MAHARASHTRA

IN-MH

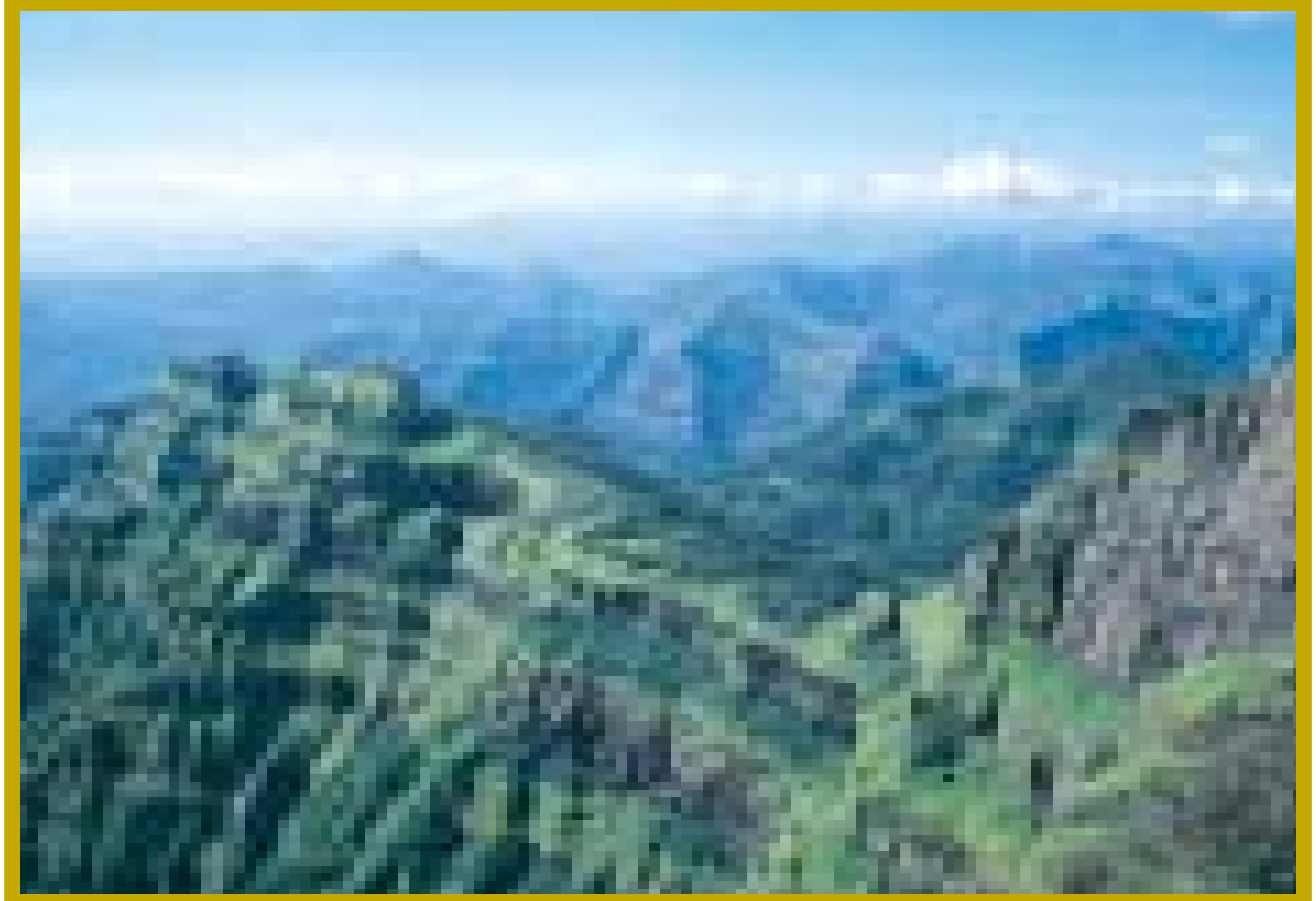

Photo: Isaac Kehimkar

A view of the northern part of the Western Ghats in Maharashtra.

Maharashtra (15º 35' - 22º 02' N and 72º 36' - 80º 54' E) is the third largest state of the country with an area of 3,07,690 sq. km, constituting 9.36% of India's total geographical area. The State is bounded by the Arabian Sea on the west, Gujarat on the northwest, Madhya Pradesh on the north, Chhatisgarh in the northeast, Andhra Pradesh in the east and Karnataka and Goa to the south. The coastline of the State is about 720 km long. The Western Ghats (*Sahyadris*) run parallel to the sea coast. Physiographically, the State can be divided into five regions, which are the Deccan Plateau, the Central Highlands, the Eastern Chotanagpur Plateau, the Western Ghats and the coastal plain. Maharashtra is divided into 35 administrative districts. Nearly 60 % of the human population depends on agriculture, from which 22% of the State's income is generated (Mathew 2003).

The State has three well-defined seasons, the monsoon, winter and summer. The monsoon lasts from mid-June to the end of September, winter is from October to January, and summer is from February to May-June. The mean maximum temperature is 36.8 °C and the mean minimum temperature is 15.8 ºC. Rainfall varies according to the topography of the region. The average annual rainfall in the Western Ghats is 2,000 mm but in some areas it reaches up to 3,500 mm. Many districts like Nashik, Pune, Ahmednagar, Nandurbar, Jalgaon, Beed, Usmanabad, Parbhani, Akola, Satara, Sangli, Solapur and some parts of Kolhapur lie in the rain shadow of the Ghats and have a mean annual rainfall of about 600 mm.

Maharashtra is the second most populous state of India, with about 9.42% of the country's population. The 2001 census records that, there are 96,752,247 people living in the State of which 42.40% are in urban areas and 67.60% in rural areas. The density is 314 persons per sq. km. The literacy rate is 77.27 %.

Vegetation

According to the Forest Research Institute, the forest area of the State is 6.38 million ha, constituting 20.75% of its geographical area. Reserved forest constitutes 76%, protected forest 14% and unclassified forest 10%.

In the Forest Research Institute 1999 report, six forest types are mentioned in Maharashtra, (1) Tropical Semi-Evergreen; (2) Tropical Moist Deciduous; (3) Tropical Dry Deciduous; (4) Tropical Thorn; (5) Subtropical Broadleaf Hill and (6) Littoral and Swamp Forests. Extensive tracts of forests are still present in the Vidarbha region and some patches in the Northern Western Ghats. Some endemic and highly endangered plants are found in the evergreen and semi-evergreen patches of the Western Ghats.

IN-MH

According to the Gazetteer of India (1974) there are more than 600 species of fishes in Maharashtra, of which 414 are marine and 168 are freshwater. Nearly 3000 species of insects, 22 species of amphibians, 97 species of reptiles and 85 species of mammals are also found here. Among the mammals *Myotis peshwa* a highly endemic bat is found in the Pune and Mumbai region**.** Recently, there have been some new additions to the list of mammals. Caracal *Felis caracal* have been reported in the Melghat Tiger Reserve (Kishore Rithe *pers. comm*. 2003). The Indian Elephants *Elephus maximus* have moved to Sawantwadi and adjoining areas in the Sindhudurg district.

Among 22 species of amphibians, the *Bufo koynayensis* is a rare frog of Western Ghats.

Photo: Varad Giri

IBAs AND PROTECTED AREAS

There are five national parks and 33 wildlife sanctuaries in the State, covering 4.68% of the State (Rodger *et al*. 2000). There are two tiger reserves, namely Melghat Tiger Reserve and Tadoba-Andhari Tiger Reserve. Sanjay Gandhi, Gugamal, Nawegaon, Pench, and Tadoba are the five national parks. A total of 20 sites have been identified as IBAs, in which seven are wildlife sanctuaries; four are national parks, and nine non-protected areas. The total area of the IBAs in the State is 12,86,581 ha.

Number of IBAs and IBA criteria

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

IBAs of Maharashtra

IBA site codes	IBA site names	IBA criteria
IN-MH-01	Bhimashankar Wildlife Sanctuary	A1, A2, A3
IN-MH-02	Burnt Island (Bandra) Vengurla Rocks	A4iii
IN-MH-03	Gangapur Dam And Grasslands	A1, A4i, A4iii
IN-MH-04	INS-Shivaji and Lonavala	A1, A2, A3
IN-MH-05	Jaikwadi Wildlife Sanctuary	A1, A4i, A4iii, A4iv
IN-MH-06	Jawaharlal Nehru Bustard Sanctuary	A1
IN-MH-07	Koyna Wildlife Sanctuary	A1, A3
IN-MH-08	Mahul-Sewree Creek	A1, A4i, A4iii
IN-MH-09	Melghat Wildlife Sanctuary and Gugmal National Park	A1, A2, A3
IN-MH-10	Nagzira Wildlife Sanctuary	A1
IN-MH-11	Nandur Madhmeshwar Wildlife Sanctuary	A1, A4i, A4ii, A4iii
IN-MH-12	Nawegaon National Park	A1, A3
IN-MH-13	Ozar And Adjoining Grassland	A1
IN-MH-14	Radhanagari Wildlife Sanctuary	A1, A2, A3
IN-MH-15	Sanjay Gandhi National Park	A1, A2, A3
IN-MH-16	Tadoba National Park and Andhari Tiger Reserve	A1, A3
IN-MH-17	Taloda Reserve Forest	A1, A2
IN-MH-18	Tansa Wildlife Sanctuary	A1, A3
IN-MH-19	Thane Creek	A1, A4i, A4iii
IN-MH-20	Toranmal Reserve Forest	A1, A2

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AVIFAUNA

Abdulali (1981) listed 540 species of birds from Maharashtra. Recently, a few more birds have been added to the list, such as the Ortolan Bunting *Emberiza hortulana* near Nashik (Raha and Gudsoorkar 2002), Nilgiri Pipit *Anthus nilghiriensis*, White-bellied Blue Flycatcher *Cyornis pallipes* (K. B. Singh *pers. comm.* 2003) and Broad-tailed Grass-Warbler *Schoenicola platyura* (B. Raha *pers. comm.* 2002). The Speckled Piculet *Picumnus innominatus* and Malabar Torgon *Harpactes fasciatus* were also observed in the Western Ghats of Maharashtra (P. Gole *pers. comm*. 2002; G. Jathar *pers. comm*. 2003). Prasad (2003) has listed about 450 bird species from Western Maharashtra.

List of threatened birds with IBA site codes

Critically Endangered		
Oriental White-backed Vulture	*Gyps bengalensis*	IN-MH-01, 03, 05, 07, 08, 09, 10, 11, 12, 14, 15, 16, 17, 18, 20
Long-billed Vulture	*Gyps indicus*	IN-MH-01, 03, 04, 07, 08, 11, 12, 14, 15, 17, 18, 20
Forest Owlet	*Heteroglaux blewitti*	IN-MH-09, 17, 20
Endangered		
Great Indian Bustard	*Ardeotis nigriceps*	IN-MH-06, 13
Lesser Florican	*Sypheotides indica*	IN-MH-03, 06, 13
Spotted Greenshank	*Tringa guttifer*	IN-MH-08
Vulnerable		
Lesser Adjutant	*Leptoptilos javanicus*	IN-MH-10, 12, 15, 16
Lesser White-fronted Goose	*Anser erythropus*	IN-MH-03
Pallas's Fish-Eagle	*Haliaeetus leucoryphus*	IN-MH-15, 18
Greater Spotted Eagle	*Aquila clanga*	IN-MH-01, 08, 12, 15, 16, 17, 19, 20
Eastern Imperial Eagle	*Aquila heliaca*	IN-MH-03, 08, 11, 12
Lesser Kestrel	*Falco naumanni*	IN-MH-01, 03, 05, 09, 12, 20
Sarus Crane	*Grus antigone*	IN-MH-12, 16
Indian Skimmer	*Rynchops albicollis*	IN-MH-15
Nilgiri Wood-Pigeon	*Columba elphinstonii*	IN-MH-01, 04, 07, 14, 15
Purple Wood-Pigeon	*Columba punicea*	IN-MH-10
Broad-tailed Grass-Warbler	*Schoenicola platyura*	IN-MH-04
Green Munia	*Amandava formosa*	IN-MH-09, 10, 12, 16, 20
Near Threatened		
Darter	*Anhinga melanogaster*	IN-MH-05
Painted Stork	*Mycteria leucocephala*	IN-MH-05
Oriental White Ibis	*Threskiornis melanocephalus*	IN-MH-05
Lesser Flamingo	*Phoenicopterus minor*	IN-MH-05, 08, 19
Ferruginous Pochard	*Aythya nyroca*	IN-MH-05
Pallid Harrier	*Circus macrourus*	IN-MH-01, 05

Restricted Range species and Endemic species

Parts of the Western Ghats in Maharashtra lie in the Endemic Bird Area (EBA123). Of the 16 restricted range species found in the Western Ghats, eight species have been recorded from Maharasthra till now: Nilgiri Wood-Pigeon *Columba elphinstonii*, Blue–winged Parakeet *Psittacula columboides*, Malabar Grey Hornbill *Ocyceros griseus*, Indian Rufous Babbler *Turdoides subrufus*, White-bellied Blue Flycatcher *Cyornis pallipes*, Nilgiri Pipit *Anthus nilghiriensis*, Broad-tailed Grass-Warbler or Grassbird *Schoenicola platyura* and Small Sunbird *Nectarinia minima*. These restricted range species are found mainly in the Bhimashankar Wildlife Sanctuary, Radhanagari Wildlife Sanctuary, Koyna Wildlife Sanctuary, INS-Shivaji and Lonavala and Sanjay Gandhi National Park.

Maharashtra also has one Secondary Area (s075: Central Indian Forests) due to the presence of the Forest Owlet.

Secondary Area s075: Central Indian Forests		
Forest Owlet	*Heteroglaux blewitti*	IN-MH-09, 17, 20

Endemic Bird Area 123: Western Ghats		
Nilgiri Wood-Pigeon	*Columba elphinstonii*	IN-MH-01, 04, 15
Blue-winged Parakeet	*Psittacula columboides*	IN-MH-01, 04
Malabar Grey Hornbill	*Ocyceros griseus*	IN-MH-01, 04, 07, 14
Nilgiri Pipit	*Anthus nilghiriensis*	IN-MH-04
Indian Rufous Babbler	*Turdoides subrufus*	IN-MH-04, 09
Broad-tailed Grass-Warbler	*Schoenicola platyura*	IN-MH-04
White-bellied Blue-Flycatcher	*Cyornis pallipes*	IN-MH-01, 14
Small Sunbird	*Nectarinia minima*	IN-MH-01, 04, 07,14

Biome

Two biomes are found in Maharashtra, the Indian Peninsula Tropical Moist Forest (Biome-10) in the Western Ghat region, and Indo-Malayan Tropical Dry Zone (Biome-11) in the remainder of the State. Biome 10 represents the Western Ghats and covers parts of Kolhapur, Sindhudurg, Ratnagiri, Raigad, Thane, Pune, Satara and Sangali districts. Of the 15 species found in Biome-10 (BirdLife International undated), 11 species have been recorded in Maharashtra. The major habitat types in these biomes are Evergreen, Semi-evergreen and Moist Deciduous. The IBAs are Koyna Wildlife Sanctuary, Radhanagari Wildlife Sanctuary, Sanjay Gandhi National Park, Tansa Wildlife Sanctuary, Bhimashankar Wildlife Sanctuary and INS-Shivaji and Lonavala. The sprawling Deccan Plateau, covering almost 80% of the state qualifies for Biome-11. Toranmal Reserve Forest, Taloda Reserve Forest, Melghat Tiger Reserve, Nagzira Wildlife Sanctuary, Tadoba - Andhari Tiger Reserve and Nawegaon National Park are the IBAs of this region. The Critically Endangered and endemic Forest Owlet *Heteroglaux blewitti* has been reported from Toranmal, Taloda and the Melghat region (Ishtiaq and Rahmani 2000, Jathar and Rahmani 2004). Vulnerable species such as the Green Munia *Amandava formosa*, Greater Spotted Eagle *Aquila clanga*, Eastern Imperial Eagle *A.heliaca*, and Lesser Kestrel *Falco naumanni* are also found here. The major habitat types in this biome are Tropical Dry Deciduous Forest, Tropical Thorn Forest, and Grassland. Nannaj plots, Ozar grassland, and Gangapur grassland fall under Tropical Thorn Forest and Grassland. These areas give refuge to the highly Endangered Great Indian Bustard *Ardeotis nigriceps* and the Lesser Florican *Sypheotides indica.*

Congregations

Thane creek, Mahul-Sewree Mudflats, Jaikwadi Wildlife Sanctuary, Nandur-Madhmeshwar Wildlife Sanctuary, Nawegaon National Park, Gangapur Dam and Vengurla Rocks qualify for A4 (congregation) criteria. The Thane creek and the Mahul-Sewree Mudflats are famous for large congregations of waders and flamingos. The Gangapur dam came into focus when the Lesser White-fronted Goose *Anser erythropus* was seen there. The Jaikwadi Wildlife Sanctuary, Nandur-Madhmeshwar Wildlife Sanctuary and Nawegaon National Park are famous for huge congregations of waterfowl. The Vengurla Rock is an IBA because thousands of seabirds breed there. Besides, a huge breeding colony of the Indian Edible-nest Swiftlet *Collocalia unicolor* resides in the caves on that island.

Sewri mudflats in the middle of Mumbai city attract thousands of flamingos and other waders.

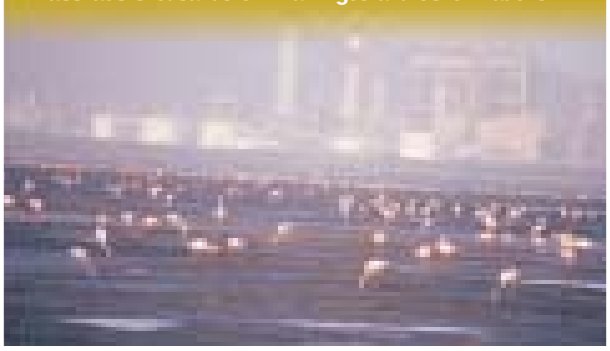


Photo: Asad R. Rahmani

THREATENED BIRD SPECIES FOR WHICH MAHARASHTRA IS IMPORTANT

The Forest Owlet *Heteroglaux blewitti* is Critically Endangered.

Photo: Farah Ishtiaq

Forest Owlet *Heteroglaux blewitti* **Critically Endangered**

The Forest Owlet was rediscovered in 1997 by a team from the Smithsonian Institute (King and Rasmussen 1998) and later BNHS began a detailed study of the bird (Ishtiaq 1999, 2000, Ishtiaq and Rahmani 2000). It has a fragmented population in the Central Indian Forests, and is graded Critically Endangered. It has been reported from the Toranmal Reserve Forest, Taloda Reserve Forest, Melghat Tiger Reserve and Mahendri Reserve Forest of Maharashtra (Ishtiaq and Rahmani 2000, Jathar and Rahmani 2004).

Lesser Adjutant *Leptoptilos javanicus* **Vulnerable**

This bird has a very wide distribution in India, mainly in the northeastern states. There are very few records of this bird from the Nagzira Wildlife Sanctuary, Nawegaon National Park, Sanjay Gandhi National Park and Tadoba National Park.

Great Indian Bustard *Ardeotis nigriceps* **Endangered**

This bustard has a very small, declining population because of habitat degradation and agricultural development. In Maharashtra, it was often seen in large numbers, especially in Nannaj (Great Indian Bustard Sanctuary). Sometimes up to 30 bustard were seen in the Nannaj plot. Ozar is another site where we can see bustard (B. Raha *pers. comm*. 2002). It has also been seen in Ahmednagar and Nagpur districts.

Lesser Florican *Sypheotides indica* **Endangered**

This species is Endangered and has a small, declining population, primarily as a result of the loss and degradation of grassland habitat. From Maharashtra, it has been reported from Ozar and adjoining grasslands and from the Gangapur grasslands. It is occassionally seen in the Nannaj plots in Solapur district.

Nilgiri Wood-Pigeon *Columba elphinstonii* **Vulnerable**

The widespread destruction of its forest habitat has led to a decline in the population of this pigeon. A Vulnerable species, it is also one of the 16 restricted range species of the Western Ghats, which occurs in the evergreen biotope. It occurs from Anamalai to Mumbai in the Western Ghats area. In Maharashtra, this bird has been recorded from the Bhimashankar, Radhanagari and Koyna wildlife sanctuaries and Sanjay Gandhi National Park.

Broad-tailed Grass-Warbler *Schoenicola platyura* **Vulnerable**

This bird is restricted to grassy highlands, mainly in the Western Ghats, at least in the breeding season. Clearance and modification of the highland grasslands range has caused great fragmentation of its population (BirdLife International 2001). This Vulnerable bird was found in the Khandala area (K, B. Singh *pers. comm.* 2003) and it is found breeding in the Ramshej Ghats (10 km from the Gangapur grasslands and 18 km from Nashik) at an elevation of 900 m (B. Raha *pers. comm*. 2003).

Restricted Range species

Blue-winged or Malabar Parakeet *Psittacula columboides*

Restricted to the Western Ghats, this parakeet is categorized as Vulnerable (BirdLife International 2001). It is mainly found in the Bhimashankar Wildlife Sanctuary, INS-Shivaji and adjoining areas of Lonavala. There are possibilities of its occurrence in a stretch of the Northern Western Ghats in areas like the Radhanagari Wildlife Sanctuary, Chandoli Wildlife Sanctuary and in parts of Ratnagiri and Sindhudurg districts.

Malabar Grey Hornbill *Ocyceros griseus*

Commonly found in the Konkan area of Maharashtra, this hornbill is found especially in the Sindhudurg and Ratnagiri districts. However, it has only been reported from three IBAs, namely Bhimashankar Wildlife Sanctuary, INS-Shivaji in the Lonavala area and the Radhanagari Wildlife Sanctuary.

Nilgiri Pipit *Anthus nilghiriensis*, **Indian Rufous Babbler** *Turdoides subrufus* and **White-bellied Blue-flycatcher** *Cyornis pallipes*

These three interesting species have been reported only from the INS-Shivaji area and not anywhere else in the Northern Western Ghats.

Small Sunbird *Nectarinia minima*

This endemic Sunbird has been recorded from the Bhimashankar Wildlife Sanctuary, INS-Shivaji and the Lonavala area, Radhanagari Wildlife Sanctuary and the Koyna Wildlife Sanctuary. It has also been reported from the Semi-evergreen forests of Ratnagiri and Sindhudurg districts.

