



EXXIS NEWSLETTER

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(Forest & Environment Department, Government of Orissa)

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From the Director's Desk...

The Environmental Information System has been providing a base for information dissemination on issues related to State of Environment of Orissa. Publication of Newsletter is one of the components of the ENVIS Programme; other being information dissemination through web-enabled system and query services. The Centre has been responding to various queries on environmental issues.



This Newsletter depicts the importance of Biodiversity Hotspot "The Bhitarkanika", the second Ramsar site of Orissa. The management practices commonly adopted by the State Government has been brought into picture. I sincerely hope that the information content of the Newsletter would enlighten environmentalists of the country on importance of wetlands and suggest how better management can improve the ecology and sustain the rich biodiversity of the area. I would like to thank Shri B. K. Patnaik, IFS, Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Orissa and Sri Prasanna Kumar Behera, DFO, Wildlife Division, Rajnagar for their support. I am thankful to the ENVIS Team and the Senior Scientists of the Wildlife Organisation: Dr. S. K. Kar and Dr. C. S. Kar for their contribution & involvement in bringing out this Newsletter.

Shri Bhagirathi Behera, IFS Director, Env.-cum-Spl. Secy. & Director Centre for Environmental Studies Forest & Env. Dept., Govt. of Orissa

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Envis Editorial Team

Shri Bhagirathi Behera, IFS, Director Gopal Krishna Pujari, Project Coordinator Pravat Mohan Dash, Programme Officer Prashanta Ku. Nayak, Computer Programmer

State of Environment: Biodiversity Hotspot - Bhitarkanika

The tidal influenced reiver systems which drain into the sea along with coastal climatic conditions have enriched Orissa with pockets of mangrove forests. Bhitarkanika region has a globally important patch of mangroves along the East Coast of India extending over nearly 200 sq. km. Bhitarkanika Wildlife Sanctuary / National Park is the second Ramsar site in Orissa. Bhitarkanika ecosystem is a hotspot of rich biological diversity. With 71 species of mangroves and mangrove associates, the area supports largest population of Estuarine crocodiles in the country, largest Indian Lizards, varieties of resident and migratory birds and a number of rare and endangered mammalian species. Gahirmatha beach in this region supports largest known nesting beach of Olive Ridley Sea turtles in the world. Various local anthropogenic activities such as encroachment of forestland, unauthorised aquaculture practices, grazing and discharge of effluent are exerting pressure on mangrove forests and the biodiversity. The State Forest & Environment Department have taken several measures for the conservation and management of this mangrove ecosystem and its biodiversity.

Keywords: Mangrove, Bhitarkanika, Conservation

Orissa is a land of green forests and colourful wildlife. Wildlife is as varied as its forests. Different ecological niches having interesting groups of wildlife display a discontinuous distribution. The tidal influenced river systems which drain into the sea along with coastal climatic conditions have enriched Orissa with

pockets of mangrove forests. These mangrove forests abound with the Estuarine crocodiles and other rare wildlife species. Bhitarkanika sanctuary was created with the main objective of giving total protection to the Estuarine crocodiles and its mangrove habitat.



The Bhitarkanika Wildlife Sanctuary is located between 20° 35′ - 20° 38′ N latitude and 86° 50′ - 87° longitude in the district of Kendrapara, Orissa. It covers an area of 672 sq. km. It has been designated as a Wildlife Sanctuary in 1975 as per the Wildlife (Protection) Act, 1972 the core of which has been notified as a National Park in 1998 covering an area of 145 sq. km. It has also been designated as one of the Ramsar sites (Wetland of International importance) in the country on 19.08.2002. In Orissa, it is the second Ramsar site. Geographically it forms the deltaic region of the rivers Baitarani and Brahmani. It is a microenvironmental region in Rajnagar Block of Kendrapara District. This region holds predominantly an important patch of mangrove forest along the East Coast of India extending over nearly 200 sq. km. It is surrounded by the tidal rivers on the North, South and West and by the Bay of Bengal on the East and is crisscrossed by network of a good number of tidal creeks. Hence, it enjoys an estuarine environment of the wet tropical zone. Physiographically the region constitutes the lower reach of the Brahmani - Baitarani delta, which is bounded by the Dhamara estuary on the North and Maipura and Baunsgarh creek on the south.

