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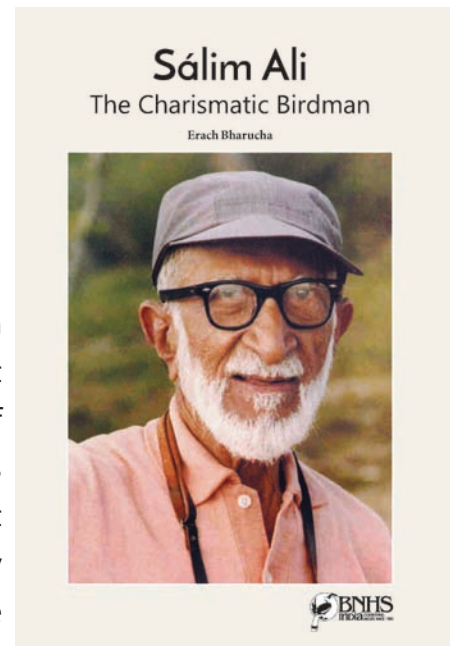
BOMBAY NATURAL HISTORY SOCIETY

Sálim Ali

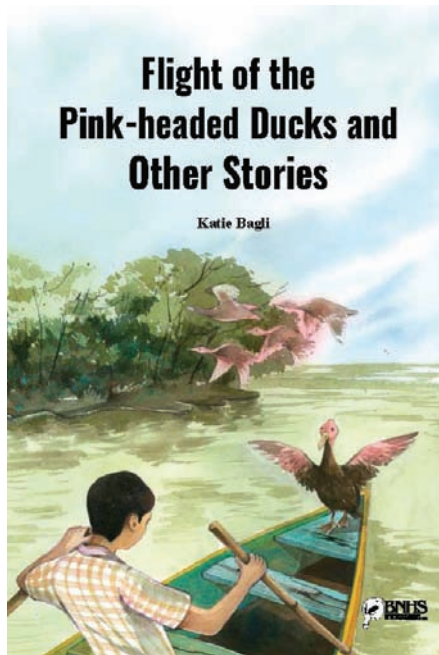
The Charismatic Birdman

by Erach Bharucha

This is the story of Dr Sálim Ali's life and his times, which were an important fragment of the conservation movement in India, from the late British period, through the tumult of the struggle for independence, to the early years of India as a sovereign nation state. It is linked to the organization that Sálim Ali steered for decades, the Bombay Natural History Society. Read Dr Erach Bharucha's inspirational account of the incredible Birdman of India.



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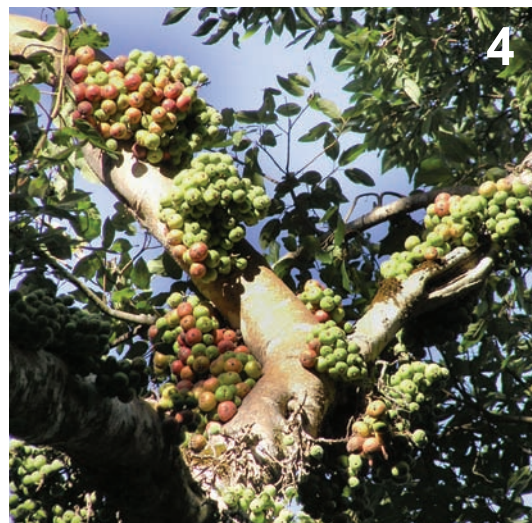
FEATURES

Figs – Divine Fruits of the Forest

What is so special about figs?

According to **Patrick David**
everything about figs is amazing,
right from their germination, to
growth and reproduction. It has
been estimated that more than
a thousand species of birds and
mammals feed on figs, and many
go on to disperse their seeds.

This makes fig trees a useful
tool for reforestation ... Want to
learn more? Then read on.



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Manipur Bush-quail: Lost, Found, Lost?

The Manipur Bush-quail, like
many other neglected species,
did not make it to 'The Most
Wanted' list of ten birds that
have not been seen for decades.

Asad R. Rahmani feels that
lack of conservation attention
and funding may result in the
disappearance of this neglected
species, and that this needs to
change, else many more species
will disappear, unstudied and
unsung.

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Editorial...

Late in the night on May 09, 2022, I was woken up by a frantic call from Parveen Shaikh, a BNHS scientist working in Chambal river. I had visited Parveen in Morena a few days ago. She took me along the Chambal river to show birds nesting on the river islands; incidentally we had a lovely sighting of a Desert Fox too. I was most impressed with her dedication to work and her remarkable initiative – “Guardians of the Skimmer”. Parveen has identified and engaged some highly committed local villagers to protect the Indian Skimmer and other birds nesting on the islands from free ranging dogs and jackals. I was thrilled to see this conservation initiative by Parveen.

That night Parveen’s voice was full of concern and she appeared to be in a state of panic. The reason – a sudden release of water from Kota barrage, into the Chambal river, had submerged two of the nesting islands of the Indian Skimmer and other riverine birds. Approximately 60 nests of Indian Skimmer with eggs and newly hatched chicks, which were present on these two islands in the upstream stretch of the river, were lost. With day-break, on May 10, Parveen was on the spot to communicate the situation on the ground. My immediate response to this alarming news was to write an appeal to the Hon’ble Chief Minister of Rajasthan, Shri Ashok Gehlot, and to Shri Bharat Singh, Hon’ble Member of the Legislative Assembly, Rajasthan, to halt the release of water for two weeks until the chicks were ready to fly. Shri Bharat Singh wasted no time in conveying the message to the Chief Minister, and urged him to order the release of the water into the canals instead of directly into the Chambal.

