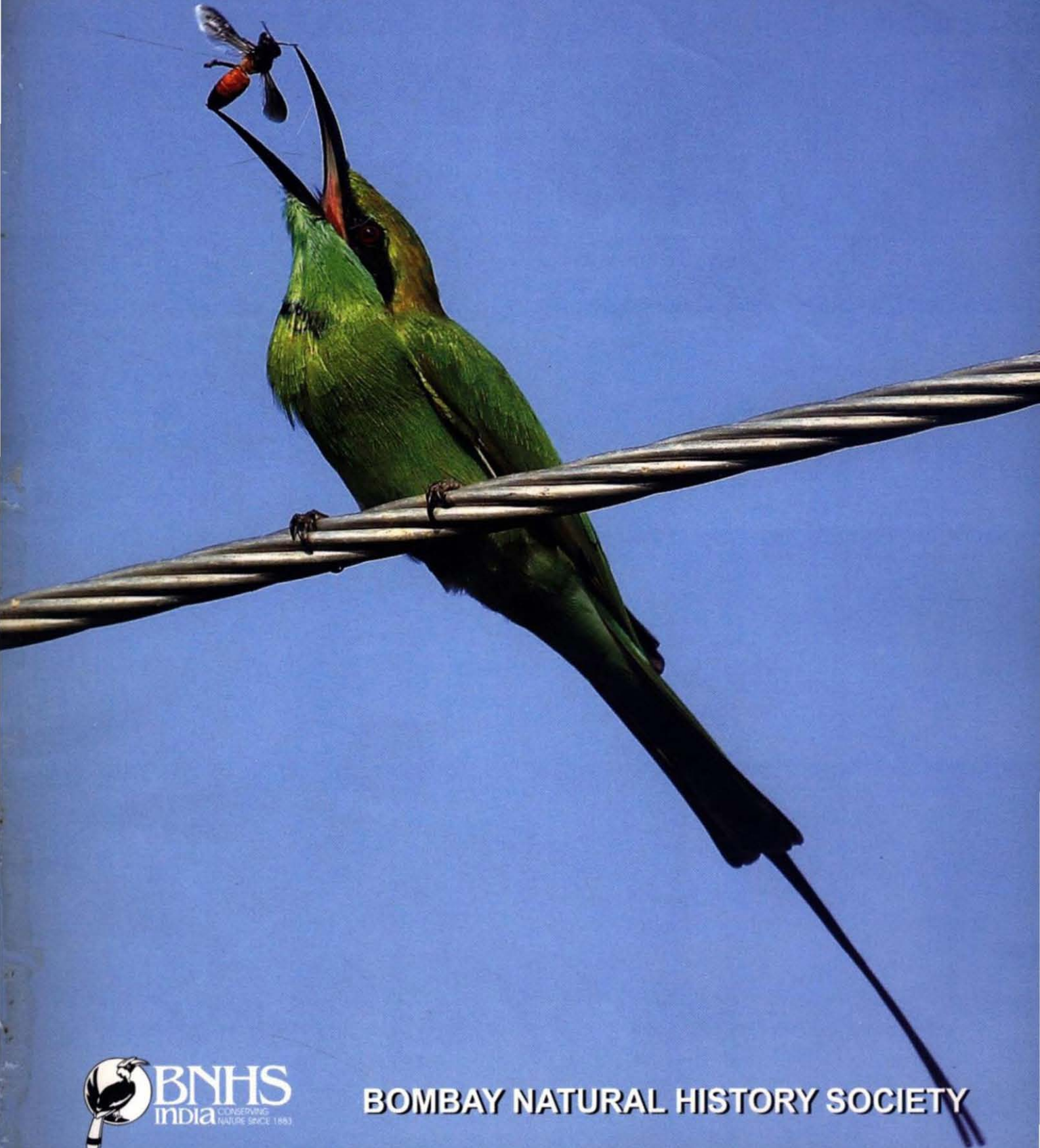


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OCTOBER-DECEMBER, 2007



BOMBAY NATURAL HISTORY SOCIETY

Declining Darter

Photo: A.I. Siddiqui



The Darter (*Anhinga melanogaster*), sometimes called Snakebird because of its long thin neck. They use their sharply pointed bill to spear their prey when they dive; this is how they get the name Darter. The presence of ventral keel on the 5-7 vertebrae allows attachment of muscles to project their bill forward like a spear.

Unmistakably large (84cm), cormorant-like water bird with very long, slender neck and head. Head and neck brown with white chin stripe extending down side of neck. The males have black and dark brown plumage, an erectile crest on the nape and a large bill than the female. Lives in large stretches of clean fresh water in lakes, big rivers, marshes, swamps, estuaries, bays, lagoons and mangrove swamps where it is an amazing diver, spending long periods under water.

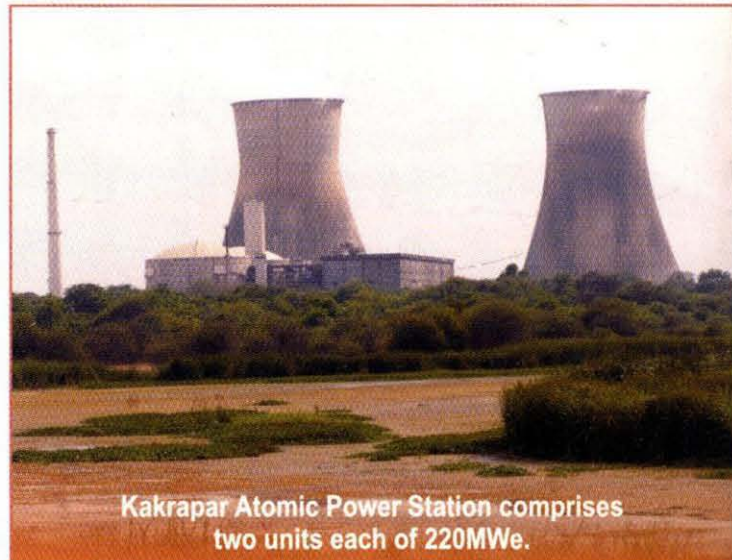
Darters feed mainly on fish but they also eat amphibians such as frogs and newts, reptiles such as snakes and turtles and invertebrates such as insects, shrimp and mollusks. The Darter is a widespread resident in India, unrecorded from parts of northwest, northeast and Himalayas.

The Darter is near-threatened species. Habitat destruction, disturbance at feeding grounds and colonies along with hunting and pollution are the main reasons for declining population. The species is generally uncommon and declining throughout Asia, with the global population estimated at 4000 individuals (BirdLife International).

Darter is found at NPCIL sites at Narora, Kakrapar, Kudankulam and Kalpakkam.

The Environment Stewardship Programme (ESP) of NPCIL, a voluntary programme, envisages scientific study of biodiversity, particularly avi-fauna, in the Exclusion Zones (EZs) and the environs of its seven nuclear power stations. EZ is a 1.6km radius area around the center of nuclear plant. While only a fraction of this area is used for the plant structures, remaining is used for green-beltting. Large number of bird species have made EZs their homes. The programme also includes training of local volunteers, public awareness campaigns to sensitize members of public on environment, improving habitat, particularly of avi-fauna, etc.

NPCIL as a responsible corporate citizen believes that these efforts will help in promoting habitat conservation and awareness on the importance of a healthy environment to make the world a better living-place.



Kakrapar Atomic Power Station comprises two units each of 220MWe.



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Small bee-eater *Merops orientalis*

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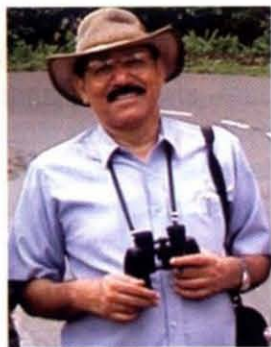
Will fenced Protected Areas work in Developed India?

It is rightly said that fences make good neighbours. As our country aspires to become a developed nation in the next 15 to 20 years (much like Europe), India will see massive changes in infrastructure development (roads, factories, airports, dams, railways, ports, mines, etc.). If we consider the demographic prediction of human population growth of India, about 40-50 crore more Indians will live on this land by 2045. All indications show that by 2050 India will be the most populated country in the world, surpassing China which holds this dubious distinction at present. If so, will there be any space for our beleaguered wildlife? Or, more importantly, what can we do to see that our wildlife survives?

An idea, perhaps heretical at present, is to fence our protected areas, particularly national parks and key biodiversity areas, so that human and wildlife are separated. This is happening in many parts of the world, particularly in southern Africa, the Middle East, and some parts of Europe. For example, the hugely popular Nairobi National Park is totally fenced from three sides to restrict the movement of people inside, and that of the animals outside the Park. In South Africa, where wildlife conservation and management have reached the highest level of professionalism, many protected areas are fenced. In this most developed country of Africa, one can go for miles without seeing any large wild animal, but as soon as one enters a protected area (private or government) it is teeming with animals of all sorts. Thanks to the booming ecotourism industry in South Africa, more and more areas are being developed as wildlife reserves. For example, in 2004, I visited the 7,000 acre Tala Private Game Reserve, a mere 45 minutes drive from Durban, which was full of antelopes of all kinds, Zebra, Giraffe, Wild Buffalo, two species of Rhino, Wildebeest and about

225 species of birds. I was told that seven years ago the Tala area was under agriculture farms, but the owners decided to convert it into a wildlife reserve as it would give them more revenue. They were not wrong. Tala is now a very popular tourist destination with entry only on advance booking. Similarly, the Pilansberg Wildlife Reserve near the famous Sun City was totally destroyed, its wildlife poached, vegetation over-grazed and land degraded. In a famous rescue operation, called 'Operation Genesis', an area of over 55,000 ha was fenced, the land was given a chance to heal, and slowly all the native wild animals reintroduced. In a 15-year period, 5,957 animals of 19 species were reintroduced. Now Pilansberg is a popular tourist reserve in South Africa. It is surrounded by 110 km double electric fence so that the animals cannot stray out.

Valmik Thapar, our respected tiger expert and writer, says that wildlife, particularly Tiger, and man cannot coexist, so they have to be separated. I totally agree with him. But how do we separate them to reduce this so-named 'man-animal conflict' (I call this man's conflict with animals)? Can we fence our protected areas in a manner that wild animals are inside, and man and his cattle, outside? This will not be easy as 3-4 million people live inside our protected areas, and many more just outside PAs. But at least we can try with some national parks that have minimum number of people, or at least fence the PA on the sides that have maximum conflicts, like in the Nairobi National Park, or our own Keoladeo National Park at Bharatpur. Perhaps before reintroducing Tigers in Sariska and after translocating villages, we have to fence this 800 sq. km Park from further encroachment and animals wandering outside the Park. Long term survival of the Sanjay Gandhi National Park in Mumbai, and its famous Leopards depend on the wall (fence) coming up on three sides, leaving only the



Tungareshwar side open for animal movement. This can happen only after the removal of encroachment that was encouraged by politicians. Once the wall comes, further encroachment would be curtailed. Perhaps, the Leopard will also know where its territory ends and human habitation begins.

The recent unfortunate electrocution of five Lions – 3 lioness and 2 cubs – outside Gir Sanctuary further convinces me that effective fencing of our major protected areas is the only long-term answer to this increasing human conflict with animals. A cotton farmer in Prempura village of the Amreli district, who was trying to protect his farm and cattle, had erected an electric fence around his farm, abutting the famous Gir Sanctuary of Gujarat. When three lioness and two cubs ambled into the electric-charged barbed-wire fence of the farmer, they were electrocuted. The farmer panicked and hurriedly buried the carcasses, and tried to forget the unfortunate incidence, but the truth soon came out when other villagers realized that five lions of a pride were missing. The 'poor' farmer was booked under the Indian Wildlife (Protection) Act. For me, this incidence shows the culpability and incompetence of our conservation movement and not the criminality of the farmer, who was trying to protect his farm. Newspaper reports indicate that the farmer will be prosecuted and may even face a 7-year jail, under the Wildlife (Protection) Act. India is probably the only country where one can be jailed for protecting his farmland!

Instead of a lethal and naively erected electric fence to protect individual farms and property around national parks, can't we erect non-lethal electric fences (which give mild shocks) around our protected areas; this will restrict wildlife, especially large carnivores and large ungulates, from straying outside? Unfortunately, our so-called 'wildlife management' has not gone beyond building ill-designed waterholes or creating ineffective fire lines! I have met some wildlife managers who have no idea of the latest wildlife management tools.

As India develops, we have to transform our wildlife cadre from IFS-based *babus* to

a highly professional cadre, that has modern thinking and uses modern technology. I recommend that modern-day wildlife managers should have a basic biology degree at at least under-graduate level. Most of our managers come from a non-biology background and during the first year of their course, they have to be taught simple lessons such as the difference between a genus and a species!

If we have to fence some of our protected areas, it is not just the physical barrier that has to be erected and maintained, but the whole gamut of wildlife management has to be changed. When we have to deal with artificially closed ecosystems, we have to upgrade our skills of conservation biology, animal behaviour, genetics, disease management, reintroduction, culling, translocation/transport of wild animals, habitat restoration, tourist management, and predictive modelling of the dynamic ecological sequences. Can this be done by a person with a degree in Mathematics or Physics? When an Arts student cannot become a doctor, how can a student of Physics become a wildlife manager? Don't we have some professional ethics? Even after 30 years in this field, I still have to refer to modern text books on basic ecology to understand some of the questions on wildlife management, while a student of Mathematics or Physics after passing a 2-year course from the Indira Gandhi National Forest Academy, Dehradun, has all the answers on wildlife management! It is perhaps only in South Asia where wildlife management is in the hands of non-professionals. The results are all around for one to see! We have *gai* (Cow) in the wildlife protected areas, and *nilgai* (Bluebull) in the cropfields, both in the wrong places. Can we rectify this mistake? Can we erect fences around some of our protected areas so that the *nilgai* enjoys the safety of a Sanctuary, while our beloved *gai* is safe from the wild predators? I think bringing more professionalism into our wildlife cadre, using modern concepts of conservation biology and thinking out-of-box solutions will help save wildlife in developed India.

Asad R. Rahmani

Nannaj –

The Land of the Great Indian Bustard

Text and Photographs: Martin Clement Francis



Great Indian Bustard

It has been for long a dream for me to photograph and to have a good look at the Great Indian Bustard (*Ardeotis nigriceps*). I saw this great bird almost 15 years back in Ranibennur, and since then have been in love with this bird. I did not have a decent camera those days and the digital world had not conquered the analogue, so the dream was still a dream until very recently, when I planned a trip to Nannaj (Great Indian Bustard Sanctuary), in the Solapur district of Maharashtra, with my camera buddy Niranjan Sant (from Belgaum). The Great Indian Bustard is an endangered species, and only some 350-500 birds are known to survive in the wilds of India.

The Forest Department Staff greeted us warmly on our arrival at the Nannaj Forest Guest House. The arrangements there were taken care of by our dear friend Mr. Raja Purohit, who himself is an ace wildlife photographer, from Pune.

Nannaj is a small town located about 20 km from Solapur city. It is one of the few places that makes one feel that there are places in our wonderful country that look like the more showcased African wilderness. The place is simple and the aroma of rural India still exists here. For individuals like me, who live in concrete jungles, any opportunity to travel to the wilds of India or to the basic life of rural India brings great joy and satisfaction.