This deltaic region is a unique bioclimatic zone in a typical geographic situation in the coastal region of Bay of Bengal.

Biodiversity of Bhitarkanika

Bhitarkanika ecosystem is a hotspot of rich biological diversity. With 71 species of mangroves and mangrove associates, the area supports largest population of Estuarine crocodiles in the country, largest Indian Lizards, varieties of resident and imigratory birds and a number of rare and endangered mamalian species. As per January 2008 Census, the crocodile population is 1498. Until now 271 bird species are identified in this area. The existing mangrove



forests in Orissa is available in the districts of Balasore, Bhadrak, Jagatsinghpur and Kendrapara, of which Kendrapara district occupies major part of mangrove forests.

Status of Mangrove cover (Sq. Km.)

	1997	1999	2001	2003	2005			
India	4827	4871	4482	4461	4445			
Orissa	211	215	219	207	203			
Balasore	3	3	3	4	4			
Bhadrak	17	18	19	20	20			
Jagatsinghpur	10	10	5	3	4			
Kendrapara	181	184	192	180	175			
Source- State Forest Report, FSI: (1997-2005)								

The dominant mangrove species in Bhitarkanika are Bani (*Avicennia officinalis*), Dhala bani (*A. alba*), Singal Bani (*A. marina*), Sundari (*Heritiera fomes*), Dhala Sundari (*H. littoralis*), Keruan (*Sonneratia apetala*), Orua (*S. caseolaris*), Guan (*Excoecaria agallocha*),



Source- State Wildlife Organisation

Rai (Rhizophora mucronata), Sisumar (X. granatum), Khalsi (Aegiceras majus), Garani (Ceriops roxburghiana), Bania (Hibiscus tiliaceous), Harkancha (Acanthus illicifolius), Habali (Thespesia populnea), Rasinia (Brugueira gymnorrhiza), Nalia grass (Myriostachya wightiana), Dhani dhana (Oryza coarctata) and Bana lembu (Merope angulata), the aquatic fern, Kharakhari (Acrostichum aureum) which is scattered throughout the sanctuary. Besides these, a deciduous plant, Karanja (Pongamia pinnata) is also seen in association with the mangrove species. Some mangrove taxa like Cerbera manghas, Acanthus volubilis, Xylocarpus granatum, Heritiera kanikensis and Bruguiera gymnorrhiza which are restricted to Bhitarkanika and are not found in other mangrove forests of Orissa. Sonneratia apetala is the dominant element found in abundance and in luxuriant state along the river banks of Bhitarkanika and its creeks. Sometimes this is also present in the elevated terrestrial area in the river banks. Others like Avicennia officinalis, Avicennia alba, Heritiera fomes and Heritiera littoralis mostly constitute the top canopy of the forest. *Xylocarpus granatum* is also found at places but is less abundant. Excoecaria algallocha is occasionally found in the vicinity of water bodies. Hibiscus tiliaceus and Pongamia pinnata also form constituent elements of the top canopy but these are found away from the creeks and channels. Kandelia candel, Aegiceras corniculatus, Ceriops roxburghiana, Cynometra iripa , Rhizophora mucronata, Clerodendrum inerme, Brownlowia tersa, Porteresia coarctata, Cyperus malaccensis and Myriostachya wightiana enjoy the direct effect of tide and ebb. The extensive root system of Myriostachya and Cyperus malaccensis checks soil erosion effectively. Climbers found in this region are Mucuna gigantea, Finlaysonia obovata, Derris trifoliata, Caesalpinia nuga, Derris scandens and Sarcolobus carinatus etc.