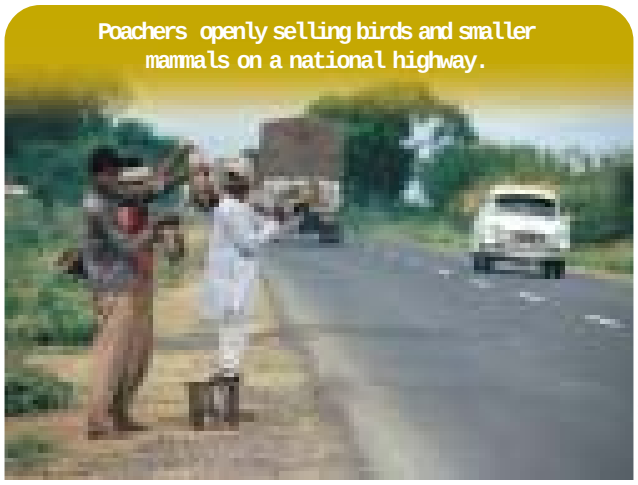
THREATS AND CONSERVATION ISSUES

Unplanned water management systems have led to creating of large dams, directly resulting in habitat destruction and fragmentation. For example, Human Dam is a major irrigation projects to be built across Human River in the Wainganga/ Godavari basin near village Sirkada in Sindewahi *tahsil*. The Human is a tributary of the Andhari River, which ultimately joins the Wainganga. The proposed project's location is near village Sirkada in Sindewahi *tahsil* of Chandrapur district and it aims to divert 132-million cubic meter water to Maharashtra State Electricity Board's Chandrapur Thermal Power Station. The project also involves forest clearance and diversion of 2906 ha land.

The Human Project will result in the submergence of the only effective wildlife corridor connecting Chandrapur Division with Brahmapuri Division. The Human Project will also result in submergence of the villages such as Palasgaon, Pipara-Perna, Sirkada (south of Palasgaon), Vihirgaon, Manemohadik, Khambada, Gondeda, Kewada, Pendhri (north of Palasgaon) that lie in and around the narrowest corridor connecting Chandrapur and Brahmapuri Forest Divisions

Large number of dams are planned on the River Narmada in Gujarat, Maharashtra and Madhya Pradesh. For example, 17 major, 173 medium and 1623 minor dams have already been built, while 65 major, 126 medium and 813 minor dams are planned. Another 11 major and 1036 minor dams are identified (Source: www.narmada.org). All these dams will lead to fragmentation of wildlife habitats.

Encroachments: With increasing population, encroachment on forestland is a common practice in India and in Maharashtra it is no different. This has resulted in massive degradation of forest and illegal exploitation of resources. For example, the Yawal Wildlife Sanctuary



Poachers openly selling birds and smaller mammals on a national highway.

Photo: Ajit Deshmukh

Encroachment by people on the fringes is increasing, especially near the Sanjay Gandhi NP in Mumbai.

Photo: M. Zafar-ul Islam

in Jalgoan, situated on the western part of the Satpura mountain and bordering Madhya Pradesh is under heavy pressure from encroachers of Madhya Pradesh. This sanctuary is also important because it is part of "Satpura Tiger landscape". It has a close link with Aner Sanctuary (Dhulia district) to the west and Ambabarawa Sanctuary towards the east, further east is Van and Narnala sanctuaries and the famous Melghat Tiger Reserve.

Mining: Over exploitation of minerals, oil and stone, has left most of the remaining resources in the protected areas of India. Mining industries are more and more coming closer to these PAs and some even inside the PAs. Such mining activities are proving to be detrimental to our last remaining wildlife habitats. Though small-scale quarrying exists all along Maharashtra's Western Ghats, the main areas in conflict have been the bauxite-rich plateaus along the crestline in southern Maharashtra. Bauxite leases and mines pockmark this portion of the Ghats. Undoubtedly the most controversial has been the mining in and around Radhanagari WLS. Indian Aluminium's (INDAL) Durgamanwad mine touches Radhanagari's northern boundary. Though the lease was granted before the notification of the sanctuary, operations commenced only in 1993. Surprisingly, environmental clearance was granted even though the mine actually touches the sanctuary border.

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

REFERENCES

Abdulali H. (1981) *Checklist of the birds of Maharashtra with notes on their status around Bombay*. Second edition. Bombay: Bombay Natural History Society, Bombay.

BirdLife International (2001) *Threatened Birds of Asia*: *the BirdLife International Red Data Book*. BirdLife International . Cambridge, UK.

BirdLife International (undated) Briefing Book on Important Bird Areas. BirdLife International, Cambridge, UK.

Forest Survey of India (2001) State of Forest Report 2001. Ministry of Environment and Forest, Dehra Dun.

Gazetteer of India (1974) Maharashtra State Gazetteers, General Series-Fauna. Maharashtra State, Mumbai.

Ishtiaq, F. (1999) Forest Owlet – an update. *Hornbill* Jun- Sept: 26-28.

Ishtiaq, F. (2000). Red Data Bird: Forest Spotted Owlet. *Newsletter for Birdwatchers* 40 (3): 29-31.

Ishtiaq, F. and A. R. Rahmani (2000) Further information on status and distribution of Forest Owlet *(Athene blewitti)*. *Forktail*. 16: 125-130.

Jathar, G. and Rahmani, A. R. (2004) Status of the Critically Endangered Forest Owlet *Heteroglaux blewitti* (Hume) in Maharashtra. Bombay Natural History Society, Mumbai. 11 pp (unpublished).

King, B. F. and P. C. Rasmussen (1998) The rediscovery of the Forest Owlet *Athene* (*Heteroglaux*) *blewitti*. *Forktail* 14.

Mathew, K. M. (2003) *Manorama Yearbook 2003*. Malayala Manorama, Kottayam.

Prasad, A. (2003) Annotated Checklist of the Birds of Western Maharashtra. *Buceros* vol. 8 (2&3).

Raha B. and S. R. Gudsoorkar (2002) Sighting of Ortolan Bunting *Emberiza hortulana* at the grassland around Gangapur, Nashik. *J. Bombay Nat. Hist. Soc*. 99 (3): P-536.

Rodgers, W. A., Panwar, H. S. and Mathur, V. B. (2000) *Wildlife Protected Area Network in India: A Review (Executive Summary)*. Wildlife Institute of India, Dehar Dun. 44 pp.

MH-01

BHIMASHANKAR WILDLIFE SANCTUARY

IBA Site Code	:	IN-MH-01
State	:	Maharashtra
District	:	Pune, Raigad, Thane
Coordinates	:	19° 14' 28" N, 73° 35' 09" E
Ownership	:	State, Private
Area	:	13,078 ha
Altitude	:	650 - 1,140 m
Rainfall	:	3,000 mm
Temperature	:	7 °C to 36 °C
Biogeographic Zone	:	Western Ghats
Habitats	:	Tropical Semi evergreen Forest, Tropical Moist Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)
PROTECTION STATUS: Wildlife Sanctuary, established in 1985

GENERAL DESCRIPTION

The Bhimashankar Wildlife Sanctuary lies in the northern part of the Western Ghats in Maharashtra. It is situated at the crest of the main Sahyadri range and includes spurs running gradually into the eastern plains, as well as steep terraced western slopes leading to the Konkan. Three rivers, Bhima, Ghod and Arala, originate from the western part of the Sanctuary. The crest of the Sanctuary experiences high velocity winds from December to March and is completely fog-bound during the monsoon. The main physical features of the Sanctuary are ridges, hill slopes, plateau, uplands, gorges, ravines, cliffs, valleys, rocky stream basins, spurs with flat tops, and valleys.

Bhimashankar Sanctuary is famous for the highly endangered subspecies of the Indian Giant Squirrel *Ratufa indica elphinstoni*, locally known as *Shekru*. This is the state animal of Maharashtra. At the heart of the Sanctuary there is an old shrine of Bheema Shankar at the origin of the River Bhima.

The Sanctuary includes Semi-evergreen, Moist Deciduous and scrub forest. It contains several evergreen species that are locally abundant only in restricted localities in the Western Ghats. Some plant species are *Memecylon umbellatum, Atlantia racemosa and Xantolis tomentosa*. *Carvia callosa* is another interesting species. During monsoon, various species of mosses and epiphytes including bioluminescent fungi can be seen on the trees.

AVIFAUNA

Gole (2000) listed over 172 bird species in the Sanctuary, including several globally threatened and restricted range species. The Sanctuary is at the crest of the Western Ghats and the northernmost distribution of some of the restricted range avian species of the Western Ghats.

The site falls in the Western Ghats Endemic Bird Area (Stattersfield *et al*. 1998). Of the 15 Biome-10 species (BirdLife International, undated), five have been identified from Bhimashankar. The site also has 15 Biome-11 species.

The Nilgiri Wood-Pigeon *Columba elphinstonii*, a globally threatened and restricted range species of the Western Ghats (BirdLife International 2001), generally arrives in February and can be seen/heard till the break up of the monsoon in end June (Gole 2000). It leaves the high rainfall plateau during the monsoon to reappear in winter. Its arrival is also dependent on the fruiting season. Several other pigeons species and parakeets such as the Blue-winged or Malabar Parakeet *Psittacula columboides* and Plum-headed Parakeet *Psittacula cyanocephala* also visit the Sanctuary from late winter onwards.

Malabar Grey Hornbill *Ocyceros griseus*, an endemic species, is generally found below the plateau on the Konkan side and not observed in the plateau. While the Yellow-browed Bulbul *Iole virescens*, a biome species, and White-bellied Blue-flycatcher *Cyornis pallipes*, an endemic species, are hill species and seldom seen below 620 m (Gole 2000). Small Sunbird *Nectarinia minima*, another endemic of the Western Ghats has good resident population in this IBA.

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Long-billed Vulture	*Gyps indicus*
Vulnerable	
Greater Spotted Eagle	*Aquila clanga*
Lesser Kestrel	*Falco naumanni*
Nilgiri Wood-Pigeon	*Columba elphinstonii*
Near Threatened	
Pallid Harrier	*Circus macrourus*
Endemic Bird Area 123: Western Ghats	
Nilgiri Wood-Pigeon	*Columba elphinstonii*
Blue-winged Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
White-bellied Blue-Flycatcher	*Cyornis pallipes*
Small Sunbird	*Nectarinia minima*
Biome-10: Indian Peninsula Tropical Moist Forest	
Malabar Trogon	*Harpactes fasciatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Whistling-Thrush	*Myiophonus horsfieldii*
Indian Scimitar-Babbler	*Pomatorhinus horsfieldii*
Loten's Sunbird	*Nectarinia lotenia*

One of the most interesting winter visitors to this site is the Tytler's Leaf Warbler *Phylloscopus tytleri*, a bird of the Western Himalaya (Ali and Ripley 1987, Grimmett *et al*. 1998). It winters in the Western Ghats, and perhaps a significant population winters in this IBA. Trevor Price (*pers. comm.* 2001) has seen a high density wintering in the neighbouring Mahabaleswar forests.

This site also has good population of the Grey-fronted or Pampadour Green Pigeon *Treron pompadora affinis*. Recently, this subspecies has been upgraded to a full-fledged species called *Treron affinis* (Rassmusen and Anderton, *in press*). This means that one more species is added in the list of endemic species of the Western Ghats.

OTHER KEY FAUNA

Leopard *Panthera pardus* is the largest carnivore of this Sanctuary. Its main prey species are the Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak*, Wild Boar *Sus scrofa*, Common Langur *Semnopithecus entellus*, Rhesus Macaque *Macaca mulatta* and Mouse Deer *Moschiola meminna*. Other carnivores include the Striped Hyena *Hyaena hyaena* and Golden Jackal *Canis aureus*. Indian Pangolin *Manis crassicaudata* is also reported, but being nocturnal, is not easily seen.

LAND USE

- Tourism and recreation
- Transport
- Nature conservation and research
- Livestock grazing
- Agriculture

THREATS AND CONSERVATION ISSUES

- Tourism
- Livestock grazing
- Man-animal conflicts
- Fuel wood gathering
- Agricultural intensification and expansion
- Commercial development
- Plastic consumption by animals

The forest has remained relatively unexploited in the past, due to religious association with temples, temple forests and sacred groves. However, nowadays, the area draws thousands of tourists and there is no restriction on their movement. Vehicular disturbance, garbage, pollution of water holes, and camp fires damage the Sanctuary. Tourism attracts immigration from the neighboring areas, and illegal construction.

The forest is exploited for fuel wood and other minor forest produce to meet the demands created by tourism. Grazing by livestock also affects the regeneration of the forest. Many wild and domestic animals have died as a result of consumption of plastic, which comes largely from the pilgrim and tourist traffic.

KEY CONTRIBUTORS

Prakash Gole and Renee Borges

KEY REFERENCES

Ali, S. and Ripley, S. D. (1987) *Compact Handbook of the Birds of India and Pakistan* (Second Edition). Oxford University Press, Delhi.

BirdLife International (2001) *Threatened Birds of Asia: The BirdLife International Red Data Book*. BirdLife International, Cambridge, U.K.

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, U.K., unpublished.

Gole, P. (2000) Survey of Birds of Bhimashankar Wildlife Sanctuary and formulation of Management guidelines for their protection.Final Report. A project sponsored by the Forest Department, Government of Maharashtra.

Grimmett, R., Inskipp, C. and Inskipp, T. (1998) *Birds of the Indian Subcontinent*. Christopher Helm (Publishers) Ltd., London, U.K.

Rasmussen, P. C. and Anderton, J. C. (in press) *Birds of South Asia: the Ripley guide*. Lynx Edicions, Barcelona.

Stattersfield, A. J., Crosby, M. J., Long, A. J. and Wege, D. C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, U.K.

MH-02

BURNT ISLAND (VENGURLA ROCKS)

IBA Site code	:	IN-MH-02
State	:	Maharashtra
District	:	Sindhudurg
Coordinates	:	15° 55' 09" N, 73° 30' 20" E
Ownership	:	State
Area	:	Not available
Altitude	:	25 - 45 m
Rainfall	:	Not available
Temperature	:	Not available
Biogeographic Zone	:	Island
Habitat	:	Tropical Secondary Scrub

IBA CRITERIA: A3(Biome-10: Indian Peninsula Tropical Moist Forest); A4iii (≥20,000 waterbirds or 10,000 pairs seabirds)
PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Burnt Island, among the Vengurla Rocks in the Arabian Sea, in Sindhudurg district, is an archipelago *c.* 14 km west to northwest of Vengurla Port. The archipelago comprises about 20 islets in an area about 5 km from north to south and 1.6 km from east to west. Detailed study on the flora and fauna has not been done.

The rocks at Vengurla are quite bare, but the crevices are covered with grasses and shrubs. The main grass is *Cymbopogon*, with scattered *Celosia argentea* and *Mollugo sperbula*. They provide shelter for chicks and fledglings of terns and other species.

AVIFAUNA

A. O. Hume visited this island to collect some information on the fauna (Hume 1876). He mentioned about the sea birds and swiftlets.

In 1938, Abdulali (1940) visited this area and recorded that the Vengurla Rocks Archipelago is a nesting site for marine birds, terns, pigeons and swiftlets. Pande (2002a) observed over 18,000 Indian Edible-nest Swiftlets or Indian Swiftlet *Collocalia unicolor* at Burnt Island during his survey. The site therefore qualifies as an IBA in the congregation criteria A4iii. Pande (2002b) recorded 8 species of terns namely, Common Tern *Sterna hirundo*, Roseate Tern *S. dougallii*, White-cheeked Tern *S. repressa*, Bridled Tern *S. anaethetus*, Sooty Tern *S. fuscata*, Large Crested Tern *S. bergii*, Lesser crested Tern *S. bengalensis* and Indian River Tern *S. aurantia*. In addition, Ruddy Turnstone *Arenaria interpres*, Common Sandpiper *Actitis hypoleucos*, Indian Reef Heron *Egretta gularis*, and White-bellied Sea Eagle *Haliaeetus leucogaster* were also recorded.

Pande (2002b) saw a flock of 22 Pomarine Jaegar *Stercorarius pomarinus* flying southward. In the Indian seas, this is a rare visitor (Grimmett *et al*. 1999) in India.

Biome-10: Indian Peninsula Tropical Moist Forest	
Indian Edible- nest Swiftlet	*Collocalia unicolor*
Congregatory species	
Large Crested Tern	*Sterna bergii*
Roseate Tern White-cheeked	*Sterna dougallii*
Tern	*Sterna repressa*
Bridled Tern	*Sterna anaethetus*
Sooty Tern	*Sterna fuscata*

OTHER KEY FAUNA

The carapace of Olive Ridley Turtle *Lepidochelys olivacea* was collected from here, suggesting occurrence of this species in the proximity of the island. Dolphins were also seen in nearby waters. A small unidentified bat species was also observed in the cave where the swiftlets were found (Pande 2002b).

LAND USE

Not Known

THREATS AND CONSERVATION ISSUES

- Removal of nests of the Indian Edible-nest Swiftlet
- Lack of infrastructure to protect the island
- Collection of eggs

The nests of the swiftlets are believed to have aphrodisiac and medicinal properties in East Asian countries and are prey to poachers. Burnt Island was one of two localities that supplied these nests (Ali and Ripley 1987). Pande (2002a, b) has reported large scale poaching of nests and recommended that the area be put under some form of protection.

KEY CONTRIBUTORS

Satish Pande and Vishwas Katdare

KEY REFERENCES

Ali, S. and Ripley, S. D. (1987) *Compact Handbook of the Birds of India and Pakistan* (Second Edition). Oxford University Press, Delhi.

Abdulali, H., (1940) Swifts and Terns at Vengurla Rocks. *J. Bombay Nat. Hist. Soc.* 41: 661-665.

Grimmett, R., Inskipp, C. and Inskipp, T. (1999) *Birds of the Indian Subcontinent.* Christopher Helm (Publishers) Ltd., London, U.K.

Hume, A. O. (1876) Laccadives and the West Coast. *Stray Feathers* 4 (4,5,6): 413-483.

Pande, S, A. (2002a) Conservation of Habitat and Documentation of the nesting status of Indian Edible- nest Swiftlets and Marine Terns of the Vengurla Rocks. Bombay Natural History Society.

Pande, S. A. (2002b) A Rocky Adventure at Vengurla Islands. *Hornbill* April-June, Pp. 22-24.

MH-03

GANGAPUR DAM AND GRASSLANDS

IBA Site Code	:	IN-MH-03
State	:	Maharashtra
District	:	Nashik
Coordinates	:	20° 03' 00" N, 73° 40' 60" E
Ownership	:	Irrigation (State), Private
Area	:	4, 000 ha
Altitude	:	600 m
Rainfall	:	1,500 - 2,000mm
Temperature	:	4 °C to 42 °C
Biogeographic Zone	:	Deccan Peninsula
Habitats	:	Freshwater Reservoir, Tropical Grassland

IBA CRITERIA: A1 (Threatened Species), A4i (≥1% biogeographic population) A4iii (≥20, 000 waterbirds)
PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Gangapur Dam is situated 16 km from Nashik city. It was constructed in 1956-57 to supply drinking water to Nashik. The area around the reservoir is undulating grassland with patches of agricultural fields.

Not much is known about the aquatic vegetation. The dominant grasses are *Heteropogon contortus*, *Dicanthuim annulatum* and *Cymbopogon martinii*.

AVIFAUNA

Gangapur Dam is a large freshwater body surrounded by grasslands, where large congregations of birds, sometime over 20,000 are seen during winter (October-March). A total of 210 bird species have been recorded, of which six are listed as threatened (BirdLife International 2001).

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Long-billed Vulture	*Gyps indicus*
Endangered	
Lesser Florican	*Sypheotides indica*
Vulnerable	
Lesser White-fronted Goose	*Anser erythropus*
Eastern Imperial Eagle	*Aquila heliaca*
Lesser Kestrel	*Falco naumanni*

According to B. Raha (*pers. comm.* 2003), the most common duck is the Common Pochard *Aythya ferina*. Sometimes, more than 10,000 are seen. According to Wetlands International (2002), this is about 1% biogeographic population that winters in South Asia. Blue-winged Teal *Anas querquedula*, Northern Pintail *Anas acuta*, Gadwall *Anas strepera* and Northern Shoveller *Anas clypeata* are also seen in hundreds. Some times, more than 2,000 Little Cormorant *Phalacrocorax niger* and Median Cormorant *P. fuscicollis* are found fishing. The 1% population threshold of Little Cormorant is 1,500 (Wetlands International 2002).

The site falls in Biome-11 (Indo-Malayan Tropical Dry Zone). BirdLife International (undated) has listed 59 species in this biome. In this site, 16 of these species have been recorded.

The most interesting sighting is of the globally threatened Lesser Florican *Sypheotides indica* in the Gangapur grasslands. This rare species has been seen breeding in the nearby grasslands of the defence establishment (Raha and Prakash 2001).

OTHER KEY FAUNA

Detailed studies of mammals and other animals have not been done. The Striped Hyena *Hyaena hyaena* and Golden Jackal *Canis aureus* are seen occasionally.

LAND USE

- Agriculture
- Irrigation project

THREATS AND CONSERVATION ISSUES

- Poaching
- Overgrazing in grassland

Earlier, poaching of waterfowl and grassland birds was common, but as a result of conservation initiatives under taken by the Nature Conservation Society these have been reduced to some extent.

The Nature Conservation Society has launched a campaign in this area to conserve the wetland and grassland birds. Forty-two hamlets and several villages around Gangapur Dam were covered.

The BNHS and the Nature Conservation Society have jointly conducted a bird banding programme here, which has helped create interest in bird conservation.

KEY CONTRIBUTORS

B. Raha and N. Bhure

KEY REFERENCES

BirdLife International (2001) *Threatened Birds of Asia: The BirdLife International Red Data Book*. BirdLife International, Cambridge, U.K.

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, U.K., unpublished.

Raha, B. and Prakash, V. (2001) Occurrence of Lesser Florican *Sypheotides indica* at Hosur, in Nashik district, Maharashtra. *J. Bombay Nat. Hist. Soc.* 98(2): 279.

Wetlands International (2002) *Waterbird Population Estimates: Third Edition*. Wetlands International Global Series No. 12. Wageningen, The Netherlands.

MH-04

INS SHIVAJI AND ADJOINING AREAS, LONAVLA

IBA Site Code	:	IN-MH-04
State	:	Maharastra
District	:	Pune, Raigad
Coordinates	:	18° 46' 10" N, 73° 24' 46" E
Ownership	:	Militar, State, Tata Hydroelectric Co.
Area	:	*c.* 1,000 ha
Altitude	:	100 - 1,100 m
Rainfall	:	4,000 - 5,000 mm
Temperature	:	12 °C to 34 °C
Biogeographic Zone	:	Western Ghats
Habitats	:	Semi Evergreen Forest, and Moist deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)
PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

INS Shivaji, established in 1945, is a premier training base of the Indian Navy located about 6 km west of Lonavla town, a popular tourist resort in the Sahyadri Hills. Lonavala (650 m) is situated *c.* 120 km from Mumbai on the main road and rail link with Pune. The presence of this defence establishment, spread over 1,500 acres, has served to protect some valuable original tropical moist/semi-evergreen forest and upland grassland habitats of the area against growing urbanisation and development. Inaccessible valleys to the west of Lonavla still hold good expanses of the original moist tropical and semi-evergreen forest. The surrounding hills provide very good upland grassland habitats during the post monsoon months. The area beyond Khandala towards Duke's Nose hill and extending towards the Tiger's Leap ravine along the top of the ridges, and up to 2 km on either side of the ridges is proposed as an IBA.

