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April-June 2023



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abounds in flora and fauna, but it is
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The Green Spirit of Gir

The Gir has a rich vegetation
that sustains diverse lifeforms,
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Maldhari people, which is why
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extensively across most parts of this
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PHOTO FEATURE

The Eclipse Collection Scientifically Accurate Wildlife Paintings

Our inconsiderate actions are
eclipsing countless species.
Akshita S. Lawrence, a wildlife artist,
shares her Eclipse Collection – a
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Editorial...

Is change necessary?

While leafing through old issues of the *Hornbill* it is likely that you may pause for a while and ponder over the viewpoints written by J.C. Daniel, the Founder Editor of the magazine. One among the many he wrote is still worth another read:

“How does one destroy a pristine natural forest which has stood for thousands of years, a treasure house of natural wealth, a primeval inheritance for later generations? The answer is simple – run a road through it. It will be like driving a poisonous spear into the heart of the forest ... a channel for the introduction of the infection and corruption of civilisation which will, within a few years, destroy the forest, its soil, its wildlife and its people, who will be lost in the melting pot of progress, development and exploitation.”

He also said, “Those who foresee and predict the downfall meet with the fate of Cassandra,” and it is so true. His words were read, liked, but rarely implemented.

Amboli is a small village cocooned in Amboli Ghat, which is probably one of the most beautiful mountain passes of the Sahyadri hills. This ecological hotspot has been explored by researchers and nature enthusiasts for long, revealing several species of reptiles and amphibians unknown to science. While the place is well-known for its herpetofauna, it also abounds in a wide variety of flora and other fauna, many endemic to the Western Ghats. However, as in the other parts of the Sahyadri, this once pristine environment is fast-changing. New houses and resorts are mushrooming in this green paradise and slowly changing its topography, threatening its biodiversity. Is anybody listening?

Talk about the Gir and the only life form that comes to mind is the Asian lion, but there is far more to look forward to when in Gir, besides the King that has diverted our attention from the rest of the flora and fauna. The Gir forest supports an astounding diversity of flora that supports both its wild and domestic herbivores which are prey for the lion and leopard – the top predators in the Gir ecosystem. The diversity and health of Gir vegetation, therefore, has a direct bearing on the future of the lion and its abundance. So the next time you visit the Gir, revise your itinerary. Look around and enjoy its botanical wealth, the ‘green spirit of the Gir’.

While we laud the Government of India for banning the drugs aceclofenac and ketoprofen, we are well aware that we are still far from the endpoint of this conservation journey that we have undertaken to save our vultures from extinction. There are at least 14 NSAIDs in veterinary use; while aceclofenac and ketoprofen are proven to be vulture-toxic, two others, namely meloxicam and tolfenamic acid, have been found to be vulture-safe. Though we have begun the release of captive-



PRANAV TRIVEDI

bred vultures in the wild, we know that this has its own set of challenges due to the prevalence of vulture-toxic NSAIDs in the environment. To ensure the safety of each captive-bred “Jatayu” that is released into the wild, BNHS scientists are constantly monitoring areas identified as Vulture Safe Zones for their release.

Extinction is a natural process and occurs over hundreds and thousands of years, allowing nature to restore the balance, but we humans have accelerated this process to a dangerous rate. Our inconsiderate actions are eclipsing countless species, like the vultures. We have successfully pushed the vultures into a safe zone, but can we say that for the many other species that are in danger of being lost forever if we do not rethink our actions?

If change is the only constant, why does it provoke anxiety? If it is inevitable, then why resist it? Let’s begin to change by listening to those who can foresee the outcome of threats to nature and predict the fate of threatened species, so we may try to restore nature’s balance and prove that we are indeed *sapiens*. Or do we wish to learn the value of a moment only after it has become a memory!

Editors



Majestic waterfall at Amboli

The Nightlife of Amboli

Text and Photographs: **Gangadharan Menon**

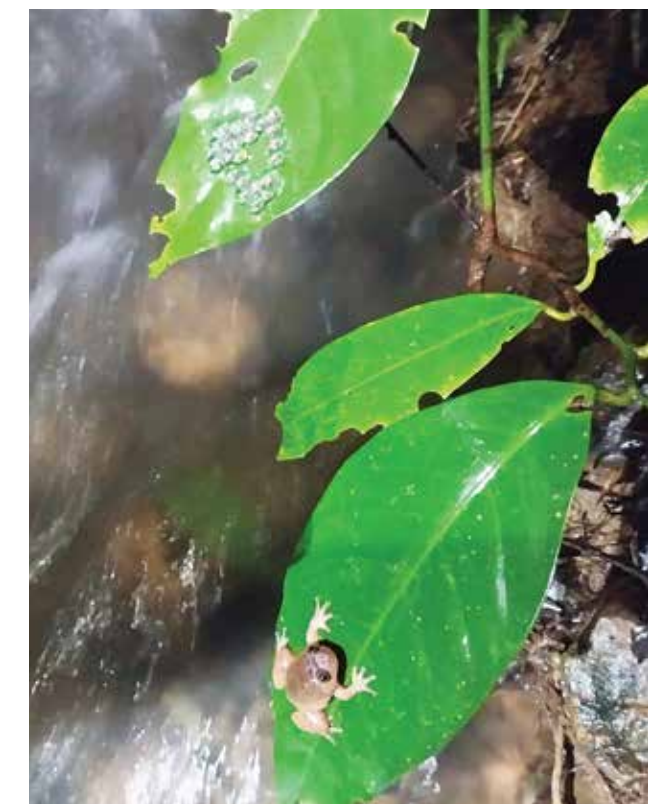
All the way from Nipani in Karnataka, right up to Amboli Ghat in Sindhudurg, Maharashtra, it rained incessantly, continuing for the next two days and two nights, with intermittent breaks which enabled photography in diffused sunlight. It is not surprising that Amboli, situated at an elevation of 610 m, has earned for itself the sobriquet of ‘the Cherrapunji of Maharashtra’, proof of which are the moist, moss-laden trees in the forests here.

Our first view of the majestic Amboli waterfall, cascading down glistening black rocks, was through two mystic curtains – one curtain of clouds and the other of water arising in a massive spray from the base of the waterfall. The sound of the waterfall itself was onomatopoeic, that has given rise to the Marathi word *dhabdhaba* for waterfalls! This waterfall splits into innumerable streams that flow down the Ghat to form the mighty Hiranyakeshi river in Amboli village below. These streams are lifelines to the unique herpetofauna of Amboli: the frogs, toads, geckos, and snakes.

My first introduction to this magical land was during the day time, but the scenario was nocturnal, as heavy rain-clouds blocked the sun, giving a feeling of eternal twilight. The entire forestscape was densely covered with Anjani trees, the leaves of which are a delicacy for the Indian giant squirrel or *shekru*. The *shekru* has a strange eating habit; it plucks a leaf, cuts a circle into it, eats the circles and drops the leftovers. So when you find scores of leaves on the forest floor with neatly cut circles, it's a tell-tale sign of the presence of these gentle giant squirrels. Anjani is one of several short trees that abound in the forests of this part of the Sahyadri, hence these are called stunted evergreen forests.

Enroute we saw a deserted *bboot bangla* that was the summer retreat of the erstwhile Maharaja of Sawantwadi. At this eerie place, a cold spring flowed out. I had seen hot springs earlier, but a cold spring was a lifer!

It is at night that Amboli comes to life, for that is when the nocturnal frogs come out of hiding, and the cacophony they create has to be heard to be believed. The first frog that made its presence heard was the Bombay frog, popularly known as the typewriter frog. It had a distinct call, like the tapping of keys on the keyboard of an old typewriter. As we quietly passed by, it sounded like it was typing our names, one by one.

Castle Rock Night Frog *Nyctibatrachus petraeus* guarding its eggs



Flowers of the Ironwood Tree *Memecylon umbellatum*



Lappet Moth caterpillar

Next up was the endemic and Critically Endangered Amboli toad, also known as tiger toad. The name tiger comes from the stripes the male gains during the breeding period, which disappear when the mating season is over! The mating pair dig up grass roots wherein the female lays her eggs so that they are not washed away in the downpour experienced in Amboli.

Another Critically Endangered species, the Amboli bush frog, has an interesting life cycle too. Unlike other frogs, this species skips the tadpole stage and emerges as tiny froglets from the eggs. Another species, the male of the marbled balloon frog tries to impress the female with both its sound and looks. The vocal sacs distend enormously on either side of its throat to amplify the call, hence the adjective balloon in its common name.

Another amazing species is the arboreal Malabar gliding frog. The female selects the leaf of a tree overhanging a waterbody for spawning, and later covers its foam nest with leaves. When the tadpoles emerge, they fall straight into the water below and start swimming. Apart from gliding from one plant to another, this frog has another strange physical feature. On both sides of its green body, there are broad red bands to attract the opposite sex, which are displayed only during courtship rituals, to avoid unwanted attention of predators.

The next morning, our guide Kaka Bhise took us back to the same place we had visited at night. The difference was like night and day. A deathly silence hung in the air – all the frogs, toads, and geckos we had seen at night had disappeared into thin mist. Only a lone green vine snake hung on a branch above our path. As it closed in on a prey, it unhinged its jaws and bared its red mouth.

