

ANDHRA PRADESH

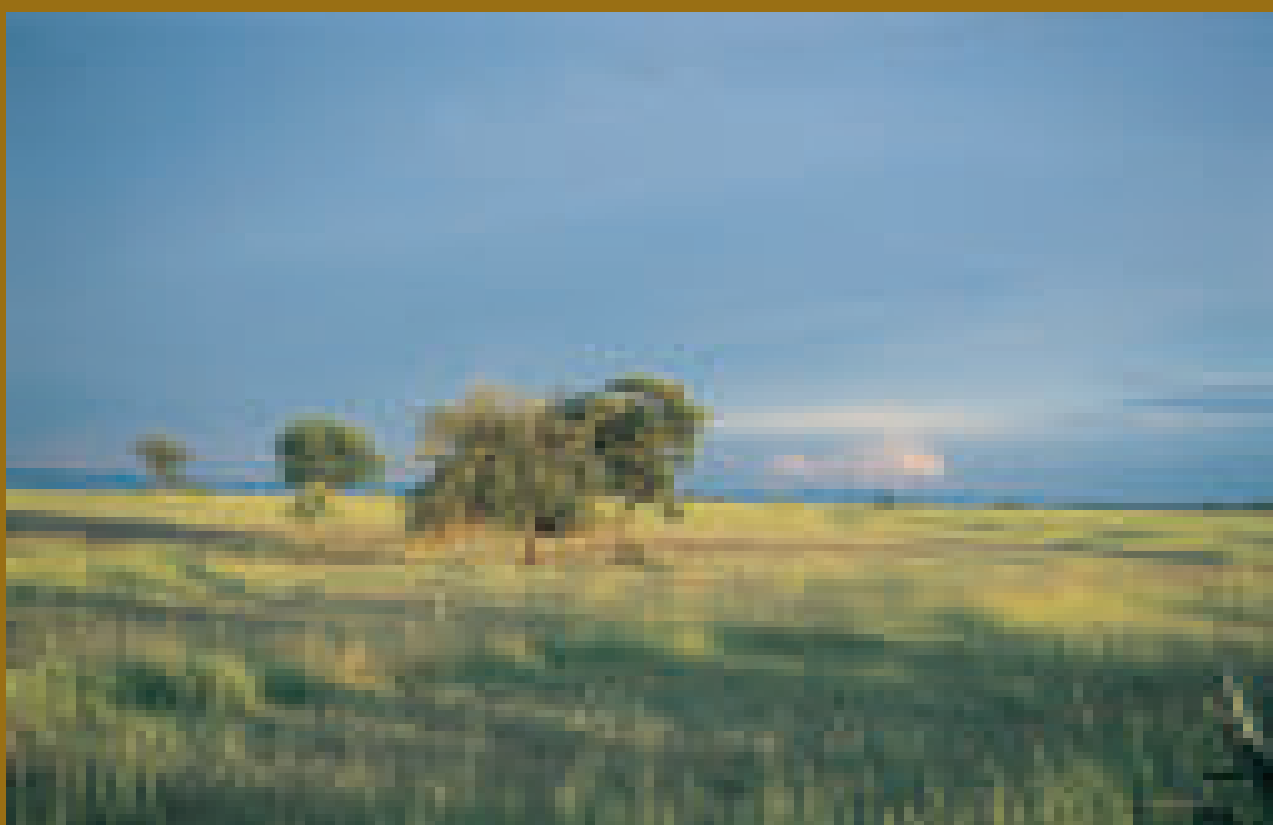


Photo: Asad R. Rahmani

Timely action by the Forest Department has saved the grasslands of Rollapadu Wildlife Sanctuary.

Andhra Pradesh (12° 40' - 19° 50' N and 76° 45' - 84° 40' E) is the fifth largest state in India, with a geographical area of 27.51 million ha, 8.37% of the total area of India. Andhra Pradesh is bounded by Tamil Nadu in the south, by Orissa on the northeast, Maharashtra and Chhattisgarh on the north, eastern Maharashtra and Karnataka on the west and by the Bay of Bengal in the east.

Andhra Pradesh has three distinct regions: the coastal region (Andhra), the interior region (Rayalaseema) and the Telengana region (Hyderabad). Andhra Pradesh is situated in the tropical zone and has 16% of its area under forest. It has a coastline of about 972 km on its eastern side. The altitude of the land varies from the sea level along the coastal plains to about 1,500 m in the Eastern Ghats. The average altitude of the plains is about 500 m. The land generally slopes from the northwest to the southeast. The major rivers are the Godavari, the Krishna, the Tungabhadra and the Pennar. Besides these, there are many medium and smaller rivers. The state has a very large freshwater lake at Kolleru and several fairly large waterbodies at Pakhal, Ramappa, Pocharam, Nelapattu, Osman Sagar and Himayat Sagar. There is an extensive salt-water lagoon called Pulicat on the extreme northern coast. There are also the Naupada swamps and the Coringa Creek, the Krishna Mangroves, the Godavari Mangroves and several reservoirs (Taher and Taher 1996). Of the four major Indian deltas on the eastern coast, the Godavari-Krishna delta of Andhra Pradesh is spread over an area of 585 sq. km with mangrove cover of 251 sq. km. It is the third largest mangrove biodiversity resource in eastern India. The other important mangrove areas are Coringa, Kandikuppa, Nachgunta, Salagondi, Yanum, Antarvedi, Sarlagondi, Ellichitladibba, Repalle and Bandamyslanka (Banerjee 2002).

The Eastern Ghats are a rugged, hilly terrain running almost parallel to the eastern coast of India. The Eastern Ghats are divisible into three zones: the northern Eastern Ghats, the middle Eastern Ghats, and the southern Eastern Ghats. Of these three zones, the northern and middle portions lie in Andhra Pradesh. The Eastern Ghats are located between 11° 30' - 22° 00' N and 76° 50' - 86° 30' E in a N-E to S-W axis. The Ghats cover an area of about 75,000 sq. km with an average width of 200 km in the north and 100 km in the south. They extend over a length of 1,750 km between the rivers Mahanadi and Vaigai. The elevation of the Eastern Ghats is from 750 m to 1,672 m. The Eastern Ghats run through Mallur in Warangal, Ukkumanidi in Khammam district, Maredumilli in East Godavari, Lankapakala in Visakhapatnam, Coringa in East Godavari, Peddacheruvu in Kurnool, Kuntlapalli in Anaparthi and Talakona in Chittoor (Jadhav and Reddy 2002).

The climate is hot and humid with temperatures ranging from 15 °C to 45 °C. Precipitation is mainly during the southwest monsoon (June-September). Nearly 80% precipitation falls during this period, the rest during the northeast monsoon (November-December). The

mean annual rainfall of the State ranges from 500 mm in the south to 1,210 mm in the north. The northeastern areas along the coastline are periodically lashed by cyclones.

Vegetation

According to the Forest Survey of India (1999), the forest cover in the State is 44,229 sq. km constituting 16.08% of the geographical area. The dense forest accounts for 24,190 sq. km; open forest 19,642 sq. km and mangrove 397 sq. km. Five major forest types occur in Andhra Pradesh: Tropical Dry Deciduous, Tropical Thorn, Tropical Moist Deciduous, Tropical Dry Evergreen and Littoral and Swamp Forests. The forest area, a long strip, begins in the north from the Nizamabad district in the west, to Srikakulam in the east. Besides this, a forest belt runs from the central to the southern part of the State in the Nallamalai hills.

According to the Botanical Survey of India Report (1977) there are 17,000 species of flowering plants in India. Of these, 5,400 (32%) are found only in India while 2000 are endemic to Peninsular India. Of these, 76 taxa are restricted specifically to the Eastern Ghats (Ahmedullah and Nayar 1987). Recently, Reddy and Raju (2001) enlisted 40 endemic taxa for the state of Andhra Pradesh and provided a detailed checklist of the endemic plants (360) of peninsular India. Three endemic and threatened species are *Cycas beddomei* (critically endangered), *Pimpinella tirupatiensis* and *Boswellia ovalifoliota* (endangered). It is estimated that nearly 1800 medicinal plants are found in Andhra Pradesh (Rani and Pullaiah 2002).

IBAs AND THE PROTECTED AREAS

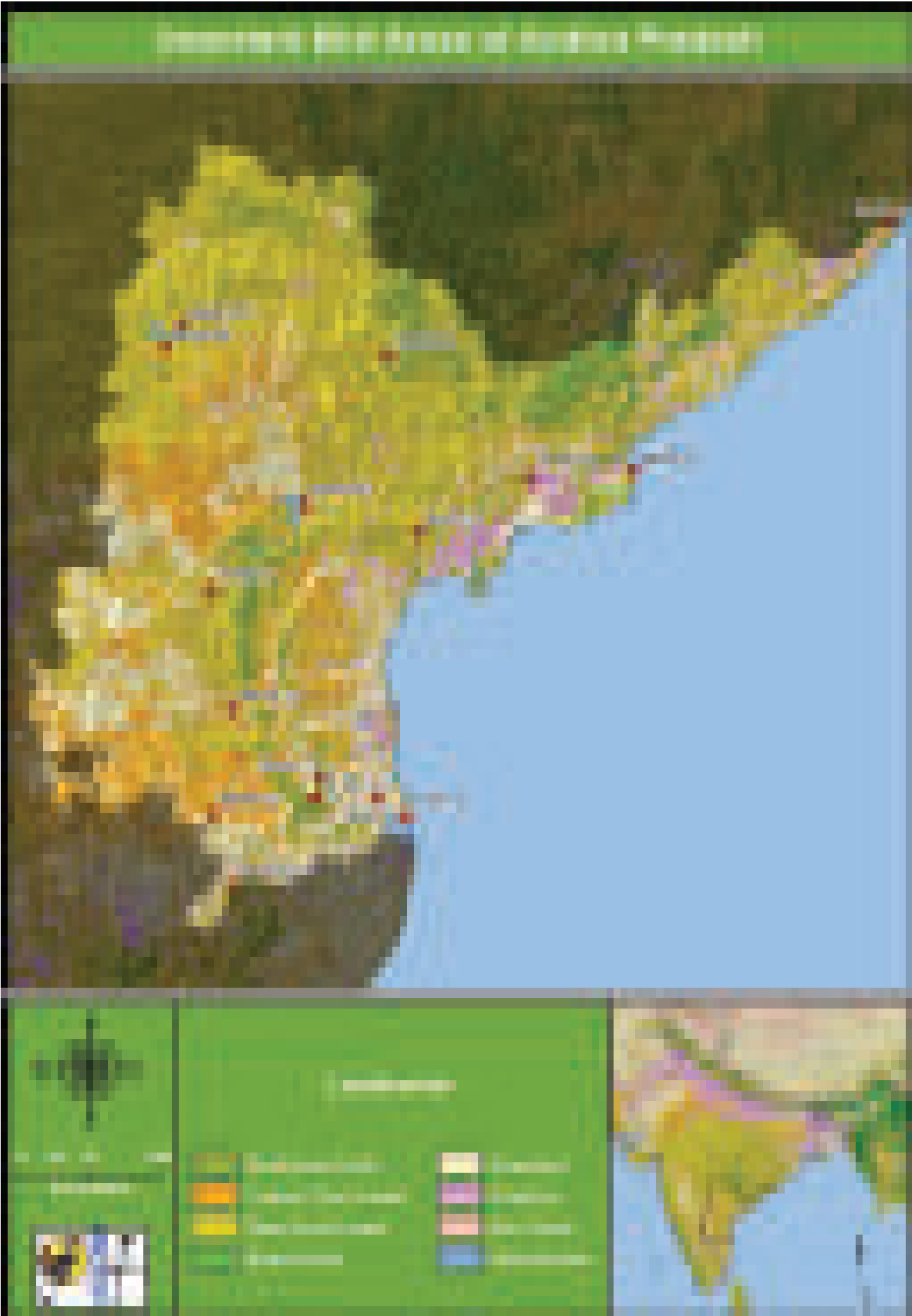
In Andhra Pradesh there are 4 national parks and 22 wildlife sanctuaries, constituting 4.56% of the State (Rodger *et al.* 2000). According to the IBA criteria, 16 sites were identified as Important Bird Areas of avifaunal significance for the state. The IBAs constitute two national parks covering an area of 3,56,809 ha and 11 sanctuaries covering about 6,99,000 ha. This is 2.5% of the geographical area of the state (under the protected area network).

Number of IBAs and IBA criteria

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

IBAs of Andhra Pradesh

IBA site codes	IBA site names	IBA criteria
IN-AP-01	Coringa Wildlife Sanctuary	A1, A4iii
IN-AP-02	Horsley Hills	A1, A2
IN-AP-03	Kaundinya Wildlife Sanctuary	A1, A2
IN-AP-04	Kolleru Wildlife Sanctuary	A1, A4i, A4iii
IN-AP-05	Manjira Wildlife Sanctuary	A1, A4i, A4iii
IN-AP-06	Nagarjunasagar-Srisailem Rajeev National Park (Tiger Reserve)	A1, A2
IN-AP-07	Nellapattu Wildlife Sanctuary	A1
IN-AP-08	Pakhal Lake Wildlife Sanctuary	A4iii
IN-AP-09	Pocharam Wildlife Sanctuary	A1, A3
IN-AP-10	Pulicat Lake Wildlife Sanctuary	A1, A4iii
IN-AP-11	Rollapadu Wildlife Sanctuary	A1, A4ii
IN-AP-12	Sri Lankamalleswara Wildlife Sanctuary	A1, A2
IN-AP-13	Sri Penusila Narasimha Wildlife Sanctuary	A1, A2
IN-AP-14	Sri Venkateswara National Park	A1, A2
IN-AP-15	Telineelapuram	A1
IN-AP-16	Uppalapadu	A1, A4i, A4iii



AVIFAUNA

Andhra Pradesh has a long history of ornithological investigation, beginning with T. C. Jerdon in 1839-1840 when he worked on the birds of the Madras Presidency (now largely in Andhra Pradesh). After 30 years, Ball (1877) worked in Kondakarla and the surrounding areas of the Vishakapatnam district. Later, Whistler and Kinnear (1930-37) and Ali (1933-34) conducted scientific surveys of the Eastern Ghats and the erstwhile Hyderabad state, respectively. Abdulali (1945) surveyed the areas of Ananthagiri, Sankarmetta and Lamasinghi and collated a fairly comprehensive list of the 'Birds of Vizagapatnam' with nearly 277 species. In 1953, Abdulali drew up an additional list. Several more studies were conducted in recent decades by Trevor Price (1978, 1979, 1990), Krishna Raju and Justus (1971), Krishna Raju and Trevor Price (1973), Grubh (1976) in Sriharikota, (Nellore district), Krishna Raju (1985), Hussian (1989, 1991), Ripely *et al.* (1987-88), and Majumdar (1984) in Adilabad district.