The area is typical of the Western Ghats, with evergreen and moist deciduous type vegetation and high diversity of plant species. The carnivorous plant *Utricularia* sp. is common in small springs, which play an important role in ecology and nitrogen cycle. Karvi *Carvia callosa* is a dominant plant species on the hill slopes. Other tree species Kumbha *Careya arborea*, Anjani *Memecylon umbellatum*, Nirgudi *Vitex nigundo* and Ranperu *Randia dumetorum* are commonly found here.

INS Shivaji and adjoining areas lie in the Western Ghats where endemic Nilgiri Wood-Pigeon is reported.

Photo: Clement Francis M.

Some medicinal plants such as Dhyati *Woodfordia fruticosa*, Ashwagandha *Withania somnifera* and Jungli Kanda *Vernonia cinerea* are also found here.

AVIFAUNA

The birds of INS Shivaji and its adjoining areas were studied from September 11 to November 10, 2002, and during a short visit earlier between March, 12 to 14, 2002. A total of 225 species were recorded during this period. The steep cliff facing towards the west of INS Shivaji has a sizeable nesting population of the Long-billed Vulture, *Gyps indicus*, a Critically Endangered species. Flocks up to 20 birds were regularly seen. Two juvenile birds were seen on cliff ledges on many occasions in September 2002, indicating successful breeding. One pair of Peregrine Falcon *Falco peregrinus* and three pairs of Common Kestrel *Falco tinnunculus* also inhabit these cliffs.

The sighting of the Nilgiri Pipit *Anthus nilghiriensis* on the hill slopes (*c.* 900-1,000 m), overgrown with post-monsoon coarse grass, is particularly interesting, and possibly the first confirmed record so far north of its range in the southern Western Ghats (Per Alstrom *pers. comm*. 2002). Eight out of 16 restricted range species of the Western Ghats Endemic Bird Area (EBA 123) and six out of 15 Biome-10 species are found in this IBA site. Tytler's Leaf-warbler *Rhylloscopus tytleri* is also recorded from this area (K. B. Singh, *pers. comm*. 2003).

During the study period, a male Red Junglefowl (*Gallus gallus*) was also seen on two occasions, indicating the presence of a small isolated population, hundreds of kilometres from the limit of its main geographical range. Possibly, they were introduced or are escaped birds. Ali and Ripley (1987) mentioned that Charles McCann had seen them in the outliers of Western Ghats near Bombay. The Red Junglefowl has also been reported from Khandala, which is near Lonavala. Grimmett *et al*. (1998) have shown this area in the distribution map of Red Junglefowl. The Grey Jungle Fowl (*Gallus sonneratii*) is particularly common here. Also interesting was the sighting of the Rusty-rumped Warbler (*Locustella certhiola*) on two occasions, perhaps the first record of the species from Maharashtra. This is a winter visitor mainly to West Bengal, Assam, Bangldesh, and there are some records in central India (Ali and Ripley 1987).

Near Threatened species such as the Painted Stork *Mycteria*

leucocephala, Black-headed Ibis *Threskiornis melanocephalus*, Darter *Anhinga melanogaster*, Pallid Harrier *Circus macrourus* and Red-necked Falcon *Falco chicquera* are regulars in the water bodies and cultivation.

The site lies in Biome-10 and is represented by the bird species of Indian Peninsula Tropical Moist Forest. However, many species of other biomes are also found here. For example, Tickell's Thrush *Turdus unicolor* and Blue-headed Rock-Thrush *Monticola cinclorhynchus* of the Sino-Himalayan Subtropical Forest and Tickell's Warbler *Phylloscopus affinis* of the Eurasian High Montane winter here. Over 30 species of Indo-Malayan Tropical Dry Zone (Biome-11) commonly seen here further add to the richness of the avifauna.

Critically Endangered	
Long-billed Vulture	*Gyps indicus*

Vulnerable	
Nilgiri Wood-Pigeon	*Columba elphinstonii*
Broad-tailed Grass-Warbler	*Schoenicola platyura*

Endemic Bird Area 123: Western Ghats	
Nilgiri Wood-Pigeon	*Columba elphinstonii*
Blue-winged Parakeet	*Psittacula columboides*
Malabar Grey Hornbill	*Ocyceros griseus*
Nilgiri Pipit	*Anthus nilghiriensis*
Indian Rufous Babbler	*Turdoides subrufus*
Broad-tailed Grass-Warbler	*Schoenicola platyura*
White-bellied Blue-Flycatcher	*Cyornis pallipes*
Small Sunbird	*Nectarinia minima*

Biome-10: Indian Peninsula Tropical Moist Forest	
Malabar Pied Hornbill	*Anthracoceros coronatus*
White-cheeked Barbet	*Megalaima viridis*
Yellow-browed Bulbul	*Iole indica*
Malabar Whistling-Thrush	*Myiophonus horsfieldii*
Indian Scimitar-Babbler	*Pomatorhinus horsfieldii*
Loten's Sunbird	*Nectarinia lotenia*

OTHER KEY FAUNA

Leopard *Panthera pardus* is the major predator, still found in this area and surrounding jungles. Its main natural prey is the Bonnet Macaque *Macaca radiata*, but it also subsists on cattle and stray dogs.

Among the reptiles, Uropeltid snakes are common. This site has many endangered amphibian species such as the Bombay Bush Frog *Philautus bombayensis* and Humayun's Wrinkled Frog *Nyctibatrachus humayuni*. *Indotyphlus battersbyi*, an endangered and endemic caecilian, inhabits the area (Varad Giri *pers. comm.*).

LAND USE

- Defense establishment
- Reserve Forest
- Roads and railway lines
- Generation of hydro-electricity

THREATS AND CONSERVATION ISSUES

- Deforestation
- Roads and railways
- Land development

The richness and diversity of this area has been preserved to a large extent due to the strategic presence of a defence establishment, which has served as a bulwark to protect the habitat against the immense pressures of urbanization, tourism and development. The Mumbai-Pune corridor is on fast track to development. Severe pressures will therefore continue to play havoc with the original pristine habitats unless conservation measures are initiated at the earliest.

KEY CONTRIBUTOR

Lt. Commd. Kanwar Bir Singh

KEY REFERENCES

Ali, S. and Ripley, S. D. (1987) *Compact Handbook of the Birds of India and Pakistan* (Second Edition). Oxford University Press, Delhi.

Grimmet, R., Inskipp, C. and Inskipp, T. (1998) *Pocket Guide to the Birds of the Indian Subcontinent*. Oxford University Press, New Delhi.

MH-05

JAIKWADI BIRD SANCTUARY

IBA Site Code	:	IN-MH-05
State	:	Maharashtra
District	:	Ahmednagar and Aurangabad
Coordinates	:	19° 29' 43" N, 75° 17' 37" E
Ownership	:	State
Area	:	34,105 ha
Altitude	:	465 m
Rainfall	:	600 mm
Temperature	:	15 °C to 40 °C
Biogeographic Zone	:	Deccan Peninsula
Habitat	:	Freshwater Reservoir

IBA CRITERIA: A1 (Threatened Species), A4i (≥1% biogeographic population), A4iii (≥20,000 waterbirds), A4iv (the site is known or thought to exceed thresholds set for migratory species)
PROTECTION STATUS: Wildlife Sanctuary, , established in 1986

GENERAL DESCRIPTION

The Jaikwadi Sanctuary is a man-made reservoir that was created after the construction of a dam in 1975 on the upper reaches of River Godavari. In the absence of natural depressions and hilly terrain, this dam has been constructed on almost flat land, because of which the impounded water spread is large, approximately 55 km long and 27 km wide. This shallow waterspread, with a receding water line is very attractive to a large number of waterfowl and waders. Taking into consideration its importance to waterfowl, the Government of Maharashtra declared this wetland as Jaikwadi Bird Sanctuary in 1986. The entire area of the reservoir was acquired from 118 villages. The waterbody of Jaikwadi dam has been named as “Nathsagar” after the great saint Eknath (Kamble 2000). The Jaikwadi Dam is near the sacred town Paithan.

The Sanctuary lies in Ahmednagar and Aurangabad districts. The total area of 34,100 ha, 33,974 ha are under the control of the Irrigation Department.

The aquatic vegetation includes mainly the species of *Chara*, *Spirogyra*, *Hydrilla*, *Potamogeton* and *Vallisneria*. *Argemone mexicana* and *Ipomoea fistulosa* are found in the surrounding area. Nearby areas are irrigated agricultural fields. The newly created reservoir has changed ecological conditions from semi-arid to rich cultivated fields.

Jaikwadi is known for huge congregations of water and terrestrial birds. The Critically Endangered Oriental White-backed Vulture is also seen here.

Photo: Tim Loseby/BirdLife International

AVIFAUNA

The Forest Department has recorded 264 species of birds in Jaikwadi (Yardi 2000). Over 10,000 Demoiselle Cranes *Grus virgo* and a congregation of over 50,000 birds were seen here during an IBA survey in 2000. This includes many species occurring in much larger numbers than their 1% biogeographic population thresholds, as determined by Wetlands International (2002). The site also has many Near Threatened species.

The site is an important stopover in the migratory flyway of cranes and other birds, which congregate here during their return migration, so it satisfies the A4iv criteria. Thirty-eight species of congregatory waterfowl have been reported in the Forest Department checklist. The site qualifies the congregatory criteria A4i, A4iii and A4iv.

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Vulnerable	
Lesser Kestrel	*Falco naumanni*
Near Threatened	
Darter	*Anhinga melanogaster*
Painted Stork	*Mycteria leucocephala*
Oriental White Ibis	*Threskiornis melanocephalus*
Lesser Flamingo	*Phoenicopterus minor*
Ferruginous Pochard	*Aythya nyroca*
Pallid Harrier	*Circus macrourus*

OTHER KEY FAUNA

There are not many large mammals as the area is under intensive agriculture and human occupation. Occasionally, Blackbuck *Antilope cervicapra* are observed here (Kamble 2000). Golden Jackal *Canis aureus*, Indian Fox *Vulpes bengalensis* and Black-naped Hare *Lepus nigricollis* are commonly seen.

LAND USE

- Agriculture
- Fishing

Photo: Dinesh Pagaria

THREATS AND CONSERVATION ISSUES

- Livestock grazing
- Agricultural intensification and expansion
- Fisheries
- Industrialization
- Urbanisation
- Pollution

Fishing is the biggest problem as far as the Sanctuary is considered. At present, there are 27 fishing cooperatives with 5,000 registered members in Nathsagar. Fishing is the main source of livelihood of the communities that live around the wetland. Before the construction of the dam, the local villagers did not know much about fishing. However, many outsiders have settled here now who, along with local people, are mainly occupied in fishing.

Poaching of waterfowl by the local *Pardhi*, *Bhil* and *Kahar* communities is not uncommon, although it has been brought under control.

Agriculture is practiced all around the reservoir. As soon as the water starts receding, farmers till the wet soil and sow seeds. This agriculture is locally known as *Galapara*. Farmers use potent pesticides that ultimately contaminate the water. At present there are 61 villages on either side of the reservoir. Land is rented out for agriculture by the Irrigation Department.

Grazing is another major problem as livestock does not leave any area undisturbed for bird species to nest.

The greatest threat to wildlife and to agriculturists is the pollution from industries and sugar mills that discharge effluents into the reservoir. Sewage from Aurangabad, Paithan, Maharashtra Industrial Development Cooperation, and 61 villages is discharged into the Nathsagar reservoir.

KEY CONTRIBUTORS

B. Raha and N. Bhure

KEY REFERENCES

Kamble, P. B. (2000) Executive Summary of the Draft Management plan for the Jaikwadi Bird Sanctuary, Forest Department, Government of Maharashtra, Paithan.

Wetlands International (2002) *Waterbirds Population Estimates: Third Edition.* Wetlands International Global Series No. 12. Wageningen, The Netherlands.

Yardi, D. (2000) Birds Checklist. Aurangabad Wildlife Circle, Aurangabad.

MH-06

JAWAHARLAL NEHRU BUSTARD SANCTUARY (NANNAJ AND OTHER GRASSLAND PLOTS)

IBA Site	:	IN-MH-06
State	:	Maharashtra
District	:	Solapur, Ahmednagar
Coordinates	:	18° 21' 00" N, 75° 11' 38" E
Ownership	:	State
Area	:	849,644 ha
Altitude	:	Not available
Rainfall	:	724 mm
Temperature	:	13 °C to 42 °C
Biogeographic Zone	:	Deccan Peninsula
Habitat	:	Tropical Grassland

IBA CRITERIA: A1 (Threatened Species)
PROTECTION STATUS: Wildlife Sanctuary, established in 1979

GENERAL DESCRIPTION

The Jawaharlal Nehru Bustard Sanctuary is situated in Solapur and Ahmednagar districts, covering a huge area of 849,644 ha. Most of the Sanctuary is under cultivation and human habitation, thus it is not suitable for the Great Indian Bustard *Ardeotis nigriceps*. Within this Sanctuary, the grassland plots where the Great Indian Bustard is regularly seen are identified as IBAs (For details about the Jawaharlal Nehru Bustard Sanctuary, see Rahmani 1989, Bharucha 1996).

From 1980, Nannaj and Karmala were selected for special conservation measures by the Forest Department for the protection of the Great Indian Bustard. While bustard has almost become extinct in Karmala due to mismanagement of the habitat, it is still surviving in Nannaj, where it is being monitored for the last 23 years by BNHS and the Forest Department. This IBA site description mainly deals with Nannaj area.

Nannaj is a small village 20 km north of Solapur on Solapur-Barshi road. The terrain is generally undulating, characteristic of the Deccan plateau. Rainfall is erratic and poorly distributed, with fluctuations over the years. The area around Nannaj can be broadly divided into plantation and grassland plots of Drought Prone Areas Programme (DPAP) and District Rural Development Authority (DRDA), unprotected grazing land and crop fields.

Important grasslands where the Great Indian Bustard is or was seen are: Nannaj plots, Mardi grazing land and grassland, Akolekati plantation and grassland, Vadala grazing land, Gangewadi plantation, Mohol grazing land and grassland, and Gangewadi grazing land.

The natural vegetation of the sanctuary can be classified as Southern Tropical Thorn Forest (Champion and Seth 1968) and Tropical Grassland. However, the natural vegetation has more or less disappeared, and in the non-agricultural areas, scrub and grasslands are seen. Grasses such as *Sehima nervosum*, *Eremopogon foveolatus* and *Cymbopogon martinii* dominate the land (Rahmani 1989).

Sometimes upto 30 Great Indian Bustard *Ardeotis nigriceps* could be seen in Nannaj.

Photo: Raja Purohit

AVIFAUNA

Nannaj is one of the critical sites where the Endangered Great Indian Bustard is surviving (Rahmani 1989, 1993 and unpublished). During the monsoon of 2003, six male and 17 female bustards were seen. In 2002-2003, 7 juveniles were seen, indicating successful breeding (B. Habib *pers. comm.* 2003).

Historically the Great Indian Bustard occupied a large range in the Indian subcontinent, mostly from dry areas. Once thought “abundant” throughout its range, currently the population of this species is considered “very rare and apparently decreasing”. The bustard locally called *Maldhok* in Maharashtra, was earlier seen mainly during the monsoon in the grassland plots of Nannaj and other areas (Rahmani and Manakadan 1986) but during the last 10 years, they are seen throughout the year, although more birds are found during monsoon. They breed in the grassland plots of the Sanctuary and the adjoining areas.

Apart from the Great Indian Bustard, about 134 bird species have been recorded in this Sanctuary, including the Painted Stork *Mycteria leucocephala*, White-necked Stork *Ciconia episcopus*, Black-winged Kite *Elanus caeruleus*, Long-legged Buzzard *Buteo rufinus*, White-eyed Buzzard *Butastur teesa*, Scavenger Vulture *Neophron percnopterus*, Black-headed or White Ibis *Threskiornis melanocephala*, Eurasian Spoonbill *Platalea leucorodia* Greater

Flamingo *Phoenicopterus ruber,* Ruddy Shelduck *Tadorna ferruginea,* Northern Pintail *Anas acuta,* Common Teal *Anas crecca,* Spotbilled Duck *Anas poecilorhyncha,* Gadwall *Anas strepera,* and Great Horned Owl *Bubo bubo.* There are occasional records of the Lesser Florican *Sypheotides indica* also.

This IBA is also an important breeding ground for grassland species such as Indian Courser *Cursorius coromandelicus*, Yellow-wattled Lapwing *Vanellus malabaricus*, Chestnut bellied Sandgrouse *Pterocles exustus*, Indian Bushlark *Mirafra erythroptera,* Sykes's Crested Lark *Galerida deva* and Ashy-crowned Finch-lark or Sparrow-lark *Eremopterix grisea.* In the monsoon, Rain Quail or Black-breasted Quail *Coturnix coromandelica*, and Rock Bush Quail *Perdicula argoondah* breed in large numbers. Nannaj grasslands are also wintering site for 25-35 harriers, mainly the Montagu's *Circus pygargus* and Pallid or Pale *C. macrourus*. Red-headed Falcon *Falco chicquera* is regularly found hunting small birds, especially during the monsoon.

Endangered	
Great Indian Bustard	*Ardeotis nigriceps*
Lesser Florican	*Sypheotides indica*

OTHER KEY FAUNA

Besides the Great Indian Bustard, Nannaj has a resident pack of Indian or Grey Wolf *Canis lupus* (Kumar and Rahmani 1997). Occasionally, up to 12 wolves, including juveniles, are seen. Their main natural prey is the Blackbuck *Antilope cervicapra,* but there are instances when bustards were killed by them. Indian Fox *Vulpes bengalensis* and Golden Jackal *Canis aureus* are the other two predators. Both are dangerous to bustard eggs and unfledged chicks. Chinkara *Gazelle bennettii* is present in Karmala and other parts of the Sanctuary, but is never seen in Nannaj. Common reptiles of the Deccan are also found here.

LAND USE

- Nature conservation
- Grazing
- Agriculture

THREATS AND CONSERVATION ISSUES

- Overgrazing outside the Grassland Plots of the Forest Department
- Expansion of agriculture
- Irrigation canal
- Poaching
- Destruction of bustard habitats

Many tribal women sell grass in the market.

Photo: Asad R. Rahmani

Thanks to good protection and management by the Forest Department, the Great Indian Bustard is still surviving in Nannaj and its environs, but it has disappeared from many other similar areas where it was commonly seen during the early 1980s, e.g. Mirajgaon, Mahi-Jalgaon, Karmala, Karjat and Deulgaon. This is mainly due to neglect, and failure to prevent overgrazing and other biotic disturbances. Despite being inside the Jawaharlal Nehru Bustard Sanctuary, many good grasslands, which were foraging areas of the bustard, were converted into industrial areas.

Due to the irrigation canals, crop pattern will change with adverse impact on the bustard habitat.

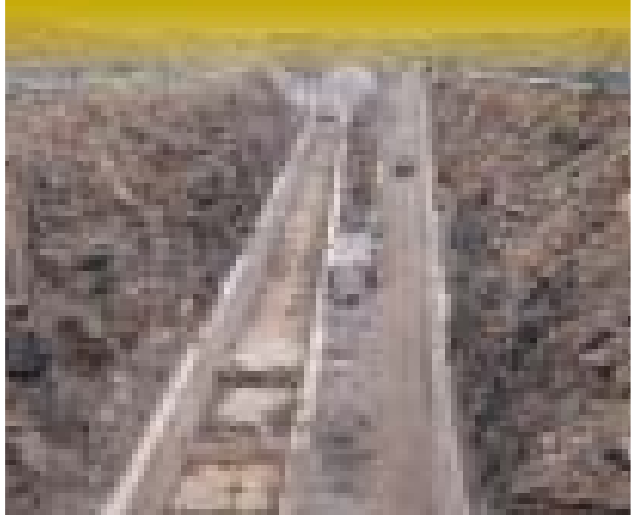


Photo: Asad R. Rahmani

However, the biggest threat which will change the landscape of Nannaj and other areas comes from an irrigation canal, which is being constructed just 3 km from Nannaj. Once this canal is completed, crop and land use pattern may change, directly affecting the bustard and other grassland dependent birds.

The Great Indian Bustard uses a large landscape for foraging, nesting and movement. It is urgently required to study its ranging pattern through satellite tracking, and colour marking to determine its movement and breeding success.

KEY CONTRIBUTORS

A. R. Rahmani and R. Manakadan

KEY REFERENCES

Bharucha, E. K. (1996) Evolving a rational strategy for an integrated protection area system in Maharashtra. *J. Bombay Nat. Hist. Soc*. 93: 513-554.

Kumar, S. and Rahmani, A. R. (1997) Status of Indian Grey Wolf *Canis lupus pallipes* and its conservation in marginal agricultural areas of Solapur district, Maharashtra. *J. Bombay Nat. Hist. Soc.* 94 (3): 466-472.

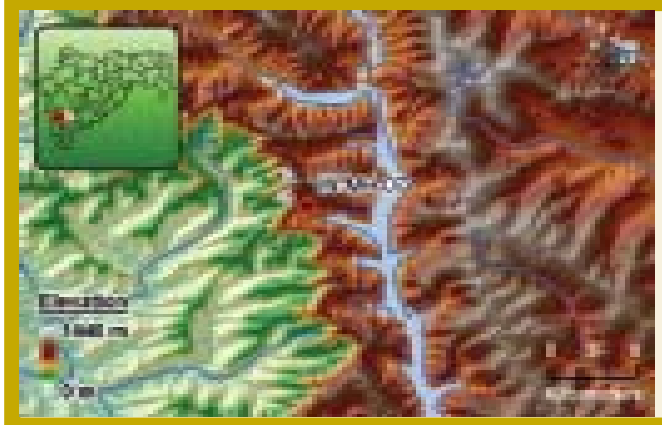
Rahmani, A. R. and Manakadan, R. (1986) Movement and flock composition of the Great Indian Bustard *Ardeotis nigriceps* (Vigors) at Nannaj, Solapur District, Maharashtra, India. *J. Bombay Nat. Hist. Soc.* 83: 17-30.

Rahmani, A. R. (1989) The Great Indian Bustard: Final Report. Bombay Natural History Society, Bombay. Pp. 234.

Rahmani, A. R. (1993) Project Bustard: Last Chance to Save the Great Indian Bustard. In: Bird Conservation- Strategies for the Nineties and Beyond (eds. Verghese, A., Sridhar, S. and Chakravarthy, A. K.). Ornithological Society of India, Bangalore. Pp.73-75.