Rain is an infrequent visitor to this region of Maharashtra, which remains dry throughout the year. The vast expanse of grasslands and thorn bush country makes Nannaj the perfect haven for the Great Indian Bustard, Blackbuck (*Antelope cervicapra*), Indian Wolf (*Canis lupus*) and the many grassland avifauna and mammals. With the help of Mr. Bhagwat, Wildlife watcher – Forest Department of Nannaj, we headed to the protected zone of the Great Indian Bustard Sanctuary. There is a watchtower situated right in the middle of this protected area from where tourists, birders, photographers and naturalists are only allowed to watch the wildlife; no one is allowed to walk or move about in the protected zone, to prevent disturbance to the wildlife. The flight of a couple of Great Indian Bustard females greeted us as we walked towards the watchtower. We took some flight shots immediately, a good start to our trip. From the watchtower we observed around 300 or more female Blackbuck and around 10 male bucks. Most adult females were pregnant. The whole group was divided into smaller groups

by the dominant males and were well-guarded by them. There was an intense battle going on between the territorial males for the right to mate. We waited at the watchtower for an hour, but there were not many wild life movements towards us so we left the area, jumped into



Great Indian Bustards in the vast grassland expanse of Nannaj



A herd of Blackbuck at Nannaj



Scores of grassland birds like these Collared Doves can be seen at Nannaj



The chicks of the Indian Courser at times pull at the tail feathers of the parent to get fed

the car and hit the roads on the periphery of the Sanctuary.

The scrubland around had scores of larks, silverbills, Chestnut-bellied Sandgrouse (*Pterocles excustus*) and many Indian Coursers (*Cursorius coromandelicus*), some with young, in breeding plumage. We found a few Indian Coursers (*Cursorius coromandelicus*) with chicks on a small sandy hillock. As daylight was fading speedily, we took our photo gear and started capturing these amazing little ground birds. As we were observing these birds, we witnessed a particular behaviour of the Courser chicks that I would love to mention here – whenever the chicks wanted to be fed, they would pull at the tail feathers of the parent with their beak, and immediately the parents would run

around collect a grub or two and feed them. We saw this behaviour a number of times. In the nearby sandy hump, which was around 2 km from where we photographed the Coursers, we observed, through the binocular, two pups and three adult Indian Wolves. It was an amazing site to see these endangered mammals, which have survived the onslaught of man for many years. It was a satisfying afternoon of birding and photography, and after sunset we returned to camp. Very close to the camp, we saw a spectacular Eurasian Eagle-owl (*Bubo bubo*) perched on the Forest Department office rooftop. Mr. Gaikwad, who was in charge of the hospitality, greeted us with some tea and snacks, before we settled down for dinner.



Blackbucks are constantly under threat from predators like domestic dogs

We hit the road early the next morning, along with Mr. Bhagwat, so that we could photograph the wildlife undisturbed. We were all set with our equipment when the first ray of morning light arrived on the grasslands. We were lucky to photograph a Southern Grey Shrike (*Lanius meridionalis*), and the Red-winged Bush Larks (*Mirafra erythroptera*) that allowed close approach. During the drive around we spotted a lone Chameleon, almost 60 cm long, the largest that I have seen till now, crossing the road. Large Grey Babblers (*Turdoides malcolmi*) were everywhere looking for insects and anything edible.

Mr. Bhagwat informed us of a nullah from where we could see the Eurasian Eagle-owl. It was almost afternoon and the sun was at its zenith, not a favourable time for photography. So, we headed back to the camp where lunch was ready and we rested for a few hours to regain our energy for the post lunch session.

We decided to spend the afternoon at the watchtower to try our luck with the Bustards. When we arrived there, we saw four adult male Great Indian Bustards at the horizon at their usual duty, picking up grubs and edibles from the grassland. Their peace was soon disturbed by two feral dogs, that had ventured into the protected area and started to chase everything in sight. They chased the Blackbuck for



The Southern Grey Shrike, surprisingly, allowed us some close encounters



Lady luck was definitely by our side else we could not have captured this Red-winged Bush Lark in our camera



This awesome Chameleon is the biggest that I have spotted until now



We almost missed a heart beat when we spotted the Black-naped Hare

sometime and then the Bustards, which made the birds to fly to a far off location. We drove in the direction where the birds landed, which was outside the protected area. We did see them again, at a private farm, standing under

the cover of thick thorn bush, but they were against the light so we could only get a few shots of them. That area was abuzz with innumerable grassland birds and we did get some photographs of the Red Collared-Dove (*Streptopelia tranquebarica*), and the Indian Courser. When returning to the camp that evening we saw the elusive Black-naped Hare (*Lepus nigricollis nigricollis*), but our attempts to get a picture failed miserably due to bad light.

The next morning it was time for us to leave Nannaj and head for home. Since we had some time, we decided to go birding until 10 a.m.; and headed towards the protected area. We found no bustards, but we were lucky to find a Black-naped Hare sitting near a bush very close to our car. We clicked to our hearts content for this was the first opportunity that I had had in these many years of my photography life. Though Black-naped Hares are found everywhere, they are very shy and seldom show up in the open. We explored the grassland areas away from the protected area, hoping to see the Bustards one last time, but returned dejected. And thus, ended a trip to a beautiful Bustard Sanctuary.



A Jackal seen searching for prey at Nannaj

A juvenile Short-toed Eagle



The future of this Sanctuary looks very bleak. There are too many private farms close to the protected area. Some real estate firms have already put-up their boards that say “residential sites for sale”. The protected area is very small to support the birds and mammals that it is home to. When the food, plants and insect life are finished within the protected area by the Blackbuck and other wildlife, they venture outside the Sanctuary where threats come in various forms. They immediately start competing with cattle owners and shepherds, this causes competition and unhealthy competitions can have tragic effects on wildlife. Domestic animals can spread diseases to the wildlife. The domestic dogs that are often seen in the protected zone can be of great threat to young Blackbuck. It has been always noticed in other wildlife parks in India that once the feral and domestic dogs taste blood, they always remain in the area and attack wild animals. These need to be eliminated immediately in the interest of the

Blackbuck and Bustards. The Forest Department personnel are knowledgeable and dedicated, they need to be supported with more manpower and better equipment to transform them into a well-organized team for biodiversity conservation. The protected zone should be increased soon; Government should promote eco-tourism, which will generate funds, which in-turn can be diverted towards protecting the area. The ever-growing population in India is putting a lot of pressure on our wildlife. Unless a valiant effort is made to protect this area, very soon this place will be only a thing of the past, with no more Bustard to grace the landscape! ■



Martin Clement Francis is a bird watcher, wildlife photographer, and an active participant in conservation activities. His work has been published in national and international magazines, books and educational brochures.



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The Magic of Nature Sound Recording

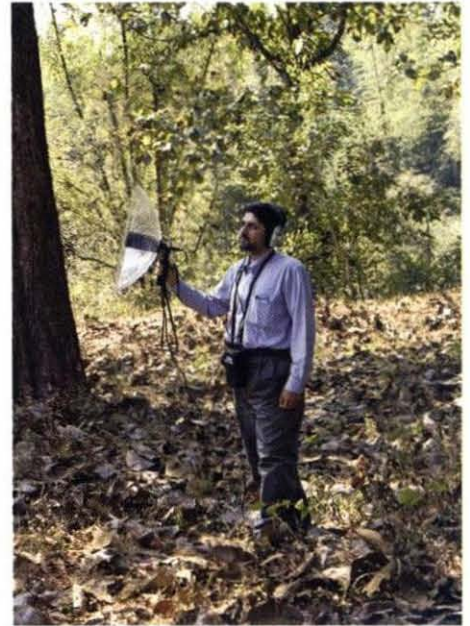
Text and Photographs: **Sanjay Marathe**

“Arrgh! ... Arrgh! ... Arrgh!”

The angry triple roar in quick succession startled us as we sat in the dark *machaan*. The next moment, having regained our senses, each of us scurried to get hold of our Sennheiser, Audio Technica (*Names of highly directional gun microphones, with elongated barrel that can be directed from a distance at a localized sound source*), Omnis (*omnidirectional mikes that can receive signals from all directions*) and Telingas (*a parabolic reflector which concentrates distant sounds onto a conventional microphone placed at its focus*), and hit the record button on our sound recorders. We sat motionless for what seemed like

eternity, but the roar did not come again. Soon after, the excitement of the sounds that we had just heard gripped us and the group was drawn in an animated exchange of expert advice accompanied by imitations of the roar. There was conjecture about it being a Black Panther, out hunting in the night. A Black Panther had been sighted in this area by some forest guards and visitors during recent outings.

Our group was perched on a 6 m high concrete *machaan* overlooking a large water body, on the jeep track leading to Kavala caves. Having reached the spot earlier at dusk,



The author recording the tapping of a woodpecker on a tree



The location of this machaan, next to the water body on the Kavala caves road, surrounded by dense trees, makes it an ideal spot for observing wildlife

Nature sound recording

we watched as the forest faded into the night, and thousands of stars appeared in the sky. In the light of the near full moon, we spotted a Barn Owl (*Tyto alba*) on a tree, and nightjars flying; the latter are nocturnal birds that get their name from their feeding habits, as they fly around with their large mouth wide open, and gobble the insects that cross their path. This mixed deciduous forest region in Dandeli Wildlife Sanctuary has dense growth of primarily teak and bamboo, and lies in northern Karnataka, about a 100 km from the borders of Maharashtra and Goa.

I was a participant at a five-day Nature Sound Recording Workshop conducted by Dr. Meena Haribal, and Mr. Umashankar, a professional sound engineer based in Delhi. Dr. Meena, who works as a research associate at the Cornell Lab of Ornithology, USA, is the author of *THE BUTTERFLIES OF SIKKIM HIMALAYA AND THEIR NATURAL HISTORY*, and was also earlier associated with the BNHS. I had reached Kulagi Nature Camp by train

from Mumbai, a couple of days in advance. Alighting at Londha junction at 2 p.m., I looked around for some kind of transport for the remaining journey. At the station, there was a solitary jeep, waiting to pick-up some employees of a local company. I managed to hitch a ride, and had good reason to feel lucky because there was

no other transport at the station – bus, tempo, rickshaw or even a bicycle. It is a 2 km walk to the nearest bus stop from where buses to Dandeli are available. But for now, in the comfort of the front seat, I settled down for the 50 km, one hour journey to Dandeli, spotting Langurs and Termite mounds as the jeep traversed the



Human presence especially after long tiring sound recording sessions all alone in the wild is a welcome break



Tents at Kulagi Nature Camp are ideally located in the forest area

winding roads of the thick forest. From Dandeli bus stop, another 15-minute share-jeep ride (state transport buses ply this route as well) dropped me off at Kulagi square. A final walk of 0.8 km brought me to the Kulagi Nature Camp.

Nature sound recording is not very common in India, though enthusiasts like Dr. Meena are trying to popularize this art among nature lovers here. It involves moving into the wild, and recording the sounds that nature has to offer. The basic hardware required is a decent microphone, analog or digital sound recorder, and a pair of good headphones, to monitor the recording.

The microphones available today range from cheap local makes to the best brands, with prices ranging from a few hundred to many thousand rupees. The same applies to recorders as well, and the better ones are quieter, resulting in noise-free recordings. There are many websites catering to the subject, as well as many good books, for the serious enthusiasts. The importance of nature sound recording has not been realized in India, though it can play a vital role in conservation, besides being an excellent learning aid. Recording the sounds of birds and animals makes it possible to hear them repeatedly, thus making it easy to identify and get familiar with various bird calls. It can also help in understanding their behavioural patterns and perhaps indicate the presence of other birds or animals associated with a particular species. A recording in a forest, if carried out periodically at the same locations, can indicate the changes in populations of various birds, thereby indicating the condition of the forest. The basics of nature sound recording are similar to any other recording process; however, the difference is that nature sound recording also requires some experience of forest trails. Some knowledge of animal and bird habitats and their behaviour patterns is beneficial, so that the recording can be done with the least disturbance, resulting in better quality of sound as well as greater variety.

At times, when reviewed back in the studio, recordings reveal sounds that were inaudible to the person while recording. Very low frequencies, also called infrasound, is caused by sound waves below the lower limit of human hearing (about 16-17 hertz) and can travel over great distances without getting impeded by obstructions. Mikes can pick up the gurgling sound

of distant streams in the forest, or the drone of aircraft engines which are miles away. Sometimes, the creature making the sound is so small that recording is not possible in the outdoors. Sounds emitted by many tiny insects are so weak, that they have to be recorded in professional studios, with special mikes in total silence. These recordings are used in wildlife documentaries to give an insight into the life of these creatures.

As we started our routine each morning, before daybreak, a vehicle dropped each participant solo in a forest region, so that there was no disturbance caused by the others' footsteps. Depending on the species in the vicinity, each person would move around and record the sounds, eagerly hoping for a miracle to happen. My first recording session was magical – as if I were in a different world! I was recording with a Sennheiser gun microphone; a gun mike is designed to primarily record unidirectional sounds, along with some other ambient sounds. Pointed in the direction of the source, it can pick-up those sounds pretty well. Equipped with this very



Camp participant Shamala tries her hand with a gun mike

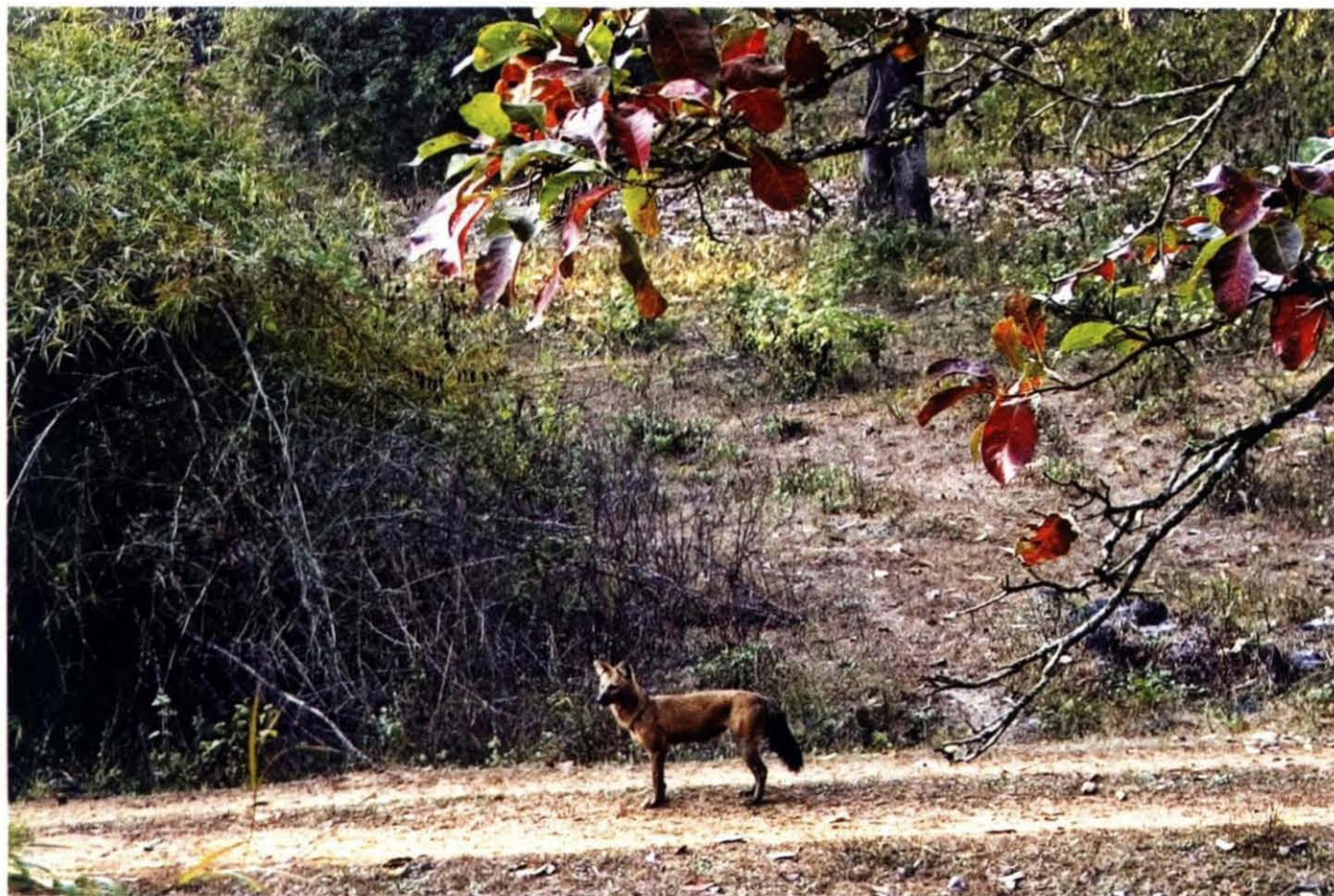
capable mike, I heard a great variety of sounds of nature – some I had never noticed earlier and others I never heard before with such clarity.

