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Cover: Himalayan Lantern flower Agapetes sp.

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Published and printed quarterly by Dr. A.M. Bhagwat for the Bombay Natural History Society, Printed at Akshata Arts Pvt. Ltd., Lower Parel, Mumbai.

Reg. No. RN 35749/79, ISSN 0441-2370.

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The alarm bells are not just for the bees, birds, and bats, they are for us too. **Sujit Narwade and Milind Joshi** have been studying the wildlife of the Deccan Plateau of Maharashtra and have reasons to believe that all is not well in this region.



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Saving the Unknown!

In India, conservation efforts are largely forest-centric in order to cover the maximum diversity in a minimal area. Nevertheless, there are a few other critical habitats which lack attention and protection due to varied reasons, which we need to conserve also. Among such habitats are rocky outcrops, scattered sporadically within our country, unnoticed and least understood. Rocky outcrops are generally defined as portions of exposed bedrock protruding above the soil due to geological activities. The term includes landforms ranging from cliffs, isolated hills and inselbergs to rocky platforms of diverse nature. These constitute a recognized habitat category under IUCN habitat classification. In India, open rocky areas in the form of naturally exposed plateaux, monoliths, kopjes and cliffs are major components of the landscape. Large monolithic inselbergs and kopjes are common in southern India. Cliffs are the dominant outcrop type in the mountainous regions. Rocky plateaux of basalt and laterite are present along the Western Ghats and Konkan region in western Maharashtra.

Konkan – as it is popularly known – is a rugged segment of the western coastline of Maharashtra, resting between the "Sahyadris", the Western Ghats mountain ranges and the Arabian Sea. The region extends over about 720 km north-south and 44 km east-west and is characterized by various land forms having gently undulating low plateaux and cliffs in the west to very steep slopes, ridges and high hills towards the eastern portion. The most remarkable of all these variations of landforms met with in Raigad, Ratnagiri, and Sindhudurg districts of the Konkan are the lateritic plateaux which cover the largest surface.

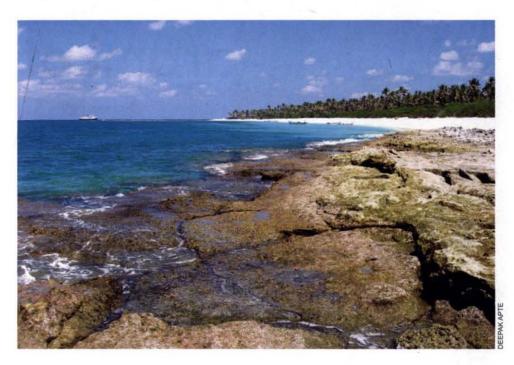
These plateaux are highly characterized by seasonality, appearing totally barren during the dry season, but full of life during the wet season. Lack or scarcity of woody species make rocky plateaux appear barren or "waste lands" for the eight months long dry season covering winter and summer. The region enjoys heavy rains during the monsoon, which goes up to an average of 2,000 mm. There is visible dynamism on the plateaux during the four months of this season, as the plateaux experience gregarious flowering of different species at different times. Monsoon also invites a lot of faunal activities, especially among invertebrates and small vertebrates, such as a wide range of insects, amphibians and reptiles.

Plateaux experience an array of adverse environmental conditions, such as very high and low temperatures, fluctuating humidity, flooding, drought, harsh wind, salinity and lack of nutrients. As a result, plateau communities are known to harbour habitat specialist plants which can cope with the extremes and flourish.

Recently, most of these coastal rocky outcrops are experiencing heavy biotic pressures such as rapid conversion for settlements, paddy fields, orchards, quarries, grazing fields, windmill farms and industrialization. Lack of awareness about their role as a special habitat, and consequent absence of baseline understanding regarding their ecology, are major hindrances in bringing them under a formal framework of protection. New management approaches are thus imperative to conserve these highly accessible landscapes. BNHS has recently undertaken an in-depth study of plant and animal communities on the coastal rocky plateaux of Ratnagiri



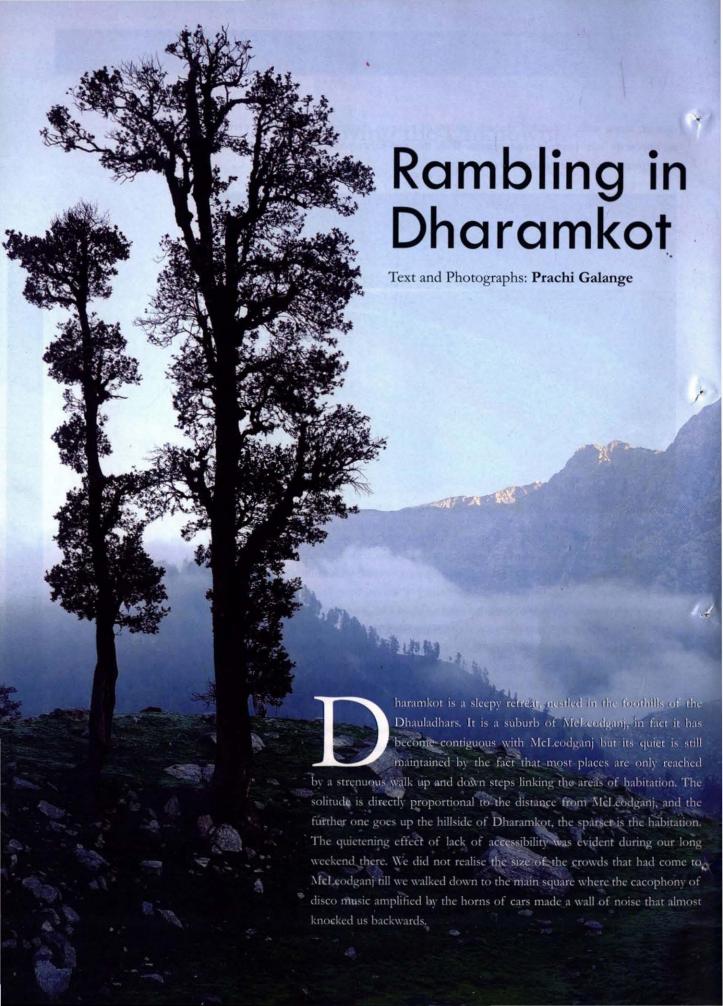
district, along with a detailed documentation of various disturbances, which is certainly an important step towards conservation. With this and other projects, we will continue to strengthen our work on neglected ecosystems.



While we continue to debate on species, habitats, and policies, a larger threat of climate change looms over us and our lives continue to hang precariously. One need not go far to find evidence that the sea level is rising. Those who are familiar with Mumbai and have stayed here for a couple of decades may realize the gravity of sea level rise. Do Mumbaikars recollect where the low and high tide boundaries used to be in Dadar and Juhu beach, two decades ago? Today, during high tide the water touches the road, especially in the monsoon. The sea has moved several metres towards the shore within two decades. With this reality, it is ironical that instead of moving away from the sea we are moving towards the sea, and we are diluting laws like the CRZ. Confrontation with nature is the last thing we need; such is the power of nature.

In the light of the vast environmental challenges that surround us, expectations from BNHS to scale up conservation research and action are always very high and rightly so. It is the sole purpose why BNHS exists in the first place. The starting of the base in Sikkim is one such step where we aim to work on issues like threatened species and climate change impacts on our habitats and species.

Deepak Apte



We stayed at a homestay, a neat, clean and well-appointed bungalow about 20 minutes walk from the road. Homestays have become a common source of income for the locals. Almost every house in Dharamkot has a room or two for hire. Most of these are taken by foreigners seeking solitude or some Indian skill like yoga, music or handicrafts, and many for long stays.

Ubiquitous signs beckoning passersby with invitations like "Indian jewellery making taught here" bears testimony to the importance of the foreigner to the local economy. The low price of rooms and food further indicates that it is the low budget traveller who is attracted. One hears the strains of gentle music, mainly flute, as one passes by houses early in the morning: someone learning something?

This scramble to earn money from homestays and hospitality has led to rampant construction. Everywhere we looked we saw signs of the locals either building small hotels in the most precarious places, or adding floors to their existing houses. Given the very fragile nature of the Himalaya, it would be wise to regulate the type of construction that can be allowed here, before a disaster like in Uttarakhand befalls this area too. Adhering to traditional architecture of small two storey stilt type houses would maintain the charm of Dharamkot, attract tourists to its quiet isolation, and enable such houses to cope with the heavy rainfall in this place.

This influence of low budget, long stay, foreign travellers is also borne out by the fact that there are plenty of eateries in and around Dharamkot that offer excellent continental food at very low prices – check out the pizza and pasta at Out of the Blue and Trek and Dine. The latter is in Dharamkot market



Early morning fog shrouds the pines, only to melt away with the first rays of sunlight

and is a popular hangout for locals and foreigners alike. Have a meal there in the evening to get a feel of the local pulse.

The real joy of Dharamkot lies in the many trails through the forests of the hills around. The geography of altitude and latitude gives it a great variety of flora which in turn is inhabited by a delightful range of birdlife. Exploring all the trails would take many days, a luxury we did not have, but we did two very productive walks, enjoying many unusual sightings. Birdlife is centred at the nullahs, big and small, for two reasons we presume. Firstly, the vegetation is much denser here, and secondly, there is access to water, generally a rare commodity in the mountains. There is little or no vehicular traffic on the only road passing through the town, making the birds more



A female Lampyrid beetle attacking a slug



Blue Whistling-thrush



Dark-sided Flycatcher (juvenile)



Grey Bushchat (male)

approachable, and we had some great opportunities to photograph them.

A nice trail is Dharamkot to Gallu Devi via an uphill track; it is about 5 km through pine and oak forests. When we went on this trail, it was raining hence bird sightings were limited. However, at the top we saw one particular tree with branches spread out wide and 'laden' with tiny warblers, flitting from one tree branch to the next, reminding us of the never-ending story about the sparrow flying to a granary to eat a grain every day. The warblers kept coming in waves, but sadly we couldn't identify a single one, due to poor light conditions. The exception was a lone Grey-headed Canary-Flycatcher amongst them, a bright spot of yellow against the leaden grey sky. All along the trail, the usual suspects like the deep blue, almost black, Blue Whistling-thrush, and one of the prettier members of the crow family, the Yellow-billed Blue Magpie were seen every day. From Gallu Devi we were told that the two-hour walk to the waterfall also yields some nice birding. However, time did not allow us to do this, so we kept it for next time.

Right behind our homestay there was a web of tracks, one of which (we never found out which one) led to the main Triund Hill track. One day we started along one of these tracks before sunrise, and in the nullah right next to us we saw an early White-capped River-chat. We just kept following tracks by instinct, going ever upwards, over the next two hours. We must have been a real sight as we scrambled up the mountainside, juggling walking stick, binoculars, camera, and rucksack. Luckily there was no one to see us, or so we thought till we heard a derisive baa from some sheep grazing nearby. The agility and nimbleness of hoof they showed as they jumped to near vertical climbs, was truly gravity defying.



Streaked Laughingthrush



Verditer Flycatcher



Grey Bushchat (female)







Early morning encounter with a White-capped River-chat

We were rewarded by lovely sightings of Rufous Sibia as a pair of them, unaware of us, flitted among the Rhododendron; we got good pictures of them. We also saw a Scaly-bellied Woodpecker as it clung to a tree trunk, calling raucously to its mate which arrived in a short while and they both flew off. Behind us a small flock of Coal Tits descended on a bush, and disappeared within as soon as they arrived.

