS

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OR-03

NALABANA BIRD SANCTUARY (CHILIKA LAKE)



IBA Site Code	: IN-OR-03
State	: Orissa
District	: Khurda, Puri, Ganjam
Coordinates	: 19° 42' 36" N, 85° 28' 48" E
Ownership	: State
Area	: 1,553 ha
Altitude	: 0 – 50 m
Rainfall	: 1,500 mm
Temperature	: 21 °C to 40 °C
Biogeographic Zone	: Coasts
Habitats	: Brackish Wetland

IBA CRITERIA: A1 (Threatened Species), A4i ($\geq 1\%$ biogeographic population), A4iii ($\geq 20,000$ waterbirds)

PROTECTION STATUS: Wildlife Sanctuary at Nalabana, established in December 1987

GENERAL DESCRIPTION

Chilika Lake is an estuarine lagoon, shallow throughout its spread of 1,16,500 ha. It is the largest brackish water wetland in India (Kar and Sahu 1993). The Government of India notified Chilika Lake as a Ramsar site in 1981. The pear-shaped lake is connected to the Bay of Bengal at its northeast end and is subject to minor tidal fluctuations. It receives water from rivers Daya and Bhargavi, and several small streams. It is the largest wintering ground for migratory waterfowl in India (Anon. 2000).

According to historical evidence, Chilika Lake was part of the Bay of Bengal about 6,000 years ago. Merchant ships used to travel from Chilika to South East Asia (Trisal and Chauhan 1998). Over a period of time, a sand spit barrier formed due to the littoral drift of the sea, as well as silt deposits carried by adjoining rivers into the wetland, separating it from the Bay of Bengal.

Several islands are located in the lagoon covering an area of 22,300 ha. The Nalabana Island of the Chilika Lake was declared as a bird sanctuary in 1987. It has an area of 1,553 ha. Nalabana literally means “forest of reeds”. It is covered with aquatic plants, predominant species being *Phragmites karka*. During monsoon, Nalabana is entirely under water, with only reeds and watchtower visible. With the onset of summer the island gradually emerges.

The major flora comprises of aquatic macrophytes such as *Potamogeton pectinatus*, *Najas faveolata*, *N. graminea*, *Halophila ovalis*, *Ruppia maritima*, *Phragmites karka*, *Scirpus littoralis*, *Cyperus* sp. and *Salicornia brachiata*. The algal forms include *Chaetomorpha linum*, *Enteromorpha intestinalis*, *Oscillatoria laetevineus*, *Cladophora glomerata*, *Ulva lactuca*; and the less common *Gracillaria verrucosa*.

AVIFAUNA

Chilika Lake in general and Nalabana area in particular are among the most important waterfowl habitats in India. The total number of waterfowl in Chilika is close to 8,00,000 birds. Of the 211 species of birds recorded in Chilika and its environs, 121 species were reported from Nalabana. Seven Vulnerable species, and many Near Threatened species are found.

In January 2003, more than 4,50,000 birds were counted on Nalabana Island, and more than 2,40,000 birds were counted in the northern sector from Kalupadaghat to Teenmuhani area. Very

large numbers of birds were also observed in the Kansari River and Gangadharpur area (Sana Nairi village). Similarly, the unapproachable areas in the southern sector near Taltaola, Rambha, Naupada and outer-channel Jahnikuda provide refuge to more than 1,70,000 ducks and waders. It is estimated that Chilika Lake supported over 8,00,000 birds during the 2002-2003 winter season (Balachandran *et al.* 2003).

Large numbers of birds such as the Pintail *Anas acuta* (80,000), Garganey *Anas querquedula*, Black-tailed Godwit *Limosa limosa* (48,000), Gadwall *Anas strepera* (1,00,000) Eurasian Wigeon *Anas penelope* (40,000) Brown-headed Gull *Larus brunnicephalus* (20,000), and the marine terns (Large Crested *Sterna bergii* and Lesser Crested *Sterna bengalensis*) congregate on and around the island at dusk for roosting, and most of them depart in the morning. Over 1,000 Bar-headed Geese *Anser indicus* spend the winter at Nalabana every year. During 3 years of monitoring the maximum wader population (1,44,000) was recorded in January 2003. The rare Asian Dowitcher *Limnodromus semipalmatus* was seen in small numbers (10-15) and a total of five individuals were also ringed between 2002 and 2003. Large congregations (>1000) of Lesser Whistling Duck *Dendrocygna javanicus* were seen during January 2003. Over 5,000 Brahminy Shelducks *Tadorna ferruginea* were observed between Satapada (outer-channel area) and Nalabana.

The globally threatened Pallas’s Fish-Eagle *Haliaeetus leucoryphus* was regularly sighted, solitarily or in pairs in Nalabana from December to March. Among other threatened species of Chilika Lake, between 175 to 300 Spot-billed Pelican were seen.