In the pre-dawn silence, before the chirping and birdsong began, I heard the tiny thuds of dewdrops hitting the dead leaves on the forest floor, as dew collected on the leaves of tall forest



Camp participant Shamala gets hands-on instructions from Meena Haribal (left)

Nature sound recording



Hunting as a pair: This Wild Dog is on the trail of a Chital, taking turns with its partner in the chase

trees, and fell on the parched ground, rejuvenating it in the process. As I enjoyed the soothing sound of dewdrops, a soft but violent generator-like rumble intrigued me. It started after every 2 minutes and continued for about 7-10 seconds, sometimes stretching to 20 seconds, before stopping with the sputter of a dying engine. Had I been in an area with habitation, I would most certainly have passed it for a motorcycle. There was no way I could see this small creature in the darkness; perhaps it was a carpenter bee boring its tunnel in a dead tree nearby. As daybreak neared, the silence was broken by intermittent calls of jungle fowl, which were easily discernible as there was no competition from other birds. But very soon, as the sun came up over the

horizon, the birds woke up one by one, and started calling. In no time, the place was full of birdsong, with different species vying for attention.

There are different kinds of calls that can be heard in the forest. This is the language used by birds, mammals, amphibians, reptiles and insects to communicate. Some calls are made to attract the opposite sex; some are used to call out to parents or young ones, some calls are signals demarcating a territory, while some are alarm calls made to warn of predators nearby. The duet calls of a pair of birds are often very enjoyable. The Coucal or *Bharadwaj* is one such bird – I have seen a pair calling in tandem. Just as one of them started calling – *Oop...oop*, its mate perched nearby would join in and stop as soon as the

first call stopped. Beginners usually start off by identifying calls of common birds like Myna, Sunbird and Parakeet, but experts can often identify scores of calls, often differentiating between individual birds of the same species. I have seen some experts imitating a birdcall, and eliciting a response from a bird in the woods; though this practice has experts divided over its misuse and potential negative impact on the species. Dr. Meena believes that indiscriminately fooling birds to respond to recorded calls often drains their precious energy, which they require in their tasks of finding real mates, and nest-building.

Having spent the first morning discovering a new world, every person in the group was addicted. For the next three days and nights, the group would

wake up earlier than the birds and retire late at night, when the nocturnal birds, animals and insects get active. At midday, we returned to camp to listen to what we had recorded on our digital recorders, and transfer the files to laptops for editing, using sound editing software, catching an occasional wink. At each outing, we covered a different spot in the jungle, thus being exposed to sounds of different species, which varied according to the habitat.

Over the period of five days, experts in the group identified calls of about 60 bird species, and confirmed many of them by sighting. Near a lake, I recorded sounds of frogs clicking and croaking in chorus, the omnipresent crickets, egrets fighting for a perch in a bamboo thicket next to the water, and the shrill 'Tetree' calls of the Red-wattled Lapwing. During our trip we got active co-operation from the District Forest Officer at Dandeli, Mr. Manoj Kumar, who is an avid conservator. He showed keen interest in our nature sound recording activity, and accompanied us a couple of times on our recording trips, always making sure to be present on time.

On the last day, early in the morning, I was recording near the *machaan* mentioned earlier, and was totally unprepared for what happened next. The pronounced crunching sound of dry leaves on my right attracted my immediate attention. To my bewilderment, I saw an adult male Spotted deer (*Chital*) spring from the



The group gets a demonstration of the hardware and software used for recording sounds in the wild

forest, running zigzag trying to dodge a pair of Wild Dogs chasing it. But that is a story in itself and will have to wait for another time; the relevance here is that when the Wild Dogs cornered the *Chital*, it gave three braying distress calls, which were picked up by one of the participants, who was recording in the vicinity. Watching the hunt from the ground with my own eyes was a unique experience, and a great way to end the trip.

As the train left Alnawar station and passed through the dense teak

forests on its winding track, the setting sun cast a soothing warm glow along its length. Watching the play of light through the trees, I recollected my thoughts about the trip, which had been quite satisfactory. However, the hunting incident and the angry Leopard call that we failed to record, taught me a most important lesson in nature sound recording – being alert, always, and maintaining concentration is a must; a moment's lapse can result in missing out on a rare bird or animal call. ■



Sanjay Marathe is a commercial photographer, teaching in a college in Mumbai. Currently he is pursuing a career in travel & nature photography/writing. Besides volunteering at the BNHS-CEC, Mumbai, he conducts the eco-club at IES's Manik Vidyamandir, Mumbai. He has recently completed a 'Diploma in Environment Education' conducted by Centre for Environment Education (CEE).

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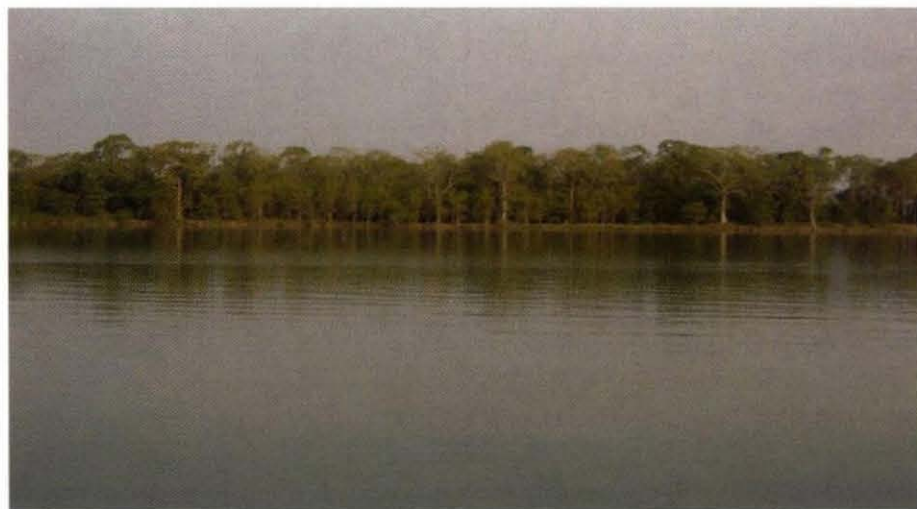
Our fascination for Katerniaghat commenced on a rather dramatic note. We were headed for Katerniaghat Wildlife Sanctuary (KGWS), for the first time, by road, from Lucknow in November 2006 when suddenly, while approaching a left turn near the Forest Rest House (FRH), a twirling movement, probably a tail, caught our attention. We slowed the vehicle and advanced cautiously. As we reached the turn, flattened in a depression, looking straight at us was a big male Leopard. Having evaluated the situation for a few seconds, it leapt backwards and in one quick single move, bounded off into the jungle. About 90 m from this place was the gate to the FRH. What a welcome!

Uttar Pradesh lost a sizeable chunk of its forest cover when Uttaranchal (now Uttarakhand) was carved out of it in November 2000. The State now holds only the Dudhwa National Park, along with Kishanpur, Katerniaghat, Suhelwa, and Sohagi Barwa Wildlife Sanctuaries. In this new political scenario the wilderness has shrunk to merely a streak along the northern Terai belt in a 'left-over' State. Among the protected area of the State the Katerniaghat Wildlife Division stands out for its forest of about 550 sq. km, near the Indo-Nepal border, located in the Bahraich district, with all the components that support a heady cocktail of wilderness. A part of the area, 400 sq. km, was already notified as a wildlife sanctuary way back in 1976. This Sanctuary presents an amazing variety of habitat with dense forests, grasslands, rivers, water bodies and even cultivated farm lands. No wonder then, that this variety is liberally expressed in the wildlife which exists here!

Motipur, Kakraha, Murtiha, Nishangarha and Katerniaghat are the five main blocks of KGWS, the last two being the main constituents. A

Exploring KATERNIAGHAT

Text: Vinai Shukla, Mamta Shukla and Amitabh Agarwal



The Geruwa river surrounded by dense forest adds to the beauty of Katerniaghat Sanctuary

single asphalt road and a parallel railway line enter Motipur and go all the way up to Katerniaghat. The road ends at the Geruwa river, having run for over 35 km through the forest. The railway line turns west from Katerniaghat towards Girijapuri

irrigation reservoir and beyond to Sitapur and Lucknow. Nishangarha is endowed with rich dense forest and has over 40 km of internal surveillance roads. Birds and butterflies abound here as do the big cats and herbivores. Katerniaghat has grasslands and an



Red-crested Pochards and Eurasian Coots are part of the diverse avifauna at Katerniaghat

active river system to add variety and support to this richness. The myriad flora of Katerniaghat is typical of the Terai region, though *Sal* trees dominate. A critical biological corridor – Khata – links Katerniaghat to the Royal Bardia National Park of Nepal, which allows unrestricted movement of animals across the border.

Running along the northern boundary of the Sanctuary is the Geruwa river. The River runs downstream westwards and reaches the irrigation barrage at Girijapuri, which is a paradise for birders. Over 140 species of local and migratory birds can be seen here. A 'bund' road runs along the river for about 6 km from Katerniaghat to Girijapuri. A drive along this road in the wee hours of morning and late in the evening provides ample sightings for birders. With a river, reservoir and other smaller water bodies on one side and the forest on the other, this stretch is rich in biodiversity.

The Ganges Dolphin *Platanista gangetica*, also known as Ganges River Dolphin, is an endangered species with less than 2000 survivors. Over 700 of these are found in Ganga and its tributaries. Locally called 'susu', these



VARAD GIRI

Pythons dwell among grasses and scattered trees of the Sanctuary

Dolphins have a poor eyesight and depend mainly on their acute sense of sound. In fact, they use 'echo-location' to track their prey, which they catch with their long beak containing many small, but sharp teeth. They can weigh up to 90 kg and measure 1.5 to 2.5 m. Fortunately, one gets to see these distant cousins of whales in the Geruwa river, but one has to be alert to spot them for they would come above the surface of water for a gulp of fresh air every 3 to 4 minutes. All one gets is a glimpse of the dorsal side

with a prominent spine and wet brownish skin. The movement is arc-shaped, but half submerged in water. Each show lasts for less than a second.

Historically, all major river systems of the Indian subcontinent had a flourishing population of Crocodiles, but obvious pressures have limited them to exist in scattered and diminishing groups. Concerted breeding programs have helped to raise their population and Geruwa river supports a healthy population. The adult male gharial



SURESH CHOUDHURI

A picturesque site of a Gharial basking in company of Lesser Whistling Teal



VINAI SHUKLA

The absolutely harmless
Common Sand Boa at the forest
rest house

(*Gavialis gangeticus*) develops a cartilaginous protuberance at the end of its snout which resembles a 'ghara' and hence its name. Although the crocodile population here seems to be high, there may not be more than five or six breeding males in this area. Less than one per cent of gharials hatched naturally reach a length of 2 m, a size which secures them from predation. They may grow up to 6 or 7 m. Mugger or Marsh Crocodiles (*Crocodylus palustris*) share the habitat here with gharials. They have stronger legs than gharials and can raise their body and walk on the ground. They are known to cover considerable distances terrestrially. It creates a very picturesque sight, when these reptiles come out to bask in sunlight, loosely scattered on sand islands and along undisturbed parts of river banks accompanied by flocks of Lesser Whistling Teals and a few waders. Brahminy ducks flock a little away on a

separate island, behind which stretches the distant river bank flanked by dense forest. In the far northern horizon, blue-grey foothills of the Himalaya present an unforgettable background.

Between Katerniaghat FRH and the river, there is an abandoned railway station. Near this is a large depression, with a shallow pond in the centre, about 20 m long and half as wide. This is surrounded by grasses and scattered trees. Pythons (*Python molurus*) abound here and when temperatures dip down in winters, they reach out to warm themselves in sunlight. At times the entire set up looks very eerie with pythons hanging from branches of trees, coiled up in forks or simply stretched out on the ground just outside the edge of water; so many of them in a little patch! As you approach them they slither away into the water creating a very unwelcome sound caused by friction of scales as their coils rub against each other on movement.

Perhaps, Katerniaghat is the only known area where vultures are nesting and laying eggs in natural conditions. More than 30 such places have been identified within the Sanctuary. Nests of Indian White-backed Vultures (*Cyps bengalensis*) are seen on Semal (*Bombax ceiba*) and Haldu (*Haldina cordifolia*) trees. Long-billed (*Cypis indicus*), Red-headed (*Sarcogyps calvus*) and Egyptian (*Neophron percnopterus*) vultures are also present in the Sanctuary. The alarming decline of vulture population over the last decade has been a cause of concern for all environmentalists. Recent extensive research indicates the medicine *Diclofenac* to be responsible

for such widespread fatality. When vultures feed on freshly dead livestock treated with the medicine, they die. Survival of the vultures depends on the effective ban of this drug.

One morning when we were about to leave for our routine jungle round, the rest house attendant came out screaming excitedly at the sight of a snake just behind the room. He added that the bite of this snake causes sudden swelling of the body which is fatal, so we all ran out to see. It was then that we discovered it to be a corpulent non-poisonous snake, a Common Sand Boa (*Eryx conicus*), which was half a meter in length and absolutely harmless.