The Indian Largest Lizard: Water Monitor Source- State Wildlife Organisation

Patches of *Crinum defixum* is found in the mud flats. *Sapium indicum* is also found in this region. Shrubby elements growing in the terrestrial regions are *Amoora cucullata*, *Intsia bijuga*, *Flagellaria indica*, *Merope angulata* and *Bruguiera gymnorrhiza* constituting the second storey of the canopy. In the defunct creeks, patches of *Acanthus illicifolius* is often found which are generally associated with *Acrostichum aureum* and sometimes with *Caesalpinia nuga*. This association provides congenial niche for the crocodiles to build nest and

lay eggs. In addition to Myriostachya wightiana and Cyperus malaccensis, Suaeda nudiflora, Suaeda maritima, Salicornia brachiata and Sesuvium portulacastrum are met with in the mudflats. Species like Carissa spinarum, Synostemon bacciforme, Blumea aurita, Ischaemum barbatum, Fimbristylis ferruginea, Eugenia bracteata and Leucas spp. are generally found in more drier areas. Notable herbs like Bulbostylis barbata, Launaea sarmentosa, Spinifex littoreus, Cyperus arenarius, Finbribstylis sericea, Pedalium murex, Trianthema portulacastrum and Gisekia pharnaceoides etc. are found near Satavaya-Gahiramatha region.

The floral diversity of the wetland is known to be the largest in India and perhaps the second largest after Papua New Guinea in the world.



Heronry in Bhitarkanika Source- State Wildlife Organisation

Considering the genetic diversity of the wetland and its importance and recommendation of the Mangrove Steering Committee of Govt. of India the National Mangrove Genetic Resource and Conservation Centre (NMGRCC) has been established in one of the potential islands of this National Park i.e. Kalibhanjadian. Among the three species of Sundari plants (*Heritiera sp.*) available in this area, *Heritiera kanikensis* or Kanika sundari is endemic to Bhitarkanika.

The animals that are associated with the mangroves span a wide range of invertebrate and vertebrates. In Bhitarkanika the fauna is distributed throughout the National Park, often in distinct zones which relate to the frequency of tidal flooding, salinity, soil type and type of surrounding plant community. Some species exploit the mangroves permanently such as crabs, snails, shrimps, some insects, reptiles and birds; others move into the area from the sea with each tide and from the land into the sea when the tide is out.

Among the mammals there are Fishing cats (Felis viverrina), the Jungle cat (Felis chaus), Hyaena (Hyaena hyaena), Wild boar (Sus scrofa), Rhesus macaque (Macaca mulatta), Indian percupine (Hystrix indica), Otter (Lutra persipicillata) and Rat (Rattus rattus). The Herbivores are represented by Chital or Spotted deer (Axis axis) and Sambar (Cervus unicolor).

271 species of birds are recorded in this area which include about 100 species of local and long distance migratory water birds. Some notable avifauna of the National Park are Grey heron (Ardea cinerea), Purple heron (Ardea purpurea), Darter (Anhinga rufa), Little cormorant (Phalacrocorax niger), Little egret (Egretta gargetta), Median egret (Egretta intermedia), Large egret (Egretta alba), Night heron (Nycticorax nycticorax), Lesser adjutant stork (Leptoptilos javanicus), Painted stork (Mycteria leucocephala), Blacknecked rare (Ephippiorhynchus asiaticus), Spoonbill (Platalea leucorodia), Brahminy kite (Haliastur indus), endangered Whitebellied sea eagle (Haliaeetus leucogaster), Pallas fishing eagle (H. leucoryphus), Osprey (Pondion haliaetus), Red jungle fowl (Gallus gallus), Red wattled lapwing (Vanellus indicus), Golden plover (Pluvialis dominica), Lesser sand plover (Charadrius mongolus), Curlew (Numenius arquata), Red shank (Tringa totanus), Little stint (Calidris minutus), Common Sandpiper (Tringa hypoleucos), Whimbrel (Numenius phaeopus), Indian river tern (Sterna aurantia), Rose-ringed parakeet (Pstittacula krameri), Koel (Eudynamys scolopacea), Spotted owlet (Athene brama), Rare white collared kingfisher (Halcyon chloris), Brown-winged storkbilled kingfisher (Pelargopsis amauroptera), Indian roller (Corcacias benghalensis), Grey hornbill (Tockus birostris), Black-naped green woodlpacker (Picus canus), Swallow (Hirundo rustica), Golden oriole (Oriolus oriolus), Indian tree pie (Dendrocitta vagabunda), Red whiskered bulbul (Pycnonotus jacosus), Paradise flycatcher (Terpsisphone paradisi), Tailor bird (Orthotornus sutorius), Majpie robin (Copsychus saularis), Indian tree pipit (Anthus hodgsoni), Loten's sunbird (Nectarinia asiatica), Baya (Ploceus philippinus), and the common Rosefinch (Carpodacus erythrinus).