Finally all the tracks seemed to peter out at an imposing cairn at the edge of a precipice, overlooking Bhagsu Nag waterfall from a great height. Tall stands of pine, indicative of our altitude, framed the mighty Dhauladhar range flecked with snow in the upper reaches. Around us were many high altitude species of flora like Pearly Everlasting (Anaphalis sp.), Thistle (Cirsium sp.), Cyathula sp., and Pink Knotweed (Persicaria sp.). There were no more trails upward and so we began our way down.

On the way back we again stopped at the nullah outside our homestay and were rewarded with close views of a Streaked Laughingthrush as it hopped amongst the bushes, just a few feet away from us. The vegetation was teeming with birdlife. We had a surfeit of birds

to watch, one after the other they came in view and did what early birds are supposed to do, get the early worm. Just as they came out of nowhere, they disappeared into the bushes. A pair of Himalayan Bulbuls sat close to each other, in a tangle of bushes, no doubt to warm each other on an otherwise cold day, a gorgeous pink Common Rosefinch sat in front of us for a split second and flew away. The fruit also attracted a known skulker, a Blackchinned Babbler, which fed on the bush before flying further inside the forest. Against the blue sky an equally blue bird perched, a Verditer Flycatcher that almost merged into the background. A Brown Bullfinch, plump and fluffed up against the cold, sat facing the early morning sunlight, which sadly for us was not a great photo-op as the light was completely against us.

Throughout our stay we saw huge fat slugs everywhere, which ranged from very light tan to very dark brown, on an average 3 to 4 inches in size. In an interesting phenomenon, we saw a female Lampyrid beetle trapped in the slime of one of these slugs – presumably the beetle had tried to take a bite out of the slug.

Another interesting walk from our homestay to the restaurant Out of the Blue invariably resulted in rich bird sightings. A distance of about 3 km, it crossed a number of nullahs and at each one of them there was something to be seen. Amongst other birds, we saw a striking Rufous-bellied Niltava, the ubiquitous Streaked Laughingthrush and a Grey-hooded Warbler during our walks. Further, the birds seemed to be attracted to a particular type of tree, possibly a Rhododendron, where we invariably saw the maximum number of birds. The almost bare branches of the tree attracted woodpeckers, treecreepers, flycatchers, warblers, and tits.

Unlike McLeodganj, which is fast turning into an open air discotheque, Dharamkot due to its inaccessibility has yet an untouched look. To get anywhere in Dharamkot one has to walk, and these walks are what gives this place its very appealing charm. A visit to Dharamkot is a must for all those who want to get away from the cacophony of everyday and enjoy the something in nothing.



An avid nature lover, Prachi Galange works with the Programmes Dept. in BNHS since the past two years. She has a wide array of interests in the wild and loves being outdoors.

B Alert from Pesticides



Mini tractors used for spraying pesticides in large volume

uring the last few years, we have been studying the wildlife of the Deccan Plateau of Maharashtra, with special reference to conservation of the Critically Endangered Great Indian Bustard Ardeotis nigriceps (GIB) and its associated fauna in human-dominated agricultural landscapes. Over the period, we realised that not only GIB but also other common life forms like earthworms and honey bees were becoming uncommon in this rain shadow region of southern tropical thorn forests of Maharashtra. Apart from major threats like habitat destruction for decline in population of wildlife residing in mosaics of grassland and croplands, we are trying to find out the other causes and would like to address one of the issues, the probable impact of pesticides on the 3 Bs, "birds, bats and bees". BNHS has taken up such studies and will come out soon with the results.

Of all crops growing on our planet, only 15% are self-pollinated while the remaining 85% depend on some agent/pollinator for pollination. Pollinators like birds, bats, and bees pollinate fruits, vegetables, and other crops that provide us with food, fibre, drugs, and fuel.

Pesticides are used very commonly all around us, in homes and gardens, and especially in agricultural fields. Their impact on our health and environment is well-known. However, of late, pesticide manufacturing companies have begun claiming that modern pesticides are less harmful to the non-targeted species. But non-target species are facing the cumulative impact of various agrochemicals on their survival and reproduction.

Pesticides are designed to damage or disrupt vital biological processes (like photosynthesis in herbs or blood clotting in mammals) of a target organism. It would, therefore, be wrong to assume that the impact of pesticides on non-target organisms, which also get exposed to these chemicals, is negligible. A review of the impact of pesticides on earthworms by Celine Pelosi and others in 2014 proved that earthworms were affected by pesticides at all physiological levels, such as disruption in enzymatic activities, increased individual mortality, decreased fecundity and

decreased feeding rate, and reduced biomass and overall density. When pesticide is applied to seed dressing, it enters into the soil and accumulates in the soil water and reaches plants and crops through their roots, impacting the primary source of the food chain. Use of herbicides is leading to low availability of palatable grasses for primary herbivores and may be limiting the availability of food resources to the dependent wildlife.

Pesticides used in the Deccan Plateau of Maharashtra

Organophosphate (OP) insecticides were introduced in India in the 1960s, carbamates in 1970s, pyrethroids in 1980s; herbicides and fungicides in the 1970s–1980s – all of these are being rampantly used not only in Deccan Plateau, but throughout India.

We found that pesticides such as Abamectin 1.9% EC (emulsifiable concentrate), Acetamiprid 20% SP (soluble powder), Thiamethoxam 70% WP (wettable powder), 25% WG (water dispersible granules), Acephate 75% SP, Imidacloprid 17.8% SL (soluble [liquid] concentrate), Cypermethrin 25% EC, Indoxacarb 14.5% EC, Profenophos 40% EC, Dimethoate 30% EC, Dichlorvos 76% EC, Emamectin benzoate 5% SG (soluble dispersible

granules), and Chlorpyriphos 20% EC were commonly used. These insecticides are highly harmful and their use should be avoided. There are a few pesticides such as Deltamethrin 76% EC, Novaluron 10% EC, Spinosad 45% SC, Phorate 10% G, and Oxydemeton methyl 25% EC, which pose comparatively moderate threat to insects, especially bees. Less harmful insecticides are Buprofezin 25% SC, Dicofol 18.5% EC, and Propargite 57% EC. Besides these, fungicides like Copper oxychloride, and antibiotics such as Streptocyclin sulphate and Tetracycline hydrochloride were observed to be used regularly. Several brands of herbicide are available in the market.

The majority of the pesticides and herbicides are systemic, i.e., they spread through the vascular system of plants and reach the pollen, nectar, and guttation droplets. Exposure to such pesticides can disrupt foraging, reproduction, navigation, immunity, as well as overall physiological processes of the affected organisms. Prolonged use of pesticides leads to the issue of pest resurgence or development of insecticide resistance in harmful insects.

Socio-economic issues leading to rampant use of pesticides

Now-a-days, labour is expensive and farmers are inclined to use easy

Use of various chemicals such as herbicides, fungicides, insecticides, antibiotics over a period surely have cumulative impact



Besides vermicomposting pits, one can rarely see earthworms in Solapur



remedies for rapid results, such as mechanized spraying of pesticides with the help of mini tractors. Farmers prefer to spray herbicides to remove weeds from a farmland area instead of using labourers. This is convenient for the farmers as it helps them become less dependent on labour. People are now also using a glue-like substance known as sticker so that the pesticide is 'glued' to the crop and does not get washed away by rain.

B Alert

1. Bees

According to Samuel McGregor – a pollination ecologist, over 30% of the daily intake of humans [in a US based study] is directly or indirectly dependent on insect-pollination. The economic value of crop yield by pollination is \$ 60–70 billion globally. In India, about 7% of crops are dependent on insect pollination, especially bees. If we want to sustain our agricultural production, we should not neglect important pollinating agents like the Honey Bee.

A condition known as Colony Collapse Disorder is causing bee populations to plummet. Though there are other reasons like global warming affecting natural blooms, habitat loss, and parasites such as harmful mites, the indiscriminate use of pesticides is

Crops benefitted by pollination by Honey Bees:

Fruits – Lemon, Orange, Sweet Lime, Almond, Apple, Cherry, Walnut, Grapes, Mango, Pomegranate, Coconut, Indian Gooseberry, Papaya, Strawberry, Watermelon

Vegetables – Ladies Finger, Brinjal, Tomato, Bitter Gourd, Serpent Gourd, Bottle Gourd, Cucumber, Cabbage, Cauliflower, Coriander, Radish, Onion, Carrot

Pulses and oil seeds – Cotton, Sunflower, all lentils and beans Spices – Black Cumin or *Shahajiri* (in Marathi), Clove Grains – Jowar, Millet, Maize

Installation of bee box can be useful

Depending on the size, area, and type of crop to be planted, bee boxes can be installed at the flowering stage of crops or plants. There should not be any chemical use near a bee box. For better results, indigenous trees should preferably be planted on the edges of croplands.

the main reason behind the decline in bee populations. In the United States alone, more than 25 per cent of the managed honey bee population has disappeared since 1990. Use of smoke for collection of honey by tribal bee hunters is another reason for the decline in population of wild bees.

Five types of Honey Bees are found in the Deccan Plateau of Maharashtra (i) Rock Bee Apis dorsata, (ii) Small or Little Honey Bee Apis florea, (iii) Indian Hive Bee Apis cerana indica, (iv) European or Italian Honey Bee Apis mellifera and (v) Trigona Honey Bee Trigona iridipennis. Rock Bee and Small Honey Bee cannot be reared in artificial bee hives but Indian and

European Bees can easily be reared in this manner throughout the year.

According to the available literature, it was found that decline in population of pollinating agents resulted in the reduction of crop yield from 0.5 to 80% (on average 26%).

2. Birds

According to BirdLife International in 2001, though the threats leading to bird population declines are many and varied, agricultural practices alone affect 87% of the globally threatened bird species. Rachel Carson's SILENT SPRING, published in 1962, first raised the issue of Dichloro Diphenyl Trichloroethane (DDT) as the cause of considerable

Decline in grasshoppers due to pesticides may lead to disruption in the foodweb



Population decline of Fan-throated Lizards needs to be monitored



decline of songbirds in United States. Birds may get killed directly by pesticides or by the cumulative effect and indirect impact of pesticides, which is more lethal. Mortality data related to pesticides is difficult to get due to the movement of birds from a pesticide prone area to other areas. Carcasses of such birds may get scavenged immediately. Reduced hatchability and reduced survival of chicks hatched from thin shelled eggs is also a well-known fact now.

In a recently published paper by Hallmann and others in Nature in July 2014, the authors concluded that there is a negative correlation of Imidacloprid (one of the neonicotinoids) with bird populations in farmland areas. They found that trends in local population of birds were significantly more negative in areas with higher surface water concentration of Imidacloprid. This chemical is a neurotoxin to insects and less harmful to birds, but decline of birds is the effect of depletion of insects - a major food resource for breeding birds. An interesting observation of the authors was that most of the birds did not eat Honey Bees; this means that Imidacloprid is a broad spectrum chemical causing death of non-targeted insects. According to the same study, the two classes of pesticides known as neonicotinoids and organophosphates together are the most widely used insecticides with a global market share of about 40 per cent, and global sales of more than \$ 2.63 billion in 2011.

3. Bats

Bats ingest pesticide while feeding on arthropods exposed to the pesticides following agricultural application. Longevity in bats can lead to accumulation of pesticides in their bodies. Pesticides accumulating in fat tissues during hibernation or migration are particularly dangerous to bats. Pesticide concentrations can potentially reach high levels, especially in the brain as well as in offspring from lactating females. Dieldrin concentrations in guano above 0.38 ppm were found caves where pesticide-related mortality occurred in 1980. Different exposure levels were found in cave bats in Arkansas, USA, during 1997 to 2002 corresponding to a 240% and 6-21% increase in use of pesticides at two different sites. This showed that greater use of pesticides led to greater exposure and therefore greater impact.

