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JULY-SEPTEMBER, 2007





# Black-necked Stork

## Black-necked Stork



Photo - A. R. Rahmani

The Black-necked Stork is a large bird; scientifically known as *Ephippiorhynchus asiaticus* it belongs to Family Ciconiidae. It is a huge wading bird of the Indian subcontinent.

The Black-necked Stork is a resident bird of southern Asia and Australasia. The distribution of Black-necked Storks stretches from India east to New Guinea and the northern half of Australia.

Like other storks, they fly with their neck outstretched. The Black-necked Stork is a massive bird, which stands tall at a height of 130 to 150 cm. The bird is spectacularly plumaged and the wingspan is around 230 cm. The plumage is white, except the head, neck, wing bar and tail area which are black. The beak is huge and black, while the legs are bright red. The only difference between a male and female Black-necked Stork is that the male has a brown iris, while the female has a yellow iris. The

young ones are light brown with a white belly and dark legs.

It inhabits marshes and wetlands in tropical lowlands.

For the purpose of breeding, Black-necked Storks build an enormous deep platform of twigs, with a depression in the centre, lined with leaves and grass near the top of large trees; the female stork lays three to five eggs at a time. The Black-necked Stork is more of a fish eater than other Storks, but it also eats frogs, reptiles and crabs. Black-necked Storks in India have been listed as 'Near Threatened' on the IUCN Red List of Threatened Species. Environmental changes, like water pollution and habitat destruction, are some of the main reasons attributed to their declining population.

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## We need wildlife for our welfare

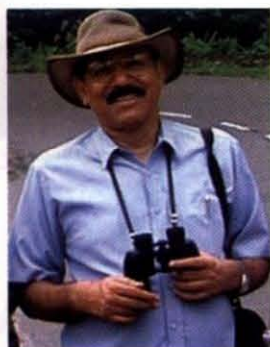
It is a common fallacy that poor people depend on natural resources so they over-exploit them while the rich people conserve them. The urban rich do not visit a forest to cut fuelwood or pluck wild fruits for food, they instead visit markets or fashionable malls, and cook it with a fuel (a natural resource) that comes packed in a cylinder, delivered to their doorstep. To conserve forests, the Indian government banned clear cutting of the natural forests in the 1980s. This was hailed as a great conservation step, but not many know that we now import timber from Indonesia, Malaysia and other countries. As India develops its timber demands may finish the Indonesian forests. With looming threats of climate change, every forest has to be protected, whether it belongs to India or Indonesia. Our ecological footprint is not confined to our political boundaries.

For the common man, wildlife means large glamorous animals like the Tiger, Elephant, Rhino, Giraffe, Ostrich, Cranes and Dolphins. I call such animals 'page 3 species', they are much like the glamorous society divas who torture us with their sartorial taste or lack of it every day on page 3 of newspaper supplements and are given importance disproportionate to their role in the day to day life of a common man, much like the 'Page 3 animals'. The glamorous species are important and need to be protected, but it is the so-called lowly species that make this world habitable for us. Do we know that without ants, termites, earthworms, soil bacteria and other microbes our natural ecosystems will collapse? Do we know that despite world-wide publicity (I call it propaganda) by profit-driven pharmaceutical companies, nearly 60% of the world's population still depends on traditional nature-based medicines?

As we progress and destroy nature, we are ironically finding more and more economical uses of species. Almost daily, our newspapers tell us the discovery of new use or re-confirmation of traditional utility of wild species for the benefit of human beings. I will give you some recent examples. Scientists at the University of Havana have found that two compounds from lobster shells, chitin and chitosan, have healing and biostimulant properties. The scientists hope to make surgical materials, which will have healing and antiseptic properties, and would increase growth and germination in seeds, with these compounds.

In a paper published in the *Proceedings of the National Academy of Sciences* (July 2007) scientists discovered that turmeric roots (*haldi*), traditionally used in Indian cuisine, have a compound – bisdemethoxycurcumin, an active ingredient of curcuminoids, which stimulates the natural immune system to fight against the debilitating and incurable Alzheimer's disease. Nearly 5% of the population above 60 years suffers from Alzheimer.

We all dream of flying like a bird and climbing like a lizard. Which child has not marvelled at the aerial acrobatics of a Swift, or the dexterity of a gecko scampering on a slippery wet wall in search of insects attracted towards light during a monsoon night. Swallows, Swifts and Martins are the most aerial birds in the world. The scientific name of Swifts is derived from the ancient Greek 'apous' meaning 'without feet'. These birds have very short legs and some species never settle on the ground or perch on trees. Instead they perch on vertical surfaces. They fly almost throughout the day, feeding on aerial insects.





When the breeding season comes, they collect small feathers and leaves flying around to make their nest and glue them by their saliva to vertical walls. Some species even sleep and mate on the wing! Engineers at the Delft University of Technology in the Netherlands have designed a micro-plane, which they call RoboSwift, with shape-shifting wings inspired by these birds. Despite our technological arrogance, our aircraft are not even half as efficient as birds. To improve their flying efficiency, the engineers studied the birds, and they found that Swifts continuously adjust their wings to the prevailing flight conditions. In the present-day aeroplanes the wings are fixed during the full length of the flight. Engineers say that this is inefficient way of flying because flight conditions change during the long journey so we should build aeroplanes with adjustable wing positions. Adjustable wings will also allow us to make sharp turns. Our little bird will tell us how to do this.

Marine mussels, a group of bivalve mollusc, lead a non-impressive life, mostly glued to rocks and feeding on planktons and other microscopic sea creatures by a process called filter feeding. Not a very exciting life indeed! Along with barnacles, they are the bane of shipmen as a colony of barnacles/mussels, glued to the boat or a ship hulk, can reduce the speed. Two species, the Blue Mussel *Mytilus edulis* and New Zealand Green-lipped Mussel *Perna canaliculus*, are an epicurean delight. But now scientists have found a better use for Blue Mussel, or more specifically their adhesive glue. In a paper published in the prestigious journal *Nature*, the scientists of Northwestern University wrote that they prepared a small piece of adhesive that mimics the structure of a gecko foot and then coated it with a polymer inspired by mussel glue. They were amazed by the results. While gecko-inspired adhesive was prepared earlier, this was the first time scientists developed an adhesive that can work on wet surface. The researchers have named it 'geckel'. There are innumerable possible uses of such an adhesive, such as water-resistant bandages, drug delivery patches and for repair of skin wounds. So, in a couple of years if you find geckel in the market, thank the gecko and the mussel.

We have killed millions of frogs for experiments in college laboratories, in most cases unnecessarily. Moreover, habitat destruction due to our rapacious demands on natural resources has destroyed the habitat of many frog species, some even before they were described to science. How many people realize that every species on this Earth is important for our well-being? In a paper published in the *Journal of Molecular Biology*, scientists describe that a molecule – Amphinase, isolated from the egg cells of the Northern Leopard Frog *Rana pipiens*, could help in treating brain tumours. Research is at an early stage but scientists are excited about the potential of this molecule in selectively destroying cancer cells. Another molecule isolated from this species is called ranpirnase, which is at its final stages of clinical trials, as a treatment for a type of lung cancer. So, next time you see a frog in your village pond please remember that a cousin of this species is a potential saver of human life.

I can cite innumerable such cases, but in a nutshell would say that every living species is useful for our survival either directly or indirectly, and the life-support system of the Earth depends on the biological diversity of life. Who said that we do not need wildlife and wild places?



# Is there no god of small things?

Text: Ashish Kothari

Photographs: Vivek Gour-Broome

A frog that looks like a bloated doughnut made international news, when discovered in India about three years back. The Purple Frog *Nasikabatrachus sabyadrensis* created ripples of excitement across the world of biologists because it was so very different from any other in India, had only a distant relative in Seychelles, could lead to the establishment of a new family of frogs after more than a century, and could yield fascinating insights into the evolutionary history of the Indian subcontinent.

Rarely, however, do small creatures like the Purple Frog create such news. Their bigger cousins, the charismatic megafauna of Earth, have always found vocal champions, though that has not necessarily meant they have survived the onslaught of the human impact on nature. But if the celebrated Tiger has suffered such a catastrophic decline, can you imagine what must have happened to the completely forgotten frog family, the usually despised snake clan, and the entire range of insect life that usually evokes revulsion or fright? Not to mention the 'lowly' fungus and lichen, and those usually invisible inhabitants of the seas?

The smaller creatures of the plant and animal kingdom make up the vast bulk of India's (and the world's) biodiversity. I am not including here



It is only on rare occasions that one takes notice of lesser forms like this Marbled Balloon Frog

micro-organisms, the diversity of which remains for the most part unknown to us. The Class Insecta, for instance, comprises two-thirds of the approximately 91,000 species of animals officially recorded in India. Non-flowering plants such as ferns, fungus, algae and lichens comprise two-thirds of the Plant Kingdom's known diversity in India. Yet in the last several decades of conservation policy and practice there has been no Project Insecta, not a single protected area set up specially for frogs or snakes or non-flowering plants, not a single government scheme meant to help protect threatened species belonging to these classes or families. The only

official step towards this has been the rather belated inclusion of a few species of amphibia, fish and insecta into the schedules of the Wildlife (Protection) Act, offering them protection against hunting or collection ... but this too is mostly on paper, since the bureaucracy set up to manage wildlife is simply not oriented towards small creatures.

But let me temporarily interrupt my litany of complaints, and provide a context to my rant.

## Small is beautiful ... and diverse

Anyone wandering through any of India's forests, grasslands, deserts, coasts, and even cities and towns, or



diving into its wetlands and marine areas cannot fail to notice the abundance of small life forms, unless of course you happen to be looking only for Tigers and Rhinos. A forest might appear to be particularly lifeless if mammals are your focus, but peer into the bush, upturn a boulder, or scrape the leaf litter, and you will see an explosion of life. Keep the light open on your porch at night, and witness the marvel of all manner of moths. Tune your ears at dusk, and hear a dozen different kinds of insects, frogs, and the occasional nightjar or owl filling up your auditory senses. An urban wetland can be an equal treat to all our senses, if we keep them alert ... dragonflies and damselflies flitting about in the sunlight, water ferns and algae covering the surface, a deafening chorus of toads and frogs at night, a turtle quietly slipping into the water as you approach.

Small creatures make up the bulk of India's wildlife, though, ironically, most books on 'Indian wildlife' deal mainly with mammals and birds. And India is lucky in having a considerable share of the world's diversity of such small beings. For instance, though we have only about 3% of the world's territory, we have over 11% of its known fish diversity, 8.5% of its reptile diversity, 7% of its arthropods (crustaceans, insects and arachnids). If we look at classes or groups almost no-one talks about, e.g. 24% of the world's Sipuncula ('peanut-worms' inhabiting marine areas), 33% of its Echiura (spoonworms, an ancient group having evolved 450 million years ago), and 27% of its Chaetognatha (arrow worms), the global share is even more distinct.

As important as the diversity is the fact that a considerable proportion is endemic, i.e. found only in India or the Indian subcontinent. Over a third



Turning a 'blind-eye' will not make lesser known animals like the Blind Snake dispensible

of its flowering plants, insects and reptiles, and 45% of its arachnids are endemic. Every one of ten species of Mesozoa reported from India is not found elsewhere; not far behind are Platyhelminths (flatworms) with over 71%, and Acanthocephala (parasitic worms) with almost 89% endemicity.

#### Small is threatened

Ask almost anyone about threatened wildlife in India, and out will come the sorry story of the Tiger, the Rhinoceros, the Elephant, the Siberian Crane, and other biggies. Not that anyone should grudge megafauna such attention, for it is indeed under serious threat ... some are already extinct like the Pink-headed Duck. But it is only the rarest of conservationist

who talks of the smaller creatures that are threatened ... and there are many! A series of workshops under the Conservation and Management Planning (CAMPs) process, by reputed scientists and conservationists, concluded that of the species they assessed the following were found to be threatened: 93 of 163 amphibians, 168 of 362 reptiles, and 217 of 323 freshwater fish. A study of orchids in the north-east region, by S.N. Hegde, revealed that out of about 850 species, 108 are endangered or threatened and 18 extinct or nearly extinct.