Vulnerable

Spot-billed Pelican	<i>Pelecanus philippensis</i>
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Lesser White-fronted Goose	<i>Anser erythropus</i>
Baer’s Pochard	<i>Aythya baeri</i>
Pallas’s Fish-Eagle	<i>Haliaeetus leucoryphus</i>
Spoonbilled Sandpiper	<i>Calidris pygmeus</i>
Indian Skimmer	<i>Rynchops albigollis</i>

Large breeding colonies of terns, namely the River Tern, Gull-billed Tern and Little Tern *Sterna albifrons*, along with the waders such as Black-winged Stilt *Himantopus himantopus* were recorded

at Nalabana Island. The majority of nests were found in the middle of the island. Among the 1,032 nests noted in 2002, 540 and 323 respectively belonged to River Tern and Gull-billed Tern. The other two wader species breeding at Nalabana are Oriental Pratincole *Glareola maldivarum* and Kentish Plover *Charadrius alexandrinus* (Balachandran *et al.* 2002a).

Many waders and ducks occur in much greater numbers than their 1% population threshold determined by Wetlands International (2002). For some species such as the Spoon-billed Sandpiper and Asian Dowitchers, this site is extremely important in India.

OTHER KEY FAUNA

Chilika Lake hosts 158 types of fish and prawn species. Fish include both marine and estuarine species. *Penaeus indicus* and *Penaeus monodon* are commercially important prawns. The sand crab *Scylla serrata* is the most abundant commercial crab of Chilika.

A remnant population of the highly endangered Irrawady Dolphin *Orcaella brevirostris* occurs only in Chilika in India.

LAND USE

- q Tourism and recreation
- q Nature conservation and research
- q Fishing

THREATS AND CONSERVATION ISSUES

- q Indiscriminate fishing
- q Pollution
- q Poaching of birds

Chilika Lake has undergone major ecological changes for the last several years, mostly due to the salinity changes caused by choking of the outer-channel and closure of the Lake's mouth to the sea, and the restoration measures (providing of a new mouth) undertaken by the Chilika Development Authority.

Nalabana Island has large breeding colonies of Gull-billed and River Terns. But during the onset of monsoon in May, many nests are washed away by floods caused by heavy rain and wind. Near total breeding failure was noticed in the above two species in 2002 and over 75% in 2003 (Balachandran *et al.* 2002a, 2002b, 2003). Nests of the River Tern are generally prone to flooding in most of their breeding areas (Ali and Ripley 1987), but the poor breeding success from this largest colony will have a particularly adverse effect on this species. Conservation measures are urgently needed for these species to protect them from natural calamities. The BNHS suggested flat floating

platforms 1 m high with an area of 25 x 10 m, covered with 15 cm or more of sand or pebbles, as nest beds in the major nesting localities as a possible conservation measure for breeding terns. Birds are also being adversely affected by the increasing numbers of mechanized boats which emit smoke, noise and oil pollution.

The forest department constructed raised platforms of sand to serve as nesting sites for the breeding terns inside the Nalabana Sanctuary. But during the breeding season of 2004, none of the terns laid nests in these platforms. Nalabana being a popular tourist destination witnesses a large number of visitors who litter the place which is a grave threat. This litter is periodically burnt off which releases noxious gases that obviously shall affect the birds since most of the waste is plastic wrappers and bags (Biswajit Mohanty *pers. comm.* 2004).

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S. Balachandran, Biswajit Mohanty and Ajit Patnaik

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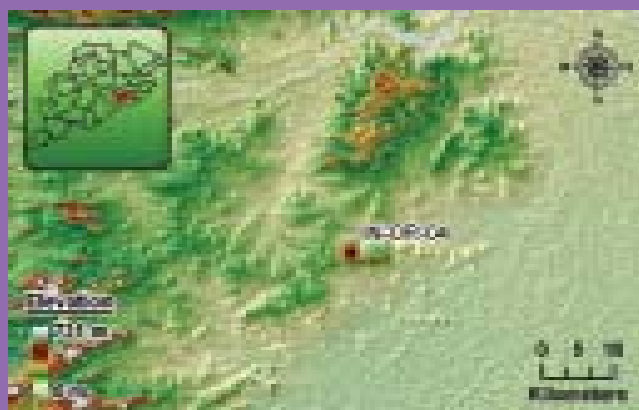
Nearly 8,00,000 waterbirds are estimated from Chilika Lake.



Photo: Hira Panjabi

OR-04

MANGALJODI



IBA Site Code	: IN-OR-04
State	: Orissa
District	: Khurda
Coordinates	: 20° 10' 00" N, 85° 37' 00" E
Ownership	:
Area	: Not available
Altitude	: 74 m
Rainfall	: Not available
Temperature	: Not available
Biogeographic Zone	: Deccan Peninsula
Habitats	: Wetlands, Reedbeds

IBA CRITERIA: A1 (Threatened Species); A4i ($\geq 1\%$ biogeographic population), A4iii ($\geq 20,000$ waterbirds)

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Mangaljodi village is located about 5 km from Tangi in district Khurda, 60 km from Bhubaneswar. It is one of the villages surrounding Chilika Lake. This village is connected to the northern sector of Chilika Lake and Kalupada Ghat by way of channels dug through the *Phragmites karka* reed bed. The area includes Mangaljodi Ghera. Mangaljodi is primarily a freshwater zone with marshes, emergent vegetation and reed beds consisting mostly of *Typha* and *Phragmites karka*.