Some preliminary observations and pesticide testing results

During a recent week-long survey in October 2014, we laid transects in various parts of Deccan Maharashtra and found bees only in sites adjoining natural forest patches and farmlands of mixed crops with less use of pesticides. For example, we saw bees only near Chuasala Forest of Yavatmal district and at Kinwat, Nanded area. We did not encounter grasshoppers during a three kilometre walk at some places such as Umred of Nagpur district, and very few grasshoppers in Nannaj area of Solapur district. One of the beautiful reptiles of the study area, Fan-throated Lizard Sitana ponticeriana, was encountered only in undisturbed grassland patches. The population of Great Indian Bustard Ardeotis nigriceps is already less than 15 birds in Maharashtra. Breeding population of Indian Courser Cursorius coromandelicus in an area between Nannaj and Vadala villages has declined from 100 birds in 2010 to 22 in 2014. There might be other reasons behind the decline in population of breeding birds, but non-availability or contamination of food may be a reason.

We came across a couple of incidents of mortality of farm dogs due to eating pesticide-contaminated rodent carcasses, and of Wild Boar Sus scrofa due to eating pesticide-dressed seeds. We received a call from representatives of Nature Conservation Circle, Solapur (a local NGO) and Office of the Divisional Forest, Solapur regarding the death of six Demoiselle Cranes Anthropoides virgo at Hipparga lake (17.72°N; 75.93°E),

Mortality of birds and mammals due to consumption of pesticide-dressed seeds has been observed in Solapur







Honey Bees not only produce honey but also are important pollinators and genetic linkers



Long-winged Tomb Bat consumes insects in large volumes, up to 100% of its body weight per night



Sighting of predatory birds such as Red-necked Falcon may be rare due to the impact of pesticides

located 5 km from Solapur town, Maharashtra, on February 2, 2015. We did laboratory testing for pesticides using Gas Chromatography and Mass Spectrometry, and found traces of Monocrotophos (MCP) in the saliva, gut contents (Jowar or Sorghum grains), intestine, spleen, and heart tissues taken from carcasses of two Demoiselle Crane Anthropoides virgo. MCP is principally used in agriculture as a relatively cheaper pesticide. It is an organophosphate known for its acute toxicity to birds and humans. This pesticide has been banned in the USA and several other countries but is being used commonly in our study area. We tested only two guano samples of Fulvous Fruit Bat Cynopterus sphinx and Egyptian Free-tailed Bat Tadarida aegyptiaca collected from Naldurga area (17.81°N; 76.27°E) of Tuljapur tehsil, Osmanabad district and found traces of DDT, Dicofol, and Lindane pesticides.

Future plans

The consequences of accumulation of pesticides with respect to their half life and type of soil is a totally neglected aspect till date. The research paper of Hallmann et al. 2014 is based on data collected from two long-term country-wide monitoring schemes in the

Netherlands, one from Dutch Common Breeding Bird Monitoring Programme Scheme, and another from surface water quality measurements. Unfortunately in India, we do not have such schemes and we need to start them. The long-term impact of pesticide use on wildlife, as well as on human beings, can be evident only after proper research and monitoring.

Need to explore possibilities of organic farming in selected areas

Preference should be given to integrated pest management, especially with the use of bio-pesticides. Granular insecticides are less harmful than liquid or powder spray. The cost of production is lower in organic farming as compared to chemical farming of cash crops like cotton and sugarcane. But the cost is higher for paddy and wheat, and we need to work to reduce this cost. Strategy should be planned according to priority, whether we want to convert fewer farmers with large farmlands or more farmers in smaller farms in developing a small corporation for organic farming.



Sujit Narwade is at present a Project Scientist with the Bombay Natural History Society. Organic manure can be provided to farmers in government subsidized schemes, and in return higher prices for the organic products can be given in areas important for the conservation of critically endangered species, such as Great Indian Bustard Ardeotis nigriceps (GIB). Certificates can be given to farmers from marginal areas of the GIB Sanctuary for encouraging organic farming under the scheme of "Species Conservation Initiative By Local People".

Our research on impact of pesticides on 3Bs, especially on birds and their food chain in Deccan Maharashtra incidentally highlighted interesting facts and raised questions regarding the use of pesticides and consequences, particularly of prolonged use. The impacts are seen across a range of biodiversity, both plant and animal, cultivated or wild. Concerted efforts must be made to study and quantify the damages, and to formulate recommendations to minimize the harmful effects that we clearly observed in this area.



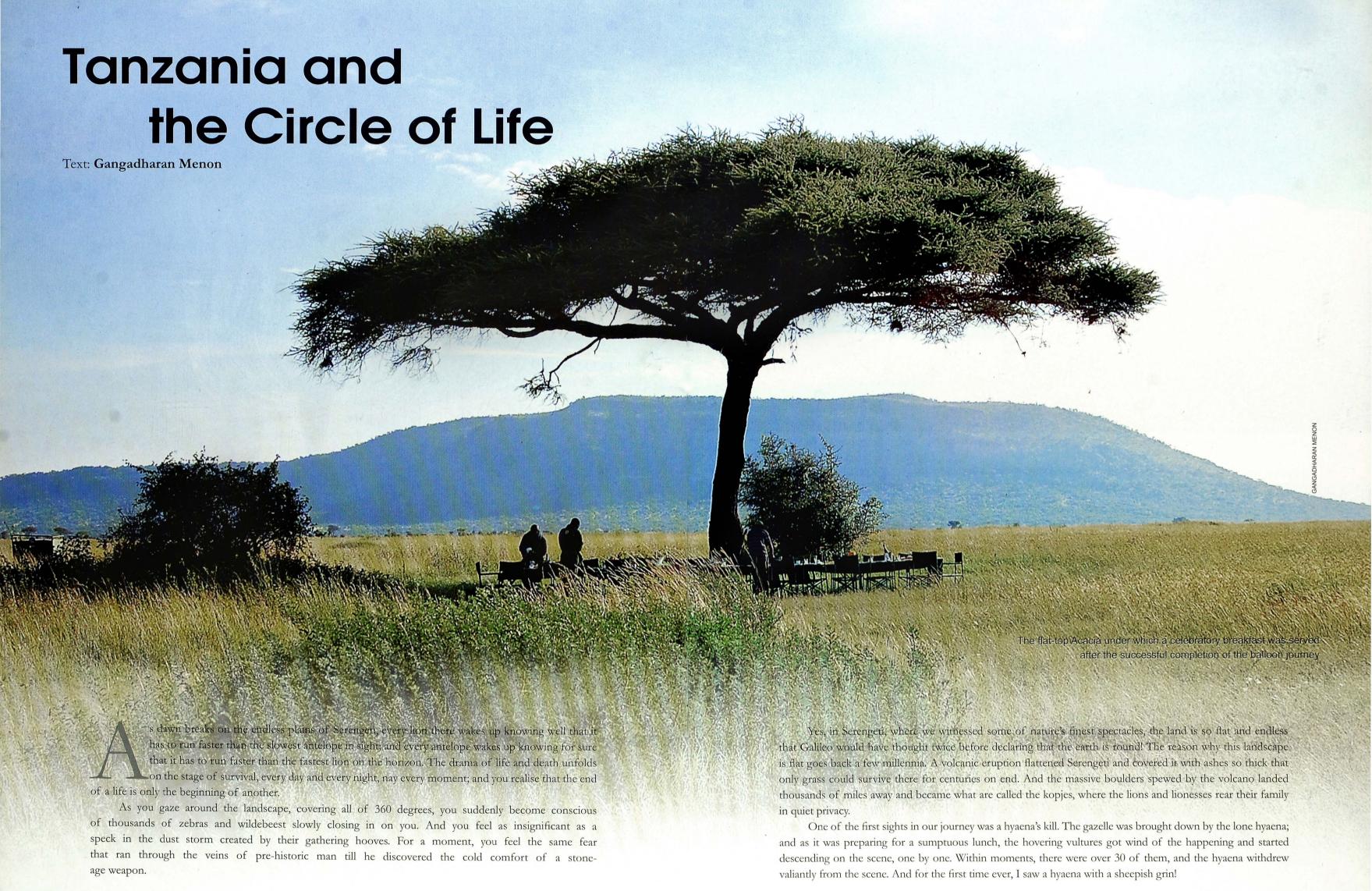
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- ▲ Couldn't resist calling this a Zebra-crossing
- ▼ Scores of wildebeest gathering for the Great Migration



As I saw the starlings flitting by, the Secretary Bird strutting along, and the White-necked Ravens creating a racket, I remembered the Pied Crested Cuckoo that had flown from Africa all the way to Mumbai to herald the monsoon. The Common Crows had piled on the poor guest, not knowing the Indian hospitality of 'atithi devo bhava'! And in a moment of spontaneous action, I had 'interfered' with nature's course, saved the cuckoo, and took it all the way to the BNHS office in town, I handed it over to the caring hands of Isaac Kehimkar, who later released it in the BNHS land near Borivli National Park. How I wish I had ringed that bird to trace its safe journey back to its homeland in Africa. Till date, I don't know whether it actually survived the ordeal. I don't really want to know, because I want to believe it did.

Then we visited Oldupai, where the remains of the earliest man ever to walk the earth were excavated. At that place I felt thirsty. Later I realised that a river ran along there, till its course was altered forever by volcanic eruptions. No wonder the recorded memory of thousands of years was transmitted in an instant to my parched throat!

The next day was what I call 'National Geographic Live!' We had booked ourselves for a ride in the hot air balloon. But before we were to see the breathtaking eagle-eye views of the Serengeti grasslands, we were to witness Tanzania by night. As our trip to Masai kopjes, the site of our balloon take off, started at five in the morning, we saw glistening eyes lit up by the headlights of our Land Rover. Piercing eyes, without accompanying bodies, staring straight at us: hippos, jackals, lions, wild hares, hyaenas ...

As the balloon, manoeuvred by a team of master fliers, soared above Serengeti, we were to witness the aerial view of the most awesome spectacle



Being a large and heavy bird, the Kori Bustard avoids flying, if possible

Who goes there? A tree-climbing lion scanning the horizon from atop a Sausage tree





Largest crater on earth, the 20 km diameter Ngorongoro holds within an entire ecosystem



The imposing sight of an African Elephant with tusks touching the grass in Ngorongoro



Oldupai gorge from where the oldest human skull has been excavated

on earth - the Great Migration. In May, thousands of zebras and wildebeest congregate into groups of twenty thousand and odd, building up their cadres to eventually touch a total of twenty lakh animals. Come August, they set off on a single trail crossing two violent rivers on the way: the Grumeti and the Mara. And return all the way back to where they started. Like in the case of the migration of Snow Geese and Siberian Cranes and scores of other birds, no clear explanations have come forth, except that they go looking for greener and warmer pastures. I would surmise it as nature's own wanderlust, or a journey in which life searches for itself.

We celebrated our survival and safe landing with a sumptuous champagne breakfast under a flattop acacia that stood lonely and tall in the grassland. There we saw, and tried to make friends with, the calf of a wildebeest that was lost and lonely. Apparently, the motherly instinct of wildebeest is least developed, and consequently, mothers losing their calves due to negligence is an hourly occurrence in Serengeti. This in spite of the fact that the instinct of survival teaches the calf to run even before it learns to walk. When one of the tourists asked whether we could carry it to the safety of civilization where it could be reared in captivity, our guide Mtaki said sternly: "Don't interfere with nature!" The import of that statement sank into our souls like a prehistoric rock.

