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Civilian Dogs, “Sarkari” Dung

The issues of habitat destruction and poaching get all the attention of conservationists, decision makers, and the media, and hardly any attention is given to two insidious problems that mar most, if not all protected areas, and certainly all terrestrial wildlife landscapes: overgrazing and the increasing menace of stray dogs.

It makes news, and rightly so, when a pack of stray dogs kills a human baby, as had happened in Bengaluru a few years ago, but what is happening daily in our countryside to wildlife, predation by strays, has not been documented. Recently, I travelled for five days in the Konkan region of Maharashtra and later in and around Tansa Wildlife Sanctuary. On several occasions I saw packs of dogs, away from any human habitation, looking for prey. Some of them ran away when they saw us, clearly indicating that they were not pet dogs, or ‘community dogs’, as dog lovers affectionately call strays. They were clearly domestic dogs turned semi-wild, hunting in packs like their forebearers would have done. Some may even have become feral (domesticated animal turning totally wild).

Usha Lachungpa, a very active member of the BNHS and now Senior Research Officer of the Sikkim Forest Department, has a running battle against stray dogs in her tiny state. A few years ago, I accompanied her to North Sikkim where we saw a pack of stray dogs digging out a Marmot, and another chasing Bharal. The locals told us that stray dogs regularly hunt wild animals, and even people are afraid to enter some areas for fear of them. Children are certainly not allowed alone. Many have lost young yaks, a precious animal for locals, to stray dogs.

I have a series of pictures of stray dogs killing an adult Cheetal in Keoladeo National Park, Bharatpur. They have become a big menace for the Great Indian Bustard in Nannaj, Solapur, and other areas. With such a tiny population left in the world, even if one chick is killed by dogs, it is a blow to the species. In Ladakh, almost 50 percent of chicks of the Black-necked Crane are killed by stray dogs that now roam all over the vast plains, particularly near human habitation and armed forces settlements.

In an army camp in North Sikkim near the China border, when Usha complained to an officer about the menace of stray dogs, the officer shrugged off all responsibility and said, “They are civilian dogs,” as if it would make any difference to a Marmot whether it was killed by a civilian dog or an army-owned dog. There are only three major predators in our high altitude plains and mountains: the Snow Leopard, Tibetan Wolf, and Red Fox. All are found in very low density and are a part of the natural ecosystem. With the arrival of armed forces in border areas, the once-pet-later-abandoned dog gets a steady supply of discarded food. There is no issue over the pet dogs that are kept for night vigilance for safety. The problem arises when some of them are abandoned and run around in search of natural prey for food. This has been happening for the last three or four decades, resulting in many dogs becoming semi-wild and some totally feral. They put huge additional predation pressure on the already fragile and disturbed high altitude areas. For a Marmot or a crane chick, it does not make a difference if it is killed by an army dog or a ‘civilian dog’ – it has lost its life.



While the dog menace may not have been noticed by many conservationists, no one can claim that they do not know the problems of overgrazing in PAs. Except in zealously protected core areas of a PA, illegal livestock grazing is found everywhere, literally from Kashmir to Kanyakumari. I have seen it in Dachigam National Park in Kashmir, in Naliya grasslands in Kutch, in Parambikulam National Park in Kerala, and in Burha-Chapori Sanctuary in Assam. Illegal livestock grazing binds all of us, a unique example of national integration!

While grazing is part of the natural cycle and grasses have co-evolved with wild ungulates, it is overgrazing that is the problem. Numerous studies show that overgrazing, particularly by livestock, changes the whole complexity of a habitat: soil is compacted, soil microfauna and plant community are changed, resulting in changes in animal communities, invasive species get greater opportunity to spread, unpalatable species take over, grassland-specific bird species disappear and generalist species take over. Some studies also prove that overgrazing spreads animal and plant diseases. Constant removal of standing biomass depletes the soil fertility.

Much of illegal livestock grazing takes place due to societal pressure and complacency of the ground staff. In the 3,162 sq. km Desert National Park of Jaisalmer and Barmer, the Forest Department has created large fenced plots for species like the Great Indian Bustard, Houbara, Chinkara, Desert Fox, Spiny-tailed Lizard, and desert flora. In all, there are about 30 such scattered plots, called enclosures, covering about 90 sq. km, each with cattle guards. Except for a few (e.g., Sudasari, Sam, Myajlar), most of them suffer from the menace of overgrazing. These enclosures are supposed to be 'core areas' for wildlife, but we mostly find livestock inside. When I was touring one large enclosure, perfectly fit for wildlife, with Dr. Ranjitsinh and Dr. Divyabhanusinh for a government committee, we found sheep and goat pellets and cow and camel dung all around the waterhole created by the Forest Department for wildlife. When Dr. Ranjitsinh asked the accompanying guard about the dung, he replied, "It is by a *sarkari* camel," pretending that illegal grazing is not taking place. How on earth he was able to distinguish between the dung of a *sarkari* and non-*sarkari* camel left us speechless.

The tragedy of our country is that we have *gai* (cattle) in protected areas, and *nilgai* (Bluebull) in private crop fields. I think both are in the wrong place. We do not want our precious remaining natural areas to be trampled by livestock, nor do we want poor farmers to suffer due to crop damage by wild animals. As one of our most respected conservationists, Dr. A.J.T. Johnsingh wrote to me once, "Free ranging dogs do not have a place in any wildlife habitat where they are a serious threat to all forms of animal life. By means fair or foul, they should be kept away from wildlife habitats. When there is grazing wildlife is always the loser. It leads to competition for and contamination of water, strife for forage and loss of peace required for wildlife. Camps of graziers usually become abodes for poachers. Grazing free areas in wildlife habitats are a must."

Will anyone listen to sage voices?

Asad R. Rahmani

The Sandgrouse of India



Painted Sandgrouse

Text and Photographs:
Udayan Rao Pawar

I shall never forget the excitement I felt on that cold winter morning in western Rajasthan, hiding under a blanket near a small village lake, waiting for the sandgrouse to arrive. After a long wait, I finally heard the faint calls of the approaching birds, and very soon, flocks of Black-bellied Sandgrouse, followed by Spotted Sandgrouse came into view. The last to arrive and leave after watering were the Chestnut-bellied Sandgrouse.

This behaviour of collectively and regularly flying to fixed watering holes is common in most sandgrouse species. Sandgrouse, as the name suggests, are generally found in dry regions, including deserts. With a diet mainly consisting of seeds, they need to fly long distances daily, in some cases as much as 80 km, to get their water requirements. Calling as they fly, all the birds in the locality gather at dawn or dusk at a select watering point. After drinking hastily, they disperse to their feeding grounds in open wastelands and fallow fields. Some sandgrouse species have developed specialised belly feathers that act like a sponge and enable them to carry water over long distances to their nestlings. This penchant for frequenting the same sites in flocks to drink makes them rather vulnerable. I was told by villagers in Rajasthan that hunting parties bagged sackfuls of sandgrouse at their favourite watering places.

Once considered similar to pigeons, sandgrouse are now placed in a separate Order Pterociformes, Family Pteroclididae. Sandgrouse are represented by two genera, namely *Syrrhaptes* and *Pterocles*. The genus *Syrrhaptes* consists of two species, which have feathered legs and toes, and are largely found in the cold deserts of Central Asia. The genus *Pterocles* consists of 14 species ranging from Iberia, the drier regions of Africa, through the Middle East to Western Asia, extending up to India. They have bare



Painted Sandgrouse display sexual dimorphism. The female (seen here) is greyish-brown, with bars and specks of a darker brown and white, and is duller in appearance than the male counterpart (see facing page)



When the Chestnut-bellied Sandgrouse (female) senses potential threat from a predator, it sits motionless and lets camouflage work its wonders, rather than fleeing



The Black-bellied Sandgrouse can be distinguished from other sandgrouse species in flight, by its black belly and white underwings

toes, including a hind-toe (absent in *Syrrhaptes*).

Of the sixteen species of sandgrouse of the world, nine are reported from the Indian region. Of these, the Tibetan, Chestnut-bellied, Painted, and Spotted Sandgrouse are resident species, the Black-bellied Sandgrouse is a regular winter migrant, while the rest could be considered as irregular migrants or vagrants in India.

The Tibetan Sandgrouse *S. tibetanus* is a resident of the cold desert plateau regions of the Trans-Himalaya (eastern Ladakh, parts of Himachal Pradesh and northern Sikkim) at altitudes ranging from 4,000-5,500 m Col. Biddulph had spotted them near the Karakoram Pass at 5,500 m. They have large bodies, compact plumage, and fully feathered legs and toes, and are suited to withstand the bitter cold of the elevated windswept regions they inhabit. I saw a large flock of Tibetan Sandgrouse in the Tso Lhamo region of northern Sikkim. They were busy feeding and allowed me to crawl quite close to them. Although listed by the IUCN as Least Concern, various developments such as increased human presence due to troop deployments, intensified road building activity, camps of road construction labourers, increasing vehicular traffic, influx of tourists, livestock

grazing, and semi-nomadic settlements, are a cause for concern. I saw migrant workers catching fish (an activity which is considered a taboo in Ladakh) in the Tangtse stream, and snares, as well as an Argali *Ovis ammon* skull with skin attached, next to a road construction site near Phobrang. An increasing number of feral dogs living close to these camps/settlements also pose a severe threat to these ground nesting birds. The Pallas's Sandgrouse *S. paradosus* is a vagrant in India, and there is only one record of this species in the country, shot in western Rajasthan in 1924 (the specimen is in the BNHS collections).

The Black-bellied Sandgrouse *P. orientalis* was earlier known as the Imperial or Large Sandgrouse, and this species was said to "afford difficult shooting and capital sport" by hunters back in the day when hunting was permitted. It is easily distinguished in the field due to its large size, black belly, and white on most of the underwing. Its range stretches from Iberia, through Africa to Western Asia, with India at the eastern extremity of its distribution, where it is purely a winter migrant. Although its historical range extended as far east and south as Uttar Pradesh and Karnataka respectively, it was found "most abundantly" in the arid areas of

north-western India until the past few decades. The Spotted Sandgrouse *P. senegallus* is said to be a locally common resident species in Rajasthan and Gujarat. However, there has been a sharp decline in its numbers and it is by no means common. It is also believed that most of the Spotted Sandgrouse seen during winters in western India may be migrants. It was in the month of January, three years ago, that I had seen a flock of Spotted Sandgrouse near Ramgarh, Rajasthan. It is quite similar in appearance to the smaller and more common Chestnut-bellied Sandgrouse *P. excustus*, the commonest and the most widespread of our sandgrouse, which perhaps explains why it does not have a separate local name in Rajasthan. The Pin-tailed or White-bellied Sandgrouse *P. albata* is perhaps the handsomest of all sandgrouse species. It has a distinctive white belly and black chest bands. Although historically recorded from as far east as near Delhi, it was more commonly found in the Punjab and Rajasthan. However, I have not heard of any sightings from India in recent times. The Crowned Sandgrouse *P. coronatus* and Lichtenstein's Sandgrouse *P. lichtensteini* occur in some areas of Pakistan – there are no records from India.

The Painted Sandgrouse *P. indicus* is

a beautiful sandgrouse with close barring on the upper parts of its body, with the males sporting a black and white band on the forehead and a beautiful tri-coloured gorget on the breast. It is a resident species, found over a greater part of India in stony hills with dry scrub or open forest habitat. Unlike most sandgrouse species of India, it is generally found in pairs or small parties instead of large flocks. It prefers relatively thick cover instead of open spaces, and is generally crepuscular in its watering habits. I once saw a few watering themselves, through the headlights of my car, while fording a stream late in the evening on my way back to camp in Palpur Kuno Wildlife Sanctuary in Madhya Pradesh. It was very well camouflaged and rose suddenly, clapping its wings and emitting clucking sounds (which is why it is called *bhat-bhata* locally), and settled

down into cover a short distance away from where I was.

Decline of Sandgrouse in the Thar

The Thar Desert is at the eastern extremity of the migration range of wintering sandgrouse from the arid regions of Western and Central Asia. Thar has changed tremendously in the last few years, adversely affecting the habitat, numbers, and distribution of sandgrouse and other desert species, including the Great Indian Bustard *Ardeotis nigriceps*, Houbara Bustard *Chlamydotis undulata*, Stoliczka's Bushchat *Saxicola macrorhynchus*, Cream-coloured Courser *Cursorius cursor*, and larks.

The biggest agent of change has been the mega-irrigation scheme of the Indira Gandhi Nahar Project (IGNP) which by bringing surplus water from Punjab to this desert has played havoc on its fragile

ecosystem. It has resulted in an unprecedented growth in human and livestock population, disruption of conservation-friendly value systems and practices, large scale conversion of virgin tracts into croplands, change in traditional cropping and grazing regimes, resulting in waterlogging, salination of soils, destruction of grasslands and loss of desert biodiversity.