The BNHS undertook detailed studies on the Great Indian Bustard *Ardeotis nigriceps* in Rollapadu (Rahmani 1989). The Lesser Florican *Sypheotides indica* was also the subject of focus at Rollapadu (Sankaran and Manakadan 1990). The re-discovery of the Jerdon's Courser *Rhinoptilus (=Cursorius) bitorquatus*, near Reddipalli village in Cuddapah district in 1986 (Bhushan 1986) led to the notification of the Sri Lankamalleswara Sanctuary in Cuddapah district. During the recent years, the BNHS also made detailed studies of the threatened Spot-billed Pelican *Pelecanus philippensis* in Pulicat Lake and Nelapattu of Nellore district (Manakadan and Kannan 2003) and the Critically Endangered Jerdon's Courser (Jeganathan *et al.* 2002, Jeganathan *et al.* 2004) in Sri Lankamalleswara Wildlife Sanctuary.

Andhra Pradesh has a large number of heronries, perhaps as many as 60, of which 41 are active. The Telikunchi heronry in the Srikakulam district is the largest in India (Subramanya 1996a), and as many as 25,000 Asian Openbill *Anastomus oscitans* breed here (Subramanya 1996b).

The Birdwatcher's Society of Andhra Pradesh and its members have made a considerable contribution to the ornithology of Andhra Pradesh through various field trips, especially in and around Hyderabad and also in the surrounding districts of Medak, Ranga Reddy, Warangal, Nizamabad, Nalgonda and Mahboobnagar. A checklist of Birds of Andhra Pradesh, compiled by Taher and Pittie (1989, 1996) includes nearly 500 species and the races found in Andhra Pradesh.

List of threatened birds with IBA site codes

Critically Endangered		
Oriental White-backed Vulture	<i>Gyps bengalensis</i>	IN-AP-01, 02, 06, 10, 14
Long-billed Vulture	<i>Gyps indicus</i>	IN-AP-01, 06, 09
Jerdon's Courser	<i>Rhinoptilus bitorquatus</i>	IN-AP-12, 13
Endangered		
Great Indian Bustard	<i>Ardeotis nigriceps</i>	IN-AP-11
Lesser Florican	<i>Sypheotides indica</i>	IN-AP-11
Vulnerable		
Spot-billed Pelican	<i>Pelecanus philippensis</i>	IN-AP-01, 04, 07, 10, 15, 16
Lesser Adjutant	<i>Leptoptilos javanicus</i>	IN-AP-05
Greater Spotted Eagle	<i>Aquila clanga</i>	IN-AP-06, 10
Indian Skimmer	<i>Rynchops albicollis</i>	IN-AP-05, 09
Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>	IN-AP-02, 03, 06, 13, 14
Near Threatened		
Darter	<i>Anhinga melanogaster</i>	IN-AP-05
Painted Stork	<i>Mycteria leucocephala</i>	IN-AP-01, 05, 06, 15
Oriental White Ibis	<i>Threskiornis melanocephala</i>	IN-AP-01, 05, 16
Ferruginous Pochard	<i>Aythya nyroca</i>	IN-AP-01
Greater Grey-headed Fish-Eagle	<i>Ichthyophaga ichthyaetus</i>	IN-AP-06
Pallid Harrier	<i>Circus macrourus</i>	IN-AP-06
Black-bellied Tern	<i>Sterna acuticauda</i>	IN-AP-06
Secondary Area s071: Eastern Andhra Pradesh		
Jerdon's Courser	<i>Rhinoptilus bitorquatus</i>	IN-AP-12, 13
Secondary Area s072: Southern Deccan Plateau		
Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>	IN-AP-02, 03, 13, 14

Species for which Andhra Pradesh is very important.

Jerdon's Courser *Rhinoptilus bitorquatus* **Critically Endangered**

This recently discovered and poorly known species qualifies as Critically Endangered as a result of its single, small, declining population, which is thought to be threatened by exploitation of scrub-forest, livestock grazing, disturbance and quarrying (BirdLife International 2001).

This bird is endemic to Andhra Pradesh and is known from the Godavari river valley near Sironcha and Bhadrachalam and from the Cuddapah and Anantapur areas in the valley to the Pennar River (Ali and Ripley 1987). Two main sites the Sri Lankamaleshwara Wildlife Sanctuary and Sri Penusila Narasimha Wildlife Sanctuary have been identified for the protection of this bird. A joint project of BNHS and RSPB, funded by Darwin Initiative has been started in 2001 to carry out detail surveys and research.

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

This bustard qualifies as Endangered because of its very small, declining population, as a result of hunting and continuing agricultural development (BirdLife International 2001). In the 1980s, the bustard was found in 3-4 areas, and up to 60 birds were seen in Rollapadu grasslands (Rahmani and Manakadan 1990) but due to poaching and mismanagement of the grasslands, the bustard population has come down to about 20-25 birds in Rollapadu. No recent surveys have been conducted in other areas so we do not know how many bustards survive elsewhere. Perhaps, as low as 50 birds are left in the whole state.

Spot-billed Pelican *Pelecanus philippensis* **Vulnerable**

This species underwent a rapid decline in the recent past. Its small population continues to decline, although at a reduced rate, as a result of widespread degradation and exploitation of wetlands and colonies. It therefore qualifies as Vulnerable (BirdLife International 2001). In the past, this pelican nested on the banks of the Godavari River and some of the wetlands of the delta are still important for this Pelican, especially from Coringa Wildlife Sanctuary, Kolleru lake (Guttikar 1979) and Kolleru pelicanry (sometimes called Aredu-Sarapalle or Kolamaru) (Perennou and Santharam 1990), Uppalapadu (Rao and Kumar 2000), Nelapattu tank and Pulicat lake (Perennou and Santharam 1990).

THREATS AND CONSERVATION ISSUES

Andhra Pradesh has usual types of threats and conservation issues such as unsustainable exploitation, over-grazing, illegal forest cutting, expansion of agriculture in forest areas, mining and building of dams/canals resulting in fragmentation of natural habitats. Out of the 16 IBAs, industrialization and urbanization, are the main threats in nine of them. Disturbance to birds in the form of poaching, trapping, overgrazing and fire during breeding period is seen in nine IBAs. Agriculture expansion and intensification are seen in eight IBAs as the main threat, along with other threats. Unsustainable exploitation in the form of illegal grazing, cutting of trees, mining in the core areas, fishing in wetlands are the major threats in five IBAs. Firewood collection, rampant in most of the forests of Andhra Pradesh, is seen in four IBAs but it is more widespread.

Threats to IBAs

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

The Pakhal and the Pocharam Wildlife Sanctuaries were established in the 1950s, just after India's Independence, but now there are 26 national parks and wildlife sanctuaries. Most of these protected areas suffer from overgrazing by livestock, illegal tree cutting, legal as well as illegal removal of minor forest products and mining. One of the most important protected areas of the State is Srisailem Tiger Reserve (an IBA). Even this sprawling Reserve of 3,568 sq. km is under threat due to a plan to extract uranium just at the border. The proposed uranium mining site is located near Lambapur village. The ore deposits are spread over 468 acres over a hill-top. This site will be mined by conventional open cast method, aggravating pollution problem. Nagarjuana Sagar reservoir lies on the southeast of the mining site, less than 2 km away. The mine company requires 1104 acres of land close to the Reserve. Needless to say, if open cast mining is allowed here, the Reserve will be negatively impacted due to biotic pressures and water pollution.

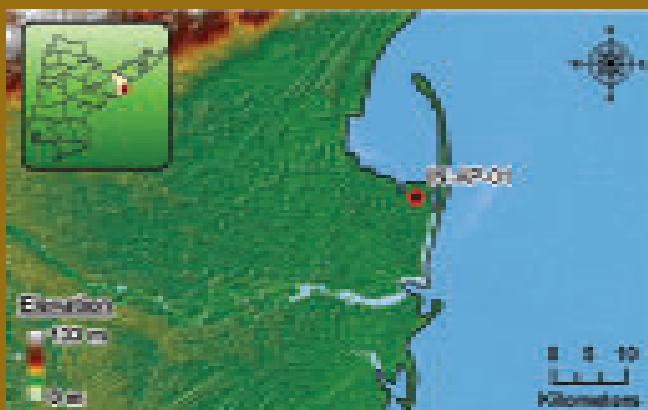
The Rollapadu Wildlife Sanctuary (Manakadan and Rahmani 1989), an IBA and at one time one of the most important Great Indian Bustard areas in south India, has suffered from mismanagement of the habitat (Manakadan *et al.* 2002) and increase in the number of Blackbuck *Antelope cervicapra* that destroy agricultural crops resulting in huge resentment amongst villagers.

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CORINGA WILDLIFE SANCTUARY AND GODAVARI ESTUARY



IBA Site Code	: IN-AP-01
State	: Andhra Pradesh
District	: East Godavari
Coordinates	: 16° 49' 53" N, 82° 20' 12" E
Ownership	: State
Area	: 23,570 ha (Coringa WLS only)
Altitude	: 0 m
Rainfall	: >1,000 mm
Temperature	: 17 °C to 40 °C
Biogeographic Zone	: Coasts
Habitats	: Mangrove, Dry Deciduous Tropical Forest

IBA CRITERIA : A1 (Threatened Species), A4iii (≥20,000 waterbirds)

PROTECTION STATUS : Wildlife Sanctuary, established in July 1978

GENERAL DESCRIPTION

Coringa Wildlife Sanctuary is located 20 km south of the port city Kakinada, on the Kakinada-Yanam state highway, nestling on the deltaic branches of Gouthami and Godavari rivers at Kakinada Bay. It has extensive marshes and mangroves. During monsoon, the mudflats get submerged under 5 m of water. These large mudflats, which are subjected to cyclic influx and efflux of tidal water, play a vital role in attracting a large number of waders to this region. About 50% of the area is the backwaters which include a sand bar of about 20 km, running north-south (Rao *et al.* 1996). Two rivers, namely the Coringa and Gaderu, and their deltaic branches intersect the entire region, along with other water channels draining into them or directly into the sea. This forms about 33,570 ha of marsh vegetation.

The Sanctuary is part of the estuary of River Godavari, and supports a rich growth of mangrove vegetation with halophytes such as *Excoecaria agallocha*, *Rhizophora mucronata*, *Avicennia officinalis*, *Lumnitzera racemosa*, *Ceriops decandra*, *Sonneratia apetala* and *Aegiceras corniculatus*. According to Raja Sekhar *et al.* (2002), 24 species are representative of the vegetation structure of Godavari Estuary.

AVIFAUNA

Rao *et al.* (1996) have identified 236 species of birds from this Sanctuary. However, they have reported species that are not likely to be present, such as Yellow-throated Bulbul *Pycnonotus xantholaemus*, Wood Snipe *Gallinago nemoricola* and Sociable Lapwing *Vanellus gregarius*. Nevertheless, Coringa is an extremely interesting area for waders and mangrove birds, and should be designated as an IBA (Aasheesh Pittie *pers. comm.* 2001). More than 20,000 waders use this area in a year. The area needs detailed investigation on its bird life.

Oriental White-backed Vulture *Gyps bengalensis* and Long-billed Vulture *G. indicus* (both considered Critical due to the sharp decline in their population: BirdLife International 2001) are found here. Among the near threatened species, Painted Stork *Mycteria leucocephala*, Oriental White Ibis *Threskiornis melanocephala*, and Ferruginous Pochard *Aythya nyroca* are found in Coringa.

Rao *et al.* (1996) have reported 17 species of ducks, and 37 species of waders of Family Charadriidae. Even though some species need to be confirmed, the site still holds a very high diversity of waterbirds.

OTHER KEY FAUNA

A fair population of Fishing Cat *Felis viverrina*, Golden Jackal *Canis aureus*, sea turtles and Salt water Crocodile *Crocodylus porosus* are present in Coringa. This IBA has a large breeding population of otters. In fact, the entire estuarine mangrove forest of Godavari river is a stronghold of otters, mainly Smooth Indian Otter *Lutra perspicillata* (Nagulu *et al.* 1991, 1999). The sighting of otters in this IBA is very common, and the group size ranges from 2 to 12, indicating healthy breeding populations (S. A. Hussain *in litt.* 2003).

The Near Threatened Painted Stork *Mycteria leucocephala* is still widely distributed in India.



Photo: Asad R. Rahmani

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>
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Near Threatened

Painted Stork	<i>Mycteria leucocephala</i>
Oriental White Ibis	<i>Threskiornis melanocephala</i>
Ferruginous Pochard	<i>Aythya nyroca</i>

LAND USE

- q Nature conservation and research
- q Tourism and recreation

THREATS AND CONSERVATION ISSUES

- q Deforestation
- q Habitat destruction
- q Poaching
- q Unsustainable exploitation of forest resources
- q Livestock grazing
- q Fuelwood collection

Despite their remoteness and difficulties in accessibility, the mangroves of Coringa are heavily exploited by the local people. In a socio-economic study, Collin *et al.* (2002) found that 95% of the fishermen of Ramananpalem village harvest wood in the mangroves and transport it by boat, usually while returning from fishing. Among the seven mangrove species collected for fuelwood, *Avicennia marina* and *A. officinalis* are preferred. The survey confirmed the villagers' high dependency on the mangrove forest for their basic needs.

Increased poaching and habitat destruction has imperilled the existence of otters in the Coringa Wildlife Sanctuary. The Forest Department is reported to have initiated steps for the conservation of otters and for the afforestation of mangroves in the Sanctuary. With the increasing industrialisation of the entire Godavari delta, and increasing aquaculture activities and fishing pressure, the survival of this isolated population of otters in Coringa is at stake (Hussain 1999).

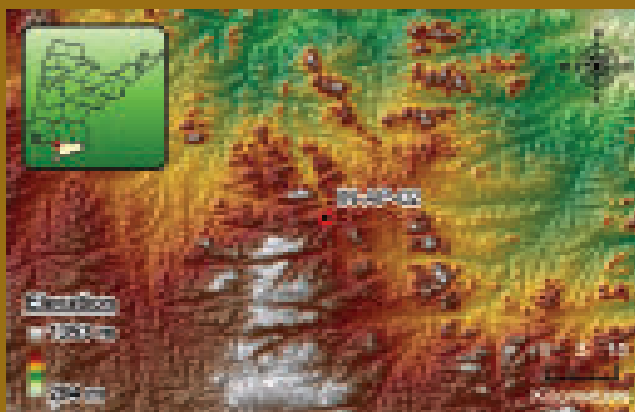
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S. A. Hussain and Aasheesh Pittie

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HORSLEY HILLS



IBA Site Code	: IN-AP-02
State	: Andhra Pradesh
District	: Chittoor
Coordinates	: 13° 40' 60" N, 78° 28' 00" E
Ownership	: State
Area	: Not available
Altitude	: 1,265 m
Rainfall	: Not available
Temperature	: 20 °C to 32 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Dry Deciduous Forest

IBA CRITERIA : A1 (Threatened Species), A2 (Secondary Area s072: Southern Deccan Plateau)

PROTECTION STATUS : Not officially protected

GENERAL DESCRIPTION

Horsley Hills in Chittoor district are a part of the Eastern Ghats. The hills were named after M. W. H. Horsley, a member of the British Indian Civil Service (Subramanya and Prasad 1996). The Hills lie within the Horsley Konda Reserve Forest and comprise an area of 4,700 ha, with a total of 13 peaks, of which seven are above 1,000 m, the highest being 1,347 m (Subramanya and Prasad 1992). Prior to 1850, when Horsley took a fancy to this place, the hills were known as Enugu Mallamma Konda. The ruins of an old fort indicate that the hills had great local importance. Recently, stone age tools were unearthed, giving these hills archaeological importance as well. The *Chenchu* tribe who inhabit the Horsley Hills keep Pungannur cows, known for their milk yielding capacity and low fodder requirement.