The great migration also results in the tale of the 'Reducing Height of the Grass'. First, the tall zebras and wildebeest eat the tall grass, thereby reducing its height. Following them are the shorter antelopes like bushbucks that feed on the grass and further reduce its height. Last come the tiny gazelles that find the grass perfectly cut to suit their height!

Yes, nature has worked it all out. Only one out of 20 attempts by a predator is successful, which means the prey gets 19 chances to live another day. No wonder we saw a Cheetah teaching her two grown up cubs the fine art of hunting in open plains. Also, nature that camouflaged the predator also camouflaged the prey - in various shades of Serengeti brown. This is probably why we saw leopards take vantage points on top of bare Acacia trees to spot distant movement of its prey.

At Lake Manyara, we saw lions that climb trees! In fact, it is the only place in the world where lions can be seen climbing trees. Their favourite perches were Sausage trees that have branches starting as low as four feet from the ground, enabling an easy climb.

Every day, as we crossed a particular patch in the jungle, we had to close the hood of our Land Rover, and pull up all the window panes, as a swarm of tsetse flies would invade the vehicle, and inflict really painful bites on our bodies! The yellow fever vaccination that is mandatory for every tourist prevents a deadly fever transmitted by these tsetse flies. It was a gentle reminder that this paradise on earth also has its Pandora's Box.

Then moved Ngorongoro, the largest crater on earth, formed as the volcanic mountains moved away in one giant seismic movement a few millennia ago. A whole ecosystem survives inside this crater which is 20 km in diameter. There is a mini Tanzania in there: elephants, lions, leopards, hyaenas, zebras, sweet water hippos, salt water flamingos, a plethora of varied species. The wildlife that exists inside never really ventures out. So it's almost as if they are marooned in the crater. Only the female elephants move around on the rim of the crater as it is rich in grass, and the male elephants with tusks almost touching the ground



Skywards for a bird's eye view of the African plains



A zoomed-in view of a crocodile from the balloon

come to visit them during the mating season. In the middle of the crater, we witnessed an entourage of lions lazing around yawning and stretching their legs - may be recharging after a hard night's work in the wilderness.

As we were driving back to the forest lodge, we saw a double rainbow in the sky spanning the entire crater. Maybe to remind us that we had witnessed a double delight in Tanzania: the endless plains of Serengeti, and the marooned mysteries of Ngorongoro

The continent of Africa is not just the place from where man migrated to the rest of the planet, but also the fountainhead of all life. Anyone interested in wildlife should make a pilgrimage here. It's not only the number of species that thrive here, but the sheer numbers of each species dotting the endless plains that makes the place a visual spectacle seen nowhere else on earth. BNHS beckons.



Gangadharan Menon has over 120 articles on Nature published in the leading newspapers of India. His first book 'Evergreen Leaves' has

just been published and is available on Amazon.

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Sunbirds at our window

wish to share a heartrending Lexperience with Hornbill readers. Every year, for the past three years, a pair of sunbirds comes and weaves a nest on the string that holds the blinds outside our drawing room window. It is thrilling to watch them work so hard and persistently to complete the nest in time for their breeding season. Once complete, the pale yellow and brown mother bird sits on her eggs; the beautiful blue and black male visits often and there is a cheerful exchange of chirping and squeaking. The birds build the nest about 1.2 m high from the ground and a little away from the window, making it an ideal location, away from the clutches of any wily predator. We watch, each year, with great interest, the busy and frenetic activities of the pair, once the eggs are hatched.

However, this year, one day after the eggs were hatched, we noticed the birds fluttering around making a lot of noise. We were horrified when we realised that the nest had fallen down. Aghast, we ran out to discover that one hatchling had fallen out of the nest and was struggling. Ants big and small had started to gather on the flailing body of the hatchling. Not knowing what to do, my husband and I scooped it up in a plastic plate and put it back into the nest. There was another hatchling inside the nest. Gingerly, we picked up the nest and tied it back onto the string in the same position. We hoped that our touching the nest would not anger the birds and prompt them to abandon

We were overjoyed when after a few hours the pair of birds returned, chirping excitedly. We hoped that they would continue to feed the young. But the next morning, to our great dismay, we found the nest empty!

What had happened to the birds? Can these tiny birds carry away their little ones to another place? Did they sense that human hands had touched their nest? There remains a little sadness

in our hearts to see that our 'neighbours' had abandoned their home.

We live in an independent house in Kochi. Although there are a lot of trees around, the place is not devoid of city noises, that of occasional honking of horns and the sounds of TV. Yet, it is heartening to note that some birds come to build their nests right outside our home.

> Lata V. Nallur Kerala

Editors' Note: The description of the bird and the photograph suggest that it was the Purple Sunbird. As long as the chicks are in the nest, the parent birds will continue to feed them, unlike the popular notion that touched birds will not be fed. The parents cannot carry the chicks, and if they were not yet capable of flight to some degree (whereupon the parents would have coaxed them into leaving the nest), they must have been preyed upon by some bird or mammal.

A Home for Sparrows

It was a calm morning in April 2009, when I noticed La pair of House Sparrows looking for an ideal place to nest. I put out a carton box, which the pair occupied



in a few days. The sparrows had found a secure place to nest and so I forgot this pair until I saw a House Sparrow feeding two nestlings, in October 2012!

When the nestlings flew away from the nest, I investigated and to my surprise there were six grass nests in the carton box that I had built. I realized that at least six pairs had used the carton as a nest to rear their young in the last three and a half years.

Inspired by this, I made a number of wooden nest shelters and arranged them around my house. Till date, the artificial nests made by me have been occupied by more than 40 pairs of sparrows. These days we wake up every morning to the songs of the sparrows, and feed them paddy, bajra and cereals. We now have a House Sparrow colony around my home.

> Mahesh Veeraa Andbra Pradesh

From My Memory Vault: Reflections of a Veteran Soldier

Author: Lt. Gen. Baljit Singh (Retd). Published by: Alpha Editions,

Published by: Alpha Editio New Delhi. 2015.

Size: 21 x 13.5 cm

Pages: 196 Price: Rs. 750/-

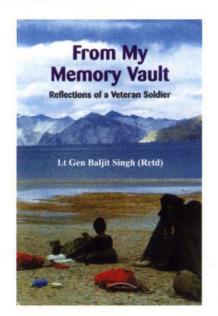
Hardbound

Reviewed by: Asad R. Rahmani

Indian Armed Forces are known for their valour in the battlefield and dedicated social work whenever called during disasters or civil unrest. Not many people know about the contribution of

our armed forces in protecting nature and natural areas, and advancing natural history knowledge. A few years ago, BNHS published a book NATURAL HISTORY AND THE INDIAN ARMY, edited by the late Mr. J.C. Daniel and Lt. Gen. Baljit Singh. The book is still available and is essential reading for our jawans and officers.

Lt. Gen. Baljit Singh is an important member of BNHS with keen interest in natural history. He was formerly interested in hunting (which he gave up long ago), which resulted in his eye for natural history details. As the blurb on the jacket of the book says "Lieutenant General (Retd) Baljit Singh, AVSM, VSM was commissioned in the Regiment of Artillery in July 1956, was absorbed in the General Cadre, promoted from Lieutenant Colonel direct to command an Infantry Brigade, served three tenures in the Military Operations Directorate, superannuated after a distinguished service of thirty-six years and on the sidelines, he remained an active promoter of Conservation of Nature, in general, but more so both within and by the Armed Forces."



The book is semi-autobiographical, not much on his personal life but focusing on a number of finer details of his professional life. This may not interest a general reader of Hornbill, but I am sure it will interest the army officers for whom it is essentially targeted. Besides being a distinguished army officer, Lt. Gen. Baljit Singh is a naturalist, trekker, climber, voracious reader, and a dedicated family man. All his elemental qualities come out through the pages of this eminently readable book. For example, I liked the way he described a Sarus pair defending its nest against a mongrel, or the 'accidental' shooting of a Sarus by his father and

subsequent death of its mate (pages 147-149).

That Lt. Gen. Baljit Singh also has a dry sense of humour is proved from the way he has described a tiger sighting in Ranthambore with the Chief of the Armed Forces, and subsequent remark by a staff "tiger kitna sundar hai, sahib!" Incidentally, in army vocabulary the Chief is called Tiger and the Chief at that time happened to be General Sunderji! There are many delightful episodes like this peppered in the book. I liked reading about his first meeting with his future wife when he had to pretend to relish cookies 'hard as rocks' to please her. The book is dedicated to his wife, affectionately called Chappu.

The only drawbacks of the book are the long winding sentences, sometimes going on and on for five to eight lines, and poor editing. Without proper punctuation thrown in, these long sentences, full of army jargon, are difficult to understand in some places. However, all in all, it is an enjoyable book to read and cherish. I only wish we have more army officers like Lt. Gen. Baljit Singh, who protect not only our borders but also the ecological security of our country.

We are grateful to

SETH PURSHOTAMDAS THAKURDAS & DIVALIBA CHARITABLE TRUST

for a generous donation to the Pratap Saraiya Hornbill Fund to support the publication of Hornbill

Evergreen Leaves

Author: Gangadharan Menon Published by: Partridge India. 2014.

Size: 21.5 x 20.5 cm

Pages: 163

Price: Not mentioned

Paperback

Reviewed by: Atul Sathe

lmost all of us living in metro cities are stuck in a rut. AThe responsibilities of office and family seldom leave any time to enjoy and appreciate the bountiful world of nature around us. Unless one is a hardcore nature lover and finds time for a quick look at birds visiting a fruit laden Pipal tree outside our office or home window or for a Sunday morning stroll in a forest close by, most of us living in urban and semi-urban areas miss out on the simple joys offered by Mother Nature. Here is a book that takes the reader on a beautiful journey to rich habitats across India, through the eyes of a person who quit an advertising career to come close to the living world!

In the words of the author, this book is a recollection of his journeys in the wilderness of India. Since this is not a travel guide, the book is not cluttered with details of how to reach and where to stay. It is expected to create a liking for the enchanting world of nature among general readers, through its interesting anecdotes. The book covers myriad habitats ranging from the snow-capped Himalaya and the



rain-drenched Western Ghats to the deserts of Rajasthan.

The book begins with a narration of the author's close encounters with wildlife while walking in the forests of Silent Valley, Palakkad, Mudumalai, and Tadoba. There is a chapter that pays tribute to Shri Ratanlal Maloo from Rajasthan, who used to feed thousands of Demoiselle Cranes in his village.

Other chapters that are interesting to read include the seasonal flowers of Kaas Plateau, flora and fauna of Rann of Kachchh, forests around Guwahati, mangroves along the coast, Sewri-Mahul mudflats in Mumbai, the colourful world of butterflies, a night in the forest, Dudhwa National Park, wildlife habitats of the Northeast, Peafowl at Morachi Chincholi near Pune, the cold desert of Ladakh, and the rainforest of Agumbe in Karnataka. Chapters like the one on the ruined wetlands of Uran near Mumbai, and one on former poachers turned protectors in Chilika, drive home the important message of nature conservation.

As expected from a book printed on art paper, it does contain some beautiful images such as sun rays percolating through the forest canopy, Indian Peafowl, miniature waterfalls in forest streams, and Glory Lily. Although the book depicts the travel experiences of the author in a colourful and biodiversity-rich country like India, the cover page looks quite dull and unattractive, and may not create the desired picture about the contents of the book in the minds of readers.