Other factors responsible for change in this region are growing urbanisation, industrialisation, mining activities, tapping of petroleum, power projects, expansion of road networks, increased vehicular traffic, and tourism. A brief account of my recent trip to western Rajasthan would serve to illustrate this transformation and its impact on the desert's flora and fauna:

Moving westward into the heart of the desert from the historic city of Jaisalmer, now a major tourism hotspot, I passed



In the Indian subcontinent, the Tibetan Sandgrouse is found in Ladakh, Himachal Pradesh, North Nepal, and is also reported from North Sikkim



A flock of Chestnut-bellied Sandgrouse in flight on their way to a watering hole

rows upon rows of giant windmills on either side of the road. Shortly after these receded from view, a cement plant loomed in front of me. This was once prime sandgrouse country, but all I could see was a flock of Chestnut-bellied Sandgrouse descending upon a fallow field covered with fine dust raised by dumpers laden with limestone from nearby quarries! I soon reached Ramgarh, a frontier town on the way to the Tanot temple near the Indo-Pak border. I decided to investigate a wetland formed due to seepage from the canal, where I had seen a dead Black-bellied Sandgrouse three years ago. I was surprised to see a sounder of wild boar grubbing for succulent vegetation in the marsh, along with a Greylag Goose, Grey Heron, and a cormorant. Most of the land alongside the canal is now cropland, and only on the Ramgarh-Asutar road did I come across patches of *sewan* grasslands between fields of gram, mustard, and wheat. The year-round availability of

water has also led to overgrazing and the ruin of these fine grasslands. At *Nathji ka Tanka*, near Loharki, I marvelled at a fine stretch of grassland, only to learn that it had recently been purchased by a private company. Prime grasslands, which are main habitats for bustards and other desert avifauna, now survive only under protection in enclosures such as Sudasri and Ramdeora. There has also been a proliferation of *Prosopis juliflora*, an exotic species, which has invaded grasslands, irrigated areas, as well as catchments of village tanks, most of which now lie in a state of disuse. I was dismayed to find dense *Prosopis* thickets near tanks at Gajner, Diyatara, and Ujla, to mention a few, which were once important watering places for the Black-bellied Sandgrouse and other sandgrouse. It is probable that sandgrouse, in the absence or unsuitability of their traditional watering places, may have shifted to using seepages from canals and pipelines. However, I failed to sight

even a single Black-bellied or Spotted Sandgrouse during the ten days of search in January 2013 at the border areas of Jaisalmer and Bikaner, where the birds would be expected to be found in large numbers. Every local I enquired with, spoke of very few '*gattas*' (local name of Black-bellied Sandgrouse; distinct from '*pattibadi*' which refers to Chestnut-bellied Sandgrouse) having visited last year, and none at all in the current year. It left me wondering if this could be attributed to erratic migration behaviour, or more ominously, indicates a trend towards declining numbers and shrinkage of their range, which may result in their vanishing forever from the Thar Desert in India. ■



Udayan Rao Pawar is a young student from Gwalior. He is keenly interested in wildlife photography and likes travelling to remote wild places.

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Birds from my Balcony

Text and Photographs: V. Gopi Naidu

Birdwatching for me began when I bought a 'sparrow house' from BNHS, where I have worked for the past 18 years. I placed the sparrow house and bird-feeder in the balcony of my flat in Kalyan, and a whole new living world opened up right in front of my eyes! This marked the beginning of my fascinating journey into the world of birds.



Indian Golden Oriole

It all began when I bought a 'sparrow house' from the BNHS Marketing Department, along with a bird-feeder, as I had heard and read about the sparrow problem, and that all of us should try to prevent their decline. I installed the sparrow house in the balcony of my house in Kalyan. This proved to be a real success as I have already counted seven families of the House Sparrow which have gone through egg laying, incubation, and successful fledging in my very own balcony! The first time the new brood was ready to take wing and leave its comfortable home, I tried to mark the birds before they left, so that I could follow them and know if the same birds returned to my sparrow house. The first brood was duly marked with ordinary ink, and to my surprise, I noticed that the birds would actually return. Later, I felt that this was unnecessary, as the marks used to rub off and I did not want to injure the sparrows in any way.

The whole process of watching the birds nesting was extremely exciting. My wife, son, and I became involved in protecting the brood. As soon as a crow or myna approached the sparrow house to prey on the eggs or nestlings, the parents would call out frantically, squeaking and screeching in order to drive the predators away. The noise would attract our attention and we would immediately run to the balcony to help our sparrows. One day my son, while answering the alarm call of the sparrows, noticed a bird sitting on a *jambul* tree just outside the balcony. When I came home that evening, he described it to me, and I sat in the balcony, patiently waiting and hoping that the bird would reappear, and it did! And thus began my quest to learn as much as I could about birds, right from my own balcony!

The very next day happened to be a holiday, so I had a lot of time to sit and observe birds. The bird I had seen the previous day seemed to be a Red-vented Bulbul *Pycnonotus cafer*, although I was not very sure and wanted to identify the bird correctly. And what helped me was my interest in photography. Instead of wasting time fetching my camera when a bird appeared, I began to keep my camera with me at all times, ever ready to capture a bird if it appeared. I wanted to keep a record of these avian visits happening right there so that they could be identified later.



The author's 'sparrow house' purchased from BNHS and installed in his house in Kalyan is buzzing with activity

A whole new living world opened up right in front of my eyes. Every holiday, I became more and more enthusiastic, much to the exasperation of my wife, who does not like the tea to get cold after she has prepared it for me! However, it wasn't long before she too was dragged into my newfound hobby! A variety of common garden birds are present in good numbers in Kalyan, despite all the buildings, because there are large numbers of huge trees like *jambul*, *mast*, and *casuarina* which are visited by several species.

The most exciting day was when we saw a parakeet which looked quite different from the common Rose-ringed Parakeet *Psittacula krameri* that we had seen several times. It was larger and had a pink wing-patch, which definitely indicated that it was an Alexandrine Parakeet *Psittacula eupatria*. The bird had brought a small drupe-like green fruit and was perched on a branch



The Red-vented Bulbul is often considered an aggressive bird as it competes for food and displaces other birds from their territories



Alexandrine Parakeets are playful and capable of mimicry, and hence desirable to bird keepers. Heavily traded, their numbers are now dwindling

of the casuarina and was busy eating it. It took its time, as there was no disturbance and fed on the whole fruit, dropped the seed, and disappeared into the sky. Elated by this unusual sighting from the balcony, I decided to wait for a while longer, wondering what I would see next.

The following day, after my morning walk, I returned to the balcony. I watched a flash of yellow fly past, alerting me to the possibility of seeing an Indian Golden Oriole *Oriolus kundoo*. As luck would have it, after a while, I saw the bird perched just where I had spotted the parakeet. It seemed to be in search of something. Perhaps for some insects, I thought to myself. But it appeared to be disappointed and flew away in less than five minutes. But I was fortunate enough to be able to capture it on camera.

Some months later I saw a sparrow-like bird, though much smaller and darker in colour. After seeing it several times, I managed to identify it as a Scaly-breasted Munia *Lonchura punctulata*. The male and female are identical, so I cannot say

which one I had seen. How much more pleasure it gave me to see this bird in the wild, rather than the way it is usually seen in the city, with its wings clipped, perched on a stick, while being sold on the road.

Yet another beautiful inhabitant of the garden that I photographed was a White-spotted Fantail *Rhipidura albogularis*, flitting about near a honeycomb, in search of insect food. The prancing bird and its fanned out tail attracted my attention, and then I heard its harsh *chuk chuk* call.

We have all heard the ringing metallic call of the Coppersmith Barbet *Megalaima haemacephala*. Usually, I used to hear the continuous *tok...tok...tok* sounds that it makes all day long. One day, however, I got to see it from rather close through the viewfinder of my camera. One bird was sitting with a morsel in its mouth, and calling at the same time, but emitting a different sound. Soon another barbet appeared and perched itself next to the first one. The first bird fed the second, even though they



Pollution and loss of fruiting trees have led to a decline in numbers of the frugivorous Coppersmith Barbet

The White-breasted Kingfisher is not partial to wetlands, unlike other kingfishers

appeared to be of the same size. Was it a parent bird feeding its fledged young, or was it a male feeding its mate during courtship? I couldn't be sure.

One day, as I sat watching the birds from my usual spot in the balcony, I spotted a Greater Coucal *Centropus sinensis* on the ground. Locally known as the Bharadwaj pakshi, it is supposed to be a good omen to see this bird. Well, it was a good omen for me as I could add a new species to my collection of photographs! The coucal soon hopped up and sat on the branch of a casuarina, where I could take a picture of it.

In the same session, long after it had become sunny, I was able to get a lovely picture of a Common Myna *Acridotheres tristis*, but what really got my attention was the sudden appearance of another myna-like bird. It was of a rather different colour (greyish instead of brown, without the bright yellow patch around its eyes, and had a bushy tuft of feathers on the forehead). I referred to the BIRDS OF THE INDIAN SUBCONTINENT:

A FIELD GUIDE by Ranjit Manakadan, J.C. Daniel, and Nikhil Bhopale, and with its help I was able to identify it as the Jungle Myna *Acridotheres fuscus*.

Yet another discovery was in store for me. Below the *jambul* tree, there is always a lot of fallen fruit, which also attracts small insects. Often I have noticed a bunch of boys chucking stones at the tree to knock down the fruit, but on this particular day there were none, and the place was undisturbed. As I looked down on the ground, I realised that I had spotted the beautiful black and white Oriental Magpie-Robin *Copsychus saularis*. I had heard the calls of this bird but had not been able to spot it before. Its early morning call sounds like a *swee-ee*, and it changes a little later to a *chur-r*. Males of this species sport a distinctive black (with a glistening, deep blue cast) and white plumage; females are greyish, and not as attractive as males, as is the case in most birds. Ever since the first time I noticed it, I have begun to hear its early call on my daily morning walks, which is a great way to begin the day!



The Greater Coucal has a deep resonant call that is associated with superstitions and omens in several parts of its range



The male Oriental Magpie-Robin has a black head, throat and upperparts, and a white shoulder-patch and underparts

All these years I have been working at BNHS, designing pages and formatting pictures of beautiful animals and birds, admiring the work of other people, and yet there was something missing. Little did I realise that a little time, a camera, and a great deal of interest was all I needed to enter into this fascinating living world. I felt like I had missed out on so much! A mere sighting of a Common Tailorbird *Orthotomus sutorius* is not as plain as it seems, when you actually watch it hopping about on branches, catching its insect prey, twittering with its *to-wit-to-wit-to-wit* call, and finally the miracle of watching it build its nest by sewing up a large leaf or two, lining it with the finest cotton, fibres, and other fluff, and laying eggs within. The whole life cycle seems so spectacular to me.

My morning walks have now become more and more oriented towards birdwatching. I have begun to carry my camera along as well, so as not to miss a single exciting event that might occur. And sure enough, one day I came across the most beautiful

sight I had ever seen. Perched solitarily on a branch hanging over a small canal was a White-breasted Kingfisher *Halcyon smyrnensis*. The first thing you notice about this bird is its bright reddish-orange bill, and the white patch on the breast. If you are lucky, it will take off in front of you in a flash of different blues. But on that day, I saw it sitting still, waiting to dive as soon as it spotted its prey in the water flowing below. Later, a pair appeared in the same place. It was during the month of April, pretty close to its breeding season. I was told that it can be spotted easily by following its typical loud cackling call which is chiefly uttered during flight.

I have had some wonderful experiences in the past few months. On just three trees, in a space of 200 metres, I have spotted all these colourful birds at various times of the day. My mornings are well spent, and the day is all the more fulfilling when I see a new bird. I wish more of us city-dwellers would just spare a little time to get a little closer to the natural world around us.



The Jungle Myna (right) is quite similar to the Common Myna (left) and can be distinguished by its greyish colour, the absence of the yellow patch around the eyes that the Common Myna sports, and the bushy tuft of feathers on its forehead

In Tamil folklore, there is a beautiful story about a great king Shibi Chakravarthi, the son of Maharaja Ushinara. He was known as the *maha-data* or great giver. Devendra and Agnideva wanted to test the king's greatness. Agnideva took the form of a *kapotam* (pigeon), while Devendra took the form of a *grudhra* (vulture). While the king was sitting in his palace grounds, a beautiful pigeon came flying and landed on his lap, short of breath, and desperate to save itself. It was being chased by a vulture, which came and demanded its prey. The king was a compassionate man, but realised that the vulture would perish without a meal, but he also did not have the heart to give the pigeon to him as he would be committing a sin, and his people would suffer the consequences. So the king said to the vulture, "I will give you a much tastier meal." The vulture insisted that it wanted its rightful prey, and to test the king further, said, "I will only take the *kapotam*, otherwise, O king, give me an equal weight of flesh from your right thigh." Immediately, Shibi Chakravarthi placed

the pigeon on one side of the weighing scale, and began to cut out his own flesh to weigh it against the pigeon, but while he kept placing his flesh, the scale refused to tilt. Finally, the king sat on the scale himself, offering his whole body. Devendra and Agnideva marvelled at the king's sacrifice, revealed their true selves and blessed the king, who is known for his supreme sacrifice and selfless protection of a *sharanaagat* (one who seeks asylum) bird even today.