The Horsley Hills are popular among local tourists who go to see their natural beauty and to escape from the heat of the plains. The Mallamma temple is another major tourist and pilgrim centre.

The habitat is predominantly Dry Deciduous, with a small patch of Moist Deciduous forest. The habitat structure has changed completely due to extensive plantations of *Eucalyptus*. The wild vegetation, wherever present, is highly disturbed. This site is well known to Indian ornithology as Jerdon (1863) possibly obtained type specimens of the globally threatened Yellow-throated Bulbul *Pycnonotus xantholaemus* (Whistler and Kinnear 1932).

The natural vegetation of the hills is represented by trees such as *Diospyros melanoxylon*, *Emblia officinalis*, *Albizia amara*, *Ficus religiosa*, *Ficus tomentosa*, *Ficus bengalensis* and *Santalum album*. Unfortunately, the natural vegetation has been replaced by plantations of *Eucalyptus*, *Jacaranda*, *Allamanda* and *Delonix*, especially at lower elevations.

AVIFAUNA

Subramanya and Prasad (1996) have conducted studies in Horsley Hills on the Yellow-throated Bulbul. Four species of bulbuls were found by them: Red-vented *Pycnonotus cafer*, Red-whiskered *P. jocosus*, White-browed *P. luteolus* and Yellow-throated *P. xantholaemus*. Among the total of 158 bulbuls sighted, the Yellow-throated was the most abundant, while the Red-vented, otherwise very common, was the least abundant (Subramanya and Prasad 1996). The Yellow-throated Bulbul was mainly seen in densely

vegetated, boulder-strewn hilly areas. Flocks of up to six birds were frequently seen. Since the collection of type species nearly 150 years ago, Horsley Hills could still be considered as the stronghold of this globally threatened bulbul, therefore, it was selected as an IBA.

Besides the Yellow-throated Bulbul (BirdLife International 2001), Horsley Hills has 28 Biome-11 species (Indo-Malayan Tropical Dry Zone). BirdLife International (undated) has reported a total of 59 species from Biome-11. This biome includes a wide range of habitats, including forests and open country. Many of the species listed have adapted to man-modified habitats, so they are widespread and common. Many species have changed their distribution due to habitat modification over hundreds of years. Interestingly, Indian Scimitar-Babbler *Pomatorhinus horsfieldii*, restricted to the hills of peninsular India, is also found here. Similarly, Loten's Sunbird *Nectarinia lotenia*, resident of well-wooded country of central and south India (Ali and Ripley 1987, Grimmett *et al.* 1998) is also reported from this IBA. Both species belong to Biome-10 (Indian Peninsula Tropical Moist Forest) according to BirdLife International (undated).

Some other Biome-10 species are also recorded from the hills. The Critically Endangered Oriental White-backed Vulture *Gyps bengalensis* is regularly sighted here.

Subramanya and Prasad (1992) sighted 83 species of birds, including the Forest Wagtail *Motacilla indica*, possibly the third record from Andhra Pradesh, and the Blue-headed Rock Thrush *Monticola cinclorhynchus*, a species uncommon in the Eastern Ghats. The thrush winters mainly in the Western Ghats and Assam hills (Ali and Ripley 1987, Grimmett *et al.* 1999).

Critically Endangered	
Oriental White-backed Vulture	<i>Gyps bengalensis</i>
Vulnerable	
Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>
Secondary Area s072: Southern Deccan Plateau	
Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>

OTHER KEY FAUNA

Important fauna includes the Sloth Bear *Melursus ursinus*, Wild Dog *Cuon alpinus*, Sambar *Cervus unicolor* and Leopard *Panthera pardus*. Beddome's Coral Snake *Calliophis beddomei*, whose population is restricted to only four known locations (Anon. 2001) is found here.

LAND USE

- q Plantations
- q Tourism and recreation

THREATS AND CONSERVATION ISSUES

- q Fuel wood collection
- q Grazing
- q Unregulated tourism and ancillary activities

Horsley Hills have an important hill station in Andhra Pradesh. The pleasant weather conditions attract tourists throughout the year. The massive plantation of exotic species was intended to increase greenery, but it has destroyed the natural vegetation of the hills.

Subramanya and Prasad (1992) did not find Jungle Crow *Corvus macrorhynchos* on the hills, but now due to increase of tourists and the resultant garbage, the crow population is increasing (Prasanna *et al.* 1997). Increase in crow population is likely to put additional pressure on the Yellow-throated Bulbul and similar birds.

Due to increase in tourism, developmental activities such as construction of hotels and lodges are taking place. Therefore, it is of major concern to check further destruction of the forest, particularly as the hill forest is an important site for the Restricted Range Yellow-throated Bulbul.

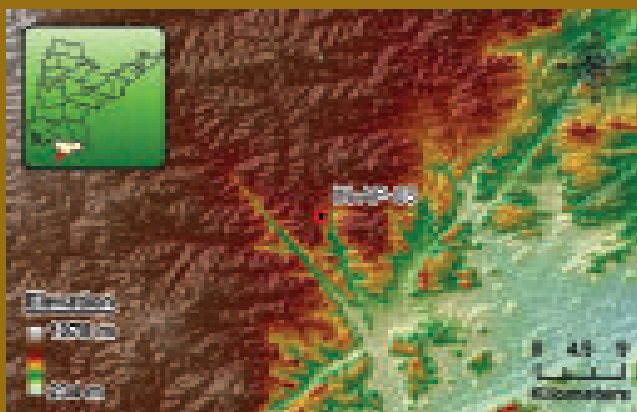
KEY CONTRIBUTOR

S. Subramanya

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KAUNDINYA WILDLIFE SANCTUARY



IBA Site Code	: IN-AP-03
State	: Andhra Pradesh
District	: Chittoor
Coordinates	: 13° 01' 30" N, 78° 38' 42" E
Ownership	: State
Area	: 35,760 ha
Altitude	: Not available
Rainfall	: Not available
Temperature	: Not available
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Dry Deciduous Forest, Tropical Secondary Scrub

IBA CRITERIA: A1 (Threatened Species), A2 (Secondary Area s072: Southern Deccan Plateau)

PROTECTION STATUS: Wildlife Sanctuary, established in December 1990

GENERAL DESCRIPTION

Kaundinya Wildlife Sanctuary covers an area of 35,760 ha in Kuppam and Palmaner Ranges of Chittoor district, Andhra Pradesh. It is the only Sanctuary in Andhra Pradesh known for harbouring a population of Asian elephants, which reportedly reappeared in 1984 after 200 years (Prasad and Reddy 2002). The Sanctuary has Dry Deciduous forests, with thorny scrub interspersed with trees providing a good habitat for Asian Elephants. These forests have small ponds, tanks and the Kaundinya and Kaigal tributaries of Palar River, which provide the main sources of water for the animals. The Sanctuary is situated 50 km from Chittoor and 120 km from Bangalore.

AVIFAUNA

No detailed study on avifauna has been conducted at this site, but the Yellow-throated Bulbul *Pycnonotus xantholaemus* is found here.

Vulnerable

Yellow-throated Bulbul *Pycnonotus xantholaemus*

Secondary Area s072: Southern Deccan Plateau

Yellow-throated Bulbul *Pycnonotus xantholaemus*

Protection of thorn forest as found in Kaundinya has provided refuge to the Yellow-throated Bulbul *Pycnonotus xantholaemus*.



Photo: Clement Francis M.

OTHER KEY FAUNA

Since the reappearance in Kaundinya in 1984 of seven elephants and then in 1986 of 22, the population has increased to 78 (Prasad and Reddy 2002). Besides the elephant, the major wildlife includes Sloth Bear *Melursus ursinus*, Leopard *Panthera pardus*, Cheetal *Axis axis*, Sambar *Cervus unicolor*, Porcupine *Hystrix indica*, Wild Boar *Sus scrofa*, Jungle Cat *Felis chaus*, Golden Jackal *Canis aureus* and Slender Loris *Loris tardigradus*.

LAND USE

q Nature Conservation

THREATS AND CONSERVATION ISSUES

- q Man-animal conflict
- q Over-grazing
- q Illegal wood collection

Since the Asian Elephants reappeared in Kaundinya WLS, it has become the focus of conservation action. Seven villages are situated inside the Sanctuary. Insufficient fodder in the forest due to severe over-grazing by livestock, and the availability of crops such as sugarcane, sorghum and *ragi* attract elephants to them, resulting in man-animal conflict. Sadly, till 2002, 42 people have been killed by elephants (Prasad and Reddy 2002). At the same time, 12 elephants were electrocuted to death by the angry villagers.

Kalyani dam in Chamala Valley near Thirupathi is found to be a good habitat for elephants. The Chamala Valley is included in Sri Venkateswara National Park (also an IBA). A corridor for elephants is planned between Kaundinya and Sri Venkateswara under Project Elephant (Prasad and Reddy 2002). With better habitat protection under Project Elephant, the Yellow-throated Bulbul would also benefit, along with other dry land bird species.

KEY CONTRIBUTORS

Workshop participants and the IBA Team

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Prasad, N. S. and Reddy, K. S. (2002) Man-elephant conflict and mitigation – Kaundinya Wildlife Sanctuary, Andhra Pradesh. *Indian Forester* 128 (2): 137-144.

KOLLERU LAKE WILDLIFE SANCTUARY



IBA Site Code	: IN-AP-04
State	: Andhra Pradesh
District	: West Godavari, Krishna
Coordinates	: 16° 47' 32" N, 81° 23' 25" E
Ownership	: State
Area	: 67,300 ha
Altitude	: 0 – 5 m
Rainfall	: 1,000 mm
Temperature	: 21 °C to 32 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Freshwater Lake

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

PROTECTION STATUS: Wildlife Sanctuary, established in September 1963

GENERAL DESCRIPTION

Kolleru is a large, natural, shallow, freshwater lake with associated marshes, situated between the Krishna and Godavari Rivers, c. 55 km east of Vijayawada and c. 25 km northwest of the coastline. The surface area of the lake is determined by the volume of monsoon run-off and is subject to wide fluctuation as water levels rise and fall. At maximum flooding of 3 m, the area of the lake is over 90,000 ha. At 1 m, it may fall to 13,000 ha. The lake drains into the Bay of Bengal through the Upputeru river. Occasionally, small amounts of salt water enter the otherwise freshwater lake through this river. The surrounding areas are mostly under agriculture.

Kolleru was declared a Ramsar Site in November 2002. It regularly supports more than 50,000 waterfowl, due to which it was selected as an IBA.

The vegetation is luxuriant and about 19 species of hydrophytes belonging to 13 angiosperm families are recorded (Seshavaram *et al.* 1982 quoted in Rao and Rao 1987). Almost the entire surface is covered with emergents and floating aquatics such as *Ipomoea aquatica*, *Ottelia alismoides*, *Nymphoides indicum*, *Limnophila indica*, *Utricularia* sp., *Potamogeton crispus*, *Nechamandara alternifolia*, *Chara* sp. and *Nitella* sp. The surrounding areas are under intensive cultivation. Cultivated Coconut trees are abundant in this area.

Imaginative plans and action involving local people are required to restore the glory of Kolleru Lake.

Photo: V. Kannan



AVIFAUNA

The site contains about 160 species of birds (Rao and Rao 1987). At one time, it was famous for a breeding colony of Spot-billed or Grey Pelican *Pelecanus philippensis*. Neelakantan (1949) and Gee (1960) described the Aedu-Sarepalle pelicanry. Aedu village near Kolleru had the largest known breeding population of Spot-billed Pelican in India, thanks to the protection provided by villagers (Krishnan 1981), but unfortunately this pelicanry disappeared in the 1970s due to unknown reasons. In the early 1960s, there were 1,500 nests. In 1968, less than 400 remained and by 1974, the colony had disappeared (Anon. 1991). The Spot-billed Pelican is now found occasionally in this lake.

However, Kolleru still attracts thousands of waterfowl. During the mid-winter waterfowl count of 1988, more than 17,000 birds were reported from around 30% of the lake area (Scott 1989). The following year, 25,000 waterfowl were recorded, but this was probably due to better methodology used in counting (Anon. 1991). The most abundant duck was the Garganey *Anas querquedula*. Up to 10,000 were counted (Scott 1989). According to Wetlands International (2002), 1% biogeographic population threshold for this species is 2,500, so about 4% of the total non-breeding Garganeys of South Asia winter in this site. Similarly, about 1,000 Asian Openbill *Anastomus oscitans* were counted, which also constitutes 4% of the known breeding population of South Asia because, according to Wetlands International (2002), there could be over 125,000 Asian Openbill in South Asia.

Other common birds are the Lesser Whistling Duck *Dendrocygna javanica*, Larger Whistling Duck *D. bicolor*, Northern Pintail *Anas acuta*, Wigeon *A. penelope*, Northern Shoveler *A. clypeata*, Common Teal *A. crecca*, Red-crested Pochard *Rhodessa rufina*, Purple Moorhen *Porphyrio porphyrio*, Pond Heron *Ardeola grayii*, Grey Heron *Ardea cinerea*, Coot *Fulica atra*, Little Grebe or Dabchick *Tachybaptus ruficollis*, Glossy Ibis *Plegadis falcinellus*, Yellow Bittern *Ixobrychus sinensis*, Chestnut Bittern *I. cinnamomeus*, Black Bittern *Dupetor flavicollis*, White-breasted Waterhen *Amaurornis phoenicurus*, Black-winged Stilt *Himantopus himantopus* and Blue-breasted or Slaty-breasted Rail *Gallirallus striatus*.

Vulnerable

Spot-billed Pelican	<i>Pelecanus philippensis</i>
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OTHER KEY FAUNA

The lake supports rich fish fauna, including some endemic subspecies. Sixty-three species of fish belonging to 29 families have been recorded in commercial catches (Dutt S. 1983, quoted in Rao and Rao 1987). However, due to poor management and over-exploitation, the fish catch is going down. For instance, in 1974, nearly 7,000 tonnes was caught, but the catch decreased to 3,000 tonnes in 1985 (Anon. 1991).

