

MADHYA PRADESH

IN-
MP



Photo : Nayana Khanolkar

Tropical Dry Deciduous forests and numerous wetlands of Madhya Pradesh provide refuge to a large number of birds.

Madhya Pradesh (21° 06" - 26° 30" North and 74° 00"- 82° 51" East) is the second largest state of India after Rajasthan and has a geographical area of 3,08,144 sq. km (9.38% of India's geographical area). Chhattisgarh bounds the State on the east, Rajasthan and Gujarat on the west, Uttar Pradesh on the north and Maharashtra on the south. It has 45 districts and the famous city of Bhopal is the capital. Earlier, Madhya Pradesh was the biggest state, but on November 1, 2000, it was divided into two states, Madhya Pradesh and Chhattisgarh. The Tropic of Cancer crosses Madhya Pradesh. The State comprises three main sections of the the Deccan plateau, namely, the Central Highland, the Satpura Maikal ranges and the Eastern plateau.

The state is blessed with many rivers such as the Chambal, Narmada, Tapti, Betwa, Ken, Sone and Jamner.

The state has mainly three seasons, namely winter, summer and monsoon. The rainfall decreases from the southeast and east to the northwest and west. The average annual rainfall varies from 500 mm (Indore) to 3,000 mm (Pachmarhi) and the temperatures range from 1 °C to 48 °C.

According to the 2001 census, the total population is 60,385,118 of which 73.33% is rural and 26.67% is urban. The population density is 196 persons per sq. km.

Vegetation

As per the Forest Survey of India report of 1999, there are four forest types, namely, the Tropical Moist Deciduous, Tropical Dry Deciduous, Tropical Thorn and Subtropical Broadleaf Hill Forests. The central, southern and eastern parts of the State have a better forest cover than the northern and western parts, which are deficient in forest vegetation. Teak and Sal are the two most important forest formations of the State, covering 18.0% and 16.7% forest area respectively, while miscellaneous forests cover 65.3% of the total forest area. Between 1999 and 2001, a net 2,128 sq. km has been added to the forest area of Madhya Pradesh (Ministry of Environment and Forest 2001). The total forest cover is 25.1% of the State's geographical area whereas it is 11.4% of the country's forest cover (Ministry of Environment and Forest 2001).

The Tropical Dry Deciduous forests harbours a large number of bird species. The numerous wetlands and reservoirs of the state provide a refuge to a large number of migrating birds during winters. The commonest waterbirds include Coot *Fulica atra*, Red-crested Pochard *Rhodonessa rufina*, Northern Pintail *Anas acuta*, Gadwall *A. strepera*, Northern Shoveler *A. clypeata*, Bar-headed Goose *Anser indicus*, Greylag Goose *A. anser* and Ruddy Shelduck *Tadorna ferruginea*. The shallow waters and mudflats of these various wetlands are a safe haven for numerous waders.

Apart from rich avifauna, the State boasts of a wide range of terrestrial fauna. The key fauna includes large carnivores like the Tiger *Panthera tigris*, Leopard *Panthera pardus*, Grey Wolf *Canis lupus* and Dhole *cuon alpinus*. The rare Caracal *Caracal caracal* has also been reported from some parts of the State.

The ungulates are represented by Spotted Deer *Axis axis*, Sambar *Cervus unicolor*, Nilgai *Boselaphus tragocamelus*, Gaur *Bos frontalis*, Chinkara *Gazella bennettii*, Four-horned Antelope *Tetracerus quadricornis*, Blackbuck *Antelope cervicapra*, Wild Buffalo *Bubalus arnee* (= *bubalis*) and Wild Boar *Sus scrofa*. Apart from these, a small population of Barasingha *Cervus duvaucelii branderi*, which is also the State Animal of Madhya Pradesh, resides in the Kanha National Park.

IBAs AND PROTECTED AREAS

Eight national parks across nine districts, spread over an area of 3,10,872 ha, and 25 wildlife sanctuaries covering an area of 7,60,812 ha across 19 districts of the State, have been created. Among these protected areas there are five Tiger Reserves, namely Kanha, Bandhavgarh, Panna, Pench and Bori-Satpura (Ministry of Environment and Forest 2001). With about 25% of the tiger population of the country in these reserves, the State has earned the sobriquet of Tiger State of the country (Jain 2001). The Pachmarhi Biosphere Reserve is one of the 11 Biosphere Reserves of the country. The Bhoj wetland is one of the Ramsar sites declared in 2002 and an IBA, located in the city of Bhopal.

A total of 17 sites have been selected as IBAs in Madhya Pradesh. These represent the Tropical Dry Deciduous Forest, Mixed Thorn Forest and grassland, and wetland habitats. One of the IBAs is a Biosphere Reserve which includes a national park, two wildlife sanctuaries and a wetland. Five sites are national parks, four being wildlife sanctuaries; seven are wetlands out of which three are partially or fully associated with protected areas with the remaining four being mostly unprotected by status.

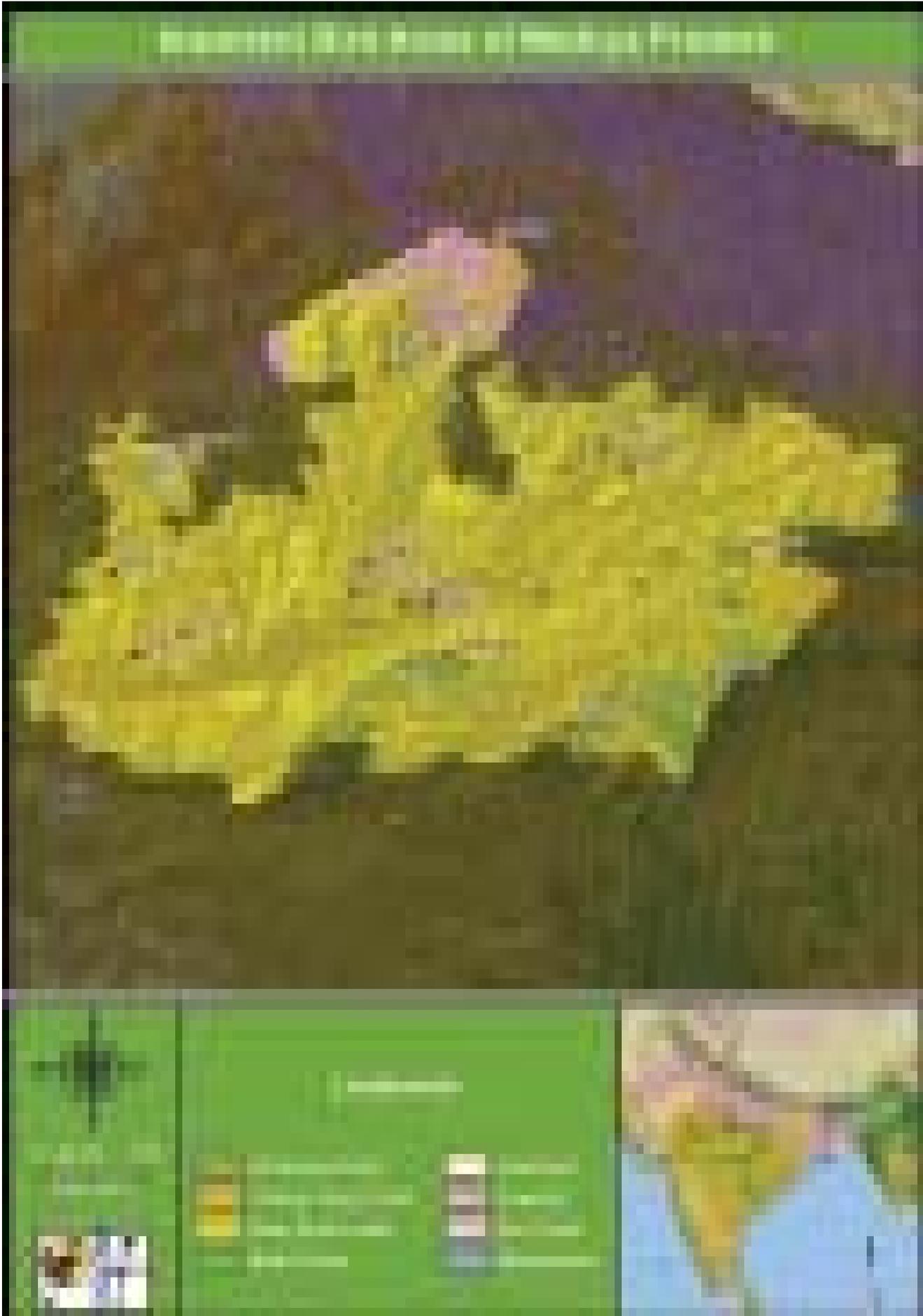
Number of IBAs and IBA criteria

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

IBAs of Madhya Pradesh

IBA site codes	IBA site names	IBA criteria
IN-MP-01	Bandhavgarh National Park	A1, A3
IN-MP-02	Barna Reservoir	A1, A4iii
IN-MP-03	Bhoj wetland	A1, A4i, A4iii
IN-MP-04	Bori Wildlife Sanctuary	A1, A3
IN-MP-05	Dihaila Jheel	A1, A4i, A4iii
IN-MP-06	Gandhi Sagar Wildlife Sanctuary and Reservoir	A4i, A4iii
IN-MP-07	Ghatigaon Wildlife Sanctuary	A1
IN-MP-08	Halali Reservoir	A1, A4iii
IN-MP-09	Kanha National Park	A1
IN-MP-10	Madhav National Park	A1, A4iii
IN-MP-11	Panna National Park	A1
IN-MP-12	Pench National Park	A1, A3
IN-MP-13	Rangawa Reservoir	A4iii
IN-MP-14	Ratapani Wildlife Sanctuary	A1, A4iii
IN-MP-15	Sailana Kharmor Sanctuary	A1
IN-MP-16	Sardarpur Wildlife Sanctuary	A1
IN-MP-17	Yeshwantsagar Reservoir	A1, A4i

Due to the lack of scientific bird surveys in the State, a few sites are data deficient and many potential sites might not have been included. Three IBAs (Sailana Wildlife Sanctuary, Sardarpur Wildlife Sanctuary and Ghatigaon Wildlife Sanctuary) fall under Tropical Thorn Forest and Grassland and provide refuge to the highly Endangered Great Indian Bustard and Lesser Florican. While seven sites (Kanha National Park, Bandhavgarh National Park, Ratapani Wildlife Sanctuary, Madhav National Park, Panna National Park, Pench National Park and Pachmarhi Biosphere Reserve) represent the Tropical Dry Deciduous Forests, a substantial area of Thorn Forest and Grassland can be observed in these sites as well.



AVIFAUNA

A total of 469 species of birds has been listed in Madhya Pradesh by Grimmett and Inskipp (2003). It includes three Critically Endangered birds (Oriental White-backed and Long-billed vultures, Siberian Crane), three Endangered species (Great Indian Bustard, Lesser Florican and Greater Adjutant) and 15 Vulnerable species. The Greater Adjutant is not found in any IBA. There are only historical records of this species from Sarguja, Sehore and Balaghat districts (BirdLife International 2001). Similarly, four species of Vulnerable category have historical or stray records, hence not listed in any IBA. Of the 15 Near Threatened species recorded in Madhya Pradesh, four are not found in any existing IBA. They are the Lesser Flamingo *Phoenicopterus minor*, White-tailed Sea-Eagle *Haliaeetus albicilla*, Lesser Grey-headed Fish Eagle *Ichthyaetus humilis* and Asian Dowitcher *Limnodromus semipalmatus*. None of them have significant population in this State.

Many birds listed in the threatened category (BirdLife International 2001) are found in Madhya Pradesh. Critically Endangered Forest Owlet *Heteroglaux blewitti* was reported in the undivided Madhya Pradesh. Recent additions to the Critically Endangered list, the Oriental White-backed *Gyps bengalensis* and the Long-billed *Gyps indicus* Vultures though largely depleted in number, can be found all over the State. The Endangered Great Indian Bustard and Lesser Florican have long been the State's pride. Vulnerable species like the Spot-billed Pelican *Pelecanus philippensis*, Lesser Adjutant *Leptoptilos javanicus*, Pallas's Fish-Eagle *Haliaeetus leucoryphus*, Greater Spotted Eagle *Aquila clanga*, Eastern Imperial Eagle *Aquila heliaca*, Lesser Kestrel *Falco naumanni*, Sarus Crane *Grus antigone*, Sociable Lapwing *Vanellus gregarius*, Indian Skimmer *Rynchops albicollis* and Green Munia *Amandava formosa* are among the other birds listed in the Red Data book (Birdlife International 2001) that are reported from the IBAs of the State.

Madhya Pradesh lies in Biome-11 (Indo-Malayan Tropical Dry Zone). BirdLife International (undated) has identified 59 species in this biome, out of which 52 have been reported from the State. Many of the species listed in the Biome-11 have adapted to man-modified habitats. This biome includes a wide range of habitats, including both forests and open country. The major habitat types are Tropical Dry Deciduous Forest, Tropical Thorn Forest and Grassland. The State also have species from other biomes, for example, Biome-5, Biome-7 and Biome-8, but these birds are mainly migratory passerines moving to central India during winter.

The State does not have any Endemic Bird Area.



Photo courtesy: Ravi Sankeeran

List of threatened birds with IBA site codes

Critically Endangered		
Oriental White-backed Vulture	<i>Gyps bengalensis</i>	IN-MP-01, 04, 05, 08, 09, 10, 11, 12, 14, 15,
Long-billed Vulture	<i>Gyps indicus</i>	IN-MP-01, 04, 05, , 08, 09, 10, 11, 12, 14, 15,
Endangered		
Great Indian Bustard	<i>Ardeotis nigriceps</i>	IN-MP-07
Lesser Florican	<i>Sypheotides indica</i>	IN-MP-09, 15, 16
Vulnerable		
Spot-billed Pelican	<i>Pelecanus philippensis</i>	IN-MP-05
Lesser Adjutant	<i>Leptoptilos javanicus</i>	IN-MP-01, 05, 09, 10, 11
Pallas' Fish Eagle	<i>Haliaeetus leucoryphus</i>	IN-MP-03
Greater spotted Eagle	<i>Aquila clanga</i>	IN-MP-05, 10, 12
Eastern Imperial Eagle	<i>Aquila heliaca</i>	IN-MP-05, 10, 12
Lesser Kestrel	<i>Falco naumanni</i>	IN-MP-12, 15
Sarus Crane	<i>Grus antigone</i>	IN-MP-01, 02, 03, 05, 08, 09, 14, 15, 17
Sociable Lapwing	<i>Vanellus gregarius</i>	IN-MP-05
Indian Skimmer	<i>Rynchops albicollis</i>	IN-MP-10, 15
Green Munia	<i>Amandava formosa</i>	IN-MP-12
Near Threatened		
Darter	<i>Anhinga melanogaster</i>	IN-MP-01, 05, 10, 11, 12, 14,
Painted Stork	<i>Mycteria leucocephala</i>	IN-MP-05, 09, 10, 11, 12, 14,
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	IN-MP-02, 03, 05, 10, 11, 12, 14,
Oriental White Ibis	<i>Threskiornis melanocephalus</i>	IN-MP-01, 05, 09, 10, 11, 12, 14,
Ferruginous Pochard	<i>Aythya nyroca</i>	IN-MP-05, 10, 11, 12, 14,
Greater Grey-headed Fish-Eagle	<i>Ichthyophaga ichthyaeus</i>	IN-MP-01, 09, 12,
Cinereous Vulture	<i>Aegypius monachus</i>	IN-MP-12,
Red-headed Vulture	<i>Sarcogyps calvus</i>	IN-MP-03, 05, 09, 10, 11, 12, 14
Pallid Harrier	<i>Circus macrourus</i>	IN-MP-09, 10,
Black-bellied Tern	<i>Sterna acuticauda</i>	IN-MP-05, 10,
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>	IN-MP-01, 09, 12

THREATENED SPECIES FOR WHICH MADHYA PRADESH IS IMPORTANT

Oriental White-backed Vulture *Gyps bengalensis* **Critically Endangered**

This Vulture has been upgraded to Critically Endangered because it has suffered an extremely rapid population decline, particularly across the Indian subcontinent (BirdLife International 2001), mostly due to the veterinary use of the drug Diclofenac (Oaks *et al.* 2004). The species has been reported breeding in many areas in the State, such as Panna NP, Bandhavgarh NP, Kanha NP and Pench NP.