MH-07

KOYNA WILDLIFE SANCTUARY



IBA Site Code	:	IN-MH-07
State	:	Maharashtra
District	:	Satara
Coordinates	:	17° 38' 26" N, 73° 42' 31" E
Ownership	:	State
Area	:	42,355 ha
Altitude	:	1,800 m
Rainfall	:	2,500-3,000 mm
Temperature	:	6 °C to 37 °C
Biogeographic Zone	:	Western Ghats
Habitats	:	Tropical Dry Evergreen Forest, Tropical Moist Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats)
PROTECTION STATUS: Wildlife Sanctuary, established in 1985

GENERAL DESCRIPTION

Koyna Wildlife Sanctuary is located in the *tehsils* of Jawali and Patan in Satara district, western Maharashtra, covering an area of 42,355 ha and extending westwards till Ratnagiri district. Koyna WLS includes the eastern and western catchments of the Koyna Dam, which is a major hydroelectric project in western Maharashtra, currently generating 2200 MW. The reservoir of the dam is known as Shivasagar. The Sanctuary is well protected to a large extent by the Shivasagar reservoir and steep slopes. The Chandoli corridor connects this Sanctuary to Radhanagari Wildlife Sanctuary in the south.

At the centre of the Sanctuary lies the historical Vasota fort, constructed during 1178-1193, which was taken over by the great Maratha warrior, Chhatrapati Shivaji in 1655 and used as a prison. During the Peshwa regime in 1817 AD, the fort was taken by the British after intense war, which resulted in its destruction. Now only ruins of the fort remain.

The vegetation consists of Southern Tropical Evergreen Forest and Southern Moist Mixed Deciduous Forest, as per the classification of Champion and Seth (1968). The Sanctuary hosts a threatened tree species called Narkya *Mappia foetida*. *Euphorbia longana* and *Elaecoarpus tectorius* are other uncommon species. Giant trees such as *Harpullia arbore* and *Turpunia malabarica*, endemic to the Western Ghats, are commonly found in this IBA.

AVIFAUNA

No systematic study of the avifauna of Koyna WLS has been done, though the area is rich in avifauna and other biodiversity. Recently, BNHS has undertaken an EIA project in the area and till now 61 bird species have been reported from a small part of the Sanctuary.

Indian Blue Robin *Luscinia brunnea*, a Himalayan bird was seen in this IBA site (A. Akhtar *pers. comm*. 2003). This is a Biome-7 (Sino-Himalayan Temperate Forest) species. During winter, it is seen in Sri Lanka, hills of the Northeast and southern Western Ghats (Ali and Ripley 1987, Grimmett *et al*. 1998). This is probably the first record from northern Western Ghats.

This IBA site is one of the undisturbed forests of the Western Ghats Endemic Bird Area. Two restricted range species have been seen, but more research is needed to know the full extent of the avian diversity of this IBA.

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Long-billed Vulture	*Gyps indicus*
Vulnerable	
Nilgiri Wood-Pigeon	*Columba elphinstonii*
Endemic Bird Area 123: Western Ghats	
Malabar Grey Hornbill	*Ocyceros griseus*
Small Sunbird	*Nectarinia minima*

OTHER KEY FAUNA

Mammals found in the Sanctuary are Tiger *Panthera tigris*, Panther *P. pardus*, Gaur *Bos frontalis*, Indian Wild Dog *Cuon alpinus*, Sloth Bear *Melursus ursinus*, Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak*, Mouse Deer *Moschiola meminna*, Indian Giant Squirrel *Ratufa indica*, Common Otter *Lutra lutra* and Common Langur *Semnopithecus entellus*. Reptiles such as the Indian Python *Python molurus*, Beddome's Keelback *Amphiesma beddomii*, Indian Chameleon *Chamaeleon zeylanicus*, Banded Gecko *Geckoella deccanensis*, and Dwarf Gecko *Cnemaspis* sp. are also found.

A unique endemic species of amphibian, the Koyna Toad *Bufo koyanensis* is reported from this Sanctuary which is the type locality of this species. Other endemic amphibians, such as *Indotyphlus*, (a Caecilian), Wrinkled Frog *Nyctibatrachus* sp., and the Bombay Bush Frog *Philautus bombayensis* are also reported (V. Giri *pers. comm*. 2003).

LAND USE

- Nature conservation
- Agriculture
- Hydroelectric project

THREATS AND CONSERVATION ISSUES

- Dam construction
- Hydroelectric project
- Poaching
- Exploitation of medicinal plants

MH-07

Koyna WLS is rich in avifauna and some of the endemic birds are reported from this area.

Photo: Anuj Khare

The major threat comes from the proposed Humbarli Pumped Storage Scheme (400 MW), as about 25 ha of pristine forest will be submerged by it. This IBA is honeycombed with privately-owned forests and patches of agricultural land. At the periphery of the Sanctuary, the area is being actively promoted as a tourism zone by the Government of Maharashtra. This would create serious environmental problems in the form of increased tourist traffic, water pollution, littering of non-degradable waste and general disturbance.

Koyna is a well-known trekking location. Aggressive promotion of tourism in this area would increase the garbage and noise pollution.

The topography of the Sanctuary is conducive to high wind velocity, and therefore likely to be considered for exploitation of non-conventional energy. The windmills that dot the landscape are at present away from the boundary of Sanctuary but are likely to come up inside also.

The area is rich in medicinal plants that are sustainably exploited by the tribal community called *Dunge-dhangar*. However, now, pharmaceutical companies have started increasingly exploiting this limited resource.

KEY CONTRIBUTORS

Girish Jathar, Varad Giri and Asad Akhtar

KEY REFERENCES

Ali, S. and Ripley, S. D. (1987) *Compact Handbook of the Birds of India and Pakistan* (Second Edition). Oxford University Press, Delhi.

Champion, H. G. and Seth, S. K. (1968) *A revised survey of forest types of India.*Govt. of India Press, Delhi.

Grimmett, R., Inskipp C. and Inskipp, T. (1998) *Birds of the Indian Subcontinent,* Christopher Helm Ltd, London.

MH-08

MAHUL - SEWRI MUDFLATS

IBA Site Code	:	IN-MH-08
State	:	Maharashtra
District	:	Mumbai
Coordinates	:	19° 01' 00" N, 72° 52' 60"E
Ownership	:	Mumbai Port Trust, BARC, BPCL
Area (ha)	:	*c.* 10 km stretch
Altitude	:	0 msl
Rainfall	:	2,300 mm
Temperature	:	13 °C to 39 °C
Biogeographic Zone	:	Coasts
Habitats	:	Littoral Forest (Mangroves) Mud flats

IBA CRITERIA: A1 (Threatened Species), A4i (≥1% biogeographic population), A4iii (≥20,000 waterbirds)
PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

The open mudflats of Trombay and Sewri are located along the Arabian Sea. An area *c.* 10 km long and 3 km wide, is dominated by mangroves all along the coast.

The area is prohibited for the general public. The jetty of Mumbai Port Trust (MbPT), Bhabha Atomic Research Centre (BARC), and Tata Electrical are located along the area. There are refineries of Oil and Natural Gas Commission (ONGC), Bharat Petroleum Corporation Limited (BPCL) and Hindustan Petroleum Corporation Limited (HPCL).

Despite the high degree of pollution, the area is a winter refuge for thousands of migratory birds from as far as the Arctic circle. They include sandpipers, plovers, gulls and terns. The area also supports a large congregation of flamingos, which are local migrants probably from Gujarat. Raptors also use the area as a stopover and a few of them winter here, such as the Eurasian Marsh Harrier *Circus aeruginosus* and the Greater Spotted Eagle *Aquila clanga*.

The area is dominated by mangrove vegetation and supports a diverse flora. Fifty-three species of vascular plants have been recorded. Of these 10 species are mangroves and 13 are mangrove-associated species. *Avicennia marina* is a dominant plant species in the area, while *Rhizophora mucronata* and *Excoecaria agallocha* also occur.

AVIFAUNA

Till now about 150 bird species have been identified from this IBA. Along the mudflats in Sewri, 1,500-2,000 Greater Flamingos *Phoenicopterus ruber,* 15,000 Lesser Flamingos *P. minor,* and 7,000 Lesser Sand Plovers *Charadrius mongolus* have been sighted in January 2003. Globally threatened species such as the Spotted Greenshank *Tringa guttifer,* Greater Spotted Eagle, Eastern Imperial Eagle *Aquila heliaca* and Oriental White-backed Vulture *Gyps bengalensis* are seen here. Other bird species include the Little Green Heron *Butorides striatus,* Western Reef Heron *Egretta gularis,* Black-headed or White Ibis *Threskiornis melanocephalus,* Common Redshank *Tringa totanus,* Marsh Sandpiper *T. stagnatilis,* Common Greenshank *T. nebularia,* Curlew Sandpiper *Calidris ferruginea,* Brown-headed Gull *Larus brunnicephalus,* Whiskered Tern *Chlidonias hybridus,* Gull-billed Tern *Gelochelidon nilotica,* Caspian Tern *Sterna caspia,* Little Tern *S. albifrons* and Eurasian Marsh Harrier. Extremely large numbers of stints (*Calidris* spp.), sometimes in flocks of 8 to 10 thousand are seen, even to the end of May. It should be noted that many of these numbers are much above the 1% threshold of biogeographic population determined by Wetlands International (2002).

This site easily fulfils A4i (≥1% of biogeographic population) and A4iii (≥20,000 waterbirds) criteria.

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Long-billed Vulture	*Gyps indicus*
Endangered	
Spotted Greenshank	*Tringa guttifer*
Vulnerable	
Greater Spotted Eagle	*Aquila clanga*
Eastern Imperial Eagle	*Aquila heliaca*
Near Threatened	
Lesser Flamingo	*Phoenicopterus minor*

BNHS and IBCN had organized a Flamingo Watch in Sewri where more than a thousand people gathered.

Photo: Mohit Kalra

Six-lane causeway is planned by the Maharashtra Government from Sewri to Nhava Shiva. This road-bridge will go right through the flamingo habitat.

Photo: M. Zafar-ul Islam

OTHER KEY FAUNA

The only large mammal species recorded in this marshland was a Golden Jackal *Canis aureus* (Verma *et al.* 2002). Other fauna includes eight reptiles, 28 species of butterflies, eight species of gastropods, five species of bivalves, two species of pulmonates and nine species of crustaceans.

LAND USE

- Industrial area
- Saltpans
- Shipyard
- Oil refineries

THREATS AND CONSERVATION ISSUES

- Pollution (chemicals, oil and grease, pesticides)
- Release of untreated sewage into the sea
- Release of dye wastes
- Oil spillage
- Fish mortality, due to hot water discharge into the sea
- Overexploitation of fishery
- Poaching of birds to some extent
- Electrocution of Flamingos
- Fuel wood collection from mangroves

Seepage of industrial effluents into the mangroves and creek is an issue of concern, as untreated waste is causing contamination of the water. Sometimes, ONGC, BPCL and HPCL release their effluents into these mudflats. Rashtriya Chemicals and Fertilizers, situated about 5 km from this creek, also releases its wastes here. Besides this, the sewage of the metropolis is being released here. A dye factory situated closeby also pours its effluents into the area. This ultimately affects the prey base of birds. Local slum dwellers are dependent on the mangroves for fuel wood; rapidly increasing slum colonies are placing a great burden on limited resources of this ecosystem. There are cases of electrocution of the flamingos due to high voltage wires.

BPCL (Bharat petroleum corporation limited) and MbPT (Mumbai Port Trust) are carrying out awareness campaigns and conservation related activities in this area with the help of BNHS.

There is a proposal to build 6 lane cause-way, right through Sewri mud flats. This would have severe impact, at least during the construction period. Attempts should be made to divert this cause-way to avoid the main feeding areas of the flamingos.

KEY CONTRIBUTORS

T. V. Sowrirajan, S. Balachandran, Ashok Verma, I. Kehimkar and Vivek Kulkarni

KEY REFERENCES

Wetlands International (2002) *Waterbird Population Estimates: Third Edition*. Wetlands International Global Series No. 12, Wageningen, The Netherlands.

Verma, A., Kehimkar, I., Balachandran, S., Chaturvedi, N. C., and J. C. Daniel (2002) Habitat enrichment of the salt marshes of Bharat Petroleum at Mahul for birds. Final Report Bombay Natural History Society, Mumbai.

MH-09

MELGHAT TIGER RESERVE

IBA Site Code	:	IN-MH-09
State	:	Maharashtra
District	:	Amravati
Coordinates	:	21° 28' 16" N, 77° 00' 06" E
Ownership	:	State
Area	:	1,15,003 ha
Altitude	:	312 - 1,178 m
Rainfall	:	1,500 - 2,200 m
Temperature	:	6 °C to 45 °C
Biogeographic Zone	:	Deccan Peninsula
Habitats	:	Tropical Dry Deciduous Forest, Tropical Grassland

IBA CRITERIA: A1 (Threatened Species), A2 (Secondary Area s075: Central Indian Forests), A3 (Biome-11: Indo-Malayan Tropical Dry Zone)
PROTECTION STATUS: Wildlife Sanctuary, established in 1985

GENERAL DESCRIPTION

The Melghat Wildlife Sanctuary and Tiger Reserve lies at the northern extreme of Amravati district of Maharashtra on the Madhya Pradesh border. It is situated on a southern offshoot of the Satpura range. The name Melghat means the place where the *ghats* meet. The core area (36,128 ha) is formed by the Gugamal National Park and the buffer area (78,828 ha), by the Melghat Wildlife Sanctuary. These were together re-notified by the state government in 1994 as the Melghat Tiger Reserve. The remaining area (52,693 ha) is managed as a 'multiple use area'. The Variat Devi Point in the Chikaldhara Plateau is at 1,178 m, the highest point in Melghat. The vegetation is mainly Southern Tropical Dry Deciduous Forest. Besides these forests, there are grassy meadows throughout the Reserve, especially on the hilltops. The terrain of the Melghat Tiger Reserve is a rugged portion of the Gavilgarh hills, which are a part of the Satpuras. Topographically it consists of a succession of hills and valleys. The main ridge, called Gavilgarh Ridge, runs east-west on the southern part of the Reserve. It is a flat plateau on top, descending in abrupt and sharp precipitous scarps on both sides and then steep slopes down to narrow valleys. These abrupt variations in altitude, aspect and gradient are seen throughout the Reserve. The Plateau was earlier used for agriculture.

The Reserve is a catchment area for five major streams, all of which are tributaries of the River Tapti.

The forest type is Tropical Dry Deciduous, dominated by Teak *Tectona grandis* and Bamboo. There are patches of Semi-evergreen and Moist Deciduous Forests. The dominant species is Teak (30-70%), which was planted in a large area clear felled for this purpose. There are many species of orchids, ferns, grasses and other herbs. The common epiphytic orchids are *Aerides*, *Rhynchostylis* and *Vanda*. *Ceropegia odorata*, an extremely rare species, is found in this area.

AVIFAUNA

The recently rediscovered Forest Owlet *Heteroglaux blewetti* has been sighted in this IBA. During a BNHS study in 2000 intended to gather information on the status and distribution of the Forest Owlet in India, one bird was sighted (Ishtiaq and Rahmani 2000). Later, K. Rithe and P. M. Lad (*pers. comm*. 2003) have seen 4-5 pairs. In a recent survey in March 2004, 39 individuals of this species were seen in Melghat area (G. Jathar, *per comm.* 2004). After Shahada and Taloda in western Maharashtra (both IBAs), Melghat is the most important site for this Critically Endangered species. Rithe (2003) also identified two Forest Owlets at Raipur, two at Malur, four at Jamodapadao in Melghat and a solitary bird at Mahendri, east of Melghat. He has recorded 10 individuals so far, and estimated a total population of about 50 birds at Melghat and the adjoining forests of Betul and Burhanpur districts in Madhya Pradesh.

Savarkar (1987) has identified 252 species of birds from this IBA site. Important old record is of Fairy Bluebird *Irena puella* and recent records of Great Black Woodpecker *Dryocopus javensis*, Stork-billed Kingfisher *Halcyon capensis* and Black-capped Kingfisher *H. pileata* (Rithe 2003).

Kasambe (2002) added four more species to the Melghat bird list: Little Green Heron *Butorides striatus*, Black-crowned Night Heron *Nycticorax nycticorax*, Sparrow-Hawk *Accipiter nisus* and Crested Bunting *Melophus lathami*.

Melghat is one of the best areas to see species of the Indo-Malayan Tropical Dry Zone (Biome-11). Out of the 59 species identified by BirdLife International (undated), 44 have been seen here till now.

Melghat Tiger Reserves is one of the few sites in India that come under the Secondary Area category of BirdLife International (undated) and Stattersfield *et al.* (1998). Secondary area is an area which supports one or more restricted range species, but does not qualify as an Endemic Bird Area because fewer that two species are entirely confined to it.

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Forest Owlet	*Heteroglaux blewitti*
Vulnerable	
Lesser Kestrel	*Falco naumanni*
Green Munia	*Amandava formosa*
Secondary Area s075: Central Indian Forests	
Forest Owlet	*Heteroglaux blewitti*

Biome-11: Indo-Malayan Tropical Dry Zone	
Black Ibis	*Pseudibis papillosa*
White-eye Buzzard	*Butastur teesa*
Painted Francolin	*Francolinus pictus*
Rain Quail	*Coturnix coromandelica*
Jungle Bush- Quail	*Perdicula asiatica*
Indian Peafowl	*Pavo cristatus*
Yellow-wattled Lapwing	*Vanellus malabaricus*
Indian Courser	*Cursorius coromandelicus*
Yellow-footed Green-Pigeon	*Treron phoenicoptera*
Plum-headed Parakeet	*Psittacula cyanocephala*
Common Indian Nightjar	*Caprimulgus asiaticus*
Indian Grey Hornbill	*Ocyceros birostris*
Yellow-fronted Pied Woodpecker	*Dendrocopos mahrattensis*
Lesser Golden-backed Woodpecker	*Dinopium benghalensis*
Black-shouldered Woodpecker	*Chrysocolaptes festivus*
Ashy-crowned Sparrow-Lark	*Eremopterix grisea*
Black-headed Cuckoo-Shrike	*Coracina melanoptera*
Small Minivet	*Pericrocotus cinnamomeus*
Common Woodshrike	*Tephrodornis pondicerianus*
Indian Robin	*Saxicoloides fulicata*
Jungle Babbler	*Turdoides striatus*
Jungle Prinia	*Prinia sylvatica*
Ashy Prinia	*Prinia socialis*
White-browed Fantail-Flycatcher	*Rhipidura aureola*
Green Munia	*Amandava formosa*
Grey-headed Starling	*Sturnus malabaricus*
Brahminy Starling	*Sturnus pagodarum*
White-bellied Drongo	*Dicrurus caerulescens*

OTHER KEY FAUNA

Almost all the large and small mammals of central India are found in Melghat, from the Tiger *Panthera tigris*, Leopard *Panthera pardus*, Gaur *Bos frontalis*, Sambar *Cervus unicolor*, Chital *Axis axis*, Barking Deer *Muntiacus muntjak*, Wild Boar *Sus scrofa*, Sloth Bear *Melursus ursinus* and Four-horned Antelope *Tetracerus quadricornis*, Indian Giant Squirrel *Ratufa indica*, Common Langur *Semnopithecus entellus* and Bonnet Macaque *Macaca radiata*.

The Caracal *Felis caracal* is also reported here, along with many other smaller cats. The faunal diversity includes 30 species of reptiles, 74 of butterflies, 23 of fish, 5 species of amphibians and 26 species of spiders.

LAND USE

- Nature conservation and research
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Invasion of exotic species
- Agricultural intensification and expansion
- Firewood collection
- Grazing
- Shifting cultivation
- Unsustainable exploitation

There are about 58 villages, with a population of over 24,335 people inside the Sanctuary, most of them being labourers who were brought into the area for timber harvesting and stayed on. Relocation and settlement of rights are planned for 29 villages and have already begun in three villages. The village have been relocated to areas outside the Sanctuary. The Forest Department has initiated eco-development schemes on the fringes of the Sanctuary. Although there are plans to relocate all the villages, the whole exercise is extremely expensive, so the State Government and Forest Department are planning to realign the boundaries of the National Park.

More than 20,000 heads of cattle roam in the Sanctuary, as a result of which the Sanctuary has been depleted of almost all undergrowth. Two state highways pass through the Reserve. *Lantana camara* and *Hyptis suaveolens* have spread to occupy almost 30% and 20% of the Reserve respectively.

Beside highway and pumped water storage in Melghat, cultivation on the fringes is increasing.

Photo: Asad R. Rahmani

Two projects are a cause of serious concern for the future of Melghat Tiger Reserve: the first is a highway being built through the Reserve; the second a pumped water storage scheme in the adjacent area.

Chikaldhara Pumped Storage Project: This proposed project is on the boundary of the tiger reserve and 100 ha of forest is going to be submerged under water. The area has prime deciduous forest and is frequented by tigers and leopards.

Denotification plan: In 1994, 500 sq. km. of Melghat Wildlife Sanctuary was denotified, and this drastically reduced the level of protection afforded to this area. Consequently, several illegal activities began in the denotified area. Incidents of encroachment, illegal timber traffic, poaching and mining have increased sharply.

KEY CONTRIBUTORS

Kishore Rithe, Deepak Apte, Dilip Yardi, S. Jhunjhunwala, B. Raha and N. B. Bhure

KEY REFERENCES

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, U.K., unpublished.

Ishtiaq, F. and A. R. Rahmani (2000) Further information on status and distribution of Forest Owlet *(Athene blewitti)*. *Forktail* 16: 125-130.

Kasambe, R. M. (2002) Additions to the birds of Melghat Tiger Reserve, Maharashtra. *Zoo's Print Journal* 18(3): 1050.

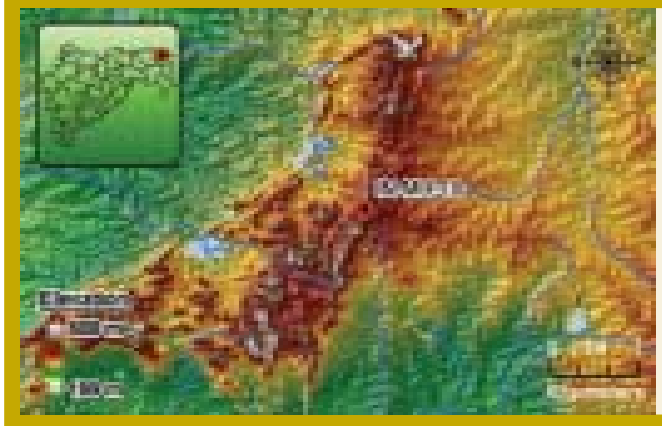
Rithe, K. (2003) Saving the Forest Owlet *Sanctuary Asia* 23 (1):30-33.