Even most botanists would not be able to name the many plant species that have already gone extinct ... so badly neglected in popular wildlife

Small creatures like this Velvet Mite though colourful will rarely make an appearance on the cover of any publication





## Small 'Matters'

circles that they are known only by their scientific names, such as *Ophiorrhiza caudata* and *Ceropegia fantastica*. The list includes relatives of the popular *mahua* tree (*Madhuca indica*) – *Madhuca insignis* and *Madhuca bourdillonii*, as also several members of the popular *Impatiens* genus of flowering plants, such as *I. johnii*, *I. anaimudica* and *I. macrocarpa*. The latter are all from the Western Ghats, one of India's biodiversity 'hotspots' that is severely threatened.

Part of the reason we don't usually focus on the small creatures that are threatened is simply that they are small. They don't impinge on our senses enough; they don't make for charismatic media coverage. But another important reason is that our knowledge on their conservation status is abysmally poor. We have some excellent scientific research on many species of insects, arachnids, amphibians, reptiles, and non-tree plants, but much of this is oriented towards ecology and behaviour. Precious little is known of the degree to which they are threatened, and the precise reasons for their threatened status. Many of the factors that threaten them are difficult to assess. For instance, pesticides or other toxic products are likely to be a significant reason, but hard to isolate as the most critical one; or introduction of exotic species may be displacing an indigenous one (as is the case with several fish, for instance), but the ecosystem in which they occur is simply not known well enough to make this judgement.

Where there is some study, however, the results are very indicative of what is probably happening to the rest of small wildlife. Take the case of sea horses, once considered abundant off India's shores. Till recently India was one of the largest exporters, with about 3.6 tonnes



One of the reason why we do not focus on creatures like this Centipede is because we are brought up to consider them 'revolting'

(approximately 1.3 million animals) per year, contributing to about 30% of the global sea horse trade. This is despite the fact that most sea horses in the Indo-Pacific area are in the IUCN Red List of threatened species. This exploitation led to a decline of the sea horse population by 25-75%, till export was mercifully banned in 2001.

By far the biggest threat is habitat destruction. India's mad rush to catch up with China, or surpass it to achieve

a 10% economic growth rate, has resulted in more and more ecologically sensitive areas being 'sacrificed' for development. Most of the mining concessions given in the last 25 years have happened in the last 7-8 years, indicating a great acceleration in destructive projects being cleared by the government. Researchers in Orissa have shown that the forested areas of Kalahandi district, where Vedanta Group's Sterlite Aluminium Ltd. wants to mine bauxite, is home to the



Precious little is known about most of the 'lower' forms of animals like this Giant Crab Spider



threatened Golden Gecko, apart from many other unique species. Studies reveal that species like the Horseshoe crab *Carcinoscorpius rotundicauda*, considered a 'living fossil' for having been around in the same form for over 500 million years and with no closely related living species, are found along the Dhamra coastline where the Tatas are proposing to build a big port. The species is already in decline, and such projects will further endanger it. In these and many other cases of so-called 'development', both the state and central governments are happily giving licenses despite strong environmental concerns. Now only if these areas had contained Tigers, perhaps the story would have been different?



The Pill Millipede's amazing 'rolling up into a hard ball' defence can't protect it from habitat destruction caused by so-called 'development' projects

### Gaps in conserving the small

Apart from the sheer lack of knowledge that confounds our understanding of the factors threatening small wildlife, there are a number of other gaps in conserving it. The biggest is the singular lack of focused attention on such species, in conservation policies and programmes. Project Tiger has often been justified as being not only a Tiger protection programme, but one that protects entire ecosystems from which small wildlife also benefits. This is undoubtedly true. But there are two other aspects to this that raise concern. Firstly, the habitats of the Tiger (or the Elephant or the Rhino or the Lion) do not necessarily cover the entire range of biodiversity in India. A model of creating a few large protected areas for megafauna may not be adequate to conserve a lot of smaller, specialized fauna (or flora). For instance, wildlife biologists studying amphibians and other small fauna in the Western Ghats have demonstrated that species composition changes quite drastically even between two adjoining

valleys or streams, so their conservation requires a different approach.

Secondly, management practices in protected areas often tend to prioritize megafauna while ignoring the small. Take fire management of grasslands in places like Corbett, Dudhwa or Kanha, for instance. Oriented towards the big herbivores that graze these pastures, there has been hardly any study on how deliberate burning may be impacting on the 'lesser' fauna that lives amidst the grasses. I remember wildlife biologist Ravi Sankaran alerting the world about how burning for the Swamp Deer in Dudhwa National Park was adversely impacting the Bengal Florican ... if management of one megafauna could be badly affecting another, imagine what it must be doing to the hundreds of micro-fauna there? Ditto for waterbodies created in dry forest areas, for the big fellows to drink from ... what would it be doing to smaller beings that are specially adapted to the dry conditions?

Third, we have grossly neglected the widespread phenomenon of community based conservation. Tribal

and other communities have had traditions of conservation and restrained resource use that have helped protect many habitats and species. Of course, these are not necessarily spread across the landscape, and very many of them have eroded or died out in modern times. Yet thousands of sites continue to be conserved, or are being taken up anew for conservation, a phenomenon now being called 'community conserved areas' or CCAs. Many of these are crucial for smaller fauna; indeed some sacred sites may contain the only remaining populations of endemic species, and other CCAs harbour the most valuable populations of many threatened species. Yet most such sites are not recognized by either government or by conservation NGOs, and many face serious threats that no-one is helping the communities to counter.

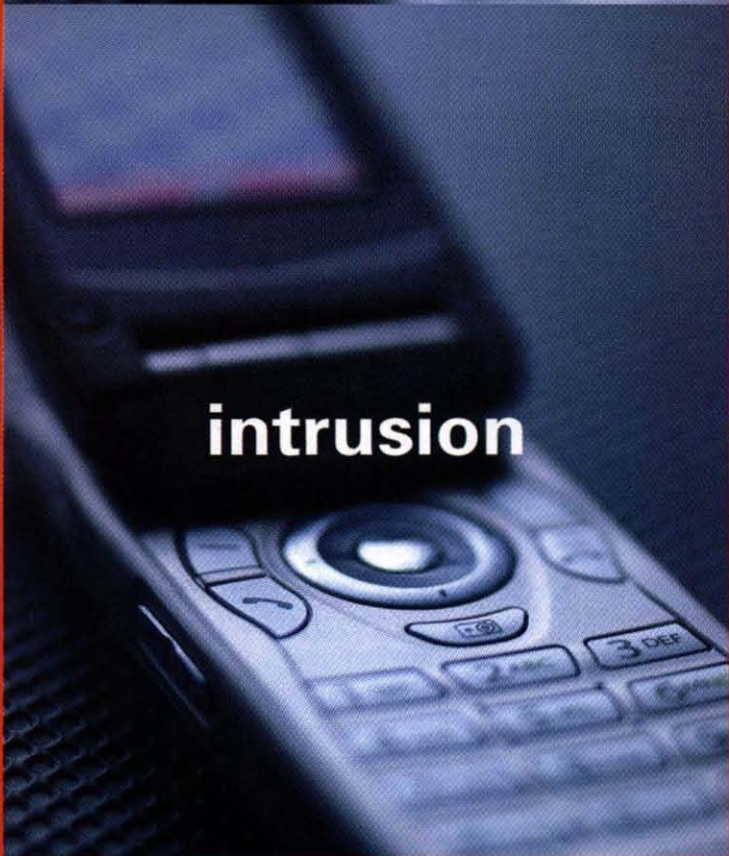
### What do we need to do?

Conservationists need to start, *first* of all, by shedding the bias towards the big. Let's collectively and openly acknowledge that we've neglected the





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The Solifuge is not the only neglected member of the Arachnid family

vast majority of the country's species in our conservation programmes. There are many researchers and activists who have been quietly working on small wildlife, let's give them a greater voice. In the last few years some seminal discoveries amongst amphibians, corals, reptiles, ants, and so on have been made, and there are, finally, some good field guides and educational materials coming out on these. Such research and public outreach need to be encouraged and significantly heightened; this also means that the kind of stranglehold that the government has on wildlife research, especially inside protected areas, needs to be loosened and a more transparent process put into place. And we need many more media stories on the incredible micro-fauna that are around us ... like the leaf-litter dwelling ant, *Discothyrea sringerensis*, recently spotted in Karnataka, which feigns death when in danger.

Let's listen also to traditional community members who have tremendous ecological knowledge and who often (but not always!) respect the entire diversity of life. In mid-August

I was at a workshop with Soliga adivasis from Biligiri Rangaswamy Temple Sanctuary in Karnataka, and when someone said something about the need to control ticks and leeches, there was a chorus of tribal voices stating that these were also part of the forest, and needed to be conserved! In Mendha-Lekha village of Gadchiroli, Maharashtra, the local Gond adivasis have long told the Forest Department that silvicultural practices that remove lianas and creepers are wrong. A researcher studying displacement in Gujarat asked a farmer, who had refused to sell his land to a mining industry, the number of family members who would be displaced if the land was taken away ... the farmer replied that he could not tell, for it included all the birds that flocked to his farm, and even more difficult, all the creatures that lived underground and would be uprooted!

But such practices or attitudes are rarely acknowledged. Some four centuries back, the Dutch scientist Hendrik Draakestein acknowledged the adivasis who helped in his research

leading to the monumental 12-volume *Hortus Malabaricus*, but this has hardly been emulated subsequently. It is worth noting that the Purple Frog, for instance, was already known to tribals in the area it was 'discovered' by formal scientists. Local people in fact lead scientists to many such new finds, but are rarely acknowledged.

*Second*, let's redesign our coverage of conservation sites. The Programme of Work on Protected Areas of the Biodiversity Convention, which India agreed to in 2004, mandates that we expand our PA network to be representative of all kinds of biodiversity. A comprehensive review is needed to assess how far we are in achieving this goal, and this must be based on whatever available knowledge we have of the distribution and threat status of the entire range of plant and animal taxa (and of course, the ecosystems in which they thrive). A huge task, but absolutely necessary.

This redesign of the conservation site network of the country needs also to encompass new paradigms. This



includes the participation of communities living within and around formal protected areas, and equally important, the recognition and legal backing of community conserved areas. It also includes planning for conservation inside cities, for there are numerous habitats in urban areas that harbour small wildlife. Crucially, such a redesign has to move away from treating protected areas as isolated oases, towards larger landscape level planning. Such planning would involve establishing connectivity between protected areas, not by throwing people out but by providing incentives to orient land use towards being wildlife friendly. A landscape level approach is all the more necessary in the light of climate change, for many species will need spaces to move into when their original habitats become unsuitable for their particular requirements.

Many of these actions seem to be futile when one considers only megafauna, but in fact they are vital for smaller wildlife. A number of European cities, for instance, have integrated the retention or creation of hedgerows, nesting niches, and other micro-habitat measures that has helped bring back considerable wildlife; Indian cities are eminently suited to such an approach. The notion of 'protected area' has unfortunately got linked to big people-less areas that one has to 'travel to', whereas if we were to consider all forms of wildlife, it could well be the park in one's own colony that is providing habitat for roosting bats, or the wetland created out of an abandoned urban quarry that harbours threatened turtle species. (I live next to one in Pune!)

Such a redesign of the conservation network would also progressively move human land and water uses within and outside special sites of

conservation, towards being compatible with conservation of small wildlife. It is well known, for instance, that organic and biologically diverse agriculture, as practiced traditionally by millions of farmers who have not yet been shoved into chemical-intensive farming, contains much higher wildlife values than does a typical Green Revolution field. Where coffee and tea plantations in the Western Ghats or eastern Himalaya have incorporated some ecological principles, wildlife



*A forest might appear to be particularly lifeless if mammals are your focus, but peer into the bush, upturn a boulder, or scrape the leaf litter, and you will see an explosion of life. Keep the light open on your porch at night, and witness the marvel of all manner of moths. Tune your ears at dusk, and hear a dozen different kinds of insects, frogs, and the occasional nightjar or owl filling up your auditory senses.*



values are much higher. How can we encourage such approaches where they already exist, and, much harder, how can we provide incentives for the monocultural or chemical-intensive farmer to shift to ecologically sustainable practices? In a number of countries, governments now provide cash or other incentives to farmers for maintaining or adapting such practices; can India consider the same?

*Third*, let's review the list of species being given legal protection across India, and plug the gaps by revising the Schedules of the Wildlife Act or

adding to the proposed list of protected species under the Biological Diversity Act.

*Fourth*, let's take up at least a few of the really critically threatened groups of smaller animals and plants, for dedicated projects such as has been done for the Tiger and is proposed for the Snow Leopard ... for instance, given the level of threats that frogs and toads face in India, a Project Amphibian would be very much in order. That way these amazing creatures would not be in the news only when dramatic new discoveries of species are made, like when the Purple Frog was found.