Long-billed Vulture *Gyps indicus* **Critically Endangered**

This species is classified as Critically Endangered because it has suffered an extremely rapid population decline. It breeds in south of the Gangetic plain, north to Delhi, east through Madhya Pradesh, south to the Nilgiris and occasionally further south. In Madhya Pradesh it may be seen in Bandhavgarh NP, Kanha NP and other areas of the State, but it became rare because of the drug Diclofenac (Oaks *et al.* 2004).

Lesser Florican *Syphotides indica* **Endangered**

This species has a small, declining population, primarily as a result of the loss and degradation of grassland habitat. From Madhya Pradesh, it has been reported from the Karera Bustard WLS (Rahmani 1991), Ratlam, Sailana and Sardarpur Florican WLS (Sankaran 2000). Also there are some records from the Kanha NP.

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

This bustard has a very small, declining population because of habitat degradation and agricultural development. This Endangered bird had a wide range throughout India, from Punjab in the north to Tamil Nadu in the south and Orissa in the east, mainly in dry areas. In Madhya Pradesh, it was seen in Karera (Great Indian Bustard Sanctuary), between 25-30 birds were seen, but now no bird is present. The other areas are Ghatigaon Bustard WLS (Rahmani and Manakadan 1990) and some other patches of grassland where the bustard could be found but no recent detailed surveys have been carried out in the State.

Sarus Crane *Grus antigone* **Vulnerable**

This crane, recently included in the Red Data Book of IUCN by BirdLife International, has suffered a rapid population decline because of habitat degradation, exploitation and the effect of pollutants. This bird has a sparse distribution, mainly in the north Indian states and in Madhya Pradesh, it has been reported from the National Chambal WLS about 40 birds (Choudhury *et al.* 1999), Karera Bustard WLS (Choudhury *et al.* 1999), Madhav NP (Johnson *et al.* 1993), Bandhavgarh NP (Choudhury *et al.* 1999), and Kanha NP (Newton *et al.* 1987).

THREATS AND CONSERVATION ISSUES

The IBAs of Madhya Pradesh face the threats of poaching, overgrazing by livestock, human habitation near the IBAs and forest fires. One of the main problems is firewood and timber collection and a huge area has been degraded just because of deforestation and clearance of woods and grasslands for grazing.

Poaching of wild animals takes place regularly in many areas. Targeted poaching of animals such as the Tiger and Leopard is regularly reported in the media. A number of local tribes such as the *Bahelia* and *Paradhi*, and local anti-social elements having connections with national and international smugglers pose major threats. The management has to address this issue adequately and effectively.

Crop damage by herbivores and lifting of cattle by large carnivores creates enmity between the local agriculturists and the PA authorities. This can be tackled with proper management of the buffer zone, and timely compensation for crop/livestock damage.

Some of the waterbodies where a large number of waterbirds congregate are the Bhoj wetlands and the Rangawa Reservoir. The main threat to Bhoj is from the increasing human population of Bhopal. Waste produced by the ever-growing population is mixed with the drainage water that enters the Bhoj, thus deteriorating the water quality. Though the Lake is mesotrophic, certain patches in the Lake where sewage water gets mixed, have become eutrophic. Moreover, the Lake is losing its catchment area due to human settlements and agricultural fields. This has reduced the inflow of rainwater and could decrease the water level of the Lake. Cultural activities such as the immersion of idols and *tazias* also pose a threat to the Lake.

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

Over-grazing by livestock in the IBAs is one of the major threats to grassland birds as in Karera Bustard Sanctuary where no Bustard is left.

Photo: Aasad R. Rahmani



The villages in the catchment area of the Rangawa Reservoir are primarily dependent on agriculture. The use of toxic pesticides is prevalent, and the farmers do not know the proper quantity of pesticides that they must use. As a result, large quantities of pesticides flow into the Reservoir, the cumulative toxic effect of which is alarming.

There is pressure from the villages on the fringes of the IBAs, e.g. 13 villages still remain inside the Panna NP boundary and they are a major source of disturbance, especially their cattle and their dependence on forest products which varies in kind and quantity according to seasons. During summer, these villagers bring hordes of cattle to graze inside the Park, as there is hardly any fodder left outside.

In Madhya Pradesh the biggest and irreversible damage done to the Panna NP and its surroundings is by the infamous Panna diamond mine, the numerous sandstone quarries and the pressure placed on the forests by hordes of mine labourers (Yoganand 2001). The Government-owned National Mineral Development Corporation (NMDC) is situated just outside the Park and falls within the earlier Gangau Wildlife Sanctuary. This mine contravenes the guidelines of

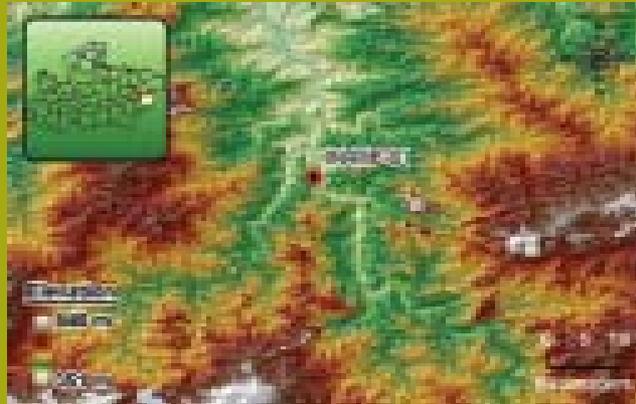
the Ministry of Environment and Forests, that industrial sites maintain a minimum distance of 25 km from ecologically sensitive areas, although, to be honest, these mines were present much before the Park was declared. According to the Nature Conservation Society, Jabalpur, 1,400 cubic meters of waste are dumped every 24 hours. Slurry from the mine enters the Kaimasan *nullah*, which flows into the Tiger Reserve.

Some of the protected areas do not have proper boundaries, while others have boundaries but no buffer zones, e.g. the Panna Tiger Reserve has no buffer zone which also violates the Project Tiger guidelines. This puts tremendous pressure on the natural resources of the Park due to the influx of humans.

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BANDHAVGARH NATIONAL PARK



IBA Code	: IN-MP-01
State	: Madhya Pradesh
District	: Shahdol
Coordinates	: 23° 35' 38" N, 81° 14' 27" E
Ownership	: State
Area	: 44,885 ha
Altitude	: 440 - 800 m
Rainfall	: 1,173 mm
Temperature	: 4 °C to 42 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Moist Deciduous Forest and Tropical Grassland

IBA CRITERIA: A1 (Threatened Species), A3 (Biome-11: Indo-Malayan Tropical Dry Zone)

PROTECTION STATUS: National Park, established in 1981

GENERAL DESCRIPTION

Bandhavgarh National Park is located in Shahdol district, 195 km from Jabalpur and 210 km from Khajuraho, two major tourist spots. This famous tiger hunting area was once owned by the erstwhile Maharaja of Rewa. It was handed over by him to the Government in 1968, when privy purses and privileges were abolished, and he was unable to look after the forest wealth. Poaching was rampant and the forest lay devastated. Once it came under the control of the Forest Department, Bandhavgarh's fortune took dramatic turn. It was declared a protected area, and the animal population began to flourish. At that time, the Park covered an area of 10,600 ha, all of which comprised the present day Tala Range (Tyabji 1994). In 1984, the area of the Park was increased to 44,800 ha, with the inclusion of three ranges, namely Kalwa, Magadhi and Khitauli. In 1993, the Park was upgraded to a Tiger Reserve.

Bandhavgarh is fortunate in that unlike most of the other parks in India, it is not an isolated and fragmented patch of forest. It forms part of a larger forest block. Apart from the 25,000 ha Panpatha Wildlife Sanctuary that is connected with the Park to the north, there are a number of smaller pockets of protected and reserve forest, interspersed with small agricultural communities (Tyabji 1994).

The Park has extensive Sal forest, hills, valleys, rivers, marshes and meadows, resulting in varied floral and faunal diversity. The forest is dominated by Sal *Shorea robusta* and Bamboo *Dendrocalamus strictus*.

The vegetation of the Park is Tropical Moist Deciduous. There are mixed forests in the higher reaches of the hills. A few rare species, such as the insectivorous plant *Drosera peltata*, and medicinal plants such as Buch *Acorus calamus* are found in some isolated patches of the Tala Range of the Reserve.

AVIFAUNA

Bandhavgarh National Park holds about 242 species of birds (Tyabji 1994). Besides the two Critically Endangered *Gyps* species, the Lesser Adjutant *Leptoptilos javanicus* and Sarus Crane *Grus antigone* are also found. An interesting difference between Kanha and Bandhavgarh (both IBAs in central India) is the almost complete absence of the Long-billed Vulture *Gyps indicus* in Kanha, while in Bandhavgarh it is just as abundant as the Oriental White-backed *Gyps bengalensis*. The steep cliffs of Bandhavgarh

Hill provide suitable nesting habitats for the Long-billed Vulture. The Sal and Bamboo forests are good for the White-naped Woodpecker *Chrysocolaptes festivus*, Red Junglefowl *Gallus gallus*, Red Spurfowl *Galloperdix spadicea* and Painted Spurfowl *G. lunulata* (Kazmierczak and Singh 1998).

Tyabji (1994) found some interesting Himalayan and Sub-Himalayan bird species such as the Plain-backed Mountain Thrush *Zoothera mollissima*, Gold-fronted Chloropsis *Chloropsis aurifrons*, Long-tailed Minivet *Pericrocotus ethologus*, Dark-grey Bush Chat *Saxicola ferrea* and Dusky Leaf Warbler *Phylloscopus fuscatus*. This proves that these species are more widely distributed and abundant than was believed earlier.

Critically Endangered

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

Vulnerable

Lesser Adjutant	<i>Leptoptilos javanicus</i>
Sarus Crane	<i>Grus antigone</i>

Near Threatened

Darter	<i>Anhinga melanogaster</i>
Oriental White Ibis	<i>Threskiornis melanocephalus</i>
Greater Grey-headed Fish-Eagle	<i>Ichthyophaga ichthyaetus</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

Biome-11: Indo-Malayan Tropical Dry Zone

White-eyed Buzzard	<i>Butastur teesa</i>
Yellow-legged Green-Pigeon	<i>Treron phoenicoptera</i>
Indian Grey Hornbill	<i>Ocyrceros birostris</i>
Lesser Golden-backed Woodpecker	<i>Dinopium benghalense</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Large Grey Babbler	<i>Turdoides malcolmi</i>
Jungle Babbler	<i>Turdoides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
White-browed Fantail-Flycatcher	<i>Rhipidura aureola</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
White-bellied Drongo	<i>Dicrurus caeruleus</i>

In January 2002, Rufous-gorgeted or Orange-gorgeted Flycatcher *Ficedula strophinata* was seen near a resort close to Bijaria village (D'Cunha, *in press*). According to Ali and Ripley (1987), and Grimmett *et al.* (1999), it is an altitudinal migrant and winters in the Himalayan foothills. Till now, there is no record of this species in central India.

The Malabar Pied Hornbill *Anthracoceros coronatus*, a Near Threatened species, is resident in the Western Ghats, East India and Sri Lanka (Grimmett *et al.* 1999). Regular sightings of this species in Bandhavgarh (Tyabji 1994), sometimes up to 13 individuals, including subadults, indicate that it is more widely distributed in central India than was believed earlier.

The Sarus Crane breeds in this area, one chick was seen in July 1989 (Tyabji 1994).

The site can be included in Biome-11, (Indo-Malayan Tropical Dry Zone). Out of the 59 species listed by BirdLife International (undated) for Biome-11, 32 are found in this IBA.

OTHER KEY FAUNA

The Bandhavgarh National Park is the place where the famous White Tigers of Rewa were discovered. The last known capture of a white tiger was in 1951. Bandhavgarh is densely populated with other animal species too. The faunal assemblage constitutes typical central Indian species.

LAND USE

- q Tourism and recreation
- q Nature conservation and research
- q Watershed management

THREATS AND CONSERVATION ISSUES

- q Poaching
- q Livestock grazing
- q Human habitation in near the site
- q Forest fires and firewood collection

Excess grazing pressure in buffer areas is a major problem. There are about 7,000 heads of cattle in 14 villages located inside the Reserve. Besides this, about 50,000 cattle from the surrounding villages put a lot of pressure on the Reserve.

Poaching of wild animals, which come out of the core area, regularly takes place. Targeted poaching of animals such as the Tiger and Leopard is regularly reported in the media. A number of local tribes such as *Bahelia* and *Paradhi*, and local anti-social elements having connections with national and international smugglers pose a major threat. The management has to address this issue adequately and effectively.

Crop damage by herbivores and cattle lifting by large carnivores creates enmity between the local agriculturists and the Park authorities. This can be tackled with proper management of the buffer zone, and timely compensation for crop/livestock damage.

KEY CONTRIBUTOR

The IBA Team

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Extensive Sal forest, valleys, rivers, marshes and meadows of Bandhavgarh NP hold about 242 species of birds.