Savarkar, V. B. (1987) Bird Survey of the Melghat Tiger Reserve. *Cheetal* 29: 4-27.

Stattersfield, A. J., Crosby, M. J., Long, A. J. and Wege, D. C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, U.K.

MH-10

NAGZIRA WILDLIFE SANCTUARY



IBA Site Code	:	IN-MH-10
State	:	Maharashtra
District	:	Bhandara
Coordinates	:	21° 18' 46" N, 80° 04' 03" E
Ownership	:	State
Area	:	15,281 ha
Altitude	:	Not available
Rainfall	:	1,500 mm
Temperature	:	6 °C to 45 °C
Biogeographic Zone	:	Deccan Peninsula
Habitats	:	Tropical Dry Deciduous Forest, Riverine Forest, Tropical Grassland

IBA CRITERIA: A1 (Threatened Species), A3 (Biome-11: Indo-Malayan Tropical Dry Zone)
PROTECTION STATUS: Wildlife Sanctuary, established in1970

GENERAL DESCRIPTION

The Nagzira Wildlife Sanctuary lies in the Tirora Range of Bhandara Forest Division in Bhandara district. The Sanctuary is considered as an oasis in the easternmost part of Maharashtra, the Vidarbha region. The Sanctuary is an important connecting link for the movement of tigers between Pench Tiger Reserve (Maharashtra) and Indravati Tiger Reserve (Chhattisgarh).

The forests have the advantage of two perennial tanks, one in Nagzira and the other in Thadezari. These two tanks guarantee a source of water to wildlife throughout the year. The Sanctuary has the rare distinction of allowing no grazing rights and no forest exploitation since its inception in 1970. The habitat in the Sanctuary varies from dense mixed forests, bamboo brakes, and grasslands interspersed with fruit and fodder trees, caves, valleys, aquatic and riparian habitats, along with seasonal streams. There are no villages inside the Sanctuary.

Nagzira harbours diverse vegetation ranging from Dry, Mixed Forests to Moist Forests and is classified as a Southern Tropical Dry Deciduous Forest. *Tectona grandis* grows sparsely associated with *Terminalia tomentosa, Anogeissus latifolia, Pterocarpus marsupium, Diospyros melanoxylon.* Bamboo *Dendrocalamus strictus* grows abundantly. The vegetation of Nagzira has been described by Malhotra and Rao (1981).

AVIFAUNA

166 bird species have been reported from the Sanctuary by the Forest Department (Misra undated). Both Red Junglefowl *Gallus gallus* and Grey Junglefowl *Gallus sonneratii* have been listed. Ali and Ripley (1987) have reported many areas where both these species occur, and sometimes hybridize. However, precise distribution ranges, especially the outer boundaries of their distribution are not fully recorded.

Chitampalli (1977) has seen three Pale-capped or Purple Wood-Pigeons *Columba punicea* on a salt lick near Intiadoh lake. This bird is found only in the Eastern Ghats, northeast India and Bangladesh (Grimmett *et al*. 1998) so the presence of this Vulnerable species (BirdLife International 2001) in this region is interesting. Possibly, it is found in many adjoining areas in Maharashtra, Chhattisgarh and Orissa. This whole region in central India remains under-explored as far as bird life is concerned.

Jamdar (1982) has reported the Forest Wagtail *Motacilla indica* from this IBA.

Four globally threatened species have been identified from this IBA. The Oriental White-backed Vulture *Gyps bengalensis* and Lesser Adjutant *Leptoptilos javanicus* are widely distributed. Probably, this IBA would be quite important for the Green Munia *Amandava formosa* whose population is declining, mainly due to trapping for trade (R. Bhargava *pers. comm*. 2003).

Nagzira has been selected as an IBA primarily for its biome species. It is one of the best areas to see the species of Indo-Malayan Tropical Dry Zone (Biome-11). Of the 59 species identified by BirdLife International (undated), 28 have been seen here. The list is too long to be included here.

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Vulnerable	
Lesser Adjutant	*Leptoptilos javanicus*
Purple Wood-Pigeon	*Columba punicea*
Green Munia	*Amandava formosa*

Nagzira has extensive tracts of Tropical Dry Deciduous Forest.

Photo: Anant Zanjale

OTHER KEY FAUNA

Mammals include the Tiger *Panthera tigris*, Leopard *P. pardus*, Wild Dog *Cuon alpinus*, Hyena *Hyaena hyaena*, Golden Jackal *Canis aureus*, Gaur *Bos frontalis*, Sambar *Cervus unicolor*, Chital *Axis axis*, Four-horned Antelope *Tetracerus quadricornis* and Barking Deer *Muntiacus muntjak*. The Sanctuary harbours about 50 species of butterflies. Amphibians are represented by Common Tree Frog *Polypedates maculatus*, Fungoid Frog *Rana malabarica* and Indian Burrowing Frog *Sphaerotheca breviceps*. Among the reptiles, besides lizards such as Fan-throated Lizard *Sitana ponticeriana*, the Jerdon's Snake-eye *Ophisops jerdoni* is also found here.

LAND USE

- Nature conservation and research
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Firewood collection
- Poaching
- Tourism

Growing tourism causes disturbance to the wildlife, largely due to vehicular noise and pollution. Tree felling also occurs (Kothari *et al*. 1989). The Wildlife Institute of India has proposed that Nagzira Wildlife Sanctuary be extended by 47.19 sq. km and be notified as a National Park (Rodgers *et al.* 2000).

KEY CONTRIBUTORS

Girish Jathar, B. Raha and N. B. Bhure

KEY REFERENCES

Ali, S. and Ripley, S. D. (1987) *Compact Handbook of the Birds of India and Pakistan* (Second Edition). Oxford University Press, Delhi.

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, U.K., unpublished.

BirdLife International (2001) *Threatened Birds of Asia: The BirdLife International Red Data Book*. BirdLife International, Cambridge, U.K.

Chitampalli, M. B. (1977) Occurrence of and some observations of the Purple Wood-Pigeon in Maharashtra (Bhandara district). *J. Bombay Nat. Hist. Soc.* 74(3): 527-528.

Grimmett, R., Inskipp, C. and Inskipp, T. (1998) *Birds of the Indian Subcontinent.* Christopher Helm (Publishers) Ltd., London, U.K.

Jamdar, N. (1982) Occurrence of Forest Wagtail (*Motacilla indica* Gmelin) in Nagzira Sanctuary, Bhandara District (Maharashtra). *J. Bombay Nat. Hist. Soc.* 79(3): 671.

Kothari, A, Pande, P, Singh, S, Variava, D. (1989) Management of National Parks and Sanctuaries in India: A status report. Environmental Studies Division, Indian Institute of Public Administration, New Delhi.

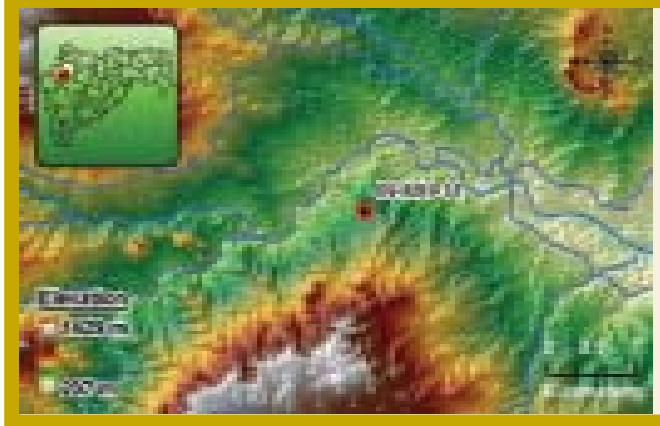
Malhotra, S. K. and Rao, K. M. (1981) The vegetation of Nagzira Wildlife Sanctuary and its environs (Maharashtra state). *J. Bombay Nat. Hist. Soc.*78 (3): 475-486.

Misra, S. S. (undated) Checklist of Birds: Nagzira Wildlife Sanctuary. Publ. Deputy Conservator of Forests (Wildlife), Nagpur.

Rodgers, W. A., H. S. Panwar and V. B. Mathur (2000) *Wildlife Protected Area Network in India: A Review (Executive Summary).* Wildlife Institute of India, Dehradun.

MH-11

NANDUR MADHMESHWAR WILDLIFE SANCTUARY



IBA Site Code	:	IN-MH-11
State	:	Maharashtra
District	:	Nashik
Coordinates	:	19° 59' 36" N, 74° 01' 50" E
Ownership	:	State, Private
Area	:	10,012 ha
Altitude	:	Not available
Rainfall	:	500 mm
Temperature	:	9 °C to 43 °C
Biogeographic Zone	:	Deccan Peninsula
Habitats	:	Freshwater Swamp, Tropical Dry Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A4i (≥1% biogeographic population), A4ii (≥1% global population of seabird or terrestrial species), A4iii (≥20,000 waterbirds)
PROTECTION STATUS: Wildlife Sanctuary, established in 1986

GENERAL DESCRIPTION

Located near Niphad in Nashik district, Nandur Madhmeshwar is a large water storage reservoir, created by the construction of a dam at the confluence of the Godavari and the Kadva rivers. The lake is a pick-up weir constructed in 1907-1913 on the Godavari river to supply water for irrigation. Over the years, the water released from Gangapur and Darana water reservoirs is stored at Nandur Madhmeshwar and subsequently released from here through canals for irrigation. Huge quantities of silt and organic matter carried in the past 90 years have accumulated in the lake, due to which islands, shallow water ponds and marshlands have been created. This has resulted in a good wetland habitat for birds. It has been aptly described as the Bharatpur of Maharashtra (Rane 1983).

The Nandur-Madhmeshwar irrigation dam and the catchment areas are surrounded by sugarcane, onion, jowar and wheat fields, and grape orchards. There is no forest around this wetland (Rane 1983).

The reservoir fills with monsoon runoff between July and September, and attracts several species of migratory birds between September and March. The water level fluctuates, depending upon the usage. This is quite suitable for waterfowl and waders, as most of them prefer shallow water, mudflats and marshes. Three large islands are also present within the waterbody. About 23 small satellite lakes are present within a radius of 25 km around the reservoir, adding to the overall importance of the region.

About 463 species of plants have been identified (Kumar *et al*. 2002), of which nearly 80 are aquatic.

AVIFAUNA

At least 253 species of birds are known to occur in the region, the majority of which are migratory. The reservoir is an important staging and wintering ground for migratory waterfowl, of which over 20,000 have been recorded. These include over 750 Little Cormorant *Phalacrocorax niger*, 600 Black-winged Stilt *Himantopus himantopus*, 700 Black-tailed Godwit *Limosa limosa*, 500 Little Stint *Calidris minuta* and 800 Small Pratincole *Glareola lactea*.

The Eastern Imperial Eagle *Aquila heliaca* is the only globally threatened species known from this area. It was first seen in December 1983 by Goenka *et al.* (1985).

Many species have been seen in numbers much above their 1% threshold level determined by the Wetlands International (2002). For example, 100 White Stork *Ciconia ciconia* were seen (Kumar *et al*. 2002), while the 1% threshold is only 45 individuals in South Asia. More than 1,000 Demoiselle Crane *Grus virgo* are seen in and around Nandur Madhmeshwar, while 100,000 of this species winter in the Indian Subcontinent (Wetlands International 2002) therefore, 1% are seen in this IBA site alone, thus qualifying is A4i criteria.

This wetland is a prime candidate as a Ramsar site.

Critically Endangered	
Oriental White-backed vulture	*Gyps bengalensis*
Long billed Vulture	*Gyps indicus*
Vulnerable	
Eastern Imperial Eagle	*Aquila heliaca*

OTHER KEY FAUNA

The Fishing cat *Felis viverrina* and over 20 species of fish including *Puntius ticto*, *Channa ranga* and *Mystus cavasius* are the important components of the biodiversity of this site.

LAND USE

- Agriculture
- Aquaculture
- Nature conservation and research
- Water management

THREATS AND CONSERVATION ISSUES

- Fisheries
- Invasion by exotic plants
- Disturbance to birds
- Filling in of wetlands
- Livestock grazing

Heavy siltation is causing the reservoir to fill up gradually. The exotic *Eichhornia crassipes* and *Parthenium* sp. have infested the area and need to be removed. Aquatic vegetation is removed for food and fodder on a large scale. Excessive fishing and grazing

Large congregations of waterbirds are found in Nandu Madhmeshwar. This IBA fulfils the Ramsar criteria.

Photo: Bishwarup Raha

by domestic livestock also cause disturbance. Diesel engines, which are used along with electric pumps to draw water, cause immense pollution (Kumar *et al.* 2002). The avifauna of the area is considerably disturbed because of blasting undertaken in the area for mining purpose. The reservoir surroundings, along with partly submerged areas in the IBA, are intensively cultivated for wheat, maize, sugarcane and vegetables.

Poaching of waterfowl which was quite common earlier (Rane 1983) has been curtailed to a large extent (Kumar *et al.* 2002) after the declaration of the Sanctuary.

Nearly 1,758 ha of submergence area was acquired from the Irrigation Department and distributed to landless tribals (Kumar *et al*. 2002). This has brought in more people around the lake.

KEY CONTRIBUTORS

B. Raha and N. B. Bhure

KEY REFERENCES

Kumar, P., Bhure, N. B. and Nigam, A. K. (2002) Conservation of Nandur Madhmeshwar wetland, India. Pp. 139-146. *In*: Birds of Wetlands and Grasslands: Proceedings of the Sâlim Ali Centenary Seminar on Conservation of Avifauna of Wetlands and Grasslands. Eds: Rahmani A.R. and G. Ugra. Bombay Natural History Society, Mumbai. Pp x+228.

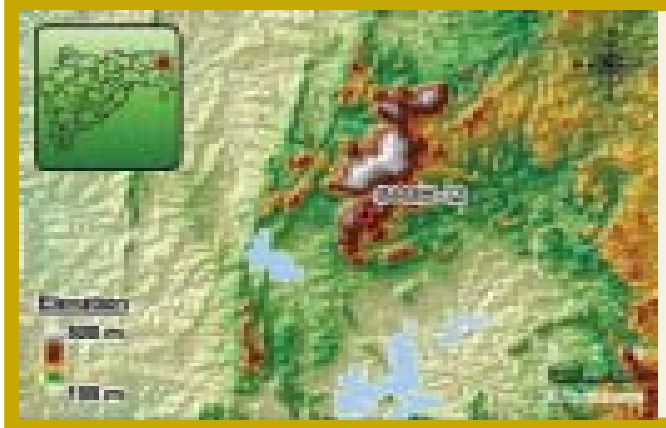
Goenka, D., Monga, S. and Srivastava, K. (1985) Imperial Eagle, *Aquila heliaca* Savigny, in Maharashtra–A Southward Extension Of Its Wintering Range. *J. Bombay Nat. Hist. Soc.* 82 (2): 406

Rane, U. (1983) Nandur Madhmeshwar: Bharatpur of Maharashtra. *Hornbill* (3): 32-37.

Wetlands International (2002) *Waterbird Population Estimates: Third Edition*. Wetlands International Global Series No. 12, Wageningen, The Netherlands.

MH-12

NAVEGAON NATIONAL PARK



IBA Site Code	:	IN-MH-12
State	:	Maharashtra
District	:	Bhandara and Gondia
Coordinates	:	20° 56' 42" N, 80° 10' 56" E
Ownership	:	State
Area	:	13,388 ha
Altitude	:	275 - 481m
Rainfall	:	1,200 mm
Temperature	:	7 °C to 47 °C
Biogeographic Zone	:	Deccan Peninsula
Habitats	:	Tropical Dry Deciduous Forests, Aquatic, Freshwater Reservoir

IBA CRITERIA: A1 (Threatened Species), A3 (Biome-11: Indo-Malayan Tropical Dry Zone)
PROTECTION STATUS: Wildlife Sanctuary, established in 1975

GENERAL DESCRIPTION

The Nawegaon National Park extends over 13,388 ha, and lies in the southern parts of the Bhandara and Gondia districts of Maharashtra. Nawegaon Lake, which spreads over 1,100 ha, was formed by the impoundment of a stream at Itiadoh, which is 14 km away. The lake is fringed by low hills covered with forests. It was built by the Kohali community, about 300 years ago. The *Gond* Queen Durgawati invited some experts from Rajasthan to construct this lake. Subsequently, the lake was maintained by the Nizam of Hyderabad, Bhosale Kings and then the British.

The natural vegetation conforms to the "Southern Tropical Dry Deciduous Mixed Forests" as classified by Champion and Seth (1968). The forest is composed of 40 species of trees, 16 species of shrubs and 44 species of herbs (Ilorkar and Khatri 2003). The dominant vegetation includes *Terminalia tomentosa, Pterocarpus marsupium, Anogeissus latifolia, Lagerstroemia parviflora, Butea monosperma, Diospyros melanoxylon Bombax ceiba, Cassia fistula* and *Adina cordifolia.* Bamboo *Dendrocalamus strictus* forms a dense undergrowth and teak *Tectona grandis* is interspersed with the other trees.

AVIFAUNA

209 species of birds are listed in the checklist of the Forest Department (Misra, undated), including some doubtful records such as the Greater Adjutant *Leptoptilos dubius* and the Crimson-backed or Small Sunbird *Nectarinia minima*. A good scientific report of birds of this area is lacking. Although 35 species of ducks, waders and storks are found, none of them exist in adequate numbers to reach the 1% biogeographical population threshold of Wetlands International (2002). As the lake is quite deep, it is not very attractive to waterfowl, and the number of those found does not satisfy A4iii criteria (>20,000 individuals). However, this site has typical representatives of the bird life of Tropical Dry Deciduous Forests of central India, and fits the A3 criteria. The checklist mentioned earlier includes 26 Biome-11 (Indo-Malayan Tropical Dry Zone) species in this IBA.

The area is notable as both Red Junglefowl *Gallus gallus* and Grey Junglefowl *Gallus sonneratii* occur (Chitampalli 1977). This site is also the southernmost limit of distribution of the Sarus crane *Grus antigone*.

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Long-billed Vulture	*Gyps indicus*
Vulnerable	
Lesser Adjutant	*Leptoptilos javanicus*
Greater Spotted Eagle	*Aquila clanga*
Eastern Imperial Eagle	*Aquila heliaca*
Lesser Kestrel	*Falco naumanni*
Sarus Crane	*Grus antigone*
Green Munia	*Amandava formosa*
Biome-11: Indo-Malayan Tropical Dry Zone	
Black Ibis	*Pseudibis papillosa*
Red-headed Vulture	*Sarcogyps calvus*
White-eyed Buzzard	*Butastur teesa*
Red-headed Falcon	*Falco chicquera*
Painted Francolin	*Francolinus pictus*
Rain Quail	*Coturnix coromandelica*
Jungle Bush-Quail	*Perdicula asiatica*
Rock Bush-Quail	*Perdicula argoondah*
Indian Peafowl	*Pavo cristatus*
Yellow-legged Green-Pigeon	*Treron phoenicoptera*
Plum-headed Parakeet	*Psittacula cyanocephala*
Common Indian Nightjar	*Caprimulgus asiaticus*
Brown-headed Barbet	*Megalaima zeylanica*
Yellow-fronted Pied Woodpecker	*Dendrocopos mahrattensis*
Lesser Golden-backed Woodpecker	*Dinopium benghalense*
Ashy-crowned Sparrow-Lark	*Eremopterix grisea*
Common Woodshrike	*Tephrodornis pondicerianus*
Indian Robin	*Saxicoloides fulicata*
Large Grey Babbler	*Turdoides malcolmi*
Jungle Babbler	*Turdoides striatus*
Ashy Prinia	*Prinia socialis*
White-browed Fantail -Flycatcher	*Rhipidura aureola*
Green Munia	*Amandava formosa*
Grey-headed Starling	*Sturnus malabaricus*
Brahminy Starling	*Sturnus pagodarum*
White-bellied Drongo	*Dicrurus caerulescens*

Photo: Valeri Moseikin

OTHER KEY FAUNA

This IBA has all the large mammals that can be expected in any good protected forest of central India, such as the Tiger *Panthera tigris*, Leopard *P. pardus*, Wild Dog *Cuon alpinus*, Hyena *Hyaena hyaena*, Wolf *Canis lupus*, Sambar *Cervus unicolor*, Gaur *Bos frontalis*, Barking Deer *Muntiacus muntjak*, Four-horned Antelope *Tetracerus quadricornis*, Sloth Bear *Melursus ursinus*, Chinkara *Gazella bennettii*, Chital *Axis axis*, and Nilgai *Boselaphus tragocamelus*. Not much is known about the reptiles, amphibians and fish fauna.

LAND USE

- Agriculture
- Fisheries
- Nature conservation and research
- Tourism

THREATS AND CONSERVATION ISSUES

- Agricultural intensification and expansion
- Fisheries
- Forest grazing
- Tourism and recreation

There are three villages around the lake with a population of about 100 people each, and two small hamlets. Agriculture is practiced and the main crop is rice. About 50 local fishermen fish in the lake. Some locals feel that the number of birds visiting the lake has reduced over the years because of fishing. The boundaries of two villages Kavelevada and Zangaegondhii have not been specified, hence the occupants of these villages encroach into the National Park land. Ungulates from the Park damage crops, causing man-animal conflict. Illicit cutting of bamboo by the villagers has also been reported from the Park. There is an influx of tourists on weekends: over 2000 tourists visit the Nawegaon National Park on holidays

KEY CONTRIBUTORS

Girish Jathar, Deepak Apte and Kishor Rithe

KEY REFERENCES

Chitampalli, M. B. (1977) Occurrence of Grey Junglefowl and Red Junglefowl together. *J. Bombay Nat. Hist. Soc.* 74(3) 527.

Champion, H. G. and Seth, S. K. (1968) *A revised survey of the forest types of India.* Govt. of India Press, Delhi. Pp. 403.

Ilorkar, V. M. and Khatri, P. K. (2003) Phytosociological study of Navegaon National Park (Maharashtra). *Indian Forester* 129(3): 377-387.

Misra, S. S. (undated) Checklist of Birds of Navegaon National Park. Published by Deputy Conservator of Forests, Nagpur.

Wetlands International (2002) *Waterbird Population Estimates - Third Edition*. Wetlands International Global Series No. 12. Wageningen, The Netherlands.