I had heard this story ages ago from teachers at school and felt a pang of nostalgia as my memory of this story was revived. Ever since I started keeping a sparrow house in my home, this story has a new meaning for me. ■



V. Gopi Naidu joined BNHS in 1993, after working for 18 years in various magazines and newspapers. He is currently Manager (Designing), and works in the Publications Department of the Society.

Rhinos, Dudhwa, and Reintroductions

Text and Photographs: **Gangadharan Menon**

After the last rhino was shot dead by a European hunter in 1878, not a single rhino existed in Dudhwa for the next 100 years. Then something changed in the April of 1984, when five rhinos were brought in from Kaziranga in Assam, followed soon after with five more from Chitwan in Nepal. Now 31 Great One-horned Rhinoceros of three generations roam the grasslands of Dudhwa.

R.L. Singh, an expert on this endangered species, put this experiment in perspective when he said, "The relocation of rhinos in Dudhwa is perhaps one of the most successful relocation programmes of an endangered species." This assumes tremendous significance when we realise that unlike tigers, whose footprints are spread across the country, the footprints of rhinos can only be found along the Brahmaputra valley in the northern parts of Assam and West Bengal. Furthermore, of the entire population of rhinos, 70% exist in just one area, the Kaziranga National Park.

My first exposure to the unique Terai region was in the Kishanpur Wildlife Sanctuary located outside Dudhwa. The reason was that there were unseasonal rains that made the roads in Dudhwa National Park slushy and inaccessible. At Kishanpur, we saw a lone male rhino that had wandered there from Nepal, for reasons best known to him! "There are no other rhinos here," explained Sonu, our guide. Gazing at the forlorn rhino, he continued, "Saab, Kishanpur is completely cut off from Dudhwa. So even if this rhino attempts to get to where the other rhinos are, he would get poached on the way. His days are numbered."

Dudhwa, where we went the following day, was a stunningly beautiful mosaic of blue and green: rivers, swamps, lakes, grasslands, and dense sal forests. This was an area so treacherous and infested with deadly mosquitoes that even the British soldiers stayed away from it for centuries. But over a period of time, poachers made their way into the last of the natural forests and grasslands

that remained in the Terai, and decimated many species. And the timber mafia hardly left any tree standing.

That was until the saviour of Dudhwa made his entry, the renowned, though controversial figure in Indian conservation, Billy Arjan Singh.

Billy was himself a hunter who had experienced a change of heart after he looked into the eyes of a leopard he had shot dead, and felt that the animal was pleading for its life even though it was dead. Just as some non-believers become fanatics after they turn believers, hunters too can become hardcore conservationists after some 'enlightenment'. Almost single-handedly, Billy fought for the protection of Dudhwa and all that dwelt in it. He had frequent run-ins with the powers that be, but survived because he had the same tenacity as the big cats that he tried to protect for six long decades. He became controversial for introducing hand-reared leopards and tigers back into the wild, though his experiments invariably met with success.

His film 'The Leopard that Changed its Spots' is a wonderful account of how he re-introduced a leopardess named Harriet into the forests of Dudhwa. The scene in which Harriet returns from the wild after a year to introduce her new-born cub to Billy, and then walks back into the forest, never to return, is an endearing moment that makes you feel blessed to have been born into this world, despite all its ills. Billy introduced another tiger named Tara back into the wild, and this too created ripples. But he deserves all credit for training these animals to hunt smaller mammals before releasing them into their natural habitat, where only the fittest survive.

One trip into the Park was enough proof of its rich biodiversity. Sonu introduced us to an interesting local who shared with us information on the most dominant tree in

Dudhwa, the sal. "*Sau saal badhe, sau saal kbade, sau saal pade*", which means, "grows for a hundred years, stands for a hundred years, and survives a hundred years even after it falls". What a beautiful description of the longevity of a tree! Seven different species of woodpeckers are found in the Park. The overall birdlife is also rich, comprising of 400 species. We recorded as many as 96 species in just two days.

Dudhwa has an interesting, and probably confused existence as far as the Forest Department is concerned. Originally it was established as a national park for protecting the Barasingha or Swamp Deer *Cervus duvaucelii* in 1977, as half of the world's population of this Endangered species lives here. In fact, five different species of deer co-exist in Dudhwa. But sadly, the numbers of Barasingha have decreased over the years except in Kishanpur Wildlife Sanctuary, which is a part of Dudhwa Tiger Reserve, where up to 600 Barasingha are found, mainly in the Jhadi Taal area. "Lose deer, lose tiger", says V.P. Singh, a member of the Uttar Pradesh Wildlife Advisory Council, who succinctly pointed to the inevitable connection between predator and prey. On our jeep ride along the *jheel* in Dudhwa, we saw small groups of Barasinghas, their elaborate antlers looking like some exotic, aboriginal headgear.

On one of our jungle treks, Manoj Sharma, an expert naturalist, shared with us his interesting take on wildlife-watching. He said, "Don't look for the tiger. If you do, chances are you will miss a hundred other species of birds, insects, trees, and flowers!" As we went on an elephant ride through a lush forest path with grass as tall as the elephant itself, we chanced upon a rhino with her new born calf. And we were convinced that all is well with the relocated rhinos here. Despite this, relocation attempts are vehemently opposed by

Dudhwa was once home to one of the most extensive Barasingha (Swamp Deer) ranges. However, loss of habitat has posed an immense threat to the species

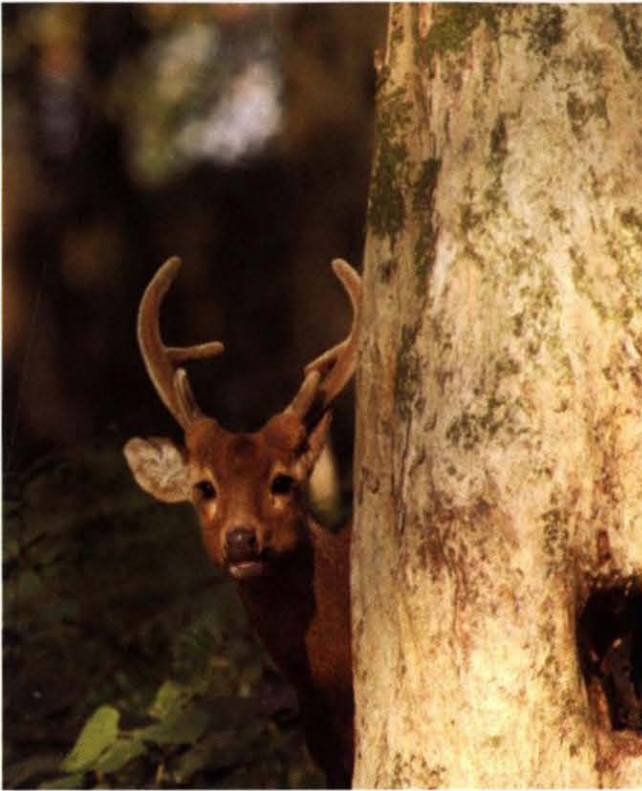




Above: The Greater One-horned Rhinoceros is poached mainly for its horn, which is wrongly believed to possess medicinal properties according to traditional Asian medicine. This species is facing a sharp decline in numbers due to the rising illicit demand for its horn

Below: Hunter-turned-conservationist, Billy Arjan Singh played a pivotal role in persuading the then Prime Minister, Mrs. Indira Gandhi to declare Dudhwa as a national park





The Indian Hog Deer gets its name because of the hog-like manner in which it holds its head low while running through the forest, unlike most other deer that leap over obstacles



Adult Bengal Monitors are terrestrial, while young monitors display certain arboreal traits. Shy and solitary in nature, they usually avoid humans

conservative wildlife experts, the most recent being in Panna Wildlife Reserve in Madhya Pradesh. Here, the redoubtable H.S. Pabla was accused of releasing a 'tame' tigress into the wild. According to his detractors, he was providing easy meat



The author was delighted to experience Dudhwa's rich and myriad biodiversity on his jeep ride across the park

to the wild tigers there. But he defended his move by stating that the released tigress was trained in hectares and hectares of protected forest to hunt and kill, and that this so-called tame tigress had hunted and killed over a hundred animals (mostly Spotted Deer) before she was released into the wild.

Around the same time, there was news of the Gujarat government refusing translocation of the endangered Asiatic Lion to Madhya Pradesh on the grounds that the site selected did not have enough of a prey-base and there was also the problem of inadequate protection from poachers. Is it a genuine environmental concern for lions, or is it the concern of losing Gujarat's so-called 'pride', I wonder! In the 1980s, it was actually a veterinary epidemic in Kaziranga that prompted the forest authorities there to reluctantly agree to relocation. Will it require another one in Gir to relocate the lions? Mother Nature forbid! ■



Gangadharan Menon made a documentary on Silent Valley, referring to the impending disaster of a hydel project coming up there, which played a part in Silent Valley being declared a National Park in 1981.

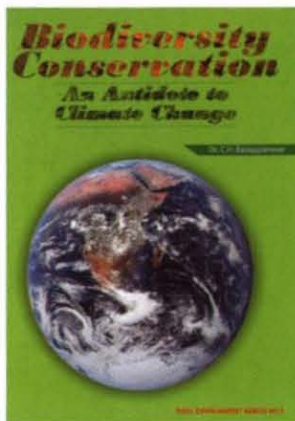
**Biodiversity Conservation –
An Antidote to Climate Change**

by C.H. Basappanavar, 2010
Published by: Vanasuma Prakashana,
Bengaluru
Size: 25 x 18 cm
Pages: 240
Price: Rs. 1,250/-
Hardbound

Reviewed by: **Atul Sathe**

Climate change has become a clichéd topic of discussion over the years and now requires sincere action rather than discourses. The book partly fulfills the need for nature education, which is important for understanding the need for the conservation of nature. This is the ninth book under the India Environment Series by the publisher. It talks about the importance of biodiversity in mitigating the impacts of climate change. The foreword by Dr. K. Radhakrishnan, Chairman, Indian Space Research Organisation (ISRO), rightly emphasises the importance of conserving India's remaining biodiversity-rich areas, such as the Himalaya, Western Ghats, north-eastern region, and Andaman and Nicobar Islands. The book is a collection of a range of related aspects of conservation such as carbon footprint, melting ice caps, bleaching of coral reefs, local green solutions, eco-friendly architecture, green careers, and satellite remote sensing as a tool for biodiversity conservation.

The role of biodiversity has been elucidated through examples such as



carbon sequestration in forests and oceans, importance of the food chain, role of species such as elephants in maintaining forest equilibrium, green house gas emissions and rainfall fluctuations resulting from deforestation, value of forest produce, and methods to prevent disasters that cause economic damage. It covers the importance of India's biodiversity across various regions, including different forest types; interaction between predator and prey, and biomass; eco-tourism and its impact; and an extremely lengthy case study of Bandipur and Nagarhole National Parks in Karnataka.

The author rightly mentions that experiments such as development of synthetic trees in the USA to mop up carbon dioxide from the atmosphere look attractive at the academic level, but cannot be the real solutions. There is good coverage of India's Vedic tradition of conservation, including spiritual

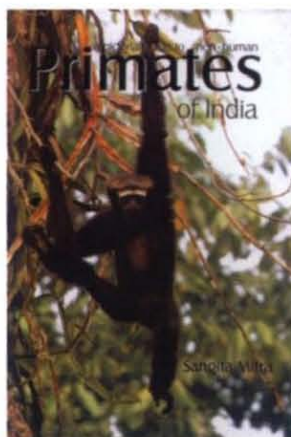
aspects such as reverence for nature rather than dominance and control. Holistic Gandhian thoughts on simple lifestyles and the biodiversity depicted in India's art and culture have been explained. It has good representative photos of India's biodiversity and maps of the forests of Karnataka. The book is a good read for students and teachers of environmental sciences, but it has drawbacks and contradictions too. A number of aspects have been crammed into one book. The author talks about the role of forest dwelling communities in conservation, but also insists on them moving out of protected areas. Not enough has been said about other important measures for combating climate change, such as individual action for sustainable living, the government's role in reducing green house gas emissions, and holistic development policies. The cover and overall appearance could have been more attractive, and the price lower in order to appeal to a wider range of readers. The map at the beginning depicting wildlife areas of India should have been updated, since community conserved areas and newly notified sanctuaries and parks have not been mentioned. "Habitat Conservation" would have been a more suitable title for the book, since the larger landscape, which includes biodiversity, plays the key role in mitigating climate change impacts. ☺

**A Pictorial Guide to
Non-human Primates of India**

by Sangita Mitra, 2011
Published by: Naturism, Kolkata
Size: 20.5 x 13.5 cm
Pages: 173
Price: Rs. 695/-
Hardbound

Reviewed by: **Atul Sathe**

Monkeys are one of the most familiar animals for most Indians, children and adults alike. We are quite



used to seeing domesticated macaques being paraded by *madaris* on streets and busy public places, and the langurs that frequent many temple complexes. Many of us also have witnessed macaques stealing tidbits from our hands. The species name Hanuman Langur is derived from Hanuman, a Hindu deity who was an ardent devotee of Rama, according to legends. However, despite monkeys being common, little is known about their life in the wild, distribution, habitats, and the

different species found and threats faced, particularly to people from urban areas.