Many of these measures have been repeatedly recommended. The National Wildlife Action Plan 2002 contains them. The draft National Biodiversity Strategy and Action Plan, that ill-fated document that the Ministry of Environment and Forests is still sitting on three years after its submission, contains them in great detail. In the wildlife working group for the 10th 5-Year Plan, I strongly argued for dedicated projects on small species; nothing came of it. Now again, in the Environment and Forest group's report for the 11th 5-Year Plan, currently under finalization, there is a strong recommendation for a focus on threatened species of various taxa. The problem is that unless there is a substantial section of the conservation community itself that backs such recommendations, they will not see the light of day. We have very vocal champions for the big animals (and may they get all the strength they need), can we have a few for the small things in life? ■



Ashish Kothari is with Kalpavriksh – an Environmental Action Group. He is also member of the Executive Committee of BNHS.



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# Conserving the Wild Buffalo — a losing battle?



Wild Buffalo *Bubalus bubalis*

S.K. SINGH

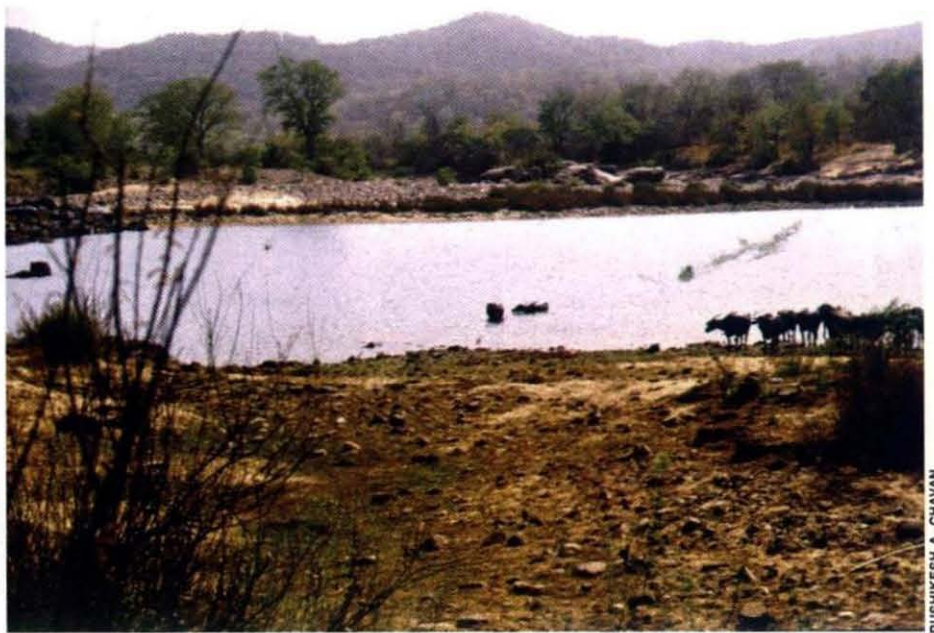
Text: Rushikesh A. Chavan

It was a usual day at office, until Dr. Rahmani, our Director, called me into his cabin and asked me to represent the Bombay Natural History Society (BNHS) on his behalf for a meeting of the Task Force for Conservation of the Wild Buffalo, Chhattisgarh. Finally, the Chhattisgarh Government was taking some action for conserving the Wild Buffalo – another species facing extinction! A series of surveys conducted by the BNHS had concluded that there were not more than 50 Wild Buffaloes left in central India.

It had all begun during the summer of 2003 for me; I had been on a presence-absence survey of the Wild Buffalo (*Bubalus bubalis*) in Gadchiroli district, Maharashtra and its peripheral areas in Chhattisgarh and Andhra Pradesh (*Hornbill*, April-June 2004). It was a disappointing visit for all we could see were signs of Wild Buffalo presence.

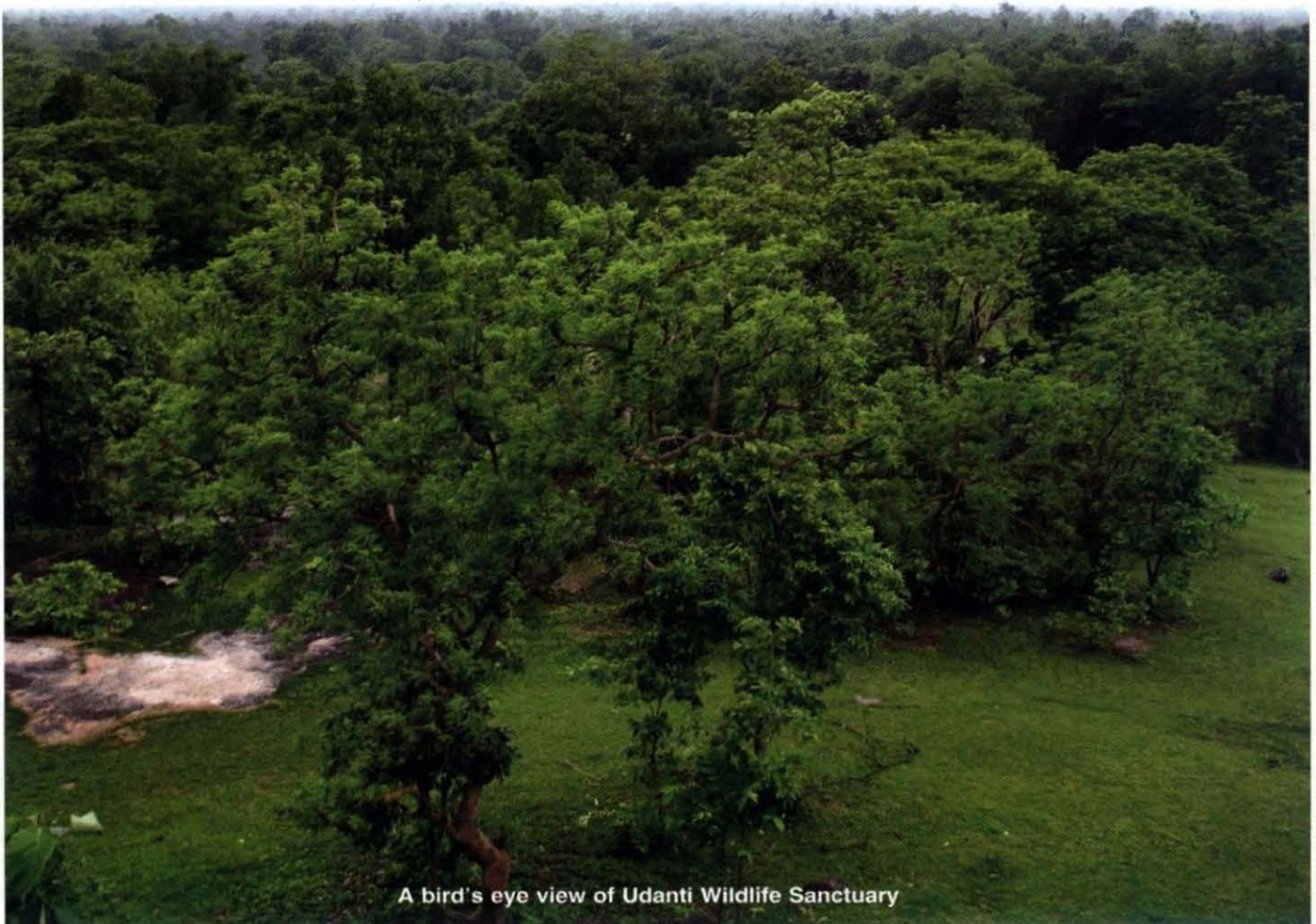


The Wild Buffalo – one of the largest ungulate (weighs about 900-1200 kg) in India, is found in Assam and Chhattisgarh. It probably has the largest horns among living mammals, their average spread being  $\approx$  1 m. Historically, its preferred habitats were low-lying alluvial grasslands and their surroundings; however, with increased pressures and dwindling habitats, the Buffalo started using riparian forests and woodlands. The Wild Buffalo originally ranged from eastern Nepal and India, east to Vietnam, and south to Malaysia. By 1963, it had been substantially reduced numerically and eliminated from the greater part of its former range. World Conservation Union (IUCN) in 2004 estimated the total world population to be less than 4000, but it may be less than 200, with



RUSHIKESH A. CHAVAN

Increasing use of such pools by domestic buffaloes leads to conflict for water resources



A bird's eye view of Udanti Wildlife Sanctuary

RUSHIKESH A. CHAVAN



# A losing battle?

possibly no pure bred Wild Buffalo left in the wild (see [www.iucnredlist.org/search/details.php/3129/all](http://www.iucnredlist.org/search/details.php/3129/all)).

In 1994, Anwaruddin Choudhury estimated that about 90% of India's Wild Buffalo population is in Assam, and faces serious genetic swamping due to interbreeding with the domestic buffalo. It is now assumed amongst the scientific community that the central Indian population of Wild Buffalo is genetically the most pure. The number of buffaloes in the country are by no standards poor, then why this hue and cry for a pure breed?

A pure wild breed of not just buffaloes but of any species is vital, as in-breeding weakens the genetic strength of a species decreasing its capacity to fight diseases. A wild stock is genetically sturdy and a valuable back-up during difficult times. In this case, when we lose the wild stock we will not just lose a species, but jeopardize one of our most flourishing business.

How? Answer this question. What is India's no. 1 crop? Rice, Wheat... No, it is Milk – a multi-crore business! As per Dairy India 2007, milk production in India in 2006 was estimated at 100 million tones, i.e. around Rs. 300,000 crores; this makes India the biggest provider in this sector. There are an estimated 70 million dairy farmers in India and the pharmaceutical industry makes thousands of crores from the dairy industry.

Even if one ignores the ethical and moral obligations to protect a species, the economical implications of conserving the Wild Buffalo are good enough reasons to save the species. Wild Buffalo populations in Bastar in 1965 were estimated to be about 100. Until the last decade, majority of the Wild Buffalo population was found in Chhattisgarh. The buffaloes



RUSHIKESH A. CHAVAN

Members of the Task Force Committee during their field visit at the Udanti Wildlife Sanctuary

## SALIENT FEATURES OF THE PETITION FILED IN THE HON'BLE SUPREME COURT

- a. The Chhattisgarh Government should be asked to prepare a rescue plan to save the Wild Buffalo from extinction and necessary funds and resources be made available;
- b. The Chhattisgarh Govt. should take immediate steps to ensure that the interbreeding between the wild and the domestic buffalo does not take place and the genetic purity of the wild species is maintained;
- c. The Chhattisgarh Govt. should take immediate steps to substitute the 700 odd domestic buffaloes reared in the villages within the Udanti WLS with other cattle, which are being distributed by respondent no. 1 (Chhattisgarh Forest Department) under an ongoing tribal welfare scheme;
- d. The Chhattisgarh Govt. should prepare a scheme, in consultation with the villagers, for relocation of villagers from Udanti WLS to nearby forest areas to ensure the survival of the endangered buffalo;
- e. The Chhattisgarh Govt. should take immediate steps to undertake intensive research and monitoring of the Wild Buffalo population in Udanti WLS and other areas where the Wild Buffaloes may still be found, including preparing their genetic profile for future reference;
- f. The Chhattisgarh Govt. should take appropriate steps to initiate wildlife training programme for officials of the Forest Department, especially those managing Udanti WLS;
- g. The Chhattisgarh Govt. should effectively provide all the research and monitoring inputs, including scientific management of the Wild Buffalo and its habitat to save it on long term basis and involve institutes such as the Wildlife Institute of India, Bombay Natural History Society for the same.





RUSHIKESH A. CHAVAN

This enclosure houses the last remaining female Wild Buffalo of Udanti WLS  
Inset: The enclosure is provided with an electric fencing

occupied the last remaining habitats in Indravati Tiger Reserve, Udanti Wildlife Sanctuary, Pamed Sanctuary and Sitanadi Wildlife Sanctuary. According to the State Forest Department, the population of Udanti Wildlife Sanctuary (WLS) was 61 individuals in 2005; however, this figure was not correct. A project of the Wildlife Trust of India (WTI) on Wild Buffalo in the Sanctuary reported only seven Wild Buffaloes, which is now the accepted number for Udanti WLS.