ABOUT THE POSTER

Eublepharis sp. is a nocturnal species distinguished from all other Indian geckos by the presence of eyelids. This Fat-tailed Gecko, as it is popularly known, is of robust build with a distinctive swollen tail. It inhabits forested hill tracts, boulders and scrubland, and lives largely on insects and other arthropods, but also preys on other geckos. The species produces a squeaky mechanical noise by sudden sideways jerks of the head. In India, three species occur, Eublepharis macularius in north-western India, E. fuscus in Gujarat, as far south as Pune and probably north Kanara, and E. hardwickii from northcentral and eastern India.

The IUCN lists the species as Least Concern, but recommends that specific impacts of threats to the species be assessed through



Fat-tailed or Leopard Gecko Eublepharis sp.

field surveys. Quarrying, watershed development works, and persecution for being a highly venomous lizard have been identified as the major threats to the species throughout its range. The species used to be common earlier in the late 1990s as reported by the locals, but currently it is much reduced throughout its range. Although there are several threats identified affecting the species in Maharashtra and Gujarat with a perceived decline in population, it is represented in several protected areas.



Living Eden: A Day in the Coral Reef

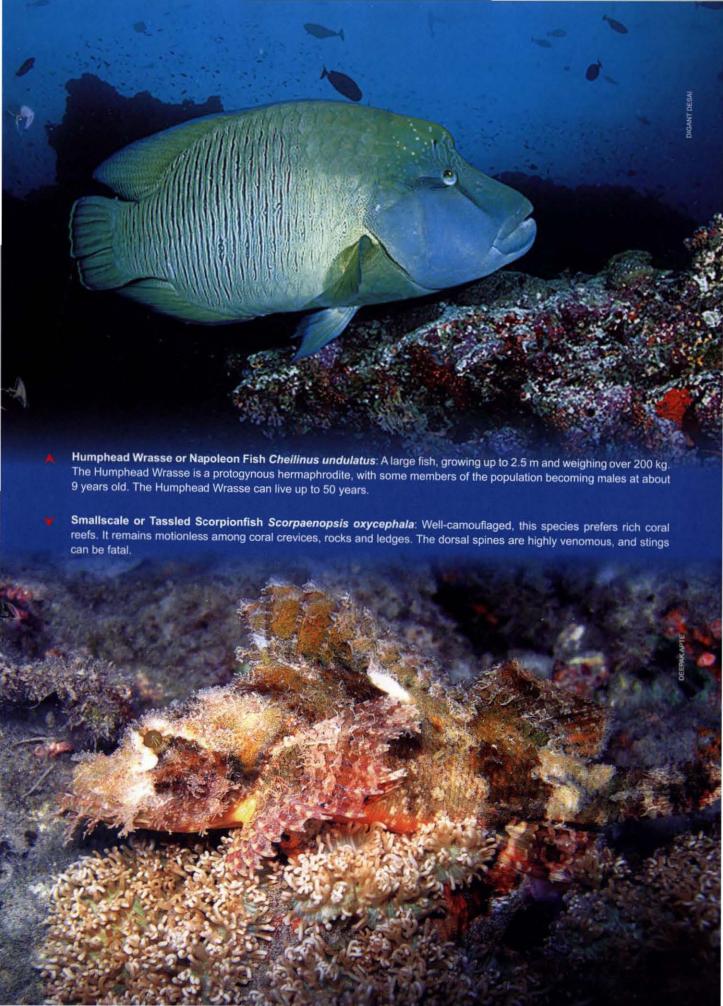
Text: Deepak Apte

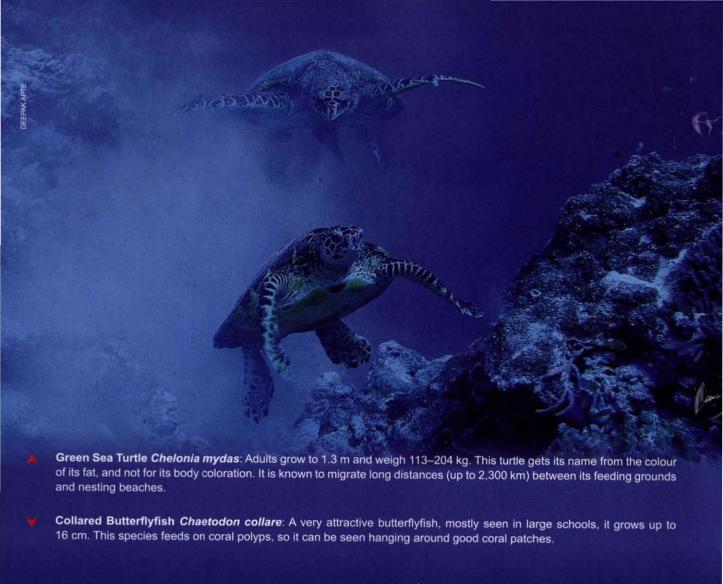


Deepak Apte is presently the Director of the BNHS. A scientist of international repute, his specialisation is in marine ecology. oral reefs, Earth's largest biological structures, have taken thousands of years to form. Life in the reef includes a mosaic of colours as they are home to several thousand species. Reefs, the world over, provide livelihood to millions in the form of fisheries, recreation, and other life support systems. They also act as natural barriers to protect coasts from erosion and people from natural calamities like cyclones, storms, and tsunamis. They are the world's largest and most effective carbon sinks. Formed by tiny, microscopic individuals called polyps (relatives of sea anemones and jellyfishes), one coral colony is built over several hundred years.

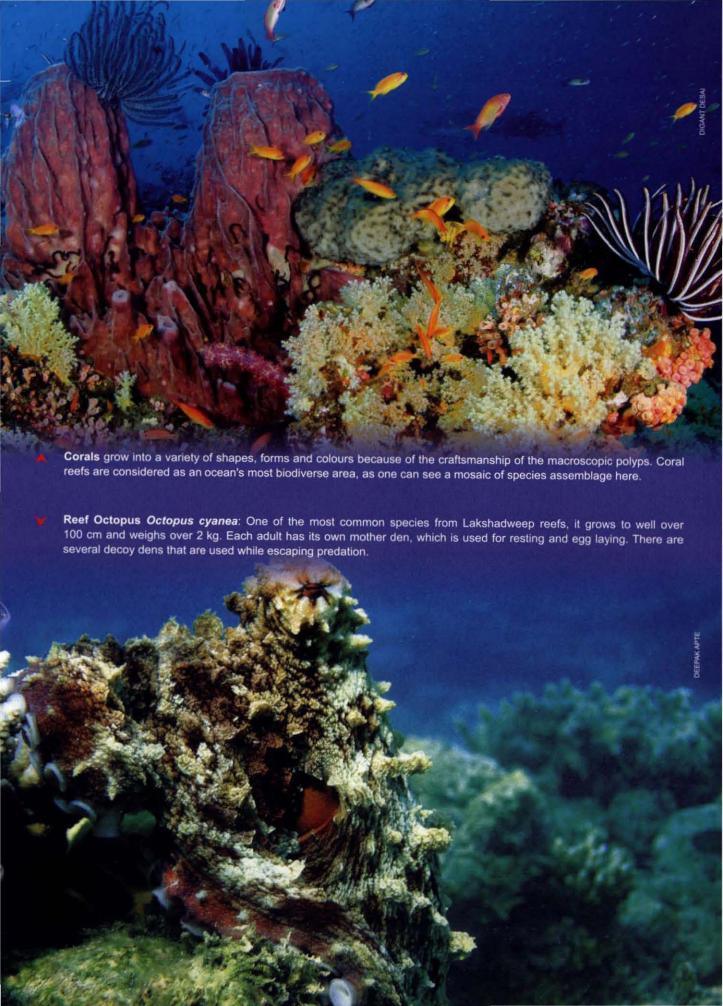
According to the Global Coral Reef Monitoring Network (GCRMN), 46% of corals in the Indian Ocean were destroyed in the 1998 El Nino related coral bleaching event. The impacts on reef ecosystem ultimately affect the fisher folk who depend on this ecosystem for their daily livelihood.

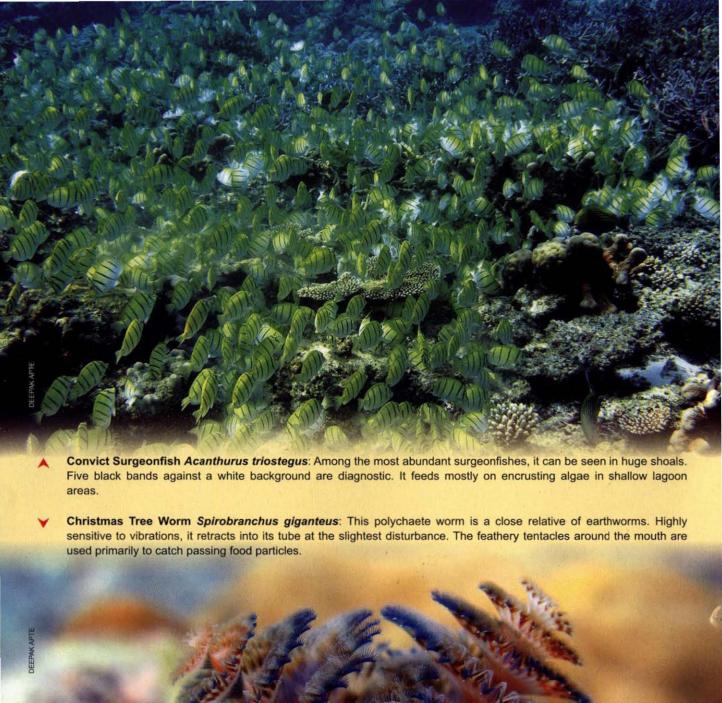










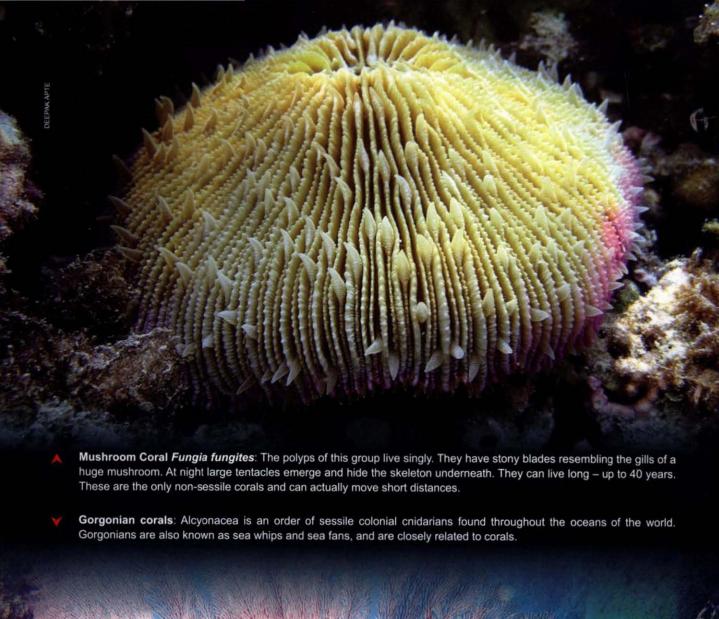






- Giant Carpet Anemone Stichodactyla gigantea: It grows up to a metre and acts as a host to anemone fishes and damselfishes. Zooxanthellae are obligate symbionts within the anemone.