Here is an interesting and informative book that provides an opportunity to know more about the primates of India. It also serves as a handy field guide for those who wish to study and identify primates in the wild. Primates have been described as “prime mates” in the book, which is an interesting way of denoting their close genetic links with humans. The cover of the book is attractive with a picture of the Hoolock Gibbon, the only species of ape found in India. The foreword by Jane Goodall, who is perhaps the most celebrated and veteran primate researcher in the world and known for her lifelong work on chimpanzees, points out the need to study and conserve primates in various parts of the world, before it is too late.

In her introductory note, the author rightly mentions that primates remain largely neglected in our conservation agenda, since most initiatives focus on species such as the tiger and elephant. The global distribution map depicting the present and past ranges of primates in the beginning of the book is informative.

Close to a third of the book has been dedicated to important aspects, such as classification, evolution with a pictorial chart, habitats with representative pictures, social composition, food and feeding habits, human-primate conflict, and reproduction and communication among primates. The field guide section of the book begins with a state-wise distribution chart of primates. Good photos accompany the text. Relative size of each species with respect to humans by way of comparative silhouettes has

been shown. Distribution maps, which play a vital role in any field guide, are also given for each species. Species covered in the book include Slender and Slow lorises; Capped, Golden, Hanuman, Nilgiri and Phayre’s Langurs; Assamese, Bonnet, Crab-eating, Lion-tailed, Rhesus, Stump-tailed and Pig-tailed Macaques; and Hoolock Gibbon. Appendices include important aspects, such as threats to primates, species outside India, genetic charts related to Indian primates, and the distinct identification points of various species in India.

A mistake noticed was that the Slender Loris, though known to occur in Maharashtra and Goa, and also shown occurring in these states in the distribution map, is not listed for these states in the state-wise distribution of species table. 🐼

Explore Tanzania

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An Easy Catch?



This picture was taken at Orange County, Kabini. Orange County is located 94 km from Mysore, spread between the districts of Kodagu and Mysore. Located to the north-west of Bandipur National Park, the Kabini reservoir separates the resort and Park, and has rich forest cover, abundant streams, valleys, and waterfalls.

We were on a motorboat in the Kabini reservoir. I asked for the engine to be turned off as I had sighted a Grey-headed Fish-Eagle, circling around, over our boat. Then at lightening speed, it landed on the grass on the bank. We were curious to know what the bird was up to. The eagle started to walk towards the bank of the river, and then entered the water near the shore. It put out its strong legs, locked its talons onto its prey, and we saw that it had caught a fish. We watched in wonder as it dragged its prey out of the water. And just like that, within seconds it dislodged the head of the fish.

Generally, this species, like the other fish-eagles, catch fish from the water's surface while scanning it in flight. I thought to myself, "Could this be a sick or injured fish that was an easy catch for this magnificent bird of prey?"

Vikas Madhav
Class 9, Sishya School
Chennai

The Swallow Family of Nandadevi Base Camp

We had been to Nandadevi Base Camp this summer organised by the Society for Trekking and Environmental Preservation (STEP). Dholchhinna is a small village en route, where we had breakfast at Hill View Restaurant, where we spotted a nest with chirpy chicks. Curiosity made me take a closer look at the nest and its occupants. I discovered that the nest belonged to a swallow family. The nest was about 20-23 cm in diameter and looked like a bowl cut in half. It was made up of feathers and straw, and cemented with the saliva of the parent birds. It was built right in middle of the main dining hall and even covered a part of the photo frame on display. Perhaps this location helped in keeping the young warm and dry in cold weather, and also protected them from predators. The restaurant owner too seemed to have left the family undisturbed and in peace. There were about 7-8 chicks in the nest that might have been just about 8-10 days old. They had opened their tiny eyes and minute feathers could be seen on their skinny bodies. I began to observe the nest. The parents were being kept on their toes, flying in and out of the nest in search of food for their ever-hungry babies.



Suddenly, as I watched, one of the nestlings turned, pushed its tail out, excreted faeces, and turned back again ready to receive the next morsel of food being brought by its parent. The whole process happened in less than a second. It amazed me how the nestlings, which had barely opened their eyes, had the instinct to keep themselves and their homes clean. The owner of the restaurant seemed to be concerned about the natural environment and had placed a box under the nest to collect the droppings and dispose of them easily so his restaurant remained clean and the birds were left undisturbed.

My mind kept going back to the swallow family during the trek. I was overjoyed when we happened to visit the same hotel for lunch on our way back, as I had a chance to see how the young had fared. In a span of twelve days, there were five of them left but they seemed rather healthy and just as busy as when I had seen them last. I was unable to get a good photograph of the chirpy family as their extremely swift movements did not permit me to do so!

Satish G. Kolvankar
Mumbai

Become a

Tree Ambassador



The 33-acre BNHS Nature Reserve at Goregaon, Mumbai, has been safeguarding more than 125 indigenous tree species for the past 30 years. This year BNHS is celebrating 20 years of conservation education on the Foundation Day of its Conservation Education Centre (CEC). To commemorate this milestone, the tall trees around the CEC are being put up for adoption. There are several interesting species which you could choose from, after going through their biodata!

How it works

You choose a tree. We put up your name tag, photograph you and your tree, record its GPS location, email you the photo and GPS co-ordinates, send you an adoption certificate, care for your tree, email you interesting observations on birds, bees, and butterflies on your tree and pictures of flowers and fruits, and invite you and your family to celebrate the adoption every year!

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ABOUT THE POSTER



Greater Adjutant *Leptoptilos dubius*

The Greater Adjutant *Leptoptilos dubius* is the largest and the 'ugliest' of Indian storks. In the Indian region, it was formerly distributed in northern India, west to Pakistan (Sind) during the Southwest monsoon, east to Bangladesh (sporadic), and south to Deccan. On the decline, the species is now largely restricted to Assam. Adjutants lack vocal muscles but produce sounds through the clattering of their bills, and are known to make low grunting, roaring, or mooing sounds, especially while nesting. The name adjutant has its genesis in the stiff 'military' gait it adopts while walking on the ground. The Greater Adjutant inhabits wetlands, particularly partially dry ones with abundant fish, which include river

beds, swamps, paddy fields, stagnant pools, and lakes, as well as carcass dumps.

Once common, the population of the Greater Adjutant is now plummeting and the species has been listed as Endangered according to IUCN's Red List for Threatened Species. Major threats include destruction of roosting sites, poaching, loss of their wetland habitats, over-fishing, besides improved carcass disposal in towns and cities. Close monitoring of the species, and reviving and conserving their wetland habitat is the need of the hour.

Greater Adjutant *Leptoptilos dubius*



FROG HYMNS AND RAIN BABIES

Monsoon Culture and the Art of Ancient South Asia

by Gautama V. Vajracharya

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On Birds and Databases

Text: Nita Shashidharan and Divya Warriar

Nowadays, there is a massive amount of work being done in environment-related fields in India. This in turn calls for management of the information for quick and easy access to students, researchers, conservationists, and others, to assist in the decision-making process. The Government of India realised the potential and importance of environment-related information and this led to the establishment of the Environmental Information System (ENVIS) network in 1983. The objectives of the ENVIS network are collection, collation, storage, retrieval of environmental information, and its dissemination to policy planners, decision-makers, researchers, academicians, other stakeholders, and the interested common man.

An introduction to ENVIS will be incomplete without stating its position in the larger global framework of its existence. ENVIS was designed to be the National Focal Point (NFP) for INFOTERRA, a global environmental information

network of the United Nations Environment Programme (UNEP). This network operates through a system of government-designated national focal points. ENVIS is a part of this information network, which is basically a network of institutions/organisations in India that are renowned for their expertise in different subject areas related to the environment. These institutions/organisations act as nodes, known as ENVIS Centres, their focal point being the Ministry of Environment and Forests (MoEF). Thus, the network includes the focal point (MoEF), State/Union Territories ENVIS Centres, and Thematic ENVIS Centres distributed across India.

BNHS and Indian Ornithology

Founded in September 1883 by eight residents of Mumbai for the study of natural history, the BNHS has had a long tradition with the study and conservation of Indian birds. Starting

ENVIS Centre On Avian Ecology
Hosted by: Bombay Natural History Society (BNHS)
Sponsored by: Ministry of Environment and Forests, Govt. of India

ENVIS Network

ENVIS Centre On Avian Ecology
Welcome to BNHS ENVIS Centre on Avian Ecology
BNHS ENVIS Centre on Avian Ecology is established under Environmental Information System (ENVIS) programme of the Ministry of Environment and Forests, Govt. of India in the area of Avian Ecology.

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V. GOPI NAIDU

ENVIS helped segregate interesting stories collected during the Online Citizen Sparrow Survey in 2012



S. BALACHANDRAN

Pioneering studies carried out by the BNHS on bird ringing and bird migration, amongst others, have made it the first choice of MoEF for establishing the ENVIS centre on Avian Ecology



VIBHU PRAKASH

A Long-billed Vulture at Pinjore, Haryana, one of three Vulture Conservation Breeding Centres which is a major avian research project of the BNHS

from natural history and anecdotal accounts of Indian birds in the early days of its existence, the Society progressed to undertaking pioneering surveys to document the avifauna of the Indian subcontinent.

Foremost among the ornithologists in BNHS who made an impact on Indian ornithology was Sálím Ali (1896–1987), also known as the ‘Birdman of India’. A series of bird surveys were carried out by him across India and neighbouring countries from 1931–1982, many of which were published as articles in the *Journal* of the Society and as books. Besides these, Sálím Ali made a seminal contribution to Indian ornithology through his book titled *HANDBOOK OF THE BIRDS OF INDIA AND PAKISTAN* (1968–75) that he co-authored with S. Dillon Ripley. The *HANDBOOK* is the definitive reference on Indian ornithology. He also popularised birdwatching in India through his book titled *THE BOOK OF INDIAN BIRDS*, first published in 1941 and now in its 13th edition. Based on the surveys and collections made from the 19th century by the Society, and contributions by its members and others, the Society has an invaluable collection of bird skins, which along with the collections of other taxa is considered as a national heritage collection by the Government of India.

The year 1959 saw a significant step forward for Indian ornithology when the first-ever organised large-scale scheme for bird ringing and migration study in the Subcontinent was taken up by the BNHS. This was the genesis of the Society’s bird migration studies, which continues off and on, now increasingly through the satellite-tracking of birds. Major and smaller projects on birds continued after that, and some of the completed or on-going projects on birds are: Important Bird Areas (IBA), Indian Bird Conservation Network (IBCN), Vulture Breeding and Conservation Programme, and projects pertaining to waterbirds, grassland and forest birds, bird migration, avian flu, and environmental impact assessments particularly focussed on birds. Because of the enormous work carried out by the BNHS on birds, it is the designated partner in India of BirdLife International, and is consulted by the MoEF on issues especially related to the conservation of Indian birds.

The BNHS ENVIS Centre on Avian Ecology

Considering the credentials of the Society in the discipline of Indian ornithology, the BNHS was selected to serve as the ENVIS Centre on Avian Ecology by the Ministry of Environment and Forests (MoEF) during the Salim Ali birth centenary celebrations in June 1996.

The objectives of the BNHS ENVIS Centre are:

- To develop and maintain various databases on avian ecology.
- To keep users updated via information portal – the ENVIS website.
- To publish a newsletter related to avian ecology.
- To disseminate information on avian ecology through a query-response service.

Keeping these objectives in mind, here are some tips on how you can make better use of the facilities provided by the BNHS ENVIS Centre:

Online Databases and Literature

The BNHS ENVIS Centre has a bibliographic database on Indian birds, comprising over 15,000 references. This database is a boon for ornithologists and researchers searching for literature on any aspect related to birds. The Centre has also developed databases on state-wise checklists of birds, IBAs, threatened birds of India, endemic birds of India, vernacular names of Indian birds, checklist of Indian waterbirds, birds in trade, besides several others. The Centre has basic information on birds and presentations on a wide range of topics like birdwatching tips for beginners, bird census, and bird evolution and classification. All these are available on the periodically updated ENVIS website (www.bnhsenvis.nic.in).