Then Kaka introduced us to the first line of defence of an evergreen forest: blood-sucking leeches that thrive among the decayed leaves on the forest floor, waiting for a passing animal or human to feast on. And the second line of defence was the extremely itchy velvet bean, called *khaaj kbujli* in Marathi. The pods of this plant when touched cause such an itch that the effect takes hours to subside. It reminded me of a plant named *aanaveratti* (meaning, the plant that scares elephants) that I had seen in the Silent Valley, and the woolly bear caterpillars, which are intimidating

in both size and intensity of itch. With such strong lines of defence, Kaka assured us, unwanted and unruly picnickers are kept at bay.

Along the Hiranyakeshi river that was in full spate, we drove to Khamda Sada (meaning, laterite plateau) – home of the Amboli toad. Thankfully, the mindless plan to convert much of this laterite plateau into a polo ground (of all things!) has been thwarted for now. The vegetation here, especially the exuberant efflorescence of minuscule flowers, was reminiscent of Kaas Plateau, Maharashtra's own Valley of Flowers. The endless plateau was shrouded in mist, but on a clear day one can see up to a kilometre and a half. If ever proof is needed that the earth is flat, all that one needs to do is to stand and stare at the plateau of Khamda Sada. Kaka whispered that if we were lucky, we would spot sloth bears at the entrance of the caves in the distance. On the way back, we stopped to stare at a tragic road-kill. It was *Rhabdops aquaticus*, also known as the water rhabdops – a stunningly beautiful snake, even in death.

Then we proceeded to the Devrai, the sacred grove of Amboli. Spread over 65 acres, the grove is the property of the village, and is considered so sacred by the villagers that they take off their footwear before they step into the grove. A Shiva temple stands at the edge of the grove, and a humongous termite mound situated at the entrance of the temple is believed to be the abode of the Nagaraja, guarding the meditating Lord Shiva inside.

Much like the Sarppakkaavus or the snake-shrines of Kerala, from where you cannot even remove a fallen twig, these groves too are untouched gene pools of flora and fauna that have remained unmutated for millennia. The villagers guard this sacred space with their life, as the dense forests on the periphery of the Devrai are a perennial source of medicinal herbs for traditional cures that have been handed down from generation to generation. The village people take recourse to these herbs, especially during epidemics, and when drought strikes, they forage in these forests for sustenance.

But the situation is fast-changing. This green paradise is being cornered from all sides. Immigrants from nearby towns and even from Goa have been buying property from the villagers, who are selling it off and moving to cities. And the newfound land is mushrooming with houses and resorts, slowly changing the topography and threatening the biodiversity of this sacred land. The moot question is, how long will the sacred groves remain sacred?

While crossing a stream, we chanced upon a porcupine quill. Kaka didn't lose the chance to bust another myth, that porcupines aim and shoot these quills when they are threatened by predators. The mere presence of these quills makes it impossible for predators to eat the porcupine, even if they manage to catch one. Kaka then showed us the empty casing of a cicada. These insects remain dormant underground, in an immature nymphal



Northern Western Ghats Vine Snake *Ahaetulla borealis* closing in on its prey



Spiderwasps are known to prey on spiders



Amboli has a rich biodiversity of reptiles: Garden Lizard *Calotes vultuosus* (L), Malabar Pit Viper *Craspedocephalus malabaricus* (R)

stage for as long as 16 years, and emerge from the ground to live for a mere month!

The second night, we trekked through gurgling streams to catch a glimpse of the bioluminescent fungi that are typical of such forests. We stumbled our way over stationary stones that had gathered much moss. Then our headlights fell upon a species named wrinkled frog as well as whistling frog. The male was zealously guarding a clutch of glistening eggs newly laid by the female near a small waterfall.

Suddenly, Kaka Bhise stopped us in our tracks. "Look!" We looked, but couldn't behold anything. Then when we switched off all our headlights and stared intently into a patch of darkness in front of us. Magically there appeared a glowing patch of green on a branch overhead; these were the bioluminescent fungi. As we were taking in this sight, the whistling frogs whistled in unison, echoing the collective joy in our hearts. And that night all our dreams were tinged in fluorescent green.

The next day, sadly, this memorable trip got over. But not before we saw the nocturnal Malabar pit viper in deep sleep after a hard night's work. Kaka revealed that these vipers are venomous, but not as deadly or fatal like other viper species. In fact, the villagers do not panic when bitten, they just eat curd-rice, and after a day the pain subsides. Even the pain resulting from the bite of a centipede is far more excruciating and lasts for a whole week. Interestingly, we learnt that vipers sense the presence of objects by thermal imaging, but cobras do so by sight. Which is why, if a photographer gets up close and personal,

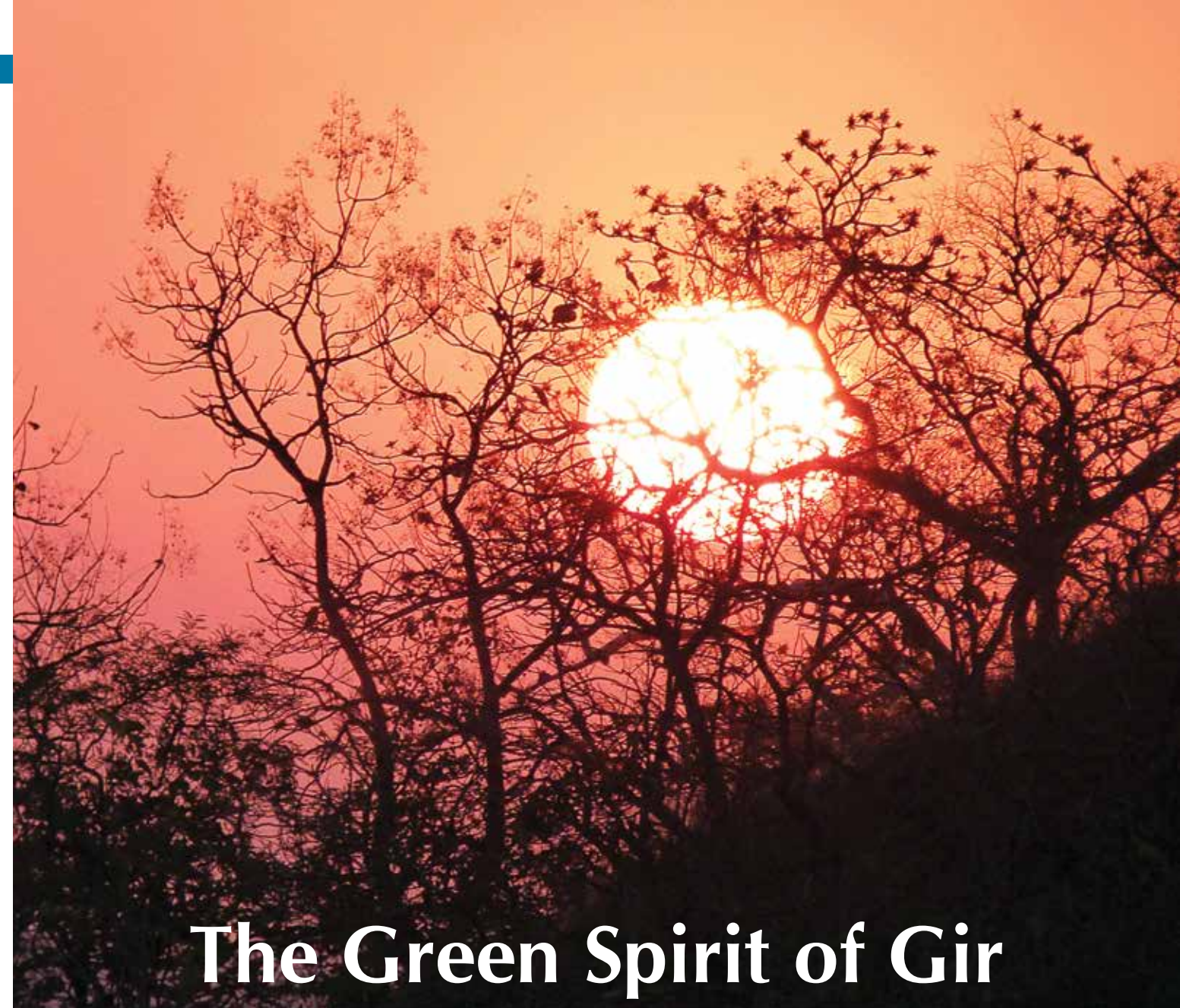
an angry cobra would strike at the lens but an irritated viper would strike at the finger!

When he found that the locals in Amboli were felling trees indiscriminately under the pretext of collecting firewood, Kaka Bhise as the Wildlife Warden of Amboli thought of a lateral solution. He got scores of his volunteers to dress up in fatigues and overnight put up boards on the trees with their names in Marathi, English, and Latin. This had the desired effect as the bombastic botanical names in Latin put the fear of God in their unsuspecting minds. And then on, the trees were mostly left untouched.

Kaka is also a great teacher. And my definition of a great teacher is one who isn't afraid of the student becoming greater than the teacher. Kaka shares everything that he knows without holding back even an iota. He has already trained more than 10 students; in fact, they regularly accompany him on his field trips. The best part is that he doesn't charge them any fee. On the contrary, he pays them to learn. And in the process, he creates the next generation of Green Warriors willing and able to preserve whatever is left on this beautiful blue planet. ♪



Gangadharan Menon is a prolific writer and wildlife photographer interested in everything that is in a forest. He was felicitated by Sanctuary Asia in 2016 for his contribution in saving Silent Valley.