LAND USE

- q Fishing
- q Agriculture - aquaculture ponds

THREAT AND CONSERVATION ISSUES

- q Expansion of agricultural activities
- q Pollution threat
- q Hunting, collection of birds' eggs
- q Removal of aquatic vegetation
- q Growth of commercial fisheries
- q Drought

Despite its status as a Sanctuary and a Ramsar site, Kolleru is threatened by encroachments, over-fishing, dumping of industrial effluents and increasing salinity due to bunding for pisciculture. A temple in the middle of the lake attracts thousands of pilgrims every year, putting additional pressure on the resources, besides creating disturbance and non-degradable garbage.

Kolleru is surrounded by dense human habitation which has been encroaching the lake for agriculture and fisheries. Nearly 34,000 ha have been drained and subsequently encroached in recent years for farmlands and fish ponds (Anon. 1991).

In several areas, large scale breeding of domestic ducks is conducted (Anon. 1991). Another problem is the introduction of Java Tilapia *Oreochromis mossambicus* (Scott 1989) for

commercial purposes, which has replaced many native fish species. Poaching is another issue which, though often highlighted by the media, remains unresolved as influential people are involved, so no one is punished.

The Government of Andhra Pradesh has approached the Hiyoshi Ecological Society, Japan, to help in designing management plans for Kolleru and other lakes.

KEY CONTRIBUTOR

IBA team

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Over-fishing, pollution and encroachment are the major threats to this Ramsar Site.

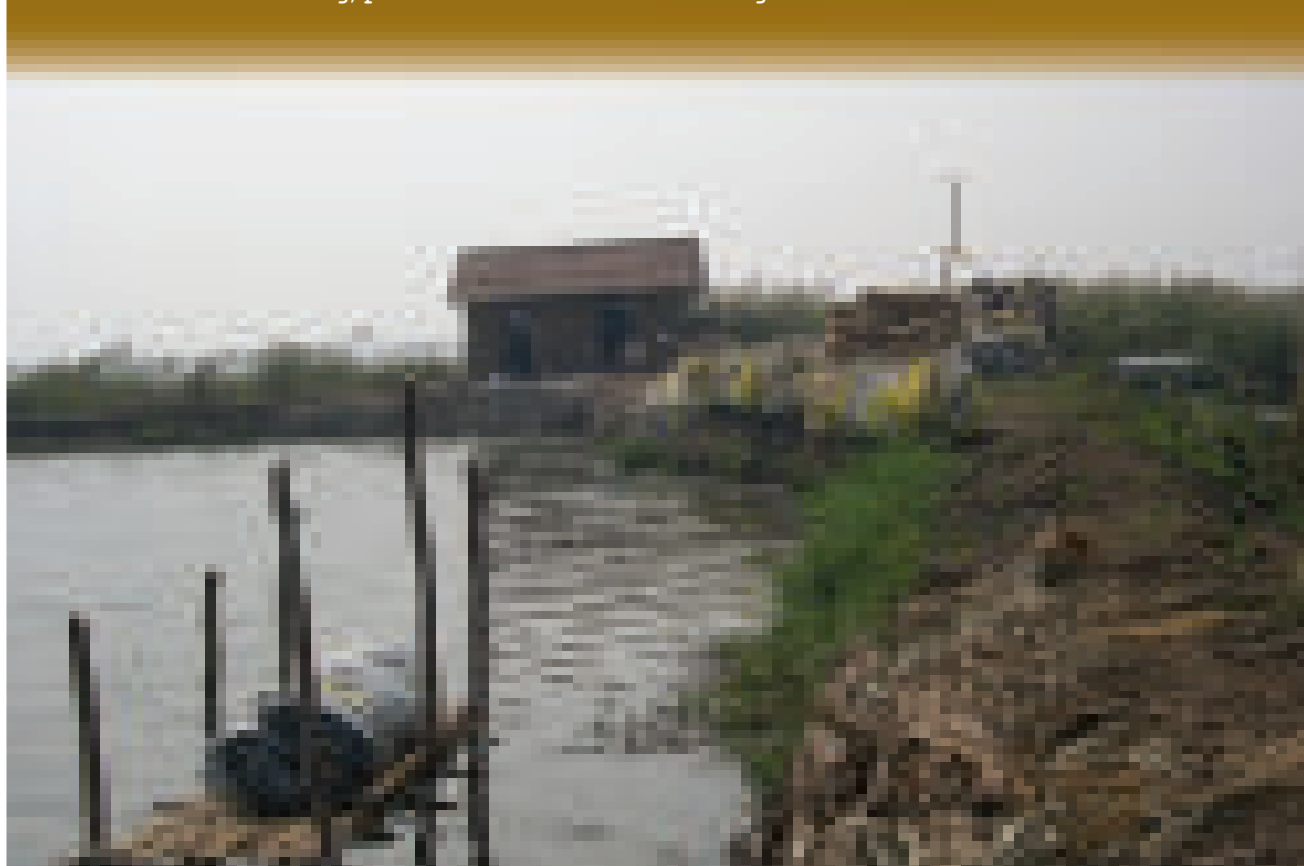


Photo: V. Kannan

MANJIRA WILDLIFE SANCTUARY



IBA Site Code	: IN-AP-05
State	: Andhra Pradesh
District	: Medak
Coordinates	: 17° 57' 52" N, 78° 02' 22" E
Ownership	: State
Area	: 2,000 ha
Altitude	: Not available
Rainfall	: 915 mm
Temperature	: 15 °C to 42 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Riverine Wetland

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

PROTECTION STATUS: Wildlife Sanctuary, established in May 1978

GENERAL DESCRIPTION

Manjira Wildlife Sanctuary in Medak district, located 50 km northwest of Hyderabad, is recognized as an important wetland for migratory birds. The water body provides considerable ecological diversity to support a large population of wetland birds. The reservoir provides drinking water to Hyderabad and Secundrabad, hence water is always stored even during the dry season. The reservoir has several islands with extensive marshy fringes, which provide good nesting sites for waterbirds.

Interestingly, Manjira was declared a sanctuary not for its large congregation of birds, but for its small population of the Mugger crocodile *Crocodylus palustris* (Vijaya Kumar and Choudhury 1994). An area of 2,800 ha between Singoor and Manjira Barrage was declared a crocodile sanctuary in June 1978 (Vijaya Kumar 1988-1992). In the mid 1980s, Manjira became known to bird watchers and an annual waterfowl count was initiated.

The reservoir supports submergent and emergent vegetation. A narrow margin of *Typha*, *Ipomoea* and *Acacia* fringes the waterline, while agricultural fields surround the reservoir and the river (Vijaya Kumar and Choudhury 1994). The river does not flow through the forested area. In the dry savannah type vegetation, scattered *Acacia*,

Prosopis, *Tamarindus indicus* and *Azadirachta indica* are seen. The reservoir has several islands with extensive marshy fringes.

AVIFAUNA

Around 73 species of birds are recorded from this site (Vijaya Kumar and Choudhury 1994, 1995; Vijaya Kumar 1998-1992), including many species of Biome-11, i.e., Indo-Malayan Tropical Dry Zone. During winter, there are usually 30,000 birds (Vijaya Kumar 1988-1992). Although the number of the species present during winter remains roughly the same, the species population fluctuates. A very large congregation of Common Teal *Anas crecca* and Cotton Pygmy-goose *Nettapus coromandelianus* is found. Sometimes more than 1,500 Ruddy Shelduck *Tadorna ferruginea* are seen (Vijaya Kumar and Choudhury 1995). A Greater Flamingo *Phoenicopterus ruber*, ringed in 1971-74 in Lake Rezaieyeh, Azerbaijan, Iran was recovered here in the winter of 1986-87 (Vijaya Kumar 1988-1992).

Fourteen species of birds breed in Manjira, Darter *Anhinga melanogaster*, Asian Openbill *Anastomus oscitans*, Painted Stork *Mycteria leucocephala*, Coot *Fulica atra* and Black-crowned Night Heron *Nycticorax nycticorax* being the most significant breeders (Vijaya Kumar and Choudhury 1994).

Many species are present in this IBA in much higher numbers than their 1% biogeographic population threshold determined by Wetlands International (2002). For instance, the population of Bar-headed Goose *Anser indicus* is estimated to be between 52,000 to 60,000 (Wetlands International 2002). At Manjira, up to 500 are found regularly which is almost 1% of the population. To give a more specific example, about 3% of the non-breeding population of Brahminy Duck winters in Manjira. Wetlands International (2002) estimates about 50,000 individuals of this species in South Asia, whereas in Manjira, Vijaya Kumar and Choudhury (1995) have found up to 1,500.

When the rainfall is inadequate in northwest India, large numbers of Demoiselle Crane *Grus virgo* are seen in peninsular India. For instance, 1986-87 saw extreme drought conditions in Gujarat, the main stronghold of Demoiselle and Common cranes *Grus grus*. In January 1987, about 3,000 Demoiselle cranes were seen in Manjira which according to recent population estimates by Wetlands International (2002), would be 3% of the total population of this species wintering in the Indian subcontinent. Such examples

Man-made wetlands such as Manjira provide much-needed habitat to extensively hunted species like the Bar-headed Goose *Anser indicus*.



Photo: Nayan Khanolkar

reinforce the importance of having a chain of IBAs in the general distribution of species range, so that if, one region is affected by human pressures or environmental factors, the species has other areas to fall back upon.

In recent years, Lesser Adjutant *Leptoptilos javanicus* and Indian Skimmer *Rynchops albicollis*, both Vulnerable species, have been sighted at Manjira (A. Pittie pers. comm. 2001).

Vulnerable	
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Indian Skimmer	<i>Rynchops albicollis</i>
Near Threatened	
Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Oriental White Ibis	<i>Threskiornis melanocephala</i>

OTHER KEY FAUNA

Among other fauna, an important species is the Mugger or Marsh Crocodile *Crocodylus palustris*.

LAND USE

- q Nature conservation and research
- q Drinking water source
- q Agriculture
- q Fishing

THREATS AND CONSERVATION ISSUES

- q Agriculture
- q Fuelwood collection
- q Grazing

On the northwest boundary of Manjira wetland, a larger waterbody has been formed by damming the Manjira river at Singur. Vijaya Kumar and Choudhury (1989) found nearly 22,000 birds in this waterbody including Red-crested Pochard *Rhodonessa rufina* and Bar-headed Goose *Anser indicus*, which were not seen in the Sanctuary. This area should be added to the notified area to develop Manjira-Singur Waterfowl Sanctuary. Incidentally, the Mugger population in Singur is quite good.

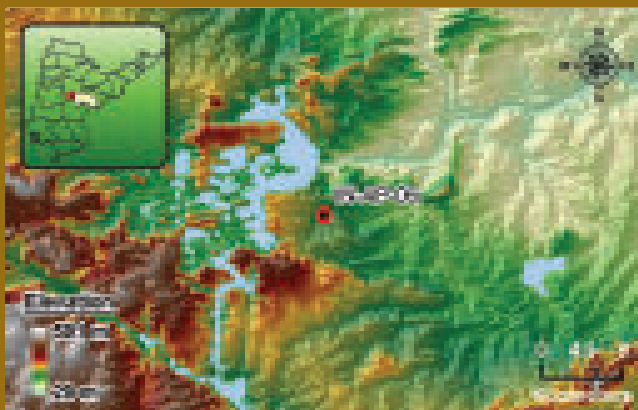
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V. Vijaya Kumar, Aasheesh Pittie and B. C. Choudhury

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NAGARJUNA SAGAR – SRISAILAM RAJIV GANDHI WILDLIFE SANCTUARY (TIGER RESERVE)



IBA Site Code	: IN-AP-06
State	: Andhra Pradesh
District	: Nalgonda, Mahboobnagar, Kurnool, Prakasam and Guntur
Coordinates	: 16° 31' 30" N, 79° 19' 00" E
Ownership	: State
Area	: 3,56,809 ha
Altitude	: 100 – 917 m
Rainfall	: 1,000 mm
Temperature	: 8 °C to 43 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Sub Tropical Dry Evergreen Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Secondary Area s072: Southern Deccan Plateau)

PROTECTION STATUS: Wildlife Sanctuary, established in July 1978

GENERAL DESCRIPTION

Rajiv Gandhi Wildlife Sanctuary, formerly known as Nagarjunasagar-Srisailem Tiger Reserve spreads over five districts Nalgonda, Mahboobnagar, Kurnool, Prakasam and Guntur in Andhra Pradesh. The landscape is hilly and varies from plains to precipitous cliffs. The wildlife is generally confined to the plateaus during the monsoon and to the valleys in the summer. Perennial water sources are located in the valley, while the plateaus suffer from acute water scarcity in the summer. The River Krishna flows over a distance of 130 km through the Reserve. The multipurpose reservoirs, Srisailem and Nagarjunasagar, which are an important source of irrigation and power for Andhra Pradesh, are located within the Tiger Reserve. The area receives rainfall from both the southwest and northeast monsoons.

The vegetation is essentially Southern Tropical Mixed Forests (Champion and Seth 1968). Important tree species are *Tectona grandis*, *Terminalia tomentosa*, *Anogeissus latifolia*, *Butea frondosa*, *Pterocarpus marsupium*, *Hardwickia binata*. In the scrub patches, *Acacia arabica*, *Madhuca indica* and *Hardwickia binata* stand over *Calotropis gigantea*, *Zizyphus oenoplia*, *Grewia* spp. and *Cassia auriculata*. Occasional clumps of bamboo are encountered on the hillsides and on the banks of forest streams. The invasive *Lantana*, *Parthenium*, *Duranta* and *Strobilanthes* grow profusely as weeds in this area (Rao *et al.* 1997).

AVIFAUNA

About 242 species of birds have been recorded from this site (Rao *et al.* 1997). Most of them belong to tropical dry deciduous forest habitats and are generally common. The large expanse of undisturbed forest, especially in the core area, probably constitutes the best of its kind in India. BirdLife International (undated) has identified 59 Biome-11 species (Indo-Malayan Tropical Dry Zone), of which 36 have been sighted here.

The globally threatened Yellow-throated Bulbul *Pycnonotus xantholaemus* was seen in April 1997 near a place called Ummamaheshwaram, close to Mannanur (Srinivasulu and Rao 2000).

Some Near Threatened species, identified by BirdLife International (2001), are also listed by Rao *et al.* (1997) in their comprehensive checklist. The Greater Spotted Eagle *Aquila clanga* considered

Vulnerable by BirdLife International (2001) is regularly seen around the water bodies that have formed due to the dams.

Despite protection during the last 25 years as a reserve forest, sanctuary and now a tiger reserve, the forest cover and quality appears to be deteriorating since the days of Dr Sâlim Ali, when he collected birds here in the former Hyderabad State in the early 1930s (Ali 1933; Ali and whistler 1933a, 1933b, 1934a, 1934b). As pointed out by Rao *et al.* (1997), Ali recorded 105 species of birds from this region, especially at Mannanur, Amrabad Plateau and at Farahabad. Some of the dense forest species recorded by Ali, such as Indian Scimitar Babbler *Pomatorhinus horsfieldii*, Malabar Trogon *Harpactes fasciatus* and Nilgiri Wood-Pigeon *Columba elphinstoni* are no longer seen. The latter species is confined to the Western Ghats (Ali and Ripley 1987, Grimmett *et al.* 1998) and is listed as Vulnerable (BirdLife International 2001).