AVIFAUNA

The marshes around Mangaljodi, and the open water between Kalupada Ghat and Teenmuhani, attract a large congregation of waterfowl, especially the dabbling ducks such as Northern Pintail *Anas acuta*, Northern Shoveller *A. clypeata*, Garganey *A. querquedula* and Brahminy Shelduck *Tadorna ferruginea*.

A very huge population of waterfowl is found on this site. The estimates were over 3,00,000 and 2,40,000 respectively for 2002 and 2003 (S. Balachandran *pers. comm.* 2003). Populations of at least 15 species exceed 1% of their bio-geographical population, as estimated by Wetlands International (2002). Over 100,000 Tufted Pochard *Aythya fuligula* representing 10% of the geographical population have been recorded. Red-crested Pochard *Netta rufina* also occurs in tens of thousands, along with Large Whistling Duck *Dendrocygna bicolor* (14,500) and Lesser Whistling Duck *D. javanicus* (2800).

The reed beds are frequented by over 10,000 Purple Moorhen or Swampfen *Porphyrio porphyrio*, 15,000 Asian Openbill *Anastomus oscitans*, 15,000 Common Moorhen *Gallinula chloropus* and more than 5,000 Cotton Teal or Pygmy Goose *Nettapus coromandelicus*. Over 400 Grey-headed Lapwings *Vanellus cinereus* were counted in Mangaljodi area which is more than 1% of their biogeographical population (Balachandran *et al.* 2002a, b, 2003). The reed beds are also roosting sites for many thousands of Streaked Weaver *Ploceus manyar* and Baya Weaver *Ploceus philippinus*, Indian Great Reed Warbler or Clamorous Reed Warbler *Acrocephalus stentoreus*, Asian Pied Starling *Sturnus contra*, and Red Munia or Red Avadavat *Amandava amandava*.

Vulnerable

Spot-billed Pelican *Pelecanus philippensis*

OTHER KEY FAUNA

No information available.

LAND USE

☐ Agriculture

THREATS AND CONSERVATION ISSUES

☐ Poaching and illegal trade of birds

☐ Reed Harvesting

Poaching is causing irreparable damage to the avifauna of Mangaljodi. There are about 80 poachers in the village, proficient in various techniques of killing birds. These birds are regularly sold in the open market, at rates varying from Rs 20/- to Rs. 60/- per bird, depending on the species and method of killing. A proficient poacher can earn anything between Rs 10,000/- to Rs 80,000/- in a year. The local police and forest authorities are helpless spectators, as political involvement remains high. Moreover, the collection of birds' eggs and their sale in the open market is another big problem. Strict vigil is required to conserve the Mangaljodi waterfowl breeding habitat, by local participation in the form of patrolling, educating the masses about bird conservation and their habitat. *Wild Orissa*, an NGO, is actively working on such issues, to prevent damaging activities in the area.

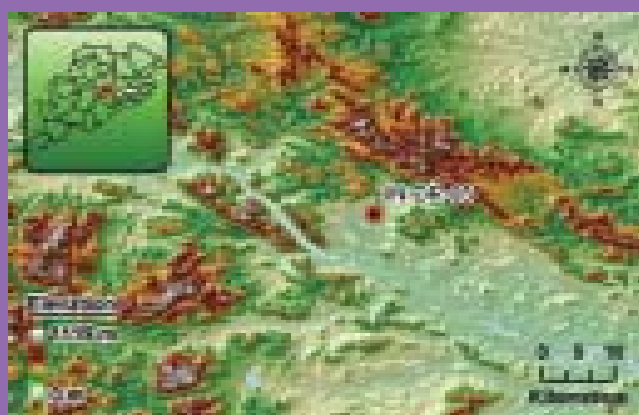
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S. Balachandran and *Wild Orissa*

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SATKOSIA GORGE WILDLIFE SANCTUARY



IBA Site Code	: IN-OR-05
State	: Orissa
District	: Dhenkanal, Cuttack, Puri, Phulbani
Coordinates	: 20° 33' 07" N, 84° 56' 51" E
Ownership	: State
Area	: 74,552 ha
Altitude	: 63 - 926 m
Rainfall	: 1,500 mm
Temperature	: 15 °C to 40 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Dry Deciduous Forest, Tropical Moist Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A3 (Biome-10: Indian Peninsula Tropical Moist Forest), A3 (Biome-11: Indo-Malayan Tropical Dry Zone)

PROTECTION STATUS: Wildlife Sanctuary, established in May 1976

GENERAL DESCRIPTION

Satkosia Gorge Sanctuary lies on either side of the River Mahanadi, in the districts of Dhenkanal, Cuttack, Puri and Phulbani. The name Satkosia refers to the 14 mile long, deep gorge formed on the Mahanadi (*saat* = seven, *kos* = 2 miles). The area can be broadly classified under woodland ecosystem, except for the freshwater aquatic ecosystem in the gorge. The Sanctuary extends over 79,525 ha, including a 32 km stretch of river bed (Choudhury, undated).

The area was declared a sanctuary mainly to protect the Gharial *Gavialis gangeticus* and Mugger Crocodile *Crocodylus palustris*. This is one of the few riverine sanctuaries in India. There is a proposal to declare Satkosia Gorge WLS as a Tiger Reserve under Project Tiger.