MH-13

OZAR, WANI AND ADJOINING GRASSLANDS

IBA Site Code	:	IN-MH-13
State	:	Maharashtra
District	:	Nashik
Coordinates	:	20° 05' 38" N, 73° 53' 32" E
Ownership	:	Hindustan Aeronautics Limited (HAL), Defense Research and Development Organization, Forest Department and Private land
Area	:	20,000 ha
Altitude	:	593 m
Rainfall	:	Not available
Temperature	:	10 °C to 40 °C
Biogeographic Zone	:	Deccan Peninsula
Habitats	:	Tropical Thorn Forest, Tropical Grassland

IBA CRITERIA: A1 (Threatened Species)
PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Ozar (=Hosur), Wani and adjoining grasslands in the dry district of Nashik shot into the limelight in the late 1990s when small populations of the endangered Great Indian Bustard *Ardeotis nigriceps* and Lesser Florican *Sypheotides indica* were discovered (Raha and Prakesh 2001a,b). These birds are seen in the 1,430 ha fenced grassland of Hindustan Aeronautics Ltd. (HAL) complex, *c.* 20 km from Nashik. Most of this complex is undulating to flat grassland, except for a small area occupied by the office, runway and factory. The HAL complex is mainly used to repair military aircraft, which are test flown from a runway that almost bisects the grassland. The bustards are quite safe inside the HAL complex, but they also move out and use a much larger area of about 3,000 ha of similar grasslands and crop fields. Most of the low-lying areas are under cultivation, but the plateaus are covered with short grasses, very conducive for the bustard.

Heteropogon contortus, *Cymbopogon martinii*, and *Cynodon dactylon* are the common grass species in this area. Among the trees and shrubs, *Acacia* sp., *Santalum album*, and *Dalbergia sissoo* are found.

AVIFAUNA

The Great Indian Bustard and the Lesser Florican were recently reported from this area by Raha and Prakash (2001a, b). The bustard breeds regularly in the HAL complex, with at least one traditional display territory of an adult male. Sometimes up to three adult males have been seen displaying in this area. The total adult population could be 10-12 adult birds.

The Lesser Florican is seen during monsoon, and breeds in some years. Only displaying males have been sighted, but no nest has been located till now. Considering the extent of the grasslands, and occasional sighting of females, they must be breeding here.

The Lesser Florican was recorded as common, and probably present throughout the year in Nashik and Ahmednagar districts during the 19th century (Hume and Marshal 1879). There were very few confirmed sightings of Lesser Florican in Maharashtra during the 1980s (Sankaran *et al*. 1992), and none from Nashik district. Since their discovery as breeding birds in Ozar grasslands in 1998, they have been seen regularly in this IBA (B. Raha *pers. comm*. 2003).

The grassland is rich in avifauna with more than 200 species identified till now (B. Raha *pers. comm.* 2003). Stone Curlew *Burhinus oedicnemus* is also found breeding in this area.

Endangered	
Great Indian Bustard	*Ardeotis nigriceps*
Lesser Florican	*Sypheotides indica*

OTHER KEY FAUNA

Detailed study on the fauna of this area has not been done. In 2003, a male bustard was killed by wolves (B. Raha *pers. comm*. 2003).

LAND USE

- Defence activities
- Agriculture

THREATS AND CONSERVATION ISSUES

- Air traffic
- Poaching outside HAL area

The core area of this site is safe and in possession of Hindustan Aeronautics Ltd which is highly protected, with restricted entry and limits on other activities.

The Nature Conservation Society and IBCN have launched a “Save the Bustard Campaign” in this area to create awareness among the local people outside the HAL complex. This campaign has been very successful and till now, there has been no case of poaching of bustard or florican.

KEY CONTRIBUTOR

B. Raha

KEY REFERENCES

Hume, A. O. and Marshal, A. H. T. (1879) *The Game birds of India, Burmah and Ceylon*. Published by the authors, Calcutta.

Raha, B. and Prakash, V. (2001a) Occurrence of Great Indian Bustard *Ardeotis nigriceps* at Hosur, Nashik district, Maharashtra. *J. Bombay Nat. Hist. Soc.* 98 (1): 110-111.

Raha, B. and Prakash, V. (2001b) Occurrence of Lesser Florican *Sypheotides indica* at Hosur, in Nashik district, Maharashtra. *J. Bombay Nat. Hist. Soc.* 98(2): 279.

Sankaran, R., Rahmani, A. R. and Ganguli-Lachungpa, U. (1992) The Distribution and Status of the Lesser Florican *Sypheotides indica* (J. F. Miller) in the Indian Subcontinent. *J. Bombay Nat. Hist. Soc*. 89 (2): 163-179.

MH-14

RADHANAGARI WILDLIFE SANCTUARY

IBA Site Code	:	IN-MH-14
State	:	Maharashtra
District	:	Kolhapur
Coordinates	:	16 ° 22' 60" N, 74° 00' 00" E
Ownership	:	State
Area	:	35,116 ha
Altitude	:	972 m
Rainfall	:	3,500 mm
Temperature	:	6 °C to 36 °C
Biogeographic Zone	:	Western Ghats
Habitats	:	Tropical Dry Evergreen Forest, Tropical Semi-evergreen Forest, Tropical Moist Deciduous

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest; Biome-11: Indo-Malayan Tropical Dry Zone)
PROTECTION STATUS: Wildlife Sanctuary, established in 1985.

GENERAL DESCRIPTION

Radhanagari Wildlife Sanctuary is situated on the border of Kolhapur and Sindhudurg districts. This beautiful Sanctuary is nestled in the Sahyadri Hills. It lies between two major reservoirs, Shahu Sagar and Laxmi Sagar in Kolhapur district. The terrain is undulating, with steep escarpments and dense forest. The soil is lateritic and in some areas there are huge plateaux with diverse flora and fauna. This forest used to be a hunting ground of the rulers of Kolhapur State, but later it was converted into a sanctuary.

There are several sacred groves inside the Sanctuary, which are traditionally protected by the local people. Due to this, large stands of virgin forest still exist. This Sanctuary is the major source of water for two major irrigation projects in Kolhapur district. Besides, some parts of the Sanctuary are rich in bauxite ore, and many plateaux with high quality bauxite have been mined. The mining company wants more areas to be opened for mining - a major threat to this fragile ecosystem.

As this area lies in the Western Ghats, the plant life is extremely rich. The forest types are Southern Semi-evergreen, Southern Moist Mixed Deciduous and Southern Evergreen. The major tree species are *Memecylon umbellatum*, *Terminalia chebula*, *Careya arborea* and *Lagerstroemia microcarpa*. Fruiting plants like *Syzygium cumini*, *Ficus racemosa* and *Carissa* spp. are found almost all over the area, attracting many frugivorous birds and mammals. Karvi *Carvia callosa* is the most important and widespread flowering plant species in this area, serving as a source of food for a multitude of herbivore species and insects.

The Sanctuary also hosts threatened and endemic tree species such as *Mappia foetida*, *Turpunia malbarica*, *Euphorbia longana*, *Elaeocarpus tectorium* and *Harpullia arborea*.

The Malabar Whistling-Thrush *Myiophonus horsfieldii* is one of the best songsters in India.

Photo: Clement Francis M.

AVIFAUNA

About 240 bird species have been recorded from the Sanctuary (G. Jathar *pers. comm.* unpubl. checklist), though a detailed study on the avifauna has not yet been done. The globally threatened Nilgiri Wood-Pigeon *Columba elphinstonii* is seen here in small number, especially during the fruiting period.

The site lies in the Western Ghats Endemic Bird Area (EBA 123) where Stattersfield *et al.* (1998) have identified 16 restricted range species. Two have been identified from this site but more are likely to occur here.

The site represents Biome-10 (Indian Peninsula Tropical Moist Forest). BirdLife International (undated) has listed 15 species in this biome, out of which five are found here. Many species of Biome-11 (Indo-Malayan Tropical Dry Zone) are also seen, especially at lower elevations where this site merges with the Deccan Plateau. Biome-11 includes a wide range of habitats, including both forests and open country. Many of the species of this biome have adapted to man-modified habitats. Some species have changed their distributions so much that they are found in other biomes also.

During winter, many Himalayan forest birds are found here. Indian Blue Robin *Luscinia brunnea*, belonging to Sino-Tropical Temperate Forest (Biome-7) has been seen here.

Some interesting species such as the Ceylon Frogmouth *Batrachostomus moniliger* have been reported from this Sanctuary (V. Giri *pers. comm.* 2003). The Yellow-browed Bulbul *Iole indica*, Dusky Eagle Owl *Bubo coromandus*, Great Pied Hornbill *Buceros bicornis*, Black Bulbul *Hypsipetes leucocephalus*, Speckled Piculet *Picumnus innominatus*, and Malabar Crested Lark *Galerida malabarica* are commonly seen here.

MH-14

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Long-billed Vulture	*Gyps indicus*
Vulnerable	
Nilgiri Wood-Pigeon	*Columba elphinstonii*
Endemic Bird Area 123: Western Ghats	
Malabar Grey Hornbill	*Ocyceros griseus*
Small Sunbird	*Nectarinia minima*
Biome-10: Indian Peninsula Tropical Moist Forest	
Malabar Pied Hornbill	*Anthracoceros coronatus*
White-cheeked Barbet	*Megalaima viridis*
Malabar Whistling-Thrush	*Myiophonus horsfieldii*
Indian Scimitar-Babbler	*Pomatorhinus horsfieldii*
Loten's Sunbird	*Nectarinia lotenia*
Biome-11: Indo-Malayan Tropical Dry Zone	
Jungle Bush-Quail	*Perdicula asiatica*
Plum-headed Parakeet	*Psittacula cynocephala*
Brown-headed Barbet	*Megalaima zeylanica*
Lesser Golden-backed Woodpecker	*Dinopium benghalensis*
Malabar Crested Lark	*Galerida malabarica*
Small Minivet	*Pericrocotus cinnamomeus*
Common Woodshrike	*Tephrodornis pondicerianus*
Indian Robin	*Saxicoloides fulicata*
Rufous-bellied Babbler	*Dumetia hyperythra*
Jungle Prinia	*Prinia sylvatica*
Ashy Prinia	*Prinia socialis*
Grey-headed Starling	*Sturnus malabaricus*
Brahminy Starling	*Sturnus pagodarum*
White-bellied Drongo	*Dicrurus caerulescens*

OTHER KEY FAUNA

This Sanctuary is well known for its Gaur *Bos frontalis* population. Other mammal species include Tiger *Panthera tigris*, Leopard *P. pardus*, Leopard Cat *Prionailurus bengalensis*, Slender Loris *Loris tardigradus*, Mouse Deer *Moschiola meminna* and the elusive nocturnal Indian Pangolin *Manis crassicaudata*.

There are some endemic and endangered species of reptiles and amphibians, notably the Malabar Pit Viper *Trimeresurus malabaricus*, Deccan Ground Gecko *Geckoella deccanensis*, Gunther's Cat Skink *Ristella guntheri*, Beddome's Lacerta *Ophisops beddomei* and amphibians such as *Rammanela* sp., Bombay Bush Frog *Philautus bombayensis*, and Humayun's Wrinkled Frog *Nyctibatrachus humayuni* (V. Giri *pers. comm.* 2003).

LAND USE

- Agriculture
- Mining
- Reservoirs

THREATS AND CONSERVATION ISSUES

- Bauxite mining
- Irrigation projects
- Encroachment
- Poaching
- Grazing

Bauxite mining is the major problem in this Sanctuary. The Indian Aluminium Co. Ltd. (INDAL) has done open cast mining, causing irreparable damage to the fragile ecosystem of the plateau. As these plateaux are rocky, tree growth is limited, so the government believes that they are of no importance. However, these grassy plateaux have their own biological and ecological values, being rich grazing grounds for herbivores and nesting ground for many species of birds. In February 1998, the Mumbai High Court recognizing the biological and watershed values of Radhanagari, passed a stay order against bauxite mining operations in Iderganj plateau by INDAL. This plateau is a watershed of two major reservoirs that were created when the Radhanagari and Kalammawadi dams were constructed. However, the Forest Department is under intense political pressure to allow mining.

NGOs like Kalpavriksha, Paryavarni and the Environmental Department of Shivaji University are struggling to have the Sanctuary declared as an Ecologically Sensitive Area.

KEY CONTRIBUTORS

Girish Jathar, Varad Giri and Deepak Apte

KEY REFERENCES

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, U.K., unpublished.

Stattersfield, A. J., Crosby, M. J., Long, A. J. and Wege, D. C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, U.K.

SANJAY GANDHI NATIONAL PARK-TUNGARESHWAR COMPLEX

IBA Site Code	:	IN-MH-15
State	:	Maharashtra
District	:	Mumbai and Thane
Coordinates	:	19° 18' 35" N, 72° 57' 48" E
Ownership	:	State
Area	:	17,266 ha
Altitude	:	0 - 500 m
Rainfall	:	3,500 mm
Temperature	:	17 °C to 37 °C
Biogeographic Zone	:	Coasts/Western Ghats
Habitats	:	Tropical Dry Deciduous Forest, Tropical Dry Evergreen Forest, Mangroves

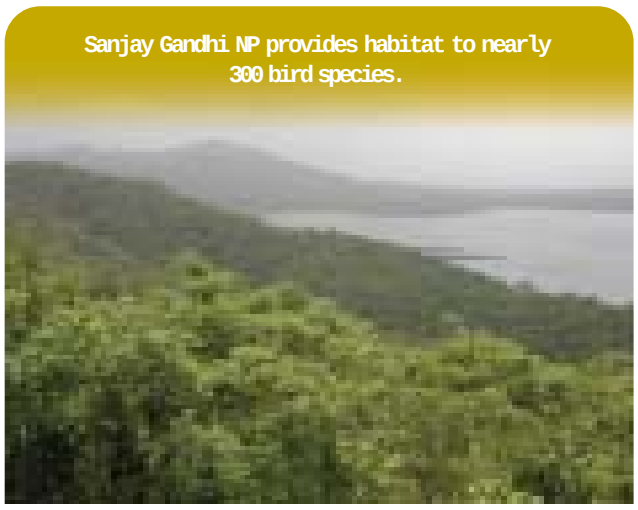
IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 123: Western Ghats), A3 (Biome-10: Indian Peninsula Tropical Moist Forest)
PROTECTION STATUS: National Park, established in 1983

GENERAL DESCRIPTION

This IBA includes a complex consisting of Sanjay Gandhi National Park (10,307 ha), Tungareshwar Wildlife Sanctuary (8,570 ha) and Reserve Forests between them. The Sanjay Gandhi National Park is located in the Sahyadri Range in the northernmost part of the Western Ghats. The Park is unique in being partly located within the mega metropolitan, Mumbai. Part of it is the adjoining district of Thane. A small portion of the Park (about 1.5%), on the banks of the Vasai creek known as Bassein, is at sea level and has mangrove patches and other characteristics of a typical coastal estuarine zone. A large variety of fauna is known to exist near Ghodbunder, Vasai Bunder and Nagla Bunder; the mangrove patches on the northern banks of Vasai creek are still in reasonably good condition.

The Park constitutes the prime catchment area of two freshwater lakes, Tulsi and Vihar, which supply water to Mumbai city. These two freshwater lakes have aquatic fauna and flora typical of man made lakes. Within the Park, there are enclosures of Lion Safari and Tiger Safari.

The existence of the old Buddhist Kanheri Caves at the centre of the Park makes the area a place of great historical importance. About 104 rockcut caves, evidence of the existence of monastic settlements from the 2nd to 9th century AD, are shelters carved in rock, with some beautiful sculptures. There are *Viharas* (monasteries) and *Chaityas* (temples), with stone beds and cisterns still intact.



Sanjay Gandhi NP provides habitat to nearly 300 bird species.

Photo: M. Zafar-ul Islam

The forest is Tropical Dry Deciduous or the Southern Dry Deciduous as classified by Champion and Seth (1968), and dominated by Teak *Tectona grandis*, and Bamboo *Dendrocalamus strictus*. Other associated species are *Pterocarpus marsupium*, *Adina cordifolia*, *Boswellia serrata*, *Diospyrus melanoxylon*, *Terminalia arjuna*, *Syzygium cumini* and *Terminalia tomentosa*. The area also bears patches of Evergreen Forest or Western Sub-tropical hill Forest.

In Tungareshwar WLS the habitat is more moist deciduous. About 600 species of plants, over 250 species of birds, 150 species of butterflies, and 36 species of herpetofauna are reported from this newly declared Sanctuary (D. Apte pers. *comm*. 2003).

AVIFAUNA

The Park is rich in flora and fauna. Nearly 300 species of birds have been identified, including some threatened ones. The rich avifauna of the Park includes Oriental White-backed Vulture *Gyps bengalensis*, Long-billed Vulture *Gyps indicus*, Pallas's Fish-Eagle *Haliaeetus leucoryphus*, Greater Spotted Eagle *Aquila clanga*, Lesser Adjutant *Leptoptilos javanicus*, Nilgiri Wood-Pigeon *Columba elphinstonii*, Emerald Dove *Chalcophaps indica*, Drongo-cuckoo *Surniculus lugubris*, Malabar Trogon *Harpactes fasciatus*, Oriental Dwarf or Three-toed Kingfisher *Ceyx erythacus*, and Crimson or Yellow-backed Sunbird *Aethopyga siparaja*.

The site lies in the Western Ghats Endemic Bird Area (EBA 123) where Stattersfield *et al*. (1998) have identified 16 restricted range species. Only one has been found here till now. This IBA also falls in Biome-10 (Indian Peninsular Tropical Moist Forest) as defined by BirdLife International (undated). Fifteen species are considered representative of this biome, out of which four have been found here. As the Park is surrounded by Mumbai and Thane on southern side and very disturbed forests all around it, many species of Biome-11 (Indo-Malayan Tropical Dry Zone) are found here. BirdLife International (undated) has listed 59 species in this biome that are found in India. This IBA and its surrounding areas have 26 species. Most of these species are common and widespread.

MH - 15

A variety of aquatic birds, both residents and winter visitors, frequent the mangroves along the Bassein Creek and the marshy margins of Vihar Lake (Monga 2000).

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Long-billed Vulture	*Gyps indicus*
Vulnerable	
Lesser Adjutant	*Leptoptilos javanicus*
Pallas's Fish-Eagle	*Haliaeetus leucoryphus*
Greater Spotted Eagle	*Aquila clanga*
Indian Skimmer	*Rynchops albicollis*
Nilgiri Wood-Pigeon	*Columba elphinstonii*
Endemic Bird Area 123: Western Ghats	
Nilgiri Wood-Pigeon	*Columba elphinstonii*
Biome-10: Indian Peninsula Tropical Moist Forest	
Malabar Trogon	*Harpactes fasciatus*
Malabar Whistling-Thrush	*Myiophonus horsfieldii*
Indian Scimitar-Babbler	*Pomatorhinus horsfieldii*
Loten's Sunbird	*Nectarinia lotenia*

OTHER KEY FAUNA

The faunal diversity of the Park includes 59 species of mammals, 155 species of butterflies, 24 species of ants, 52 species of reptiles, 13 species of amphibians and 30 species of fishes. Marsh Crocodile *Crocodylus palustris* has been reintroduced into Tulsi and Vihar Lakes. Leopard *Panthera pardus* is the largest carnivore, with a healthy population of about 40 individuals – perhaps the highest natural leopard density in the world, within a metropolis. These leopards mainly subsist on stray dogs, Common Langur *Semnopithecus entellus*, Rhesus Macaque *Macaca mulatta*, Wild Boar *Sus scrofa*, Chital *Axis axis*, Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak* and Four-horned Antelope *Tetracerus quadricornis*. Indian Chevrotain or Mouse Deer *Moschiola meminna* is not uncommon, but rarely seen due to its secretive nature. In May-June 2003, a Tiger was seen in Tungareshwar WLS.

Some of the important species of reptiles reported from this IBA are the introduced Crocodile, Pond Terrapin *Melanochelys trijuga*, Deccan Banded Gecko *Geckoella dekkanensis*, and the Spotted Forest Gecko *G. collegalensis*.

LAND USE

- Nature conservation and research

THREATS AND CONSERVATION ISSUES

- Illegal tree felling
- Man-animal conflict
- Encroachment
- Illegal stone quarries
- Firewood collection
- Poaching
- Tourism
- Anti-social elements

The Sanjay Gandhi National Park is surrounded by Mumbai and Thane districts. Encroachment of slum colonies into the Park, smuggling of timber, firewood collection, poaching, other anti-social activites and human-animal conflicts are growing rapidly.

Frequent human-animal conflict clearly indicates the increasing pressure of these negative anthropogenic activities on the natural habitat of wild animals.

Mahashivaratri, a festival venerating Lord Shiva, is celebrated in February or early March, and it completely changes the face of the National Park. More than 2,00,000 people throng the Park on their way to the Kanheri Caves and Gomukh temple. In recent years, considerable stretches of the forest area have been swamped by garbage or damaged by fire (Monga 2000).

A water purification plant, stone quarry and the Film City within the Park are also major concerns. A herd of about 500 feral cattle graze in the Park. Villagers, especially tribals, cultivate the park land and depend on the forest for their livelihood.

Tungareshwar also suffers from many biotic pressures. Illegal expansion of roads and diversion of natural streams has disturbed this Sanctuary. A cart tract as shown in forest topographical sheets has been illegally converted into a 20 m wide road that provides vehicular access to the public. Another road from Parol to Sadanand-Baba Ashram, once a pristine forest, has been converted into 10 m wide road and is another blatant example of violation of the Indian Forest Conservation Act. After lobbying by BNHS, the Government of Maharashtra declared 8,570 ha as Wildlife Sanctuary in November 2003. Hopefully, the sanctuary status would, to some extent help in curtailing the illegal activities. Considering it as a recreational area coupled with temple and ashram, the sanctuary is facing an ongoing threat due to large number of tourists, who often carry plastic and other non-biodegradable material, and are also responsible for forest fire.

In order to ensure long-term viability of Sanjay Gandhi National Park and Tungareshwar Wildlife Sanctuary, it is extremely important to protect the reserve forests lying between them.

KEY CONTRIBUTORS

Rushikesh Chavan, Deepak Apte, Debi Goenka, Sunjoy Monga and Vijay A. Paranjpye

KEY REFERENCES

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, U.K., unpublished.

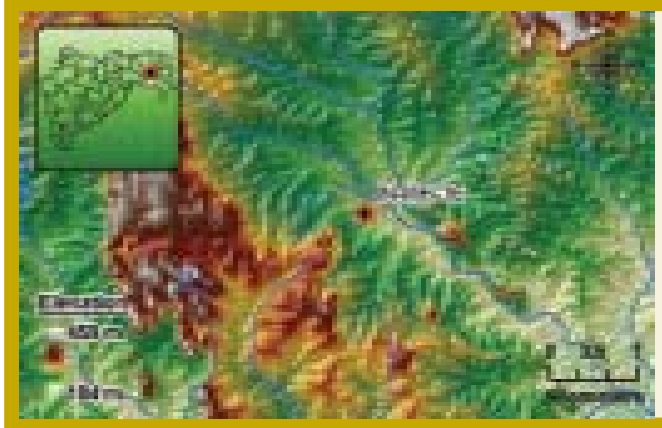
Champion, H. G. and Seth, S. K. (1968) *A revised survey of forest types of India*, Govt. of India Press, Delhi.

Monga, S. (2000) City Forest: Mumbai's National Park, India Book House Ltd., Mumbai.