Although Katerniaghat offers a lot of promise, a very strong human presence now pervades the air. The main road is steadily getting busier with ever increasing local traffic mainly catering to villages within the Sanctuary. Bichhiya is a small settlement that has come up on encroached forest land between Nishangarha and Katerniaghat. It caters to all basic needs of the locals as well as visitors like us. As we reach Bichhiya, we are struck by the graffiti splattered across walls screaming for 'independence' of 'Van Grams', which are settlements within the Sanctuary fighting against relocation and claiming to be as much a part of Sanctuary as its flora and fauna. They vow to protect jungles and their denizens, in case they are liberated under a movement called 'Azadi'. Convincing as of now, but what happens as these settlements grow and explode encroaching uninhibitedly? ■



Vinai Shukla, businessman by profession, is a keen wildlife enthusiast, writer, photographer and traveller. He is currently studying butterfly parks of the world.



Mamta Shukla, a post graduate in Ecology and Environment, works as a freelance consultant for various conservation projects.



Amitabh Agarwal, an advocate and member of the SC Bar Association, works for wildlife conservation and has represented numerous NGOs.

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DAROJI BEAR SANCTUARY

A Haven for Wildlife

Text & Photographs: Shrenik Kumar N. Baldota

“*Papa bhaaloo kabaan hai?*” my little Karmaditya asked coolly. We were at Daroji Bear Sanctuary waiting to catch a glimpse of Sloth Bears; it was a February afternoon and the sun was hot, and the boulders blistered. We sat excitedly staring at the ‘*Karadikallu Gudda*’ (a hillock of bears), which has hundreds of caves sheltering a number of Sloth Bears (*Melursus ursinus*).

Around 3:30 in the evening, the Sloth Bears emerged from the caves. There were many singletons, mothers and cubs. They came in batches to the lick area and after having had their share disappeared into the bushy forest. We saw about 12 bears that afternoon. Though it is generally difficult to see any wildlife in its habitat, here one could see the animals easily; and I captured as many of them as I could in my camera.



The thorny and rocky forest that stretches between Daroji village of Sandur taluka and Ramsagara village of Hospet taluka has been an abode of Sloth Bears for centuries. The stony outcrops, caves and the dry deciduous forest provide a suitable habitat for Sloth Bears. This area, including Hampi nearby, is believed to be the mythological 'Kishkinda' – the kingdom of Hanuman and Jambuvanta (the Bear). As the human population in the nearby areas increased the pressure on the forest increased. The forest was cleared for fuel wood and agriculture. Loss of food chain and habitat drove the Sloth Bears to nearby agriculture fields. Man-animal conflicts were common, and losses on both sides were mounting, until the Karnataka Forest Department intervened and strived to declare

a 55.87 sq. km area in Bellary district, Karnataka, Daroji Bear Sanctuary on October 17, 1994.

Imposition of stringent laws and committed watch and ward activities allowed the forest to regenerate naturally. The barren and degraded forest of yesteryears bloomed into a green forest. The Sloth Bears have also contributed to the growth of the forest. The forest harbours endemic species of different fruit bearing bushes that yield fruits throughout the year. The Sloth Bear eat these fruits, and spread the seeds across the forest through droppings.

Not only flora, but also fauna flourishes here. It is roughly estimated that about 130 Bears, a number of Leopards, Wild Boars, Hyena, Wolves, Jackals, Pangolin, Porcupine, Hares,



Wildlife like the Wild Boar exist in the Sanctuary



Peafowls wander freely at the Daroji Bear Sanctuary



The stone caves and dry deciduous forest at Daroji provide an ideal habitat for the Sloth Bear

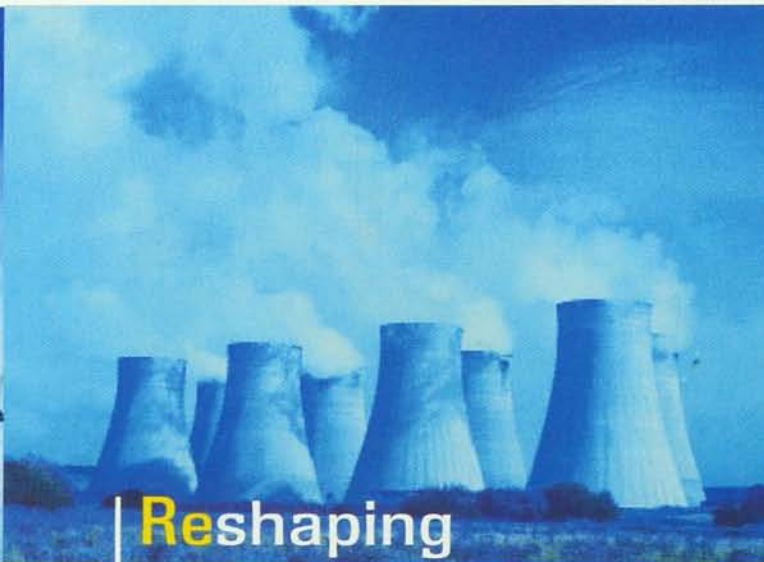
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Daroji Bear Sanctuary is a must visit destination for a wildlife enthusiast

more than 100 species of Birds, and around 30 species of butterflies are found at the Daroji Bear Sanctuary.

The arduous effort of the committed staff at Daroji is the reason behind the success of the Sanctuary. In the beginning the Range Forest Officer (RFO), Mr. S.V. Kambali identified the borders of the Sanctuary and took up development activities. But it was Mr. Sangamesh Math, whose efforts made this barren, rocky and thorny forest area a safe haven for wildlife, including the Sloth Bears. Mr. Math had studied

the life and behaviour of the Indian Sloth Bear and other wildlife. It was he who persuaded the people of the surrounding villages to support wildlife conservation, and the difference it made is there for all to enjoy.

A local villager recollects, "When we were children, we used to go to the forest to collect firewood. There was nothing left to call this area a forest. Today it is hard to believe that this thick green lush forest was our once stripped forest?"

The man-animal conflict that created such a hue and cry in the area a decade ago seems to have been resolved. Since food is available in plenty in the forest, the Sloth Bears do not raid the crop fields.

Those who have visited thick and evergreen forests may find this forest insignificant. But this tiny green patch of 55 sq. km is like an oasis in the midst of Bellary district. The Sanctuary provides a perfect habitat for flora and fauna that would have disappeared had they been left unprotected. It is this 'tiny patch' that provides liberty to a mother Sloth Bear to take her infant cubs for a joy ride in broad day light; and creates opportunities to capture the beautiful Indian wildlife in our cameras. ■



Mr. Shrenik Kumar N. Baldota, Executive Director, MSPL, is a philanthropist, an avid wildlife watcher, adventurer, excellent photographer, glider, trekker, and expedition traveller. He has visited the north pole, Antarctica, and Vanuatu volcanoes, and researched the Botswana Nile crocodiles.

ABOUT THE POSTER



Red-headed Vulture *Sarcogyps calvus*

A huge black turkey-like vulture, the Red-headed Vulture has a deep scarlet naked head, neck and legs. It is a carrion-feeder, usually present in singles, couples or in triplets among all the vulture gatherings at animal carcasses. This Vulture has a false reputation for boldness and audacity, and for monopolizing a carcass until it has had its fill of the choicest tit-bits. In fact, it is timid and cowardly, keeping differentially aloof of the scrimmage, sneaking in and hurriedly withdrawing with a goblet of flesh only when the pressure of the other feasters has momentarily ceased. The population of this species is declining every year since the late 1990s, and what once was a plentiful species numbering in the hundreds of thousands has now come dangerously close to extinction in a mere decade-and-a-half or so. It has been up-listed to Critically Endangered in the 2007 IUCN Red List.

Red-headed Vulture
Sarcogyps calvus





PHOTO: HIRA PUNJABI / SANCTUARY PHOTO LIBRARY

GROWING TOGETHER

The lion *Panthera leo* stands out among other 'big cats' not only due to its distinctive appearance, but also as the only felid that lives in organised social groups called prides. It is common for the females within the pride to be closely related, and together participate in bringing up the young. The young cub till it grows up to fend off on its own will not venture out from its mothers safety. Extremely protective lionesses are always on the alert for dangers to its young one.

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Kashmir Stag

KASHMIR STAG

— The Final Journey?

Text: Khursheed Ahmad

The Hangul or Kashmir Stag (*Cervus elaphus hanglu*) is one of the four easternmost subspecies of Red Deer (*Cervus elaphus*) that are found in Asia. Originally extending from the Western Europe to the Central Asia and from the Central Asia westwards through North America and Canada, the Hangul has had a restricted global distribution.

The Hangul were once distributed widely in the mountains of the Kashmir region of north-west Himalaya in an arc 64 km wide, extending from Karen in Kishenganga catchment over to Dorus in Lolab valley, and Erin catchments in Bandipora to Chamba district of Himachal Pradesh, through the present day Baltal-Thajwas Wildlife Sanctuary (WS), Overa-Aru WS, Tral Reserves, Desu WS, Rajpariyar (Daksum) WS and Wadwan in Kishtwar High Altitude NP. The Gamgul Siya-Behi Sanctuary in Himachal Pradesh, on the state border, was

the only area outside Jammu and Kashmir that probably retained a few Hangul. At present, the only genetically viable population of Hangul is confined to the 141 sq. km Dachigam National Park; some relic Hangul populations also occur in the adjoining areas.

During the recent past, the distribution range of the Hangul appears to have declined drastically, possibly due to poaching, large-scale habitat fragmentation and degradation. The population of Hangul in Kashmir in 1900 was estimated to be 5,000, and in 1947, when India became independent, about 2,000 Hangul were still surviving. But 10 years later, the population was reported to have reduced drastically to about 400 individuals, and in 1969, George Schaller estimated the Hangul population as not more than 180 individuals. Collin Holloway, in 1970, in his first scientific census, estimated the Hangul population ranging from 140-170 individuals.

I have been researching the Hangul since 2001 under the supervision of Dr. S. Sathyakumar and Mr. Qamar Qureshi of Wildlife Institute of India, in the projects funded by the Government of Jammu and Kashmir and Ministry of Environment & Forests, Government of India. I have also been lucky to have advisory inputs from Dr. Jamal A. Khan, Department of Wildlife Sciences, Aligarh Muslim University. We have carried out intensive study on the ecology of Hangul in Dachigam National Park and extensive habitat assessments in the Hangul, and other erstwhile, stronghold areas in the Kashmir Mountains.

Hangul used to range in summer up to about 3000 m in Dagwan, Nagberan and Marsar of Upper Dachigam. These areas have over a period been occupied by livestock, nomads and graziers, resulting in the disappearance of the Hangul, with the exception of a few strays. During our surveys we saw no direct or indirect evidence of Hangul presence in the alpine meadows of the Upper Dachigam.

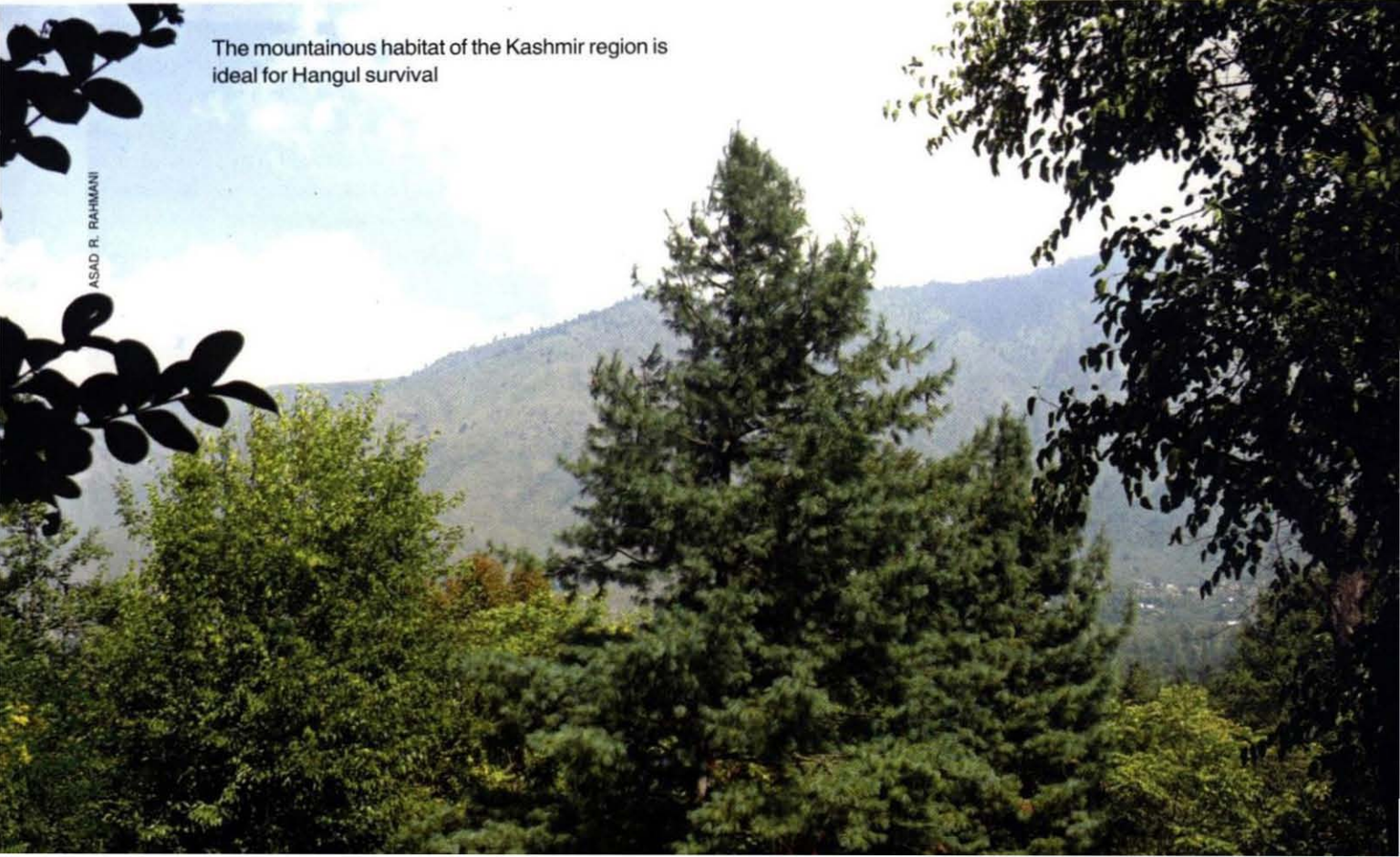
The current trends of Hangul population indicate that the species could go extinct if necessary serious interventions are not made immediately. Some of the major issues concerning long-term conservation and survival of the Hangul have been low sex ratio and fawn to female ratio, predation by Leopard, poaching, and

summer dispersion to unknown areas north-west in the Sindh Forest Division, outside Dachigam National Park

The low Hangul sex ratio is of great concern for the long term survival of the Hangul populations; in fact, at present it is lower than the reported ideal ratio for Red deer. Our studies show an overall Hangul sex ratio of 23 males per 100 females, and 30 young per 100 females. A regulated monitoring of the Hangul populations on a long term scientific basis, particularly during fawning and at the time of rut, will help to determine the causes of low reproduction and fawn survival in Dachigam NP.