The Green Spirit of Gir

Sunrise from Ambla hill, Gir Forest

Text and Photographs: **Pranav Trivedi**

Endless rows of forested hills lay stretched out before me, as far as my eyes could see. As dawn broke over the horizon, the first rays of the rising sun lit up the silhouettes of trees on distant ridgelines. Gentle sunlight soon spread over the slopes and valleys. Suddenly, the seemingly inactive forest was brought back to life by the roar of a lion in the valley below! The lion continued to roar as it moved farther into the forest, while patrolling its territory. Mesmerised, I witnessed this light-and-sound show of nature atop Ambla Hill in the Gir forest.

From this high perch, I could also see several meandering tributaries reflecting a silvery glow, and

was reminded of my first five months in 1992–93 in the Gir. This stay, when I studied habitat selection by Indian peafowl for my Master's dissertation in Wildlife Biology from the Wildlife Institute of India, is the most memorable time of my life. Extensive walking and travelling to most parts of the Gir helped me understand its landscape and vegetation. It was here that I received intensive field lessons in identifying and sampling forest vegetation. My field 'assistants' (a misnomer, as they are more like guardians and teachers than assistants), the late Dhanabhai Gadhvi, Karsan, and Mohammad, kept me on my toes while testing my ability (still improving) to identify plant species in the serene wilderness of the Gir forests.



Banyan – a keystone species in the Gir

Based on the first-ever systematic mapping of Junagadh forests conducted by The Great Trigonometric Survey of India, Gir forest was spread over 3,100 sq. km in the 1880s; by the early 1900s it was reduced to about half that size. Subsequently, the forest received protection from the erstwhile princely state of Junagadh and then by the Government of Gujarat. This not only prevented further forest loss, but also enriched the habitat and wildlife. A major cyclone in 1982 devastated the forest by uprooting a staggering 2.8 million trees!

for aeons. The Gir forest supports an astounding number of wild and domestic herbivores such as chital, sambar, nilgai, chinkara, chousinga, langur and the livestock of the local Maldhari people. These herbivores are prey for the lion and leopard – the top predators in the Gir ecosystem. The diversity and health of Gir vegetation has a direct bearing on the future of the lion and the abundance of its prey. With close to 50 species of grasses, Gir could be called a ‘grass heaven’ for herbivores!

Located in a geologically ancient land (the Deccan trap), the Gir Forest is a jewel that lies in the south-central part of the semi-arid Saurashtra peninsula of Gujarat. Home to over 3,000 species of plants and animals, it is one of the most biodiverse protected areas of Gujarat. Gir has a vast plant diversity that includes more than 100 species each of trees and shrubs, over 200 species of herbs, nearly 80 species of climbers, and approximately 50 species of grasses. This largest contiguous forest tract of Gujarat also has vast and open areas inhabited by animals that have adapted to human presence.

The present area of the Gir forest (c. 1,400 sq. km) acts as a huge sponge that soaks an annual 400–1,000 mm

I have since marvelled at this rich habitat that has sustained diverse lifeforms, including the Asian lion that, with its majestic appearance and rarity, has diverted our attention from the rest of the remarkable flora and fauna,



The King of Gir



Gir in wet (above) and dry (below) seasons with its major herbivores – the Maldharis' buffaloes (L) and wild Chital (R)

of rainfall received by this region. The hilly terrain of Gir (80–640 m above msl) is traversed by dozens of streams that join to form more than 12 rivers, seven of which are semi-perennial, small and medium-sized rivers that meet the Arabian Sea. These rivers and the four dams on the Hiran, Shingavda, Machhundri, and Rawal rivers irrigate large areas outside Gir National Park and Sanctuary (GNPS), majorly crop fields and *kesar* mango orchards of nearby villages.

The Arabian Sea is very close to the southern part of Gir (Sasan) – c. 40 km as the crow flies from the famous Somnath temple. Rainfall in Gir decreases from south to north and from west to east, resulting in luxuriant vegetation in the West Gir region. The chief forest types in Gir are tropical dry deciduous forest, tropical thorn forest and tropical dry evergreen forest (riparian or riverine forest), while other dominant vegetation types are savanna and thorn-scrub. West Gir is dominated by denser teak and mixed forests and East Gir by sparse deciduous/thorn forests, savannah, and thorn-scrub.

The dry deciduous forests of the western and central parts of Gir National Park and Sanctuary (GNPS) are dominated by teak *Tectona grandis*. In the eastern parts, teak is replaced by Dhavdo or Dhav *Anogeissus latifolia* with some variations in their associate species based on the prevalent terrain, soil and moisture regime. Climbers of various species connect the different strata of the forest, while the epiphytic mistletoe, locally called vando *Dendrophthoe falcata* is commonly found on the branches of larger trees.

The thorn forest/woodland has scattered trees and abundant grass. These forest patches are dominated by four species of *Acacia* (babul, khair, harmo, and gorad) and ‘bor’ or jujuba tree. Owing to good grass and fruit availability, this habitat attracts a large number of herbivores, especially chital and common langur, as well as the livestock of the Maldharis. The savannah has a profusion of grass and scattered shrubs with occasional *Acacia*, *Ziziphus*, or *Bauhinia racemosa* trees. Thorn-scrub is dominated by thorny shrubs such as *Ziziphus nummularia*

Since the riverine forests remain green more or less throughout the year, their value for wild animals is extremely high. Lions extensively use the karaunda thickets in riverine areas to rest. Studies on the behaviour and ecology of the Asian lion found that a high proportion of kills were made in the riverine patches as these provide excellent opportunities for ambush. Since ungulates, such as chital, sambar, and livestock intensively use these forests for resting and foraging, it is rewarding for the predators to frequent such areas.

along with herbs such as *Cassia tora* and grasses of inferior quality; however, this habitat barely has any trees.

Grasslands and savannahs are transient habitats which get transformed into woodlands first, and then forests if biotic, edaphic, and climatic factors are conducive. Hence, these habitats need to be actively managed through controlled fire, systematic uprooting of regenerating trees, and tolerable level of grazing. It is often argued that Gir forest is becoming denser and that the lion may increasingly find it difficult to hunt, as a result. It is beyond doubt that the vegetation in Gir is becoming denser (strict protection from livestock grazing and increasing rainfall could be a major factor in this), but this may not be an obstacle for the lion as shown by research. A high number of kills made in dense riverine and deciduous forests by lions provides evidence that they are at ease hunting here.



Climbing Glory Lily

However, manipulating some dense patches of teak forest to open up the canopy and facilitate grass growth is an option worth trying. Additionally, broadcasting seeds of viable, palatable grass species such as *Apluda mutica* and *Themeda quadrivalvis* may benefit the wild herbivores.

As described above, the riverine forests extending 30–75 m along the network of streams in the landscape are the lifeline of GNPS. These perennial green patches have a canopy density of over 70%. The characteristic flora of this ecosystem includes jambu, banyan, karanj, tamarind, and kadamb. Bamboo – locally called as manvel – also occurs in some riverine patches, so do bushy and impenetrable thickets of karaunda and nevri at the base of trees, along with various seasonal and perennial climbers. The availability of food, water, and shade makes these forests ideal breeding, foraging, and roosting sites for a variety of species, notably Indian pitta, Indian peafowl, and common langur, besides being favourite hunting ground for the lion, leopard, and jungle cat.

According to me, the most striking feature of Gir's vegetation is the presence of numerous banyan trees throughout the forest. Considered a keystone species, the banyan plays a vital function in tropical forest ecosystems. A fruiting banyan attracts dozens of bird and mammalian species. Some of the birds attracted by banyans include yellow-footed green-pigeon, coppersmith barbet, chestnut-tailed starling, brahminy starling, Eurasian golden oriole, rufous treepie, red-vented bulbul, Western



Flame of the Forest



Hiran river at Sasan Gir

koel, common iora, house crow, large-billed crow, oriental magpie-robin, parakeets, the migratory Eurasian blackbird, thrushes and different leaf warbler species. Among the mammals, Indian flying fox (largest fruit bat), common langur, five-striped palm squirrel, and two species of civets frequent the banyan trees to consume its fruits. Some species, such as chital, wild pig, and Indian peafowl, which cannot easily reach the fruits on the branches, feast on fallen fruits.

One of my most favourite trees in Gir forest is kadayo or ghost tree *Sterculia urens*. Found along steep stream banks or on rocky hillsides, its stark white, pinkish, or light brown bark, elegant and beautifully sculpted trunks and branches, and buttressed roots make it one of the most characteristic trees in the Gir landscape. The holes in its branches are invariably occupied by noisy parakeets! Though one encounters it mostly in its leafless state, the tree looks as pretty with leaves, besides having fascinating flowers and fruits.

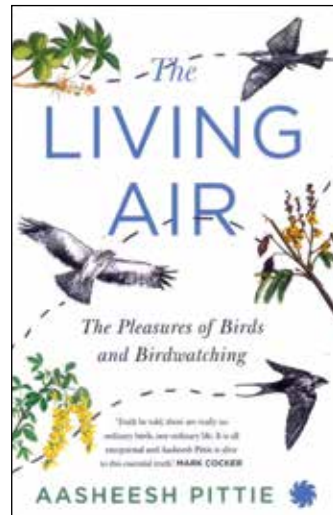
Other trees that attract my attention are silk-cotton with its large red flowers, kesudo or flame of the forest with its abundant orange flowers, and the beautiful kusum, with its bright newly sprouted red leaves. I was also fortunate to witness some rare trees, such as bhilamo *Semecarpus anacardium*, tetu *Oroxylum indicum*, vayvarno *Crataeva nurvala*, kodaro *Firmiana colorata*, bhammar-

chhal *Hymenodictyon excelsum*, mokho or markho *Schrebera swietenoides*, and gugal *Commiphora wightii* among others.