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>
Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>

Near Threatened

Painted Stork	<i>Mycteria leucocephala</i>
Greater Grey-headed Fish-Eagle	<i>Ichthyophaga ichthyaetus</i>
Pallid Harrier	<i>Circus macrourus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

Secondary Area s072: Southern Deccan Plateau

Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>
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OTHER KEY FAUNA

Nagarjunasagar-Srisailem is one of the largest tiger reserves in India. The 1979 census showed 49 Tigers in the Reserve, which by 1988, had increased to 65, according to the Forest Department. The Reserve also has Leopard *Panthera pardus*, Wild Dog *Cuon alpinus*, Golden Jackal *Canis aureus*, Wolf *Canis lupus*, Sambar *Cervus unicolor*, Chital *Axis axis* and Wild Boar *Sus scrofa*. Blackbuck *Antelope*

cervicapra is present outside the Reserve in open areas. The Mouse Deer *Moschiola meminna* is also found, but it is extremely difficult to see due to its small size and secretive nature.

LAND USE

- q Conservation and Research
- q Forestry
- q Dam: Irrigation and Power Supply

THREATS AND CONSERVATION ISSUES

- q Poaching
- q Fire
- q Grazing
- q Vehicular traffic
- q Water Scarcity

Funds needed to manage the Reserve are inadequate and there is a lack of trained staff. There is a livestock population of about 15,000 in the core area and 43,350 in the non-core area. In addition, about 300,000 nomadic cattle graze in the Reserve and the forest floor is set on fire to encourage growth of new grasses by the nomadic cattle grazers. Timber is smuggled from the Reserve down to the plains, to meet the minor timber and fuel wood demands of all the surrounding districts.

About 200 villages are situated in and around the Reserve, of which 120 villages are within the Sanctuary. The Chenchus are a primitive tribe, semi-nomadic, living in bamboo huts called gudems. Twenty-three gudems exist in the core area, but due to their simple lifestyle, these tribals are not considered a major threat to the forest and its biodiversity. The biggest threat comes from armed rebels or

Naxalites, who hide in the forest and exploit natural resources and villagers. Many Naxalites indulge in poaching.

One highway passes through the Reserve and one runs along its boundary. The Reserve is also threatened by the ecological impacts of irrigation projects and hydroelectric projects. There is a plan to divert Srisailem water through a tunnel to various towns. Several electric lines are being laid through the Reserve. Several families staying within the Reserve are dependent on selling fuel wood and making leaf plates for a living.

Poaching is rampant in some parts such as Nallamalla Range where the tiger has almost been wiped out.

The Atomic Mineral Division has requested permission to exploit uranium deposits in about 700 ha at Chitrial in Guntur district. The area is likely to yield 30 million tones of uranium ore.

KEY CONTRIBUTOR

IBA Team

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Education and awareness programmes should be initiated for 200 villages in and around Srisailem

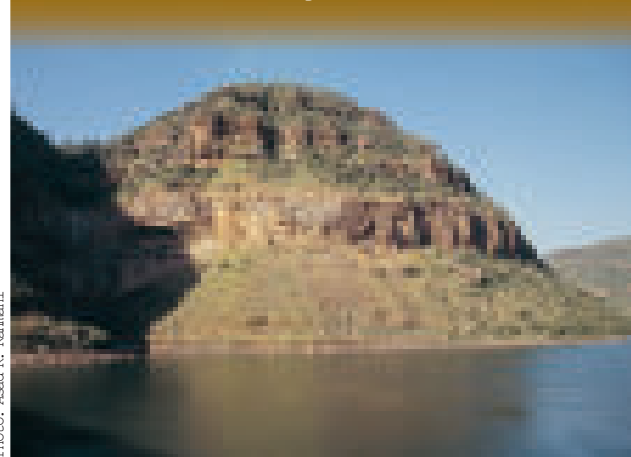


Photo: Asad R. Rahmani

NELAPATTU BIRD SANCTUARY



IBA Site Code	: IN-AP-07
State	: Andhra Pradesh
District	: Nellore
Coordinates	: 13° 50' 14" N, 79° 59' 06" E
Ownership	: State
Area	: 440 ha
Altitude	: c. 30 m
Rainfall	: 1,000 mm
Temperature	: 23 °C to 45 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Littoral Forest, Tropical Secondary Scrub

IBA CRITERIA: A1 (Threatened Species)

PROTECTION STATUS: Wildlife Sanctuary, established in September 1976

GENERAL DESCRIPTION

Nelapattu, named after village of the same name in Doravani Sathram Mandal of Nellore district, was notified as a bird sanctuary in 1976. The Sanctuary is divided into the following components: Kallur Reserve Forest Area (288.14 ha), Nelapattu Tank Area (82.56 ha) and Unreserved Forest Area (88.22 ha). The Sanctuary supports the largest pelicanry of Spot-billed or Grey Pelican *Pelecanus philippensis* in India. It is also a breeding site for the White or Black-headed Ibis *Threskiornis melanocephalus*, Asian Openbill *Anastomus oscitans*, Black-crowned Night Heron *Nycticorax nycticorax*, and Little Cormorant *Phalacrocorax niger*. It is a haven for a broad spectrum of bird species for both breeding and roosting.

About 12 km from Nelapattu Bird Sanctuary lies village Vedurupattu, where hundreds of Painted Stork *Mycteria leucocephala* breed (Philip *et al.* 1998). Both these sites can be considered as one IBA.

The Sanctuary has Swamp Forests in the tank portion and Southern Dry Evergreen Scrub Forests in the Reserve and Unreserved Forest. The dominant species are *Manilkara hexandra*, *Maba buxifolia* and *Buchanania angustifolia* in the Reserve and Unreserved forests, and *Barringtonia acutangula* in the tank area.

AVIFAUNA

About 187 bird species are known to occur in the Sanctuary, of which 50 are migratory (Sharma and Raghavaiah 2002). The Grey or Spot-billed Pelican, White Ibis, Asian Openbill, Little Cormorant, Eurasian Spoonbill *Platalea leucorodia* and the Black-crowned Night Heron are some of the major breeders. Other waterfowl species include Dabchick *Tachybaptus ruficollis*, Northern Pintail *Anas acuta*, Common Teal *A. crecca*, Northern Shoveler *A. clypeata*, Garganey *A. querquedula*, Gadwall *A. strepera*, Coot *Fulica atra*, Grey Heron *Ardea cinerea*, Darter *Anhinga melanogaster*, Black-winged Stilt *Himantopus himantopus* and various egrets, terns and other waders.

Nelapattu is one of the most important pelicanries in India, but the number of breeding pairs has decreased, judging from 1,500 nests during its heyday to 300-350 nests in 1980-81, and only 100 pairs in 1990 (Santharam 1993). V. Kannan of the BNHS counted 265 nests in 2002-2003, but according to the Forest

Department, between 350 and 500 nests were present, and over 750 chicks hatched in the 2002-2003 season (N. Shiva Kumar *in litt.* 2003).

Besides the Spot-billed Pelican, other species also breed in Nelapattu tank. In 1997, Philip *et al.* (1998) found 951 adults and chicks of Asian Openbill, 121 of White Ibis, 3445 of Little Cormorant, 182 of Black-crowned Night Heron, 337 of Little Egret, 152 of Cattle Egret and 76 of Little Grebe.

In the village Vedurupattu, about 12 km from Nelapattu, Philip *et al.* (1998) reported more than 1300 Painted Stork adults and chicks. The birds nest right in the middle of the village on large trees and the villagers even raise the fallen chicks till they are able to fly. But according to Manakadan and Kannan (2003), breeding was not noticed during 2002 and 2003.

Vulnerable

Spot-billed Pelican	<i>Pelecanus philippensis</i>
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OTHER KEY FAUNA

There are no large mammals in the sanctuary. However, Golden Jackal *Canis aureus*, Black-naped Hare *Lepus nigricollis*, Monitor Lizard *Varanus bengalensis*, Tortoise and some species of snakes exist in the Sanctuary.

LAND USE

- q Forestry
- q Fishing

THREATS AND CONSERVATION ISSUES

- q Pumping of water from tank
- q Decline in *Barringtonia* trees

Local people treat the birds as celestial beings and offer them protection. Droppings of pelican and other birds enrich the soil and water, which is used by the villagers for irrigation.

The pivotal conservation issue on which the survival of this pelicanry depends is the growth of *Barringtonia* trees. Since the devastating cyclone of 1984, during which large numbers of old *Barringtonia* trees were uprooted and the tank bund breached, the Sanctuary has not regained its past glory. Of the 120 trees in the tank before the cyclone, less than 40 now

survive and even they are under tremendous pressure (Santharam 1993).

Another problem is the pumping out of tank water by rich farmers, exposing the nests to terrestrial predators and human disturbance. The pelican and other birds nest on submerged *Barringtonia* trees. Earlier, the trees used to be surrounded by water for many months, till the chicks were able to fly. But now, influential farmers draw out the water through motor pumps, thus the tank dries up much faster. Sharma and Raghavaiah (2002) have shown a direct correlation between rainfall (and water level in the tank) and breeding success of the Pelicans. If Nelapattu Bird Sanctuary is to be saved, the Forest Department, and the local villagers should regulate the use of water to ensure that some water remains till the pelican chicks are able to fly.

To safeguard the interests of the villagers, the Wildlife Wing has taken up eco-developmental activities. These include an agricultural improvement programme by drilling bore wells for irrigation and drinking water facility. To reduce dependency on the sanctuary area for their fuel wood requirement, alternate energy sources like biogas plants, smokeless “chullas” are provided. To

meet the fodder requirement of cattle, silvipasture plantations are being raised. Apart from this, laying of road to the village and planting avenue trees has also been taken up.

KEY CONTRIBUTORS

V. Kannan and V. Santharam

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Nelapattu is one of the most important pelicanaries in south India where 265 nests of Spot-billed Pelicans *Pelecanus philippensis* were counted in 2002-2003.



Photo: V. Kannan

PAKHAL SANCTUARY



IBA Site Code	: IN-AP-08
State	: Andhra Pradesh
District	: Warangal
Coordinates	: 17° 54' 07" N, 80° 04' 51" E
Ownership	: State
Area	: 87,930 ha
Altitude	: 250 m
Rainfall	: 1,000 mm
Temperature	: 15 °C to 45 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Southern Mixed Deciduous Forest

IBA CRITERIA: A4iii (≥ 20,000 waterbirds), Data Deficient

PROTECTION STATUS: Wildlife Sanctuary, established in March 1952

GENERAL DESCRIPTION

Pakhal Wildlife Sanctuary is a Dry Deciduous Teak forest with a small freshwater lake. The 1500 ha lake was created in the 16th century by the construction of an earthen dam, which was renovated in 1918 (Spillet 1968, Scott 1989). The lake provides water for irrigation of almost 9000 acres of farmland, and is also of considerable significance for the avifauna which remains undisturbed within the Sanctuary. The lake and its environs form the core area of the Pakhal Wildlife Sanctuary. The lake is fed by numerous ephemeral and seasonal streams. Pakhal is 60 km from Warangal (Kazipet) Railway Station and 250 km from Hyderabad by road.

The lake supports a luxuriant growth of aquatic and emergent marsh vegetation. The extensive grasslands around the lake are composed of *Apluda*, *Eragrostis*, *Heteropogon* and *Vetiveria*. Dominant trees near the lake include *Barringtonia* and *Xeromphis*. The other common trees are species of *Terminalia*, *Anogeissus*, *Cleistanthus*, *Boswellia*, *Chloroxylon*, *Diospyros*, *Acacia* and *Sterculia*.

AVIFAUNA

The lake is known to support large concentrations of migratory waterfowl. However, no study has been conducted on the avifauna. It probably qualifies for A4iii criteria, as some people claim that more than 20,000 waterfowl are present. Due to inadequate information on the avifauna, this site is being listed as Data Deficient.

OTHER KEY FAUNA

The forest supports most of the large mammals usually found in dry deciduous forests of Andhra Pradesh such as the Tiger

Panthera tigris, Leopard *P. pardus*, Spotted Deer *Axis axis*, Sambar *Cervus unicolor* and others. Among the important fish species inhabiting the lake are *Catla catla*, *Labeo rohita* and *Ophicephalus* sp.

LAND USE

- q Nature conservation and research
- q Livestock grazing
- q Subsistence agriculture

THREATS AND CONSERVATION ISSUES

- q Overgrazing by livestock
- q Encroachment or settlement
- q Cultivation and fires
- q Collection of firewood

Strict prohibition of domestic livestock grazing is essential. Forest operations, including the collection of the minor forest produce, inside the sanctuary must be controlled.

KEY CONTRIBUTORS

Workshop participants and IBA Team

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POCHARAM WILDLIFE SANCTUARY



IBA Site Code	: IN-AP-09
State	: Andhra Pradesh
District	: Medak, Nizamabad
Coordinates	: 18° 10' 00" N, 78° 12' 00" E
Ownership	: State
Area	: 13,000 ha
Altitude	: 450 m
Rainfall	: Not available
Temperature	: 6 °C to 46 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Mixed Dry Deciduous Forest

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

PROTECTION STATUS: Wildlife Sanctuary, established in February 1952

GENERAL DESCRIPTION

Pocharam Wildlife Sanctuary is situated 120 km from Hyderabad by road. It is a mixed dry deciduous forest with patches of scrub and grassy banks. The terrain is undulating, with low hills and small waterbodies. Adjacent to the Sanctuary is the Pocharam Reservoir on River Manjira, about 70 km downstream from Manjira Wildlife Sanctuary (an IBA).

The lake area has extensive marshy fringes and abundant aquatic vegetation typical of the region. The islands were originally wooded, but have recently been cleared. The surrounding area is mainly agricultural lands with scattered *Acacia* spp.

AVIFAUNA

More than 70 bird species are reported to be present in Pocharam (Forest Department records.) The lake is known to support a variety of both resident and migratory waterfowl. Large numbers of shorebirds are also present.

Critically Endangered	
Long-billed Vulture	<i>Gyps indicus</i>
Vulnerable	
Indian Skimmer	<i>Rynchops albicollis</i>
Biome-11: Indo-Malayan Tropical Dry Zone	
Long-billed Vulture	<i>Gyps indicus</i>
Red-headed Falcon	<i>Falco chicquera</i>
Rain Quail	<i>Coturnix coromandelica</i>
Jungle Bush-Quail	<i>Perdica asiatica</i>
Rock Bush-Quail	<i>Perdica argoondah</i>
Painted Bush-Quail	<i>Perdica erythrorhynchos</i>
Painted Spur-fowl	<i>Gallus lunulata</i>
Indian Peafowl	<i>Pavo cristatus</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Mottled Wood-Owl	<i>Strix ocellata</i>
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>
Indian Grey Hornbill	<i>Ocyrops birostris</i>

Red-winged Bush-Lark	<i>Mirafra erythroptera</i>
Ashy-crowned Sparrow-Lark	<i>Eremopterix grisea</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>
White-headed Babbler	<i>Turdoides affinis</i>
Rufous-fronted Prinia	<i>Prinia buchanani</i>
Jungle Prinia	<i>Prinia sylvatica</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>
Ashy Woodswallow	<i>Artamus fuscus</i>

OTHER KEY FAUNA

The mammalian fauna in this site includes Leopard *Panthera pardus*, Sloth Bear *Melursus ursinus*, Wild Boar *Sus scrofa*, Chital *Axis axis*, Sambar *Cervus unicolor*, Nilgai *Boselaphus tragocamelus*, Hyena *Hyaena hyaena* and Golden Jackal *Canis aureus*.