Predation by Leopard on all sex and age classes and of Black Bear, both of which prey principally on young deer, is one of the major threats for this endangered Deer. Our study on predator-prey relationships at Dachigam National Park has revealed that 60% biomass of Leopard diet constituted of Hangul.

Since a demographically and genetically viable population of Hangul is present only in Dachigam NP, it is important to expand the range and habitat of Hangul to some of its past ranges of occurrence. A Conservation Breeding Plan should be initiated urgently to repopulate existing good habitats in the Hangul range. Overa Wildlife Sanctuary and Shikargah Conservation Reserve, both along the Lidder valley of Pahalgam, are almost free



The mountainous habitat of the Kashmir region is ideal for Hangul survival



Only immediate action can help save the Hangul from extinction

from human interferences, and ideal locations to initiate the reintroduction. These regions held a good population of Hangul in the past and hold some stray Hangul population (an estimated 6 individuals) today. Besides, the habitat here is similar to Dachigam and these protected areas are linked with Dachigam NP.

The range of Hangul in Dachigam NP should also be extended to its alpine meadows in Upper Dachigam, so that these ideal summer habitats are recuperated and used by Hangul during summer, as in the past. But first, this area should be free from livestock grazing, as it may prove harmful to the Hangul in the long run. In fact, the Sheep-Breeding Farm at Dachigam National Park and Upper Dachigam should be shifted. Long term scientific studies/monitoring of the impacts of grazing and habitat degradations should continue in the area to collect detailed information on the seasonal status, distribution and other ecological requirements of Hangul and its associate faunal species in the area.

Special but immediate attention is also required to be given to the Surfrao, Akhal and Kangan blocks of the Sindh Forest Division, sharing its boundaries to the north and north-east of Dachigam NP, that have been observed to attract large populations of Hangul, particularly in

summer and beginning of autumn. This might possibly be because the upper sub alpine reaches of Dachigam NP, during this season are under heavy pressure of biotic interferences in the form of excessive livestock grazing by the local Gujjars and Bakarwals, and sheep and goat of the Government Sheep breeding farm. This area as such is required to be notified as a Sanctuary in order to serve as a summer home for the Hangul.

There have been frequent wildfires in Dachigam National Park in recent years, mainly on the southern aspect comprising of open grassland and scrub habitats. These wildfires have destroyed the litter layer, damaged saplings, seedlings and even canopy cover in the immediate adjacent coniferous patches. These fires can lead to long term declines in soil fertility and structure and may hamper forest regeneration. Hangul have used these tall grasslands as shelters, foraging substrates and to escape predators. *Hatab* (*Parrotiopsis jacquimontiana*) trees providing natural fire lines in the forest may be tried to control fires in the grassland and scrub habitats of Dachigam NP. Controlled and scientific fire management is a tool that will help to conserve the Hangul habitat.

Most of *nullas* in Dachigam NP are dried-up throughout the year; this could be probably due to the

ASAD R. RAHMANI



Protecting the forest may help to protect the Hangul

impact of global warming, since the glacial areas of Upper Dachigam have been snowless even during the beginning of summer. Non-availability of water during summer may force the Hangul, especially lactating females, to move towards disturbed habitats in and outside Dachigam.

Continued examination of the perceptions and the opinions of locals living near Dachigam NP and adjoining protected areas and reserves is essential. As it help to perpetuate an effective long term strategy and a conservation and management recovery plan for the Hangul and its habitats; this would include among others an ex-situ conservation breeding programme.

GPS telemetry can be used to track the movement patterns of the Hangul outside Dachigam NP, and to demarcate the actual area on either side of Dachigam that could be declared as a Sanctuary.

Immediate attention for successful species recovery plan and effective long term conservation and management of Hangul appears to be the only hope for the Hangul for now. ■



Khursheed Ahmad is an Assistant Professor, Wildlife Management, Veterinary Sciences and Animal Husbandry, Faculty of University of Agricultural Sciences & Technology of Kashmir. He has worked on various projects with the Wildlife Institute of India and Jammu & the Kashmir Wildlife Protection Department. His doctoral study was on Aspects of Ecology of Hangul in Dachigam National Park.



ASAD R. RAHMANI

The Great Burdock is an indicator of the biorichness of an area



Beautiful Beetles

By Amol Patwardhan

Insects appeared on our planet during the Devonian period some 300 million years ago. They are found on all continents and are most abundant in the tropics and poles. Around 2000 species of insects have been recorded only in the Arctic during its brief summers. It is, therefore, not an exaggeration to quote that 'Insects rule the World'.

Among insects the beetles, with over 350,000 species, dominate the group. Every fifth living creature on this planet is a beetle. Beetles are holometabolic insects, i.e. they undergo complete change in body form; pass through four different stages. The egg hatches into a grub, which in no way resembles the adult. The grub then pupates and finally emerges as an adult.

Giraffe Weevil

A commonly encountered weevil. The males of Giraffe Weevils have a longer, elbowed neck. The female curls leaves to form a packet into which she lays the eggs. Legless larvae grow within this packet and feed on the plant tissue; adult Giraffe Weevils feed on plants.

Leaf Beetle

One of the leaf beetles, *Sagra femorata* is a common species in Indian forests. This is a metallic green leaf-eating beetle, and is smooth, diurnal and without a long antennae.



Blister Beetle

Blister beetles receive their common name from their ability to produce blisters, a defence mechanism for the beetle. Predators learn to keep-off from these brightly coloured insects after an unpleasant encounter. Blister beetles are herbivorous, feeding on leaves and flowers, and when abundant, form a conspicuous part of the diurnal fauna.



Stag Beetle

A large beetle; in males the large mandibles project as two large and formidable jaws, which are used during combat with a rival. The males are known to fly at night.

Stag beetles are often illegally collected for their rarity. They are forest dwellers and live in decaying trees. The shrinking forest habitat is endangering their existence.



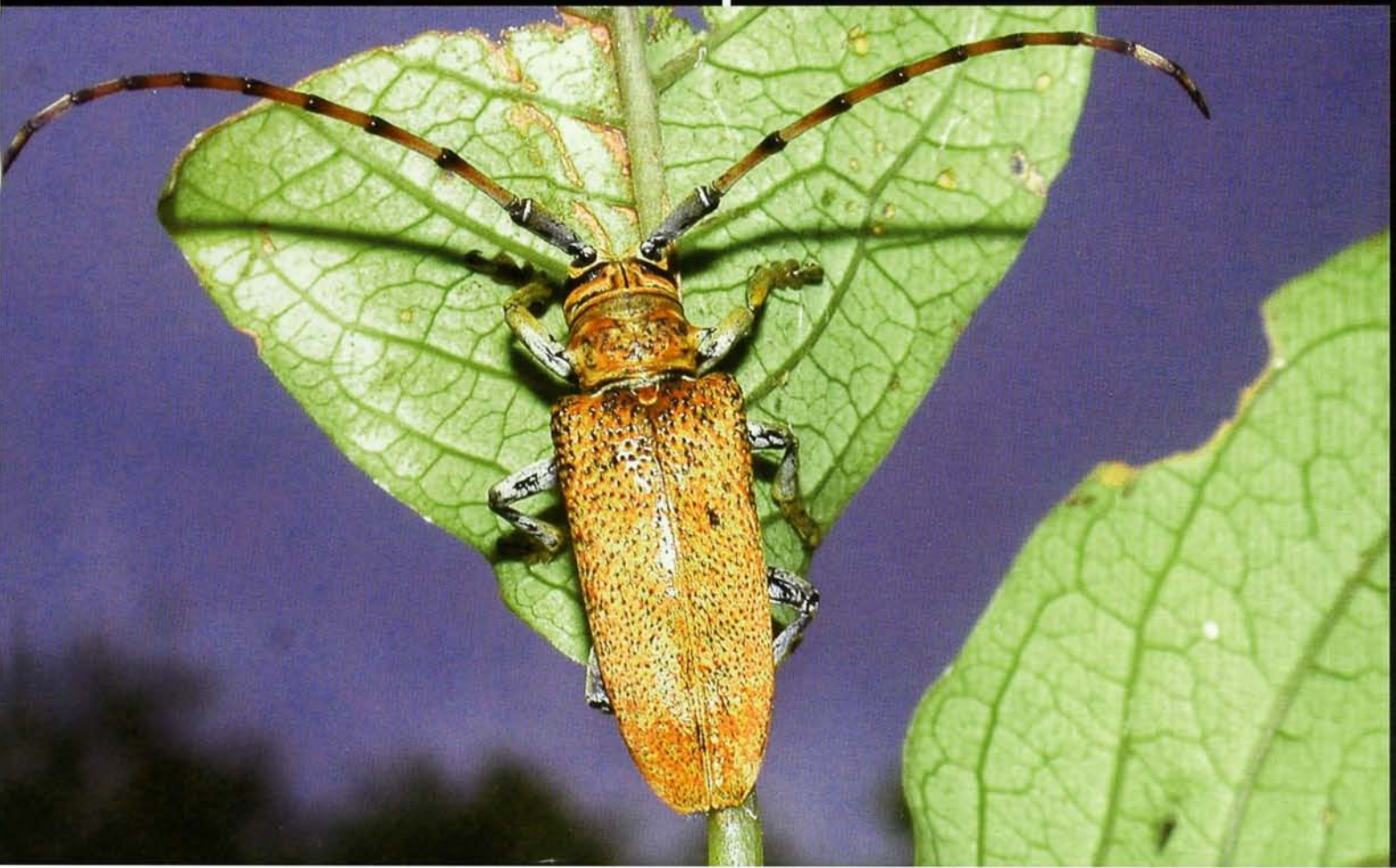
Tiger Beetle

Palaohroa octonotata is one of the common and most beautiful tiger beetle restricted to north-east India. It is brilliantly coloured and with the spots or bands on it. These are active insects flying and running short distances with great rapidity. The common species are diurnal in habit while some are known to be nocturnal.

Tiger beetles are today considered as good indicator species to monitor biodiversity.

Long horned beetle

These beetles are readily recognisable from their appearance and long antennae. The body of long-horned beetles is robustly built. These are mainly confined to forests and few are found in cultivated areas. The wood boring habit of the larvae is known to cause large scale damage, e.g. the Sal borer disease.



Meloid Beetle

These are also Blister beetles. Meloid beetles feed on flowers and leaves. These insects can be toxic when accidentally fed to livestock. The larvae are predacious and are known to eat grasshopper eggs.



Ground Beetle

The Six-Spotted Ground Beetle *Anthia sexguttata* is the most striking beetle of the plains, black in colour with six large white spots. These beetles vary in size from small to moderately large. The body is usually oval and flattened.

Ground beetles are wingless and found wholly on soil. The predacious habit of Ground beetles make them friends of the farmers.

There are three major reasons why insects are successful inhabitants of our planet. *First*, the ecological niches utilized by their life stages are different, i.e. larvae or immatures thrive in a different niche than that of the adult. *Second*, they can undergo a dormant period called aestivation or hibernation during unfavourable weather conditions. In fact, they can undergo a short sleep stage called diapause. *Third*, their adaptability; insects readily adapt to new environs due to their genetic makeup. They can undergo rapid positive genetic changes to adapt to changed conditions and within two or three generations they can live happily in the changed environs.

Amol Patwardhan, a member of BNHS since 1993, is photographing wildlife since 1999; he has a special interest in insects, especially butterflies. He has studied for his PhD on Click Beetles of Maharashtra.



Birds in Our Lives

by Ashish Kothari

Published by Universities Press,
Hyderabad, 2007

Size: 22.5 cm x 13.5 cm

Pages: 292

Price: Rs. 550/- (INR)

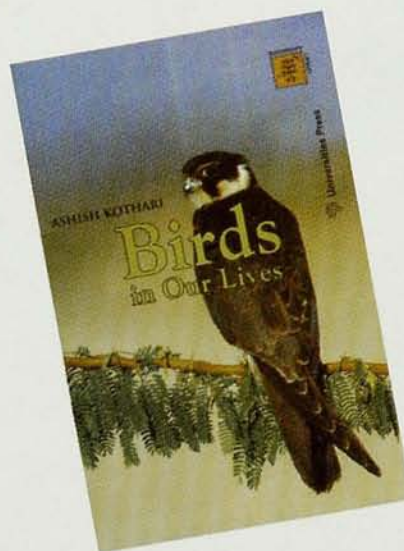
Paperback Edition

Reviewed by Asad R. Rahmani

Ashish Kothari is a well-known writer, thinker, and a leader on social and conservation issues of India, but this book proves that he is also a good bird watcher and a photographer. Actually, it was birds that had sparked his interest in conservation as a young man studying in Delhi, where he was a part of a bird watching group. Later he helped in establishing *Kalpavriksh*, a well-known environmental action group, which aims to integrate development, livelihood and conservation concerns. He also coordinated the famous National Biodiversity Strategy and Action Plan (NBSAP) on behalf of the Government of India. I think anyone interested in the conservation issues of India should have a copy of the Compact Disc of the NBSAP, which is treasure-house of knowledge and conservation wisdom.

BIRDS IN OUR LIVES is another top-class book of Ashish – full of knowledge and facts, some well-known and some obscure, but nevertheless interesting. The book is divided into 7 chapters, and 4 annexures, which cover almost 20% of the book. But the annexures, 'Threatened Birds of India', 'Important Bird Areas of India', 'Ramsar Sites of India', and 'Some Periodicals on Indian Birds' are quite relevant and enhance the quality of this book.

The first chapter 'Birds, Birds, Everywhere' deals with the distribution of Indian birds in various habitat types, and common species which one can encounter easily. It is a well-researched chapter, full of interesting information, but Ashish's erudition comes out more convincingly in the second chapter 'Birds in Indian Culture'. I did not know the



deep-rooted influence of Indian birds in our culture, religion, history, art, music, dance, literature and architecture. Perhaps Ashish can write a full book on this subject as 15 pages do not do justice to this interesting topic. The third chapter 'Ornithology through Indian History' is also interesting to read. The contribution of amateurs in the science of Ornithology and Avian Natural History is well-known, but what is not so well-known is the vast storehouse of knowledge available in different cultures and regions of India (which many professional ornithologists tend to ignore). It will be pity if this traditional knowledge disappears as India roars towards modernization. The fourth chapter deals with migration, the subject that never fails to fascinate us. The next chapter deals with the importance of birds, both ecological and economical. This chapter should be read by the decision makers who are changing the face of India, without much thought to the ecological security that nature and wildlife provide to any land/country. The next two chapters deal with the threats to Indian birds and measures to prevent large-scale extinction looming to the Indian bird species.

The book is profusely illustrated with pictures, many taken by Ashish but mostly by Clement Francis whom I consider the best bird photographer in India. The captions are appropriate, except in a few cases. For example, on page 103, there is a lovely picture of two pairs of Bar-headed Geese with goslings, swimming placidly in a high-altitude lake of Ladakh (perhaps Tso-Moriri) but the

caption says "Some migratory species such as the Bar-headed Goose, when foraging in large flocks, can cause considerable damage to standing crop." A picture of Bar-headed Geese in a crop field would have been more appropriate.