The Gir forest changes dramatically with change of seasons. The bone-dry forest of late winter and summer is brought back to life every year with the onset of monsoon. The arrival of the rains is celebrated by every plant and animal. Just as the rain nurtures the forest from above, the rich leaf litter and herbivore droppings nourish the forest floor! The forest in turn nurtures wild animals, and this infinite cycle keeps the soil fertile. Yet, it is easy to overlook the thick carpet of fallen leaves and the dry, decaying wood as the pillars on which the future of His Majesty the Asian lion rests. In that sense, the vegetation or the green spirit of Gir ensures the big cat's survival for eternity! 🌳



Pranav Trivedi is an alumnus of the Wildlife Institute of India. His interests include development and application of experiential nature education programmes, nature interpretation, and natural history writing.



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by Aasheesh Pittie

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Paperback

Reviewed by: **Asad R. Rahmani**

All bird books are lovely to read, but some are lovelier than others. I place *THE LIVING AIR* in the latter category. But before you read my review, I must confess that Aasheesh and I are good friends (though he is a generation younger than me) and I admire his dense ornithological books (e.g., *THE WRITTEN BIRD: BIRDS IN BOOKS 2*); nonetheless, I shall be as unbiased as possible as a reviewer.

The subtitle of the book says *THE PLEASURE OF BIRDS AND BIRDWATCHING* to which I would like to add 'the pleasures of reading this book'. It is a lovely book in all senses: the cover design, size, print quality, editing, flow of the chapters, illustrations (by the talented Sangeetha Kador), content, and finally the simple language. In addition to his natural history observations, which are astoundingly superb, his reflective statements add value to the book. For example, in Chapter 24, *Bird on a Wire*, he writes "Migrant swallows strung up like musical notes across a calm blue sky..." On the next page, he writes "The wire is a clothes line for nature's wardrobe where the fabric is a multi-hued feather." What beautiful prose! In the subsequent chapter, *Revisiting Shamirpet Lake*, he laments the destruction of his favourite lake under the

garb of development, and says "The greatest danger of rapidly disappearing wilderness areas is generational amnesia." The whole book is strewn with such profound statements that show his deep concern for environmental degradation.

Like the arrestingly imaginative titles of essays by my favourite naturalist-author M. Krishnan, Aasheesh's chapter titles are not far behind. Savour some samples: *Spotted Owllet*, *The City Gossip*, *The Silence of the Sparrows*, *A Bouquet of Banishaan*, *A Plague of Pigeons*, and *Seeing the Spectacular in the Ordinary*. Who will not be attracted to read these chapters?

The book has four major sections – Birds, Birding, Birders, and My Kind of Birding – each having chapters of four to six pages. After reading the Introduction to get familiarized with the book, one can pick up any chapter, as each is independent of the others. The book is a good companion in any situation, whether with the morning cup of coffee or a pint of beer in the evening, or while waiting for a train or plane. I also recommend that you carry it in your backpack – end your birding day reading the writings of one of the finest bird data recorders of India.

In a deeply personal memoir, a humane and thoughtful person always acknowledges the people who have influenced his/her life. Aasheesh frequently mentions the people who made him what he is today, starting with his parents, his field guru, mentors, Siraj Taher – a fellow Hyderabadi, Pushp Kumar – a fine forest officer who would go to any length to encourage youngsters, Sâlim Ali, Humayun Abdulali, and Zafar Futehally of BNHS, and many others. Aasheesh, like many youngsters in the 1980s and 90s, was fascinated by Humayun Abdulali. Supposedly a 'difficult person', as Mr J.C. Daniel put it, Abdulali was a father figure to many budding naturalists. A whole breed of naturalists owes their interest in nature to Humayun Abdulali. A visit with him to his favourite Borivali (now Sanjay Gandhi) National Park in Mumbai remains a life-long memory for anyone who was fortunate enough to have his company and enjoy his and his wife's hospitality, even in the field. Abdulali's 'difficulty' was that he could not tolerate charlatans and fools (he had an uncanny ability to quickly identify them, much to their chagrin and to the delight of others). Aasheesh has recorded the immense contribution of Humayun Abdulali to natural history and to BNHS. Though brief, read his chapter to know the amazing personality of Abdulali.

I consider Chapter 18, *S is for Shikera*, as one of the finest chapters of the book – it is not on birds, but on

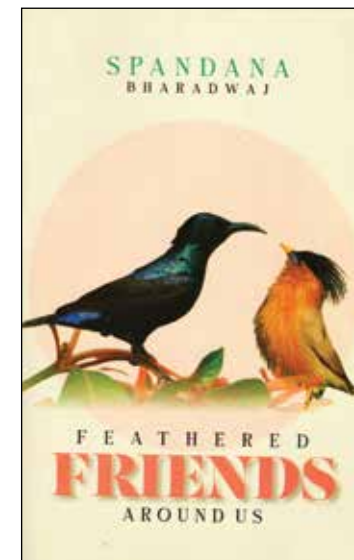
Aasheesh's mentors, Siraj Taher and Pushp Kumar. I am privy to some of the happenings, albeit from a distance, so reading the chapter brought back memories of my visits to Hyderabad in the 1980s and early 90s.

This chapter also showcases the writing skills of Aasheesh: his play of words, his command over English, and the compositional dexterity of his sentences, could be the envy of any English writer. Describing field visits with Siraj Saheb, Aasheesh writes "Newcomers stood stupefied by this bunch of loonies telling time on a tree while trying to locate a bird! Siraj Saheb was privy to this notorious gang and thoroughly enjoyed the perplexity of the uninitiated." The chapter is full of such charming sentences.

Aasheesh has a rational view even of his beloved avian world, unlike the fanatic stray dog lovers who can go to

any extent to defend strays in our cities and countryside. In the chapter *A Plague of Pigeons* he writes about the irrationality of feeding feral pigeons, which are a source of hypersensitive pneumonitis, one of the several forms of pulmonary fibrosis. In this well-researched chapter, he convinces us to desist from feeding feral pigeons, and that this misdirected love for stray dogs or feral pigeons should be diverted to more pressing issues of environmental deterioration.

I can go on and on in praise of this book, but as reviewer I have to be measured. I can only say, or rather appeal to Aasheesh Pittie, not to stop here but to continue writing more books on his birding experiences. Not only the readers, but even the birds in the fast-growing metropolis, Hyderabad, will know that there is someone who cares for them. 🐦



Feathered Friends Around Us

by Spandana Bharadwaj

Published by: Anamika Prakashan, Prayagraj, 2023

Size: 21.5 x 14 cm

Pages: x + 50

Price: ₹ 125/-

Paperback

Reviewed by: **Asif N. Khan**

FEATHERED FRIENDS AROUND US by Spandana Bharadwaj, a student of class 12, is a remarkable book that showcases the diversity and beauty of the birds around us.

Despite the high quality, which reflects the efforts put in, the book is priced at only ₹ 125/-. The book is

ideal for young birders, but a beginner in bird watching can enjoy it too as bird species widely distributed across the country have been carefully selected for inclusion.

The well-designed pictorial section, with perfectly selected colour schemes and background illustrations, makes it not only easy to use for young birders but also attractive. Moreover, the *Bird Trivia* and *Did You Know* sections break the monotony for restless children.

The book contains high-resolution photographs of 82 bird species, along with their brief introduction and some interesting facts. The description of each species begins with a section on the family name, vernacular family name, followed by the common English name, vernacular name, and scientific name. In the second section, other information such as bird size, 'where to see' (habitat), distribution, 'what they eat', 'sounds like', and nesting, has been provided. These descriptions are well-written and allow the reader to learn important information about the bird at a single glance, a feature that some field guides still lack.

The only suggestion to the author is regarding the comparative reference for bird size. Comparative sizes should be in reference to the four or five common birds that are generally used, such as sparrow, myna, hen, pigeon, and black kite. As these birds are common and widespread, even an amateur can visualize their size and relate it to the bird at hand. Additionally, in terms of design, a couple of blank pages could be useful for writing notes. Nevertheless, these minor points do not detract from an otherwise beautiful book. 🐦

Mortality Risk to the Greater Adjutant from Electrocution

Around 2020, following the construction of a four-lane road in the breeding zone of greater adjutant, uninsulated 11,000 KV electric transmission wires were laid on poles in front of a huge peepal *Ficus religiosa* tree across the road from Khairpur Middle School in Kadwa-Khairpur, Naugachhia subdivision of Bhagalpur District, Bihar. On this peepal about 10–20 pairs of greater adjutant nest every year. We had counted 23 nests during the breeding season of 2013–2014.