Stattersfield, A. J., Crosby, M. J., Long, A. J. and Wege, D. C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, U.K.

MH-16

TADOBA - ANDHARI TIGER RESERVE



IBA Site Code	:	IN-MH-16
State	:	Maharashtra
District	:	Chandrapur
Coordinates	:	20° 23' 23" N, 79° 26' 05" E
Ownership	:	State
Area	:	11,655 ha
Altitude	:	212 - 360 m
Rainfall	:	1,175 mm
Temperature	:	5 °C to 48 °C
Biogeographic Zone	:	Deccan Peninsula
Habitats	:	Tropical Dry Deciduous Forest, Tropical Wet Evergreen Forest, reshwater Swamp

IBA CRITERIA: A1 (Threatened Species), A3 (Biome-11:Indo-Malayan Tropical Dry Zone)
PROTECTION STATUS: Wildlife Sanctuary, established in 1935, National Park in 1955, and Tiger Reserve in 1995

GENERAL DESCRIPTION

The Tadoba-Andhari Tiger Reserve is located in three ranges: Moharli, Tadoba and Kolsa in West Chandrapur Forest Division. Tadoba National Park was declared in 1955 and is one of the oldest national parks of India. It occupies an area of 11,650 ha, while the Andhari Wildlife Sanctuary occupies 50,880 ha. Together they form the Tadoba-Andhari Tiger Reserve covering a total area of 62,540 ha. The Park has a lake called Tadoba, visited by migratory waterfowl in winter. There are two more lakes, Kolsa and Jamni visted by winter migrants (Y. Dubey *in litt.* 2003).

The name Tadoba is traceable to a king named Taru who was believed to have been killed by a tiger and since then the king was deified by the tribals (Tuljapurkar 1994). They established a shrine in his memory, which is visited by the local tribals during the large annual fair held between December and January.

The habitat of these two protected areas, consisting of Southern Tropical Dry Deciduous Forests, interspersed with several large meadows, is such that it provides a good herbivore density for large cats.

The forest is typical Southern Tropical Dry Deciduous Forest, dominated by teak *Tectona grandis* and bamboo *Dendrocalamus strictus*. Other associates are *Pterocarpus marsupium, Adina cordifolia, Boswellia serrata, Diospyros melanoxylon, Terminalia arjuna, T. tomentosa,* and *Syzygium cumini* interspersed with bamboo. In some areas, patches of Moist Deciduous Forest are present, the prominent species found are *Syzygium cumini, Actinodaphne hookerii, Terminalia chebula,* and *Olea dioica*. Epiphytes, lichens and ferns are also recorded (Anon 1971).

AVIFAUNA

In the checklist prepared by the Forest Department, 181 bird species are mentioned (Rajkondawar 1991). Yogesh Dubey (*pers. comm.* 2003) has listed 185 bird species.

This site qualifies A1 criteria as five globally threatened species have been identified within it.

This site harbours the typical birds of Tropical Dry Deciduous Forest of central India. Of the 59 species listed by BirdLife International (undated) for Biome-11, 23 have been seen here. Most of them are quite common and present in other parts of India, and owing to the long history of protection of these forests, they are doing quite well here. This site is selected both for threatened species (A1) and biome species (A3).

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Vulnerable	
Lesser Adjutant	*Leptoptilos javanicus*
Greater Spotted Eagle	*Aquila clanga*
Sarus Crane	*Grus antigone*
Green Munia	*Amandava formosa*
Biome-11: Indo-Malayan Tropical Dry Zone	
Black Ibis	*Pseudibis papillosa*
White-eyed Buzzard	*Butastur teesa*
Painted Francolin	*Francolinus pictus*
Rain Quail	*Coturnix coromandelica*
Jungle Bush-Quail	*Perdicula asiatica*
Indian Peafowl	*Pavo cristatus*
Yellow-legged Green-Pigeon	*Treron phoenicoptera*
Plum-headed Parakeet	*Psittacula cyanocephala*
Common Indian Nightjar	*Caprimulgus asiaticus*
Brown-headed Barbet	*Megalaima zeylanica*
Yellow-fronted Pied Woodpecker	*Dendrocopos mahrattensis*
Lesser Golden-backed Woodpecker	*Dinopium benghalense*
Ashy-crowned Sparrow-Lark	*Eremopterix grisea*
Small Minivet	*Pericrocotus cinnamomeus*
Common Woodshrike	*Tephrodornis pondicerianus*
Indian Robin	*Saxicoloides fulicata*
Indian Chat	*Cercomela fusca*
Jungle Babbler	*Turdoides striatus*
Jungle Prinia	*Prinia sylvatica*
Ashy Prinia	*Prinia socialis*
Green Munia	*Amandava formosa*
Brahminy Starling	*Sturnus pagodarum*
White-bellied Drongo	*Dicrurus caerulescens*

Tadoba-Andhari is also the southern most region in the distribution range of Sarus Crane *Grus antigone*. The Sarus is not found inside

the forest but at Moharli Lake that lies on the outskirts of the Park. However, Y. Dubey who worked in Tadoba for three years have never seen Sarus in this lake. Sarus has been reported from Junoona area in Chandrapur district but the area is quite far from Tadoba (Yogesh Dubey *pers. comm.* 2003)

OTHER KEY FAUNA

The faunal diversity includes 41 species of mammals, 30 species of reptiles, 5 species of amphibians, 74 species of butterflies, 26 species of spiders, and 23 species of fishes. The Marsh Crocodile *Crocodylus palustris* has been introduced in Tadoba Lake.

LAND USE

- Tourism and recreation
- Nature conservation and research

Five globally threatened bird species are reported from Tadoba TR.

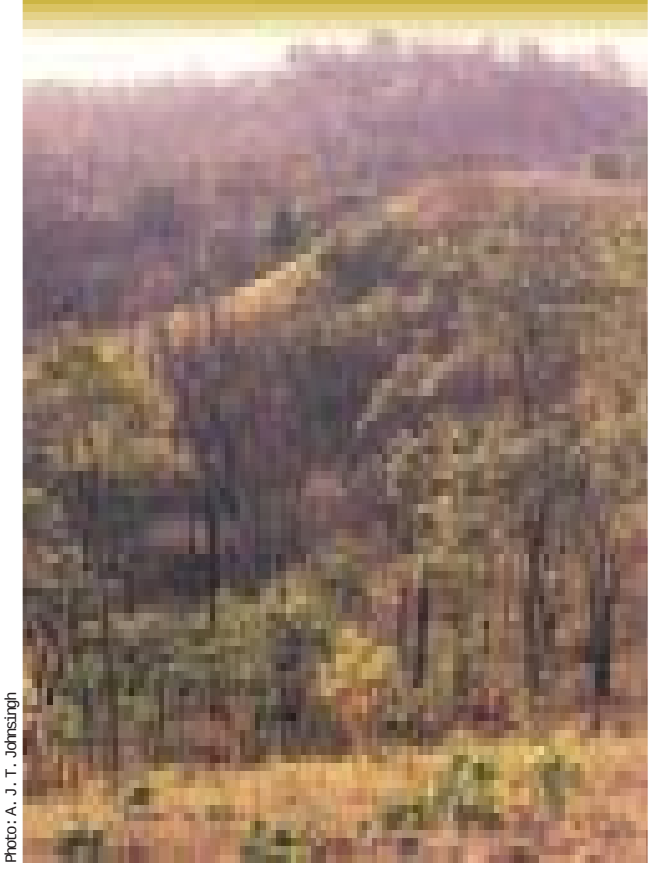


Photo: A. J. T. Johnsingh

THREATS AND CONSERVATION ISSUES

- Construction and impact of dams
- Forest grazing
- Firewood collection
- Man-animal conflict
- Forest fires
- Poaching

The Tadoba National Park and Andhari Wildlife Sanctuary are surrounded by big villages. There are six villages inside the Park and 52 on the periphery. The actual area under the control of the Forest Department differs from the notified area. Illegal grazing and hunting are known to occur and patrolling is necessary. Illegal tree felling, encroachment, and crop raiding by wildlife result in man-animal conflicts. The construction of a dam is proposed outside the Park near Arjuni village.

The Tadoba-Andhari Tiger Reserve is gaining from excellent protection measures, but these benefits will be negated if the irrigation project is allowed to come up. This project will submerge almost 3,000 ha of forests adjoining the Reserve. Apart from the direct loss of forest land due to submergence, there will also be disturbance during the construction process, workers' colonies, fishing operations on the reservoir and secondary pressure on surrounding forests. The project will also destroy the continuity of tiger habitat between Tadoba and Indravati Tiger Reserve in Chhattisgarh. The reservoir formed by the dam will prevent free movement of wildlife to the east and southeast of Tadoba.

Killing of domestic livestock by tigers and leopards is frequent in areas where there are villages. This usually has an adverse impact on the economic conditions of the local people and results in antagonism towards the management and the tigers.

KEY CONTRIBUTORS

Anish Andheria, Deepak Apte, Rushikesh Chauhan and Girish Jathar

KEY REFERENCES

Anonymous (1971) National Parks and Wildlife Sanctuaries in Maharashtra State. Directorate of Publicity, Government of Maharashtra, Bombay, India.

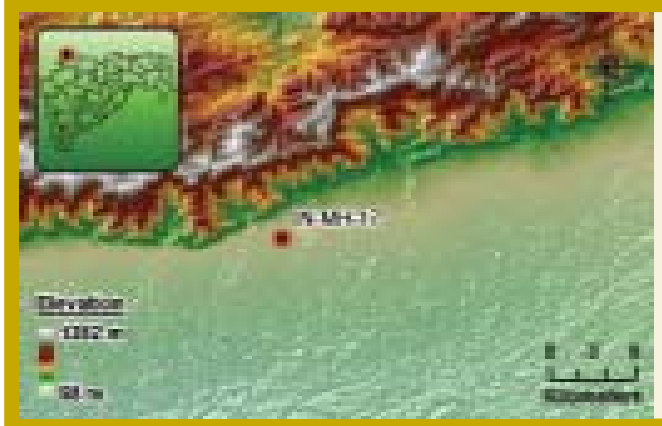
BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book.* BirdLife International, Cambridge, U.K., unpublished.

Rajkondawar, P. L. (1991) Tadoba National Park, Chandrapur: Checklist of Avifauna. Published by Dy. Conservator of Forest, Chandrapur. Pp. 10.

Tuljapurkar, B. (1994) Magic moments – A Tadoba experience. *Sanctuary Asia* 14(5): 35-41.

MH-17

TALODA RESERVE FORESTS



IBA Site Code	:	IN-MH-17
State	:	Maharashtra
District	:	Nandurbar
Coordinates	:	21° 37' 60" N, 74° 12' 00 E
Ownership	:	State
Area	:	Not available
Altitude	:	500 - 600 m
Rainfall	:	900 mm
Temperature	:	8 °C to 43 °C
Biogeographic Zone	:	Deccan Peninsula
Habitats	:	Tropical Dry Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Secondary Area s075: Central Indian Forests)
PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Taloda Forest range is located in Taloda *tehsil* of Nandurbar district, south of the Narmada river and *c.* 60 km from the Gujarat border. The general topography of the area consists of steep hills with open as well as dense patches of dry deciduous forests.

The *Bheels* and *Pawaras* are the dominant tribes in this area. They have a rich cultural diversity. In some remote areas, they still lead their traditional way of life, untouched by modernity. They are totally dependent on forests for their day-to-day requirements. Taloda forest was made famous in 1997 when the Forest Owlet *Heteroglaux blewitti* was found here by P. C. Rasmussen and F. Ishtiaq (Ishtiaq 1999).

In 2003, some areas near the forest owlet site was cleared for rehabilitation of tribals from the Sardar Sarovar dam site.

The forest is of Tropical Dry Deciduous type. The dominant species are Teak *Tectona grandis* and *Anogeissus latifolia*, with several associated species such as *Boswellia serrata*, *Mitragyna parvifolia*, *Adina cordifolia*, *Madhuca indica* and *Bombax ceiba*. Grasses like *Cymbopogon* are commonly found on the slopes.

Taloda RF is one of the few sites for the Forest Owlet *Heteroglaux blewitti*.

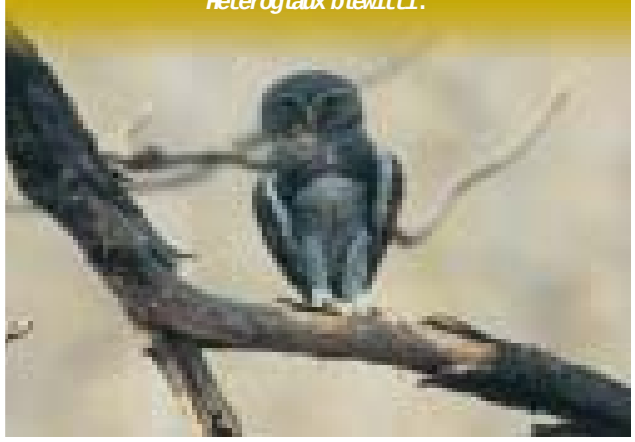


Photo: Girish Jathar

AVIFAUNA

Taloda forest range is one of the refuges of the highly endangered and endemic Forest Owlet *Heteroglaux blewitti*. This bird is listed as Critically Endangered by BirdLife International (2001). The species was thought to be extinct, until its rediscovery in 1997 by King and Rasmussen (1998). Later during a BNHS study on the Forest Owlet, three pairs were recorded here in 2000 (Ishtiaq and Rahmani 2000). In the past, James Davidson had collected four specimens of Forest Owlet from Taloda tehsil (Davidson 1881).

Taloda is one of the few sites in India that come under the Secondary Area category of BirdLife International. Secondary area is an area which supports one or more Restricted Range species, but does not qualify as an Endemic Bird Area because the number of species entirely confined to it is less than two.

The globally threatened Greater Spotted Eagle *Aquila clanga* is also found here in winter.

Taloda is one of the few sites where three Critically Endangered species are found.

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Long-billed Vulture	*Gyps indicus*
Forest Owlet	*Heteroglaux blewitti*
Vulnerable	
Greater Spotted Eagle	*Aquila clanga*
Secondary Area s 075: Central Indian Forests	
Forest Owlet	*Heteroglaux blewitti*

OTHER KEY FAUNA

The mammalian fauna of the Reserve Forest includes Leopard *Panthera pardus*, Four-horned Antelope *Tetracerus quadricornis*, Barking Deer *Muntiacus muntjak*, Sloth Bear *Melursus ursinus*, Jungle Cat *Felis chaus*, Common Langur *Semnopithecus entellus*, and the Rufous-tailed Hare *Lepus nigricollis ruficaudatus*.

LAND USE

- Forestry
- Agriculture

MH-17

There is a great opportunity to involve tribals in the protection of Forest Owlet and other species, through conservation education.

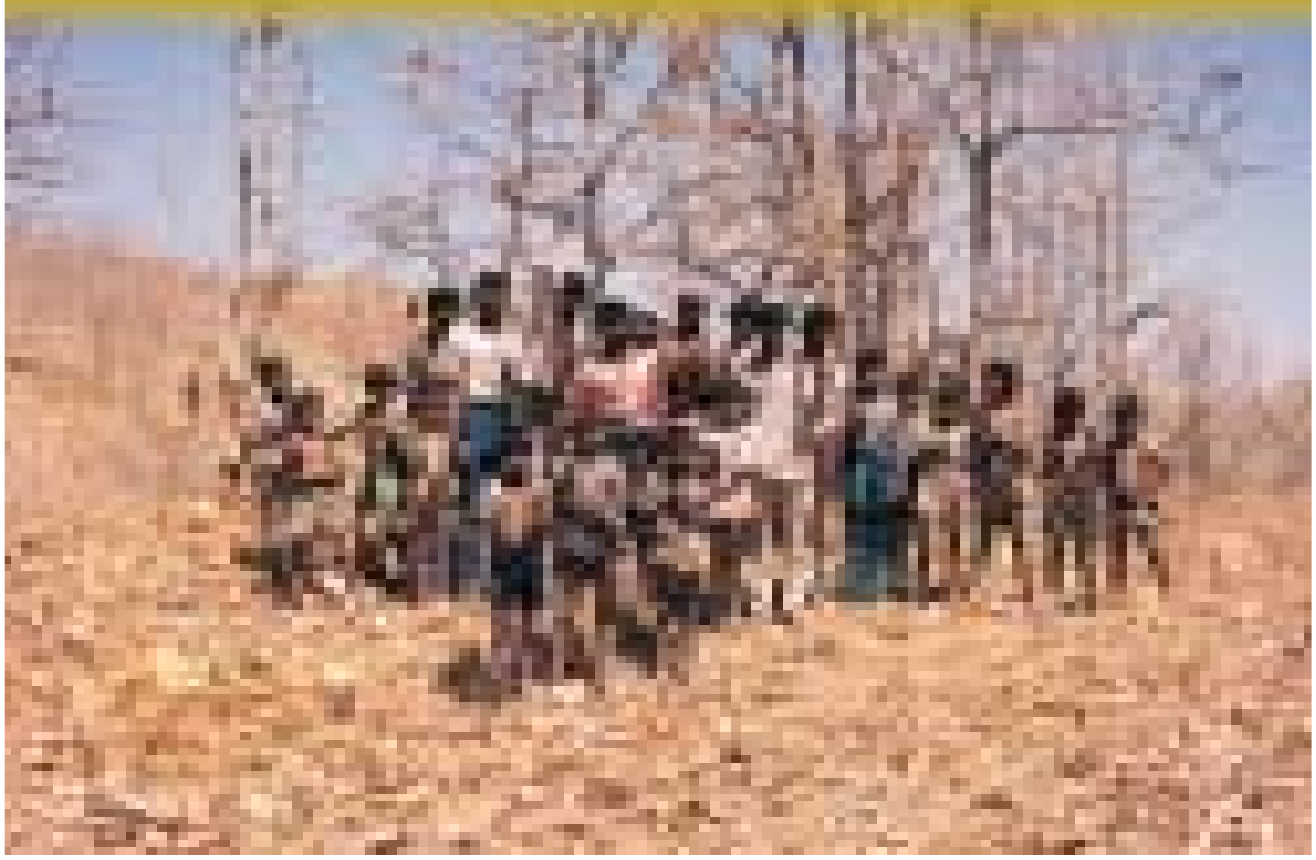


Photo: Mehboob Alam

THREATS AND CONSERVATION ISSUES

- Encroachment
- Grazing
- Illicit woodcutting
- Intentional forest fires
- Rehabilitation of tribals from Sardar Saravor project

The major threat for the Forest Owlet is habitat degradation and destruction. In 2000, about 5,000 ha of plain forest area near the Forest Owlet site was cleared to rehabilitate displaced persons from the Sardar Sarovar Project. About 500 families now live in this area and use the forest resources that add to the burden on the rapidly disappearing habitat of the Forest Owlet (Ishtiaq 2000).

The tribals hunt owls and destroy their nests due to superstitious beliefs.

KEY CONTRIBUTORS

Girish Jathar and Farah Ishtiaq

KEY REFERENCES

BirdLife International (2001) *Threatened Birds of Asia: The BirdLife International Red Data Book*. BirdLife International, Cambridge, U.K.

Davidson, J. (1881) Rough list of birds of Khandesh. *Stray Feathers* 10: 279-327.

Ishtiaq, F. (1999) Forest Owlet – an update. *Hornbill* June- Sept: 26-28.

Ishtiaq, F. (2000). Red Data Bird: Forest Spotted Owlet. *Newsletter for Birdwatchers*40 (3): 29-31.

Ishtiaq, F. and A. R. Rahmani (2000) Further information on status and distribution of Forest Owlet *(Athene blewitti)*. *Forktail*. 16: 125-130.

King, B. F. and P. C. Rasmussen (1998) The rediscovery of the Forest Owlet *Athene* (*Heteroglaux*) *blewitti*. *Forktail*. 14: 51-53.

MH-18

TANSA WILDLIFE SANCTUARY

IBA Site Code	:	IN-MH-18
State	:	Maharashtra
District	:	Thane
Coordinates	:	19° 31' 18" N, 73° 15' 36" E
Ownership	:	State
Area	:	30,481 ha
Altitude	:	70 - 300 m
Rainfall	:	3,000 mm
Temperature	:	10 °C to 38 °C
Biogeographic Zone	:	Western Ghats
Habitats	:	Tropical Dry Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A3 (Biome-11: Indo-Malayan Tropical Dry Zone)
PROTECTION STATUS: Wildlife Sanctuary, established in June 1970

GENERAL DESCRIPTION

Tansa Wildlife Sanctuary is located 90 km northeast of Mumbai, in the foothills of the Sahyadris (Western Ghats). It extends over Wada, Shahapur and Mokhada *talukas* of Thane district. It has two rivers, the Tansa and Vaitarna, and the Sanctuary gets its name from the former which divides the Sanctuary into two parts.

The Sanctuary forms the catchment area of Tansa lake, along with the surrounding forests of Khardi, Vaitarna, Wada and Shahapur ranges. The reservoir on the River Tansa occupying an area of *c.* 20 sq. km is under the administration of Brihanmumbai Municipal Corporation (BMC). Tansa reservoir, along with Vaitarna and Bhatsa reservoirs, is the major sources of water to the megacities of Mumbai and Thane.

Five revenue villages located geographically within the Sanctuary, donot form part of the Sanctuary. More than 100 villages are found in the periphery of the Sanctuary, many dependent on the Sanctuary for livelihood.

Within Tansa Sanctuary, there is a fort at Mahuli, situated on a 762 m high hill top, indicating the area's historical importance.

The Sanctuary has Southern Tropical Moist Deciduous Forest, with a few patches of Evergreen forest. The dominant species are Teak *Tectona grandis*, Khair *Acacia katechu*, Kadam *Mitragyna parvifolia*, *Adina cordifolia*, Mahua *Madhuca indica*, and Red Silk Cotton *Bombax ceiba*.

Tansa in the foothills of Western Ghats provide habitat for 212 species of birds.

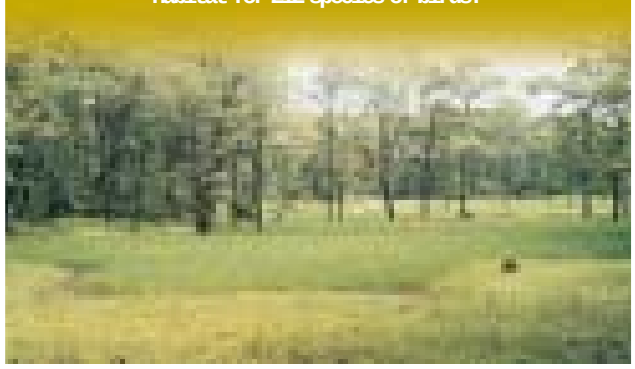


Photo: Girish Jathar

AVIFAUNA

About 212 bird species have been recorded from Tansa (S. Laad *pers comm.* 2003; Maharashtra Forest Dept Unpubl. Checklist 1996). Besides the two Critically Endangered *Gyps* species of vultures, the Vulnerable Pallas's Fish-Eagle *Haliaeetus leucoryphus* is also seen here.