The Universities Press, and Orient Longman – the distributor, should be complimented for bringing out this book. Till now they have published nine books in this series; the two forthcoming titles I am eagerly waiting to read and review. ☺

The Illustrated Tigers of India

by Valmik Thapar

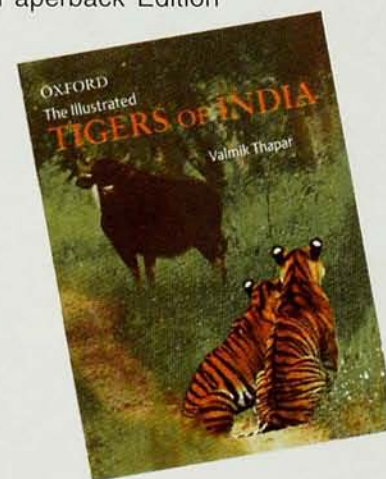
Published by Oxford University
Press, 2007

Size: 25.5 cm x 18 cm

Pages: 115

Price: Rs. 225/- (INR)

Paperback Edition



Reviewed by J.C.Daniel

The Tiger probably is the only wild animal which has the distinction of having the largest number of books published on it. Valmik Thapar, the author of this book has published 14 books earlier on the same subject. This book, one in the series of books entitled by Oxford India Collection, presents the history of the Tiger from its origin in the past to its present parlous state. Valmik Thapar writes with verve on a subject on which he has spent a lifetime and one hopes the message will get through to the people, young and old, that one of their invaluable wildlife assets needs their unstinted help to survive. ☺

A Photographic Guide to the Birds of Japan and North-east Asia

by Tadao Shimba

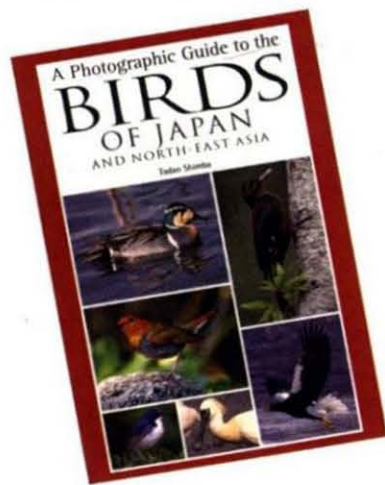
Published by Christopher Helm, London, 2007

Size: 19 cm x 12 cm

Pages: 504

Price: Rs. 2036/- (INR), £ 24.99

Paperback Edition



Reviewed by Asad R. Rahmani

Whatever the Japanese do, they do it with style and perfection. This book is a classical example of this general statement. During my three visits to Japan, I have seen many excellent books on birds in Japanese, but this is the first book in English which covers nearly 600 species, with over 1,500 stunning photographs. Besides Japan, the book covers the Korean peninsula, north-east China and the Russian far-east.

The official bird checklist of Japan lists 542 birds as having occurred on the islands. The author, based on field experience, has added a further 82 bird species to this list, resulting in a total of approximately 620 species, of which 554 have been selected to appear in the main text. A further 28 bird species are included that one would expect to see in north-east Asia, but which have not been recorded in Japan.

Japan has more than 3,000 islands, but four islands, from north to south – Hokkaido, Honshu, Shikoku and

Kyushu – are the main ones. The distance from north to south is about 3,000 km which results in various climatic differences – the north is temperate with very cold winter and mild summer, while the south has a mild winter, and hot and humid summer. Mountains constitute nearly 70% of the Japanese archipelago, often with dense woodlands. The central Honshu range can go as high as 2,500 m, with alpine vegetation. The Alpine Accentor, Spotted Nutcracker and Rock Ptarmigan live in these areas. Ocean islands that are away from the mainland have some endemic bird species or subspecies not found anywhere in the world. The ever-green forests of the south-western part of Honshu, Shikoku and Kyushu have many resident species, such as the Japanese White-eye and Varied Tit.

Japan is an intensively urbanized country, particularly the plains, so most of the wetlands have been converted to rice fields, but Hokkaido remains relatively rich in wetland habitats where the Red-crowned Cranes breed, along with the Oriental Reed Warbler and Zitting Cisticola. Japanese like birds, particularly the large ones, so they regularly feed ducks, swans and cranes which swarm in large numbers in winter in the urban and semi-urban wetlands and cultivated fields. For example, 90% of the world's Hooded Cranes and 50% of all White-naped Cranes spend the winter in Arasaki, Kyushu where they are fed grains.

This photographic guide succinctly describes the key identification features, voice, breeding range, and status in Japan. If the plumage varies due to age, sex, and during breeding and non-breeding seasons, it is illustrated with pictures. Month and the place where a picture was taken are mentioned.

Tadao Shimba is an excellent photographer. He was born in Tokyo and developed interest in nature and photography when visiting his mother's hometown in the foothills of the Japanese Alps every summer. Such a book would make any mother proud of her son. ☺

Walk the Rainforest with Niwupah

by Aparajita Datta and Nima Manjrekar

Art by Maya Ramaswamy

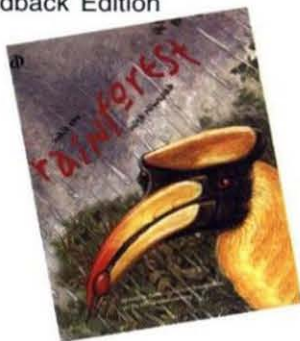
Published by Katha, New Delhi, 2004

Size: 25.5 cm x 28 cm

Pages: 32

Price: Rs. 150/- (INR)

Hardback Edition



Reviewed by Isaac Kehimkar

This colourful book takes you on an enjoyable journey in India's rainforest of Arunachal Pradesh, while educating with interesting facts on the denizens of this magical forest. Later, we are introduced to Niwupah – the Great Hornbill that takes you on a tour in the forest. Here we learn how the survival of these handsome birds is linked with this unique ecosystem, and why they are called the farmers of the forest. Hornbills are indeed the true mascots of the rainforests. The book ends with an appeal to conserve these vanishing forests and provides good tips on supporting conservation.

Both authors are wildlife biologists, who have had an enviable opportunity to work in some of the best wild places in India. Narration of experiences in simple language, for children, is a difficult art. But the authors have mastered it and we look forward to a series of such wonderful books to introduce our natural heritage. It is of course the imagery, the artist has woven that makes this book so delightful. However, one wonders while most creatures are represented here, there is a conspicuous absence of butterflies, especially from the land of the flying jewels. ☺

An Albino Jungle Babbler

On October 6, 2007 at 6.50 a.m., I chanced upon an albino Jungle Babbler in the Rose Garden at Chandigarh. In the company of four zoologically 'normal' Jungle Babblers, it was turning dry leaves for food in a flower bed. It was pure milk white except for tar-black on the trailing edges of the primaries, close to the wing tips only. There was one broken black shaft on the middle of the tail above and three large black spots spaced in a triangle on the lower tail feathers. The beak was sand coloured. Its overall size gave the impression of having a bit more rounded and plump body than the normal bird of the species.

As luck would have it, I was face to face with the Albino once again on October 29, 2007, at 7.45 a.m., about 800 m from where first encountered. This time it was in a larger flock of 13. Light condition and the eye-level perch atop a rounded bush were ideal for observation. The eyes, beak and claws were not different in colour from the normal. The black traces near the tips of the primaries were distinct. However, the black on the tail above, observed on October 6, was obviously a trick of light and shadow.

On December 12, 2007 at 8.40 a.m. I saw the bird once again about five metres from the second encounter. The shaft on the upper tail had two grey spots, the size of a shelled green pea, and the undertail appeared light greyish to white.

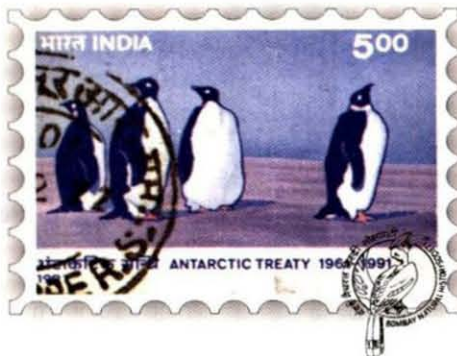
Albino Tigers and Blackbuck (in the forest around Raj Bhawan, Chennai) are fairly well known to us, but albino Jungle Babblers is a new rarity to our avian world.

Lt. Gen. Baljit Singh (Retd.)
Chandigarh



Strange sounds

I had gone on a short trip to Calicut in Kerala where I came across a very interesting phenomenon; I heard strange



sounds emanating from the kitchen. The sounds were akin to alarm calls of a hen/cock. I tried to locate the source, but was unsuccessful.

On asking my cousin revealed that the sound was the call of a brown coloured frog. Closer inspection of the kitchen soon revealed the source of the strange sound; it belonged to the Fungoid frog *Rana malabarica*. There were around 8-10 of them in the kitchen. The frogs sometimes would enter the kitchen in large numbers from the water store room situated between the kitchen and the freshwater well. They would enter and exit the storeroom through a small hole at the bottom of the door. I tried catching one of them, but this 'slippery' amphibian always managed to escape, crossing the many obstacles in the kitchen.

Sanal Nair
Mumbai



Save the Black-necked Stork

We located a nesting site of the rare Black-necked Stork, Schedule IV species, with three chicks at Valvod village, Anand district, Gujarat; and observed the site for three months with our friends, Jarul, Sanjiv and Kamal. The parents fed the chicks' with fish, crab, prawns, frogs and smaller reptiles; the chicks were never left alone until they were two months old. The parents were also seen repairing the nest all the time. The three chicks fledged successfully. We see them regularly in a nearby river called Mahisagar. We have been visiting this area for the last nine years,

but it was only this year, after a number of efforts, that we could locate this nest.

Considering the current population of the Black-necked Stork – around 25 in the state and around 400 in the country – we have written to State Forest Department to immediately upgrade this bird to Schedule I of the Wildlife Protection Act, 1972 to provide more protection to it.

Rohit S. Vyas & Anil Gohil
Vadodra



A mistaken identity

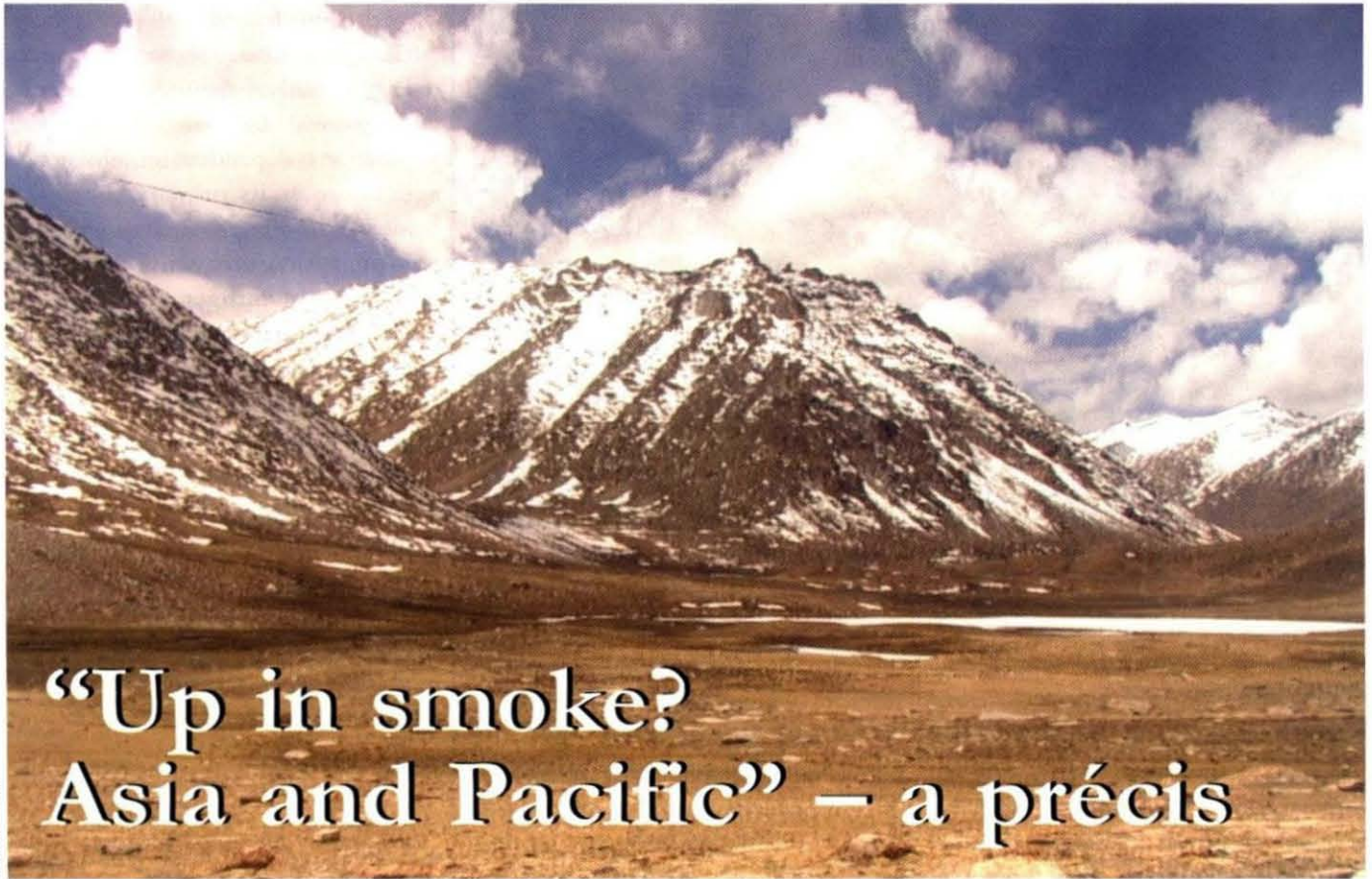
I saw a Pied Bush Chat (*Saxicola caprata*) female with a sub-adult chick, for about ten days, around my residence at Raipur, Chhattisgarh. Its behaviour was normal.

When the chick was ready to fledge it was deserted; in fact, the mother avoided feeding the chick about 4-5 days earlier. The chick tried to feed itself and even attempted occasional aerial captures of winged insects, though unsuccessfully most of the time.

However on the evening of April 30, 2007, I noticed an interesting behaviour. A female Indian Robin (*Saxicoloides fulvicata*) was perching on the parapet wall about 3 m from me, when the Pied Bush Chat chick perched itself close to it and started demanding for food. The Robin ignored the chick and after a few seconds flew about 15 m and perched on a roof top. The chick instantaneously followed the Robin and started demanding food, this time vigorously. The Robin, after a few seconds, appeared to have placed something in the chick's widely opened mouth. Was the Robin pretending to feed the chick so as to get rid of it? Or was it a natural urge to feed this chick, a clear case of mistaken identity?

It appears that the overall appearance of the female Indian Robin confused the chick, which took it as its mother, and the Robin mistook the chick as its own and fed it.

A.M.K. Bharos
Raipur



DEEPAK APTE

“Up in smoke? Asia and Pacific” – a précis

Compiled by Rushikesh Chavan, Conservation Officer, BNHS

The fifth report – Up in Smoke? Asia and Pacific, The Threat from Climate Change to Human Development and Environment – from the Working Group on Climate Change and Development asks, will global warming send Asia and Pacific ‘up in smoke?’. The foreword is written by Dr. R.K. Pachauri, Inter-governmental Panel on Climate Change (IPCC), Director General, The Energy and Resources Institute (TERI), and a Nobel Laureate. This article is an attempt to condense the report for a quick preview of their findings and predictions for Asia.