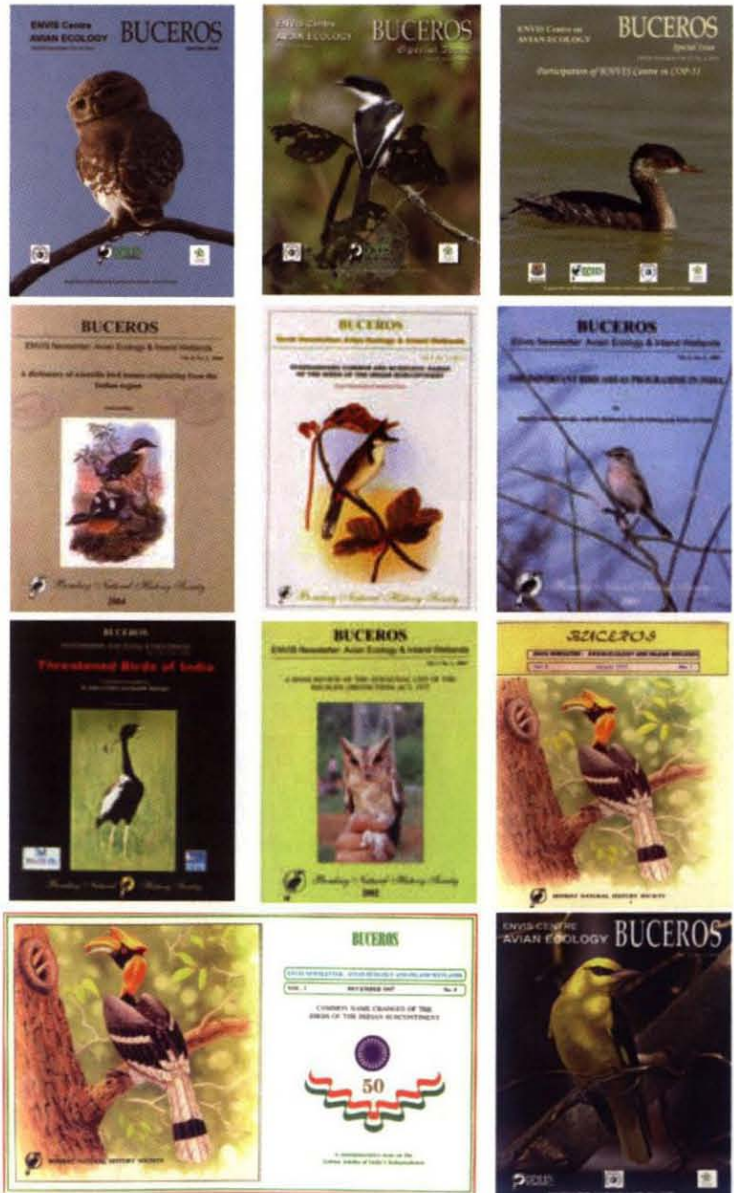
Buceros

The Centre publishes a newsletter *Buceros*, which is the generic name of the Great Pied Hornbill *Buceros bicornis*. The Great Pied Hornbill is the mascot of the Society. We were keen to adopt the name of our mascot for our newsletter, which has three issues a year, but since the Society already has a magazine named *Hornbill*, we decided to use the generic name of the species. Initial issues of the newsletter were monographs covering various themes such as 'Vernacular names of the Birds of Indian Subcontinent',

'Standardised English Names of Birds of the Indian Subcontinent', 'The History of Indian Ornithology' and 'Bibliography of Anatidae of South Asia', to name a few. However, with the mandate of the nodal agency at the MoEF in 2007 that the ENVIS newsletter should follow a popular format keeping the interest of general public and update them with current developments in avian ecology, *Buceros* now includes news, events, articles, and abstracts.

Query-Response Service

The ENVIS Centre has an active and prompt query-response service. Annually, we receive substantial queries from all over India and abroad



seeking information on birds on a wide variety of topics, ranging from species status, to climate change and other subject-specific queries. The Centre provides the required information, be it scientific or popular in nature, or suggests relevant references to obtain more information.

Researchers, academicians, and government officials make requests for published literature on the status and population of birds, bird census techniques, bird systematics, bird-strikes, impacts of climate change, habitat loss, pesticides, and poaching on birds. The print and electronic media also contact us for validation of scientific names of birds and information on ongoing issues of bird conservation. The Centre also receives queries from amateur and hardcore birdwatchers seeking information and guidance on bird identification, birdwatching tips, bird rescue, popular birding destinations, and general information about the distribution, behaviour and conservation of birds. Many educational institutions and NGOs often request us to provide informative posters and presentations on birds.

A widespread interest in the work done by the BNHS on Indian birds is reflected by the numerous queries received by the Centre on the ongoing research projects in the Society, many of which are on the Great Indian Bustard, vultures, and bird migration. There are also queries regarding the history of Indian ornithology, and about popular ornithologists and their contribution to the field.

Strange as it may be, some have contacted our Centre to dispel their doubts on birds arising from Indian mythology and superstitions! We were even contacted for literature on birds mentioned in THE ORNITHOLOGY OF SHAKESPEARE. However strange or amusing the query may be, the Centre tries its best to resolve it.

We hope that the role of the Society's ENVIS Centre in documentation and dissemination of information on Indian birds reaches all those who are interested in birds. Please do visit or contact our ENVIS Centre in case you wish to learn more about our feathered cohabitants on this planet. ■



Nita Shashidharan (left), Information Officer, and Divya Warriar (right), Scientist-in-Charge, ENVIS Centre on Avian Ecology, at the BNHS, demystify the Centre and enlighten us on how birdwatchers, researchers and others can make optimum use its open access resources.



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Save Indian Bustards

Before it is too late !



Less than 30 Indian Bustards are left in the wild in Kutch, out of the 300-odd that still exist in India. Despite being listed as **critically endangered** by IUCN, not much attention is given to protect the Indian Bustard and its habitat.

The Corbett Foundation, an NGO established and supported by Infinity Resorts, is fighting hard to save the natural habitat of these majestic birds in Kutch, Gujarat.

Lend your support to "Save the Indian Bustards Campaign" of The Corbett Foundation and urge the Gujarat Government to protect and conserve their habitat by signing an online petition of The Corbett Foundation

www.change.org/petitions/save-the-indian-bustard-campaign



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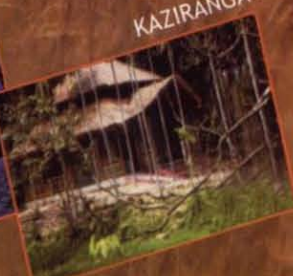
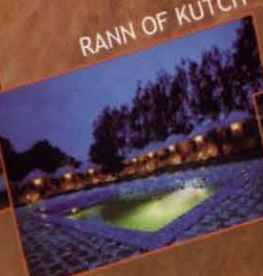
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Being Inspired...

Text: Saloni Bhatia

We are in Spiti to explore the potential for artificial glaciers that might help conserve spring water to make up for the progressing deficit of winter precipitation in this cold Trans-Himalayan landscape.

"There's a story which goes like this," explains *Aba le*, "Once a loving father gifted his son a shawl worth Rs. 1,000. The son, who had recently purchased a pair of shoes for Rs. 200, not knowing the value of the shawl, used it to wipe the dust off his shoes." "Yikes!" I exclaim, unable to hide my displeasure. *Aba le* smiles, "You see, any kind of developmental activity must be collaborative, giving the community equal stakes in the process. Unless we contribute to it equally, we will never feel responsible for it."

I nod my head in agreement and begin to discuss the specifications of the check dams that we intend to create in Kibber,

'Aba' in Ladakhi stands for father and 'le' is an address of respect. His official name is Chewang Norphel. He is a retired civil engineer from Leh and works with the Leh Nutrition Project. He came up with the concept of artificial glaciers about twenty-five years ago while experimenting with the flow of water in the nullah next to his house. Since the late 1990s, he has built over ten artificial glaciers in Leh, some of which were destroyed in the 2010 flash floods that swept across central Ladakh.

a tiny village in Spiti. Kibber has had a particularly bad agricultural output this year because of untimely hail that destroyed the green peas (the main cash crop of the Upper Spiti landscape). The crop that is normally priced at Rs 39-50/kg fetched only Rs. 12-29/kg this year, much to the disappointment of this agro-pastoralist community. With the

unpredictability of weather, marked decline in winter precipitation, and increasing trend in summer precipitation (as suggested by meteorological records), Kibber, like most other villages in this landscape, is struggling to adapt to climate change. The smaller glaciers, which are an important source of irrigation water in spring, seem to be receding at a remarkable rate. This year, it has resulted in a fifteen-day delay in sowing, making the crop more vulnerable to autumn's weather changes. Apart from the soil and moisture conservation benefits, artificial glaciers can be used to mitigate the impacts of climate change.

In autumn, water from the springs is channelled to cooler, usually north-facing slopes at mid-elevations and retained on uniformly levelled ground using check dams, which soon freezes into substantial sheets of ice. Simple monitoring ensures that it is readily available for agriculture the following spring when glaciers at



Representatives from Kibber, a small hamlet in Spiti



SALONI BHATIA

A spectacular view of Kibber and Chicham villages

higher elevations remain frozen. Such a structure guarantees supply of water during the critical sowing period, which can enable better yields. Artificial glaciers can also be harnessed for local pasture development which could, in turn, reduce grazing pressure by directing free-ranging livestock to a particular patch for grazing in the summer months.

Since nearly two decades, the Nature Conservation Foundation (NCF) has been working with the local community to secure Snow Leopard landscapes by focussing on policy, research, and

conservation aspects in a collaborative and participatory manner. Creating artificial glaciers is an endeavour in this direction. Hence NCF and Snow Leopard Trust, in collaboration with the Himachal Pradesh Forest Department, invited *Aba le* to assess the possibility of creating such glaciers to augment livelihood and biodiversity conservation in Spiti.

The eagerness of Kibber's artificial glacier committee members is palpable as they crowd around *Aba le* to understand its technicalities. The Junior Engineers (J.E.), exhausted and famished with the

two-hour climb to the site, try to cool themselves down with some fruit juice. *Aba le* walks swiftly up and down the slope. He carefully measures the width of the nullah and makes quick calculations of the dimensions of the retaining wall and the volume of resources that will be necessary to execute the task. He politely takes charge of the diary of one of the J.E.s and scribbles this information while making simple diagrams which villagers can follow with relative ease. The whole point of this exercise is to make the locals realise that they are as capable of making



SALONI BHATIA

Spiti which means 'The Land in the Middle' is so named because the valley lies between Tibet, Ladakh, and the Kullu and Kinnaur valleys



TANZIN THINLEY

Aba le, known as the 'Ice Man' has built 12 artificial glaciers. These glaciers increase ground water recharge, rejuvenate spring water and provide water for irrigation during the critical sowing period, which can aid in better yields

these dams as any engineer would be – of course with a few technical inputs from qualified personnel in the beginning.

Over the next few days, we meet close to forty stakeholders, including *pradhans* of the different panchayats, principals of schools, and heads of various government departments in Kaza, the capital of Spiti. *Aba le* enthusiastically repeats all that he has to say, stressing on some of the key issues over and over again. Enthused by the ongoing work in Kibber, the neighbouring village, Chicham, also invites him to survey potential sites in the village. *Aba le* is delighted at this prospect. Despite his ill-health and a heart condition, this 78-year-old man gladly accepts their invitation and undertakes a back-breaking two-hour journey on the unpredictable Spitian roads to get to the village.

The next day, he climbs uphill on a donkey (not the one to complain about unavailability of horses) and gains an altitude of 4,800 m reaching the only spot in Chicham village where an artificial glacier can be built. The same J.E.s, who have attended under the orders of the Sub-divisional Officer, sit quietly, their morale visibly affected by the heights that they have just scaled. Some of the accompanying members wander off to look for mushrooms. *Aba le* jots down a few points and offers a menu of water conservation ideas to the village committee. At his next stop Lossar, *Aba le* engages in an animated discussion on a range of livelihood ideas, such as plantations, eco-tourism, self-help groups, and organic farming, drawing parallels with Leh, his hometown. During his discourse, Lossar's long-haired *numberdar* sitting next to him dozes off disinterestedly, yet *Aba le* persists.

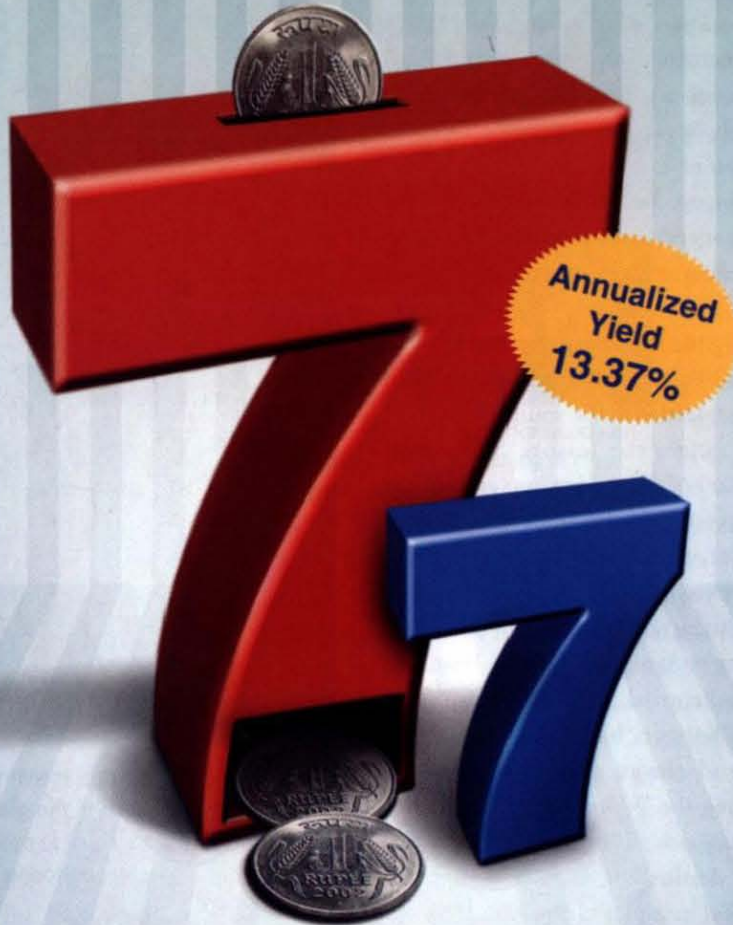
Despite being showered with national and international recognition, *Aba le* remains as humble as any man can ever be. He seems rather preoccupied with issues that do not directly concern him. He treats the problems of humankind as if they were his own. "Why is that?", one wonders. His actions can be likened to that of a *lama* who gives up worldly pleasures to serve his fellow creatures. As I write this, in 2012, the words of Karmaji (our staff in Leh) come to mind. *Aba le* is, in fact, a Bodhisattva – a being who is worthy of nirvana but stays behind in the material world out of compassion for suffering beings. ■



Saloni Bhatia works as a Research Affiliate with the high altitude programme at the Nature Conservation Foundation.