The woodland ecosystem can be classified as Northern Tropical Moist Deciduous Forest and Northern Tropical Dry Deciduous Forest. Sal *Shorea robusta* is the dominant tree in the former type. The canopy is irregular, with trees of unequal ages. Owing to the remote and difficult terrain, not much deforestation has occurred. The dry deciduous forest is bare and leafless in summer. The main species are *Anogeissus latifolia*, *Terminalia tomentosa*, *Adina cordifolia* and *Albizia lebbek*.

AVIFAUNA

Besides the two critically endangered *Gyps* vultures, which are widespread in any case, this site harbours two globally threatened species: Indian Skimmer *Rynchops albicollis* and Bristled Grass-Warbler or Grassbird *Chaetornis striatus*. The Indian Skimmer breeds on the islands in the Mahanadi river (B. C. Choudhury *pers. comm.* 2003).

This site is designated as an IBA based on the presence of these two globally threatened species and also as the breeding site of the Indian Skimmer.

The bird life is fairly typical of eastern India. Of the 59 species listed in Biome-11 by BirdLife International (undated), 32 are found at this site. Four species of Biome-10 (Indian Peninsula Tropical Moist Forest) are also reported i.e. Malabar Trogon *Harpactes fasciatus*, Malabar Pied Hornbill *Anthracoceros coronatus*, Indian Scimitar Babbler *Pomatorhinus horsfieldii* and Small Green-billed or Blue-faced Malkoha *Phaenicophaeus viridirostris*. These are at the northeastern extreme of their range.

Ripley (1978) in his paper on the bird fauna of the Simlipal forest area in Mayurbhanj and Dhenkanal districts mentions Tytler's Warbler *Phylloscopus tytleri* "in forest near the Mahanadi River in Dhenkanal District". This interesting record extends the winter range considerably east from the River Tapti in Madhya Pradesh. It seems to have been missed by Ali and Ripley (1987) and Grimmett *et al.* (1998).

Among the threatened birds, the Indian Skimmer *Rynchops albicollis* is found breeding on some islands.



Photo: P. M. Lad

Critically Endangered	
Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Vulnerable	
Indian Skimmer	<i>Rynchops albicollis</i>
Bristled Grass-Warbler	<i>Chaetornis striatus</i>
Biome-10: Indian Peninsula Tropical Moist Forest	
Small Green-billed Malkoha	<i>Phaenicophaeus viridirostris</i>
Malabar Trogon	<i>Harpactes fasciatus</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
Indian Scimitar-Babbler	<i>Pomatorhinus horsfieldii</i>

Biome-11: Indo-Malayan Tropical Dry Zone

Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-Quail	<i>Perdica asiatica</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Yellow-legged Green-Pigeon	<i>Treron phoenicoptera</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Sirkeer Malkoha	<i>Phaenicophaeus leschenaultii</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocyrocus birostris</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>
Lesser Golden-backed Woodpecker	<i>Dinopium benghalensis</i>
Red-winged Bush-Lark	<i>Mirafra erythroptera</i>
Bengal Bush-Lark	<i>Mirafra assamica</i>
Ashy-crowned Sparrow-Lark	<i>Eremopterix grisea</i>
Black-headed Cuckoo-Shrike	<i>Coracina melanoptera</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
White-browed Bulbul	<i>Pycnonotus luteolus</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Rufous-bellied Babbler	<i>Dumetia hyperythra</i>
Jungle Babbler	<i>Turdoides striatus</i>
Jungle Prinia	<i>Prinia sylvatica</i>
Ashy Prinia	<i>Prinia socialis</i>
White-browed Fantail-Flycatcher	<i>Rhipidura aureola</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Bank Myna	<i>Acridotheres ginginianus</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>

OTHER KEY FAUNA

Most of the representative large vertebrates of tropical dry deciduous forests of the Indian plains are found in Satkosia WLS, such as Tiger *Panthera tigris*, Leopard *Panthera pardus*, Sloth Bear *Melursus ursinus*, Wild Dog *Cuon alpinus*, Gaur *Bos frontalis*, Chital *Axis axis*, Barking Deer *Muntiacus muntjak*, Bluebull *Boselaphus tragocamelus*, Four-horned Antelope *Tetracerus quadricornis*, and Wild Boar *Sus scrofa*, as well as the Asian Elephant *Elephas maximus*.

LAND USE

- ☐ Nature conservation and research
- ☐ Tourism and recreation

THREATS AND CONSERVATION ISSUES

- ☐ Fishing
- ☐ Poaching
- ☐ Fragmentation of habitat by canals
- ☐ Livestock grazing
- ☐ Tourism
- ☐ Forest fire

There are 53 villages inside the Sanctuary and there is immense pressure due to fishing on the Mahanadi river, although it was banned on a 27-km stretch of the river to protect the Gharial. These villages inside the Sanctuary are a grave threat, since they carry out a number of unsustainable activities including goat and cattle grazing in large numbers. Most of the fertile valleys are converted into paddy fields. There is use of poison in the Mahanadi gorge inside the sanctuary (since the last two years) to catch fish which will severely impact the ecology.