The latest global scientific consensus from the IPCC indicates that all of Asia is likely to warm during this century. Warming will be accompanied

by less predictable and more extreme patterns of rainfall, including droughts and extreme inundations. Tropical cyclones are projected to increase in magnitude and frequency, while monsoons, around which farming systems are designed, are expected to become more temperamental in their strength and time of onset. Ironically, if industrial pollutants are reduced the temporary cooling effect that results from having blankets of smog, could lead to very rapid warming.

The term ‘global warming’ is misleading. While the greenhouse effect is causing an overall warming of Earth, the effects on the climate and weather are regional. The vast expanse of the Asia-Pacific region means it includes a huge diversity of climatic zones. As a result, the impacts

of climate change will be equally diverse. There are cold, densely forested regions in the north (boreal Asia), deserts in the land-locked regions of the Eurasian continent (arid and semi-arid Asia), temperate regions towards the east of the continent (temperate Asia) and regions rich with flora and fauna in tropical Asia. Among these, the arid and semi-arid regions of Asia are set to suffer further shortages of water, while tropical, temperate and boreal Asia are likely to experience an increase in flooding. Rising sea levels due to thermal expansion of ocean water, and melting glaciers and polar ice caps mean that some communities living on islands are already victims of the impacts of climate change. At the same time, several factors contribute to an



RUSHIKESH CHAVAN

Species diversity is critical to the climate control role of forest

exponential rise in environmental stress which, in turn, increases the vulnerability of people and ecosystems to a changing climate. These factors include: air and water pollution, water scarcity, and an ever increasing consumption capacity, coupled with mass production for the global markets, that produces growing mountains of waste.

Climate Change in India

The Indian subcontinent is particularly vulnerable to climate change. India is a rising economic power and yet large proportions of its population still live in poverty. Over 250 million people live on less than US\$1 per day. India is likely to suffer a wide array of impacts, including insecure energy and food supplies, and reduced availability of fresh water, extreme weather events; public health, human development goals and the rich biodiversity of the country all stand to be affected. The worst-hit will be the poor, both in rural and urban areas.

India's climate is dominated by the south-west monsoon, which brings most of the region's life-giving rainfall. Heavier rainfall during the monsoon may increase flooding. However, the

increasing frequency and intensity of the El Niño phenomenon could also result in a failed monsoon. With over 6,500 km of low-lying, densely populated land, millions of Indians are at significant risk due to rise in sea-level. In August 2007, British aid agencies, including those in the Working Group, asked the UK public for funds to assist up to 28 million people affected by flooding in South Asia. Most water sources in affected areas of India, Bangladesh and Nepal were said to be contaminated or submerged.



P. JEGANNATHAN

A rise in temperature by 4°C or more will seriously affect the global food production

Farming and food

The agricultural sector represents over one-third of the Indian economy, and around 60 per cent of the population is dependent on subsistence agriculture as its primary source of income. Any effect that climate change has on agriculture will, therefore, significantly impact the lives of millions, and could potentially curb the country's development. India's large rural population, which is heavily dependent on rain- and meltwater-fed agriculture, is already beginning to experience climate change impacts.

As agricultural systems either suffer from declining productivity or complete collapse, people will be forced to migrate in search of work. Distress migration from rural to urban areas could result in rising social tensions and conflicts, as well as the overstretching of urban infrastructure and amenities.

In India, less water for rain- and meltwater-fed agriculture could cause a loss of up to 30 per cent of India's agricultural production, including food grains.

Energy

Eighty per cent of the carbon dioxide, connected to human activity,

released into the atmosphere each year is due to burning of fossil fuels, mainly used to produce electricity, heat or transport. While the use of fossil fuels in Asia continues to spiral upwards, per capita greenhouse gas emissions across the continent are still far below European and American levels. India is the world's fourth-largest greenhouse gas emitter and produces about four per cent of global carbon dioxide emissions.

In 2004, Cyclone Heta struck the Pacific island of Niue, the smallest nation on Earth, and destroyed 70 per cent of its infrastructure. After the population's immediate needs were met, the Government set out to make Niue the first nation on Earth to meet all its energy requirements from renewable sources. Niue had been entirely dependent on imported diesel for all its energy needs. Now, it has signed an agreement with Greenpeace, to shift to wind energy. Small islands in the Sunderbans off the south coast of India have set themselves similar targets.

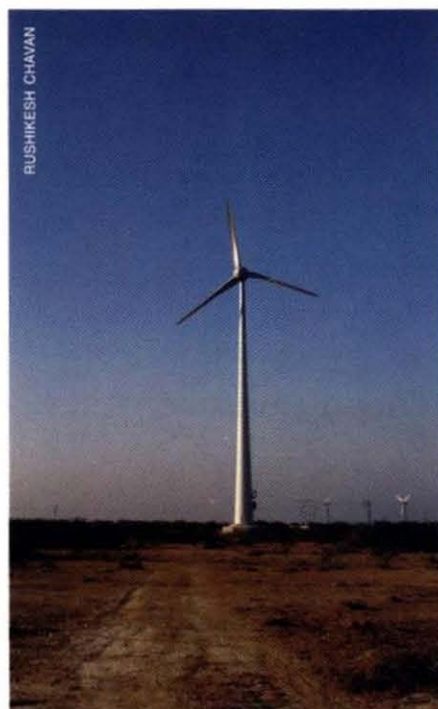
The amazing flexibility of renewable energy technologies is visible in the remote region of Chalanbeel in Bangladesh. Here, a fleet of boats fitted with photovoltaic systems deliver a combination of services, including children's education, libraries, training in sustainable agriculture, health advice, batteries charged to run solar home lighting systems, mobile phones and Internet access, using solar energy.

Biofuels: blessing or curse?

Biofuels are seen by some as an alternative source of fuel, in the face of decreasing global oil reserves, to combat climate change. Indonesia has some 6 million hectares of land under oil palm and the Government is actively encouraging further expansion. In 2007, the Indonesian Government

signed 58 agreements worth US\$12.4 billion to produce about 200,000 barrels of oil-equivalent biofuel per day by 2010, and replace 10 per cent of the country's total oil-based fuel needs. This could result in the emission of an additional 300 million tones of carbon dioxide to the atmosphere each year!

Deforestation is already the second-largest contributor to rising levels of carbon dioxide in the atmosphere. As a result of deforestation, some of which is for palm oil plantations, Indonesia is the third-largest emitter of carbon dioxide, after the USA and China. Deforestation to make way for large-scale mono-cropping of energy crops obliterates the 'green credentials' of the biofuel. In addition, land clearing for large-scale plantations will accelerate the destruction of peat lands, which are vitally important carbon stores – containing nearly 30 per cent of all land carbon stores, while covering only 3 per cent of the land area. But, the rise of the biofuel



Alternate energy options like wind energy exist, but we need to identify them

market is having still wider effects. Its economic attraction is leading to the conflict between crops grown for food and those grown for fuel. Increasingly, the result is expected to be both greater competition for land and higher food prices.

Health

Global warming will cause multiple impacts on human health and a wide range of diseases – vector-borne, water-borne and respiratory – have demonstrated links to climatic changes. The most vulnerable will be older age groups, disabled and urban poor populations as they already face limited access to health facilities and have limited disposable income to cover additional medical costs.

Bangladesh is already vulnerable to the outbreaks of climate-sensitive diseases. Incidences of malaria here have dramatically increased in the last 30 years, and malaria is now a major public health problem. Other diseases like diarrhoea, skin diseases, asthma, hypertension, dengue and dysentery are also increasing, especially during summer.

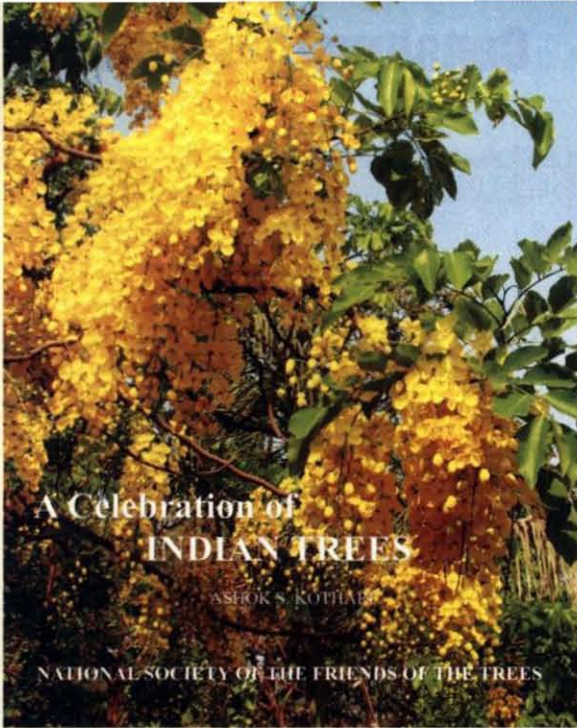
According to one recent report, the range of climate change-related health impacts are diverse, and include heat-related deaths, vector- and water-borne diseases, loss of life due to extreme weather events, and the effects of food and water insecurity.

Of these, malaria is of particular concern, as climate change could increase the occurrence of malaria in areas that are already malaria-prone and also introduce it into new areas due to shifts in climate zones. The periodic epidemics of malaria, which occur every 5 to 7 years, resulted in the loss of 577,000 Disability Adjusted Life Years in 1998. Records also suggest that outbreaks of Dengue and Chikungunya, two other vector-borne

A Celebration of INDIAN TREES

by Ashok S. Kothari

Published by Marg Publications in association with
the National Society of the Friends of the Trees



A Celebration of INDIAN TREES

ASHOK S. KOTHARI

NATIONAL SOCIETY OF THE FRIENDS OF THE TREES

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The names of the species in various local languages and dialects, details about the medicinal value of various parts of each tree besides its other benefits, are also provided.



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DRASHOK S. KOTHARI has been practising medicine in Mumbai for nearly four decades, simultaneously pursuing his keen interest in nature. He is an Honorary Joint Secretary on the Managing Council of the National Society of the Friends of the Trees.

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diseases, are also rising. Climate change could increase heat stress and other vector-borne diseases. In addition, decrease in water availability and food production will indirectly affect people's health.

Migration

From Bangladesh to the communities living by the mega deltas of Asia and the low lying Pacific islands, climate change stands to greatly increase recourse to the most extreme form of adaptation – migration. In general, people don't want to be forced to leave their homes. Forced migration can have a devastating impact on the health and well-being, and an individual's sense of identity, culture and security. It can also lead to conflict between resident communities and the new arrivals.

Cities

The relationship between urban centres and climate change is complex and two-fold. Urban areas, with their energy consumption and burning of fossil fuels, help cause climate change, but they are also particularly vulnerable to its impacts. China, the world's most populous nation, is urbanising rapidly. But, as the population migrates increasingly into urban areas, its vulnerability to extreme weather events, such as heavy rainfall, is set to increase. Mumbai, the financial hub of India, is especially vulnerable to

sea-level rise, and climate change could result in gigantic financial losses.

In Hong Kong, global warming in combination with urbanisation means the city's cool winters could vanish within 50 years. The number of 'cold days,' when temperatures dip below 12° C, might soon be zero. Between 1961 and 1990, there was an average of 21 cold days every winter. The number of summer 'hot-nights' above 28° C, on the other hand, has risen almost four-fold since the 1990s. Heat trapped by the city and its skyscrapers is unable to escape at night, causing multiple health stresses.

Water and drought

The impacts of global warming are centred on the water cycle. And, for large parts of Asia, that means changes to the glacial cycle in the Himalaya. Over the past decade, the retreat of glaciers and the thawing of permafrost in the Himalayan highlands in north Asia have accelerated. Supplying seven of Asia's great rivers – the Ganga, Indus, Brahmaputra, Salween, Mekong, Yangtze and Huang He – the glaciers on the Tibetan Plateau, including Himalayan glaciers, ensure a year-round supply of water to billions of people. The impacts of glacial retreat range from increased risk of flooding in Himalayan catchment areas in the short-term, to reduced river flow in the long-term.

Initially, accelerated Himalayan

glacial runoff will increase the risk of lethal glacier lake outburst floods, avalanches and mud flows. Central Asia already experiences a high degree of water stress. Agricultural systems and ecosystems in some areas may be able to cope with some decrease in rainfall, but other semi-arid areas could be amongst the first to show the effects of climate change. The prospect of declining rainfall in places with arid climates like Iran means a bleak outlook for sustainable fresh-water supplies. Currently, 94 per cent of water use in Iran is accounted for by irrigation for farming, and over half of that, around 55 per cent, comes from ground sources.

Adequate water supply is a major challenge for India, particularly as 60 per cent of the population is dependent on agriculture for its livelihood. Over the next 20 to 50 years, it is likely that India will face a major water crisis from the higher frequency of floods and drought due to increased variability of annual monsoon rains, and the unusually fast depletion of the Himalayan glaciers. "Surface temperatures in most parts of India have increased by half a degree centigrade during the second half of the century," says Professor Srinivasan of the Centre for Atmospheric and Oceanic Sciences in Bangalore, adding 'the surface air temperature in the Himalaya has increased by one degree during the

Coastal cities will be the worst affected by climate change



RUSHIKESH CHAVAN

Over 20% of all greenhouse gases are due to deforestation



RUSHIKESH CHAVAN

same period. This has led to the rapid melting of the glaciers in the Himalaya.”

Seas and coasts

Environmental change associated with global warming has already affected China. Its coastal economy and environment were hit heavily particularly in 2004 and 2006 by the effects of rising sea levels, coupled with storm surges, coastal erosion, and saline water intrusion. In 2006, saline water intrusion and coastal erosion intensified in Yangtze Delta region. Shanghai City's water supply was affected, reducing the quality of groundwater supplies and soils, with even broader impacts on local ecosystems. Coastal areas provide an important habitat for many species and support countless peasant livelihoods. Both will suffer from high tides, coastal erosion and saline water intrusion as the sea levels rise. But impacts will also stretch inland affecting the reproduction and behaviour of fish living in river estuaries. The fishing industry already suffering from over-fishing, will be further hit.

Observations show that sea levels are rising at an average rate of 3.14 millimetres per year. A one-metre rise – predicted to occur by the end of this century without major cuts in greenhouse gases – would inundate about 1,000 sq. km of the Ganga Delta. Already, over the past two decades, four islands – Bedford, Lohachara, Kabasgadi and Suparibhanga – have been submerged leaving 6,000 families homeless. Some of the most recent predictions suggest that one of the largest islands – Sagar Island – could lose at least 15 per cent of its habitat area by 2020.

Development along India's 6,500 km coastline has damaged natural

ecosystems that have historically provided defence against coastal erosion and acted as a buffer to prevent flooding from wave action or tidal surges. Now, over 7 million people are vulnerable to coastal flooding and rising sea levels.