Population and trend of Estuarine crocodile status in Bhitarkanika (2000-2008)								
Year	Hatchings	Yearlings	Juveniles	Sub-adults	Adults	Total		
2000	319	181	123	145	146	914		
2001	341	277	237	36	107	1098		
2002	441	340	187	145	217	1330		
2003	484	370	180	82	192	1308		
2004	525	303	210	100	220	1358		
2005	681	290	169	107	207	1454		
2006	657	283	197	122	203	1462		
2007	503	368	259	135	232	1497		
2008	538	343	231	143	261	1516		
					Source- www.wildlifeorissa.in			

Migratory water birds / water fowl visiting the area include the Ruddy shelduck (Tadorna ferruginea), Gargany teal (Anas uerquedula), Pintail (Anas acuta), Gadwall (A. strepera), Lesser whistling teal (Dendrocygna javanica), Little grebe (Podiceps ruficollis), Spotbilled pelican (Palecanus philippensis) and Lesser flamingo (Phoenicopterus roseus). The main attraction during monsoon is the 'Baga gahana' (Heronry), Where 11 species of winter birds such as Egrets: 4 species, Herons: 3 species, Darters, Cormorants, Open billed storks, White Ibis nest together. The total nesting population of nesting birds is above 40,000. Sixty percent of nesting birds include openbilled storks. Bhitarkanika estuarine forest is an ideal habitat for many reptiles, both aquatic and terrestrial. The Olive Ridley Sea turtle (Lepidochelys olivacea) arrive in thousands in the coastal waters during November - December. They lay eggs on the sandy beaches of the east coast of the sanctuary. The mass nesting of the turtle takes place along the Gahirmatha coast. A minimum of 1.5 lakh to maximum of 7.0 lakh with an average of 3.0 lakh female turtles visit the beach for nesting / egg laying during late December to April. Bhitarkanika harbours one of the largest populations of endangered

Estuarine Crocodile in India and is globally unique since it inlude 10 percent of the adults which exceed 6m length.

Nearly 1500 Estuarine crocodiles inhabit the rivers and creeks. World's longest Estuarine crocodile has been lighted in this area. Snakes of the area include the deadly poisonous Kingcobra (*Ophiophagus hannah*), Banded krait (*Bungarus fasciatus*) and the common krait (*B. caeruleus*). Non-poisonous snakes include Indian Rock python (*Python molurus*), Rat snake (*Ptyas mucosus*) and the water snake (*Natrix piscator*). Lizard species found in this area are India's largest lizard / Water monitor lizard (*Varanus salvator*) and Land monitor (*Varanus flavescens*); Chameleon (*Chameleo zeylanicus*), Garden lizard (*Calotes versicolour*), House geeko (*Hemindactylus sp.*) and the skink (*Mabuya sp.*)

Some of the commercial fishes recorded in this area are Ilisha (*Hilsa Illisha*), Khainga (*Mullet sp.*), Bhekti (*Lates calcarifer*), Kantia (*Mystus gulio*), and Kokili (*Anchovella sp.*), Prawns such as *Penaeus indicus*, Tiger prawn, *Penaeus monodon*, *Metapenaeus affinis* and crabs mainly the Mud crab, *Scylla serrata* and Fiddler crab (*Uca sp.*).