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Jessore: in search of the Hornbill

Text and Photographs: **Parikshit Acharya**

Nature has so much to offer but very few are fortunate enough to receive a part of its bounty as it requires hard work, patience, and sometimes just plain luck. It is rightly said that when one is gathering honey its quality and quantity depends on how far you are willing to go in search of it. This belief can be extended to the search of a 'denizen' in the wild. The Jessore Sloth Bear Sanctuary, in our case, offered plenty of experiences to learn from during the two or three trekking expeditions we made each year for ten years.

Jessore is situated along the Gujarat-Rajasthan border, located off the Ahmedabad-Palanpur-Mount Abu highway, and is easily approachable. Nestled in the southern portion of the ancient Aravali range, the Jessore Sloth Bear Sanctuary, spread over an area of 180 sq. km, was specifically established for the conservation of the Sloth Bear. It is an extremely enchanting forest, with the Banas and Sipu rivers flowing through it. With over 400 plant, 212 bird, and 25 mammal species, Jessore can be ranked as one of the richest natural habitats in the state. Apart from Sloth Bear, the Sanctuary is home to the Leopard, Striped Hyena, Small Indian Civet, Common Langur, hare, porcupine, and hedgehog, mongoose, and eleven species of globally endangered birds, including the White-naped Tit, White-rumped Vulture, and Ferruginous Pochard. Jessore is also an important pilgrimage destination, and the Kedarnath Temple and other smaller temples draw hundreds of pilgrims each year.

Jessore is very close to our home and heart, and we often venture into new areas to explore previously unvisited areas of the forest. Our group, consisting of Kailash Jani, Mukesh Raval, Harnath Dhunia, and me, is extremely eager to embark upon a journey to this place at every given opportunity. We had been here in June 2012 to see the Indian Grey Hornbill and Asian Paradise-Flycatcher. A few years ago, during a field trip, I had seen a Paradise-Flycatcher at Khata Aamba, an interior and one of the greenest parts of the Sanctuary, which has many Sloth Bears and Leopards. When I suggested a birding trip to the area, our group agreed unanimously, though knowing that it would be a difficult trek.



The Indian Grey Hornbill is almost completely arboreal and seldom descends to the ground, except to pick up fallen fruits, dustbathe or to collect mud pellets during the nesting period to seal its nest

We reached the tourist rest house at Jessore in the evening, and set our tent up for the night on a small island in the midst of a lake situated close to the rest house. Sunset was just around the corner. It always gives us immense pleasure to spend an evening in this Sanctuary. Although it was a hot summer day, the evening was comparatively cool, and a gentle, dry, wind kept the heat at bay. We devoured a simple but delicious meal of *roti* and *sabji* that Raval had prepared. There is something extremely special about food cooked with love, and Raval has always been fond of cooking, so much so that he barely allows any of us to help him out.

We fixed our schedule for the following day and retired at around 10:00 p.m. under the open sky as the tent had become a habitat for pond insects, flies, and crickets. We started our

mission at 5:30 a.m. One of our team members, Harnath could not join us for the trek because of his physical disability. We could not have breakfast or even tea as our camp was not too close to the Forest Department kitchen, and we did not want to waste time as early mornings are the best time for birdwatching. We only carried binoculars, a Canon 1100D camera and water bottles.

The weather was rather pleasant in the morning. After walking down for half an hour by the side of the pond that stretches vertically in the direction of Khata Aamba, we entered the core of the jungle. June is always scorching in Gujarat. The monsoon was on its way, but by then summer would have already left its

conspicuous mark on the environment. Almost all the trees were stripped of leaves, except a few big ones on the banks of a dried stream. The temperature was rising by the hour. I have observed in all my trekking programmes that when we went with a special task, all hurdles were easily overcome. We were enjoying every step even though it was steep and rocky. Suddenly we heard an ear-catching and sweet call; this we discovered belonged to the Indian Pitta. These birds are usually not seen in the Sanctuary, and are probably migrants to the area. They were in a group sitting on different trees calling out to each other intensely, perhaps warning each other of the dangers of us intruders in their habitat.

It was around 9:00 a.m. and we had almost reached our destination – Khata Aamba. To our surprise, we saw a small stream emerging from the big rocks and descending into a small patch of ground where the greenery was still intact, a sight



Baya Weavers are social birds and forage for seeds on plants and on the ground in flocks. Flocks fly in close formations, often carrying out complex manoeuvres

Asian Paradise-Flycatcher. With this, we confirmed that this bird is a resident of the area. The male Asian Paradise-Flycatcher is really beautiful and flies with so much grace. It is indeed a bird of paradise! After spending around an hour and a half here, we moved further inside this place. We also spotted the Great Tit, Coppersmith Barbet, and the hariyal (Yellow-footed Green-Pigeon).



Widely distributed over the plains of Asia, the Painted Stork is not a migratory bird and only travels short distances within its range in search of food and for breeding

we did not expect to see in the peak of summer. We were delighted to see some male Paradise-Flycatchers there. These birds love to be around water. We rested for a while on rocks and then used the fresh, cool water to freshen ourselves. Feeling rejuvenated, it was now time for us to resume birding. We tried to make as few movements and noise as possible and concentrated on looking for birds, as there were many small birds flying around. After a little while, Mukesh pointed a finger towards a tree. It was a female Asian Paradise-Flycatcher sitting on a branch of a banyan tree. It is much easier to spot a bird on a tree than to get a good picture of it! We were also lucky to spot a couple of young ones of the

It was noon and the temperature was soaring. We were all hungry and tired. Mukesh was resting on a huge rock under the shade of a tree. Kailash and I were having a conversation about the birds of this Sanctuary. At the tourist rest house, photographs of birds of the Sanctuary had been displayed, and we had recorded all the bird species listed, except for the Indian Grey Hornbill. This bird was last recorded in the Sanctuary about a decade ago, and there had been no records since then. Kailash and I moved further outside the green patch and all of a sudden,

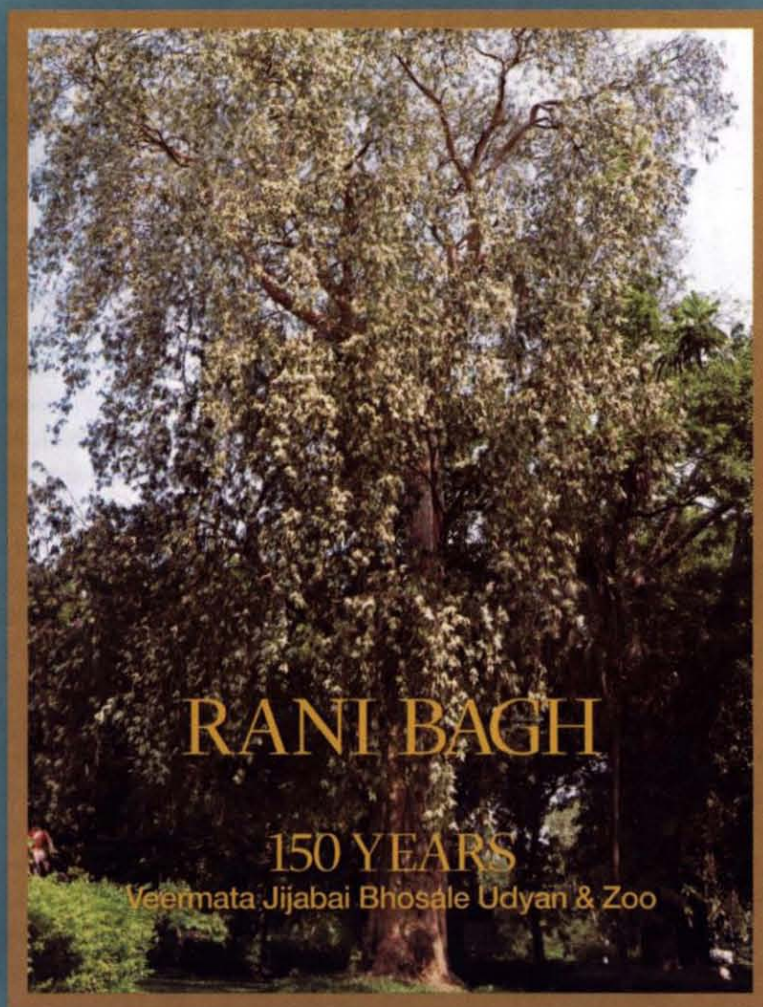
Kailash murmured softly in my car and with a finger directed my gaze towards a far branch of a greyish tree, and lo and behold, on it was our most sought after bird, the Indian Grey Hornbill! It was sitting on a big branch and holding something in its beak. What a sight it was! No words can describe how elated we felt, it was sheer euphoria! I took my camera out, moved towards that tree stealthily and took a few shots, and also managed to invite Mukesh to witness this extremely rare sight.

This was a trip to sight the Indian Grey Hornbill and Asian Paradise-Flycatcher and we were fortunate to see both the species. We returned to the rest house by 2:00 p.m., forgetting

the hunger and heat due to the immense excitement. Harnath was waiting for us at base camp and was happy to hear the news. The Forest Department appreciated our efforts and we gifted the photographs of our successful expedition to them. ■



Parikshit Acharya is an avid birdwatcher and trekker and loves spending his time in the jungle.



The book features the garden's early history, planning and architectural aspects, botanical heritage, and its recent struggle to protect this heritage botanical garden from the threat of redevelopment.



For further details contact: Bombay Natural History Society,
Hornbill House, S.B. Singh Road, Mumbai 400 001, Maharashtra, India.
Tel: (022) 2282 1811, (022) 2202 5481 (82), Email: bnhscmd@gmail.com

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- JRD Tata

The Plight of the Neglected Coastal and Marine Ecosystems of India

Text: Deepak Apte

Photographs: Reshma Pitale

Marine biodiversity conservation in India is in its infancy. Lack of attention at the national policy level, ambiguities in marine conservation policy, absence of a dedicated marine enforcement mechanism, inadequate financial and human resources, self-defeating mandates of various departments, and large scale development interests of power and port infrastructure, are a few of the major causes for concern. With ever expanding economic aspirations leading to large scale coastal infrastructure, development is bound to have an enormous ecological footprint, which could lead to severe consequences for coastal and marine biodiversity, other natural resources, and coastal communities as well.

Worldwide, more than 50% of the population lives in coastal areas — a figure that is expected to rise to 75% by 2025. Among the 63 most populated urban areas (with 5 million or more inhabitants in 2011), 72% of them are located on or near the coast. In India, about 47% of the population lives in the coastal states. Thus, these people who depend on marine and coastal biodiversity for their livelihood, either directly or indirectly, are vulnerable due to its accelerated degradation.

One way of saving these resources is by the formation of Marine Protected Areas (MPAs). There is no shortage of MPAs in India (both existing and proposed); 34 in all (nine national parks and 25 sanctuaries) covering 627,212 ha of area. However, compared to the size of the coast, contribution of MPAs in India is about 4% which by any standard is poor. Moreover, MPAs are not distributed evenly and most of them are on the east coast (30), of which, 15 are in the Andaman and Nicobar Islands. The west coast of India has only four MPAs. Of the 34 MPAs, only 18 fall in 'Category I' of IUCN's list of categories for Protected Areas, which have both intertidal and subtidal zones. The other 16 have only intertidal zones (along with terrestrial habitats). There are three biosphere reserves and at least another 30 PAs that have terrestrial or freshwater ecosystems that partly contain

coastal and marine environment. The effectiveness of these MPAs is altogether a different issue.

Despite all these marine and coastal protected areas, there are certain marine and coastal ecosystems that are in dire need of attention. We call them 'neglected ecosystems'. Mudflats, seagrass, intertidal rocky shores, sandy shores, and sand dunes have received little attention in national conservation policies. Some of these habitats, to a certain extent, form part of the existing MPA network. However, there is lack of information on the diversity that exists within such areas, and this has probably resulted in ill-defined conservation and management policies for these habitats. A number of species which are protected under the Wildlife (Protection) Act, 1972 and listed in the IUCN Red List of Threatened Species are dependent directly or indirectly on these habitats (Table 1). Besides, a large number of coastal and other communities depend on them for direct or indirect uses.