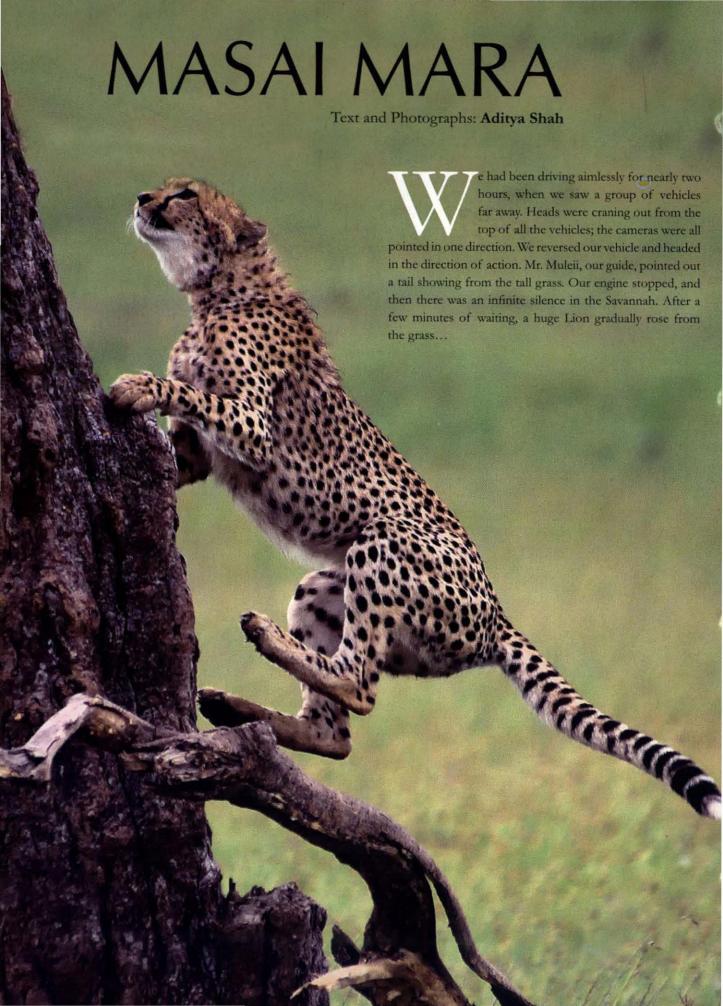
















Tourists may not see a new animal every day, but a new action enthralls them in Masai Mara National Reserve

The Masai Mara National Reserve in Kenya, covering an area of about 1,510 sq. km, is part of the Mara-Serengeti ecosystem that extends into Tanzania as Serengeti. Watered by the Mara river, the Reserve is at 2,000 m above sea level. This ecosystem is a haven for all nature lovers as it has something unique to present each day. You may not see a new animal everyday, but you will still be enthralled with a new action everyday. No two days in the Mara are ever the same. Kenya's economy is heavily reliant on tourism, and the core area, the Mara National Reserve, generates an estimated £13 million each year.

... This was no ordinary lion. It was a nomadic lion, a 'special' kind of male that has a stronger and larger body than the average male lion. It had a darker mane, which seemed to scintillate in the golden light of the sunset. Nomadic lions are so named because they do not have a fixed pride. They defeat males from a pride, mate with the lionesses, and move on. They generally saunter in groups of two or three. In no time, two other lions of the exact same build rose from the grass, and headed towards what they had killed the previous night: a Hippopotamus. Unlikely as it may seem, even the Hippopotamus must have been no match for these three hunks. In the distance, I saw a pride (separate from the nomadic lions) waiting ardently to have a go at the kill. But one fierce roar

was enough to keep an entire pride of lions at bay.

Another animal, which was truly a delight to watch, was the cheetah. We spotted a mother with four cubs that were training to survive on their own. The cheetahs climbed onto jeeps around us to get a better view of potential prey in the grassland. They sat there for an hour, and walked around on the top of jeeps. Some amongst us were bold enough to crane their necks out of the roof to get a better view. I froze when one of the cheetahs almost slipped and I thought that it would fall into the jeep through the roof. After some serious scouring, the cheetahs began to slowly jump off the jeep, one after another. Something in the distance had caught their attention.

They crouched a little in the tall grass, and began to head towards what they had seen. Finally, we saw what they had seen - a lone Impala. The Impala should have known better than to be alone in a cheetah's territory. The Impala must have sensed the impending danger, it looked up once, and fled. One of the cheetahs broke into a run, but soon realized that the prey was too distant, and abandoned the chase.

We followed the cheetahs, and saw the mother watch her children as they played games that would improve their hunting skills. The young cheetahs chased each other about, and pounced on each other, as though they were

killing prey. They also practised climbing trees, and other skills that would help them thrive in the wild. Seeing a cheetah, fully stretched, leaping onto a tree with its powerful legs, with the Mara landscape as the backdrop and the sun shining brightly on its stretched body, is truly priceless.

Traditionally, the Masai ways of living have been harmonious with the wildlife; however, with development, their pastoral way of life is declining slowly. It is not surprising to find a man wearing a red Masai scarf holding a brand new iPhone 5s. Privatization of land and the embracing of new technology pose a threat to the Mara. This situation is similar to that in India, where similar causes are leading to shrinkage of forests. However, conservationists are working hard, and the numbers of a few species, such as elephants, have even increased over the

"If you can teach people about wildlife, they will be touched. Because humans want to save things that they love." Steve Irwin, Australian wildlife expert and conservationist, a.k.a. The Crocodile Hunter.



Aditya Shah has published a book MASAI MARA: CAPTURING THE WILDERNESS to showcase the plethora of African wildlife.



Poachers to Protectors: The story of Mangalajodi

Text: Sanjib Sarangi

hile on one hand our pace of development is causing large scale degeneration of ecological settings, on the other there are spontaneous community attempts to conserve our environment. Populations that have faced the wrath of nature tend to voluntarily come forward to protect it until economic pressures for survival reduce the priority of nature conservation.

This is the story of a village of erstwhile poachers that have survived economic pressures and are today actively patrolling and protecting birds in its marshes.

Mangalajodi is a small picturesque village on the north-western fringe of Chilika lake in Odisha. Known for its marshes and waterfowl congregations, until 13 years ago, it was often associated with poaching of birds. A census in 2000 counted a mere 5,000 birds in the region around Mangalajodi. The area was witnessing a steep decline in the number of birds due to various reasons, poaching being the prime reason.

Primarily a fishing community, the villagers of Mangalajodi are also engaged in farming and non-farming activities like boat making and fishnet making. Fish nets were also used for bird poaching in the 1990s. As the livelihoods of the villagers depend on nature, their earnings have strong seasonality and they struggle during lean periods. Natural events like rain and cyclones affect their fish catch from the Chilika lagoon. After the introduction of cultured fisheries system in the lagoon, the gheris [illegal prawn culture encircling massive areas (with bamboo sticks/fish nets)] made by prawn mafias have affected the catch made by traditional methods of fishing (captured fishery).

The dwindling bird populations stimulated various agencies to initiate a concerted effort to reverse the situation. The efforts focussed on sensitizing the locals to the importance of Mangalajodi wetland and converting them into conservation. Today, Mangalajodi is one of the foremost sites for ecotourism and for photographers alike. The locals monitor the bird population, coordinate with the forest department, assist in research and take tourists around on birding trips. Protection has saved not only birds, but also benefited other life forms in the wetland system, including, among others, fishes, snakes, monitor lizards and the rare fishing cats. Mangalajodi now hosts more

The Operation Area

Chilika Lagoon is Asia's largest estuarine ecosystem hosting migratory birds every year. Chilika supports some of the largest congregations of aquatic birds in the country, particularly during winter. Flocks of migratory waterfowl arrive from as far as the Caspian Sea, Lake Baikal, Aral Sea, remote parts of Russia, Kirghiz steppes of Mongolia, Central and Southeast Asia, Ladakh, and the Himalaya, to feed and breed in its fertile waters. Normally, the lake hosts over 200 species of birds during the peak season, of which around 115 are migratory.

than 300,000 birds in the peak season of November-December. It has been designated as an 'Important Bird Area' by BirdLife International, as a significant global waterfowl habitat.

After over a decade long persuasion by NGOs, government, corporate, and other agencies, the locals were convinced to become partners in conservation and converted into protectors. The transition was not easy, but continuous efforts through awareness and support different agencies proved effective. A people-centric communitybased institution was facilitated and the Mangalajodi Ecotourism Trust www. mangalajodiecotourism.com was born.

The board of trustees was involved from the inception to ensure their ownership and capacity enhancement to run the enterprise. RBS Foundation, (RBSFI) roped in Indian India Grameen Services (IGS) to extend the handholing support to Mangalajodi Ecotourism Trust. The strategy of the IGS was to develop ecotourism so that an alternative source of livelihood may emerge for the inhabitants, who would also be dependent exclusively on conservation of birds.

The ecotourism initiatives Mangalajodi were meaningfully facilitated by the IGS, Bhubaneswar, with assistance from RBSFI. IGS works for the protection of birds by involving local villagers. Their aim was to strengthen the community institution building process and to carry forward wetland-centric ecotourism initiatives at Mangalajodi to develop it

Guided bird watching and ecotourism employing locals is encouraged at Mangalajodi





Country boat ready to sail on the wetland



Aesthetic mud cottages provide accommodation to tourists at Mangalajodi



Livelihood support system at Mangalajodi wetland

as a sustainable source of livelihood for the locals. Chilika Wildlife Division, Government of Odisha, with the How to get there

By road: Mangalajodi is c. 75 km from Bhubaneswar off NH 5 that connects Bhubaneswar to Berhampur. Visitors can get off at Chandpur Tangi and take an autorikshaw to Mangalajodi; buses regularly ply from Bhubaneswar to Tangi. Alternatively, one can hire a taxi from Bhubaneswar.

By rail: Mangalajodi is 50 km from Khurda Road railway station and 35 km from Balugaon.

Best time to visit: Between November and February. The largest congregation of birds can be seen from mid-December to end-January. The wetlands are closed to visitors for two days in the first or second week of January for the Forest Department's annual waterfowl census. So do check before firming up your programme.

Places around Mangalajodi: A visit to Mangalajodi can be combined with a visit to the Bhetnoi, a community protected Blackbuck sanctuary near Aska, and Rushikulya beach where mass nesting of Olive Ridley turtles occurs.

help of the Department of Forests and Wildlife, Chilika Development Authority (CDA), and Bombay Natural History Society (BNHS) are supporting this community conservation effort.

Ecotourism is arguably the fastest growing sector of tourism; it is possibly the largest service industry in the world. Like any other industry it is governed by growth and quick returns. The principal advantage of this industry is the meaningful involvement of locals to conserve the flora and fauna of the area.

The Impact

The tourist inflow at Mangalajodi has increased from a meagre 350 (during 2010–2011) to 1466 (during 2014–2015), probably as a result of effective marketing and promotion of the destination.

Most importantly, participation of villagers has increased progressively, witnessing a steady growth in the activities of the Trust. Consequently, a healthy atmosphere has been created in the village, wherein a general belief has taken hold that everyone may have their fair share in increasing economic development. Due to a steady increase in tourist inflow, there was an inevitable increase in revenue generation to the tune of around fifteen lakh rupees during 2014–2015, which is almost 12 times more than was generated during 2010–2011. This speaks for the vast potential of further growth.

stakeholders Various have contributed to the success ecotourism initiatives in Mangalajodi and are thus partners in the economic development of the village. The collaboration framework and conscious efforts in ensuring participation of all stakeholders were necessary for the rapid development and long-term success of ecotourism interventions in a small place like Mangalajodi. Conservation has been aided and livelihoods have flourished in a village of limited opportunities.



Sanjib Sarangi works as AVP & Head, Natural Resource based Livelihood Programs, Indian Grameen Services.