Biodiversity and the environment

According to the IPCC, an estimated 20 to 30 per cent of plant and animal species in India are likely to be at increased risk of extinction if the global average temperature exceeds 1.5 to 2.5° C above pre-industrial levels. While very little is known about the full impacts of climate change on individual species, indicator species in different floral and faunal groups, which are known to have a narrow range of temperature and rainfall requirements, provide some clues into the vulnerability of the natural environment to climate change.

Critical ecosystems like deserts, grasslands, coasts, and mountains are at particularly high risk. For example,

a rapid-warming scenario could have a significant impact on mountain ecosystems which harbour rare and endangered plant species, including medicinal plants which are adapted to colder climates. India's extensive forests, which cover around 20 per cent of its land, provide vital services for biodiversity, the supply of biomass, watersheds, and the livelihoods of communities. Around 200,000 villages are located in or near forests. Climate change is likely to cause a shift in forest boundaries and forest dieback having significant implications on all communities who depend on forest resources and services.

Disasters

Natural hazards are common in Asia and many are not directly related to climate change, such as the Indian Ocean tsunami, which struck in 2004 and the devastating earthquake that hit Pakistan in 2005. Vitaly, regions that are already vulnerable to natural hazards like this will have a weakened capacity to adapt to the impacts



RUSHIKESH CHAVAN

Millions of people depend on the seas and coast for livelihood

of climate change. Bangladesh, for example, has limited capacity to adapt, in part because it faced at least 174 disasters between 1974 and 2003.

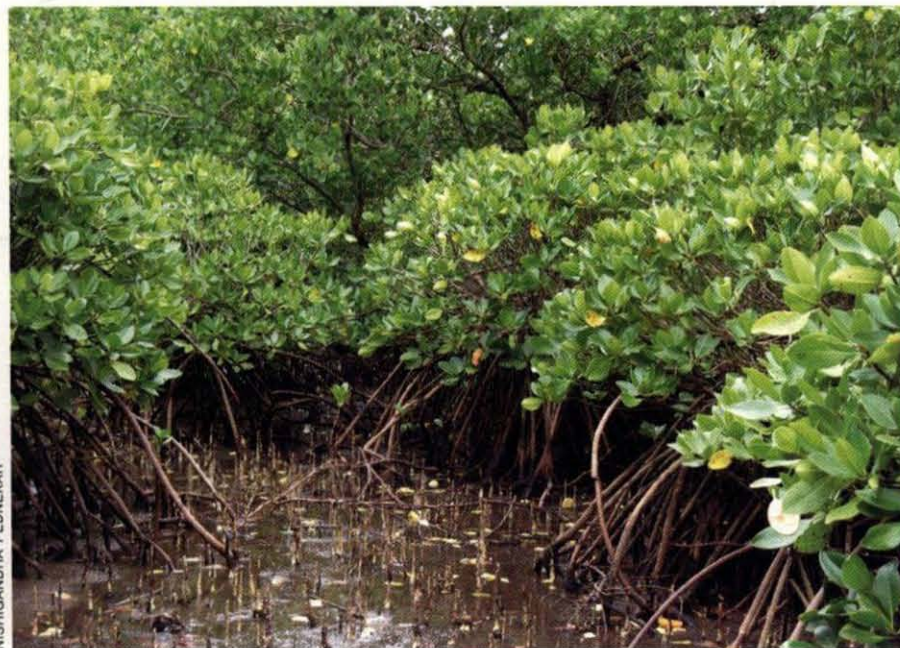
Two-thirds of all disasters in India are climate or weather related, mainly due to drought, flooding, and storms, damaging infrastructure and affecting millions, especially those already weakened by poverty and disease. The

and irreversible climate change becomes far greater above this level; in fact increases below 2° C will also doom many of the Pacific island nations. Environmental and development organisations in countries like the UK are supporting calls for the Government to do its fair share by setting a legally binding, annual, constantly contracting 'carbon budget', which plots a course, year on year,

in the UNFCCC (United Nations Framework Convention on Climate Change) and the Kyoto Protocol must deliver a fair, effective and equitable agreement beyond 2012 that deepens reduction targets in industrialised countries, allows greater mitigation contributions from some of the larger developing countries, and ensures a strong focus on adaptation. These negotiations must be completed by 2009 to ensure that there is no gap between the first commitment period of the Kyoto Protocol, which ends in 2012, and the second commitment period. The expanded framework needs to revive the original intent of the UNFCCC for developed countries to take leadership by reducing emissions at home. It must also provide the opportunity for poor countries to escape poverty through massive investments in adaptation and renewable energy, and by supporting their sustainable development through greater flexibility in the rules governing the global economy on issues like trade, finance and intellectual property. Technology transfer, especially energy technology, is also important. Adaptation funds under the UNFCCC and Kyoto Protocol need to increase in size by several orders of magnitude.

Individuals globally must also take action to reduce their emissions. The growing numbers of demonstrations against airport and motorway expansion in many countries are evidence of rising public action to tackle carbon emissions.

These are just excerpts from the report that has a lot to offer, from challenges to commitments, and recommendations. One can easily download this report from the IPCC website to get in-depth information. ■



NISHIGANDHA PEDNEKAR

Mangroves sequester carbon, but could be climate change's first victim

number of strong tropical cyclones has continued to increase over the past three decades. The moisture in the atmosphere increases when the temperature of the Indian Ocean rises, thus increasing the strength of storms.

A global climate framework post-2012

The first priority is to cut global greenhouse gas emissions so that average temperatures do not rise more than 2° C above pre-industrial levels – a goal of the European Union since 1996. The likelihood of major

towards an emission cut of at least 80 per cent on 1990 levels by 2050. There are less than 10 years before global emissions must start to decline – instead emissions from the UK and other wealthy industrialised countries are still rising remorselessly.

There is not a moment to lose. Wealthy industrialised countries must act first and fastest to cut greenhouse gas emissions. Much of the historical responsibility for climate change lies with these industrialised nations and their use of fossil fuels over the last 150 years. The negotiations underway

PHOTO: GERTRUD AND HELMUT DENZAU



SAVINGS IN NATURE

Honeybees are useful not only to the ecosystems in which they live, but also directly to human beings. A single worker bee may visit over a few thousand flower heads in a day, in search of nectar and thus serve as super pollinators for countless plant species, including the commercially vital crops and fruits.

A single honey bee colony may contain over 10,000 worker bees and the economic advantage to humans is difficult even to tabulate.

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Expressions of a beautiful mind



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The young naturalists painted colourful impressions of mangroves on paper

To celebrate Wildlife Week, the Conservation Department of the Bombay Natural History Society (BNHS) organised a painting competition for students of Class V to VIII at various centres in Mumbai, Ratnagiri, and Sindhudurg. The theme for the competition was 'Mangrove Biodiversity & Conservation'. Around 450 students participated in this competition.

The paintings were judged by renowned artists Mr. J.P. Irani and Mrs. Hutoxi Irani. The prize



BNHS PHOTO LIBRARY

A colourful expression of beautiful and thought provoking ideas

distribution ceremony was held on the Children's Day – November 14, 2007. The Chief Guest for the ceremony was Mrs. Pheroza Godrej, Vice President, BNHS, who distributed the awards to the winners. A total of 18 awards and certificates were given to students in two age groups from each of the districts where the competition was held. The judges commented that it was difficult to judge students with such good understanding of the subject, indeed these were expressions of a beautiful mind. ■



BNHS PHOTO LIBRARY

The enthusiasm in these children indicates that our tomorrow is in safe hands

The BNHS-Conservation Education Centre, Delhi, along with the Department of Environment, Forests and Wildlife, Government of NCT, Delhi conducted a painting, pencil drawing, clay modelling, face painting, quiz, essay writing and slogan writing competitions during the Wildlife Week this year.

Around 200 students from different schools participated in the competitions at the BNHS-CEC,



BNHS PHOTO LIBRARY

Paper was not the only medium that these young hands used to express themselves

Delhi premises. Mr. Toby Sinclair, Wildlife Filmmaker, distributed the prizes to the winners.

Mr. Kartik Satyanarayan, Co-founder of Wildlife SOS, gave an enlightening lecture on the behaviour of reptiles. Some of the rescued reptiles were also released on the same day. Mr. Prabhat Tyagi, DCF (South Delhi), who was also present at the occasion, shared his thoughts with the children. ■

Bash with Bugs

On October 7, 2007, an half a day event, exclusively dedicated to Insects, was held at the BNHS-Conservation Education Centre, Mumbai. This event was attended by more than 70 participants, including children. The event started with an inaugural talk by Dr. V. Shubhalaxmi followed by a nature trail, to explore insects in the area.

The main highlights of this event were sessions like '*Kidagiri*, *Kidon ke funde* and *Timtimate jugnu*'. A special session '*Kitchen Mate*' by Dr. V. Shubhalaxmi on how to have a cockroach free kitchen was the attraction of the event. A variety of other fun-filled activities like treasure hunt, crossword, and face-painting were organized for the children. The bash was completed by serving a sumptuous breakfast. An informative programme kit comprising of education material and a souvenir were provided to the participants. ■



The participants were given tips on how to establish a butterfly garden

Breakfast with Butterflies

A special event to explore the mystifying world of insects was held on the November 4, 2007. Around 200 participants, including children from throughout Mumbai, participated in the event that started at 8.00 a.m. at the BNHS-Conservation Education Centre, Mumbai.

The cloudy weather could not hide the about 30 species of butterflies that the different groups spotted. The main attractions of day were Gaudy Baron, Blue Mormon, Commander, Yellow Pansy, Lemon Pansy, and Blue Oak Leaf. Sessions like 'Early Stages of Butterflies', 'Tips on Butterfly Gardening', 'Butterfly Baiting', 'Butterfly Photography' were most liked by the adults, while activities like 'Treasure Hunt', 'Crossword' and 'Face Painting' were a hit amongst the young. An informative audio visual on 'Butterflies of India' was conducted by Katie Bagli, a BNHS member and volunteer.

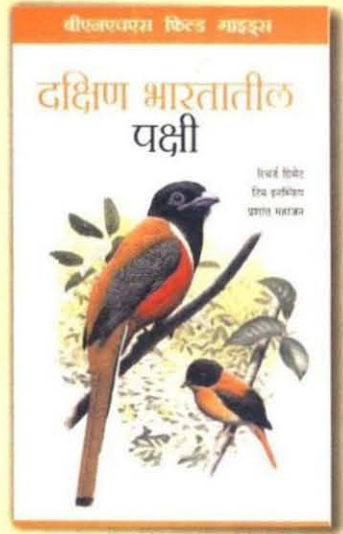
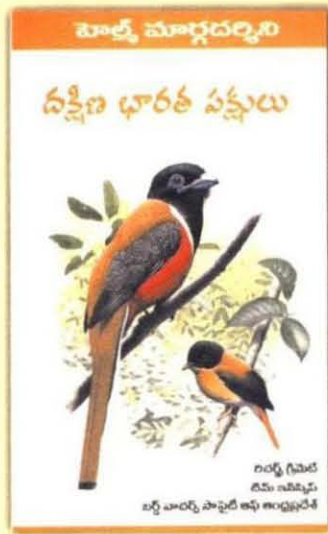
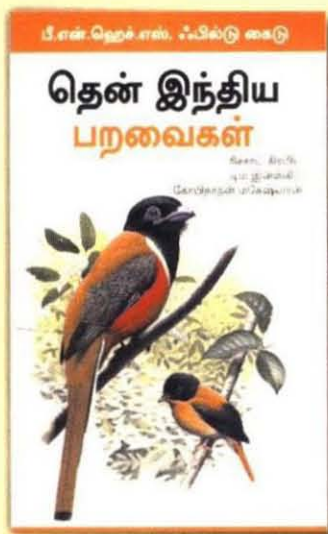


Interactive displays were used to introduce the behaviour of butterflies

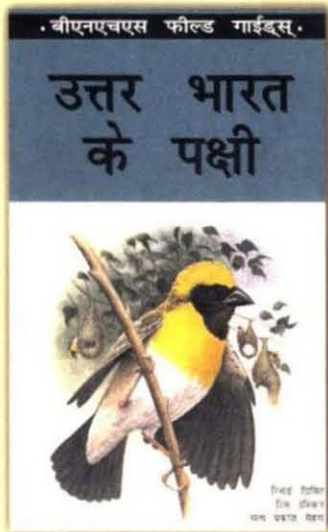
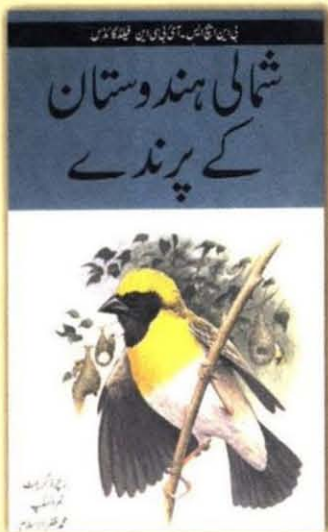
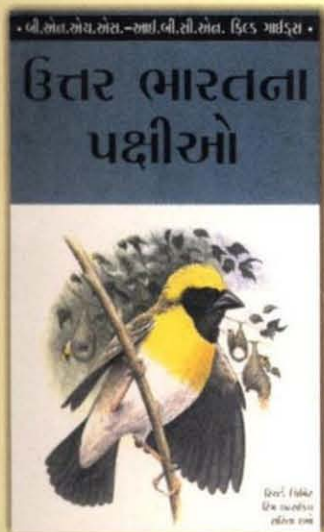
A lavish breakfast, followed by the jingle '*Ek Kabani Tittli Ki*' and a speech by Dr. V. Shubhalaxmi concluded the event. The participants were given a complete information kit at the end of the session. ■

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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 and 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.



IRON ORE MINING

Breaking New Grounds

MSPL Limited is the flagship company of the Baldota Group. It is one of the largest exporters of iron ore from the private sector. MSPL has significant exports to China and has won the CAPEXIL Export Award consequently 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 Karnataka, Maharashtra and Gujarat have a total group capacity of 191.6 MW, which is the largest installed wind power capacity in India. MSPL's Wind Energy Project has been registered as one of the largest renewable energy CDM projects in the world by UNFCCC.



GASES

Medical & Industrial Lifeline

MSPL Gases undertakes the medical and industrial gases business of the Baldota Group. It manufactures gases like liquid and gaseous oxygen, nitrogen, and argon gas. Last year it commissioned its first BOO (Build, Own & Operate) oxygen plant at SAIL, Bhadravati.

STEEL

Proving its Mettle

The Baldota Group is setting up an advanced integrated steel plant in Karnataka - Aaress Iron & Steel Limited. This project will initially set up a 2.5 MMT steel production capacity per annum and a 180 MW power plant to generate power by using waste heats from the process.



The Baldota Group is riding on the crest of some eventful years. This year, it was honoured with the First Prize for Independent Power Producer under Wind Programme (2002-07) by the Ministry of New and Renewable Energy. In 2006 it was awarded the prestigious CFBP (Council for Fair Business Practices) Jamnalal Bajaj Award for Fair Business Practices and the Export Excellence Award by the Federation for Karnataka Chambers of Commerce and Industry (FKCCI) for its outstanding export performance during the year. Back in 2005, the Group had also received the KREDL award for the highest investment and production in wind power.



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