According to Dr. M.K. Ranjitsinh, a famous conservationist, the Wild Buffaloes in Pamed and Sitanadi WLSs have been wiped out, whereas Indravati Tiger Reserve probably has 25 individuals. However, given the hostile situation due to naxalite

activities in the region and the shy nature of the animal it is not possible, at least in the near future, to visit these areas to confirm the numbers and carry out emergency conservation interventions. The total population of Wild Buffalo in central India may not be more than 35 individuals. For effective conservation interventions we have, for now, the seven individuals of Udanti WLS. Of these, five are males, one a female, and one a male calf. However, to complicate matters is the genetic purity of this female? The female buffalo currently in captivity shows traits of a Wild Buffalo, but it is feared that she might not be a pure strain. Villagers claim that she is a domestic buffalo and was taken into custody from a buffalo shed of one of the villagers, whereas the

Forest Department and a WTI researcher, Dr. Rajendra Mishra, claim that it is a Wild Buffalo as they have been tracking it for the last 18 months. However, WTI will officially take a stand once the genetic profile is established by the Centre for Cellular and Molecular Biology (CCMB). A tissue sample has been sent to CCMB, Hyderabad to confirm this doubt, the report is still awaited.

It's a pity that such a magnificent species, the State animal of Chhattisgarh, which is protected under the Schedule I of the Wildlife (Protection) Act, 1972, faces extinction in its own State.

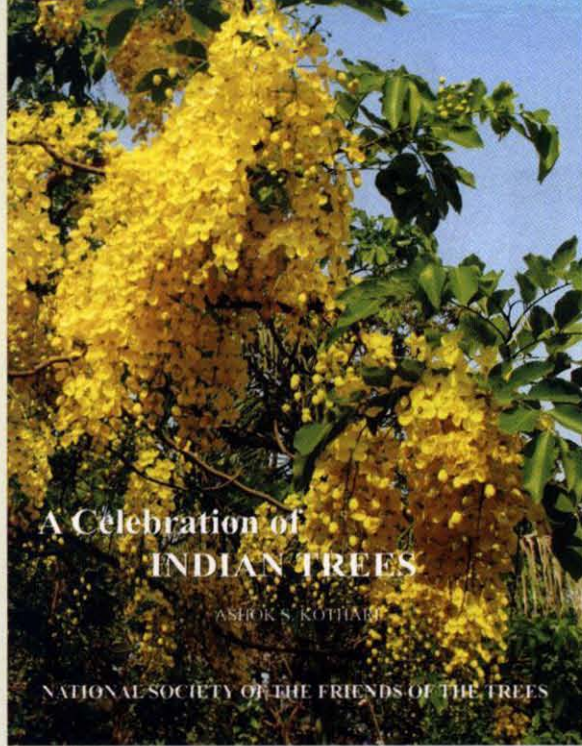
The current situation in Udanti WLS has come to light only after a PIL was filed (IA no. 1433 of 2005 in WP (Civil) no. 202 of 1995) by



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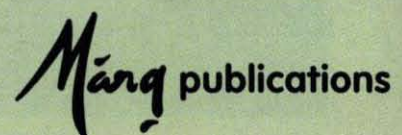
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## MAJOR RECOMMENDATIONS BY THE CENTRAL EMPOWERED COMMITTEE

- a. The State Government should constitute a Task Force for saving the Asiatic Buffalo of peninsular India and this should be done within one week. The names of the following members were proposed for consideration
  - i. Director, Wildlife Institute of India
  - ii. Representative of the Ministry of Environment and Forests (MoEF)
  - iii. One non-official expert/ naturalist
  - iv. PCCF (Wildlife)/Chief Wildlife Warden, Chhattisgarh
  - v. Conservator of Forests (Working Plan) Chhattisgarh Forest Department should convene the meetingThe Task Force will be at liberty to co-opt any other person(s) as a special invitee and will hold its first meeting as soon as possible preferably within a fortnight. The Task Force should be empowered to take decisions that are considered necessary for saving the Wild Buffalo.
- b. The Task Force shall prepare an action plan and submit the same to the Hon'ble Supreme Court within 30 days. The action plan shall indicate the requirement of the funds so that the same could be provided from the CAMPA.
- c. The genetic profile of the Udanti population should be carried out within one month to ascertain, with reference to the tissue samples from the old known trophies, whether the surviving animals are genetically pure or not. Whether the Udanti population is homozygous or heterozygous should also be examined as this will have a bearing on the long-term survival of such small populations of any species.
- d. The Chief Wildlife Warden should with immediate effect and under his direct supervision put in place a round the clock monitoring and patrolling mechanism with sufficient hand picked staff and necessary logistical support.
- e. Immediate steps should be taken to replace the 600 odd domestic buffaloes reared by the villagers within and around the Udanti WLS with cows/ bullocks to prevent inbreeding with the Wild Buffalo. The co-operation of the Raipur Milk Union should be taken in this regard.
- f. The Task Force will explore the possibility of ex-situ breeding and re-introduction of species at appropriate time after consulting the experts to save this population from extinction. The last point is essential since the fall in population has been alarming.



RUSHIKESH A. CHAVAN

The artificial pond created within the enclosure at Udanti Wildlife Sanctuary

Amicus Curiae in the Honourable Supreme Court of India for directions. However, it is relieving to see the concern and willingness of the Forest Department officials, including the PCCF, to bring about conservation interventions. The Forest Department has initiated measures to revive the Wild Buffalo population in Udanti

WLS. The Department has been monitoring the population daily for the past few months and tracking the movement of the animals. They have also built an enclosure, with a wallowing pond and grazing area for captive breeding. The enclosure is electrically fenced from all sides to prevent entry of predators such as Dholes and

Leopards into the enclosure. The enclosure currently houses the female and calf. Once the Forest Department captures the males, it can initiate the Captive Breeding Programme. The Forest Department has also appointed a veterinary doctor for medical support. The Department is also in the process of resettling the three villages within Udanti WLS, this will increase grazing area – a crucial intervention. It is important that along with captive breeding we create habitats for the buffalo to survive in future.

This is our only chance to revive the population of the majestic Wild Buffalo in central India. If we fail today this last chance, may well be the lost chance. ■



Rushikesh A. Chavan is the Conservation Officer at the BNHS



# Rediscovery of the Sikkim False Wolf Snake

Text and Photograph: Viral Mistry

I was in the unexplored forests of Arunachal Pradesh in Eagle-Nest Wildlife Sanctuary, documenting Herpetofauna and Lepidopteron for a project initiated by Dr. Ramana Athreya. Fifteen days of intense searching in the peak of monsoon, yielded many butterflies and only two snakes; but the second snake found during a camp shifting trek, a beautiful looking keel-back, which matched none of the descriptions by Smith, rekindled hope and excitement. The only other recollection of the search trips was heavy rain, blinding fog and lots of fresh Elephant dung. Tired from the previous days arduous 12 km uphill walk I decided to content myself with only

a night search around the campsite and not explore too far. Non-stop rain, lack of visibility due to cloud cover and fog, and thus the fear of being trampled by Elephants reinforced the decision and helped curb my excitement.

After dinner, I put on my wet field clothes and goaded Nima my local guide to accompany me. We began searching, on the ground, under rocks, on barks and on walls. After a while I spotted an active beautiful black and golden yellow snake trying to enter a breach in a window corner of an abandoned General Reserve Engineering Force (GREF) establishment about 4 m above the ground. Adrenaline rushed. Fearing that I might





lose the snake, which usually happens when one spots a snake near an escape, I climbed, taking a foothold on the plinth projection, and grabbed the tail of this beautifully ornamented snake, one-fourth of it was still inside the crack, ensuring that I was not going to tear the snake out, but determined not to let it escape. Now the trick – well experimented successfully earlier – was to gently hold the snake without the slightest pull and wait for the snake to get tired of tugging at you. This is simple but here the challenge was to hang on to the tail with one hand, without the slightest pull, while balancing on an inch wide plinth projection for a foothold, with the other hand propped to the windowsill for support. To get out of this tight position quickly, which could be dangerous for the snake, I instructed Nima, my assistant, to break into the room, open the window, and take the tail from me. A scared Nima, after being reassured that I would take the tail from him before the snake reversed, did as I instructed. Fifteen minutes after I took over, this silent tug-of-war ended and I finally had the snake in my hand. I bagged the snake quickly and safely without letting it bite me. I had to constantly remind myself in all the excitement that I was in the middle of a jungle and the nearest help, in case of emergency, was an approximately 42 km walk. This was a perfect end to the day.

Next day I began observing and counting morphological characters to identify it, and could place it in the genus *Lycodon* (Wolf Snakes). Most characters matched the description of *Lycodon fasciatus* given by Smith, but not all. I left the final identification till I could meet Ashok Captain, an inspiring, experienced, and irrepressible snake taxonomist who spends a lot of time in Arunachal Pradesh, and all over India, studying reptiles. After counting scales and photographing the snake, I freed it at the same spot where it was caught. It entered the same crack and reversed to find a safer spot. Much later I discovered that there were small bats living in that crack and would make easy meals for this snake.

Later during this project, I was joined by Ishan Agarwal, a keen herpetologist, also in charge of documenting herpetofauna. He had spoken to Ashok Captain about what reptiles to expect in this area and had done his homework well. Ishan immediately asked me to check the genus *Dinodon* (False Wolf Snakes). After comparing it with the species key in this genus, we short-listed the identity of my find to be either *Dinodon gammiei* or *Lycodon fasciatus*. We left the brain storming for later and kept the fieldwork going.

Later in Bombay at the Bombay Natural History Society (BNHS), with the help of Ashok Captain, I found a specimen in the herpetology collection labelled *Dinodon gammiei* collected by Father Richard Lane-Smith, though it had not been mentioned in scientific literature. We received a lot of support from Mr. Naresh Chaturvedi, Curator and Varad Giri, Scientist who let us work on that specimen and observe other specimens of the species with which my find may be confused. After comparing my data with the specimen at the BNHS, the type specimen at the Zoological Survey of India, Kolkata, and



Probably the first and the only coloured photograph of a living, wild, individual of *Dinodon gammiei*

the original descriptions, the snake was finally identified as *Dinodon gammiei* (Sikkim False Wolf Snake). Gernot Vögel of Germany confirmed our identification.

*Lycodon fasciatus* and *Dinodon gammiei* being the closest links between these two genera confused us as well as earlier taxonomists with the validity of this species. In fact, the latter was synonymised with *Lycodon fasciatus* by the herpetologist Frank Wall, who later accepted it as a valid species.

In literature, this species was known only from five specimens. J.A. Gammie collected the type from a tea estate in Darjeeling in 1878. The photographed individual is probably the only one seen about 400 km from the type locality. ■

Viral Mistry is an engineer by training and is currently running an engineering business. He is also associated with the Kaati Trust, Pune helping with the Eagle-Nest Biodiversity Project. He has been considering moving into ecology full-time.





# Off the beaten track

'Ghost Tree' *Sterculia urens*

**Text and Photographs: Rutvij Merchant**

It was early morning and a low-lying mist enveloped the rocky hill sides. The first rays of the sun were peeping over the eastern horizon, lighting up the sky. The forest was bursting with varied early morning noises and bird calls. Away down in the valley, the frantic alarm calls of Chital and Langurs added to the confusion.

Up in the hills, everything was relatively quiet and peaceful. Nothing stirred amongst the great rocks and boulders that lined the road. The pale rays of the rising sun struggled to pierce through the thick cloud and disperse the mist. It was a forbidding place, where grass was sparse and yet the imposing boulders made one feel insignificant.

Slowly, the mist began to clear, revealing a blue patch of sky above. Suddenly, a large, weird-looking, old gnarled tree, with a striking white trunk came into my view. This was the 'Ghost tree' *Sterculia urens* for which I had journeyed this far to Pench, a national



Pench National Park is one of the few parks in the country where Indian Wild Dog sightings occur

park located at the western boundary of Madhya Pradesh. Pench is part of the Satpuda hills, which also includes the reserve of Tadoba in Maharashtra. It is well known for its prodigious sightings of Tigers and Leopards, but there are many other wonders that are

not given the publicity they deserve.

I was told by an acquaintance who had travelled to Pench of the existence of 'Ghost Tree', locally known as the *karaya*. The white ash colour of the tree trunk gives the tree its name. Just the name got my curiosity levels to



peak. This coupled with the fact that Pench is one of the few parks in India where wild dog sightings occur attracted me like a magnet.