Avian Gems of Dibru Saikhowa National Park

Text: Ravi Rajagopal

ibru Saikhowa National Park (350 sq. km) is located 12 km north of Tinsukia town in Assam, in the districts of Dibrugarh and Tinsukia. The Park is bounded by the Brahmaputra and Lohit rivers in the north, and Dibru river in the south. It mainly has moist mixed semi-evergreen and deciduous forests, cane brakes and grasslands. The cane and bamboo brakes around the sandy rivers give it a unique habitat. The Magori beel and Magori grasslands are situated close to the Park.

Dibru Saikhowa is a haven for many threatened species, and in this article I share my sightings of a few endangered species during a trip to the Park in February 2013.



Black-breasted Parrotbill

Paradoxornis flavirostris

The Black-breasted Parrotbill is a medium-sized parrotbill with rufous-brownheadandolive-brownunderparts, a black patch on ear coverts and a huge yellow bill. Its usual habitat is reed beds and tall grass. It used to be easily spotted without much effort at Dibru Saikhowa about six to seven years ago, but due to habitat destruction, the species became rare. It is now recovering with habitat protection.

One of the guides had spotted it just a few days earlier, at a distance of to the top of the grass. Then, both male and female were sighted and we were surrounded by them calling to each other. It was such an enthralling experience. The sexes are almost similar, except for the presence of a small crest in the male. Hopefully, with the Park officials now sensitized about the status of the bird, its habitat will get protected.

Chestnut-capped Babbler

Timalia pileata

The Chestnut-capped Babbler is one of the most attractive babblers, and is

calls, but my luck changed, when the babbler decided to come out and perch in the open. It was a wonderful sight. I did not realize its masked bandit-like appearance till I looked closely at some of the photographs taken.

Jerdon's Babbler

Chrysomma altirostre

Jerdon's Babbler is another globally threatened species that frequents the Magori grasslands. It was said that sighting this species was difficult, but it is not so now, probably since its numbers have increased with habitat



Black-breasted Parrotbill



Chestnut-capped Babbler



Jerdon's Babbler

3–4 km from the river. However, for our sighting, we had to make an arduous 20 km trek to the grassland deep inside the Park. By the time we reached the spot, all our energy reserves had been drained, with none left to go back – unless we regained some energy if we saw the bird! To our dismay, there were no signs of the Parrotbill for the initial 15 minutes, despite hearing it call a few minutes earlier. So my guide decided to playback* its call, to which the bird responded and gradually climbed up

characterized by a masked appearance. It sports a chestnut cap and has a reddish iris. The forehead, supercilium, throat and breast are white, with slategrey sides to the neck, flanks buffish, and tail barred. I had been nurturing a desire to see it for a long time. During my trip to Manas National Park, I had heard its calls, but was not able to see the bird. My luck changed on my visit to Dibru Saikhowa with a visit to the Magori grasslands. I initially thought I would again have to make do with its

protection. It shares its habitat with the Striated Babbler *Turdoides earlei*. The race found in the northeast *Chrysomma altirostre griseigularis* differs from that found in the Indus plains *C. a. scindium* in that the throat is greyish, with richer chestnut-brown upperparts, and richer buff on the belly, flanks and vent.

Jerdon's Bushchat

Saxicola jerdoni

The tall grasslands of Dibru Saikhowa are also home to another

uncommon species of bushchat. The male Jerdon's Bushchat is distinctive in its contrasting colours, and can be made out easily from a distance though it tends to be somewhat restive. The male has black upperparts contrasting with white underparts. The call is a high pitched whistle.

Marsh Babbler

Pellorneum pallustre

The Marsh Babbler is yet another globally threatened species of the marshy grasslands of Dibru Saikhowa. I never imagined what it would be to

This babbler is extremely restive and sensitive to movements, so my colleague and I had to sit as still as possible as it circled repeatedly around us in the grass, giving us only brief glimpses of it. Its movement was so rapid that I could get only a record shot. Its melodious call made us all forget the uncomfortable position that we were in.

Himalayan Rubythroat

Luscinia pectoralis

The Magori grasslands are also home to the Himalayan or White-tailed Rubythroat, which comes out into the Flycatcher, Pin-striped Tit-Babbler, Common Green Magpie, Yellowbellied Prinia, Black-faced Bunting, Graceful Prinia, Bright-headed Cisticola, Dark-necked Tailorbird, Striated Grassbird, Pied Harrier, Baikal Teal and Falcated Duck, among many others. It is a wonderful biodiversity hotspot, and hopefully all these rare species will survive the test of time and the pressures of mankind.

The success of the trip was due to Amith Kumar, who gave me the initial briefing; Binandan Hatibaruah, my guide for the tour (introduced by



Jerdon's Bushchat



Himalayan Rubythroat



Marsh Babbler

spot this species till I experienced it! One has to crouch on the swampy ground in between the thickets of tall grass and sit still in this position for hours. I had quite given up hope and thought what a relief it would be to quit this uncomfortable position and stand up, when my guide hushed me when he heard the call of the marsh babbler. The call echoed across the grass and was so melodious that I could not believe it to be from a babbler.

open at the edge of the marshy grassland and looks for flies on the ground. In contrast to the Siberian Rubythroat, the Himalayan Rubythroat has a distinctive black breast-band with greyer upperparts, and has white sides and white tip to the tail. The race/subspecies in the northeast has a white moustachial stripe.

Dibru Saikhowa and the adjoining Magori grasslands are a haven for many other species such as all the three pied hornbills, Black-breasted Sunbird, Crimson Sunbird. Pale-chinned

Ms. Geetanjali Dhar of IT Nature Club); and my co-photographer, Porag Jyoti Phukan. And I thank Deborshee Gogoi for permitting the use of his photograph of Marsh Babbler.

*Disclaimer: BNHS does not support call playback activity unless required for serious research.



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Text: Vibhu Prakash Photographs: Nikita Prakash

Slender-billed Vulture

extraordinary gazette notification of the Government of India on July 17, 2015, restricting the size of packaging of human formulation of the drug diclofenac to 3 ml ampoules, brought cheer to vulture conservationists across the world. It was considered the most urgent and effective step by the Union Health and Family Welfare Ministry to stop the misuse of human formulations of this non-steroidal antiinflammatory drug (NSAID) in treating cattle. The drug, considered a wonder anti-inflammatory and painkiller for cattle and humans, is very toxic to vultures even at concentrations of 0.2 mg/kg body weight. The vultures get exposed to diclofenac when they feed on the carcass of an animal which was treated with the drug up to 72 hours prior to its death. Enough residue of



The Long-billed Vultures housed and bred in BNHS's Conservation Breeding Centres, for the first time ever

the drug remains in the carcass to cause renal failure in vultures. Diclofenac caused massive mortality in vultures across South Asia during the last two

decades and brought the three resident Gyps vultures, White-backed Gyps bengalensis, Long-billed Gyps indicus, and Slender-billed Gyps tenuirostris, to the verge of extinction, from being among the commonest large birds of prey in the world.

Diclofenac was banned as a veterinary drug in 2006 by the Drug Controller General of India and the ban was gazetted in 2008. However, diclofenac formulations for human use were not banned and formulations available in multi-dose vials of 30 or 50 ml were misused by people treating cattle, resulting in vulture deaths due to diclofenac poisoning. Typically, the dose for an adult cow or buffalo is 10-15

study published in the highly reputed medical journal Lancet, diclofenac has been found to cause heart attacks in humans. Its harmful impact on kidneys in humans is also well documented.

We must remember that vultures and other scavenging birds are indicators of the health of the environment. They keep the environment clean by feeding on animal carcasses, which are virtually the culture medium of pathogens, thereby preventing the outbreak of disease in humans and livestock. Vultures also ingest chemicals (drugs)

carcasses, the principal food of vultures. The nation-wide population surveys of vultures by BNHS have indicated stabilization of the populations of all three species. The time has now come to release the captive-bred vultures into the wild. A group of 10 vultures captive-bred immature Oriental White-backed, 2 non-breeding wildcaught adult Oriental White-backed, and 2 wild-caught adult Himalayan Griffons - housed at the Pinjore Centre of the BNHS were moved to the pre-release aviary in November 2015, as part of the



Vultures keep the environment clean and prevent outbreak of diseases by feeding on animal carcasses

ml, depending on the body weight; so multi-dose vials of human formulations available in 30 to 50 ml presentations came in handy for use in treating cattle. A single dose for humans is just 3 ml, therefore, multi-dose vials are not required. Drug companies had flooded the market with these presentations as they would fetch them high profit. It is hoped that with the ban on multidose vials for human use, their misuse in treating cattle will be minimized and the environment will become safer for vultures. Incidentally, according to a

from the carcasses and if these are toxic, the vultures are affected.

The other exciting development in vulture conservation is the initiation of the Reintroduction Programme of vultures into the wild. The releases are an integral part of the Vulture Conservation Breeding Programme, which is an important conservation tool to save the three Gyps species from possible extinction. The analysis of samples collected from different parts of the country now indicate a lower prevalence of diclofenac in cattle soft release programme for the birds. The pre-release aviary is largely made up of strong plastic and netlon nettings and the vultures get a very good view of the surrounding habitat and landscape, where they will be reintroduced. The vultures in the pre-release aviary are fed on entire carcasses. Free-ranging wild birds are attracted to the aviary by providing carcasses just outside the aviary. Within a few months, when the wild vultures start feeding regularly close to the aviary and the captive vultures start interacting



Pre-release aviary at Pinjore: The vultures will be housed in pre-release aviary located in the area where they will be ultimately released in the wild

them, the netting will be lifted. The vultures will be fed both inside and outside the aviary for several months to ensure that they remain confined to the release site and eventually start moving off with the wild vultures. The wild birds and the wild-caught adult vultures will act as guides to the captive-bred vultures. The vultures will be fed till they are able to locate carcasses on their own. For this biologists will be monitoring the birds with the help of satellite transmitters. The released vultures will, however, be constantly monitored with the help of satellite transmitters deployed as backpacks before release. It would be very interesting to see how the captivebred vultures adjust to the wild. BNHS proposes to release 600 pairs of all the three species into the wild from its centres, within 10 years of the beginning of the Reintroduction Programme.

BNHS, in collaboration with state governments and Central Zoo Authority, set up a Vulture Conservation Breeding Programme for the three *Gyps* species as an insurance against extinction, and the centre at Pinjore in Haryana was the first to be established in 2004. Seven more Vulture Conservation Breeding Centres were established in different locations. All the three *Gyps* species have now bred, with close to 60 nestlings fledging this year, and over 490 birds held in captivity.

The centres were established in response to the recommendations of the Vulture Recovery Plan which was incorporated in MoEF & CC's Vulture Action Plan of 2006. The Vulture Recovery Plan was prepared in 2004, led by BNHS with the help of experts from various national and international conservation organizations working on vultures, including the International Union for Conservation of Nature and Natural Resources (IUCN), Captive Breeding Specialist Group, decision makers from central and state governments and veterinarians. Conservation Breeding Programmes though not considered the best of conservation actions, have saved various species from extinction, such as Californian Condor and Mauritian Kestrel. Such programmes become very important when conditions in the wild are unsafe for the species. This programme was recommended for the three species of vultures because urgent measures were required to save them from possible extinction as their population had crashed by over 97% (from over 40 million to less than hundred thousand within a decade) because of the poisoning of their principal food - domestic ungulate (livestock) carcasses with diclofenac.



Colony Aviary at VCBC, Pinjore: The vultures are housed in huge aviaries where they live in near natural conditions

The first release will be experimental, as this has not been done before for any avian species in India. Every aspect of this programme is being meticulously planned and documented. What we learn will also help conservation breeding programmes for other species of birds.