LAND USE

- q Forestry exploitation and agriculture
- q Water supply for irrigation and domestic use

THREATS AND CONSERVATION ISSUES

- q Unsustainable Forestry
- q Agricultural activities

The reservoir was declared a Sanctuary to afford protection to the Marsh crocodile *Crocodylus palustris*.

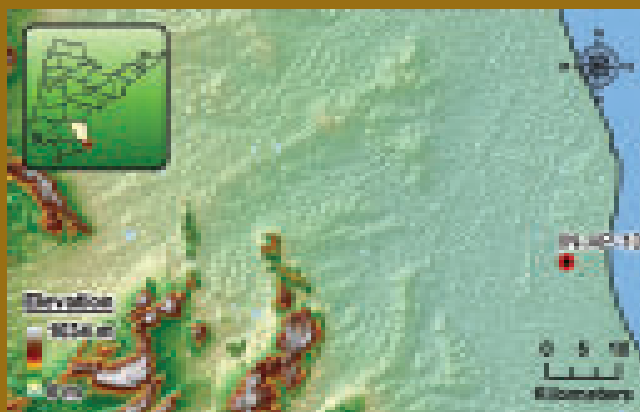
KEY CONTRIBUTOR

IBA Team

KEY REFERENCE

Not available

PULICAT LAKE SANCTUARY



IBA Site Code	: IN-AP-10
State	: Andhra Pradesh
District	: Nellore
Coordinates	: 13° 40' 00" N, 80° 11' 00" E
Ownership	: State
Area	: 60,000 ha
Altitude	: 0 – 10 m
Rainfall	: 1,000 mm
Temperature	: 15 °C to 45 °C
Biogeographic Zone	: Coasts
Habitats	: Littoral Forest, Tropical Dry Evergreen Forest

IBA CRITERIA: A1 (Threatened Species), A4iii (≥20,000 waterbirds)

PROTECTION STATUS: Wildlife Sanctuary, established in September 1976

GENERAL DESCRIPTION

Pulicat lake is an extensive brackish to saline lagoon with associated marshes and a massive freshwater to brackish swamp to the north. There are two connections with the sea; in general, sea water enters the lagoon through the channel at the northern end of Sriharikota Island, and flows back into the Bay of Bengal through the channel at the southern end. The backwaters attract large congregations of the Greater *Phoenicopus ruber* and Lesser *P. minor* flamingos, Spot-billed or Grey Pelican *Pelecanus philippensis*, Painted Stork *Mycteria leucocephala*, Grey Heron *Ardea cinerea*, and species of ducks, teals, terns, gulls and waders. Pulicat is the third most important wetland for migratory shorebirds on the eastern board of India.

Sriharikota Island, well protected as it is the satellite launching station of the Indian Space Research Organisation (ISRO), has remnants of Tropical Dry Evergreen Forest of considerable botanical interest (Suryanarayana *et al.* 1989, 1998). On the other islands in the lake, where protection is negligible, the exotic *Prosopis chilensis* has invaded many areas (Scott 1989). In the elevated mudflats, succulent halophytes, such as *Arthrocnemum indicus*, *Sesuvium portulacastrum*, *Salicornia brachiata*, *Suaeda maritima*, *S. monoica* and *S. nudiflora* occur. Submerged macrophytes include species of *Enteromorpha*, *Hypnea*, *Ulva*, *Halophila* and *Enhalus* (Oswin 1987).

AVIFAUNA

Pulicat Lake is an extremely important area for a variety of resident and Palaearctic migratory waterfowl. The lagoon supports significant populations of Spot-billed Pelican *Pelecanus philippensis*. A total of 88 species of birds has been recorded from Pulicat Bird Sanctuary during a BNHS study (Rao and Mohapatra 1993). During the mid-winter waterfowl count in 1988, 83,000 waterfowl were counted in the Sanctuary. However, during 1991 and 1992, the numbers were 38,722 and 10,902 respectively (Rao and Mohapatra 1993). The abundance of waterfowl fluctuates mainly with the prevailing water regime.

This site has been selected as an IBA on the basis of its population of Spot-billed Pelican (Criteria A1) and waterfowl congregation (Criteria A4iii). Pulicat is the major foraging ground of pelicans that breed in Nelapattu Bird Sanctuary, an IBA, less than 20 km away (Manakadan and Kannan 2003).

The lagoon in Pulicat Lake is one of the two major wintering grounds in southeast India for shorebirds (Prater *et al.* 1977). Due to its vastness, only a rough estimate of the wader population is possible (Rao and Mohapatra 1993). Many waders are likely to occur above their 1% geographical population threshold. Therefore this site would qualify for A4i criteria.

Most of the waders are distributed over the extensive mudflats along the Sriharikota-Sulurpet road and near Tada in the southwest part of the lagoon. The BNHS has conducted ringing camps in this area, and a notable recovery was that of a Curlew Sandpiper *Calidris testacea* with a Polish ring. Subsequently, it was found that the bird had been banded in the Arctic Circle region of Russia (Rao and Mohapatra 1993).

Taher and Pittie (1989) have prepared a checklist of birds of Andhra Pradesh. During ringing at Pulicat Lake in 1990-91, seven birds were added to the bird list of Andhra Pradesh (Rao and Mohapatra 1994). Interesting among them are the Large Sand Plover *Charadrius leschenaultii*, Knot *Calidris canutus*, Eastern Knot *C. tenuirostris* and Black Tern *Chlidonias niger*.

Pulicat Lake also provides suitable feeding conditions for the two species of flamingos. In October 2002, more than 2,000 Greater Flamingos were seen there.

Critically Endangered

Oriental White-backed Vulture	<i>Gyps bengalensis</i>
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Vulnerable

Spot-billed Pelican	<i>Pelecanus philippensis</i>
Greater Spotted Eagle	<i>Aquila clanga</i>

OTHER KEY FAUNA

The mammalian fauna includes the Jungle Cat *Felis chaus*, Golden Jackal *Canis aureus*, Wild Boar *Sus scrofa*, Small Indian Mongoose *Herpestes auropunctatus* and Monitor Lizard *Varanus bengalensis*. Recently, a dead Leopard *Panthera pardus* was found, trapped in the slush in the lake. This was the first record of Leopard from Pulicat Lake (Kannan and Manakadan *in press*).

LAND USE

- q Sea route
- q Space Research Centre

THREATS AND CONSERVATION ISSUES

- q Fishing activities
- q Illegal Prawn farming
- q Industrial development on the shores of the lagoon
- q Siltation

More than 1,00,000 people live in 52 villages around the borders and islands of Pulicat Lake. The southernmost end of the lagoon is near the metropolis of Chennai, which burdens it with additional 'developmental problems'. Due to these and other factors, Pulicat Lake faces a number of threats.

The fishing community in Pulicat Lake numbers around 30,000, spread over 50 settlements. An average of c. 1200 tonnes of fish is harvested each year. Sixty percent of the catch is made up of prawns, 23% of mullets, and the rest largely *Clupeoides* catfish, *Beloniformes* and crabs. Since the northern side of the lake dries up in summer, a large part of the fishing ground is not productive throughout the year. Depletion of fish resources due to over-fishing, use of destructive fishing gear, and changes in the hydrology have resulted in conflicts among fishermen, especially between the fishermen of Andhra Pradesh and Tamil Nadu. Another problem related to fisheries is the conversion of land for prawn aquaculture since 1993, some of which were/are in the sanctuary area. Prawn farms are largely concentrated around Durgarajpatnam, and as of 1994, there were about 32 parties guilty of raising aqua farms illegally in the precincts of the Sanctuary (Ramesh 1994, Panini 1996).

The area of Pulicat Lake in Tamil Nadu faces greater threats than those in Andhra Pradesh. The 630MW North Chennai Thermal Power Station (NCTPS), the Ennore Satellite Port project, and a proposed petrochemical park are major threats to the lake's ecosystem. Thousands of acres of land have been cleared for three projects that will progressively damage the ecosystem, stretching across 40 km, from Ennore (20 km north of Chennai) to Pulicat.

The North Chennai Thermal Power Station (NCTPS) draws 44 lakh litres of fresh water from the Ennore Creek, lets out hot coolant water into the Buckingham Canal, and discharges toxic fly ash, in the form of slurry, into the lagoon. This has resulted in an increase of temperatures of 5 °C at the outlets. Despite precipitators and chemical filters, the fly ash contains toxic elements such as arsenic, cadmium, mercury, lead, manganese, fluorine and beryllium. In Athipattu village, 10 km from NCTPS, the contamination of saltpans has forced the people to give up their occupation. Fly ash is especially harmful as it can be inhaled and leads to permanent respiratory disorders, dermatitis, asthma, bronchitis and cancer. The silica in fly ash could cause silicosis.

The site of the Ennore Satellite Port falls in Category I (No-Development Zone) of the Coastal Regulatory Zone (CRZ) classification. The port, a sheltered harbour facility, when fully operational, is expected to handle about 16.12 tonnes of coal, which is the daily requirement for the NCTPS and the thermal power stations at Mettur.

The construction of the breakwaters for the port has caused the sea to ingress 50 m into the mainland that separates the Pulicat lagoon system and the sea. This has caused severe water erosion at Korai-kuppam and eight other fishing hamlets in the Pazhaverkadu area, which form an island, with the sea to its east, and the lagoon to the west. This island is home to a fishing community more than 20,000 strong.

The Tamil Nadu Industrial Development Corporation (TIDCO) is acquiring 2,900 ha for the proposed Rs. 600 million petrochemicals industrial complex. It is estimated that the proposed complex would require 45 million litres of water per day, an amount that would seriously deplete coastal aquifers.

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ROLLAPADU WILDLIFE SANCTUARY



IBA Site Code	: IN-AP-11
State	: Andhra Pradesh
District	: Kurnool
Coordinates	: 15° 45' 00" N, 78° 27' 00" E
Ownership	: State
Area	: 614 ha
Altitude	: Not available
Rainfall	: 670 mm
Temperature	: 17 °C to 42 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Grassland

IBA CRITERIA: A1 (Threatened Species), A4ii (1% biogeographic population),

PROTECTION STATUS: Wildlife Sanctuary, established in 1988

GENERAL DESCRIPTION

Rollapadu is a small village, 18 km southeast of Nandikotkur town, in the plains between the Nallamalai and Erramalai ranges of the Eastern Ghats. The River Krishna flows northwest of Nandikotkur. Rollapadu shot to fame in July 1984 when a flock of 35 Great Indian Bustard *Ardeotis nigricaps* was discovered (Manakadan and Rahmani 1989, 1993). Recommendations were made by the Endangered Species Project of the Bombay Natural History Society to the Andhra Pradesh Forest Department to establish a sanctuary. Soon after, the State Forest Department declared the Rollapadu Great Indian Bustard Sanctuary.

The Sanctuary, though established primarily to protect the Great Indian Bustard, has benefited the rest of the wildlife in the area. Prior to its establishment, the animals were persecuted by professional trappers and hunters from nearby towns and villages (Manakadan and Rahmani 1989).

Most of the Sanctuary is covered by grasses. Shrubs and small trees are common near the two small streams that flow within the Sanctuary.

Due to mismanagement of grasslands and increase of Blackbuck, the Great Indian Bustard *Ardeotis nigricaps* has declined in Rollapadu.

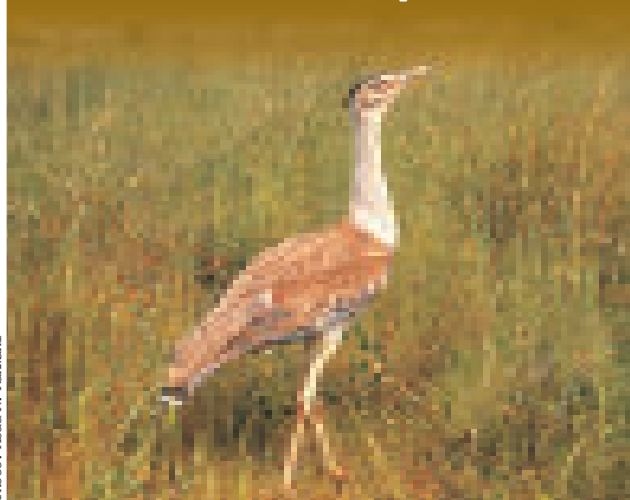


Photo: Asad R. Rahmani

AVIFAUNA

In the 1980s, there were about 60-70 bustards in and around Rollapadu and the Sanctuary was developing very well, but due to subsequent mismanagement of the grasslands, and poaching of bustards during their movement away from Rollapadu, the bustard population has come down drastically. Not more than 20-25 birds remain. Large flocks of 15-20 birds are rarely sighted now.

Another globally threatened species that is now regularly seen is the Lesser Florican *Sypheotides indica* (Sankaran and Manakadan 1990, Manakadan and Rahmani 1999).

About 150 bird species are reported in and around Rollapadu Wildlife Sanctuary, including the second largest roost of harriers (*Circus* spp.) in India (Rahmani and Manakadan 1986). Nearly 2,000 harriers of four species are found in the grasslands (*Circus pygargus*, *C. macrourus*, *C. aeruginosus* and *C. melanoleucos*). This site can easily qualify for A4ii criteria (known or thought to hold, on a regular basis, >1% of the global population of a congregatory seabird or terrestrial species).

Endangered

Great Indian Bustard	<i>Ardeotis nigricaps</i>
Lesser Florican	<i>Sypheotides indica</i>

OTHER KEY FAUNA

The most conspicuous mammal, which has benefited most from protection, is the Blackbuck *Antelope cervicapra*. In 1985, its population was not more than 17 individuals. Now, it has gone up to 500 (Forest Department records, and our observations). A pack of Grey Wolf *Canis lupus* inhabits the Rollapadu grasslands. Indian Fox *Vulpes bengalensis* is also found, and shows great fluctuations in population.

LAND USE

q Nature conservation and research

THREAT AND CONSERVATION ISSUES

- q Poaching
- q Irresponsible management inputs
- q Irrigation projects

The decline in bustard population has been blamed on the increase

of the Blackbuck population from 15-20 in 1985 to nearly 500 in 2002, but this alone can not be the reason. Most of the time, the majority of the bustards remain outside the Sanctuary, where they are not safe from poachers. The goodwill among villagers generated by the development of the Sanctuary has been nullified by the crop damage caused by Blackbuck. Based on two 3-years studies, the BNHS had recommended that Blackbuck numbers should be reduced to less than 100 individuals, and poaching of bustard should be stopped, but this has not been done. Instead, the Forest Department wasted funds on the development of a fence (to prevent Blackbuck from going outside the grasslands) and on construction

This irrigation canal and development of a large lake near Rollapadu will change the crop pattern and negatively impact the Great Indian Bustard *Ardeotis nigriceps*.