Since the construction, three greater adjutants have died of electrocution from these high-power transmission lines. On February 25, 2022, after providing the bird death figures, we convinced Shri Dipak Kumar Singh, Addl Chief Secretary, Dept of Environment, Forest and Climate Change, Bihar State Government to lay the transmission lines underground near the nesting tree. Shri Singh took urgent notice of our plea and the site was inspected on March 16, 2022 by Shri Kumar Gaurav Pandey, Electrical Superintending Engineer, and his officers in Bhagalpur. I joined the inspection party along with members of the Garud Saviours and Garud Guardians.

The work of laying underground transmission lines began on March 23, 2022 and was completed within 11–12 days. An underground cable was laid over 500 m along the sides of the four-lane road. Another 150 m electric line that reached the village transformer was replaced by insulated wires in front of the nesting tree. The Garud Saviours and Garud Guardians and all the villagers were happy to see that their request was heard and acted upon promptly, with the minimum necessary official correspondence with decision makers.

Overhead cables are proving fatal for thousands of birds every year due to collision and electrocution, including Critically Endangered species like the great Indian bustard (GIB). Overhead cables are responsible for 15% mortality in GIB. In December 2020, the National Green Tribunal ordered that the power lines of renewable energy schemes in critical GIB habitats in Maharashtra, Rajasthan, Gujarat, Karnataka, and Andhra Pradesh be laid underground.

On April 19, 2021, the Supreme Court of India ordered the governments of Gujarat and Rajasthan to replace



overhead electricity transmission lines with underground lines in a bid to protect the great Indian bustard. The Rajasthan government argued that this would hinder development of new industries and transmission lines necessary for international projects; also they argued that it was economically unviable. The Gujarat government too expressed their reservations.

If laying power lines underground in the entire GIB habitat is an expensive affair, can the government not identify sensitive locations where collision frequency and electrocution is high, and prioritize such locations for laying underground power lines. Also, assistance can be sought from international agencies. In cases where overhead high-tension wires cannot be laid underground, installation of firefly bird diverters may help to reduce the mortality rate. I am not sure if the greater adjutant, like GIB, has poor frontal vision, which is said to be the main reason for the greater collision risk of these large birds with overhead power lines. But I am sure that if decision makers hear and take immediate action, we can repeat the Kadwa-Khairpur story in different parts of the country for the greater good of our avian friends.

I am thankful to Bhagalpur Forest Division, the local people, the Garud Guardians and Garud Saviours of Kadwa, especially Mr Rajiv Kumar and Mr Jai Nandan Mandal for their cooperation and support in the field. ■

Arvind Mishra, *Bhagalpur, Bihar*

CLARIFICATION

Hornbill July–September, 2022, page 77: It was kindly brought to our notice by Mr Behram Pardiwala, Life Member, that the boundaries depicted in a map of NSAID free districts of Nepal published in *Hornbill* is incorrect – the village areas of Kalapani, Lipulekh, and Limpiyadhura are part of Indian territory and should have been shown as such. The map showcases the ecological boundaries of the diclofenac-free and vulture safe zones of Nepal. The map is not to scale and the boundaries are only for reference. However, if the author has incorporated any Indian territory into the districts of Nepal, it is regretted. Hence this clarification.

– Editors

Wonders of Nature!



March 2017



January 2019



December 2019

In March 2017, for the first time, I photographed an Indian paradise flycatcher with slightly different crest coloration than usual. The male had white on the crest, as opposed to the usual bluish-black. I continued to photograph this individual which was a regular visitor to the forest at the base of Sinhagad Fort, Pune.

By January 2019, I observed that a greater proportion of its crest feathers were now white and so were the areas near the eyes and throat.

Later, in December 2019, when I saw this individual again, most of its crest, throat, and face had turned white; there was very little black in the plumage near the beak.

During all these sightings, other than discoloration, I observed no other physical or behavioural abnormality in the bird.

Earlier, I believed this to be a case of partial leucism, but I wonder now, is it so? ■

Alok Katkar
Pune, Maharashtra

ABOUT THE POSTER

The large-scaled pit viper *Craspedocephalus macrolepis*, earlier named *Trimeresurus macrolepis*, is a venomous species of pit viper endemic to the Western Ghats of India. It was described in 1862 by Col. Richard H. Beddome from the Anaimalai and Palani hills of Tamil Nadu. It is named so due to the presence of large scales on its head. This nocturnal snake is an arboreal ambush predator, characterized by a small prehensile tail that helps it to hold on to branches of trees. A recent study on the pit vipers of the Western Ghats showed that the large-scaled is restricted to the high elevation montane forests of the southern Western Ghats, its northernmost limit being south of the Palghat Gap, the Nelliampathy hills, Anaimalai hills, and the Palani hills being the easternmost edge of its distribution, extending southwards across the Meghamalai hill range, to the Sivagiri-Devarmalai range, ending north of the Shencottah Gap in Tamil Nadu and Kerala. The species occurs in the high elevation shola forests and forests along high elevation grasslands, but has



Large-scaled Pit Viper *Craspedocephalus macrolepis*

also been recorded sometimes in tea estates and cardamom plantations, at elevations above 1,000 m. It is listed as Near Threatened by IUCN.

The individual in the picture was found in an evergreen forest during a monsoon herpetological expedition exploring the high elevation forests of Devarmalai hills in Kerala. ■

Large-scaled Pit Viper
Craspedocephalus macrolepis



THE ECLIPSE COLLECTION

SCIENTIFICALLY ACCURATE WILDLIFE PAINTINGS

Text and Illustrations: Akshita S. Lawrence

Our planet is currently in the midst of the sixth mass extinction, losing thousands of species each year, largely due to anthropogenic activities. To spread awareness about these human-driven extinction events and to sensitize people, I created the Eclipse Collection – a curated series of hyper-realistic, scientifically accurate paintings featuring eight species that we may lose in this mass extinction, as indicated by the IUCN, unless we adhere to crucial conservation measures. The population trend of all but Amur leopard among these seven species is decreasing.

A mass extinction is defined as the loss of about three-quarters of all of Earth's existing species over a short period. From the Permian extinction that wiped out over 90% of the planet's species, to the Cretaceous-Tertiary extinction that wiped out the dinosaurs, there have been five mass extinctions as of today. It is estimated that of the four billion species that evolved over the last 3.5 billion years, 99% have been driven to extinction.

Extinction is a natural process and occurs over hundreds and thousands of years, allowing nature to restore the balance, but humans have accelerated this process to a dangerous rate. Our inconsiderate actions are eclipsing countless species, just like darkness obscures light during an eclipse.

It is, thus, high time that we rethink our actions, to conserve species that are in danger of being lost forever.



The Rarest Big Cat: **AMUR LEOPARD**

The Amur leopard *Panthera pardus orientalis* is also known as the far east leopard, Korean leopard, and Manchurian leopard. Official census reports estimate around a hundred in the wild, making it the rarest big cat in the world. Sadly, this species is already locally extinct in the Chinese and Korean peninsulas.

Threats: Poaching of the leopard and its prey (Sika deer, Siberian roe deer, wild boar, musk deer, wapiti and other unguligrades) habitat loss, exploitation of forests, forest fires, and construction of new roads.

Conservation status: Critically Endangered

Current location: Far East Russia

The Most Threatened Ape: **TAPANULI ORANGUTAN**

Orangutans (Malay: person of the forest) classified under the genus *Pongo*, were initially considered to be one species. In 1996, two separate species were identified: Bornean *Pongo pygmaeus* and Sumatran *P. abelii*. A third species, Tapanuli orangutan *P. tapanuliensis*, discovered in 2017, has only 800 individuals surviving in the wild. Conservationists predict an 83% decline in three generations (75 years) if necessary measures are not implemented.

Threats: Hunting, conflict with humans, illegal wildlife trade, habitat destruction for small-scale agriculture, mining, and the proposed Batang Toru hydropower project, in areas with the highest density of orangutans have eclipsed their population. Also, orangutans are extremely slow breeders. If all these threats persist, they will eventually disappear, taking forests along with them.

Conservation status: Critically Endangered

Current location: Indonesia



Falling Giants: **AFRICAN FOREST ELEPHANT**

The African forest elephant *Loxodonta cyclotis*, one of the two living African elephant species, plays a key role in maintaining the ecosystem. They are known as “ecosystem engineers” due to their influence on the forest’s composition and structure as they move through it. However, their population has significantly declined due to habitat destruction and poaching.

Once widespread across African forests, they are now confined to only 25 percent of their historical range. The numbers have plummeted by over 86 percent in just

three decades, primarily due to poaching and habitat loss.

Studying African Forest Elephants has been challenging due to their dense forest habitat. However, advancements in thermal imaging technology have provided researchers with valuable insights into their ecology, population numbers, behaviour, and interactions with other species.

Threats: Habitat loss, poaching for ivory, fragmented genetic diversity, climate change, man-animal conflicts.