The Sanctuary is a haven for timber smugglers and poachers from the surrounding small towns like Narsinghpur and Angul who enter the area almost every day for timber felling and poaching. Snares and traps are regularly laid throughout the sanctuary. Hundreds of local poachers enter the forest everyday with countrymade guns. There is severe loss of habitat and the rate has accelerated in the last 5 years by heavily armed timber smugglers who have killed forest guards on many occasions. Fire is also a major problem cause of forest loss especially during summer (Biswajit Mohanty *pers. comm.* 2004).

According to *Wild Orissa*, a local NGO, the elephant corridor between Satkosia Gorge Wildlife Sanctuary and Kapilas forest in Dhenkal district has been severed at many places due to canals laid under the Rengali Irrigation Project. Before constructing the canals, the government had promised that corridors would remain intact, but this premise was not kept, and nearly 100 Asian Elephants are isolated in Kapilas forest, unable to access the rich forests and water resources of Satkosia Gorge (Monalisa Bhujabal *in litt.* 2002).

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Bivash Pandav, B. C. Choudhury, Biswajit Mohanty and Monalisa Bhujabal

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SIMLIPAL NATIONAL PARK



IBA Site Code	: IN-OR-06
State	: Orissa
District	: Mayurbhanj
Coordinates	: 21° 55' 52" N, 85° 59' 40" E
Ownership	: State
Area	: 84,570 ha
Altitude	: 500 - 1,200 m
Rainfall	: 2,000 mm
Temperature	: 5 °C to 45 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Semi-evergreen Forest, Tropical Moist Deciduous Forest, Tropical Dry Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A3 (Biome 10: Indian Peninsula Tropical Moist Forest and Biome 12: Indo-Malayan Tropical Dry Zone)
PROTECTION STATUS: Tiger Reserve, established on August 1980

GENERAL DESCRIPTION

The Simlipal National Park is the most important protected area of Orissa, and one of the largest Tiger Reserves (2,75,000 ha) in India. At one time, it was the hunting ground of the Maharajas of Mayurbhanj, where record sized tigers were shot. In 1980, 84,570 ha were declared as a National Park - the core area continues to have four villages which have not been shifted even after 30 years. and has no human habitation. The surrounding forest was taken up as the buffer zone, where tribals continue to live their traditional life. A much larger area of 4,37,400 ha constitutes Simlipal Biosphere Reserve (Srivastava and Singh 1988)

The highest peak in Simlipal hills is Khairi-buru (1178 m). There is no locality in the Simlipal hills which suffers from scarcity of water at any time of the year. Several streams flow through the Park and drain into the Bay of Bengal. The major perennial streams are the Budhabalanga, Palpala, Deo, Nekendanacha, Bandan, Kahairi and Khadkei.

Simlipal is very popular with tourists who come to enjoy its scenic beauty and to see the Tiger, but most of them do not know of the rich bird life of this area.

The vegetation of the Simlipal National Park ranges from Semi-Evergreen to Dry Deciduous. Semi-evergreen forest is characterized by *Michelia champaca*, *Anthocephalus cadamba* and *Mesua ferrea*. Moist Deciduous forest is comprised of *Shorea robusta*, *Terminalia arjuna* and *T. chebula*, and Dry Deciduous forest has *Boswellia serrata* and *Acacia leucophloea*. The most important species are *Shorea robusta*, *Terminalia tomentosa*, *Syzygium cumini*, *Protium serratum* and *Dillenia pentagyna* (Mohanty *et al.* 2002). More than 90 species of orchids are found in this IBA, of which atleast two are endemic (*Eria meghasaniensis* and *Bulbophyllum panigrahium*).

AVIFAUNA

Despite the great importance of Simlipal National Park to the Orissa Government and Project Tiger authorities, its bird life is not well documented. However, Jain (2001) says that more than 250 species of birds are found here.

Simlipal forest stands as a link between the flora and fauna of southern

India and the Himalayas. For instance, the Red-breasted Falconet *Microhierax caerulescens* was sighted in Simlipal in 1987 (Prakash and Rahmani 1989), far south of its known range in the Himalayan foothills, Sikkim, Bhutan and Assam (Ali and Ripley 1987).

BirdLife International has identified 59 species in Biome-11, of which 33 have been reported till now from Simlipal. Besides, six species of Biome-10 are also seen. Species at the northernmost extreme of their range are the Malabar Trogon *Harpactes fasciatus*, Malabar Pied Hornbill *Anthracoceros coronatus*, and Malabar Whistling Thrush *Myiophonus horsfieldii*. The essentially Himalayan species such as Large Green-billed Malkoha *Phaenicophaeus tristis* and Blue-throated Barbet *Megalaima asiatica* are near their southern limit in Simlipal (Kazmierczak and Singh 1998). Ripley (1978) has recorded *Picus canus*, another Himalayan bird with disjunct distribution in Mayurbhanj district in Orissa (see map. 6, plate 16, Grimmett *et al.* 1999). Other Himalayan species found in these forests are the Rufous-capped Babbler *Stachyris ruficeps* and Striped Tit Babbler *Macronous gularis* (Ripley 1978).