The Ghost Tree is set apart by the many peculiar characteristics, in addition to its striking white colour. However, the most spectacular feature is that the Ghost Tree will always grow in the most inhospitable conditions. Invariably, the tree will have sprouted from the top of a large boulder! It is inconceivable to me how a seed could germinate and grow from solid rock. Just the idea of a tree growing on a humungous boulder with no soil to take root in, defied imagination. Also, the tree is known for sticking out at odd angles from the mountainside, often crookedly.

Just after entering the Park, it strikes one how bone-dry the vegetation is. During summer the air is still and heavy, and the atmosphere saps your energy.

Even though Kanha and Pench are scarcely a four-hour drive away, the two parks are totally different types of forests. Kanha is evergreen and is filled with sal and teak trees, while Pench is dry and deciduous, and is far more hilly and rockier than Kanha, being located closer to the Satpuda mountain range. During summer, the forest becomes nearly leafless.

Having explained our objective to the guides, we went towards the rockier

terrain in the Park in search of the 'Ghost Trees'. I was quite overjoyed by the magnificent opportunity that I had to look at such a unique natural phenomenon.

This part of the Park was at an altitude and totally uncovered by canopy. The 'Ghost Trees' were all around, looking totally out of place, they grew amid clumps of rock and boulder, with not the slightest bit of green or brown on them. Amazingly, the ground for most parts was bare and only covered by sparse clumps of grass.

Another amazing characteristic of this tree was that more than half of the branches did not taper off into leaves and twigs, instead they were round, with circular stumps at their end, much like an amputated limb. The locals said that this happened when a branch is untimely cut off, or breaks away in a storm or gale.

The unique qualities and appearance of this tree has given it a special place in the heart of the locals, and is a part of the local superstition. It is said that one should not pass too close to the tree on a no-moon night.

I was fortunate to encounter a fine specimen, which grew right next to the road. It looked imposing, almost intimidating and made me feel quite insignificant. From a distance, the trees looked quite spectacular, especially with the golden hue the early morning

sun gave them. Close up, the tree looked gnarled and ancient, a survivor out of the past.

Back home I looked for details on these white trees and the closest mention that I could find was of white Birch Trees that grew in the Taiga of northern Canada, as well as parts of Europe and other similar gum trees were seen in Australia.

Over the next few days, as we travelled the Park, the 'Ghost Tree' became just as much of an attraction as a Gaur or Nilgai spotting. I could not help noticing them; even after a few days the excitement of seeing one was never lost.

It was another stifling hot day and the sun beat down on the parched land of the Park. The steady hum of the gypsy's engine as it bounced over the deeply rutted track was the only sound in the area. After a morning full of alarm calls, pugmarks and feverish excitement I sank into a bit of a stupor as the gypsy made its way to the gate of the reserve. Suddenly, the brakes were slammed on. As the jeep came to a shuddering halt, there in the road in front of us was a pair of brown Indian Wild Dog puppies, gazing with innocent curiosity at the monster before them. A commanding bark from the bushes sent them scurrying for cover. After a patient 10-minute wait, a breathtaking beautiful Wild Dog with a russet-red coat came trotting

**The massed crowns of bright orange flowers of the  
Flame of Forest *Butea monosperma* suggest a forest in flame**





## Nature Watch



Clockwise (from top left): Chital *Axis axis*, Yellow-wattled Lapwing *Vanellus malabaricus*, Gaur *Bos gaurus*, Tiger *Panthera tigris* are some of the other beautiful animals one can see at Pench

out of the bushes followed by his pack.

Apparently, they had stashed a kill just by the side of the road and were on their way to feed. Wild Dogs are voracious eaters. The alpha eats first and then the other members of the pack join in with a lot of snarling and bickering.

This was a large pack, with thirteen adults and six puppies, varying in size and age. I spent the entire afternoon with them and the crowning moment came when I saw the pack running in full formation towards a large lake after the meal. They looked like a charging fighter squadron, bushy tails erect and the alpha dog at the head. As they all disappeared one by one, into the thick green grass around the water body (presumably for a nap), I marvelled at my luck to have caught sight of this extremely rare animal and be able to get a glimpse of its

fascinating private and day to day life.

Pench is also one of the last places in India where one can see these Indian Wild Dogs. Wild Dogs have been regarded as vermin for eons and have almost been hunted to extinction in Africa and India. They are also severely affected by canine diseases like rabies and canine distemper. These diseases are passed on from stray dogs, and epidemics have destroyed whole populations. Dholes have a very complex social structure and their interaction is very intense.

Most of the famous parks of India are home to a number of beautiful animals and plants that can rival the famous Tigers and Leopards, which everyone hankers after. I think that the Wild Dogs, which are highly intelligent and social animal, and top my list, should be given the same respect as them.

Pench Tiger Reserve is best known for its Tigers and frequent Leopard sightings, but there is a wealth of other rare and just as beautiful flora and fauna that deserves to be conserved and appreciated. I am not trying to undermine the big cat's majestic beauty, but it is important that we don't miss out on the other life forms. Any reserve would give a visitor a truly unique experience if only one was willing to broaden his horizon and look beyond the world of Tigers, Leopards and Deer. ■



Rutvij Merchant is at present schooling in Grade 9CG at the Dubai College, Dubai. He enjoys travelling to national parks, trekking and reading. He has contributed writings for Jet Wings – the in-flight magazine of Jet Airways.





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## About the Poster



The Tibetan Wild Ass (*Equus hemionus kiang*), locally known as Kiang, is the nearest kin of modern horses. Man knows them from the historic past. It is regarded by some as a distinct species and by others as a race of the Asiatic Wild Ass *Equus hemionus* or Onager. The Onager is lighter in colour, while Kiang is darker and redder, and has a narrower dorsal stripe and larger horse-like hooves. Kiang mostly feeds on alpine grass and herbs and has a remarkable power for living on little food. It occurs in Ladakh and Tibet and the high open plateaux of the regions further north. In past, the range of the Kiang had extended as far of north as Kononor in Tsinghai, and south to Ladakh, Nepal and Sikkim. Now its distribution has shrunk to the plateau of Tibet. The Tibetan Wild Ass is now an endangered animal in India, although a couple of thousands are found in Tibet. ■

We are grateful to

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Tibetan Wild Ass  
*Equus hemionus kiang*







# ... and life transforms

Text: **Hemant G. Tripathi and Sunita S. Pandey**

Photographs: **Hemant G. Tripathi**

Monsoon was still a month away and the forest of Sanjay Gandhi National Park was dry and seemingly lifeless. To a casual eye it looked quiescent, but the forest was speedily and perfectly preparing the foundation for many interesting wilderness stories. Under the desiccated and dehydrated appearance was a remarkable transformation that this sedate wilderness was eager to show-off, but for this it had to wait for the first shower of monsoon.



### Finally the rains arrived,

marking the onset of monsoon. The soothing shower breathed a new life into the scorching earth and triggered the process of regeneration. The dormant reproductive bodies below the soil were active once again, a new process of life had begun. The dry forest transformed gradually into a moist ecosystem within a short duration. As the volume of rain, moisture and humidity rose, the most amazing life forms on earth – plants, gained energy and sprung above the ground. The supposedly dry and dead vegetation bounced back to life with the first kiss of rain.

These new arrivals, botanically known as ephemerals, bloom briefly, complete their reproductive cycle and slip back into a dormant phase until the next monsoon. Ephemerals are a specific group of plants that complete their visible life cycle within a very short period.

The seeds, tubers, rhizome and other propagating bodies of ephemerals have a unique mechanism

to sense favourable conditions of growth and reproduction; in fact in absence of ideal conditions the ephemerals are known to remain dormant for decades.

Soon after the ephemeral, other herbs start emerging and gradually dominating the system, and in a short span the entire forest is thickly wrapped with colourful blooms.

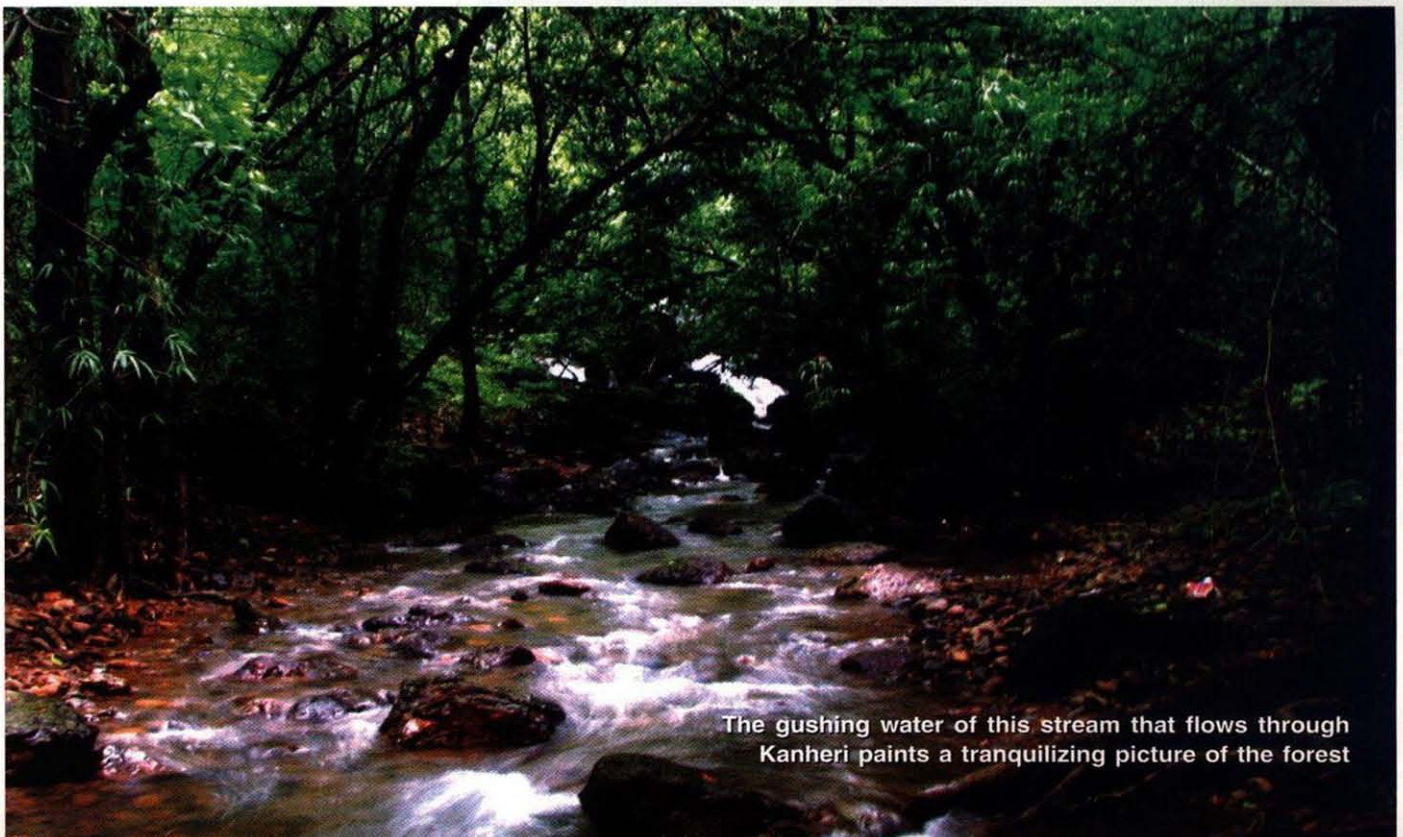
Though the monsoon flowers

resemble other seasonal flowers, they are unique. Most have highly developed nectarines and unlike the seasonals depend solely on nectar as bait for cross-pollination. The nectarines and pollination mechanics together allow for proficient pollination.

Each plant species has its own rate, range and style of germination. Majority of the potent seeds are lost



Gearing up for new challenges: Seeds embedded inside the pod of the Red Silk Cotton are ready for dispersal



The gushing water of this stream that flows through Kanheri paints a tranquilizing picture of the forest



## ... and life transforms



Beautiful flowers of *Scilla hyacinthina* (left) and *Chlorophytum borivillianum* (right) can be seen soon after the first monsoon shower



Inflorescence of  
Wild Grapes

much before germination, only a few seeds germinate and still fewer survive to maturity, reminding one of Darwin's theory 'Survival of the Fittest'. Thus, numerous seeds are produced to sustain the vegetation density of an ecosystem.

The whole process of regeneration is executed in a well-planned approach; various factors combine to suffice the necessities of the ecosystem.