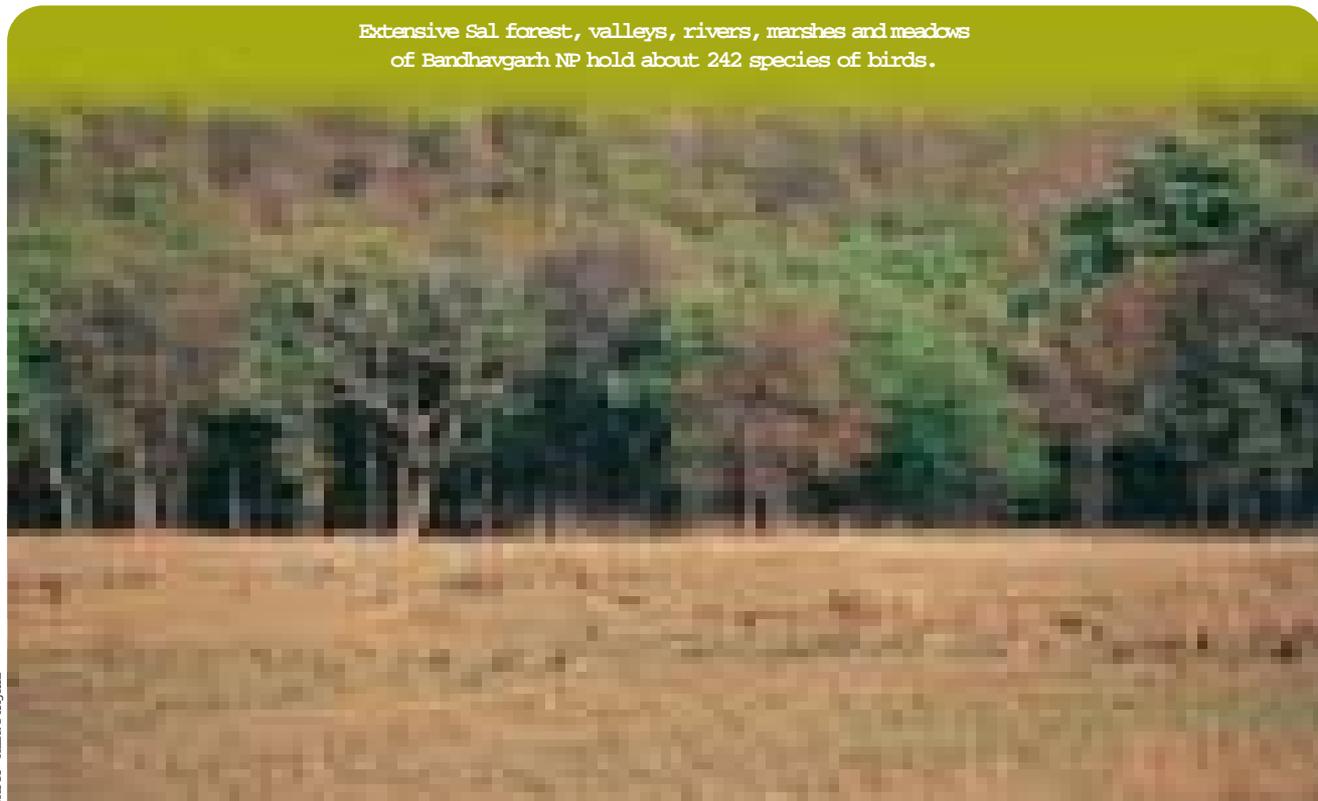
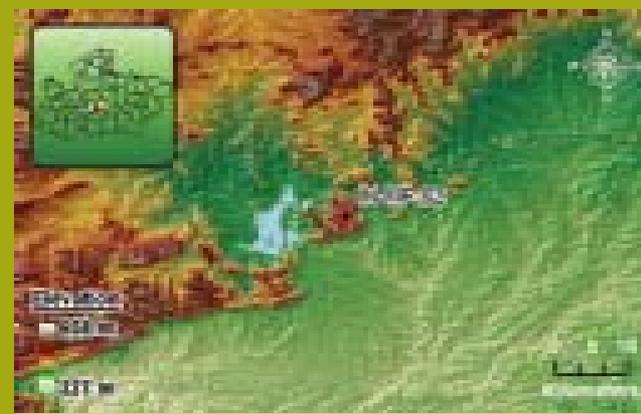


Photo: Hira Parjapati

BARNA RESERVOIR



IBA Code	: IN-MP-02
State	: Madhya Pradesh
District	: Raisen
Coordinates	: 23° 04' 60" N, 78° 07' 00" E
Ownership	: State
Area	: 7,690 ha
Altitude	: 349 m
Rainfall	: 117 cm
Temperature	: 8 °C to 46 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Freshwater Wetland

IBA CRITERIA: A1 (Threatened Species), A4iii (≥ 20,000 waterbirds)
PROTECTION STATUS: Partially protected, located besides two Wildlife Sanctuaries

GENERAL DESCRIPTION

Barna Reservoir is located beside the national highway NH-12, c. 85 km from Bhopal, the state capital and c. 45 km from the nearest railhead, Obedullaganj. It is one of the most important waterbodies of Raisen district. The reservoir has dense forest on three sides, and shares its perimeter with two sanctuaries as its bund lies inside Singhori WLS while the backwaters lie inside the Ratapani WLS (an IBA).

Barna Reservoir, apart from being a perennial water source to the animals of the sanctuaries, provides refuge to thousands of migratory birds during winter. It is mainly used for fishing and irrigation, and was created by damming the Barna river under the Narmada Valley Project. The reservoir looks like an amoeba when seen from above, with large numbers of bays and meandering inland channels, surrounded on both sides by forest or agricultural land. These extensive belts of shallow water are ideal for waterfowl and waders.

The forest around Barna belongs to Mixed Dry Deciduous category. Most forest is open and subjected to heavy biotic pressure. Apart from natural vegetation, the reservoir shares its boundary with miles of agricultural land.

AVIFAUNA

No detailed study has been conducted on the water birds of the Barna reservoir, but a preliminary survey in the winter of 2001-2002 revealed a huge congregation of more than 20,000 birds on the main waterbody (Koustubh Sharma *pers. comm.* 2002). This site seems to qualify easily for A4iii criteria (site known or thought to hold on a regular basis equal to or more than 20,000 birds). Among the conspicuous birds, large flocks of Common Coot *Fulica atra* and Red-crested Pochard *Rhodonessa rufina* were seen in the relatively deeper portion of the reservoir. This site has not been covered during the Asian Waterfowl Census, and needs regular monitoring of waterfowl and other birds.

Villagers report nesting of Sarus Crane *Grus antigone* in agricultural land, where the Sarus traditionally enjoys protection. The near threatened Black-necked Stork *Ephippiorhynchus asiaticus* is also seen, but breeding has not been recorded.

The surrounding forest and agricultural fields have 30 species listed in Biome-11 (Indo-Malayan Tropical Dry Zone). However, most of these species are presently common and widely distributed, hence of low conservation importance.

Vulnerable

Sarus Crane	<i>Grus antigone</i>
Near Threatened	
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>

OTHER KEY FAUNA

A moderate population of Tiger *Panthera tigris*, Leopard *Panthera pardus* and Dhole *Cuon alpinus* is reported from Ratapani Wildlife Sanctuary as well as Singhori Wildlife Sanctuary that surround Barna Reservoir. Apart from these, Striped Hyena *Hyaena hyaena*, Golden Jackal *Canis aureus* and Jungle Cat *Felis chaus* constitute the main carnivore population. Herbivore population consists of Chital *Axis axis*, Sambar *Cervus unicolor*, Nilgai *Boselaphus tragocamelus*, Four-horned Antelope *Tetracerus quadricornis*, Chinkara *Gazella bennettii*, Blackbuck *Antelope cervicapra* and Wild Boar *Sus scrofa*.

LAND USE

- ☐ Irrigation
- ☐ Tourism and recreation

THREATS AND CONSERVATION ISSUES

- ☐ Poaching
- ☐ Encroachment
- ☐ Pesticides

As agricultural fields border the reservoir, the danger of pesticides reaching water, and accumulating in the different trophic levels, are very high. No study has been conducted on this aspect.

Apart from this, changeover from traditional crops to cultivation of cash crops threatens the presence of many birds including the Sarus Crane *Grus antigone*. Poaching and illegal exploitation of the reservoir for fishing are persistent threats.

Although the site is not popular among hunters and poachers from outside due to difficulty in reaching the birds, rich and influential local people frequently hunt here.

KEY CONTRIBUTOR

Koustubh Sharma

KEY REFERENCE

None

MP-03

BHOJ (UPPER LAKE) WETLAND



IBA Code	: IN-MP-03
State	: Madhya Pradesh
District	: Bhopal
Coordinates	: 23° 13' 40" N, 77° 21' 38" E
Ownership	: State
Area	: 3,072 ha
Altitude	: 523 m
Rainfall	: 1,180 mm
Temperature	: 10 °C to 44 °C
Biogeographic Zone	: Semi-Arid
Habitats	: Freshwater Reservoir, Tropical Secondary Scrub, Tropical Dry Deciduous Forest

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

PROTECTION STATUS: National Park, established in 1982. Declared Ramsar Site in 2002

GENERAL DESCRIPTION

Bhoj Wetland comprises two contiguous man-made reservoirs, the “Upper Lake” and the “Lower Lake”. The Upper Lake was created by Raja Bhoj in the 11th century by the construction of an earthen dam across the Kolans river, and the Lower Lake was constructed nearly 200 years ago, largely from the overflow of water from the Upper Lake. Both the lakes are urban waterbodies, located in the fast growing city of Bhopal, the state capital. Bhoj Wetland was designated as a Ramsar site in November 2002.

The Upper Lake is surrounded by Van Vihar National Park on the south, human settlements on the east and north, and agriculture fields on the west. The Lower Lake is surrounded by human settlements on all sides. The Upper Lake is a major source of potable water for Bhopal.

The Upper lake is very rich in biodiversity, particularly resident and migratory birds, macrophytes, phytoplankton, zooplankton, both natural and cultured fish species, insects, reptiles and amphibians. A management action plan has been implemented since 1995, with financial support from the Government of Japan. As part of this management plan, to follow up the impact on birds, 18-month study was undertaken in 2000-01, which helped in documenting the avifauna of the site. During this study, more than 20,000 waterbirds (A4iii criteria) were recorded.

A belt of deciduous forest, with cliffs and steep contours towards the southeastern boundary comprises Van Vihar National Park. The greater part of the long western and southwestern peripheries of the site is covered with a mix of semi-desert and secondary scrub, semi-arid grassland, arable land, improved pastureland, perennial crop cultivation and forestry plantation. The extensive forestry plantation, being still young, around the lake boundaries augurs well for avian diversity in the near future.

AVIFAUNA

Nearly 179 species of birds are reported from the wetland along with the surrounding forest areas (Sharma 2002). In the peak season, the population of waterbirds exceeds 35,000 (Koustubh Sharma *pers. comm.* 2003). Therefore, the site qualifies A4iii criteria. Coot *Fulica atra* is the most numerous waterbird, followed by the Red-crested Pochard *Rhodonessa rufina*. In some years, its population exceeds 2,000 individuals. According to Wetlands International (2002), its 1% threshold is 1,000.

The Near Threatened Black-necked Stork *Ephippiorhynchus asiaticus* is also seen regularly, but no nest has been found. However, a solitary juvenile was seen in the spring of 2002 (Koustubh Sharma *pers. comm.* 2003). Four individuals were seen, all singly.

One of the most notable records is the sighting of more than 120 Sarus Crane *Grus antigone*. According to Wetlands International (2002), the 1% threshold of Sarus crane is 90. Therefore, this site easily qualifies A4i criteria also.

Large congregations of waterfowl attract many predators such as the Pallas’s Fish Eagle *Haliaeetus leucocephala* and the Western Marsh Harrier *Circus aeruginosus*. Pallas’s Fish Eagle was seen twice in 2001.

Vulnerable	
Pallas’ Fish Eagle	<i>Haliaeetus leucorhynchus</i>
Sarus Crane	<i>Grus antigone</i>
Near Threatened	
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Red-headed Vulture	<i>Sarcogyps calvus</i>

OTHER KEY FAUNA

The Upper Lake shares its boundaries on one side with Van Vihar National Park. Unique in itself, the Park supports rich populations of Chital *Axis axis*, Wild Boar *Sus scrofa*, Nilgai *Boselaphus tragocamelus* and Sambar *Cervus unicolor*, that roam wild inside the Park. Many other animals are also kept in enclosures inside the Park, which is also a Zoo. The western and southwestern parts of the site are generally devoid of much terrestrial wild fauna, apart from the occasional sighting of Golden Jackal *Canis aureus* and Indian Fox *Vulpes bengalensis*. But due to a vast stretch of shallow water, they support huge populations of birds during winter.

More than 10 species of reptiles and amphibians; more than 40 species of fish; and around 100 species of insects have been identified in the Upper Lake (Sharma 2002).

LAND USE

- Domestic water management
- Tourism and recreation
- Aquaculture

Bhoj Wetland is a perfect refuge to thousands of wintering migratory waterbirds.



MP-03

Photo: Koustubh Sharma

THREATS AND CONSERVATION ISSUES

- q Poaching and trapping
- q Siltation
- q Eutrophication
- q Influx of sewage water
- q Toxic waste from hospitals and factories
- q Use of pesticides in agriculture
- q Encroachment of the catchment area
- q Cultivation of aquatic plants

The increasing human population of Bhopal is the most important issue. Waste produced by the ever-growing population is mixed with the drainage water that enters the lake, thus deteriorating the water quality. Though the Lake is mesotrophic, certain patches in the Lake where sewage water gets mixed, have become eutrophic. Moreover, the Lake is losing its catchment area due to human

settlements and agricultural fields. This has reduced the inflow of rainwater and could decrease the water level of the Lake. Cultural activities such as the immersion of idols and *tazias* also pose a threat to the lake.

KEY CONTRIBUTORS

Koustubh Sharma and P. K. Nandi

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BORI WILDLIFE SANCTUARY



IBA Site Code	: N-MP-04
State	: Madhya Pradesh
District	: Hoshangabad
Coordinates	: 22° 33' 22" N, 78° 17' 47" E
Ownership	: State
Area	: 48,572 ha
Altitude	: 300 - 1,352 m
Rainfall	: 1,750 mm
Temperature	: 6°C to 47°C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Dry Deciduous Forest

CRITERIA: A1 (Threatened Species), A3 (Biome-11: Indo-Malayan Tropical Dry Zone)

PROTECTION STATUS: Wildlife Sanctuary, established in 1978

GENERAL DESCRIPTION

The Bori Wildlife Sanctuary gets its name from the River Bori. It lies on the southern slopes of the Satpura Hills in Hoshangabad district. It has the distinction of being the first forest reserve declared in India (Pai 1993). Mahadeo Ranges, which form a part of Satpura National Park and Pachmarhi Sanctuary, bind this Sanctuary to the north, while the River Tawa forms its western and southwestern boundaries.

Several streams and rivulets of the Bori and Sonbhadra rivers provide water inside the Sanctuary. The terrain varies from steep slopes in the east to plain or undulating land in the west.