Conservation status: Critically Endangered

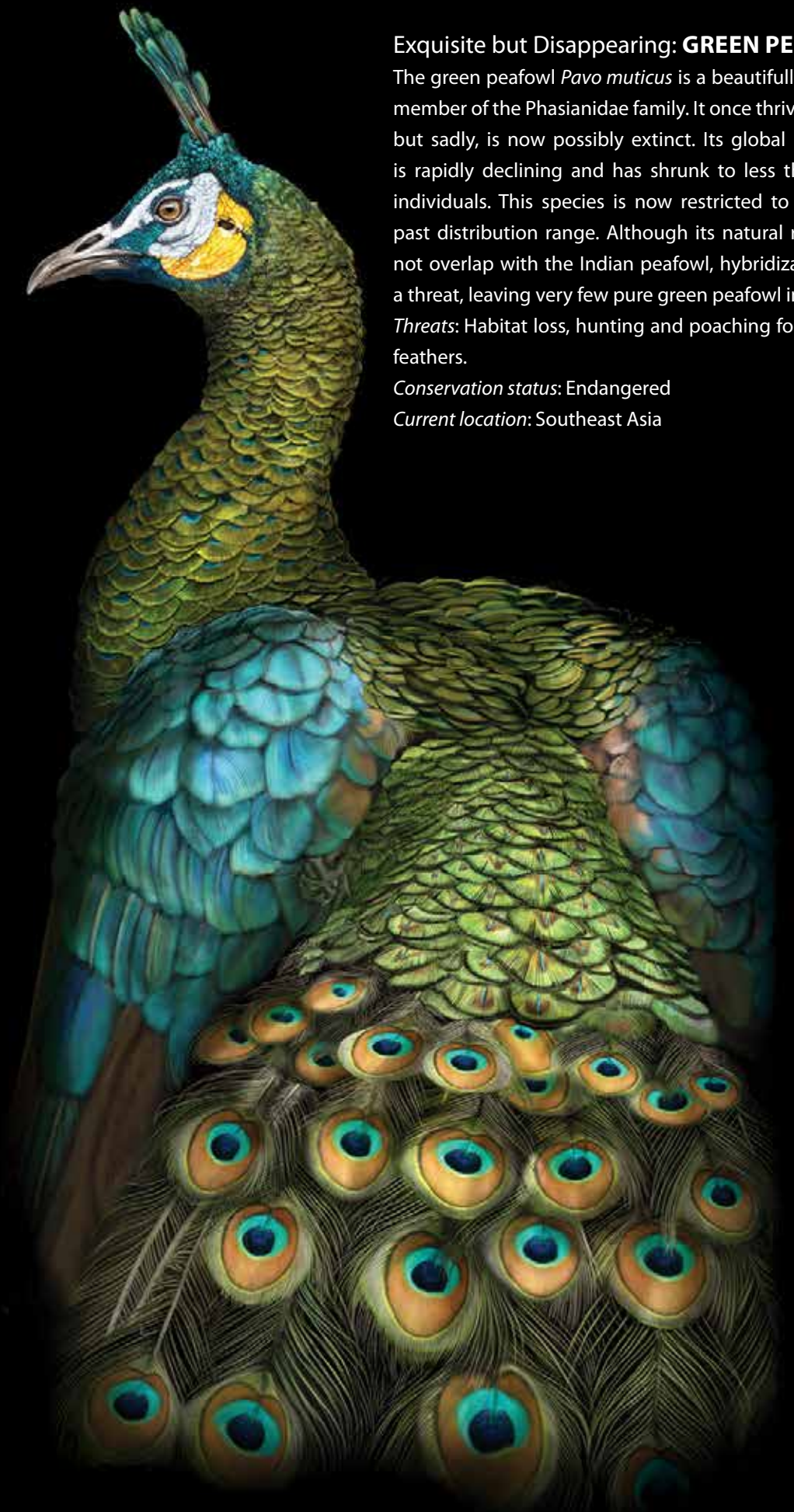
Current location: Central and fragmented areas of West Africa



The Bamboo Eater: **RED PANDA**

The red panda *Ailurus fulgens* is majorly nocturnal because of its shy and elusive nature. Its slow reproduction rate makes it difficult for the panda to recover from population decline. Giant panda and red panda are not closely related, despite sharing a common name. Giant panda belongs to the bear family Ursidae, whilst red panda belongs to the family Ailuridae. In 1869, the first red panda arrived at London Zoo from

the Himalaya. The panda was offered prime meat, as it was assumed to be a carnivore, but refused to consume it. Concerned about its lack of eating, zoo superintendent Papa Barlett took it outside for fresh air, where the panda paused at a rose bush and skillfully picked a bud to eat. This incident revealed that the red panda is a herbivore. *Threats:* Habitat loss, hunting, and poaching. *Conservation status:* Endangered *Current location:* Southeast Asia



Exquisite but Disappearing: **GREEN PEAFOWL**

The green peafowl *Pavo muticus* is a beautifully spangled member of the Phasianidae family. It once thrived in India, but sadly, is now possibly extinct. Its global population is rapidly declining and has shrunk to less than 10,000 individuals. This species is now restricted to 16% of its past distribution range. Although its natural range does not overlap with the Indian peafowl, hybridization is still a threat, leaving very few pure green peafowl in the wild. *Threats:* Habitat loss, hunting and poaching for meat and feathers.

Conservation status: Endangered

Current location: Southeast Asia



Vanishing Stripes: **PLAINS ZEBRA**

While the population trend of the plains zebra *Equus quagga* appears good, it has sharply declined in recent years in 10 out of the 17 countries it inhabits. It is possibly extinct in Burundi, Lesotho, and Somalia. The subspecies *Equus quagga quagga* was driven to extinction in the late 19th century due to overhunting and competition with livestock.

Zebras require a constant water supply; during droughts and dry seasons, the herds migrate and

compete with domestic livestock for water resources. As a result, farmers and ranchers often erect fences on their property, restricting the zebras' access to grazing lands and blocking their migratory routes.

Threats: Habitat loss, illegal hunting and poaching, competition with livestock, climate change, and droughts.

Conservation status: Near Threatened

Current location: Africa

On the Brink: **GREAT INDIAN BUSTARD**

The great Indian bustard *Ardeotis nigriceps* is one of the heaviest flying birds in the world. Despite being the state bird of Rajasthan, its population is being 'eclipsed' by human interference; consequently, it has disappeared from over 90% of its former range. Power transmission lines in the habitat pose a serious threat to the species. The adult birds do not seem to have any natural predators. However, the chicks may be preyed on by

raptors (eagles), felines, and canines (jackals, wolves, and feral dogs). Moreover, its eggs are occasionally stolen by monitor lizards and snakes, and even Egyptian vultures. Sadly, only a couple of hundred individuals exist in the wild, the majority in Rajasthan.

Threats: Habitat loss and degradation, hunting, poaching, power lines, and feral dogs.

Conservation status: Critically Endangered

Current location: India



Akshita S. Lawrence is a wildlife artist, educator, and conservation advocate.



L: Indian Pied Starling
T/R: Asian Green Bee-eater
B/R: Coppersmith Barbet

Birding in Jamshedpur The Tata Connection

Text and Photographs: **Vijaya Bharat**

Jamshedpur in Jharkhand state in eastern India is named after its founder Jamsetji Nusserwanji Tata (1839–1904). He envisioned a steel plant and instructed his son Dorabji Tata (1859–1932) to build a township with tree-lined avenues, parks, and gardens. Tata Steel was commissioned in 1908 after the founder's demise, and the city expanded around the factory. Situated in a scenic habitat where Kharkai river meets the Subarnarekha, and surrounded by Dalma hills, the steel city has rich biodiversity, and yet it is not widely known as a birding spot. I have lived in Jamshedpur for 45 years and was quite oblivious of the avian fauna until the COVID-19 pandemic and the lockdown.

The pandemic brought all human activities to a grinding halt, and the streets of Jamshedpur became deserted and quiet. My husband, a plastic surgeon, and I, a cardiologist, both in our late sixties, were cooped up in our empty nest for weeks together. A silver lining to this disturbing period was our introduction to the avian world from our fourth-floor apartment. Earlier, we never paid much attention to the chatty common mynas that would hop on the balcony or the rose-ringed parakeets that would land on a jamun tree, with their tail feathers quivering. But with no noise and traffic during the pandemic, we spotted many birds and even tried to learn their names by referring to an old copy of *THE BOOK*

OF INDIAN BIRDS by Salim Ali. Subsequently, with a detective's thrill, we started identifying birds.

The bank myna, which could be differentiated from the common myna by its coral-red eye patch, nested in the holes in a compound wall. Other myna look-alikes were starlings with sharp beaks and no eye patch. The Asian pied starling was surely the most attractive with its white belly and black upper body parts, while the brahminy starling looked well-groomed with its black head feathers swept back neatly, and the chestnut-tailed starling, with its sharp beak having a blue base, always looked angry. We also saw a pair of large parakeets with red patches on their shoulders, which we later identified as Alexandrine parakeets which are Near Threatened, according to the IUCN Red List.

During our birdwatching sessions, we had several 'wow' moments, seeing birds in all their splendour. A purple sunbird in its breeding plumage could be identified from the bright yellow patch on its shoulder, with a red centre. A lone Indian golden oriole was perched on a tree top and when it turned around, we saw the exquisite black markings on its wings. Further, we watched with delight the antics of a coppersmith barbet on a dead branch, the hunting spree of a black drongo, and four Asian green bee-eaters



that flew like small kites and returned to the same spot with their insect prey. On another morning, a flock of well-camouflaged yellow-footed green-

T/R: Chestnut-tailed Starling
M/R: Long-tailed Shrike
L: Yellow-eyed Babbler
B/R: Bank Myna

pigeons sat still, like statues. We also saw a tiny bird with a white brow after hearing its chirping, and later identified it as the greenish warbler. This bird was smaller than a jamun leaf, making it difficult to spot. We were amazed to learn that such a tiny bird migrates all the way from the Himalaya. In addition to all these enchanting sights, the *kili kili* calls of a white-throated kingfisher and the constant *tuk tuk tuk* of a coppersmith barbet gave us a sense of peace.