### Monsoon flora

Monsoon flora is typical of the conditions prevailing during monsoons. Majority of the flora are annuals, and complete their life cycle within a single year. The floral biodiversity is very rich and exhibits itself during the season.

*Crinum latifolium* (Crinum Lily) – an ephemeral – gradually dominates the moist thickly vegetated open slopes.

The high moisture content in the air triggers the growth of shoots and initiates flowering. The plant contains around eleven different alkaloids and amino acids.

*Chlorophytum borivillianum* (Safed Musli) and *Scilla hyacinthina* (South Indian Scilla) dominate the open slopes and are indicators of a good grassland ecosystem. *Chlorophytum* was once on the verge of extinction due to over collection for medicinal use. Both species have a low survival rate due to slow tuber multiplication and little seed formation.

*Curcuma pseudomontana* (Wild Hill Turmeric) is an inhabitant of slopes, often found near shady patches. Curcumin is the principal curcuminoid of turmeric. Curcuminoids are polyphenols and are responsible for the yellow colour of turmeric.



*Curculigo orchioides* (Kali Musli) is a tuberous forest ephemeral herb with a short or elongate rootstock bearing several fleshy lateral roots.

*Iphigenia indica* (Grass Lily) is a herb with simple sparse branching inhabiting grassland slopes. The corms and corm buds of this small ephemeral is collected for traditional medicine.

*Ampelocissus quadrangularis* (Wild Grapes) is a thick climber with reddish flowers belonging to the grape family. The fruits after prolonged ripening undergo fermentation and produce an intoxicating odour. Fruits as well as flowers attract a wide variety of birds and insects.

*Strobilanthes callosus* (Karvi) flowers every seven years, although sporadic flowerings are seen in non-flowering years. After mass flowering the Karvi plant usually dies after the seeds are set. Since Karvi flowers over a brief period it has to recruit suitable pollinators. This job is accomplished by providing abundant pollen, and nectar as a reward.

*Helicteres isora* (Indian Screw Plant) flowers by mid-monsoon. This extensively fibrous plant produces red flowers with nectar to attract suitable pollinators. Once pollinated the flower changes its colour from red to blue discouraging regular pollinators, hence avoiding wastage of floral resources.

*Gloriosa superba* (Glory Lily) is a twining weak climber. Endangered due to extensive collection, this climber mostly multiplies vegetatively and in very rare cases it germinates from seed, however, fruit and seed formation is noticeably seen. The tuberous roots and dried seeds are extensively used as medicine.

*Costus speciosus* (Spiral Ginger) is a twining shrub with huge white flowers often seen in wet places in mountainous regions and open areas.



Strategies of survival: The seeds of *Breyניה pattens* will pop out when the fruit is dry



The beautiful *Gloriosa superba* is endangered in the wild

*Costus* show a gregarious habit. Flowers rich in nectar are borne on red bracts.

*Aeginetia indica* (Purple Witch/Ghost Flower) is a root parasite on Bamboo and some grasses. The root of this plant is a mass of short, bulky swollen organ attached to its host by a hooked haustorium, which transfers nutrients from the host to the parasite. *Aeginetia* possess a short simple stem; the seeds are tiny and produced in plenty.

*Breyניה pattens* (Cup and Saucer Plant) is well known for its Cup and

Saucer-like fruits. The flowers are greenish and stalked on the lower side of the branch while the fruits turn greenish to bright red with bluish seeds; the fruits eventually upturn and show on the surface.

*Celosia argentea* (Kurdu) is a common monsoon herb often collected or cultivated as a Leaf vegetable. The flowers are cream white to pink and are borne on a dense conical head inflorescence. The herb is an indicator of open land and is often restricted to slopes and moist grassland areas.



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The stinking, yet beautiful Veil mushroom is a rare sight in the wild



Fungi, like this Bracket fungus, are one of the important decomposers in the wild

*Impatiens balsamina* (Balsam), the name 'Impatiens' is derived from the impatient habit of the fruits; the mature fruits tend to burst with the slightest external pressure. These flowers dominate the forest floor during mid-monsoon phase and eventually complete their life cycle with the end of monsoon.

*Dictyophora indusiata* (Veil Mushroom) gets its name from the veil-like covering on the stalk. This beautiful phallic-shaped fungus has an unpleasant odour, like decaying flesh, which attracts large numbers of flies, that help to disperse the spores. Commonly seen in a community of 2-5 bodies, the mushroom inhabits humid, dense and littered areas in the forest.

Growth and development form an integral part of biodiversity, and death, decay and decomposition are critical factors for life in wilderness. Monsoon is not just the season of regeneration, but also decomposition and decay as it provides all the necessary conditions for the process.

Decomposition may occur with the help of certain saprophytic bacteria, fungi, termites and even abiotic factor like heat (Thermal decomposition).

Decomposing agents like bacteria preferably act on the faunal decay while the Fungi are more specialized to help in the decomposition of wood, although both the roles can be played by either. The termites act as a catalyst for the process, being the only organisms that can digest wood cellulose with the help of certain Flagellates (Protista) that survive in their ducts.

#### Wood decomposition

In 1906 A.H.R. Buller said, "Wood is the most abundant material on earth".



## ... and life transforms

Wood is composed of cellulose, hemicelluloses, and lignin. It is the most complex organic material on earth. Lignin in wood acts as a physical barrier and prevents enzymatic decomposition of cellulose and hemicelluloses. In order to digest the complex cellulose, this barrier has to be breached. Insects, borers and fungi can do this mechanically; fungi use biochemical processes.

Millions of tonnes of wood is produced in forests throughout the year and almost equal amounts is decomposed at the same time. This never-ending cycle of biosynthesis and bio-decomposition forms a dominant part of the carbon cycle.

### Plant-Animal Interactions

Various factors, like cross-pollination, dispersal and to some extent germination, necessary for survival have made plants dependent on animal life. But the fact that has

always strengthened this association is dependency of the faunal life on vegetation for food as well as shelter. In terms of ecology, these interactions play a major role; the various levels of interaction govern the process and happenings in the ecosystem. The termites, fungi and other life forms play an incredible role in the process of decomposition without which the germination space in the forest could be widely hampered. E.g. Insects as pollinators while flowers as pollinator attractors have co-evolved just to ensure and maintain the species potency and dynamism. Insects in return exploit plant as home, hiding, hunting and feeding sites. Spiders control the population of insects as their overpopulation can affect the diversity and density of plant species. Thus all life forms play a role in ecology and ecological interactions to strengthen the balance of the ecosystem.

An ecosystem that has run in such a planned fashion, so far, with all its components working in balance has been made fragile by man.

Climate change is taking toll on the ways of nature. Seasons have been altered and eventually the ecosystem will also change, thereby causing irreversible damages.

### Climate change

Climate is the average weather conditions prevailing in a given area for a given period of time. It is a delicate balance between the sun, atmosphere, topography, plants and other living organisms.

Climate change is a natural phenomenon and is dynamic. A number of factors like Continental drift, Volcanoes, Ocean currents, Earth's tilt, Asteroids, Meteorites induce climate change. But in the last 150 years the rate at which climate change has occurred is very high. The



Mosses are an indicator of a humid ecosystem





A Lynx spider perfectly camouflages itself on a *Celosia* inflorescence waiting to ambush its prey

main culprits for this are anthropogenic activities like industrialization, consumerism, deforestation, urbanization and transportation.

The drastic change in climate patterns has gradually affected life on earth. Alteration in climate has led to global warming, which in turn affects the ecosystems and biodiversity on earth.

If we restrict ourselves only to India, a developing country, we realise that the effects of climate change can be more dreadful. Agriculture, the backbone of Indian economy is directly dependent on climate. The change in precipitation patterns, amount of rainfall, temperature are some of the factors that are very crucial and may lead to the crash of the Indian economy.

The monsoon season lasts for a limited period and thus availability of water is restricted to a few months. Forest plays a vital and deciding role as a catchment area and is therefore a natural rain harvesting agent. With the loss of catchment area due to deforestation and encroachments, huge amount of monsoon water is likely to be wasted. The decreased area

and density of forest cover available will not be able to hold the extra water.

Forests tend to deteriorate in absence of moisture and dearth of sufficient water table during the drier months of the year, further damaging the ecological interactions, flowering-fruitlet periods and other physiological mechanisms.

Water sources like rivers and lakes will dry in the absence of healthy catchment areas and huge amount of water will run into the drains, low lands, seas and oceans. The precious forest soil rich in nutrients and minerals will get washed away in absence of vegetative barriers, thereby resulting loss of quality soil. With large amount of water open to evaporation, with less forest cover over the water bodies, with increasing temperatures due to global warming, the future scenario is expected to worsen with time. The future monsoons beyond doubt would be heavier and with no place and no catchment areas to accommodate increasing amount of rainfall...

In the midst of the continuous loss of forests and inefficient rainwater harvesting systems, affairs around the

demand and availability of portable drinking water looks messy. Mammoth dams coming at the price of forests and ecological rules and balances surely are not the solutions for future.

The survival of man depends upon the forest and it's high time we understand the right values of such systems of ecology that may seem worthless.

Monsoon is not just a wet season, but a season of new life, a season of new beginnings, and its serenades have enriched our lives for centuries. In Linda Hogan's words, "There is a way that nature speaks, that land speaks. Most of the time we are simply not patient enough, quiet enough, to pay attention to the story." ■



Hemant G. Tripathi is at present a Research Officer at the ENVIS centre of the Society. He is interested in plant taxonomy and ecology.



Sunita S. Pandey is at present an Education Officer at the BNHS-CEC, Mumbai. She is interested in Environment economics, Plant ecology and studies related to climate change.





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## Let's save the Leopard Cats

The Burnihat locality of Meghalaya State has some tribal villages of the Khasi and Garo tribes. The Hills here are covered mainly with bamboo as a consequence of shifting cultivation, practiced some years back. I was in Meghalaya to attend a course in Conservation Biology when I heard of three Leopard Cat *Felis bengalensis* killings in one of these villages. The three hides, found in three different households of the village, were in good condition.

All three specimens were of adult females. The largest Cat was 100 cm long and the smallest 90 cm long. They were caught in an indigenous trap made by these villagers; all three were injured on one of the limbs.

According to the villagers, such killings were not rare in the area. While some individuals opined that the Leopard Cats were a threat for their livestock and poultry, others claimed that the hides of these animals fetched them about Rs. 100-150/-. Whatever the reason behind these killings, the villagers were ignorant about the seriousness of their crime. The Leopard Cat is listed under Schedule I of the Indian Wildlife (Protection) Act, 1972, the highest degree of protection in India.

This is a matter of serious concern as it is obvious that there is a market for these wild Cats, which are being



procured from these villagers. Let us all get together to save the Leopard Cats of Meghalaya.

Pankaj Sarmah  
Guwahati



## Where are our Summer Visitors?

It was April again and the *Gardenia*, *Kanchan* and *Temple tree* in our backyard were in full bloom. But this year our annual summer visitors were conspicuous by their absence. We were missing the early morning long musical notes of the Magpie Robin; the day long loud staccato calls of the tailor bird; the chatter of the Red-vented Bulbul in the evening as they settle in the foliage; the quick soft chirping call of the Purple Sunbird as it hovers in the blossom. What we had instead was a pair of Fantail-flycatchers, our usual winter visitors who had overstayed the duration of their visit this year. Usually

they come around November and leave by February. They are very restless, quarrelsome and aggressive. It is quite an amusing sight to see a small but ferocious fantail push out a resident Crow more than three times its size that flies out of the tree with just a meek protest! The summer birds have probably got wind of this, and stayed away. For some reason, the fantails treated the resident sparrows with benign indifference. Both flitted around on the same tree unmindful of each other's existence. What could be the reason for the fantails to extend their winter stay? And why were they partial to the sparrows? Won't we see our summer visitors this year?

Neelima Bhawe  
Mumbai



## Congrats!

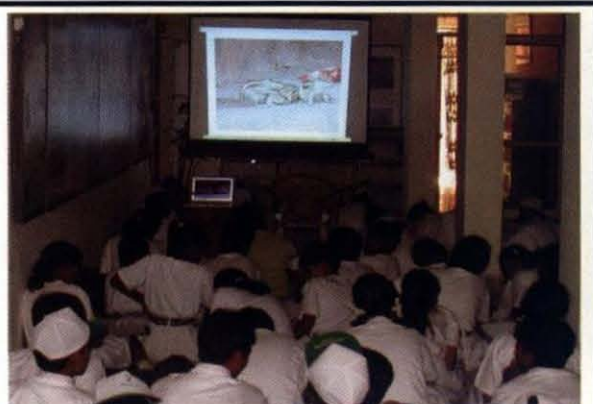
I want to congratulate and compliment the BNHS team responsible for bringing out issue after issue of *Hornbill* to an international standard in terms of fine design, good layout, superb reproduction, outstanding photographs and of course excellent content, for which the BNHS and we members should really be proud.