According to Champion and Seth (1968), Bori has South Indian Moist Deciduous Forest, sub-type Moist Teak Forests. It has many riparian forests along the streams. This area lies in the Teak and Sal transition zone which makes it very interesting from the faunal point of view. Bori Wildlife Sanctuary was intensively worked for Teak and Bamboo till 1991.

AVIFAUNA

More than 230 species of birds are reported from this IBA (Prachi Mehta *pers. comm.* 2003). Both the Critically Endangered *Gyps* species have been recorded from this IBA. BirdLife International (undated) has identified 59 species of birds present in Biome-11 (Indo-Malayan Tropical Dry Zone). In this IBA, 35 Biome-11 species are seen, perhaps the highest number known to occur in any IBA in central India.

Besides Biome-11, three species of Biome-10 (Indian Peninsular Tropical Moist Zone) are also found. They are Malabar Pied Hornbill *Anthracoceros coronatus*, Malabar Whistling Thrush *Myiophonus horsfieldii* and Indian Scimitar Babbler *Pomatorhinus horsfieldii*.

Bori has both Grey *Gallus sonneratii* and Red *Gallus gallus* Junglefowls, which are reported to hybridize in this area (Ali and Ripley 1987).

Biome-11: Indo-Malayan Tropical Dry Zone

Black Ibis	<i>Pseudibis papillosa</i>
Long-billed Vulture	<i>Gyps indicus</i>
Red-headed Vulture	<i>Sarcogyps calvus</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Jungle Bush-Quail	<i>Pedicularia asiatica</i>
Rock Bush-Quail	<i>Pedicularia argoondah</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-legged Green-Pigeon	<i>Treron phoenicoptera</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Sirkeer Malkoha	<i>Phaenicophaeus leschenaultii</i>
Mottled Wood-Owl	<i>Strix ocellata</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocyroceros birostris</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Yellow-fronted Pied Woodpecker	<i>Dendrocopos mahattensis</i>
Lesser Golden-backed Woodpecker	<i>Dinopium benghalense</i>
Black-shouldered Woodpecker	<i>Chrysocolaptes festivus</i>
Ashy-crowned Sparrow-Lark	<i>Eremopterix grisea</i>
Black-headed Cuckoo-Shrike	<i>Coracina melanoptera</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
White-bellied Minivet	<i>Pericrocotus erythropterygius</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Indian Robin	<i>Saxicoloides fulvicata</i>
Rufous-bellied Babbler	<i>Dumetia hyperythra</i>
Large Grey Babbler	<i>Turdoides malcolmi</i>
Jungle Babbler	<i>Turdoides striatus</i>
Jungle Prinia	<i>Prinia sylvatica</i>
Ashy Prinia	<i>Prinia socialis</i>
White-browed Fantail-Flycatcher	<i>Rhipidura aureola</i>
Grey-headed Starling	<i>Sturnus malabaricus</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Bank Myna	<i>Acridotheres ginginianus</i>
White-bellied Drongo	<i>Dicrurus caeruleus</i>
Ashy Woodswallow	<i>Artamus fuscus</i>

Critically Endangered

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

Riparian forests especially Teak and Bamboo forest provide shelter to 230 species of birds in Bori WLS.



Photo: Raja Parodit

OTHER KEY FAUNA

Almost all large and small mammals of central India are found in Bori. Till now, 25 species of mammals have been recorded, from Tiger *Panthera tigris*, Leopard *P. pardus*, to Mouse Deer or Chevrotain *Moschiola meminna*. Three species of antelopes are found: Nilgai *Boselaphus tragocamelus*, Four-horned Antelope *Tetracerus quadricornis* and Chinkara *Gazella bennettii*. Bori is also famous for its herds of wild Gaur *Bos frontalis*.

LAND USE

- Agriculture
- Tourism and recreation
- Nature conservation and research

THREATS AND CONSERVATION ISSUES

- Poaching
- Livestock grazing
- Lopping of trees
- Human habitation in the marginal area
- Firewood collection
- Unsustainable exploitation of forest resources

About 5,000 cattle from the surrounding 24 villages graze inside the Sanctuary. Reclamation of land around Bunglapura has led to the destruction of large areas of virgin forest.

KEY CONTRIBUTORS

Koustubh Sharma and Prachi Mehta

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MP-05

DIHAILA JHEEL AND OTHER WETLANDS



IBA Code	: IN-MP-05
State	: Madhya Pradesh
District	: Shivpuri
Coordinates	: 25° 41' 44" N, 78° 09' 59" E
Ownership	: State
Area	: c. 371 ha
Altitude	: 370 m
Rainfall	: 825 mm
Temperature	: 17 °C to 32 °C
Biogeographic Zone	: Semi-Arid
Habitat	: Freshwater Swamp

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

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

The Karera Bustard Sanctuary in Shivpuri district has one of the richest wetlands of the state, Dihaila *jheel*. Being entirely rain-fed, the size of Dihaila *jheel* varies from year to year, depending on the quantity of the monsoon rain received which falls between July and September. Two barrages help to impound the water, which is released through sluice gates for irrigation. Being used in all possible ways, the *jheel* is an extremely important feature of the area. Dihaila *jheel* helps local inhabitants by providing water for irrigation during years of good rainfall, land for cultivation during poor rainfall years, and pasture for livestock as the *jheel* dries out (Rahmani 1987).

A variety of birds find a haven in the *jheel* throughout the year. These include resident, breeding and Palearctic migratory birds.

As the Great Indian Bustard *Ardeotis nigriceps* has disappeared totally from the Karera Bustard Sanctuary (Rahmani 2002), and there does not appear any chance for its revival, we have taken only Dihaila *jheel* as an IBA.

Besides Dihaila, there are many more man-made waterbodies within Karera Bustard Sanctuary. The important ones are Ronija tank (10-15 ha), Barsori-Fatehpur tank (30-40 ha), Berkhera tank (104 ha), Karhai-Ramgarha (20 ha), and Gadha tank (20 ha). All these water bodies are included in this IBA.

Up to 1,00,000 waterbirds have been recorded from Dihaila Jheel and other nearby wetlands.



Photo: Asad R. Rahmani

AVIFAUNA

A wide range of species of birds can be seen in and around Dihaila *jheel*. With the onset of the monsoon in late June or early July, hundreds of Lesser Whistling Duck *Dendrocygna javanica*, Comb Duck *Sarkidiornis melanotos*, Spot-billed Duck *Anas poecilorhyncha*, Cotton Teal or Pygmy Goose *Nettapus coromandelicus*, Pheasant-tailed Jacana *Hydrophasianus chirurgus*, Little Grebe *Tachybaptus ruficollis*, as well as egrets and storks occupy the newly inundated areas. The Teal, Comb Duck and Spot-billed Duck soon leave the *jheel* to nest elsewhere. By September-October, migratory Palearctic birds start arriving. Among ducks, the first to arrive is the Northern Pintail *Anas acuta*, one of the most common ducks in India. Within a few days, Garganey *Anas querquedula*, Northern Shoveler *A. clypeata*, Wigeon *A. penelope*, Common Teal *A. crecca*, Gadwall *A. strepera*, Redcrested Pochard *Rhodonessa rufina*, Common Pochard *Aythya ferina*, White-eyed Pochard or Ferruginous Pochard *Aythya nyroca* and Tufted Duck *A. fuligula* cover the *jheel*. Flocks consisting of 40-50 thousand ducks are not uncommon. Huge dense flocks of the Ruff *Philomachus pugnax*, sometimes consisting of 20-30 thousands birds, are found in the inundated paddy fields, downstream of the *jheel*. They move around in restless flocks. By mid-November, Bar-headed Geese *Anser indicus* and Greylag Geese *A. anser* arrive. Up to 1,500 were counted in 1986 (Rahmani 1988). The influx of more birds is seen again on their return migration in end March and early April.

White-necked Storks *Ciconia episcopus*, Asian Openbill *Anastomus oscitans*, Black-necked Stork *Ephippiorhynchus asiaticus* and Painted Stork *Mycteria leucocephala* are commonly seen at Dihaila. There are also a few records of White Stork *Ciconia ciconia*. First observed in 1982, the Greater Flamingo *Phoenicopterus ruber* has been regularly visiting the area thereafter. In 1988, even a Siberian Crane *Grus leucogeranus* was sighted for about three months (Hussain *et al.* 1988-89).

The Greater Spotted Eagle *Aquila clanga*, Tawny Eagle *A. rapax*, Osprey *Pandion haliaetus*, Peregrine falcon *Falco peregrinus*, Pallas's Fish-Eagle *Haliaeetus leucoryphus* and Western Marsh Harrier *Circus aeruginosus* comprise the six species of raptors that are seen at the *jheel*. There are many more in the surrounding grasslands and crop fields (Rahmani 1991). Resident Sarus Cranes

Grus antigone and migrant Demoiselle Cranes *Grus virgo* are a regular feature at the site. Two or three pairs of Sarus are found around Dihaila, and some more pairs in other wetlands of the Sanctuary (Rahmani 1991).

A total of 27 species of waders have been identified in the *jheel* and surrounding areas. A graduated feeding habitat comprising of dry, muddy and submerged areas occurring in close proximity is provided to the waders as the water of the *jheel* recedes.

At the onset of winter, when the paddy is just ripening, farmers face the difficulty of protecting their crops from depredation by migrating ducks.

No fewer than 100,000 waterfowl are regularly present during winter in Dihaila *jheel* and other waterbodies in the Karera Bustard Sanctuary (Rahmani 1987). Dihaila *jheel* also serves as a moulting ground for the Comb Duck during winter, when a few hundred birds become flightless for about 2-3 weeks.

Bird ringing was done in Dihaila and other waterbodies by BNHS between 1985 and 1989. Some interesting records were made. For instance, a male Greater Scaup *Aythya marila* was ringed on November 23, 1985 (Natarajan and Sugathan 1987). It is an uncommon migrant to large waterbodies in north India.

Critically Endangered	
Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Vulnerable	
Spot-billed Pelican	<i>Pelecanus philippensis</i>
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Greater Spotted Eagle	<i>Aquila clanga</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>
Sarus Crane	<i>Grus antigone</i>
Sociable Lapwing	<i>Vanellus gregarius</i>
Near Threatened	
Darter	<i>Anhinga malenogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Oriental White Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Pochard	<i>Aythya nyroca</i>
Red-headed Vulture	<i>Sarcogyps calvus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

OTHER KEY FAUNA

Sadly, the Great Indian Bustard became locally extinct in this area in 1993-94. Among the mammals, Blackbuck *Antelope cervicapra*, Chinkara *Gazella bennettii*, Wolf *Canis lupus*, Golden Jackal *Canis aureus* and Indian Fox *Vulpes bengalensis* are found in the area. Nilgai or Bluebul *Boselaphus tragocamelus*, was not found in the mid 1980s, but it is now seen in increasing numbers.

LAND USE

- ☐ Irrigation
- ☐ Agriculture
- ☐ Nature education

THREATS AND CONSERVATION ISSUES

- ☐ Denotification of Karera Bustard Sanctuary
- ☐ Extensive human intervention in the area
- ☐ Anti-wildlife feeling developing amongst people due to crop damage by Blackbuck

Before the establishment of the Karera Bustard Sanctuary, Dihaila *jheel* was a favourite hunting ground for wildfowl. However, once it was declared a sanctuary, adequate protection was given to all wildlife in the area.

Tremendous pressure by local politicians and villagers risk the very existence of this waterbody.

Furthermore, plans to build a canal to bring water from more than 50 km away form part of the main irrigation plan of the Mohini Sagar Project. Once completed, the canal will greatly increase the irrigation facilities inside the Sanctuary. Also, the water of Dihaila *jheel* may no longer be required for irrigation, and if that is the case there is the danger that the *jheel* itself will be drained and cultivated. On the other hand, it may also increase the water inflow to the *jheel* thereby increasing its water retaining capacity for a much longer period through regular refilling. There is an urgent need to protect this wetlands, in collaboration with the villagers. If necessary, the Government of Madhya Pradesh should purchase this wetland and declare it as a national park.



Photo: Koustubh Sharma

KEY CONTRIBUTOR

Asad R. Rahmani

KEY REFERENCES

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GANDHISAGAR RESERVOIR



IBA Code	: IN-MP-06
State	: Madhya Pradesh
District	: Neemuch, Mandsaur
Coordinates	: 24° 36' 03" N, 75° 40' 41" E
Ownership	: State
Area	: 36,862 ha
Altitude	: 399 m
Rainfall	: 786 mm
Temperature	: 9 °C to 45 °C
Biogeographic Zone	: Semi-Arid
Habitats	: Wetland and Dry Deciduous Forest

IBA CRITERIA: A4i ($\geq 1\%$ biogeographic population), A4iii ($\geq 20,000$ waterbirds)
PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Gandhisagar is the second largest reservoir (in area) in the country, next only to Hirakud in Orissa. It is formed by an impoundment on the River Chambal. The Chambal, at the dam site, is fed by the catchment areas from the Vindhya ranges to the south and Aravalli to the northeast, covering a drainage area of 23,025 sq. km. The maximum length and width of the reservoir are 68 and 26 km respectively, while the Sanctuary is 36,700 ha in area. Gandhisagar Dam is one among the four dams of the Integrated Chambal Development Programme.

Shared by Mandsaur and Neemuch districts, the Gandhisagar reservoir and adjoining Gandhisagar Wildlife Sanctuary are about 130 km from Mandsaur.

The forests included in the Wildlife Sanctuary were the hunting reserves of the ruling Holkar family of Indore. Until a few decades ago, these forests were dense and full of wildlife. Unfortunately, due to over-exploitation and unrestricted hunting, the area has become depleted both in flora and fauna.

AVIFAUNA

Gandhisagar reservoir draws a large number of migratory and non-migratory birds throughout the year. This reservoir can easily qualify for A4iii criteria, i.e. congregation of 20,000 or more waterbirds. There are reports of Lesser Adjutant *Leptoptilos javanicus* and flamingos *Phoenicopterus* spp. This reservoir is also famous for large numbers of the Bar-headed Goose *Anser indicus*. Although no proper census of this species has been conducted, its population could easily reach the 1% threshold determined by Wetlands International (2002). As the waterspread is very large and difficult to assess, the number and species composition of other waterfowl is also not known, but many would easily cross the 1% population threshold.

Despite the lack of information on waterfowl, and considering its large size and suitability of habitat for waterbirds, we have included Gandhisagar as an IBA based on A4i and A4iii criteria.

LAND USE

- ☐ Irrigation
- ☐ Electrical power generation
- ☐ Fishing
- ☐ Tourism and recreation

THREATS AND CONSERVATION ISSUES

- ☐ Excessive fishing
- ☐ Pesticides run-off
- ☐ Over-fishing
- ☐ Poaching

As the reservoir is under the control of the irrigation and fisheries departments, it is used for fishing. Over-fishing by small mesh size nets is detrimental for fish-dependent birds.