As the lockdown restrictions were lifted and normal life resumed, we could see only those birds that were bold enough to withstand the din of traffic and other human activities. The mesmerising woodland birds had quietly and abruptly left, but not before transforming us from passive birdwatchers to passionate birders. We started visiting the city outskirts, lakes and dams, grasslands, and foothills, and even trekked up the Dalma hills, in search of these birds. We eventually upgraded our Sony Cybershot to a Nikon Coolpix P1000, donned camouflage tees, and continued our bird explorations. In just a

few months, we could easily spot more than a hundred bird species.

It was exhilarating to see the elegant Indian paradise-flycatcher and the colourful Indian pitta nesting in the Dalma foothills and the magical transformation of pheasant-tailed jacanas into their bewitching breeding plumage. Long-distance winter migrants, such as red-crested pochards and brown-headed gulls arrived in flocks at the lakes. Some migrants from South India shared the habitat of the resident Indian grey hornbill, Jerdon's leafbird, and various barbet species. We learned that Thomas C. Jerdon (1811–1872), after whom some bird species have been named, was a British physician and a pioneering ornithologist who described many birds in India. A few lone travellers, such as a citrine wagtail and a green sandpiper were seen in small ponds with other resident birds, such as Asian openbills, grey herons, little grebes, coots, and moorhens.

During our birding trips we would meet other bird enthusiasts and soon we formed a group – Jamshedpur Birders – to plan field trips,

B/L: Alexandrine Parakeet
T/R: Brahminy Myna
B/R: Indian Golden Oriole



L: Common Kingfisher, R: Red-crested Pochard

exchange photographs, discuss threats to birds and debate on possible solutions. In June 2022, Tata Steel Limited organized a birdwatching trip in collaboration with Jamshedpur Birders, where many employees of the steel plant and other citizens were given primary training in birdwatching.

We had frequently noticed small birds flying swiftly, their flight path curving back on itself like a boomerang. The smaller birds, named little swift, had a white chin and rump, while the somewhat bigger grey ones had a forked tail: these were the common swift. We learnt that swifts spend almost their entire lives in the air and can fly non-stop for as long as 200 days! Here we discovered a Tata connection – a subspecies of alpine swift named after Sir Dorabji Tata! In 1965, Humayun Abdulali described a distinct type of alpine swift that was large and had a prominent broad brown breast band between its white belly and chin, which he named *Apus melba dorabatai*. He wrote in *JBNHS 62(1)*: 153–160: “The name is a small token of my appreciation of the generous aid so often given by the Sir Dorabji Tata Trust, Bombay, to the Bombay Natural History Society and to many individuals engaged in scientific research.” Subsequently, the genus *Apus* (Greek

apus = lacking feet) was changed to *Tachymarptis* (Greek *takhus* = fast, *marptis* = seizer, in this case of insects in the air). Thus, the black-and-white species *melba* came to be linked with Tata.

Since alpine swifts are known to migrate over long distances, we hope to someday spot a *Tachymarptis melba dorabatai* flying over Jamshedpur. Sir Dorabji Tata fulfilled his father's vision by establishing India's first steel plant during the tough colonial regime, and developed one of the first planned cities in India that is still green and clean. The Tata connection with a bird, and with nature, should make the citizens of the steel city feel duty bound to preserve its natural habitat, even as the city expands for human needs. This tough balancing act can be achieved with a clear vision executed with the grit of Sir Dorabji Tata and the endurance of a swift. ➔



Vijaya Bharat is a Consultant Cardiologist from Jamshedpur. She is a member of the BNHS and has founded a Rotary Satellite Club of Jamshedpur Birders.

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to support the publication of *Hornbill*



Released White-rumped Vulture near a water source

Steps to save Jatayu

Text: Kishor Rithe

Not often do things go in one's favour, but when they do, it is a dream come true! Our fight to ban vulture-toxic drugs finally bore fruit when the Drugs Technical Advisory Board (DTAB), Government of India, issued a ban on the manufacture, sale, and use of veterinary drugs aceclofenac and ketoprofen, in May 2023. This

decision is possibly the most important step in saving our Jatayu vultures. To add to the good news, BNHS has optimized its vulture conservation breeding capacity, and in parallel is expediting its vulture release programme.

The population of *Gyps* species – white-rumped vulture (Oriental white-backed vulture), Indian

vulture (long-billed vulture), and slender-billed vulture – crashed during the mid-1990s throughout the Indian subcontinent. BNHS published its findings on this decline in the *JBNHS*, and since then has been working to bring them back from the brink of extinction. BNHS scientists spent years determining the cause of such mass declines. All likely reasons – road and railway kills, increase in livestock meat export through increasing number of slaughterhouses, and poaching of birds for their derivatives – were explored, but they did not appear to be the cause for such a drastic fall in numbers. A breakthrough paper published in *Nature* in 2004 (<https://doi.org/10.1038/nature02317>) proved that the non-steroidal anti-inflammatory drug (NSAID) diclofenac was causing the decline in *Gyps* vultures in the Indian subcontinent (see 'Race to Save Vultures' by A.R. Rahmani in *Hornbill* Oct–Dec, 2008). Diclofenac is a veterinary NSAID widely used in livestock treatment. BNHS scientists conveyed these findings to the Government of India (GoI). Finally, in 2006, the GoI decided to impose a ban on the veterinary use of diclofenac (a gazette notification was issued in 2008).

Yet, we humans find ways to flout the law. It was, therefore, not surprising that after the use of veterinary diclofenac was banned, it was replaced by human-use diclofenac. To address this loophole, GoI restricted the packaging of human-use diclofenac to 3 ml ampoules in 2015, to reduce the prevalence of diclofenac in veterinary use. BNHS's representation on the toxicity of diclofenac in vultures played a pivotal role in the government's decision to ban the veterinary use of the drug. However, a new question arose – Was only diclofenac harming our Jatayu? This encouraged BNHS scientists and partner organizations, such as the Royal Society for Protection of Birds (RSPB) to conduct further studies.

Over the past decade, BNHS has been working on safety-testing of veterinary drugs in collaboration with Indian Veterinary Research Institute, Izatnagar, and implementing policies for veterinary NSAIDs with support from GoI, state governments of Haryana, Madhya Pradesh (MP), West Bengal, and Assam, and from RSPB. After an exhaustive study, scientists identified aceclofenac, nimesulide, and ketoprofen as vulture-toxic also. Safe alternatives to these drugs, meloxicam and tolfenamic acid, were also identified.

The final gazette notification in 2008 ensuring a ban on diclofenac had come after an arduous campaign conducted by our BNHS team, and we knew that the next step to obtain a similar ban on aceclofenac, nimesulide,



Aceclofenac, ketoprofen, and nimesulide are three of the 14 NSAIDs known to be toxic to vultures



Sick-looking wild vultures with drooping necks provided an early clue that led to the finding that vulture populations had declined drastically

and ketoprofen would also be challenging. However, BNHS strove to pursue state and central governments to save the vultures.

On March 14, 2022, BNHS through the Vulture Conservation Policy component, submitted a detailed dossier to the Wildlife Division, Ministry of Environment, Forest and Climate Change (MoEF&CC), with a constitutional provision, scientific evidence, and policy provisions on the vulture-toxicity of aceclofenac, nimesulide, and ketoprofen, requesting regulation of their veterinary use through the Ministry of Health and Family Welfare. The dossier also suggested widespread use of the proposed vulture-safe alternatives meloxicam and tolfenamic acid. The MoEF&CC sought comments from Wildlife Institute of India and Indian Veterinary Research Institute, both of which supported the dossier, which was then shared with Arulagam NGO in Tamil Nadu, which works on vulture conservation and drug regulation in Nilgiris, Erode, and Coimbatore districts, to facilitate



VIBHU PRAKASH

Free-ranging vultures are attracted to the area outside the release aviary

interaction with state-level bureaucracy and public representatives on matters related to vulture conservation.

In May 2022, a writ petition was filed at the Hon'ble Delhi High Court seeking a ban on the three toxic NSAIDs, and a mechanism for safety testing of existing and new veterinary drugs, with BNHS as one of the respondents. BNHS extended full technical support to the judiciary, sharing scientific evidence on vulture-toxicity of these drugs, and on the vulture-safety of meloxicam and tolfenamic acid. Relevant policy documents of the GoI – the Action Plan for Vulture Conservation in India (2020–2025) – and a multi-lateral policy document were also presented at the hearing.

The Hon'ble Delhi High Court directed the competent authority to consider steps to ban the three drugs. The next hearing was scheduled for September 1, 2023. Meanwhile, the DTAB, New Delhi, called a meeting on May 10, 2023

to discuss this issue and recommended a ban on the use, manufacture, distribution, and sale of ketoprofen and aceclofenac. The minutes of the meeting state that “the Board considered representations mentioning ketoprofen and aceclofenac in cattle is equally toxic as diclofenac and can kill vultures. Study showed that aceclofenac was rapidly metabolised into diclofenac and ketoprofen is toxic to *Gyps* vultures.” This is a huge step taken by Government of India for vulture conservation, and BNHS is immensely grateful to DTAB for imposing a ban on these drugs.