Photo: M. Zafar-ul Islam

of waterholes (15 in 600 ha!). Thankfully, the management is now in better hands, and some measures are being taken to reduce the Blackbuck numbers. Even so, unless poaching is curtailed and the cooperation of local villagers gained, the bustard population will keep on declining.

Increasing scrub vegetation in the grasslands (Manakadan *et al.* 2002) is another cause for concern, as it is reducing the bustard habitat.

However, the greatest and irrevocable threat to the Great Indian Bustard is the development of a large irrigation project 3 km from Rollapadu that will change the land use and crop patterns of the area completely. In future, there will be less area available to the bustard for foraging and nesting. Therefore, it is necessary to monitor the movement of the bustards, through satellite and radio tracking, to record its use of the surrounding landscape and then to develop a long-term conservation strategy to protect pockets of grasslands where the bustards spend most of their time. A holistic approach is required to save the bustard habitat, otherwise the measures taken at Rollapadu will not succeed in reviving the bustard population.

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SRI LANKAMALLESWARA WILDLIFE SANCTUARY



IBA Site Code	: IN-AP-12
State	: Andhra Pradesh
District	: Cuddapah
Coordinates	: 14° 38' 24" N, 78° 40' 12" E
Ownership	: State
Area	: 46,442 ha
Altitude	: 150 – 784 m
Rainfall	: 800 mm
Temperature	: 21 °C to 46 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Sub Tropical Dry Deciduous Forests

IBA CRITERIA: A1 (Threatened Species), A2 (Secondary Area s071: Eastern Andhra Pradesh)

PROTECTION STATUS: Wildlife Sanctuary, established in October 1988

GENERAL DESCRIPTION

Sri Lankamalleshwara Wildlife Sanctuary, situated in the Lankamalai Hill ranges, is about 30 km from Cuddapah. This sanctuary was declared mainly for the Critically Endangered Jerdon's Courser *Rhinoptilus bitorquatus* after its rediscovery in 1986 (Bhushan 1986).

The major types of forest in this Sanctuary are Southern Tropical Thorn and Southern Tropical Dry Deciduous (Champion and Seth 1968). The Sanctuary bears dry deciduous forest in the higher elevations to scrub forest in the plains. Major floristic components of the scrub forest are thorny species of *Acacia*, *Zizyphus* and *Carissa*, and non-thorny species of *Cassia*, *Hardwickia* and

Anogeissus. The Red Sandal *Pterocarpus santalinus*, endemic to Andhra Pradesh, occurs here.

AVIFAUNA

Nearly 200 bird species are found in this Sanctuary (P. Jeganathan and A. R. Rahmani *in prep.*). The Critically Endangered Jerdon's Courser was restricted to a small patch of scrub jungle within this Sanctuary. Recent studies reveal that this bird is found in three more localities within the Sanctuary (Jeganathan 2002).

The Sri Lankamalleshwara Wildlife Sanctuary has been selected on the basis of presence of a single species. It is a Secondary Area where a single Restricted Range species is found (Stattersfield *et al.* 1998).

The Critically Endangered Jerdon's Courser *Rhinoptilus bitorquatus* has been found by BNHS scientists at two new sites in Sri Lankamalleshwara Sanctuary.



Photo: P. Jeganathan

Critically EndangeredJerdon's Courser *Rhinoptilus bitorquatus***Secondary Area s071: Eastern Andhra Pradesh**Jerdon's Courser *Rhinoptilus bitorquatus***OTHER KEY FAUNA**

Although the Sanctuary was declared with the sole purpose of protecting the habitat of the Jerdon's Courser, many other species have benefited, perhaps more than the target species! Leopard *Panthera pardus*, Dhole or Indian Wild Dog *Cuon alpinus*, Sloth Bear *Melursus ursinus*, Chital *Axis axis*, Sambar *Cervus unicolor*, Chinkara *Gazella bennettii* and Wild Boar *Sus scrofa* are seen in the forested areas. Even the Wolf *Canis lupus* has been sighted a couple of times since the year 2000 (P. Jeganathan *pers. comm.* 2001).

LAND USE

q Agriculture

THREATS AND CONSERVATION ISSUES

- q Quarrying on the hills.
- q Developmental activities
- q Clearing the scrub jungle for lemon farms.
- q Habitat alteration by introduction of exotic plants.

The major land use around the Sanctuary is agriculture, mainly for paddy, sunflower and cotton and in recent times sweet lime farming. Developmental activities such as construction of check dams, percolation ponds and trenching also carried on.

The scrub jungle is being cleared to provide space for local people and for lemon farms, which is most alarming. Collection of fuel wood, illegal felling of trees, poaching of small animals and poisoning the water holes to kill deer and antelopes is known to occur in the Sanctuary.

KEY CONTRIBUTOR

Panchapakesan Jeganathan

KEY REFERENCES

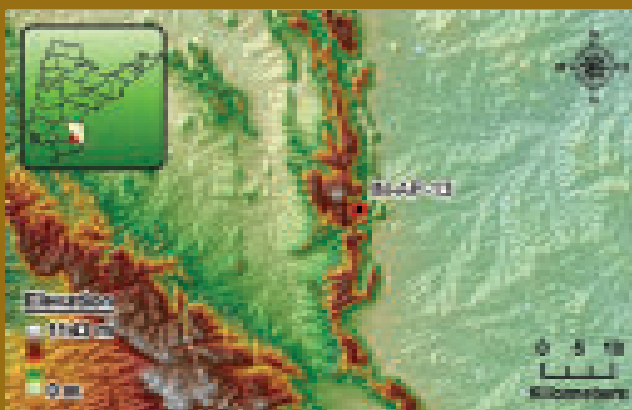
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The Jerdon's Courser requires lightly-grazed areas, with scattered low bushes therefore some grazing is required to keep the vegetation low.



Photo: Asad R. Rahmani

SRI PENUSILA NARASIMHA WILDLIFE SANCTUARY



IBA Site Code	: IN-AP-13
State	: Andhra Pradesh
District	: Nellore and Cuddapah
Coordinates	: 14° 00' 33" N, 79° 27' 50" E
Ownership	: State
Area	: 1,03,085 ha
Altitude	: 150–800 m
Rainfall	: 800 mm
Temperature	: 21 °C to 46 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Moist Deciduous, Sub Tropical Secondary Scrub

IBA CRITERIA: A1 (Threatened Species), A2 (Secondary Area s071: Eastern Andhra Pradesh; Secondary Area s072: Southern Deccan Plateau)

PROTECTION STATUS: Wildlife Sanctuary, established in 1997

GENERAL DESCRIPTION

Sri Penusila Narasimha Wildlife Sanctuary, earlier known as the Velikonda Wildlife Sanctuary, spreads over the districts of Cuddapah and Nellore, Andhra Pradesh. This area encompasses Turupukonda hills, part of the Velikonda Hill range, Somasila Dam and Kandaleru Reservoir. This area was proposed as the Velikonda Wildlife Sanctuary soon after the sightings of the Critically Endangered Jerdon's Courser on the western slopes of Turupukonda Hills (Bhushan 1994) but it was declared only after about ten years as Sri Penusila Narasimha Wildlife Sanctuary.

This IBA site contains Moist Deciduous forest, and Dry Thorn forest on the foothills of Velikonda Hill ranges, apart from *Euphorbia* scrub forests and monoculture plantation, especially of *Eucalyptus* and *Terminalia arjuna*.

AVIFAUNA

Sixty-eight bird species have been recorded in this Sanctuary recently (Jeganathan 2003), of which 3 species fall under Biome-10, 16 species under Biome-11, while 2 are Restricted Range species. Jerdon's Courser *Rhinoptilus bitorquatus* was reported from this Sanctuary in 1986 (Bhushan 1994) and Yellow-throated Bulbul *Pycnonotus xantholaemus* was recorded very recently (P. Jeganathan pers. comm. 2003).

Critically Endangered	
Jerdon's Courser	<i>Rhinoptilus bitorquatus</i>
Vulnerable	
Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>
Secondary Area s071: Eastern Andhra Pradesh	
Jerdon's Courser	<i>Rhinoptilus bitorquatus</i>
Secondary Area s072: Southern Deccan plateau	
Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>

OTHER KEY FAUNA

Leopard *Panthera pardus*, Sloth Bear *Melursus ursinus*, Chital *Axis axis*, Sambar *Cervus unicolor*, Chinkara *Gazella bennettii*

and Wild Boar *Sus scrofa* are seen in the forested areas. Even the Wolf *Canis lupus* has been reported, along with Golden Jackal *C. aureus* and Indian Fox *Vulpes bengalensis* (Jeganathan 2003).

LAND USE

- ☐ Nature Conservation
- ☐ Aquaculture
- ☐ Agriculture

THREATS AND CONSERVATION ISSUES

- ☐ Clearance of scrub jungle habitat
- ☐ Construction of dams and reservoirs.
- ☐ Quarrying on the hills
- ☐ Illegal felling
- ☐ Construction of roads inside the Sanctuary to the Sri Penusila Narasimha Swamy temple

The Sri Penusila Narasimha Swamy temple, present inside the Sanctuary, attracts large numbers of pilgrims, especially during festivals. Disposal of non-degradable litter and plastic bags is a major conservation problem. Illegal felling is common and increases during the pilgrimage period. The proposal to increase the height of the Somasila dam and extend the Kandaleru reservoir will result in further submergence of forest area inside the Sanctuary. Clearing the scrub jungle habitat for lemon farming and monoculture plantations is another issue that needs to be addressed.

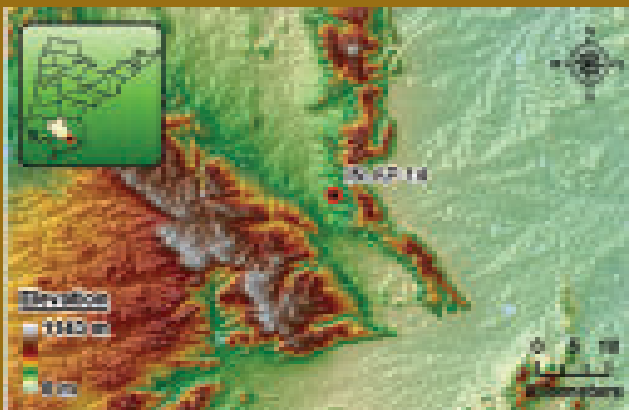
KEY CONTRIBUTOR

Panchapakesan Jeganathan

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SRI VENKATESWARA WILDLIFE SANCTUARY AND NATIONAL PARK



IBA Site Code	: IN-AP-14
State	: Andhra Pradesh
District	: Chittoor and Cuddapah
Coordinates	: 13° 50' 41" N, 79° 24' 48" E
Ownership	: State
Area	: 50,694 ha
Altitude	: 150 – 1,130 m
Rainfall	: 900 mm
Temperature	: 12 °C to 44 °C
Biogeographic Zone	: Deccan Peninsula
Habitats	: Tropical Dry Deciduous Forest

IBA CRITERIA: A1 (Threatened Species), A2 (Secondary Area s072: Southern Deccan Plateau)

PROTECTION STATUS: National Park, established in September 1989

GENERAL DESCRIPTION

Sri Venkateswara National Park (35,362 ha) and Wildlife Sanctuary (15,332 ha), located in southern Eastern Ghats, are spread over the Seshachalam hills of Cuddapah district and Tirumala hills of Chittoor district. The elevation ranges from 150 to 1,130 m, the terrain is undulating, with deep forest-covered valleys. Most of the rainfall is received from the northeast monsoon and a little from the southwest monsoon. The area has about 1,500 vascular plant species belonging to 174 families, of which many are endemic (Anand Mohan 2000).

In this IBA, the vegetation is a unique mix of the Dry Deciduous and Moist Deciduous types. The Park is home to six endemic plant species: *Cycas beddomei*, *Pterocarpus santalinus*, *Terminalia pallida*, *Syzygium alternifolium*, *Shorea tambaggia* and *Boswellia ovalifoliolata*.

AVIFAUNA

Anand Mohan (2000) has identified 178 species of birds from this Sanctuary. The globally threatened Yellow-throated Bulbul *Pycnonotus xantholaemus* is seen here (BirdLife International 2001). During BNHS ringing camps in 1989 and 1998-99, two Yellow-throated Bulbuls were ringed each time (S. Balachandran pers. comm. 2002). Pompadour Green Pigeon *Treron pompadora*, a bird of the Himalayas and the Western Ghats (Grimmett *et al.* 1999) is quite common in these forests. Another interesting record from this site is the presence of Large Hawk-Cuckoo *Hierococcyx sparveriioides* (Pittie and Balachandran 2002), the first record from Andhra Pradesh state. This area is extremely important due to its location at the junction of Eastern and Western Ghats, therefore it has been selected as an IBA.

The site lies in Biome-11 (Indo-Malayan Tropical Dry Zone) in which BirdLife International (undated) has listed 59 species which represent this biome bird assemblage. Till now 30 species have been identified here, further proving the importance of the site for conservation. Interestingly, four species that are listed under Biome-10 (Indian Peninsula Tropical Moist Forest) are also found here. They are Blue-faced Malkoha *Phaenicophaeus viridirostris*, Yellow-browed Bulbul *Iole indica*, Indian Scimitar-Babbler *Pomatorhinus horsfieldii* and Loten's Sunbird *Nectarinia lotenia*.

Critically Endangered

Oriental White-backed Vulture	<i>Gyps bengalensis</i>
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Vulnerable

Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>
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Secondary Area s072: Southern Deccan plateau

Yellow-throated Bulbul	<i>Pycnonotus xantholaemus</i>
------------------------	--------------------------------

OTHER KEY FAUNA

In 1984, the Asian Elephant *Elephas maximus*, not seen in Andhra Pradesh for nearly 300 years, re-appeared in the southern part of Chittoor district. In 1993, a breakaway herd of five individuals moved to the Chamala Valley of Tirumala forests in this IBA (Rao 1993).

Till now, Tiger *Panthera tigris* has not been reported from this site but Leopard *Panthera pardus* is quite common, along with the Wild Dog or Dhole *Cuon alpinus*. Other predators include Hyena *Hyaena hyaena*, Golden Jackal *Canis aureus*, Indian Fox *Vulpes bengalensis*, Small Indian Civet *Viverricula indica* and Jungle Cat *Felis chaus*. Sloth Bear *Melursus ursinus* is frequently encountered. Sambar *Cervus unicolor*, Spotted Deer *Axis axis*, Mouse Deer *Moschiola meminna*, Barking Deer *Muntiacus muntjak*, Four-horned Antelope *Tetracerus quadricornis* and Wild Boar *Sus scrofa* are the main ungulates. The nocturnal Slender Loris *Loris tardigradus* could be common but is seldom seen. Indian Giant Squirrel *Ratufa indica* and Tree Shrew *Anathana ellioti* are other interesting species.