Thus, Simlipal is a very interesting IBA, not only from the view point of protection of tropical dry forest avifauna, but also from the biogeographic point of view as it connects the Eastern Himalayan avifauna to that of the Western Ghats, albeit through a weak link.

Critically Endangered	
Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Vulnerable	
Greater Spotted Eagle	<i>Aquila clanga</i>
Purple Wood-Pigeon	<i>Columba punicea</i>
Green Munia	<i>Amandava formosa</i>
Biome 10: Indian Peninsula Tropical Moist Forest	
Small Green-billed Malkoha	<i>Phaenicophaeus viridirostris</i>
Malabar Trogon	<i>Harpactes fasciatus</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>
Indian Scimitar-Babbler	<i>Pomatorhinus horsfieldii</i>
Malabar Whistling-Thrush	<i>Myiophonus horsfieldii</i>

Biome 12: Indo-Malayan Tropical Dry Zone

Loten's Sunbird	<i>Nectarinia lotenia</i>
Red-headed Vulture	<i>Sarcogyps calvus</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Red-headed Falcon	<i>Falco chicquera</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-Quail	<i>Perdica asiatica</i>
Painted Bush-Quail	<i>Perdica erythrorhyncha</i>
Painted Spurfowl	<i>Galloperdix lunulata</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Yellow-legged Green-Pigeon	<i>Treron phoenicoptera</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Sirkeer Malkoha	<i>Phaenicophaeus leschenaultii</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocyeros birostris</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Lineated Barbet	<i>Megalaima lineata</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>
Lesser Golden-backed Woodpecker	<i>Dinopium benghalensis</i>
Red-winged Bush-Lark	<i>Mirafra erythroptera</i>
Bengal Bush-Lark	<i>Mirafra assamica</i>
Ashy-crowned Sparrow-Lark	<i>Eremopterix grisea</i>
Black-headed Cuckoo-Shrike	<i>Coracina melanoptera</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
White-browed Bulbul	<i>Pycnonotus luteolus</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Rufous-bellied Babbler	<i>Dumetia hyperythra</i>
Jungle Babbler	<i>Turdoides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Bank Myna	<i>Acridotheres ginginianus</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>

OTHER KEY FAUNA

Important mammals of the Park include Tiger *Panthera tigris*, Leopard *Panthera pardus*, Asian Elephant *Elephas maximus*, Sambar *Cervus unicolor*, Mouse Deer *Moschiola meminna*, Chital *Axis axis*, Gaur *Bos frontalis*, Wild Dog *Cuon alpinus*, Sloth Bear *Melursus ursinus* and Striped Hyena *Hyaena hyaena*. Among reptiles, Mugger *Crocodylus palustris* is the most prominent species. King Cobra *Ophiophagus hannah* is also found.

LAND USE

- q Tourism and recreation
- q Nature conservation and research

THREATS AND CONSERVATION ISSUES

- q Poaching
- q Overgrazing on the fringes and around villages

According to Srivastava and Singh (2002), the major issues affecting Simlipal and requiring management interventions with research data and support are:

- Man-wildlife interface and mitigation of man-wildlife conflict.
- Management of ecotourism.
- Impacts of incompatible developmental programmes launched by other agencies.
- Biodiversity status assessment and monitoring with particular emphasis on invertebrates and lower plants.
- Impacts of habitat alteration.

- Checking large-scale hunting, illegal extraction of timber and collection of non-timber forest products, human encroachment into forested areas, increasing cattle population, forest fire.

The Wildlife Society of Orissa (WSO) has reported that overgrazing is the major problem, as goat rearing is very popular here. There are presently 65 villages inside Simlipal TR, all of which have a population of goats. An estimated 7000 goats from the villages inside the Park and another 70,000 from the peripheral villages of the Sanctuary graze inside the Park daily. This adversely affects wild herbivores like Sambar, Barking Deer, and Gaur.

Organised poaching of Elephants, ritual mass hunting (*Akhand Shikar*) of animals by tribals during April, and poisoning is a major problem. *Akhand Shikar* (non-stop hunting) for seven days occurs in April every year. The Forest Department and NGOs have started a campaign and education programme among tribal against mass killing, because of which many villagers have now stopped participating in this organised ritual annual hunt.

The tiger population (estimated at 99 as per 2004 census) is concentrated in the core area of 845 sq. kms. due to the extensive disturbance of habitat in the buffer area of 2,200 sq. kms. There is a big question mark on the future of Simlipal's tigers. Black tigers indicative of genetic aberration have been sighted by forest officials in recent years. Some experts believe that this is the result of inbreeding of tigers since the population is confined to a small patch and no corridors for movement of tigers to other forests like Keonjhar and Kuldiha exist any more.

Lack of management resources is another major problem in this large forest. The forest authorities have only four vehicles, shared by five rangers! As many as 40 posts are lying vacant (P. Das, *in litt.* 2000). For the last 20 years, the district authorities have not been able to shift four villages from the core area, though the Park authorities have deposited funds for this purpose.