Pesticide run-off from the surrounding agricultural fields is another danger, which has not been studied properly. Hunting of waterfowl continues near villages, but the large-scale hunting of earlier days has stopped. Gandhisagar reservoir is a good subject for studies on the impact of man-made reservoirs on the distribution pattern of local and migratory waterfowl.

KEY CONTRIBUTOR

Koustubh Sharma

KEY REFERENCE

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GHATIGAON BUSTARD SANCTUARY



IBA Code	: IN-MP-07
State	: Madhya Pradesh
District	: Gwalior
Coordinates	: 26° 01' 38" N, 77° 51' 40" E
Ownership	: State
Area	: 51,100 ha
Altitude	: Not available
Rainfall	: 750 mm
Temperature	: 4°C to 45°C
Biogeographic Zone	: Semi-Arid
Habitats	: Tropical Dry Deciduous Forest, Tropical Arid Zone

IBA CRITERIA: A1 (Threatened Species)
PROTECTION STATUS: Wildlife Sanctuary, established in 1981

GENERAL DESCRIPTION

The Ghatigaon Bustard Sanctuary in Gwalior district was established specially to protect the Great Indian Bustard *Ardeotis nigriceps*, but the habitat selected (thick dry deciduous forest and hilly, undulating terrain) was not suitable for this species which prefers plains with short grasses. Eight to ten bustards were seen in a flat area near Ghatigaon village. However, the most important area, Tigra, was not included in the Sanctuary. Even now in Tigra, some bustards are surviving.

Ghatigaon Bustard Sanctuary is located c. 20 km from Gwalior, off the Agra-Mumbai national highway. The Sanctuary gets its name from Ghatigaon village, which is the headquarters of the Sanctuary.

The vegetation comprises Mixed Dry Deciduous Forest, with *Anogeissus*, *Acacia*, *Zizyphus* and *Butea* as the dominant genera.

AVIFAUNA

In the early 1980s, 15 to 18 Great Indian Bustards were found in the Sanctuary (Rahmani and Manakadan 1988). They were mainly seen in Kalitalai (near Ghatigaon village) and the Tigra dam area near Gwalior. However, the present population is estimated at not more than 5 birds. As in Karera Bustard Sanctuary, the bustard is likely to become extinct in Ghatigaon in another 2-3 years, because no concerted efforts are made by the Forest Department to arrest this unfortunate decline.

There is no data on other bird life of this Sanctuary.

Endangered	
Great Indian Bustard	<i>Ardeotis nigriceps</i>

OTHER KEY FAUNA

Ghatigaon is a large sanctuary, generally forested and suitable for species such as Sambar *Cervus unicolor*, Chital *Axis axis*, Nilgai or Bluebul *Boselaphus tragocamelus* and Chinkara *Gazella bennettii*. Blackbuck *Antelope cervicapra* is found in flat areas such as Kalitalai. Grey Wolf *Canis lupus*, Golden Jackal *Canis aureus* and Indian Fox *Vulpes bengalensis* are found in the area.

Leopard *Panthera pardus* and Striped Hyena *Hyaena hyaena* are the large predators.

LAND USE

- ☐ Nature education

THREATS AND CONSERVATION ISSUES

- ☐ Mismanagement of habitat
- ☐ Lack of interest on the part of Government
- ☐ Overgrazing during the bustard breeding season
- ☐ Expansion of human habitation

Despite its proximity to Gwalior Forest Division, Ghatigaon Bustard Sanctuary is totally neglected with practically no concern for the fate of the remnant Great Indian Bustard population. During intensive studies on this species in Karera (Rahmani 1989, Rahmani and Manakadan 1988) specific management plans were made to protect the habitat of the bustard. The recommendations were personally discussed with forest officials many times, sometimes in the field. However, no action was taken by the concerned authorities to maintain the grassland habitat in Kalitalai near Ghatigaon, where bustards were regularly found. It was strongly recommended that the vast open areas near Tigra Dam, where the bustard used to breed, should be added to the Sanctuary and effective habitat protection provided during the breeding period. However, no attempt was made to take such initiatives, and it is now too late. There is a proposal to expand Gwalior city towards the Tigra dam site, and as a consequence the last bustard habitat would be lost forever.

KEY CONTRIBUTOR

Asad R. Rahmani

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MP-08

HALALI RESERVOIR



IBA Code	: IN-MP-08
State	: Madhya Pradesh
District	: Bhopal, Raisen
Coordinates	: 23° 30' 00" N, 77° 30' 00" E
Ownership	: State
Area	: 2,528 ha
Altitude	: 458 m
Rainfall	: 1,800 mm
Temperature	: 5 °C to 45 °C
Biogeographic Zone	: Semi-Arid
Habitats	: Freshwater Reservoir

IBA CRITERIA: A1 (Threatened Species), A4iii (>20,000 waterbirds)
PROTECTION STATUS: Not protected, reservoir established in 1973

GENERAL DESCRIPTION

Halali reservoir is located 25 km from Bhopal, the capital of Madhya Pradesh. The reservoir was created in 1973, when an earthen dam was constructed over the River Halali. Two more rivers, Chamari and Ferozi, feed this huge reservoir.

Mainly used for irrigation and fishery, the reservoir attracts a large number of birds during winter. It has vast shallow stretches of water on its western shores. Most of the birds are seen towards the shallow end. Towards the bund side, the forest attracts many terrestrial birds. Although no detailed study has been conducted on the avifauna of this wetland and its environs, some useful information was collected during the winter of 2001-2002.

AVIFAUNA

The precise number of species in this area is unknown, but certainly more than 20,000 migratory birds visit the reservoir during winter (Koustubh Sharma *pers. comm.* 2003).

The shallow shores of Halali reservoir can be reached by travelling through undulating village paths, via Islamnagar, which is a famous picnic spot near Bhopal. The area surrounding the villages is often littered with carcasses of domestic cattle. The carcasses can have Oriental White-backed *Gyps bengalensis*, Long-billed *G. indicus* and Egyptian *Neophron percnopterus* vultures feasting on them, along with domestic dogs. The vast open fields around the villages have clusters of trees, distributed sporadically, that provide perches for these scavengers. It is quite possible that these vultures could be

nesting here, as was evident from discussions with local villagers. A more detailed investigation to confirm their breeding is required.

As a result of the slow recession of water during winter, good roosting and foraging sites emerge on the shores. These areas provide perfect foraging grounds to waterfowl and waders. The presence of an unidentified species of pelicans and the Sarus Crane *Grus antigone* in the area, along with massive congregations of over 30,000 birds, makes this site a contender for IBA status.

Critically Endangered

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

Vulnerable

Sarus Crane	<i>Grus antigone</i>
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OTHER FAUNA

No information

LAND USE

- ☐ Irrigation
- ☐ Fisheries

THREATS AND CONSERVATION ISSUES

- ☐ Poaching and trapping
- ☐ Use of pesticides by farmers

The reservoir is under the control of the Irrigation Department of Madhya Pradesh. Changes are taking places in the cropping pattern, which could be detrimental to birds, as the farmers have now started using pesticides. Their increasing investment of money and other resources makes them less tolerant to crop damage by birds. Poaching, especially by rich and influential people, is another problem, which could be solved by patrolling by forest guards. Presently, there is no Forest Department staff in the area.

There is an urgent need for a study on the socio-economic and ecological importance of this wetland, to develop a long-term conservation strategy that would benefit farmers and birds.

KEY CONTRIBUTOR

Koustubh Sharma

KEY REFERENCE

None.

Beside 30,000 waterbirds, Halali Reservoir also attracts Critically Endangered Gyps vultures.



Photo: Asad R. Raimani

KANHA NATIONAL PARK



IBA Code	: IN-MP-09
State	: Madhya Pradesh
District	: Mandla and Balaghat
Coordinates	: 22° 20' 08" N, 80° 53' 09" E
Ownership	: State
Area	: 94,000 ha
Altitude	: 600 - 900 m
Rainfall	: 1,520 mm
Temperature	: 2 °C to 43 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Moist Deciduous Forest, Tropical Dry Deciduous Forests, Tropical Grasslands

IBA CRITERIA: A1 (Threatened Species)
PROTECTION STATUS: National Park (Tiger Reserve), established on June 1955

GENERAL DESCRIPTION

Kanha National Park (Tiger Reserve) in the central Indian highlands is well known as a world-class natural heritage site due to its large mammals, but not many people know that it is also an excellent bird watching area. Located in the heart of Madhya Pradesh and stretching over an area of 94,000 ha, Kanha National Park is part of one of the largest Tiger Reserves in the world. The National Park constitutes the core of the Tiger Reserve. The buffer zone comprises of 194,500 ha of Tropical Moist Deciduous Forest and grassland. We have considered the National Park as an IBA.

Two river valleys are prominent features of the Park's topography: the Banjar in the west and the Halon in the east, both tributaries of the Narmada.

Kanha is a comparatively well-studied area (Schaller 1967, Kurt 1973, Martin 1977, Newton 1984, Kotwal 1984, 1987; Panwar 1977) but information on birds was lacking till Newton *et al.* (1986) published a preliminary list. Since then, there have been many additions to their records.

Four principal vegetation types have been identified in Kanha: Moist Deciduous Forest, Dry Deciduous Forest, valley meadow and plateau meadow. The vegetation is chiefly made up of Sal and bamboo forests, and grassland. The vegetation has been described in detail by Jain and Sastry (1983) Kotwal (1984, 1987), and Kotwal and Parihar (1989).

AVIFAUNA

More than 260 bird species have been listed from this IBA site (Newton *et al.* 1986; D'Cunha 1998, 2003). Besides, the two Critically Endangered vulture species, the Oriental White-backed *Gyps bengalensis*, and the Long-billed *Gyps indicus*, the highly endangered Lesser Florican *Sypheotides indicus* is also occasionally seen in the grasslands of Kanha (Ranjitsinh 1983). The Sarus Crane *Grus antigone* is found just outside the Park, in Khapa in the buffer zone (Newton *et al.* 1986). Sightings of Dark Grey Bushchat *Saxicola ferrea* and Gold-fronted Chloropsis *Chloropsis aurifrons* have increased their known distribution range. Newton *et al.* (1986) also recorded that the Rosy Minivet *Pericrocotus roseus* is not a sporadic winter visitor to central India, as recorded by Ali and Ripley (1987), but also breeds in this area, as they observed a bird with nest material in May.

Newton *et al.* (1986), during their visits to Kanha between 1980 and 1983, found the Oriental White-backed Vulture to be common, "scavenging tiger (*Panthera tigris*) and Dhole *Cuon alpinus* kills". However, Eric D'Cunha (*pers. comm.* 2003) says that this species has become extremely rare. The Long-billed Vulture was always rare, mainly due to lack of nesting cliffs, but now it has disappeared completely from Kanha.

The Malabar Pied Hornbill *Anthracoceros coronatus*, mainly found in the Western Ghats, east India and Sri Lanka (Grimmett *et al.* 1998) was found to be common in the Sulkam Valley of Kanha (Newton *et al.* 1986).

In central India, Kanha is one of the largest and best protected areas, with well preserved forests. Therefore, the bird life is rich and varied. It has most of the representative species of Indo-Malayan Tropical Dry Zone (Biome-11). Of the 59 Biome-11 species listed by BirdLife International (undated), 33 are found in Kanha. As this National Park is visited by many birdwatchers, new sight records are regularly reported. For instance, D'Cunha (2003) has recently reported Crimson Sunbird *Aethopyga siparaja*, which is fairly common in the Himalayas and northeast hills and comes down to winter in the adjacent plains (Grimmett *et al.* 1998). It was reported once by D'Abreu (1913) from Balaghat district, so this is the second record from central India.

Critically Endangered	
Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Endangered	
Lesser Florican	<i>Sypheotides indica</i>
Vulnerable	
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Sarus Crane	<i>Grus antigone</i>
Threatened	
Painted Stork	<i>Mycteria leucocephala</i>
Oriental White Ibis	<i>Threskiornis melanocephalus</i>
Greater Grey-headed Fish-Eagle	<i>Ichthyophaga ichthyaeetus</i>
Red-headed Vulture	<i>Sarcogyps calvus</i>
Pallid Harrier	<i>Circus macrourus</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

OTHER KEY FAUNA

The Park was originally established to protect the hard-ground Barasingha *Cervus duvauceli branderi*, which is presently restricted to the Park (Panwar 1977). Today there are about 200 individuals. Other mammals include Tiger *Panthera tigris*, Leopard *P. pardus*, Sloth Bear *Melursus ursinus*, Indian Wild Dog *Cuon alpinus*, and all other large and small mammals typically seen in central Indian forests. Hispid Hare *Caprolagus hispidus* has also been reported from the Kanha meadows, but has not been confirmed by sighting (Bell *et al.* 1990, Goutam Narayan pers. comm. 2002).

LAND USE

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

THREATS AND CONSERVATION ISSUES

- q Poaching in buffer zone
- q Extensive tourism
- q Grazing in buffer zone
- q Human habitation
- q Illegal felling of trees
- q Collection of timber and firewood

Due to strict protection measures undertaken by the Project Tiger management, illicit felling, poaching and encroachment are well under control in the Reserve. There is a proposal to link Phen WLS with Kanha Tiger Reserve. Excessive tourism is creating problem, especially in the tourism zones.

KEY CONTRIBUTOR

The IBA Team

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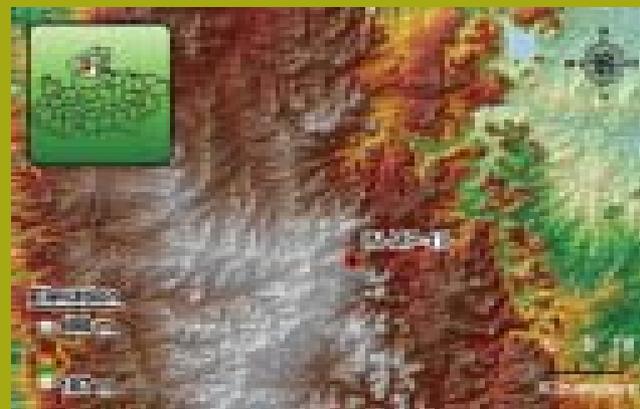
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MADHAV NATIONAL PARK



IBA Code	: IN-MP-10
State	: Madhya Pradesh
District	: Shivpuri
Coordinates	: 25° 28' 50" N, 77° 41' 26" E
Ownership	: State
Area	: 37,522 ha
Altitude	: 360 - 480 m
Rainfall	: 903 mm
Temperature	: 7 °C to 48 °C
Biogeographic Zone	: Semi-Arid
Habitats	: Tropical Dry Deciduous Forest and Freshwater Reservoirs

IBA CRITERIA: A1 (Threatened Species), A4iii (>20,000 waterbirds)
PROTECTION STATUS: National Park, established in January 1959

GENERAL DESCRIPTION

Madhav National Park was established in 1958 at the time of the creation of the state of Madhya Pradesh. It got its present name in 1959, when it was given final notification of establishment. The Park adjoins Shivpuri town, and is located about 110 km south of the city of Gwalior. Two national highways, N-3 Bombay-Agra and N-25 Shivpuri-Bhognipur, pass through the Park. The Park also has a good network of motorable roads for tourists.