Eco-Tourism

The Bhitarkanika Wildlife Sanctuary / Bhitarkanika National Park and Gahirmatha Marine Sanctuary boast natures most pictureque sites. The unique bio-diversity attracts visitors round the year. There are many scenic places in this region.



Eco-Tourism site
Source-State Wildlife Organisation

Dangmal

The main attraction at Dangmal is the Captive Breeding & Research Centre for Estuarine crocodiles and the Museum.

Bhitarkanika Forest Block

A nature's trail in Bhitarkanika Forest Block over a stretch of 4 km. is very enchanting. Mangrove species give way to its associates like Kochila, Mankada Kendu. One can look for Chitals, Water monitor lizards, migratory and resident birds.

Ekakula

Jackles, Hyena, Red Jungle fowl, Chitals, Wild Boars abound in the area. It is a paradise for bird watchers. Besides, Coconut Island, Wheeler Island, Nasi-I Island, Nasi-II Island, Babubali Island can be approached from this place.

Habalikhati

The 2.54 kms trail from jetty across Baunsagarh nala to tourists cottage is a thrilling experience. One may look for Red jungle fowl,

Fishing cat, Chital, Wild boar and Monitor lizard.

Kalibhanjadia

It is a beautiful Island surrounded by Sapua river on one side, Dhamra river on another side and the Bay of Bengal towards the east. Lots of Rhesus monkeys, Chittals, Wild Bour, Python and King Cobra in habitate this island. One can have a glimpse of the National Mangrove Genetic Resource & Conservation Centre (NMGRCC) at Kalibhanjadia.

Gahirmatha Coast

The vast expanse of Bay of Bengal and the pollution free beach attracts the tourists.

Barunei/Pentha

Pentha beach is known for higher density sporadic nesting of Ridleys and the beautiful sea beach.

THREATS

Encroachment of forestland

Encroachment of forestland by the migratory people and conversion of the same into other purpose is the main problem in this area. It has put tremendous biotic pressure on the mangrove forests.

Aquaculture

Unauthorised intensive prawn farming has put pressure on the naturally grown mangrove forest. Discharge of untreated effluent creates pollution of the nearby rivers and creeks affecting the aquatic fauna and the mangroves. Fishing in the rivers and creeks by the people of the surroundings villages pose adverse factors on the migrtory routes of fishes, movement of crocodiles and other aquatic wildlife.

Grazing

Large number of cattle graze in this area which put pressure on mangrove vegetation.

Conservation Measures

A massive awareness campaign has been taken by the Rajnagar Wildlife Division to check poaching and illegal fishing activities. This is being supported with the establishment of ant-poaching camps at starategic locations in the National Park. Habitat development inside the sanctuary is being done which include raising of plantations, digging and renovation of creeks and ponds. The State Forest and Environment Department have taken several measures for the conservation and management of this ecosystem and its biodiversity with the support of the Ministry of Environment & Forests, Govt. of India which include:

Strengthen research activities and building of dabtabase

- Protection of Estuarine crocodiles and sea turtles.
- Protection of migratory waterfowl and other species prone to poaching.
- Restoration of degraded habitats.
- Pollution control
- Creation of awareness on importance of mangroves and ecosystem conservation.
- Institutional strengthening
- Promotion of Eco-tourism
- Community participation & capacity building.

"Let us preserve the unique mangrove ecosystem of Bhitarkanika and its rich biodiversity."

Disclaimer:

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This newsletter is also available in electronic form at our website: www.envisorissa.org & www.cesorissa.org

Feedback

We would appreciate if you send us comments and suggestions.

Shri Bhagirathi Behera, IFS Director

CENTRE FOR ENVIRONMENTAL STUDIES

(Forest & Environment Department, Govt. of Orissa) N-3/56, IRC Village, Nayapalli, Bhubaneswar-751015 Telefax: 0674-2551853

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