KEY CONTRIBUTOR

Wildlife Society of Orissa

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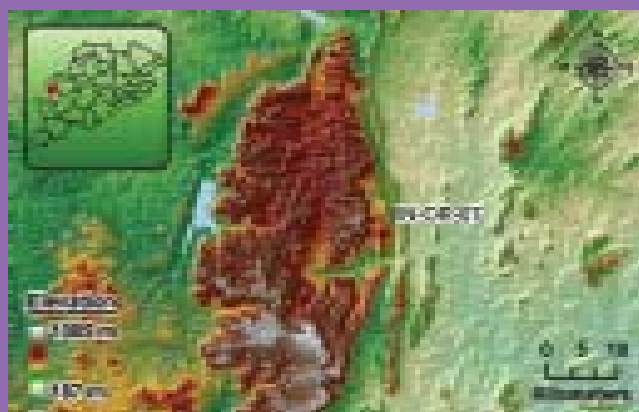
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SUNABEDA WILDLIFE SANCTUARY



IBA Site Code	: IN-OR-07
State	: Orissa
District	: Nuapada
Coordinates	: 20° 26' 60" N, 82° 32' 33" E
Ownership	: State
Area	: 50,000 ha
Altitude	: 350 - 1,000 m
Rainfall	: 1,000 mm
Temperature	: 8 °C to 47 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Dry Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A3 (Biome 11: Indo-Malayan Tropical Dry Zone)
PROTECTION STATUS: Wildlife Sanctuary, established in July 1988

GENERAL DESCRIPTION

Sunabeda is situated in the Nuapada district of Orissa, adjoining Chhattisgarh State. The Sanctuary harbours a great diversity of wildlife habitats, with a vast plateau and canyons with 11 waterfalls. There are several riparian forests patches where species such as the Giant Squirrel *Ratufa indica* and the Flying Squirrel *Petaurista* sp. could be expected (Kotwal 1997).

The Sanctuary forms the catchment area of the Jonk river, over which a dam has been constructed to facilitate irrigation. Thirty-five families in Maragura village within the Sanctuary need to be rehabilitated (Kotwal 1997). The Indra nullah lies to the south and Son River to the west of the Sanctuary.

The important vegetation of the site comprises Dry Deciduous Tropical Forest species such as *Tectona grandis*, *Dalbergia sissoo*, *Boswellia serrata*, *Adina cordifolia*, *Diospyros melanoxylon*, *Embllica officinalis* and *Terminalia bellerica*, as well as semi-evergreen species around the riverine belt such as *Terminalia arjuna* and *Syzygium cumini*.

AVIFAUNA

Around 200 species of birds have been reported from this area (H. K. Bisht *in litt.* 2002). BirdLife International (undated) has listed 59 species in Biome-11 (Indo-Malayan Tropical Dry Zone), of which 18 have been seen till now, but more are likely to occur. Except for the two *Gyps* vultures, which are now included in the

Critically Endangered category by BirdLife International (2001) due to their steep decline during the last 10 years, none of the other species is threatened with extinction. Biome-11 includes a wide range of habitats, including forests and open country. Many of the species listed have adapted to man-modified habitats. Some species have deviated so far from their earlier distribution that they may not be useful in identifying IBAs for the protection of this biome (BirdLife International, undated).

Critically Endangered

Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>

Biome 11: Indo-Malayan Tropical Dry Zone

Sirkeer Malkoha	<i>Phaenicophaeus leschenaultii</i>
Jungle Bush-Quail	<i>Perdicula asiatica</i>
Painted Bush-Quail	<i>Perdicula erythrorhyncha</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Dusky Eagle-Owl	<i>Bubo coromandus</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocyrceros birostris</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahrattensis</i>
Lesser Golden-backed Woodpecker	<i>Dinopium benghalense</i>
Red-winged Bush-Lark	<i>Mirafra erythroptera</i>
Bengal Bush-Lark	<i>Mirafra assamica</i>
White-browed Bulbul	<i>Pycnonotus luteolus</i>
Jungle Babbler	<i>Turdoides striatus</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
White-bellied Drongo	<i>Dicrurus caeruleus</i>

OTHER KEY FAUNA

Sunabeda Wildlife Sanctuary has certainly seen better days. It had Swamp Deer *Cervus duvauceli branderi* and Wild Buffalo *Bubalus bubalis* (= *arnee*) (Kotwal 1997). Even now, typical central Indian wild mammals such as Tiger *Panthera tigris*, Leopard *P. pardus*, Gaur *Bos frontalis*, Sloth Bear *Melursus ursinus*, Barking Deer *Muntiacus muntjak*, Wild Boar *Sus scrofa* and Bluebull *Boselaphus tragocamelus* are found, although depleted by poaching. Among the non-human primates, Common Langur *Semnopithecus entellus* and Rhesus Monkey *Macaca mulatta* are very common.



Photo: Asad R. Rahmani

Critically Endangered Oriental White-backed Vulture
Gyps bengalensis is now very rare in this IBA.

OR-07

Jungle Babbler *Turdoides striatus* is commonly seen in Sunabeda.