The Park is interspersed with hills and valleys of the central Indian Vindhyaal hill ranges. It is very popular amongst local tourists and visitors, but not so much among foreign tourists. It was the hunting preserve and summer resort of the former Maharaja of Gwalior. It is reported that in 1916, Lord Hardinge shot eight tigers in one day in the Shivpuri forests, and Lord Minto shot 19 tigers during his trip to Gwalior State. These forests enjoyed a high degree of protection up to 1946.

In 1918, the Maharaja of Gwalior constructed dams on the Manihar river, creating the Sakhya Sagar (300 ha) and Madhav lakes (49 ha). With their scenic beauty and complete infrastructure for wildlife conservation, these reservoirs now attract thousands of waterfowl.

The forests of the Park are typically Mixed Dry Deciduous. Important tree species in the Park are *Anogeissus pendula*, *Boswellia serrata* and *Acacia catechu*.

AVIFAUNA

During a study by the BNHS, 227 birds were identified from this Park. The lakes attract thousands of ducks and other water birds, sometimes numbering more than 20,000 (A4iii criteria). During the drought years of 1987-88, when other waterbodies were dry, not less than 25,000 birds were found in the Sakhya Sagar reservoir.

During normal rainfall years when other waterbodies are full, the number of Demoiselle Cranes *Grus virgo* and Common Cranes *Grus grus* vary from 400 to 550, and less than 100 respectively. However, during the severe drought of 1987-88, Saxena (1990) claims to have found 7,000 Demoiselle and 1,000 Common Cranes. Sarus Crane *Grus antigone* is also found, but was not found to breed there between 1982-1988.

During ringing camps of the BNHS between 1987 and 1992, 979 birds of 115 species were ringed (Hussain 1998). Madhav NP is

also rich in bird life typical of Dry Deciduous Tropical Forest. BirdLife International (undated) has listed 59 from Biome-11 (Indo-Malayan Tropical Dry Zone), of which 30 species have been listed by Hussain (1998).

A pair of Black-necked Stork *Ephippiorhynchus asiaticus* was regularly seen but no nest could be found.

Critically Endangered	
Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Vulnerable	
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Great Spotted Eagle	<i>Aquila clanga</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>
Indian Skimmer	<i>Rynchops albicollis</i>
Near Threatened	
Darter	<i>Anhinga malenogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Oriental White Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Pochard	<i>Aythya nyroca</i>
Red-headed Vulture	<i>Sarcogyps calvus</i>
Pallid Harrier	<i>Circus macrourus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

OTHER KEY FAUNA

Madhav National Park has a long history of protection, as mentioned above. However, Wild Tiger *Panthera tigris* has disappeared as a resident animal, although occasional individuals are sighted. The major carnivores are Leopard *P. pardus*, Striped Hyena *Hyaena hyaena*, Golden Jackal *Canis aureus* and Jungle Cat *Felis chaus*. Chital *Axis axis*, Sambar *Cervus unicorn*, Nilgai *Boselaphus tragocamelus*, Four-horned Antelope *Tetracerus quadricornis*, Gazelle *Gazella bennettii* and Wild Boar *Sus scrofa* are the major ungulates. Sloth Bear *Melursus ursinus* is reported, but rarely seen. Common Langur *Semnopithecus entellus* is abundant, and the waterbodies are inhabited by Marsh Crocodile *Crocodylus palustris*.

Dams at Madhav NP built by Maharaja of Gwalior attract thousands of waterbirds.



Photo: Asad R. Rahmani

LAND USE

- ☐ Tourism and recreation
- ☐ Nature conservation and research
- ☐ Forestry activities

THREATS AND CONSERVATION ISSUES

- ☐ Tourism
- ☐ National Highways NH3 and NH25 pass through the Park
- ☐ Illicit felling, encroachment and mining
- ☐ Poaching
- ☐ Collection of firewood
- ☐ Grazing

Livestock grazing is the biggest problem in the Park. Although the Park is enclosed by a wall, it is breached in many places to let in cows. The villagers also abandon their cattle when they stop giving milk, so herds of semi-feral animals can be seen. Till now, only half-hearted attempts have been made to solve this long term problem.

As the Park is surrounded by agricultural fields, the wild animals go out in the night to graze, and many get shot. However, inside the Park poaching is under control.

In the late 1980s, misguided attempts were made to bring back the tiger to the Park, and millions of rupees were spent to put up a 'tiger safari' in the core of the Park. Fortunately, after refusal by the Central Zoo Authority, this so-called tiger safari is now being dismantled.

In the extension area of the Park, stone mines have been totally closed, which has resulted in the revival of the flora and fauna. However, cattle grazing is still a problem which needs to be tackled.

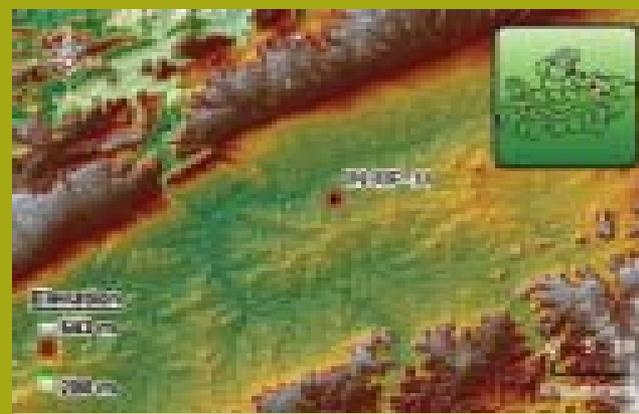
KEY CONTRIBUTORS

Asad R. Rahmani and Shailesh Pathak

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PANNA TIGER RESERVE



IBA Code	: IN-MP-11
State	: Madhya Pradesh
District	: Panna, Chhattarpur
Coordinates	: 24° 25' 56" N, 80° 04' 47" E
Ownership	: State
Area	: 54,267 ha
Altitude	: 200 - 550 m
Rainfall	: 1,100 mm
Temperature	: 5 °C to 48 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Dry Deciduous Mixed Forest

IBA CRITERIA: A1 (Threatened Species)
PROTECTION STATUS: Tiger Reserve, established in 1975

GENERAL DESCRIPTION

Panna National Park is located in the northern part of Madhya Pradesh and spreads over two districts, Panna and Chhattarpur. It is 37 km from the airport at Khajuraho, a World Heritage site famous for its beautifully sculpted temples. Satna is the nearest railhead, c. 70 km from the Park headquarters.

The forest of Panna was the game reserve of the erstwhile princely states of Bijawar, Chhattarpur and Panna. The boundaries of the earlier Gangau Wildlife Sanctuary were modified in 1981, to create the present Panna National Park. In 1994, it became India's 22nd Tiger Reserve.

Panna can boast of some of the most ruggedly beautiful scenery, vast flat plateaux separated by steep escarpments, ranging from 30 to 100 m. Talgoan and Hinota plateau extend over roughly half of the Park. Three villages located on the Hinota plateau were relocated in the early 1980s, creating a large area free of human disturbance (Yoganand 2001). This now forms the core area of the Park. More than a third of the Park the Chandranagar range, lies to the west of the Ken river. This area is a mosaic of tablelands and valleys. Unfortunately, this range suffers from high biotic pressure due to its proximity to villages.

Ken River, which joins the Yamuna, passes through the Park forming a perennial source of water in this area.

The main forest types in the Park are Tropical Dry Deciduous Mixed Forest with Teak *Tectona grandis*. Although predominantly an open forest, Panna supports varied vegetation types: closed canopy forested areas, which occur mostly along the escarpments, stream beds and less disturbed areas; open forests with short grass and shrub understorey; open savannah woodlands on the shallow plateau; tall grasslands that grow in relocated village sites and degraded scrub, largely towards the south and the periphery (Yoganand 2001).

AVIFAUNA

In a checklist prepared by the Wildlife Institute of India (Gogate *et al.* 2002), 228 species of birds have been listed, but later six more (Yellow-legged Button-quail *Turnix tanki*, Barred Button-quail *Turnix suscitator*, Slaty-breasted Rail *Gallirallus striatus*, Brown Hawk Owl, *Ninox scutulata*, Brahminy Kite *Haliastur indus* and the Grey-necked Bunting *Emberiza buchanani*) have been added (Koustubh Sharma *pers. comm* 2003).

Panna is perhaps the best and most extensive forest left in north-central Madhya Pradesh in the Bundelkhand area. It is located at the junction of the Deccan and the Indo-Gangetic Plains, therefore the bird life is very rich. With about 235 species of birds, it hosts almost all the biome assemblage species of this area, thus justifying its selection as an IBA. Another reason for its selection is that Panna still has a breeding colony of the Critically Endangered Long-billed Vulture *Gyps indicus*. During the 2002 breeding season, five active nests were observed at Dhundhwa cliffs of Hinouta Range, which were regularly monitored. Only one of these nests seemingly succeeded and a fledgling flew off during the observation period. Many other cliffs of this Park could have nesting sites and need to be further investigated. The vultures, though substantially depleted in number, still can be seen on carcasses around the Park.

The Lesser Adjutant *Leptoptilos javanicus*, listed as Vulnerable can be seen in Panna frequently after late winters.

The Birdlife International(undated) has listed 59 species in Biome-11. Panna NP has 32, including the two *Gyps* species mentioned earlier. The list is too long to be mentioned here.

Critically Endangered	
Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Vulnerable	
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Near Threatened	
Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Oriental White Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Pochard	<i>Aythya nyroca</i>
Red-headed Vulture	<i>Sarcogyps calvus</i>

OTHER KEY FAUNA

Among the large predators, Tiger *Panthera tigris* is the top carnivore in the Reserve with its nearest competitor being the Leopard *Panthera pardus* followed by rarely seen packs of Dhole or Wild Dog *Cuon alpinus*. The best known areas of animal distribution are Madla, Hinouta and Panna ranges. The various

Varried vegetation type at Panna TR provides habitat for 228 species of birds including nesting colonies of vultures on the cliffs.



Photo: Asad R. Rahmani

habitat types available in these ranges provide haven to good populations of Chinkara *Gazella bennettii*, Nilgai *Boselaphus tragocamelus*, Sloth Bear *Melursus ursinus*, Chital *Axis axis*, Sambar *Cervus unicolor* and Wild Boar *Sus scrofa*. Panna also boasts of a good population of Four-horned antelope *Tetracerus quadricornis*, which can be seen mostly in thick grassy areas, patches of good undergrowth and moderate canopy cover.

LAND USE

- q Tourism and recreation
- q Nature conservation and research
- q Mining industries
- q Pilgrimage

THREATS AND CONSERVATION ISSUES

- q Tourism
- q Pilgrims
- q Man-animal conflict
- q Forest fires
- q Livestock grazing
- q Mining of sandstone and diamond
- q Illicit activities such as felling of trees and poaching
- q Unsustainable exploitation of the forest resources
- q Collection of firewood

The Park has a special place in north-central Madhya Pradesh from the point of view of ecology, vegetation, and culture and is a true representative of Bundelkhand region.

Thirteen villages still remain inside the Park's boundary and they are the major source of disturbance, especially their cattle and their dependence on forest products which varies in kind and quantity throughout the year, according to seasons. During summer, these villagers bring hordes of their cattle to graze inside the Park, as there is hardly any fodder left outside.

The biggest and irreversible damage done to the Park and surroundings is by the Panna diamond mine, the numerous sandstone quarries and the pressure placed on the forests by hordes of mine labourers (Yoganand 2001). The Government-owned National Mineral Development Corporation (NMDC) is situated just outside the Park and falls within the earlier Gangau Wildlife Sanctuary. This mine contravenes the guidelines of the Ministry of Environment and Forests, that industrial sites maintain a minimum distance of 25 km from ecologically sensitive areas although to be honest, these mines were present much before the Park was declared. Slurry from the mine enters the Kaimasan nullah, which flows into the Tiger Reserve.

Though poaching is not as serious a problem yet, it needs to be continuously monitored as there are a number of local tribes like *Bahalias*, who are hunters by tradition. These locals kill wild animals if protection is lax. Herbivores cause massive damage to the crop of villages inside and around the Park boundary which at times has severe fallouts. This man-animal conflict leads to laying of snares by villagers in order to kill animals not only outside, but inside the Park boundary as well.

Another very important issue with Panna Tiger Reserve is the absence of buffer zone which also violates the Project Tiger guidelines. This puts tremendous pressure on the natural resources of the Park due to the influx of humans.

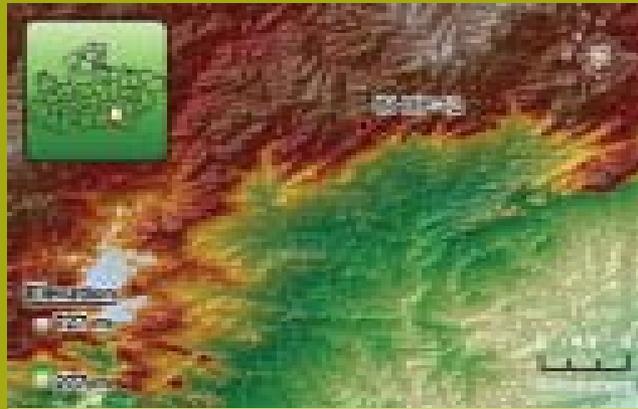
KEY CONTRIBUTORS

Koustubh Sharma and T. Yoganand

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PENCH TIGER RESERVE



IBA Code	: IN-MP-12
State	: Madhya Pradesh, Maharashtra
District	: Seoni and Chhindwara
Coordinates	: 21° 50' 42" N, 79° 27' 47" E
Ownership	: State
Area	: 29,285 ha
Altitude	: 425 - 630 m
Rainfall	: 1,397 mm
Temperature	: 3 °C to 47 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Dry Deciduous Forest

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

GENERAL DESCRIPTION

Pench Tiger Reserve is named after the Pench river, which flows from north to south through the Reserve. The Reserve is located in the southern reaches of the Satpura hills in the Seoni and Chhindwara districts in Madhya Pradesh, and continues in Nagpur district in Maharashtra as a separate Sanctuary. The terrain is undulating, with most of the area covered by small hills and steep slopes on the sides.

Pench is located in an area of Central India that holds a significant place in the natural history of India. The description of its richness in fauna and flora and its natural beauty has been recorded in numerous books dating back to the 17th century.