The site also qualifies for Biome-11 criteria, as 19 out of 59 species of this biome can be easily seen here. If detailed studies are conducted, many more species would be added.

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Long-billed Vulture	*Gyps indicus*
Vulnerable	
Pallas's Fish-Eagle	*Haliaeetus leucoryphus*
Biome-11: Indo-Malayan Tropical Dry Zone	
Black Ibis	*Pseudibis papillosa*
Jungle Bush-Quail	*Perdicula asiatica*
Indian Peafowl	*Pavo cristatus*
Yellow-wattled Lapwing	*Vanellus malabaricus*
Yellow-legged Green-Pigeon	*Treron phoenicoptera*
Plum-headed Parakeet	*Psittacula cyanocephala*
Mottled wood-Owl	*Strix ocellata*
Common Indian Nightjar	*Caprimulgus asiaticus*
Indian Grey Hornbill	*Ocyceros birostris*
Lesser Golden-backed Woodpecker	*Dinopium benghalensis*
Sykes's Crested Lark	*Galerida deva*
Small Minivet	*Pericrocotus cinnamomeus*
Common Woodshrike	*Tephrodornis pondicerianus*
Jungle Babbler	*Turdoides striatus*
Jungle Prinia	*Prinia sylvatica*
Ashy Prinia	*Prinia socialis*
Grey-headed Starling	*Sturnus malabaricus*
Brahminy Starling	*Sturnus pagodarum*
White-bellied Drongo	*Dicrurus caerulescens*

MH-18

OTHER KEY FAUNA

Little work has been done on the fauna of this Sanctuary (Singh and Pradhan 1992). Tiger *Panthera tigris* is occasionally sighted. Two were sighted in Suryamal Range by tribals and forest authorities in 1986. The Leopard *Panthera pardus* is quite common. Other members of the Felidae family reported by Singh and Pradhan (1992) are the Indian Desert Cat *Felis silvestris*, Jungle Cat *F. chaus*, Leopard Cat *F. bengalensis* and Rusty-Spotted Cat *Prionailurus rubiginosus*. However, Desert Cat and Rusty-spotted Cat need further confirmation.

Other mammal species present at Tansa are Golden Jackal *Canis aureus*, Striped Hyena *Hyaena hyaena*, Wild Boar *Sus scrofa*, Four-horned Antelope *Tetracerus quadricornis*, Chital *Axis axis*, Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak*, Mouse Deer *Moschiola meminna* and Black-naped Hare *Lepus nigricollis*.

Indian Porcupine *Hystrix indica*, Ruddy Mongoose *Herpestes smithii*, Small India Civet *Viverricula indica* and Indian Pangolin *Manis crassicaudata* are the common smaller mammals.

Among reptiles, Indian Pond Terrapin *Melanochelys trijuga*, Common Indian Monitor Lizard *Varanus bengalensis*, Indian Rock Python *Python molurus*, Trinket Snake *Elaphe helena* and Rat Snake *Ptyas mucosus* are common.

LAND USE

- Nature conservation
- Catchment area of reservoirs

THREATS AND CONSERVATION ISSUES

- Overgrazing
- Illegal felling of trees
- Expansion of agriculture
- Poaching/ hunting of birds and animals

Many roads link the Sanctuary to the Mumbai-Agra highway and to the railway lines, which facilitates the activities of the timber mafia. Illegally felled timber is smuggled by these routes to different places. Khair, needed for manufacturing Gutka, is also smuggled from the forest of Tansa, and is further transferred to northeast India.

A nearby area was declared as an industrial zone, thus attracting outsiders who are putting pressure on the natural resources of the Sanctuary.

As the road inside the Sanctuary is under the control of the BMC, there is very little check on the vehicles passing through the Sanctuary, so many wildlife crimes remain undetected.

Though, Tansa is one of the source of water to Mumbai city, its surrounding villages suffers acute shortage of water during the dry months. This leads to unrest among the people around the Sanctuary. The Sanctuary is also riddled with human settlements and villages, making it extremely difficult for the Forest Department to manage, especially when they have limited resources and inadequate staff.

Low level of poaching is the major problem in and around Tansa Lake.

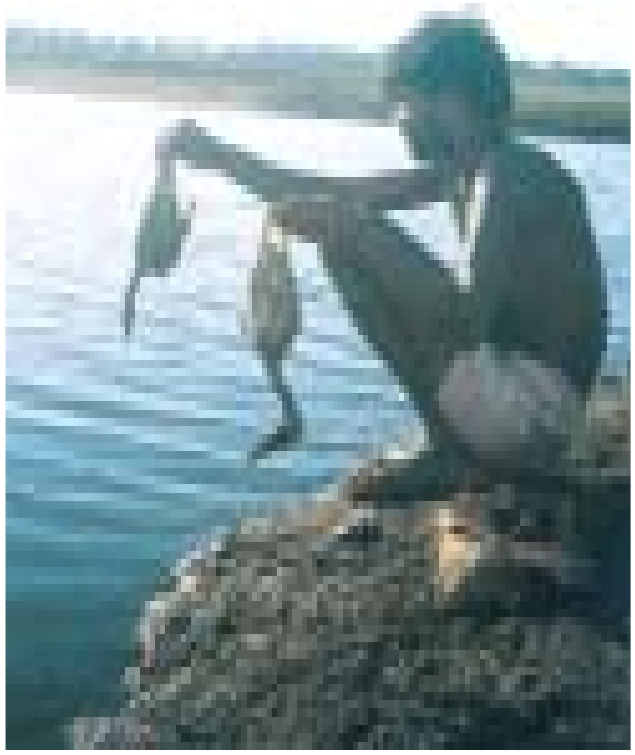


Photo: Sunil Laad

KEY CONTRIBUTOR

Sunil Laad

KEY REFERENCE

Singh, D. F. and Pradhan, M. S. (1992) Vertebrate fauna of Tansa Wildlife Sanctuary, Maharashtra. *Rec. Zool. Surv. India* 91(3-4): 449-470.

MH-19

THANE CREEK

IBA Site Code	:	IN-MH-19
State	:	Maharashtra
District	:	Mumbai, Thane
Coordinates	:	19° 07' 30" N, 72° 57' 30" E
Ownership	:	State and Private
Area	:	12,200 ha
Altitude	:	0 m
Rainfall	:	2,293 mm
Temperature	:	17 °C to 35 °C
Biogeographic Zone	:	Coasts
Habitats	:	Littoral Forest, Mudflats

IBA CRITERIA: A1 (Threatened Species), A4i (≥1% biogeographic population of waterbird), A4iii (≥20,000 population of waterbirds)
PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Thane creek is one of the largest creeks in Asia and is located partly on the coast of Mumbai metropolis. The east bank lies in the Thane and Navi Mumbai districts, while the west bank is in the Greater Mumbai district. The creek runs about 26 km north from Mumbai harbour before it joins Ulhas river through a small channel. There are several sources of fresh water for the creek, of which Ulhas river is the largest, followed by numerous drainage channels from various suburban areas of Mumbai, Navi Mumbai and Thane.

The site is a mixture of saltpans as well as stretches of mangroves. The saltpan lands are potential areas for mangrove development, and can be easily reverted to their original status, that of mangroves.

Considering the value of the adjoining areas in terms of bird habitat, the IBA can be extended to Uran on the eastern side and Sewree on the western side. The area also includes Elephanta Island, which is an international tourist destination.

About 90 species of plants are recorded from this IBA. Three types of vegetation are recognized here: mangrove, mangrove associated species and non-mangrove plants. Among mangroves *Avicennia marina, A. officinalis, A. alba, Rhizophora mucronata* and *Ceriops tagal* are the dominant species. Among the mangrove associates *Acanthus ilicifolius, Aleuropus lagopoides, Sesuvium protulacastrum* and *Salvadora persica* are dominant (Nitsure 2002).

AVIFAUNA

Over 205 species of birds have been reported from this area (Nitsure 2002). Thane Creek is a very important wintering ground for waterbirds. It supports over 1,00,000 birds during winter (Kulkarni 2000). These include the Lesser Flamingo *Phoenicopterus minor*, Greater Flamingo *Phoenicopterus ruber*, Asian Openbill *Anastomus oscitans*, White Stork *Ciconia ciconia*, Pied Avocet *Recurvirostra avosetta*, Eastern Golden Plover *Pluvialis dominica*, Ruddy Turnstone *Arenaria interpres* and Dunlin *Calidris alpina*. Smaller waders, especially Little Stints *Calidris minutus* and Temminck's Stints *C. temminckii* are sometimes seen in tens of thousands.

Thane Creek and surrounding regions sometimes show unusual bird species. For instance, on June 4, 1970, a Least Frigate Bird *Fregata ariel iredalei* was found on the Mumbai beach. It was tagged at Aldabra Island on April 18, 1969 (Ali 1970). Similarly, a Pallas's Fish Eagle *Haliaeetus leucoryphus* was noted near Vihar Lake (Bannerjee 1984), about 10 km from Thane Creek.

This site is selected as an IBA mainly because of a very large number of waterbirds found here (A4 criteria). Many species occur much above their 1% biogeographic population threshold determined by the Wetlands International (2002). Detailed studies on the bird life of this important site are urgently required.

Vulnerable	
Greater Spotted Eagle	*Aquila clanga*
Near Threatened	
Lesser Flamingo	*Phoenicopterus minor*

OTHER KEY FAUNA

About 27 species of phytoplankton were recorded from this area (Quadrus 2001). About 33 species of reptiles, 13 species of crabs, 7 species of prawns, 23 species of butterflies and 21 species of fish, and mammals like the Jungle Cat *Felis chaus*, Golden Jackal *Canis aureus* and Common Mongoose *Herpestes edwardsi* also inhabit the area (Deshmukh 1990, Kulkarni 2000).

The endangered Green Turtle *Chelonia mydas* was also recorded from here (Varad Giri *pers. comm.* 2002).

LAND USE

- Dumping waste and effluents
- New bridges and road construction
- Industries
- Land fills
- Sewage treatment facilities

THREATS AND CONSERVATION ISSUES

- Industrialization
- Urbanization
- Dumping of solid waste in the creek
- Seepage of organic and inorganic waste in the creek
- Logging
- Illicit liquor production
- Oil spills
- Siltation

MH-19

Thane Creek is a proposed Ramsar site for its large congregation of waders and flamingos.

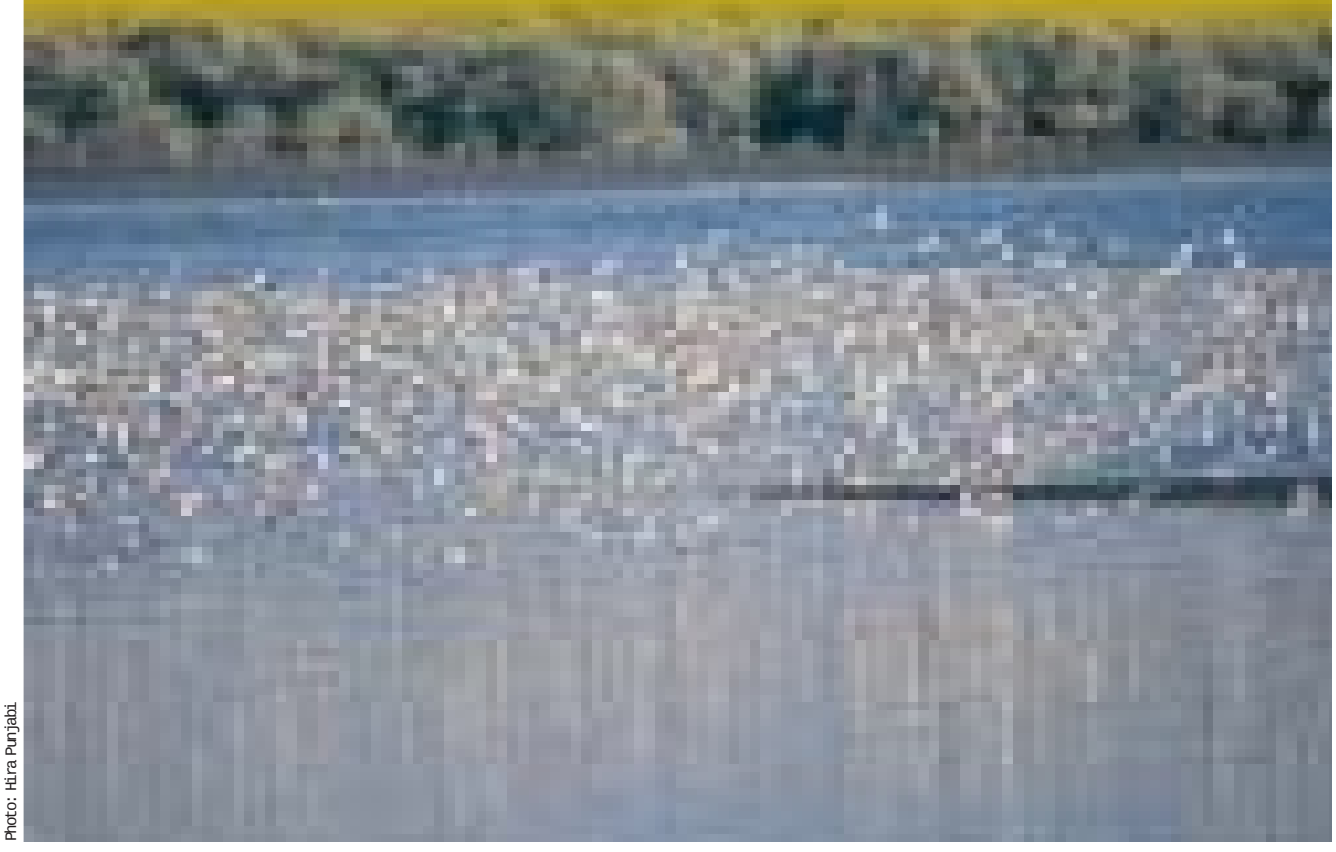


Photo: Hira Punjabi

The biggest threat to the mangroves in this area is reclamation of land for housing, slums, industries, and dumping of debris. The area receives high loads of sewage, effluents and bacterial load. The water is highly contaminated with oils and grease due to its proximity to two ports. The oil slick causes particular trouble to waterbirds. Slums growing around the creek are dependent on the mangroves for fuel wood, and an estimated 400 tons of mangroves are cut every year for this purpose. About 3,000 metric tons of solid waste is dumped along the creek everyday. Due to heavy siltation, the creek is becoming shallower. Poaching by local fishermen is also considerable, and the birds thus taken are usually eaten locally.

KEY CONTRIBUTORS

Vivek Kulkarni and Debi Goenka

KEY REFERENCES

Ali, R.(1970) Occurrence of Least Frigate Bird (*Fregata ariel iredalei* Mathews) in Bombay. *J. Bombay Nat. Hist. Soc.* 67(3): 569-570.

Bannerjee, D. P. (1984) Sighting of Ringtailed Fishing Eagle at Vihar Lake, Greater Bombay. *J. Bombay Nat. Hist. Soc.* 81(2): 468-469.

Deshmukh, S. V. (1990) Ecological Studies of Mangroves in Bombay. Ph.D. thesis. University of Bombay. Pp. 153.

Kulkarni, V. S. (2000) Godrej: Symbiosis of Industry and Nature, Published by Soonabai Pirojsha Godrej Foundation and Bombay Natural History Society.

Nitsure, S. R (2002) The Study of Avifauna at Thane Creek near Rutuchakkra Nature Park. M.Sc Dissertation.Indian Institute of Ecology and Environment, New Delhi.

Quadrus, G. (2001) Study of Intertidal fauna of Thane creek Ph.D. Thesis. University of Mumbai, Mumbai.

Wetlands International (2002) *Waterbird Population Estimates: Third Edition*. Wetlands International Global Series No. 12. Wageningen, The Netherlands.

MH-20

TORANMAL RESERVE FOREST

IBA Site Code	:	IN-MH-20
State	:	Maharashtra
District	:	Nandurbar
Coordinates	:	21° 45' 00" N, 74° 30' 00" E
Ownership	:	State
Area	:	26,000 ha
Altitude	:	350 - 1,200 m
Rainfall	:	900 mm
Temperature	:	10 °C to 48 °C
Biogeographic Zone	:	Deccan Peninsula
Habitats	:	Tropical Dry Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Secondary Area s075: Central Indian Forests)
PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Toranmal Reserve Forest is located in Shahada *tehsil* of Nandurbar district, Maharashtra. Situated south of the Narmada river, *c.* 100 km from the Gujarat border, this area is located on the Deccan pleateau of Central India.

The general topography of the area is undulating hills with open as well as dense patches of forests, which are Dry Deciduous type. There are 46 villages in and around the Reserve Forest, and the local population depends entirely on the forest for livelihood. Nine different tribal communities reside in and around the Reserve Forest. The *Pawara*, *Bheel*, *Nahal*, and *Rathod* tribals are the dominant tribal communities who have been living in these forests for hundreds of years.

This Reserve Forest has two water reservoirs which support the surrounding villages and wildlife. However, the area experiences acute water shortage during the hot dry summer months.

This IBA has Tropical Dry Deciduous type of forest. About 225 species of plants are reported from the Reserve Forest (Forest Department checklist). The dominant species are Teak *Tectona grandis*, Salai *Boswellia serrata*, Kadam *Mitragyna parvifolia*, Mahua *Madhuca indica*, and Red Silk Cotton *Bombax ceiba*.

AVIFAUNA

Davidson (1881) mentioned the rich bird diversity of this region. He had recorded around 294 species of birds from Western Khandesh. He also recorded the Green Munia *Amandava formosa*, Syke's Nightjar *Caprimulgus mahrattensis*, Blue-cheeked Bee-eater *Merops persicus*, Spot-billed Pelican *Pelecanus philippensis*, Sociable Lapwing *Vanellus gregarius*, Lesser Florican *Sypheotides indica*, Great Indian Bustard *Ardeotis nigriceps* and the Forest Owlet *Heteroglaux blewitti*. Due to the increasing human population, these birds were slowly eliminated from Western Khandesh.

Toranmal Reserve Forest is considered to be one of the last refuges of the Critically Endangered, endemic Forest Owlet. This species was considered extinct until 1997, when it was rediscovered by Ben King and Pamela Rasmussen (King and Rasmussen 1998). Since 1999, the BNHS is carrying out ecological studies on this bird (Ishtiaq and Rahmani 2000, Jathar and Rahmani 2002).

The presence of the Critically Endangered Forest owlet is reason enough to designate this area as an IBA. Along with Taloda, Toranmal is one of the few sites in India that come under Secondary Area category of BirdLife International (undated) and Stattersfield *et al*. (1998). Secondary area is an area which supports one or more restricted range species, but does not qualify as an Endemic Bird Area because fewer that two species are entirely confined to it.

The remnant forest of Western Khandesh is representative of the type of forest that was present a hundred years ago. Most of the rare species mentioned by Davidson (1881) are no longer found here, but even so birds of tropical dry deciduous forest are found. According to studies conducted by the BNHS, there are 233 species of birds (G. Jathar, unpublished checklist.). Of the 59 Biome-11 species identified by BirdLife International (undated), 27 have already been seen here. Therefore, this site qualifies in A3 criteria also.

Critically Endangered	
Oriental White-backed Vulture	*Gyps bengalensis*
Long-billed Vulture	*Gyps indicus*
Forest Owlet	*Heteroglaux blewitti*
Vulnerable	
Greater Spotted-Eagle	*Aquila clanga*
Lesser Kestrel	*Falco naumanni*
Green Munia?	*Amandava formosa*
Secondary Area s075: Central Indian Forests	
Forest Owlet	*Heteroglaux blewitti*

OTHER KEY FAUNA

Studies conducted by the BNHS have revealed eight species of rodents, three species of shrews, five species of lizards and skinks, four species of geckos and five species of amphibians. Large mammals include Leopard *Panthera pardus*, Golden Jackal *Canis aureus*, Four-horned Antelope *Tetracerus quadricornis*, Sloth Bear *Melursus ursinus*, and Striped Hyena *Hyaena hyaena*.Rufous-tailed Hare *Lepus nigricollis ruficaudatus* is quite common. Forty species of butterflies have been recorded (G. Jathar *pers. comm*. 2003).

LAND USE

- Forestry
- Agriculture
- Small irrigation projects

MH-20

THREATS AND CONSERVATION ISSUES

- Encroachment
- Grazing
- Illicit wood cutting
- Intentional forest fires
- Poor management practices by Forest Department
- Myths and misconceptions among tribals

Toranmal Reserve Forest is under tremendous human pressure. It suffers from the usual problems of a typical Indian forest: over-grazing by livestock, illicit cutting of trees, encroachment, intentional fires set by tribal and graziers for good growth of grass, removal of large trees in the name of collection of minor forest products, etc. The remaining pairs of Forest Owlet are under intense pressure of poaching by tribals for superstitious reasons. It was observed that the local tribals utilize owl eggs and body parts for witchcraft and other ritual customs (Jathar and Rahmani 2002).

Toranmal is another site for Forest Owlet *Heteroglaux blewitti*. Black magic is a major threat for this rare species.

Photo: Girish Jathar

Another longer-term threat is the encroachment around the Forest Owlet area by tribals for cultivation. Forest management practices such as removal of bamboo and afforestation of exotic species in the Forest Owlet area may significantly affect the Forest Owlet habitat. Scientific management of the Reserve Forest is required.

It is strongly recommended that any further deforestation in the name of rehabilitation of Narmada Dam oustees should be stopped at once, and this important habitat of the Forest Owlet should be declared as a National Park or a Sanctuary. Very strong environmental awareness programmes should be started amongst the tribals to wean them away from killing this highly endangered bird. Perhaps an alternative to their customary practices should be found.

KEY CONTRIBUTOR

Girish A. Jathar

KEY REFERENCES

BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, U.K., unpublished.

Davidson, J. (1881) Rough list of birds of Khandesh. *Stray Feathers* 10: 279-327.

Ishtiaq, F. and A. R. Rahmani (2000) Further information on status and distribution of Forest Owlet *(Athene blewitti)*. *Forktail* 16: 125-130.

Jathar, G. A. and A. R. Rahmani (2002) Ecological studies on the Forest Spotted Owlet *Athene* (*Heteroglaux*) *blewitti*. Annual Report. Bombay Natural History Society, Mumbai.

King, B. F. and P. C. Rasmussen (1998) The rediscovery of the Forest Owlet *Athene* (*Heteroglaux*) *blewitti*. *Forktail* 14: 51-53.

Stattersfield, A. J., Crosby, M. J., Long, A. J. and Wege, D. C. (1998) *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. BirdLife Conservation Series No. 7. BirdLife International, Cambridge, U.K.