Among reptiles, the most interesting species is the Draco or Gliding Lizard *Draco dussumieri*, found in some deep forested valleys (Balachandran and Pittie 2000). This species primarily inhabits evergreen biotopes in the Western Ghats (Daniel 2002), therefore, its presence in the southern Eastern Ghats is interesting from the biogeographical point of view. *Draco* is an example of the Malayan element in the fauna of southern India (Daniel 2002).

Another important reptile of this IBA is the Golden Gecko *Calodactylodes aureus*. Originally reported from rocky ravines in the Eastern Ghats, the Golden Gecko was rediscovered from the same area in 1985 (Daniel *et al.* 1986). It is now known to be widely distributed and recently recorded in the Western Ghats of Karnataka (Ashok Captain pers. comm. to J. C. Daniel).

LAND USE

- q Nature Conservation
- q Agriculture

IBAs not only save birds, other fauna such as the Golden Gecko *Calodactylodes aureus* rediscovered from this site in 1985, gain protection.

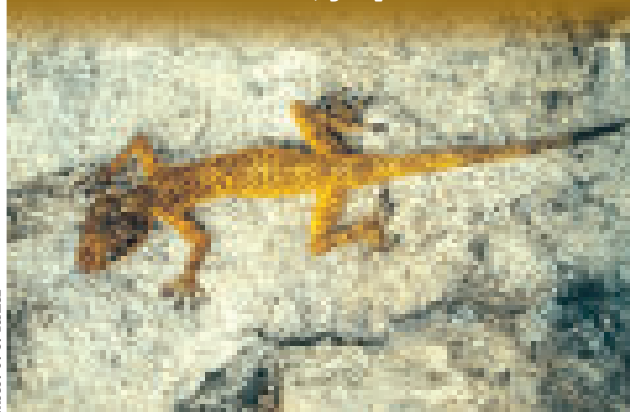


Photo: J. C. Daniel

THREATS AND CONSERVATION ISSUES

- q Construction of roads and dam
- q Quarrying on the hills

The Andhra Pradesh state highway Project (APSHP) is in the process of upgrading its State Highways and major district roads, partly supported by the World Bank. This includes the construction of Warangal-Pollacolu road which passes close to the western boundary of this IBA. Also, the Indian Board for Wildlife has, after laying down conditions, allowed the construction of the Kapil Teerthan Dam inside the Sri Venkateswara Sanctuary by the Andhra Pradesh Government and the Tirumala Tirupati Devasthanam. Both these constructions raise concerns over the potential impact of the road

and the dam on the habitat and the wildlife in the Sanctuary (*Protected Area Update*: Issue No. 13 and 45)

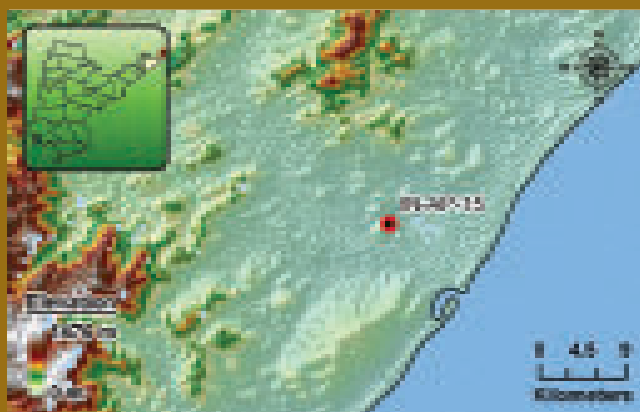
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Panchapakesan Jeganathan and S. Balachandran

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TELINEELAPURAM



IBA Site Code	: IN-AP-15
State	: Andhra Pradesh
District	: Srikakulam
Coordinates	: 19° 07' 00" N, 84° 40' 60" E
Ownership	: Gram Panchayat (Village Council)
Area	: 460 ha
Altitude	: 27 m
Rainfall	: Not available
Temperature	: Not available
Biogeographic Zone	: Deccan Peninsula
Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened Species)

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

Telineelapuram is located c. 5 km east of Tekkali town in Srikakulam district. The Telineelapuram Gram Panchayat (village council) governs four villages: Telineelapuram (460 ha), Viswanadhapuram and Vemalavada (410 ha), and Srirangam (56.3 ha). Very large numbers of Spot-billed Pelican *Pelecanus philippensis* and Painted Stork *Mycteria leucocephala* breed in these villages, mainly on *Prosopis chilensis*. Some nests are also found on *Tamarindus indica* and *Enterolobium saman*.

Common trees of human habitations, such as *Azadirachta indica*,

Tamarindus indica, *Enterolobium saman* and the introduced *Prosopis chilensis*, are widespread at the site.

AVIFAUNA

This breeding colony is surviving mainly because of the protection provided by villagers, who consider them sacred and auspicious. If the birds fail to come for breeding (in drought years), villagers believe that harm will come to them. About 150 pelicans and about 250 Painted Stork breed regularly at Telineelapuram. The pelicans mainly breed on four large *Ficus*

Importance of conservation by local communities is reflected in the presence of flourishing colonies of Spot-billed Pelicans in many villages.

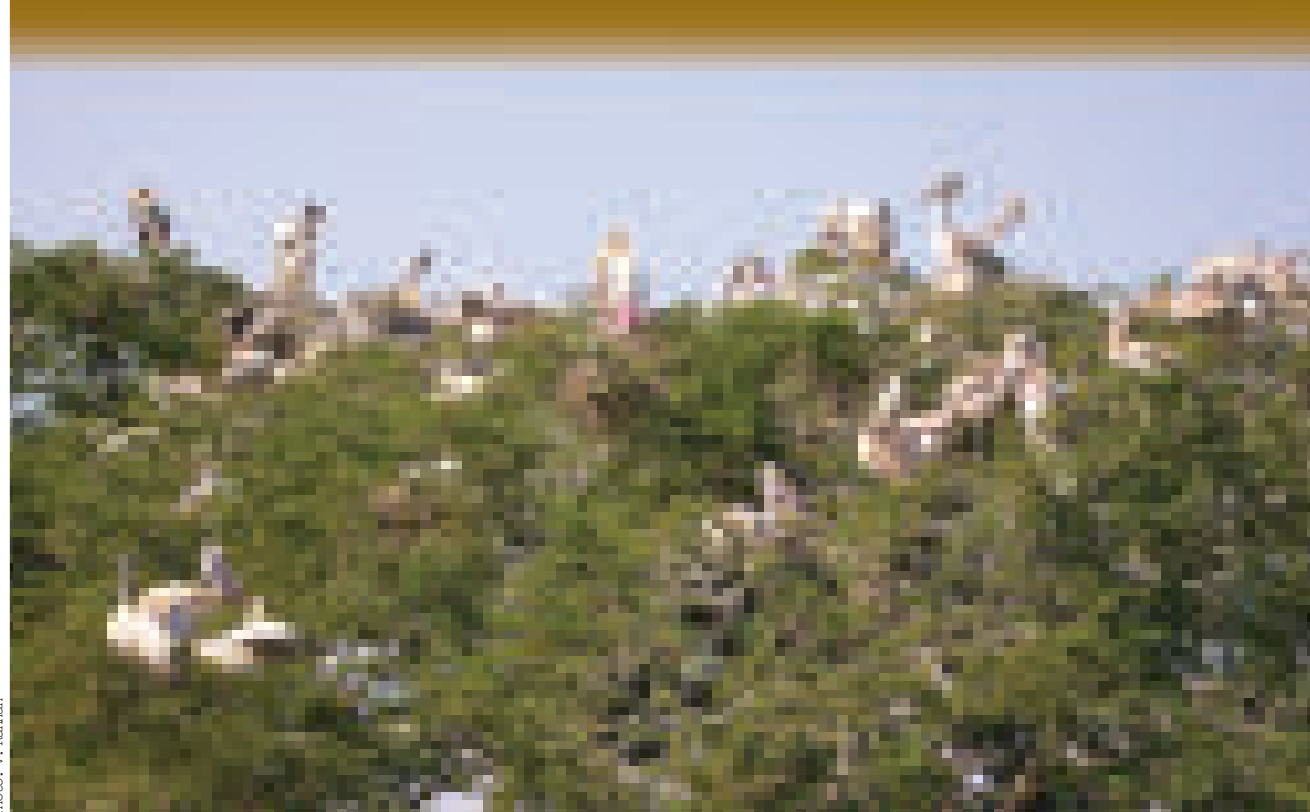


Photo: V. Kannan

trees, while the storks breed on *Acacia* trees. Their main foraging ground is at Kakarpally Creek, locally known as Kakarapally *parras*, located about 10 km from the Telineelapuram heronry. The creek spreads over 1000 ha and fills up with sea water during high tide.

This site is selected as an IBA solely for its importance as a breeding site of the globally threatened Spot-billed Pelican.

Vulnerable	
Spot-billed Pelican	<i>Pelecanus philippensis</i>
Near Threatened	
Painted Stork	<i>Mycteria leucocephala</i>

OTHER KEY FAUNA

There is no mammalian fauna of any significance, as the IBA site is located in a village.

LAND USE

- q Agriculture
- q Fishing

THREATS AND CONSERVATION ISSUES

- q Unregulated and insensitive tourism
- q Poaching outside the villages
- q Excessive fishing

The village community was protecting the nesting colony for many generations, but once it came into the limelight, the Forest Department took over to give legal protection to the birds and to the nesting site. It has now become quite popular among bird watchers and tourists. Some of the visitors go too close to the nests and disturb them. Tourism has to be regulated and, if necessary, prohibited during the early stages when the chicks are small. Unfortunately, the Forest Department has constructed a watch tower very close to the nesting trees. This should be demolished and a new tower constructed a little farther, if at all necessary.

Villagers have even put up nets to rescue pelican chicks falling from the nests.



As the villagers actively protect the birds, the Forest Department, with local NGOs and the village council, should spend funds in developing a bird rescue and rearing centre, instead of wasting money on building watchtowers. Facilities to rear chicks which fall out of the nests and abandoned should be developed.

Visakha Society for Prevention of Cruelty to Animals, based in Visakhapatnam has been campaigning against poaching of birds in and around this site. The birds are totally protected inside the villages, but while foraging in the surrounding wetlands, they fall prey to poachers and trappers.

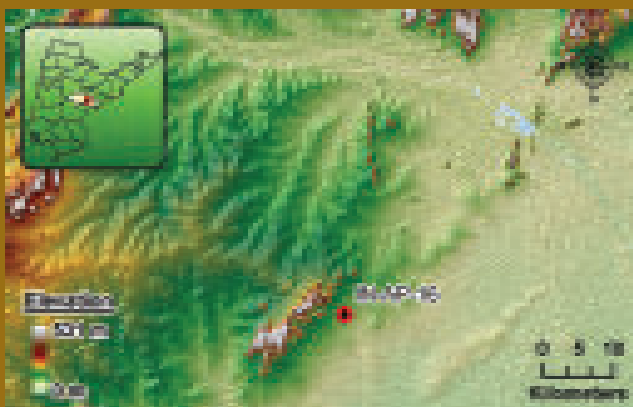
KEY CONTRIBUTOR

V. Kannan

KEY REFERENCE

Not available

UPPALAPADU



IBA Site Code	:	IN-AP-16
State	:	Andhra Pradesh
District	:	Guntur
Coordinates	:	16° 16' 26" N, 80° 21' 58" E
Ownership	:	Village Council
Area	:	15 ha
Altitude	:	33 m
Rainfall	:	Not available
Temperature	:	Not available
Biogeographic Zone	:	Deccan Peninsula
Habitats	:	Freshwater Swamp

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

PROTECTION STATUS: Not officially protected

GENERAL DESCRIPTION

The Uppalapadu, a freshwater tank situated in Uppalapadu village under Village Council (Gram Panchayat) revenue land, is small but very important for the globally threatened Spot-billed Pelican *Pelecanus philippensis*. The depth of the tank is c. 3 m. Uppalapadu is c. 8 km from Guntur town. The pelicanry is of recent origin, and nesting was first recorded in the winter of 2000 (Rao and Kumar 2000).

AVIFAUNA

In 1999, Spot-billed Pelican, Asian Openbill *Anastomus oscitans*, Oriental White Ibis *Threskiornis melanocephalus*, Glossy Ibis *Plegadis falcinellus* and Little Cormorant *Phalacrocorax niger* suddenly appeared in 30 acre wetland of Uppalapadu village and started breeding on large trees (K. M. Rao *pers. comm.* 2002). In October 2001, 60 pairs of Pelicans were counted and 600 nests of Asian Openbill were seen. As the birds became established in the area, the villagers could not bear the increasing smell of guano. They also complained that the tank water was getting polluted due to the excreta and fish dropped by these birds. Some villagers uprooted trees to stop the birds breeding there, but others protested, so this was stopped. Finally, about 6 acres of the pond was apportioned to the birds by building a small bund. However, this was found to be too small. Local NGOs approached the Forest Department to save the breeding colony. The district authorities have agreed to provide an alternative supply of water to villagers (K. M. Rao *in litt.* 2001). It is likely that the pelicans have shifted from Kolleru pelicanry which had been abandoned (Manakadan and Kannan 2003).

In December 2002, Manakadan and Kannan (2003) recorded a total of 244 pelicans and counted 114 nests.

Vulnerable	
Spot-billed Pelican	<i>Pelecanus philippensis</i>
Near Threatened	
Oriental White Ibis	<i>Threskiornis melanocephalus</i>

OTHER KEY FAUNA

This small village pond does not have any mammalian fauna presently of conservation concern.

LAND USE

- q Agriculture
- q Fishing
- q Water management

THREATS AND CONSERVATION ISSUES

- q Reduction of the tank area
- q Draining of the tank in summer to harvest fish
- q Death of nesting trees in and around the tank due to excessive excrement of birds
- q Anthropogenic disturbances
- q Opposition from local populace due to pollution of water by bird excrement, leading to skin disease.

The most important issue related to this aquatic body is the continuous shrinking of the area, which has been reduced from 30 acres to 6 acres (K. M. Rao *pers. comm.* 2001). The reduction in tank area is due to the village settlements increasing around it. Though this was the area actually allotted by the villagers for the birds, it is now becoming too small for the birds. The carrying capacity of the tank is not sufficient to accommodate thousands of birds. Several species of smaller birds were driven away by the bigger species. The vegetation of the tank is slowly dying due to overcrowding of breeding and roosting birds throughout the year. Droppings of thousands of birds pollute the tank water. This has further enhanced the death of vegetation inside and around the tank.

To overcome the problem, it is necessary to take immediate steps to increase the size of the tank so that the site could be developed as a favourable habitat for resident and migratory species.

KEY CONTRIBUTORS

K. Mrutyumjaya Rao and V. Kannan

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