Mudflats

Mudflats, also known as tidal flats, are coastal wetlands that are formed when mud is deposited by tides or rivers. The sheltered environment and low water currents, which can encourage the deposition of sediment particles carried by water over time, are factors responsible for the formation of these complex muddy shorelines. High organic detritus material dominated by silt and clay is the textural characteristic of such deposits. Estuarine-creek complexes, which are semi-enclosed transitional water systems having both fresh and marine water influx, are ideal places where such sedimentation can occur. Intertidal mudflats are formed in the open or on the banks of estuarine systems (partly enclosed areas, lagoons and channels).

Mudflats are structurally less complex than mangroves, but they contain diverse and abundant invertebrate fauna. Mudflats are periodically submerged and exposed with each tidal cycle. They are therefore only available to nekton during tidal inundations. These flat areas or muddy

substrates support rich marine fauna such as algae, crabs, fish, polychaetes, molluscs, crustaceans, and mudskippers, which are the preferred food for many vertebrates (fish, reptiles, and birds). These mudflats, thus, play an important role as stopover sites for migratory birds to refuel for the long journey to their wintering or breeding destinations.

According to the Indian Naval Hydrographic Department's data, the mainland coast consists of 43% sandy shores, 11% rocky coast including cliffs, and 46% mudflats. The Indian coastline has extensive mudflats, covering an area of more than 38,000 sq. km. Most of the larger river mouths are concentrated in coastal areas in the north-east and north-west, and hence the muddy coasts of India are mainly located in these areas (specifically the east coast of India of the Gangetic, Mahanadi, Godavari, Krishna and Cauvery deltas). India's non-vegetated mudflats have a total area of about 22,300 sq. km, 90% of which are located in Gujarat. The Government of Gujarat's aggressive mangrove afforestation programme can have dire consequences on such mudflats as it would lead to a loss of feeding grounds for millions of migratory waders, and other aspects of biodiversity would be affected as well. Striking a balance between mangrove afforestation and protecting mudflats is therefore essential.

Seagrass

Seagrasses are submerged aquatic vegetation that have evolved from terrestrial plants to live in the marine environment. Seagrasses grow from the regularly inundated intertidal zone to a depth of nearly 15 metres in sandy subtidal zones. THE WORLD ATLAS OF SEAGRASSES provides species specific distribution maps of various coasts with a



Mudflats and mangroves are important ecosystems and play a crucial role in preventing soil erosion. Brachyurans (mangrove crabs [inset]) are common residents, and their constant movement increases water penetration

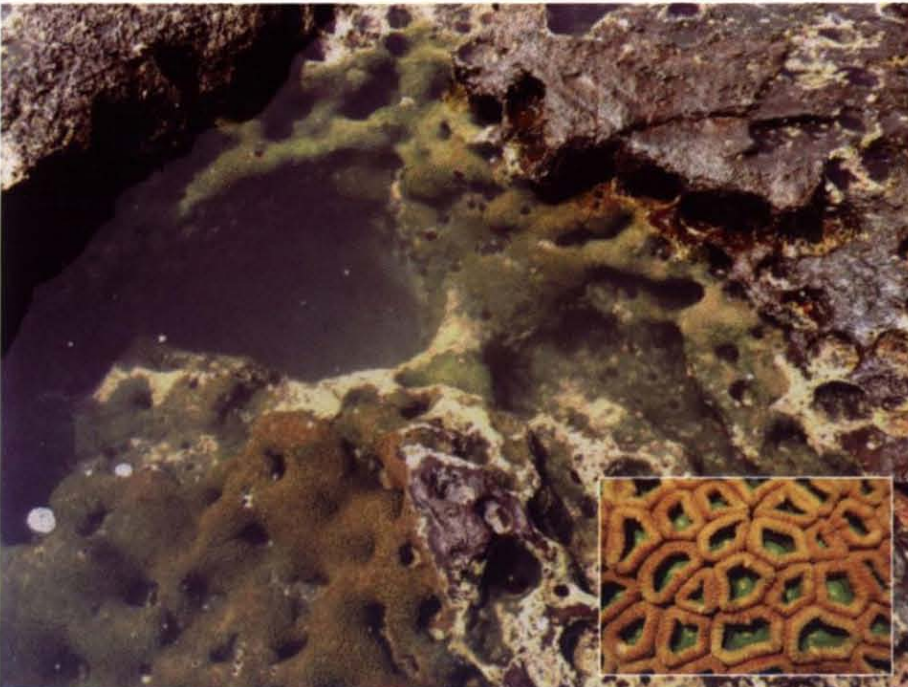
compilation of ecosystem services of seagrass beds. Seagrasses are the main diet of the Dugong and Green Sea Turtle and provide a nursery for many smaller marine animals of commercial importance, like shrimps and fish. They also absorb nutrients from coastal runoff and stabilise sediment, helping to keep the water clear. Due to sustainment of high biodiversity, and



Seagrasses provide shelter and food for a variety of life forms. Several grazing species of gastropod molluscs [inset] feed on epiphytic algae growing on grass leaves, helping to maintain the normal rate of photosynthesis in the grasses



Rocky shores are an assemblage of heterogeneous habitats, supporting rich floral and faunal communities like polyclad flatworms [inset]. The floral and faunal composition is usually peculiar to a particular tidal inundation level



Rock pools are found in various zones of intertidal areas. Zoanthids [inset] occupy the wall of the pool, and support various types of colonisation

their sensitivity towards changing water quality, seagrasses have become recognised as important indicators of the overall health of coastal ecosystems. The major seagrass meadows in India exist along the southeast coast (Gulf of Mannar and Palk Bay) and in the lagoons of islands from Lakshadweep in

activity are found. In comparison with sandy or rocky shores, the structure of a rock pool is three dimensional. Light, frequency of exposure to the tides, salinity, and temperature play very important roles in determining rock pool diversity.

the Arabian Sea to the Andaman and Nicobar Islands in the Bay of Bengal. They are home to 15 species, dominated by *Cymodocea* spp., *Rotundata* spp., *Thalassia bempriichii*, *Halodule uninervis*, *H. pinifolia*, and *Halophila beccarii*. Open marine sandy habitats display great species diversity and are abundant in seagrass biomass.

Intertidal Rocky Shores

Various forms of rocky shores dominates both the east and west coast of India. Coastal cliffs are the most observed characteristic geomorphic feature along the Indian coastline. Rocky shores in the Konkan, for example, are outcrops of the foothills of the Sahyadris and are made up of eroded cliffs, wave-cut platforms and rugged sea cliffs. These are formed in between sandy shores which have bays with a characteristic “C” shape. There are about 32 rocky shores along coastal Maharashtra. Rock pools (pools of sea water which are formed within the rocky substrate) provide dynamic microhabitats and form micro-niches for many organisms which may spend their entire life cycle in a single pool. Abundance of hydroids and sea anemones, echinoderms, sponges, bryozoans, molluscs, various algal forms, and their associated life forms are mostly seen in these sheltered rock pools. The Konkan coast has characteristic rock pool formations, which serve as a habitat for several species. The east coast has a comparatively narrow continental shelf as in the case of southern Tamil Nadu where rocky shores with heavy wave

Sandy Shores and Sand Dunes

Sandy shores are formed by the accumulation of sand particles driven by wind or water currents. Sandy shores are classified on the basis of sand structure, wave action, surf zones, and sand grain size. The sandy shore fauna is highly adapted, diverse and is an ecologically significant group. The habitat of sandy shore fauna is determined by the size of the sand particle and compactness of sediment. Due to high energy waves, sand substrate tends to change and hence can cause a change in the fauna as well.

Sand dunes are elevated areas or even small hills formed by the accumulation of sand due to the activity of tides, waves, and wind. Sand dune fauna and flora are limited but unique to the habitat. They are highly adapted to survive the harsh conditions of the shore like strong winds, salinity, dryness of sand, and temperature fluctuations. Coastal sand dunes form a different habitat along the shore which serves as a good nesting habitat for some endangered species of birds and sea turtles. Approximately 338 plant species are known to grow on sand dunes of which 92 species are common to both the east and west coasts of India.

Sandy shores are important from an economic and social perspective. Sand or beaches cover 63,033 ha of the 37,03,971 ha of coastal wetland areas of India. Human settlement is increasing on lands near sandy shores. Issues such as flattening of sand dunes and sand mining have severe consequences on shore erosion. Sandy shores are widely used for recreational purposes. This human interference has played a key role in disturbing their biodiversity which provides protection to the coastline. The coastal sand dune ecosystem is generally neglected by the scientific community and is very poorly documented and understood in India.

Sandy shores are a dominant feature of most of the world's ice-free coastlines, and are increasingly threatened by coastal squeeze (trapping of coastal habitat between the landward fixed boundary and increasing sea levels. The habitat literally gets squeezed between these two constraints). The threat to sandy shores is further aggravated because they are relatively poorly understood. In 2004, an extent of 1,214 km of the 5,422 km Indian coastline was reported to be affected by sea erosion. This has now increased to 1,624 km, according to the Coastal Protection and Development Advisory Committee



Sand-dwelling crabs [inset], gastropods, bivalves, and several species of worms that form the epibiotic and interstitial community are an integral part of the sandy shore

(CPDAC). This shows up as an increase in the extent of erosion from 22.4% of the coast in 2004 to 30%. According to the CPDAC, 748 km of the coastline is currently protected; the protection is mainly localised, using RCC or rubble mounded seawalls, though in recent years attempts have been made to use geotubes (geotubes are made up of geotextile fabric and filled with sediment. These tubes are arranged parallel to the shore within trenches and foredunes). Not surprisingly, Kerala which has 80% of its coast as sandy shores and reportedly the maximum extent of erosion – was found to have 216 km of seawall, followed by Gujarat with 118 km. In both cases, sand mining is said to be a major cause for coastal erosion. Of the 565 structures in the littoral zone, 204 were groynes (walls/bunds created to avoid erosion.) and 93 were breakwaters (barriers created for the protection of the coast from strong waves and to avoid longshore drift). Groyne fields are being increasingly promoted as the solution to coastal erosion, often as alternatives to seawalls – which affect the access to the shore. However, these structures (seawalls and groynes) are built on an ad hoc basis or for emergency protection, and rarely address the root cause of the problem of erosion, thereby cause greater erosion.

With the increasing extent of coastal armouring, there are now concerns about the cumulative impact of such structures on the coastline, considering the various adverse impacts, ranging from disturbing transport of sediment along the shore, restricting access to the beach, disturbing the aesthetic value of the landscape, to the impact on the ecology of the area.

Table 1: Species protected under Wildlife (Protection) Act, 1972 and IUCN status of some species inhabiting the 'Neglected Coastal and Marine Ecosystems' of India

Common Name	Scientific Name	WPA Schedule	IUCN	Habitat
Porifera				
Sponges	All sponges	III	NA	Intertidal-subtidal rocky habitat, reef areas
Arthropoda				
Horse-shoe Crab	<i>Tachypleaus gigas</i>	IV	NA	Sandy shores for nesting
Mangrove Horse-shoe Crab	<i>Carcinoscopius rotundicauda</i>	IV	NA	Sandy shores for nesting
Mollusca (Pelecypoda, Gastropoda, and Cephalopoda)				
Giant Helmet Shell	<i>Cassia cornuta</i>	I	NA	Sandy bottom
Queens Conch	<i>Cypraecassis rufa</i>	I	NA	Sandy bottom
Triton's Trumpet	<i>Charonia tritonis</i>	I	NA	Sandy bottom
Glory of India	<i>Conus milneedwardsi</i>	I	LC	Sandy bottom
Spiral Tudicla	<i>Tudicla spirillus</i>	I	NA	Mudflats/Sandy bottom
Window-pane Oyster	<i>Placenta placenta</i>	IV	NA	Mangroves, sandy-muddy substrate
Chiragra Spiderconch	<i>Harpago chiragra</i>	IV	NA	Sandy bottom
Crocus Spiderconch	<i>Lambis crocata</i>	IV	NA	Sandy bottom
Arthritic Spiderconch	<i>Harpago arthritica</i>	IV	NA	Sandy bottom
Orange Spiderconch	<i>Lambis crocea</i>	IV	NA	Sandy bottom
Millipede Spiderconch	<i>Lambis millepeda</i>	IV	NA	Sandy bottom
Scorpius Spiderconch	<i>Lambis scorpius</i>	IV	NA	Sandy bottom
Truncate Spiderconch	<i>Lambis truncata</i>	IV	NA	Sandy bottom
Pigeon Conch	<i>Dolomena plicata</i>	IV	NA	Sandy bottom
Trapezium Horse Conch	<i>Pleuroploca trapezium</i>	IV	NA	Seagrass areas
Gold-banded Volute	<i>Harpulina arausiaca</i>	IV	NA	Sandy bottom
Top Shell	<i>Tectus niloticus</i>	IV	NA	Coral and rocky reefs
Echinodermata				
Sea Cucumber	All Holothurians	I	-	Sandy bottom and rocky shore
Pisces				
Sea Horse	Family Syngnathidae	I	-	Coral reefs, intertidal rocky shores
Giant Grouper	<i>Epinephelus lanceolatus</i>	I	NA	Coral reefs, nearshore areas
Reptiles				
Dog-faced Water Snake	<i>Cerberus rynchops</i>	IV	LC	Mangroves, mudflats
Green Sea Turtle	<i>Chelonia mydas</i>	I	EN	Sandy shores and sand dunes for nesting/ seagrass for feeding
Hawksbill Turtle	<i>Eretmochelys imbricata</i>	I	CR	Sandy shores and sand dunes for nesting/coral reef for feeding
Leatherback Turtle	<i>Dermochelys coriacea</i>	I	CR	Sandy shores and sand dunes for nesting
Loggerhead Turtle	<i>Caretta caretta</i>	I	EN	Sandy shores and sand dunes for nesting/coral reef for feeding
Olive Ridley Turtle	<i>Lepidochelys olivacea</i>	I	VU	Sandy shores and sand dunes for nesting
Aves				
Eurasian Spoonbill	<i>Platalea leucorodia</i>	I	NT	Mudflats-mangroves or fine sandy beds
Purple Heron	<i>Ardea purpurea</i>	IV	LC	Intertidal areas for feeding
Large Egret	<i>Egretta alba</i>	IV	LC	Intertidal areas for feeding
Black-tailed Godwit	<i>Limosa limosa</i>	IV	NT	Mudflats for feeding
Eurasian Curlew	<i>Numenius arquata</i>	IV	NT	Rocky-sandy beaches, mudflats, mangroves for feeding
Common Redshank	<i>Tringa totanus</i>	IV	LC	Coastal salt marshes for feeding
Common Greenshank	<i>Tringa nebularia</i>	IV	LC	Estuaries, swamps, salt marshes, mudflats, mangroves for feeding