Successful conservation breeding

BNHS and RSPB have been managing four Vulture Conservation Breeding Centres (VCBC) across the country in partnership with the Governments of Haryana in Pinjore (2001), West Bengal in Rajabhatkhawa (2005), Assam in Rani, Guwahati (2007), and MP in Bhopal (2011). At

these centres, BNHS scientists have bred more than 700 birds in captivity since 2004, contributing greatly to secure the future of vultures in India. This programme could not have been possible without the support of the MoEF&CC, state governments, and RSPB.

S. No.	Species	Pinjore (Haryana)	Rajabhatkhawa (West Bengal)	Bhopal (MP)	Rani (Assam)
1	White-rumped vulture	138	95	20	84
2	Indian / Long-billed vulture	209	40	46	0
3	Slender-billed vulture	52	19	0	44
	Total	399	154	66	128

The Bhopal centre, established in 2011 at Van Vihar National Park, became operational in 2014. The Field Director of Van Vihar NP requested the PCCF(WL) & CWLW, Haryana, through the Central Zoo Authority, to acquire 20 white-rumped vultures to build a founder population. Over time, the centre successfully bred white-rumped and Indian vultures in captivity. Vulture Conservation Breeding Centre (VCBC) Pinjore, designated as the co-ordinating zoo for the Vulture Conservation Breeding Programme, currently houses 399 vultures of the three Critically Endangered resident *Gyps* species, and has been breeding vultures since 2004.

With permission from Mr Pankaj Goel, IFS, PCCF(WL) & CWLW, Haryana, 20 white-rumped vultures selected by BNHS scientists were shifted on June 22, 2023, from VCBC Pinjore to VCBC Bhopal. The team led by Dr Rohan Shringarpure, Centre Manager, VCBC Bhopal transported the birds safely to Van Vihar. At Van Vihar VCBC, Shri Shubhraman Sen, IFS, Addl PCCF (Wildlife), and Smt Padmapriya Balakrishnan, IFS, Director, Van Vihar NP, released the 20 vultures in the quarantine aviaries.

Vulture release in Vulture Safe Zones

BNHS is working on establishing Vulture Safe Zones (VSZs) in UP, MP, and Assam, besides Vulture Release Zones (VRZs) in Haryana and West Bengal. These VSZs and VRZs aim to provide NSAID-free food for wild vultures and to ensure safe landscapes for the release of captive-bred vultures. BNHS teams are also conducting pharmacy surveys and carcass sampling, as well as community engagement and awareness programmes for cattle owners and villagers around the vulture nesting colonies to sensitize them (*see Hornbill July–September 2022 for details on Vulture Safe Zones*).

Captive-bred vultures soaring high

Till now, BNHS has released eight vultures in Haryana and 31 in West Bengal, and has been monitoring them 24x7. Of the birds released from Rajabhatkhawa in West Bengal, two reached Nepal and Bhutan. They are presently moving across Nepal, Bhutan, and India, and independently locating food. For more than 29 months, since the first 10 captive-bred vultures were released in the wild, NSAID-related vulture mortality has not been reported, indicating that the environment is relatively safe for vultures.

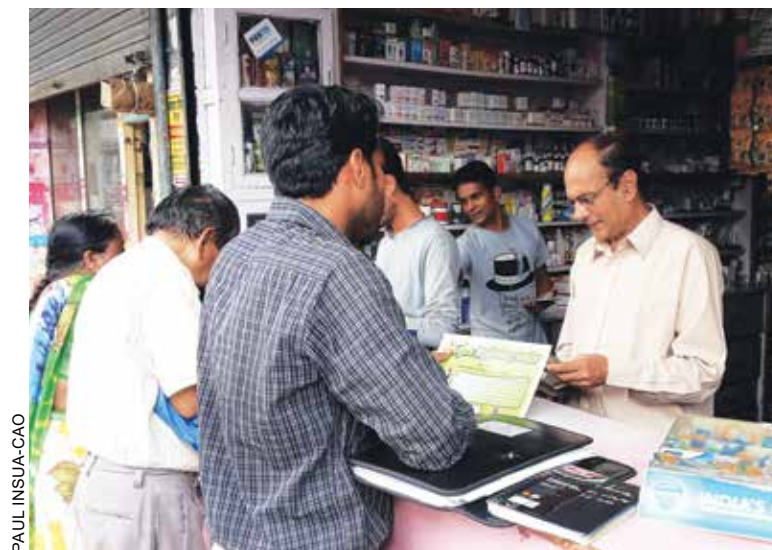
BNHS discovered natural VSZs

Since the last 20 years, India's tiger reserves have achieved remarkable success. The National Tiger

Conservation Authority reports that our tiger population has increased significantly, probably because several villages from Melghat and Tadoba TR in Maharashtra, Satpuda and Kanha in MP, and several TRs in other states of India, have been successfully relocated. Thus, an area of 1,500–2,500 sq. km has become free from humans and livestock, and harbours NSAID-free wild prey. BNHS is presently in discussion with the Governments of Maharashtra and Rajasthan to utilize these inviolate areas to release captive-bred vultures sourced from VCBC Pinjore. The potential release areas could be Pench, Tadoba, and Melghat TRs in Maharashtra; and areas around Chambal and Mukundra Hill TR, Chambal and Ranthambore TR, Sariska TR, Kumbhalgarh Wildlife Sanctuary, Jorbeer Conservation Reserve, Taal Chhapar WLS in Rajasthan, and other areas of western Rajasthan. The Forest Department of Maharashtra has already requested BNHS to collaborate in the release of 20 white-rumped and Indian vultures, and Rajasthan Forest Department has sent a similar request.

Prior to release, BNHS will assess these sites to estimate food availability and status of NSAIDs through pharmacy surveys and carcass sampling. If high NSAID levels are found, appropriate regulatory action will be undertaken with the help of the concerned authorities at the state levels.

The authorities of the concerned PAs and TRs will construct watch towers and pre-release aviaries surrounded with solar fences at vulture release sites. Birds will be kept in the pre-release aviary for three months to monitor their health and will be fed in the presence of veterinarians



PAUL INSUA-CAO

Sensitization of pharmacists and identifying vulture safe zones are some of the challenges before us



RAJAT BHARGAVA

After nearly two decades, we will finally see vultures soar freely in the sky

deployed by the State Forest Department (SFD) at every site. All birds intended for release will be colour-tagged or ringed. The SFD plans to allocate funds for satellite tagging of a few birds to track their movements. BNHS experts will train FD staff in conducting pharmacy surveys, carcass sampling, bird release, post-release monitoring, colony monitoring, and vulture population census through road transects. To ensure the safety of the released vultures outside the TRs, BNHS is currently raising funds to run the VSZ programme in a 100 km radius area around the release sites.

BNHS will utilize the optimized breeding potential at Pinjore, Bhopal, and Assam centres to procure more birds for release in the proposed release sites, which will help ensure the survival of the released birds and provide them with safe feeding grounds in wild habitats.

What next?

The fight to revive vulture populations in the wild has not been yet won. For vultures to take off in the wild, soft release centres are being constructed in Assam, at three TRs in Maharashtra, and the above mentioned areas in

Rajasthan. Apart from these interventions, the production of aceclofenac and ketoprofen vials larger than 3 ml must be prohibited urgently, and existing stocks destroyed. Nimesulide must also be urgently banned by the DTAB. Further, to estimate vulture populations in India, BNHS plans to undertake a nationwide survey. With support from the central and state governments, along with international funding agencies, India will definitely be able to revive its Jatayu population to earlier times, and large congregations of vultures will finally soar in the skies freely after nearly two decades. ■

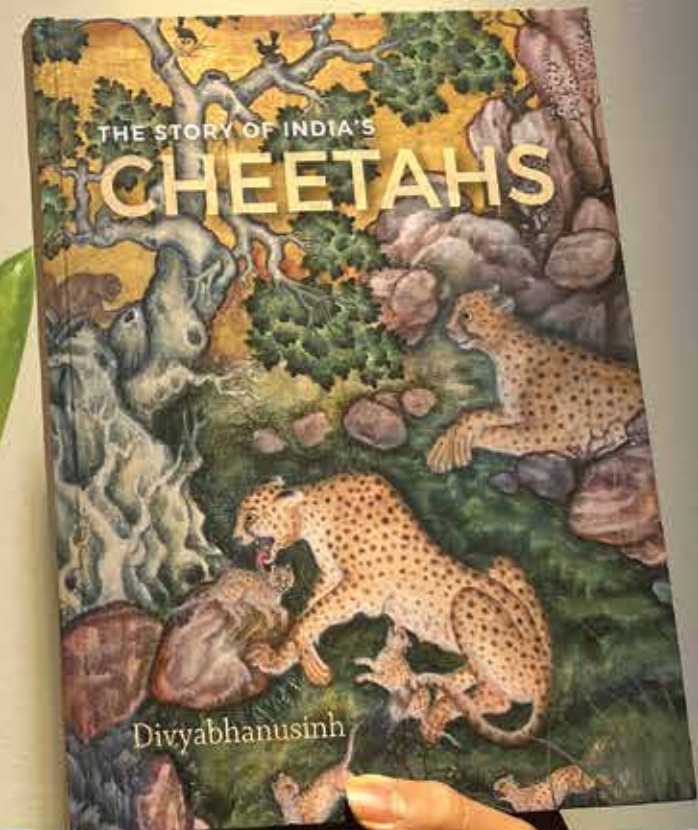


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