Pench Tiger Reserve was created in 1992, becoming the 19th Reserve in the Project Tiger network (Jain 2001). The core zone of the Reserve, Pench National Park was created in 1983. This was carved out of the Pench Sanctuary created in 1977 with an area of 44,939 ha. The area of the Park is 29,285 ha, which is divided almost equally among two districts-14,536 ha in Seoni and 14,728 ha in Chhindwara.

The area is criss-crossed by numerous seasonal streams and nullahs. The Pench river which flows through the center of the Reserve is dry by the end of April, but a number of pools, locally known as *dohs*, remain which serve as waterholes for the wildlife. A few perennial springs also exist in this area. The Pench reservoir at the centre of the Reserve is the only major water source during the summer period.

Pench Tiger Reserve of Madhya Pradesh adjoins Pench Wildlife Sanctuary of Maharashtra (both considered separate IBAs for administrative reasons).

One village is situated within the Reserve and nine are located on its periphery. The core area of the Reserve lies about 7 km away from the Nagpur-Jabalpur National Highway. The proximity of the Reserve to Nagpur city attracts several tourists to the area. On an average, 100,000 tourists visit this area every year.

The main forest type of the area is Southern Tropical Dry Deciduous Forest. The understorey trees include *Emblica officinalis*, *Acacia catechu*, and *Chloroxylon swietenia*. Bamboo *Dendrocalamus strictus* occurs sparsely, and is restricted to some valleys. There are almost pure patches of *Cleistanthus collinus* and *Terminalia alata* at several places. Thick stands of lantana

can be seen in areas with low-density forests near habitation (Dwivedi 2003).

AVIFAUNA

About 269 species of birds have been identified from this IBA site between February 1996 and July 2000 (Pasha *et al.* unpublished).

The Pench reservoir, spread over 5,000 ha, is a major attraction to migratory waterfowl, and the dead trees scattered amidst the reservoir are good nesting sites for cormorants, egrets, herons and storks. White-necked Stork *Ciconia episcopus*, Painted Stork *Mycteria leucocephala*, Asian Openbill *Anastomus oscitans*, White Ibis or Black-headed Ibis *Threskiornis melanocephalus* and Purple Heron *Ardea purpurea* are some of the birds that breed around the reservoir. As the reservoir touches the forest and does not have low-lying shallow areas, small waders are not common.

Since fishing was totally prohibited, the number of waterfowl has increased dramatically, both as breeding and wintering birds. According to R. N. Saxena (*pers. comm.* 2003), more than 2,000 Little Cormorant *Phalacrocorax niger* were found nesting in 2001-2002.

Some of the interesting bird records of Pasha *et al.* (unpublished) are regular sightings of Pied Harrier *Circus*

Pench TR is an excellent birding area where 269 species are recorded, including the Vulnerable Greater Spotted Eagle *Aquila clanga*.



Photo: Tim Lossy/BirdLife International

melanoleucos every year since 1996; upto ten pairs of Malabar Pied Hornbill *Anthracoceros coronatus*; and a male Rosy Minivet *Pericrocotus roseus*. The Malabar Pied Hornbill is found mainly in the Western Ghats and east India, while the Rosy Minivet is a bird of the Himalayas and northeast India, wintering mainly in northeast and eastern India (Grimmett *et al.* 1999). Their presence in Pench indicates that they have a wider distribution than known earlier.

Besides the six globally threatened species found in this IBA, Pench TR has been selected as an IBA on A3 (Biome-11: Indo-Malayan Tropical Dry Zone) criteria also. Pench has the typical forest type and bird assemblages of central India. The BirdLife International (undated) has identified 59 species in Biome-11. In Pench, 29 have been seen till now (Pasha *et al.* unpublished). Probably more occur here. The list is too long to be included here.

Critically Endangered	
Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Vulnerable	
Greater Spotted Eagle	<i>Aquila clanga</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>
Lesser Kestrel	<i>Falco naumanni</i>
Green Munia	<i>Amandava formosa</i>
Near Threatened	
Darter	<i>Anhinga malenogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Oriental White Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Pochard	<i>Aythya nyroca</i>
Greater Grey-headed Fish-Eagle	<i>Ichthyophaga ichthyaetus</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Red-headed Vulture	<i>Sarcogyps calvus</i>
Malabar Pied Hornbill	<i>Anthracoceros coronatus</i>

OTHER KEY FAUNA

Pench has most of the mammals of central Indian forests, such as the Tiger *Panthera tigris*, Leopard *P. pardus*, Sloth Bear *Melursus ursinus*, Chinese Pangolin *Manis pentadactyla*, Chital *Axis axis*, Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak*, Blue bull or Nilgai *Boselaphus tragocamelus*, Wild Boar *Sus scrofa*, and Gaur *Bos frontalis*. Jungle Cat *Felis chaus*, Leopard Cat *Prionailurus bengalensis*, Striped Hyena *Hyaena hyaena*, Wild Dog *Cuon alpinus*, and Common Mongoose *Herpestes edwardsi* are the smaller carnivores. The Freshwater Crocodile *Crocodylus palustris* is found in the reservoir.

LAND USE

- ☐ Agriculture
- ☐ Nature conservation and research
- ☐ Tourism and recreation
- ☐ Watershed and management



More than 2000 Little Cormorants *Phalacrocorax niger* nested in 2001-02.

Photo: R. N. Saxena

KEY THREATS AND CONSERVATION ISSUES

- ☐ Grazing
- ☐ Illegal fishing
- ☐ Tourism
- ☐ Introduction of exotic species
- ☐ Collection of timber and firewood

There were two villages within the Park, but they have been relocated outside the Park in 1992. These have been converted to good pasture for wild ungulates. *Butea monosperma*, *Lagerstroemia parvifolia* and *Terminalia alata* have spread, along with weeds. These need to be controlled.

Tremendous disturbance was inflicted on the forests of the Reserve during the construction of the Pench Dam at Totladoh. Since the ban on fishing in the reservoir, the bird life has improved tremendously. However, illegal fishing continues in the reservoir.

Funds and infrastructure to manage the Reserve are scarce, and about 30% of the posts of forest guards are vacant. About 4,000 heads of livestock from the surrounding villages depend solely on the Reserve for grazing. A similar number of villagers in and around the Reserve are entirely dependent on the Reserve for their needs of firewood and small timber. There is also some encroachment by villagers from Ghatpendhri. A new road has been constructed through the Reserve, which could increase the poaching problem.

KEY CONTRIBUTORS

Khalid Pasha and R. N. Saxena

KEY REFERENCES

- BirdLife International (undated) *Important Bird Areas (IBA) in Asia: Project briefing book*. BirdLife International, Cambridge, U.K., unpublished.
- Dwivedi, A. P. (2003) *Protected Areas of Madhya Pradesh*. Forest Department of Madhya Pradesh, Bhopal.
- Grimmett, R., Inskipp C and Inskipp, T. (1998) *Birds of the Indian Subcontinent*, Christopher Helm, London.
- Jain, P. (2001) *Project Tiger Status Report* Project Tiger, Ministry of Environment and Forests, Government of India, New Delhi.
- Pasha, K., Jaypal, R., Areendran, G., Qureshi, Q. and Sankar, K. (unpublished). *Birds of Pench Tiger Reserve, Madhya Pradesh, Central India*.

RANGAWA RESERVOIR



IBA Code	: IN-MP-13
State	: Madhya Pradesh
District	: Chhattarpur
Coordinates	: 24° 41' 60" N, 79° 50' 60" E
Ownership	: State
Area	: 500 ha
Altitude	: 257 m
Rainfall	: 1,074 mm
Temperature	: 4 °C to 48 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Freshwater Reservoir

IBA CRITERIA: A4iii (≥20,000 waterbirds) Data Deficient
PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Rangawa reservoir is located about 15 km from the airport of Khajuraho, a World Heritage Site. It is a vast reservoir of c. 500 ha. The wetland is surrounded by hillocks, villages and agricultural fields. The boundary of the Panna Tiger Reserve (an IBA) is located just a few hundred metres from the reservoir. The reservoir is easily accessible, being close to the national highway and village roads.

The vegetation around the reservoir comprises mostly thick Teak forest *Tectona grandis*, which covers almost the entire terrain towards the southeast of the reservoir. Apart from this, Palash or Dhak *Butea monosperma*, makes up the rest of the vegetative cover. Other hillocks around the reservoir bear small shrubs.

The main bund of the Dam is about 2 km long, and gives way to a canal which is used for irrigation.

The Rangawa reservoir has long shallow stretches towards its northern and western peripheries, close to the Panna-Khajuraho road. This area supports most of the migratory birds during winter. As fishing and other conspicuous human activities are conducted towards the deeper zones, the birds get a relatively disturbance free refuge in the shallow areas.

AVIFAUNA

The precise number of species present in and around the lake is unknown. Reports suggest that the reservoir hosts more than 20,000 birds during peak winter season. Therefore, it satisfies A4iii criterion.

The reservoir is mainly used for irrigation and fishing. An old, partially submerged castle towards the southeast is used by Great Cormorant *Phalacrocorax carbo*, Little Cormorant *Phalacrocorax niger* and other birds for roosting.

Many forest birds that are seen in Panna Tiger Reserve can be seen here, although no proper survey has ever been conducted.

LAND USE

- ☐ Agriculture
- ☐ Fishing

THREATS AND CONSERVATION ISSUES

- ☐ Soil erosion at the reservoir banks
- ☐ Poaching
- ☐ Encroachment and intensive land use

The villages in the catchment area of Rangawa reservoir are primarily dependent on agriculture. Use of toxic pesticides is prevalent, and the farmers do not know the proper quantity of pesticides that they must use. As a result, large quantities of pesticides flow into the reservoir, the cumulative toxic effect needs to be studied.

KEY CONTRIBUTOR

Koustubh Sharma

KEY REFERENCE

None.

Rangawa Reservoir is a roosting area for cormorants.
 More than 20,000 waterbirds congregate here.



Photo: Ketil Knudsen/Peter Lobo

RATAPANI WILDLIFE SANCTUARY



IBA Code	: IN-MP-14
State	: Madhya Pradesh
District	: Raisen, Sehore
Coordinates	: 23° 07' 13" N, 77° 52' 35" E
Ownership	: State
Area (ha)	: 82,384 ha
Altitude	: 300 - 690 m
Rainfall	: Not available
Temperature	: Not available
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Dry Deciduous Forest, Tropical Moist Deciduous Forest, Freshwater Reservoir

IBA CRITERIA: A1 (Threatened Species), A4iii (>20,000 waterbirds)
PROTECTION STATUS: Wildlife Sanctuary, established in 1978

GENERAL DESCRIPTION

Ratapani WLS is spread over a vast area in the forests of the Vindhyaal Ranges, north of the Narmada river. Bhopal, the state capital, is about 35 km away. The landscape is undulating, with hills, plateaux, valleys and plains. A number of seasonal streams irrigate the site in the monsoon, and water is retained in some pools along these streams even in the summer. Two large reservoirs, namely Barna Reservoir and Ratapani Dam (Barrusot lake) are among the major waterbodies adjacent to or inside the Sanctuary.

The forest of Ratapani is Dry Deciduous and Moist Deciduous type, with Teak *Tectona grandis* as the main tree species. About 55% of the area is covered by Teak. The remaining mixed forests consist of various dry deciduous species. Bamboo *Dendrocalamus strictus* overlaps the two aforementioned forest types and covers about one quarter of the forest area (Dwivedi 2003).

AVIFAUNA

The Ratapani WLS is rich in the typical wildlife of central India. Not much work has been done on the birds of Ratapani, although frequent visits by birdwatchers to the site provide baseline information on the species seen in and around the site. More than 150 species of birds are reported from Ratapani Wildlife Sanctuary (K. Sharma *pers. comm.* 2003).

Painted Stork *Mycteria leucocephala* is regularly seen in good numbers.



Photo: VSFCA

Oriental White-backed Vulture *Gyps bengalensis*, Long-billed Vulture *Gyps indicus* and Red-headed Vulture *Sarcogyps calvus* are often found perched on a cluster of trees or soaring at great heights in search of food (K. Sharma *pers. comm.* 2002). The Ratapani dam at the periphery of the Sanctuary invites thousands of migratory birds in winter. There are many smaller reservoirs dotted all over the Sanctuary. The total waterfowl populations in all these smaller reservoirs and Ratapani reservoir would easily exceed 20,000 (A4iii criteria). Moreover, these waterbodies also attract large wading birds such as the Sarus Crane *Grus antigone*, Painted Stork *Mycteria leucocephala*, Black-necked Stork *Ephippiorhynchus asiaticus* and White-necked Stork *Ciconia episcopus* (K. Sharma *pers. comm.* 2002). The rich diversity in terrestrial species throughout the Sanctuary certainly calls for a proper bird survey of the area.

Ratapani retains some of the finest representative forest cover of the Indo-Malayan Tropical Dry Zone (Biome-11). Of the 59 bird species identified by BirdLife International (undated) in this biome, 33 are found in Ratapani, further proving the importance of this site for the protection of biome species. Detailed studies could reveal more bird species.

Critically Endangered

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

Vulnerable

Sarus Crane	<i>Grus antigone</i>
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Near Threatened

Darter	<i>Anhinga malenogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Oriental White Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Pochard	<i>Aythya nyroca</i>
Red-headed Vulture	<i>Sarcogyps calvus</i>

OTHER KEY FAUNA

This site has almost all the carnivores and herbivores found in dry deciduous forests of central India, such as the Tiger *Panthera tigris*, Leopard *Panthera pardus*, and Dhole or Wild Dog *Cuon alpinus*, Striped Hyena *Hyaena hyaena*, Jackal *Canis aureus* and Jungle

Cat *Felis chaus*. The herbivores include Chital *Axis axis*, Sambar *Cervus unicolor*, Nilgai *Boselaphus tragocamelus*, Four-horned Antelope *Tetracerus quadricornis* and Wild Boar *Sus scrofa* (Dwivedi 2003). Not much is known about the smaller mammals, reptiles and amphibians.

LAND USE

- q Tourism and recreation
- q Fishing
- q Irrigation

THREATS AND CONSERVATION ISSUES

- q Poaching
- q Encroachment and forest fires
- q Illicit felling
- q Livestock grazing
- q Man-animal conflict

This large sanctuary faces pressures from all directions. Illicit felling, grazing by cattle, poaching and encroachment are the major concerns for the management. Presence of 26 villages inside the Sanctuary and another 109 villages around it exert the associated anthropogenic pressures. These villages are dependent for their day-to-day needs on the biomass resources of the Sanctuary. Forest fires, natural and man-made, are a major problem in summer. The long, narrow area of Ratapani WLS (about 70 km long and about 15 km wide) makes it more vulnerable to intensive biotic pressure in most of its areas.



MP-14

KEY CONTRIBUTOR

Koustubh Sharma

KEY REFERENCES

- BirdLife International (undated) *Important Bird Areas (IBAs) in Asia: Project briefing book*. BirdLife International, Cambridge, U.K., unpublished.
- Dwivedi, A. P. (2003) *Protected Areas of Madhya Pradesh*. Forest Department of Madhya Pradesh, Bhopal.