Table 1: Species protected under Wildlife (Protection) Act, 1972 and IUCN status of some species inhabiting the 'Neglected Coastal and Marine Ecosystems' of India (contd.)

Common Name	Scientific Name	WPA Schedule	IUCN	Habitat
Wood Sandpiper	<i>Tringa glareola</i>	IV	LC	Mudflats for feeding
Common Sandpiper	<i>Actitis hypoleucos</i>	IV	LC	Mudflats, estuaries and sheltered coast for feeding
Ruddy Turnstone	<i>Arenaria interpres</i>	IV	LC	Rocky-sandy shore, mudflats for feeding
Curlew Sandpiper	<i>Calidris ferruginea</i>	IV	LC	Mudflats, sandflats, saltmarshes for feeding
Greater Flamingo	<i>Phoenicopterus roseus</i>	IV	LC	Mudflats for feeding
Lesser Flamingo	<i>Phoeniconaias minor</i>	IV	NA	Mudflats for feeding
Mammals				
Dugong	<i>Dugong dugon</i>	I	VU	Offshore seagrass habitat for feeding
Smooth-coated Otter	<i>Lutrogale perspicillata</i>	-	VU	Mudflats, creeks, estuaries for feeding
Seagrass				
	<i>Halophila beccarii</i>	-	VU	Mudflats, sandy substrate

NA: Not yet been accessed by IUCN; LC: Least Concern; NT: Near Threatened VU: Vulnerable; EN: Endangered; CR: Critically Endangered

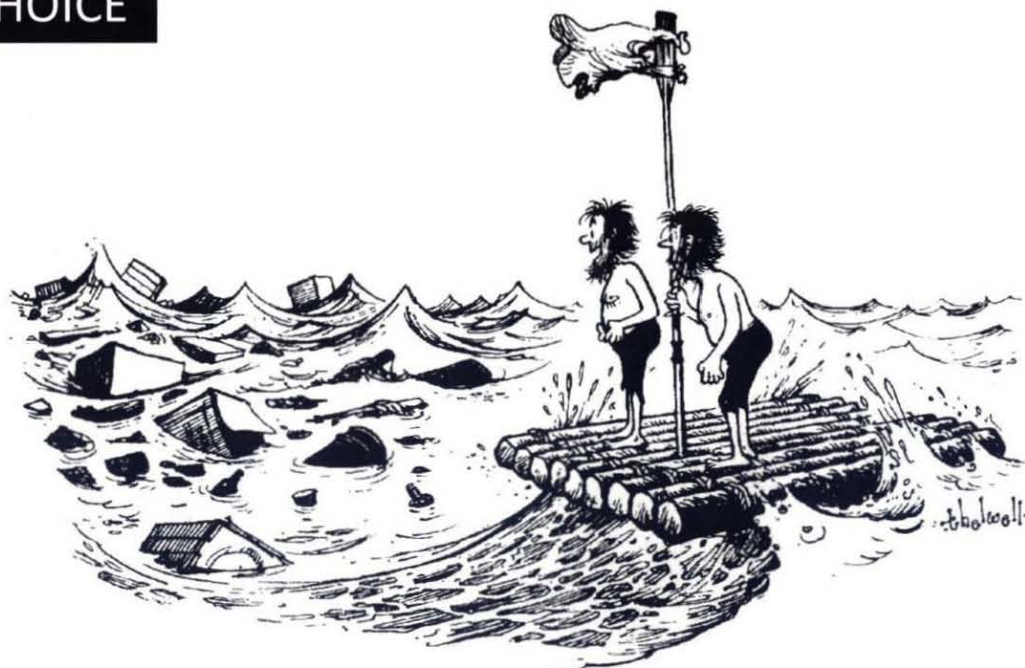
Negligence is the reason behind the constant degradation of ecologically and economically significant habitats. Several rules and legislations have been introduced for the protection of these habitats. Perhaps it is necessary to educate local communities about the role of these habitats and the faunal and floral lifeforms that inhabit them to improve productivity within these subsistence communities. A detailed analysis of these habitats and their existing ecological conditions and subsequent awareness will decrease the current rate of

impairment. However, coastal constructions and their impacts are a different argument altogether! ■



Deepak Apte, Chief Operating Officer at the BNHS, is a marine ecologist and Open Water PADI diver.

EDITOR'S CHOICE



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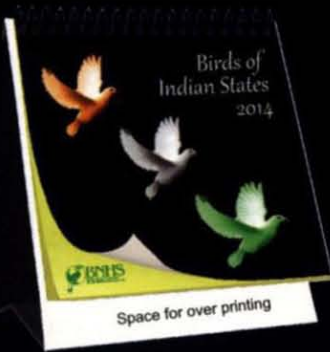
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The resources that we generate through all our activities are used to protect our natural environment through research, conservation and education.

Dr. Rahmani receives BirdLife International Award



Her Highness, Princess Takamado of Japan, hands over the "Member of Honour" Award to Dr. Asad R. Rahmani

Dr. Asad R. Rahmani, Director, BNHS, received the prestigious "Member of Honour" Award from the UK-based BirdLife International on June 22, 2013, in Ottawa, Canada. BNHS is the India partner of BirdLife International. The award was presented to Dr. Rahmani by Her Highness, Princess Takamado of Japan during the BirdLife International World Congress in the presence of Marco Lambertini, CEO, BirdLife International, and BirdLife partners from across the globe. The event was attended by people from more than 120 countries. The award recognises Dr. Rahmani's persistent efforts in research and conservation of birds in general, and the Great Indian Bustard (GIB) in particular. Recently, he was also honoured with the Lifetime Achievement Award of Kirloskar Vasundhara in Pune. Dr. Rahmani is a veteran in bird conservation in India. As a member of the National Board for Wildlife, he has been advocating the protection of Important Bird Areas (IBAs) and Biodiversity Areas. BNHS and BirdLife International have so far identified 466 IBAs across India. He has been advocating the initiation of "Project Bustards", along with a conservation breeding programme for the survival of these threatened species. Dr. Rahmani and his team at the BNHS have also been working on other threatened bird species, such as the Black-necked Stork, Greater Adjutant, and Swamp Francolin. ■

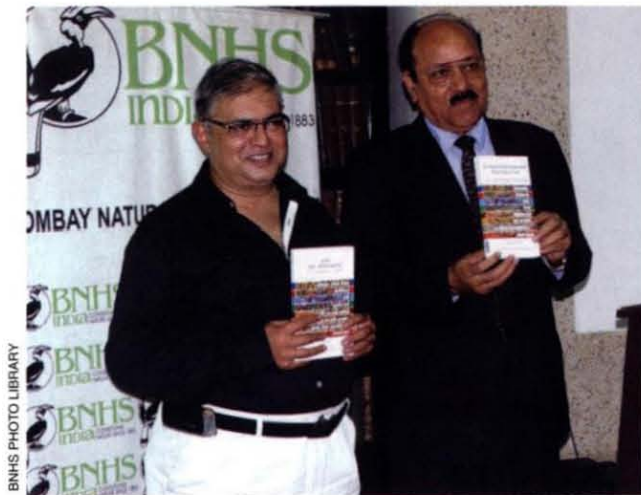
Dr. Apte receives Whitley Continuation Grant



Dr. Deepak Apte was awarded the Continuation Funding grant by the Whitley Fund for his exceptional work in the MPAs in Lakshadweep

Dr. Deepak Apte, Chief Operating Officer, BNHS, has been awarded the Continuation Funding grant by the Whitley Fund in June 2013, for developing a Giant Clam species recovery plan and identifying potential sites for marine conservation reserves in the Andaman and Nicobar Islands. After rigorous review and discussion, the Whitley Fund confirmed the award of £70,000 for a two-year programme. The Ministry of Environment and Forests, Government of India, has also provided Rs. 27 lakh to the BNHS for studies on the Giant Clam in the Andamans. The BNHS Andaman-Nicobar Programme is starting off at an appropriate time and is in line with the AICHI Targets of CBD-COP. BNHS aims to collect baseline data on Giant Clam population ecology, and document and understand the social fabric of these islands. This will be done by undertaking social and natural resource-use mapping. BNHS also aims to arrange national legal consultation to identify gaps in existing conservation reserve policies. Giant Clams are endangered species found in the tropical coral reefs, all of which are protected under Schedule I of the Wildlife (Protection) Act. ■

Book launch and reading event



The author, Santosh Shintre and Dr. Asad R. Rahmani, at the book launch at Hornbill House

A new bilingual book in English and Marathi titled **E**COLOGICAL AND ENVIRONMENTAL REPORTING IN INDIA was launched at Hornbill House on July 23, 2013. The book has

been written by the Pune-based author and nature lover, Santosh Shintre. Speaking on the occasion, Mr. Shintre expressed his views on the need for balanced and holistic reporting of crucial environmental issues in India. He added that the book aims to empower its target readership with its researched and authentic content. He also made a presentation on the eco-friendly development model being followed in Bhutan. Views expressed during the event pointed out to the fact that India and Bhutan share a common tradition of living in harmony with nature and India should also revive the same, taking a clue from Bhutan. BNHS Director, Dr. Asad R. Rahmani presided over the function. While addressing the gathering, he said that well-researched articles, features, and news stories are the need of the hour and will go a long way in furthering the cause of nature conservation in India.

On July 26, 2013, Katie Bagli, member of the BNHS, held a reading of her new book for children titled **OUR GREEN SAVIORS** at Hornbill House. This was well-received by children and adults alike. ■

BNHS-CEC celebrates the changing seasons

BNHS-Conservation Education Centre (CEC) was once again abuzz with myriad activities that gave the participants a first-hand experience of the summer and monsoon. Nature camps for children during summer holidays included two batches of 'Junior Nature Nuts Summer Camp' and 'Nature Novices Summer Camp', while monsoon treks included locations such as Rabale in Navi Mumbai, Yeoor in Thane, and BNHS Nature Reserve in Mumbai. BNHS had tied-up with *Hindustan Times* for the "HT No TV Day" on June 1, to encourage Mumbaikars to turn off their TVs and spend time with their family in the company of nature. On the occasion of World Environment Day on June 5, CEC conducted volunteering activities and a workshop for employees of the Standard Chartered Bank, based on the theme "Think, Eat, Save; Reduce your Foodprint". A similar workshop was organised with the Maharashtra Forest Department at the Sanjay Gandhi National Park. On the occasion of the International Day for Biological Diversity, CEC was invited to the Nehru Centre, Mumbai, to make a



CEC conducts several interesting nature camps for children to bring them closer to nature

presentation on "Urban Biodiversity". A workshop on Environmental Professional Development Programme, supported by JSW Steel, was conducted for teachers of municipal schools in June 2013. ■

ERRATA

Hornbill April-June 2013: Page 20

The image of the Western Reef-Egret *Egretta gularis* was wrongly identified as Grey Heron *Ardea cinerea*

Published on September 20, 2013, by Ms Sumaira Abdulali for Bombay Natural History Society, Hornbill House, Dr. Sálím Ali Chowk, Shaheed Bhagat Singh Road, Mumbai 400 001, Maharashtra, India.

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