A number of actions are, however, required before the vultures can be released into the wild. An assessment of habitat within a radius of 100 km would have to be done to ensure that there are enough roosting and nesting sites and safe food, i.e., carcasses with very low prevalence of vulture toxic drugs like diclofenac, ketoprofen and aceclofenac. Scientific evidence will be produced and presented to the Drug Controller General of India to ban the drugs ketoprofen and aceclofenac for veterinary use. The Ministry of Environment, Forests and Climate Change (MoEF&CC) will be urged to release funds for its programme on safety testing of existing molecules of veterinary NSAIDs on vultures to the Indian Veterinary Research Institute and BNHS-India. The proposal has already been approved by the Ministry in February 2015. Unless safety testing of drugs is done on vultures and toxic drugs are removed from veterinary use, it would be very difficult to conserve these species in the wild.

Vultures are today the most threatened group of birds in the world. Four species - Oriental White-backed Gyps bengalensis, Long-billed Vulture Gyps indicus, Slender-billed Vulture Gyps tenuirostris, and Red-headed Vulture Aegypius calvus - out of nine recorded in India are listed as critically endangered in the IUCN Red list, which means that their extinction is possible within the next ten years. Another species, the Egyptian Vulture Neophron percnopterus, is considered endangered. Three more, the Himalayan Griffon

Gyps himalayensis, Cinereous Vulture Aegypius monachus, and Bearded Vulture Gypaetus barbatus are near threatened. Only the Eurasian Griffon, which winters in India, is of least concern. All the Gyps species are known to be susceptible to NSAIDs and the other species are likely to be susceptible. The vultures have rung alarm bells against the indiscriminate introduction of medicines in the market without adequate safety testing and study of their impact on our environment. We must remember that vultures are known indicators of the health of our environment and what has happened to vulture populations could well happen to humans too.



Vibhu Prakash is presently Deputy Director and Head of the Vulture Conservation Breeding Programme, BNHS. He has identified and documented the crash in Gyps vulture population.

CEC Mumbai: Journalism Workshop and other initiatives



Journalists and writers on a nature trail during the workshop

CEC Mumbai hosted a range of innovative and exciting nature activities during the quarter.

A workshop on Environmental Journalism was conducted on October 17, 2015, in association with the Mumbai Press Club and Public Relations Council of India (PRCI). The half day event was attended by 40 participants, including practicing journalists, PR professionals, freelancers and students of mass media. The workshop addressed the dos and

don'ts of reporting, understanding research from a layman's perspective and local biodiversity. The objective of the workshop was to sensitize the media fraternity for holistic and scientific reporting on environmental issues.

The educational visits to CEC Mumbai were from SVDD School, Jnana Prabodhini Extension Centre, Parle Tilak Vidyalaya, Veer Bhagat Singh School, CJ High School, Pragyna Bodhini High School, and Patkar College. In a visit initiated by Dr. Ashok Kothari, GC Member, BNHS, more than 100 participants from various Rotary Clubs of Mumbai and exchange students from abroad attended a monsoon trail.

Among other initiatives, CEC Mumbai has begun a pilot project of growing organic vegetables on its land. All nature trails were freshly demarcated and the longer trail to Sálim Ali Point has been reopened.

BNHS' ornithology course syllabus revised

BNHS conducts four distant learning courses. Launched in 1994, the Basic Course in Ornithology (BCO) has been a valuable part of our educational activities. The course material for the batch of 2015–16 has been updated by Dr. Ranjit Manakadan and Mr. Asif Khan. This comprehensive course is for anyone interested in learning about birds and their conservation. CEC Mumbai is also working on revising the syllabus of the Leadership Course in Biodiversity Conservation.

The first camp for the BCO batch of 2015–16 was organised by CEC Mumbai on August 29–30, 2015; the camp was attended by 55 participants. On September 13, the BCO students visited Sanjay Gandhi National Park, followed by a four-day camp to the



Participants of BCO inaugural camp in the field

BNHS Bird Migration Study Centre in Point Calimere from October 2-5 and a field visit to Karnala Bird Sanctuary on November 1. ■

CEC Delhi: Wildlife conservation initiatives

t CEC Delhi, September began with a seed collection walk to support the ongoing Seed Bank project, followed by another walk to study native trees to promote their importance. On September 13, 2015, a post-monsoon walk was organized to explore the forest.

A dragonfly festival titled "Story of Dragonflies" was conducted from September 15-22 at Zakir Hussain Delhi College and Manay Rachana College to highlight the importance of lesser known species. The focus was on the natural history, evolution, aerodynamic bodies and role of dragonflies as biological indicators. As a part of the festival, a field study was conducted on September 15 near Bathera Dam, Bharatpur, with Mr. Dhirender Singh, a dragonfly expert.

Wildlife Week was celebrated from October 2-9 by conducting programmes for schools, colleges, and naturalists related to community awareness, habitat restoration, recycling, urban biodiversity,



A number of school students participated during wildlife week celebrations at CEC Delhi

and wetland ecosystems. A bird feeder workshop followed by a seminar on Ridge vegetation was part of the Wildlife celebration. These programmes reached out to over 2,000 individuals. Students of various educational institutions like GBSSS (Tughlakabad), Adarsh Gyan Vatika School, Katha Lab School, GBSSS (Kalkaji), DAV Public School, Guru Gobind Indraprastha University and University of Delhi participated wildlife quiz, clay modelling, painting, photography and writing competitions. On October 18, a birdwatching trip was organized to Bhindawas Bird Sanctuary. A nature and heritage walk was organized on October 25, at Humayun's Tomb to promote the idea of wildlife spots in heritage monuments.

Activities @ Hornbill House

the last quarter of the year at the BNHS headquarters started off with a book reading event of THE LAST WAVE - AN ISLAND NOVEL by Pankaj Sekhsaria on October 8. Mr. Sekhsaria read out excerpts from his book on the Andaman & Nicobar archipelago, which was followed by an open discussion. On October 9, the release of the book THE LESS LIKED LOVABLES, the latest in the children's series by Katie Bagli was attended by children and adults alike. The function began with a presentation by Ms. Bagli that aimed to shatter myths about animals. Dr. Vijaya Gupchup, Chief Guest and Ms. Sree Nandy, Guest of Honour, each delivered short yet remarkable talks on the book.

On October 14, the documentary "Racing to Zero" directed by Christopher Beaver was screened, in which 'Garbage as a resource, rather than waste' formed the focal point. The audience's questions and ideas about garbage management in their localities were thoroughly discussed in a session with Mr. Beaver and the Producer Ms. Diana Fuller.

The BNHS Library and Collections were visited by a pleasantly curious batch of 8th standard students from IES Raja Shivaji Vidyalaya, Dadar. A documentary was screened featuring the nest building process of Oven Bird, followed by an informative talk by the ENVIS team on the subject.



Book reading was followed by an open discussion



LESS LIKED LOVABLES by Katie Bagli was released by Dr. Vijaya Gupchup



Chairman of Natural History Museum (UK) visits BNHS

On Wednesday, November 25, 2015, Lord Green of Hurstpierpoint, Chairman of the Natural History Museum, London, visited BNHS to explore avenues for future collaboration of the Natural History Museum with the BNHS. During the visit, the Chairman appraised BNHS Collections and the nature conservation efforts of the BNHS.

BNHS revives Sálim Ali Bird Count

o commemorate the birth anniversary (12th November) ■ of the 'Bird Man of India' Dr. Sálim Ali, BNHS revived the Sálim Ali Bird Count this year, after a long gap. This activity, which was held on November 15, will be organized every year on the first Sunday after November 12. Sálim Ali Bird Count, organized in association with Bird Count India, witnessed phenomenal participation with 15,638 observations recorded by 280 people from 22 states covering 99 districts of India. A total of 514 species were recorded in a single day through 549 lists, which were uploaded on the eBird website www.ebird. org. Among them, 383 were unique lists, whereas the rest had multiple contributors. The count witnessed a remarkable effort of 805 person hours, which fulfills the objective of encouraging participation of the public in field study and documentation. Maharashtra ranked first among all the states with 123 lists, followed by Kerala (59), Karnataka (40), Tamil Nadu (40), and Uttarakhand (24). Birders recorded 30 species which are on the IUCN Red List 2015. White-rumped Vulture, which is Critically



More than 15,000 observations were by birders from 22 states

Endangered and four birds from the Endangered category were also spotted during the count. The Sálim Ali Bird Count is an effort to involve common people in birdwatching and make them ambassadors for conservation by raising awareness.

Advocacy and Policy efforts

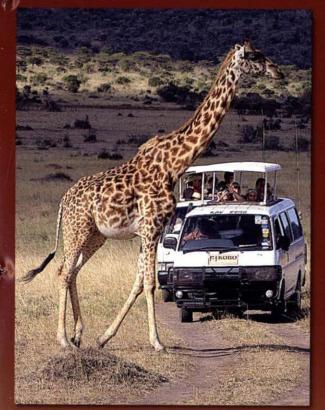
Advocacy at various levels of the government hierarchy plays an important role in promoting sustainable policies. Neha Sinha, Policy and Advocacy Officer, BNHS, was invited for the Student Conference on Conservation Science (SCCS) 2015 in Bengaluru to conduct two interactive workshops. This annual event is conducted by the Asia chapter of the SCCS, which first started in Cambridge, UK. The first workshop conducted by Ms. Sinha introduced participants to the environmental decision making process, policy, and multilateral environmental agreements. The second workshop focused on the pressures and peculiarities of working with the press; it also carried out an analysis of media articles to discuss how wildlife and nature can be depicted in a fair manner.

In light of the floods in Kashmir last year, forest department officials, experts and Indian Bird Conservation Network (IBCN) felt the need for a multi-disciplinary wetland policy for the state of Jammu & Kashmir. With this objective, a workshop was held at Kashmir University, Srinagar on September 4 by the BNHS and IBCN-Jammu & Kashmir. The workshop also aimed to strengthen the IBCN in the state. Academia, activists, conservationists, government officials, law students and scientists came together for the event. The resource persons included Ritwick Dutta, a lawyer; Ashfaq Ahmad Zarri, J&K IBCN state coordinator; Neha Sinha; Asad R. Rahmani, Senior Scientific Advisor, BNHS, and S. Ramshoo, wetland expert, Kashmir University. The workshop suggested creating a wetland policy for the state which included inventorization and conservation of wetlands, their zones of influence, capacity building of officers and setting up a People's Biodiversity Register from a wetland perspective.

Published on December 18, 2015, by Dr. A.M. Bhagwat for Bombay Natural History Society, Hornbill House, Dr. Sálim Ali Chowk, Shaheed Bhagat Singh Road, Mumbai 400 001, Maharashtra, India.

BNHS AFRICAN SAFARI

Tanzania – Date: May 21–28, 2016 Kenya – Date: August 14–22, 2016





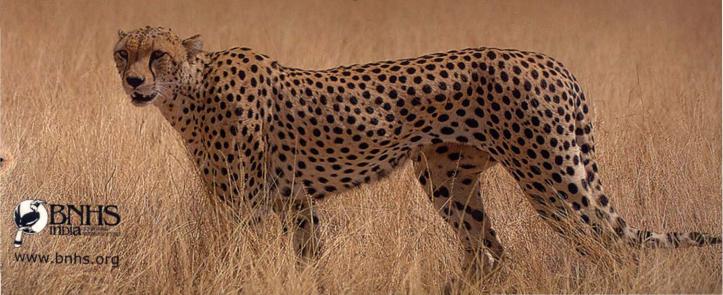








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