J.P. Irani  
Mumbai

## We are grateful to

Mr. T.N. Caldwell, Chief Executive Officer, Caldwell Investment Management Ltd. and Mr. Brendan Caldwell for a generous donation of 8000 Canadian dollars to procure a Laptop and LCD projector for the Conservation Education Centre-Delhi.


This financial assistance has enabled CEC-Delhi to procure this equipment to conduct awareness programmes for saving the biodiversity of the country.





# A spectacular display

Text and Photographs: Ganesh Dhane



The Chalakewadi-Thoseghar plateau in Satara district of Maharashtra is noted for its biodiversity. While travelling through this plateau during May this year, I came across a road-kill of an interesting lizard, which was later identified as the Fan-throated Lizard *Sitana ponticeriana*. Amazed by its beauty I started looking for it on the plateau. I visited the area regularly and spent hours looking for and photographing the activities and moods of this spectacular lizard. I sought out areas where I could see both the male and female in large numbers and was not disappointed with the opportunities that this beautiful lizard offered me. The frames here are just a glimpse of what I could capture with my lens.

During April-June, the breeding season of the lizard, the throat-fan in males becomes a brilliant blue, black, and red, which helps to attract the female. The courting male displays to the well-camouflaged female by raising itself on its forelegs and rapidly opening and closing its throat-fan.



During the mating season, the female sits quietly in one position, head raised, waiting for almost 2-3 hours. The subdued colours of the female melt her into the surroundings. In fact, at times one can see a displaying male, with female in sight.



The display is at times so intense that one may miss the displayed bright blue skin behind the head.

Apart from attracting females the display also helps the male to protect his territory. In case of an intrusion the resident male fights the intruder in defence of his territory. The winner gets a better chance to win the female.

Ganesh Dhane is a Commercial Artist. At present he is a still photographer with an Advertising Agency, and a member of the 'Drongo Environment Movement', Satara.





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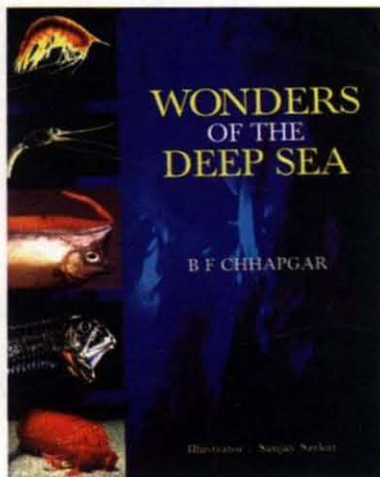


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### **Wonders of the Deep Sea**

by Dr. B.F. Chhapgar

Published by: National Book Trust, India, 2006

Size: 24 cm x 18 cm

Pages: 52

Price: Rs. 35/- (INR)

Paperback Edition

Reviewed by Dr. (Ms.) Pramila J. Salian

Dr. B.F. Chhapgar, one of the eminent marine biologists of India, has presented this time a book especially for children and teenagers. Throughout, his main interest has been the life of marine fishes and their environment, including those in the deep sea. In this book, his own depth of knowledge is reflected and the reader is intrigued and enlightened in the field of marine exploration by unusual information.

His earlier books with National Book Trust, *WONDER WORLD UNDER WATER* and *MAN INSIDE THE SEA* were highly informative. His latest book, *WONDERS OF THE DEEP SEA*, which comprises of twelve brief chapters, is truly a great pleasure for the reader. It focuses on a wide range of rare body patterns/designs, and some rare phenomena such as light emitting spots in fishes. One can get the thrilling experience of diving into the sea just by reading this book!

The colourful illustrations go along with the flow of the text and carry the reader to a pinnacle of imagination. The diversity of marine life and their mysterious art of survival by developing various adaptations are simply astonishing! Even trained Ichthyologists, who are conversant with shallow-water fishes, find it completely amazing when they see deep-sea fishes for the first time.

The back cover shows some vague discernible patterns, which are presumably of deep-sea fishes. It would have been better if a 'blurb' containing a summary of the contents of the book and a brief biodata of the author had been included on the back cover. Also, the contents deserve to be preserved in the form of a hardbound book for posterity.

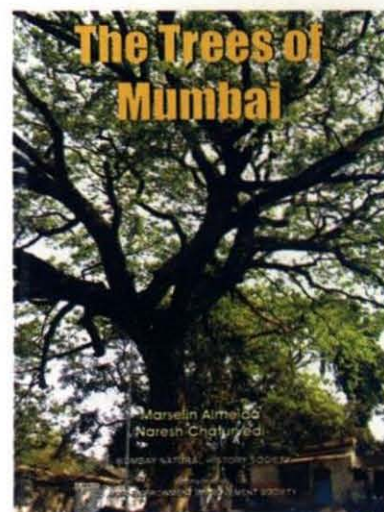
Nevertheless, this book is a rare collection of information about deep-sea fishes that are not otherwise common and is recommended for the young and adventurous minds. ☺

Reviewed by Ashok S. Kothari

The city of Mumbai is well-known for its vast variety of trees found throughout the city. The British and the Portuguese introduced many exotic trees during their stay in Mumbai. These trees have grown well in the favourable soil and environment of Mumbai. In fact during earlier days, when P & O Steamers used to anchor in the Mumbai harbour, the passengers would hire a cab to see the old trees of Mumbai. A booklet on the trees of Mumbai was published nearly two decades ago, but is now out of print. Therefore, the need for a book on the trees of Mumbai, similar to the ones available for other principal cities of India, was long due. It was surprising that such a book was absent though the city has renowned organizations like the Bombay Natural History Society and

The National Society of the Friends of the Trees.

Dr. M.R. Almeida, a renowned field botanist and Mr. Naresh Chaturvedi, a renowned Entomologist and Curator of the BNHS finally took up the challenge. Their collaboration has resulted in *THE TREES OF MUMBAI*. This 250-page book contains vivid descriptions and pictures of 108 trees, including indigenous and exotic trees, and also Palms and Mangroves. Many unknown facts about trees like their medicinal uses and also tips about propagation are given. The location of the photographed tree is indeed beneficial for those who are always keen to visit the tree and learn more. As expected the book is doing extremely well, and the day when the first edition will be completely sold out is not far away. ☺



### **The Trees of Mumbai**

by Marselin Almeida & Naresh Chaturvedi

Published by: Bombay Natural History Society, Mumbai, 2006

Size: 21 cm x 13.5 cm

Pages: 250

Price: 465/- (INR)

Hardback Edition



# Life and Livelihood under Siege!



NISHIGANDHA PEDNEKAR

Healthy mangrove ecosystems (facing page) are silently massacred by bunds for exploiting the land for anthropogenic activities

Text: **Ashwina Mahanti**

**A**s the world steadily shrinks into a global village, India's endeavour to ape the economic progress of its Asian counterpart, China, has assumed the form of Special

Economic Zones (SEZs). After the success SEZs enjoyed in China, the Indian government heralded SEZs with much optimism and its characteristic myopic vision. SEZs may well spell disaster for both the Indian ecology and economy. Today, over 550 SEZs have been proposed in India of which 220 have been created already. While the World Bank ponders over the sustainability of such a large number of SEZs, the very concept of sustainability remains alien to Indian policy makers.

SEZs are enclaves of privileges for exporters and business ventures, as the only eligibility requirement is that the investor has to be a Net Foreign Exchange earner. SEZs will be created under the Government of India SEZ Act, 2005. They will offer benefits such as:

- Fiscal incentives through tax breaks, exemption of duties and levies of Central and State Governments
- Permit off-shore Banking Units
- Single point clearance system and minimum inspections will be required under State Laws/Rules
- Exempt from routine examination of export and import cargo.
- Deemed as foreign territories for trade operations, duties and tariffs

In short, SEZs provide maximum benefits (to the investor) with minimum formalities. The SEZ Act, though a Business tycoon's dream come true, has glaring shortcomings. It not only dilutes the powers of local self-governments, but also ignores the vital issues of the impact on the environment. Alarming, the SEZ Act, 2005 does not call for an Environmental Impact Assessment. It permits facilities such as golf courses, desalination plants, hotels and non-polluting service industries within the Coastal Zones Regulation area, also it violates the Fisheries Act, 2003 besides others.

Ensnared in the heart of Kachchh, Gujarat, is the quaint port of Mundra. Little did one know that this taluka, known for its dates and small fishing activity, would one day turn into a hub of business activity for larger players? The Mundra SEZ Project is an ambitious venture







# Plant Life



## I AM WORTH 32 LAKHS !!

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Disaster struck Kachchh twice first as a cyclone in May 1998 and then as an earthquake in January 2001. Mundra survived with relatively less damages while Kandla suffered the most. The locals attribute this anomaly of nature to the dense mangrove cover that Mundra could boast of in those years, while Kandla had cleared much of its mangrove cover for its port. The thick mangrove cover that saved Mundra twice from fatal blows is in peril today.

It's not just the locals who have identified this service provided by the mangroves, a peer reviewed study released in *Science* also shows that areas buffered by coastal forests, like mangroves, were strikingly less damaged by the 2004 tsunami than areas without mangroves. Of the five villages examined during the study, two were on the coast and three were behind mangroves. The villages on the coast were completely destroyed, whereas those behind mangroves suffered no destruction, also, not surprisingly, the areas unshielded by vegetation at the same distance as these villages from the coast were damaged. The study used before-and-after satellite photographs of the Cuddalore district in south-eastern India and surveys on the ground to reach their conclusions. The study concluded that the coastal forests protected the villages from tsunami damage by reducing the energy of waves. The study confirms earlier laboratory experiments, which show that 30 trees per 100 square metres may reduce the maximum flow of a tsunami by more than 90 percent.

Apart from serving as a natural shield, standing guard against impending natural disasters, mangroves are an indispensable part of the ecology. Mangroves are salt-tolerant plants of tropical and subtropical inter-tidal regions of the world. The specific regions where these plants occur are termed as a 'mangrove ecosystem'. These are highly productive, but extremely sensitive and fragile. They form a nursery for marine fauna and are an integral part in maintaining the ecological balance. Environmental services, such as sediment stabilization, carbon sequestration,



Bunds break the crucial water supply to mangroves

by the Adani Group of Industries in Mundra, Kachchh. The Mundra SEZ promises to have world-class industrial, business and social infrastructures like development of industrial plots, commercial and residential buildings, schools, colleges, hospital, entertainment, sports and recreation facilities. The SEZ will have all essential utilities such as power generation, transmission and distribution network, water desalination plant and supply network, sewage water recycling plant, telecom network and multi-modal connectivity, namely roads, airport, seaport and rail. The pre-existing in-zone Mundra port is another feather in the Adani cap. Indeed, the sky seems to be the limit for this region!



Several shrimp farms are constructed illegally by clearing mangroves





Salt pans are made by clearing mangrove forests

and watershed, are provided by mangroves. Mangroves also have tremendous economic value.

**Direct value:** Mangrove forests are home to a large variety of commercially important fish, crab, shrimp, and mollusc species. Mangrove wood is resistant to rot and insects, making it extremely valuable. Many communities rely on this wood for construction material, as well as for fuel. These communities also collect medicinal plants from mangrove ecosystems and use mangrove leaves as animal fodder. Recently, the forests have also been commercially harvested for pulp, wood chip, and charcoal production. The barks of mangrove trees are harvested as a source of tannin for the tanning industry. High tannin content is found especially in members of Family Rhizophoraceae, to increase their resistance to herbivore.

Indeed, mangroves are treasures of nature that cannot be taken for granted for either

foreign or unsustainable investments. SEZs are important to strengthen a nation economically and are a reality of modern time that cannot be ignored. What then is the solution? While SEZs do make sound economic sense in terms of foreign investment and employment creation, they need to be undertaken in consultation with the local community and with due concern to the impacts on the local environment and livelihoods. They need to be confined to areas that are truly 'wasteland', and not by means more foul than fair.