MP-15

SAILANA KHARMOR SANCTUARY



IBA Code	: IN-MP-15
State	: Madhya Pradesh
District	: Ratlam
Coordinates	: 23° 24' 26" N, 74° 58' 05" E
Ownership	: State
Area	: 1,296 ha
Altitude	: 484 m
Rainfall	: 800 mm
Temperature	: 10 °C to 43 °C
Biogeographic Zone	: Semi-Arid
Habitats	: Tropical Grassland

IBA CRITERIA: A1 (Threatened Species)
PROTECTION STATUS: Wildlife Sanctuary, since June 1983

GENERAL DESCRIPTION

The Sailana Kharmor Sanctuary was declared a protected area in June 1983 to safeguard the highly endangered Lesser Florican *Sypheotides indica*, known locally as *Kharmor* or 'Grass Peacock'. It comprised of 354 ha of grassland, crop fields and grazing lands. The Sanctuary is bounded by three villages, Sailana, Adwanya and Gordhanpura, and the whole area is jointly owned by agriculturists. The grassland area within the Sanctuary is about 200 ha and is known as *Naulakha beed* (Sankaran 1990). The grassland was maintained and protected primarily for fodder production.

Sailana Kharmor Sanctuary falls within the Malwa plateau, which covers about 3,460,000 ha and is a wide tableland with a mean elevation of about 484 m above msl. It is a vast, undulating plateau, interspersed with a few small hills. Once this plateau was apparently well wooded, with Teak *Tectona grandis* and Dhak *Butea monosperma*, but with the loss of the original forest, pure grasslands were formed.

Most of the area of the Sanctuary is treeless, and dominated by the grass species *Sehima nervosum*-*Chrysopogon fulvus* type. Other grass species are *Heteropogon contortus*, *Apluda mutica*, *Cymbopogon martinii*, *Aristida funiculata* and species of genera *Brachiaria*, *Eragrostis*, *Dicanthium*, *Digitaria*, *Setaria*, *Bothriocloa* and *Pseudoanthistiria*. The scattered trees found in the Sanctuary area are *Prosopis chilensis*, *Zizyphus jujuba*, *Acacia catechu* and *Butea monosperma*.

Up to 15 males Lesser Florican *Sypheotides indica* were recorded in the Sanctuary in the 1980s.



Photo: I. R. Gadhvi

AVIFAUNA

The BNHS initiated studies on this bird in 1984. During these preliminary surveys, 15 floricans, mainly males were seen (Sankaran and Rahmani 1990). Intensive studies were conducted from 1986 to 1989 (Sankaran and Rahmani 1990, Sankaran 1991). The area was going through a cyclic dry phase, and 1987 experienced extreme drought. The florican population declined, and by 1989, only 11 males were sighted. However, from 1991 onwards, for almost a decade the rainfall was normal or above normal but the florican number still declined mainly due to shrinkage of habitat. As the grassland habitat was converted into crop fields, there was less and less habitat available for florican. During a survey in 2002, only 4-5 males were seen (P. M. Lad *pers. comm.* 2002) Records of floricans from different grasslands, some outside the notified Sanctuary, are given in Sankaran *et al.* (1992).

Besides the Lesser Florican, 125 species of birds have been reported from Sailana grasslands (Anon. 1990). In the 1980s, a pair of Sarus Crane *Grus antigone* was found in the Sanctuary, and many more in the surrounding areas. According to P. M. Lad (*pers. comm.* 2003), a pair of Sarus is still seen around Sailana. Lesser Whistling Duck *Dendrocygna javanica* commonly breeds in the grasslands near wetlands, especially during normal monsoon years when the grass is tall. During winter, three species of harriers (*Circus macrourus*, *C. pygargus* and *C. aeruginosus*) are seen, sometimes as many as 40-50 gather to roost. Sailana grasslands are good breeding grounds for the endemic Sykes' Crested Lark *Galerida deva*.

Hundreds of European Rollers *Coracias garrulus*, Blue-cheeked Bee-eaters *Merops superciliosus* and Blue-tailed Bee-eaters *M. philippinus* are seen on passage migration.

Critically Endangered	
Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Endangered	
Lesser Florican	<i>Sypheotides indica</i>
Vulnerable	
Lesser Kestrel	<i>Falco naumanni</i>
Sarus Crane	<i>Grus antigone</i>
Indian Skimmer	<i>Rynchops albicollis</i>

OTHER KEY FAUNA

There is no large wild mammal left in Sailana and the surrounding areas. Golden Jackal *Canis aureus*, Indian Fox *Vulpes bengalensis* and Jungle Cat *Felis chaus* are the major predators of Lesser Florican, other birds and Black-naped Hare *Lepus nigricollis*. Many species of snakes are found, including Indian Cobra *Naja naja*, but none of them are of any conservation concern as they are commonly found in many areas.

LAND USE

- q Agriculture
- q Human habitation
- q Nature conservation and research

THREATS AND CONSERVATION ISSUES

- q Human settlements
- q Livestock grazing

Although Sailana Kharmor Sanctuary was properly notified and forest staff posted, no attempt was made to acquire the main grassland where the Lesser Florican used to breed. During the last 20 years or so, more than half of this grassland has been converted to crop fields, or is open to year-long livestock grazing. The florican population has dwindled to 4-5 adult territorial males (P. M. Lad *pers. comm.* 2002) in Sailana Kharmor Sanctuary.

During the survey in 1986, up to 45 male floricans were estimated in Sailana and in private grasslands, but the population has now been reduced to less than 20 individuals (P. M. Lad *pers. comm.* 2002), as many private grass *beeds* (grassland) have been converted to crop fields.

In order to arrest further decline, the Forest Department must purchase the remaining grasslands and manage them properly. The produce from these grasslands should be given on subsidized rates to local farmers and livestock owners. Without appropriate protection, there is no future for the Lesser Florican in Sailana Kharmor Sanctuary.

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Asad R. Rahmani, Ravi Sankaran and P. M. Lad

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SARDARPUR WILDLIFE SANCTUARY



IBA Code	: IN-MP-16
State	: Madhya Pradesh
District	: Dhar
Coordinates	: 22° 35' 53" N, 75° 12' 21" E
Ownership	: State
Area	: 34,812 ha
Altitude	: c. 500 m
Rainfall	: 1,200 mm
Temperature	: 10 °C to 43 °C
Biogeographic Zone	: Semi-Arid
Habitats	: Tropical Grassland

IBA CRITERIA: A1 (Threatened Species)
PROTECTION STATUS: Wildlife Sanctuary, since June 1983

GENERAL DESCRIPTION

Sardarpur Kharmor Sanctuary was established on the recommendations of Sâlim Ali for the protection of the Lesser Florican *Sypheotides indica*. A survey was conducted during 1981 by P. M. Lad, the then Director, Van Vihar, Bhopal, and later Conservator of Forests, on the recommendation of Sâlim Ali. During this survey, it was found that the Lesser Florican is present in around 14 villages near Sardarpur *taluka* in Dhar district. Accordingly, a sanctuary was constituted and notified vide order No. 2410-X-2-83, dated June 4, 1983 by the Government of Madhya Pradesh.

Sardarpur is located close to Rajgarhnagar on the Indore-Ahmedabad road, about 55 km from the district headquarters of Dhar and 125 km from Indore.

Most of the area of the Sanctuary is treeless, and dominated by the grass species *Sehima nervosum-Chrysopogon fulvus* type. Other grass species are *Heteropogon contortus*, *Apluda mutica*, *Cymbopogon martinii*, *Aristida funiculata* and species of genera *Brachiaria*, *Eragrostis*, *Dicanthium*, *Digitaria*, *Setaria*, *Bothriocloa* and *Pseudoanthistiria*. *Prosopis chilensis*, *Zizyphus jujuba*, *Acacia catechu* and *Butea monosperma* trees are found growing singly in the Sanctuary area.



Photo: Asad R. Rahmani

Sardarpur is a well known Sanctuary for the Lesser Florican *Sypheotides indica*.

AVIFAUNA

The Lesser Florican is seen only during the breeding season. It arrives at the onset of monsoon by the end of June or beginning of July, and leaves by the end of October or in November.

A mosaic of grasslands and agricultural fields are present in this Sanctuary. The Florican is mostly found in protected grasslands. During 1984, nine males were sighted in Chadawat, Dhulat-Rajabheda, Karnawat and Pipami grasslands, while 7 were seen in 1989 (Sankaran and Rahmani 1990). In the 2,700 ha Panpura grasslands, no florican was sighted at that time. But now, 4-8 males are regularly seen (P. M. Lad *pers. comm.* 2002). As private and government grasslands have decreased in size and deteriorated in quality due to over-grazing, the birds could have shifted to Panpura, which is protected by the Forest Department.

No work has been done on the bird life of this Sanctuary but it could not be very different from Sailana Kharmor Sanctuary.

Endangered	
Lesser Florican	<i>Sypheotides indica</i>

OTHER KEY FAUNA

Sardarpur Kharmor Sanctuary does not have large ungulates or predators (except for a stray record of Leopard *Panthera pardus*). Smaller mammals include the Golden Jackal *Canis aureus*, Indian Fox *Vulpes bengalensis*, and Common Langur *Semnopithecus entellus*.

LAND USE

- ☐ Agriculture
- ☐ Human habitation
- ☐ Nature conservation and research

THREATS AND CONSERVATION ISSUES

- ☐ Human settlements
- ☐ Livestock grazing
- ☐ Water scarcity

After the initial notification of the Sanctuary under Section 18, no progress could be made under Section 19 to 25 (for determination of rights) to enable its notification under Section 26-A. After intervention by the Supreme Court, efforts were made to start proceedings under Section 19 to 25. During 1991, amendments

The Forest Department has made grassland enclosures to protect the nesting sites of the Lesser Florican.



MP-16

Photo: Divyesh Kothari

were made in the Wildlife (Protection) Act 1972 (WPA). Meanwhile, difficulties were experienced by local people in transfer of their own proprietary land (*bhoomi swami* land) due to the provisions of Section 20 of the WPA. Therefore, a section of villagers demanded that their villages should be excluded from the Sanctuary area. The Cabinet Sub-committee of Madhya Pradesh state deliberated on this issue and decided that the proposals to rationalize areas of national parks and sanctuaries may be examined by a technical experts committee. Accordingly, a committee was constituted for the rationalization of the Kharmor Sanctuary.

The Committee examined the Amendments made to the Act during 1991 and 2002. A provision has been made in the WPA under Section 24, that in certain cases rights of local people can continue within the limits of a sanctuary in consultation with the Chief Wildlife Warden of the State. In the present case, it is not advisable to exclude any area of the Kharmor Sanctuary keeping in view the requirement of this globally threatened species, listed as Endangered species in the Red Data Book of the IUCN (World Conservation Union). Secondly, it is also not advisable and desirable to acquire private crop fields because it would cause

misery to the local people, and would require massive financial resources which are not available. Therefore, to accommodate the requirements of the florican and the local community, the Committee recommended that:

The local people should be permitted to exercise their rights on their land under Section 24(c). Within the Sanctuary area some revenue grasslands (defined as forest under the definition provided by the Supreme Court) should be identified and handed over to the Forest Department so that a mosaic of grasslands and cultivation is maintained. There is no need to denotify any part of the Sardarpur Kharmor Sanctuary.

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P. M. Lad, Asad R. Rahmani and R.N. Saxena

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YESHWANTSAGAR RESERVOIR



IBA Code	: IN-MP-17
State	: Madhya Pradesh
District	: Indore
Coordinates	: 22° 49' 00" N, 75° 40' 60" E
Ownership	: Irrigation Department, Indore Municipal Corporation
Area	: 14,000 ha
Altitude	: 535 m
Rainfall	: 1,050 mm
Temperature	: 12 °C to 43 °C
Biogeographic Zone	: Semi-Arid
Habitats	: Freshwater Reservoir

IBA CRITERIA: A1 (Threatened Species), A4i (>1% biogeographic population)
Data Deficient

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

The ruler of erstwhile Indore state created Yeshwantsagar reservoir in 1939 to meet the growing needs of the city. Made by the construction of a dam on the Gambhir river, the reservoir is situated at a distance of c. 21 km from Indore, which is also known as the business capital of Madhya Pradesh and is well connected by both air and rail routes. Water from the reservoir is mainly used for irrigation and drinking purposes and supports the requirement of Indore, which is shared by the Narmada river as well.

Open fields on almost all sides surround Yeshwantsagar reservoir. The main cultivation is wheat, corn, pulses and cash crops. The terrain is mostly flat and devoid of undulating areas. The aquatic vegetation comprises mostly of *Ipomoea*, water lily, lotus and reeds. The reservoir is mostly shallow, good for waders and other waterfowl. As the water level recedes, many islands serve as roosting sites for waterfowl.

AVIFAUNA

Due to its vast shallow reedbeds, the wetland is a haven to a large number of birds in winter and in summer. Large congregations of Sarus Crane *Grus antigone*, with numbers exceeding 170, are reported from the site, apart from several nesting pairs (Gopi Sundar *et al.* 1999). This number, being more than 1% of the biogeographical population of the species, qualifies the site as an IBA. These Sarus Cranes formed the major population of all Sarus Cranes counted in the state of Madhya Pradesh (Gopi Sundar *et al.* 2000). Later, a similar congregation was reported from the Upper Lake of Bhopal (Koustubh Sharma *pers. comm.* 2002).

As no proper survey has been done on the avifauna of the area, not much can be said about the species and its population in this site.

	Vulnerable
Sarus Crane	<i>Grus antigone</i>

LAND USE

- ☐ Tourism and recreation
- ☐ Fishing
- ☐ Irrigation and potable water

THREATS AND CONSERVATION ISSUES

- ☐ Pollution
- ☐ Use of pesticides
- ☐ Increasing trend to shift from traditional crops to cash crops
- ☐ Tourism

Yeshwantsagar reservoir, being close to a populous city, invites thousands of picnickers throughout the year. Pollution caused by these tourists is a major threat, as large amounts of plastic and other junk litter the banks of the reservoir close to the road from Indore. Submerging of Plaster-of-Paris and clay idols, degradable and non-degradable garbage, and the use of toxic pesticides for agriculture pose an alarming threat to the wetland habitat.

The impact of changing water levels in the reservoir on Sarus populations is unknown and could form an important and interesting study (Gopi Sundar *et al.* 1999). The Sarus Crane enjoys protection from farmers, due to the traditional belief that it has a lifelong pair bonding habit. However, the impact of changing cultivation and agricultural techniques seems to be affecting the population. As Yeshwantsagar is a stronghold of the Sarus, it becomes extremely important for the species' conservation.

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K. S. Gopi Sundar and Koustubh Sharma

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