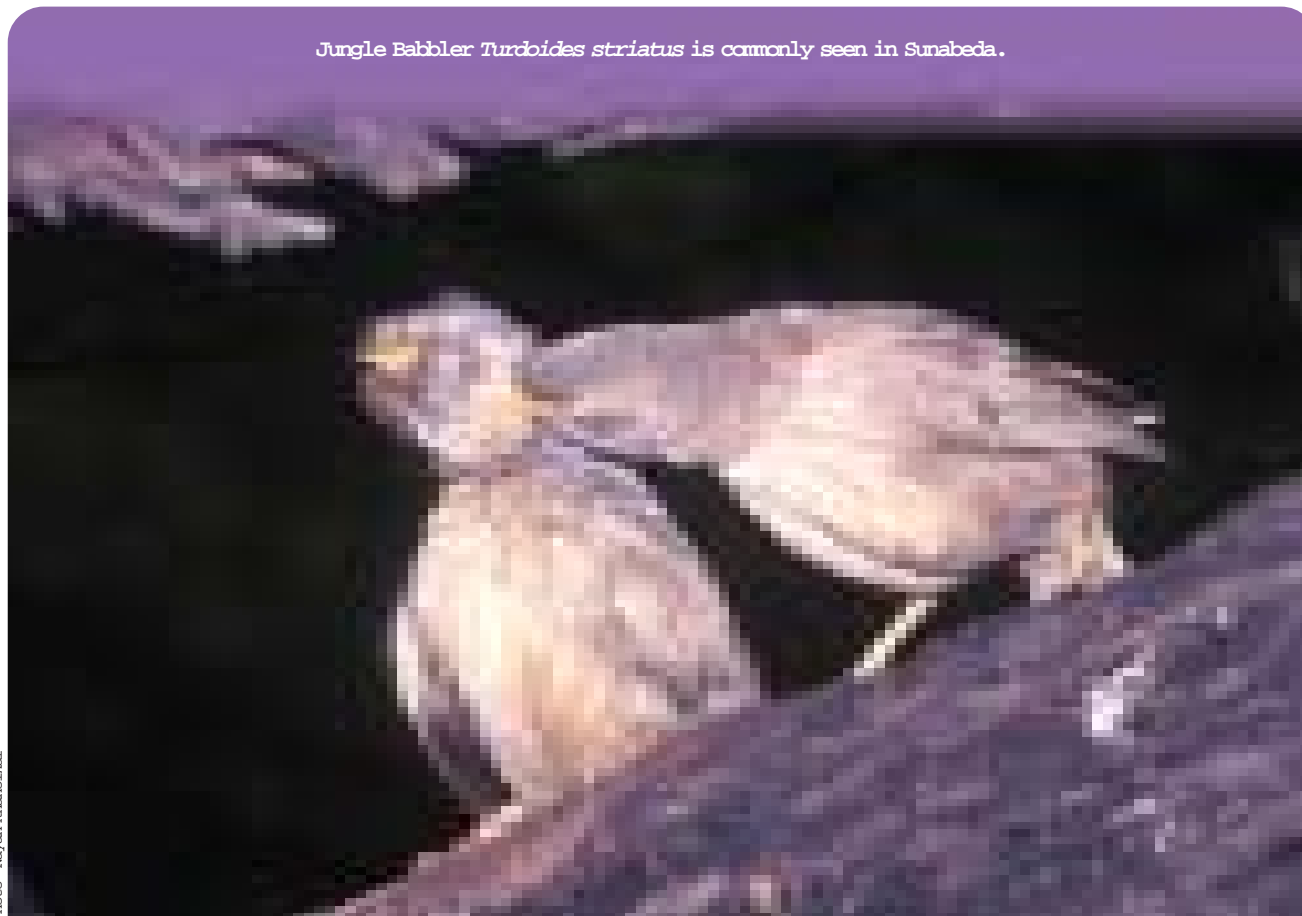


Photo: Nayari Khanolkar

LAND USE

- q Nature conservation and research
- q Human settlements

THREATS AND CONSERVATION ISSUES

- q Human pressure
- q Livestock grazing
- q Encroachment of forestland
- q Forest fire
- q Unsustainable exploitation of the forest resources
- q Illegal felling

According to Kotwal (1997), the highly endangered Wild Buffalo used to occur here nearly 70 years ago. At present, they are found in Udanti Wildlife Sanctuary in Chhattisgarh, about 20 km away but there is a Patdhara Reserve Forest corridor. Efforts should be made to improve the habitat so that the Wild Buffalo can come back to Sunabeda using this corridor. This would give a boost to the protection of this Sanctuary, which is important for birds also.

About 64 villages, with a human population of 20,000, fragment this Sanctuary and there is a large population of cattle. The villagers subsist on forest products to a great extent, as they have land holdings with poor yield. Grazing and encroachment of forest land

for cultivation of *Cannabis sativa* are major threats to the Sanctuary. Graziers from other states including Rajasthan arrive here with their camels and goats, which compete with local herbivores for the grass. Though there is a proposal for a tiger reserve, there are extensive encroachments inside the sanctuary. It is doubtful if these people could be shifted (Biswajit Mohanty *pers. comm.* 2004).

The core area of Sunabeda could be increased southwards across the Indra *nullah* (stream), to add 30,000 ha of forest without human habitation (Kotwal 1997).

KEY CONTRIBUTORS

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