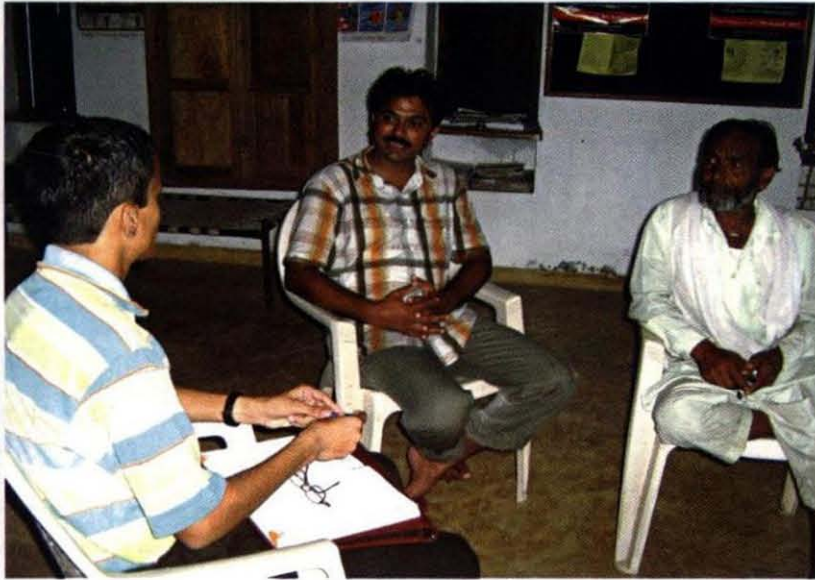
Relentless clearing of mangrove rich areas has been going on over the past few years to give way to rampant industrialization. While officials claim that the land

acquired by them is 'wasteland' and can be used for no purpose other than industrial use, a brief visit to Mundra tells a different story all together; a story of steady mangrove destruction. This destruction is highly systematic. First, bunds are constructed around mangroves plots; the trapped saline water finally chokes the mangrove to death. The mudflats are rendered useless and can now be reclaimed as 'wasteland' by industries. Such blatant degradation of a once



JCBs are being used to clear Mangroves in Mundra





Ibrahim bhai (extreme right) talking to the survey team

mangrove rich area! Is the Government aware of this ecological damage?

The Mundra SEZ is not just an ecological disaster, but also a socio-economic disaster. The *wagharis* – local fishermen community are already resisting the SEZ as it threatens their traditional livelihood. They have been fishing in this area for the last 200 years and have mastered the skill of fishing in different seasons, the skills passed onto the next generation. The SEZ not only directly threatens their settlements but also their fish catch. Relentless mangrove destruction has significantly reduced the fish catch in recent times. Ibrahimbhai, a highly revered senior fisherman of Bhadreshwar painstakingly explains how vital the mangrove cover is for the fish to lay their eggs. He has watched the fish catch decline with declining mangrove cover. Bhadreshwar lies between the Kandla and Mundra port. Polluted water from both the ports has made fish catch scanty on the Bhadreshwar coastline; fishermen now have to venture further into the sea to catch fish as

these pollutants alter the chemical nature and temperature of the coastal water. When asked if the fishermen would like to work in the SEZ as then they would have an assured means of livelihood without the seasonality and dangers that fishing involves, Ibrahimbhai merely smiles and says that the sea is their life. They were born as free fishermen and would like to live that way. Nonetheless he admits that with the decreasing fish catch it would not be surprising if the next generation of *wagharis* switch to working in the upcoming SEZ, however much they may resent it! Also, the fear of being uneducated and thus rejected in favour of other educated workers, coupled with the dignity levels of the work, makes them apprehensive about seeking work elsewhere. Such are the facets of an SEZ that promises to add to the 'booming economy', while it casts a shadow that will change the face of quaint talukas like Mundra forever.

It is understandable and acceptable that SEZs will provide a window towards rapid development. However, one needs to be careful that the very means of development do not become the reason for jeopardizing it. The question then is: How much should we sacrifice in the name of industrialization, for unmindful and ill planned business ventures? Are we willing to pay for it at the cost of putting our own survival systems at peril? After all its just one planet that we have and unless we give this a careful thought and take a stand today, the headlines tomorrow may well read ...

### "Cyclone devastates Indian coastline"



Ashwina Mahanti was an intern with the Conservation Department at the Society.

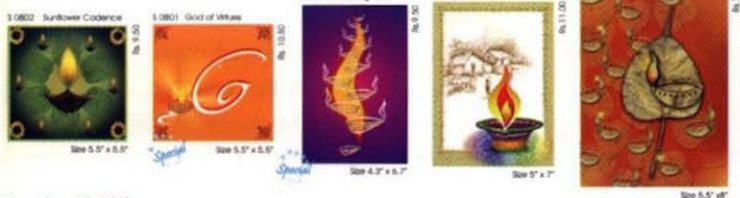
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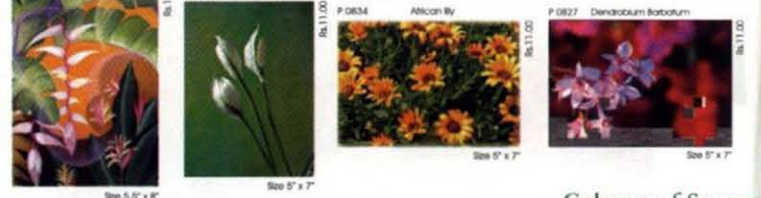


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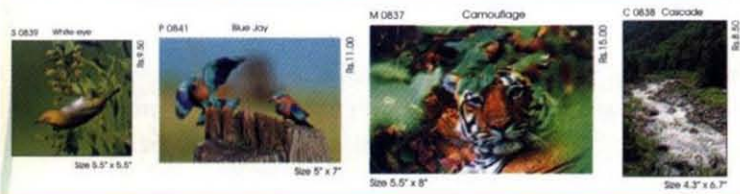
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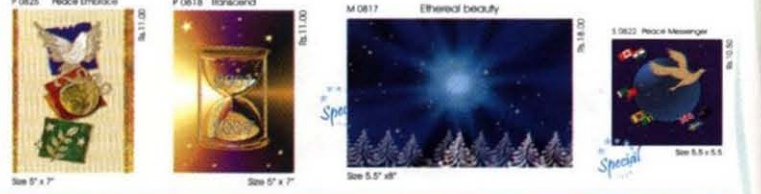
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## Workshop on Earth Charter at BNHS-CEC, Delhi

A two-day workshop for school teachers was conducted on August 27-28, 2007 at BNHS-CEC, Delhi in collaboration with the Development Alternative. Teachers from 45 schools participated in the Programme. Dr. B.C. Sabata, the Senior Scientific Officer from the Department of Environment and Forests also attended the workshop and shared his experiences with the participants. ■



BNHS PHOTO LIBRARY

The two-day workshop was of great help to the participants



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## 'Jungle Night' at BNHS-CEC, Mumbai

BNHS-CEC, Mumbai organised a 'Jungle Night' Camp on September 22-23, 2007 for children between 7-14 years; eighteen children attended the camp. The camp began with a walk in the wild, during which the children learnt different facets of nature. The new Display Room with its interactive displays on Camouflage, Tracks and Trails, Standing Tall were enjoyed by the children.

The participants were also taught a few gardening tips and how to make bunds. Bund-making, though tiring, taught the children the importance of bunds in preventing soil erosion and increasing ground water level. The camp ended with presentations by the children on their experiences at the camp. ■

It is important that we show the value of nature conservation to young minds



## 'PlantLife' Campaign of BNHS



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Shri H.D. Kumaraswamy, Chief Minister, Karnataka (second from left) launched the PlantLife Campaign of the BNHS

**BNHS** has initiated the 'PlantLife' Campaign with the aim and objective of positioning itself as a national conservation organization, and to build awareness about global warming and its effects through planting of trees. BNHS has been granted 200 acres of land in Mysore at Vijaynagar phase I, II & III by the Mysore Urban Development Authority (MUDA), Karnataka Government, for planting trees and nurturing them till they can sustain themselves. With the help of a horticulturist, BNHS will be taking care of these trees for three years.

The Chief Minister of Karnataka, Shri H.D. Kumaraswamy officially launched the campaign on September 2, 2007; the first sapling was handed over to the CM by Mr. Alexander Panicker, BNHS.

Members can sponsor the planting of a tree at a nominal cost of Rs. 750/- per tree with a signage. ■

## Prestigious J. Paul Getty awarded to Dr. Karanth

**Dr. K. Ullas Karanth**, Director Wildlife Conservation Society-India Program will be awarded the prestigious J. Paul Getty Award for Conservation Leadership by The World Wildlife Fund-US (WWF-US) on October 16, 2007. The award is established in memory of the famous philanthropist J. Paul Getty to honour outstanding contributions and accomplishments of some of the world's most distinguished conservationists and conservation institutions. The award is in recognition of Dr. Karanth's pioneering and outstanding leadership in conservation science throughout his distinguished career.



Previous winners of the award include His Majesty, Jigme Singye Wangchuck, King of Bhutan, pioneer in chimpanzee research Dr. Jane Goodall, Dr. Boonsong Lekagul from Thailand, famed ornithologist Dr. Sálím Ali, and Sir Peter Scott from Great Britain.

The award is unique as it not only recognizes today's top conservationists, but also helps develop conservation leadership for tomorrow. The award's cash prize of \$200,000 will be used to establish graduate fellowships named in honour of Dr. Karanth and J. Paul Getty. The fellowships will support graduate students in conservation-related fields at an institution of higher learning of the winner's choice. ■



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BALDOTA

# THE BALDOTA GROUP

## ADDING VALUE TO NATURE'S RESOURCES

Founded by Late Shri Abheraj H. Baldota in 1961, the Baldota Group is one of India's leading iron ore mining companies and holds the distinction of being the country's largest producer of wind power.

Under his visionary aegis, the Baldota Group transformed from a fledgling mining company to a full-fledged conglomerate, achieving leadership position in diversified businesses such as Iron Ore, Wind Power, Gases, Steel, Chemical, Diamond & Gold Mining. The Group has also demonstrated unflinching commitment to the community and has been recognized for its environment stewardship through various national awards.



The Group is built around the ethos of **Creativity • Commitment • Concern • Care • Core Values**

### Iron Ore Mining Breaking New Grounds

MSPL Limited is the flagship company of the Baldota Group. It is one of the largest exporter of iron ore from the private sector and was the first private sector company licensed to export iron ore from India and is the first unit certified in the mining sector of India for upgrades to ISO 9001: 2000 and ISO 14001: 2004. MSPL has significant exports to China and has won the CAPEXIL Export Award consecutively for six years for its excellent export performance.

The group is also foraying into diamond and gold exploration in the states of Karnataka and Andhra Pradesh and are likely to enter exploration of base metals.

### Wind Power Empowering a Greener Future

The Baldota Group, through MSPL and its group companies diversified into Wind Power generation. Its wind farms across the States of Karnataka, Maharashtra and Gujarat are taking its commitment to sustainable development to new highs. Together they generate a total group capacity of 191.6 MW, which is the largest installed wind power capacity in India in 2006.

MSPL's Wind Energy Project has been registered as one of the largest Renewable Energy CDM projects in the world by UNFCCC. The project will deliver green power of approximately 3033 Million Units (MU), thereby reducing emission of greenhouse gases (GHGs) to the tune of 2.50 Lac Tons/annum.

### Gases Medical and Industrial Lifeline

MSPL Gases undertakes the medical and industrial gases business of the Baldota group. It manufactures gases like liquid & gaseous Oxygen, Nitrogen and Argon Gas. Last year it crossed a milestone with the successful commissioning of its 50TPD (Build, Own and Operate) BOO oxygen plant at the SAIL premises in Bhadravati.

### Steel - Proving its Mettle

The Baldota group is setting up an advanced integrated steel plant in Karnataka - Aares Iron & Steel Limited. This project will initially set up a 2.5 MMT steel production capacity per annum. It will also comprise of a 180MW power plant, to produce the power using waste heats from the iron making process.

The Baldota Group is riding on the crest of some eventful years. It received the KREDL award for the highest investment and production in wind power in 2005. In 2006 it was awarded the prestigious CFBP (Council for Fair Business Practices) Jannalal Bajaj Award for Fair Business Practices. Recently it was awarded the Export Excellence Award by the Fédération for Karnataka Chambers of Commerce and Industry (FKCCI) for its outstanding export performance during the year.



BALDOTA

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