The Irrigation Department immediately issued an order diverting the water to smaller canals; further release of water into the Chambal was stopped by 4:00 p.m. on the same day, i.e. on May 10. Though some nests were lost in the two islands in the upper reaches, nearly 500 nests of Indian Skimmer in the islands further downstream of River Chambal could be saved due to this timely intervention. We acknowledge the prompt action of Shri Bharat Singh and the Forest and District Administration in this matter.

Construction of dams and barrages has heavily altered the ecology of many rivers, thereby adversely affecting our riverine wildlife; and the Chambal is no exception to this. Obstruction of water due to dams and barrages has resulted in fragmentation of the Chambal, affecting key species like Gharial and Ganges River Dolphin. Unlike the Marsh Crocodile, the Gharial with its poor leg musculature cannot negotiate a route within the fragmented pools in Chambal river. Lack of minimum flow in the river also confines river dolphins to a few pools, adversely affecting their survival.





GANESH PALLEIA

Maintaining a minimum flow of water in the river during summer and preventing excess release of water during the nesting season of riverine birds, crocodiles, and turtles, is an issue that the irrigation authorities need to be made aware of. The ignorance of a few stakeholders cannot be allowed to be the cause of the decline of endangered species, like Gharial and Indian Skimmer.

BNHS has been working on the habitats and avian diversity of the Chambal river for the past five years; and after witnessing such catastrophic events we are determined to spread awareness among all stakeholders in the forthcoming breeding season. BNHS biologists do not merely document the decline of a species, they also intervene actively to save species from further decline. I request all our readers to come forward and support BNHS in its endeavour to save our endangered species, like Indian Skimmer, Lesser Florican, Great Indian Bustard, and scores of others. Your support matters to us and to these threatened species.

Bivash Pandav, PhD

FEATURES

FIGS

divine fruits of the
FOREST

Text: Patrick David

ANAND OSURI / SOURCED FROM WIKIMEDIA COMMONS

It was while studying the relationship between fruits and fruit-eating animals in a coastal tropical dry evergreen forest in southern India, some 10 years ago, that I contemplated writing an article on an amazing group of plants, the figs. I was not able to put pen to paper due to various reasons, until an email from my friend about an “art performance on figs” rekindled the urge to start writing on the subject. Figs are a group of plants under the family Moraceae and genus *Ficus*, comprising about 750 species of woody trees, shrubs, vines, epiphytes, and hemi-epiphytes (plants that germinate in tree crowns, but later establish contact with the ground via aerial roots) that are native throughout the tropics, with a few species found in the semi-warm temperate zone.

Germination and Growth

What is so special about figs? Well, right from their germination, growth and reproduction, everything about figs is amazing. These plants use a variety of substrates, on the ground or in crevices in walls or on standing live trees, to germinate. There is a group known as strangler figs, that germinate high above in crevices of trees near the canopy. They produce strong roots that embrace the host plant as they grow towards the ground. The embrace is so strong that it eventually squeezes the life out of the host plant. Starting life high above is also a strategy; the plant makes optimum use of light, which is scarce on the forest floor, to get a head start in life. Examples of strangler figs are *Ficus altissima*, *F. virens*, and *F. microcarpa*. Not all fig trees are stranglers; the non-strangler species start life on the ground like many other plants. Some grow so wide, like Banyan *Ficus benghalensis*, that they need to send down strong aerial roots, called prop roots, for support.

◀ *Ficus racemosa*

Figs, Wasps, and Pollination

Once the fig tree is a few years old, its branches are strong and wide-reaching, and the roots are spread far, providing the necessary support to the weight of the fruit that it will bear. The flowers of fig trees, unlike other plants, are not conspicuous; the entire inflorescence is hidden within an urn-like structure called syconium. Each syconium contains many flowers. Since the flowers are not distinctly visible, it was earlier believed that fig trees do not produce flowers. It is remarkable how fig trees manage to pollinate and produce seeds, though the flowers are encapsulated! The answer lies in the unusual relationship that figs have with a group of insects called fig wasps. Almost every species of fig tree is pollinated by its own distinct species of fig wasp, each being an amazing example of co-evolution. Fig trees depend on female wasps to carry their pollen and fertilize the flowers that they visit. In return, they provide the wasps a refuge in which to lay their eggs and reproduce. Such closely-knit relationships are known as mutualism, where both the interactors are benefitted.

A fig wasp's life begins and ends in a fig! The story of fig pollination starts with a female



ALAN MANSON / SOURCED FROM: WIKIMEDIA COMMONS

Fig wasp *Serus rotundus* on the fruiting body of *Ficus abutilifolia*



VIVEK SUDHAKARAN

Golden-fronted Leafbird



VIVEK SUDHAKARAN

Red-whiskered Bulbul



VIVEK SUDHAKARAN

Indian Blackbird

fig wasp laying eggs in mature flowers of figs. While the wasp is depositing her eggs in one flower, the pollen that she is carrying from the fig of her birth gets deposited onto other female flowers. Flowers that receive pollen (and not the wasp eggs) develop into seed, while the flowers that receive the wasp eggs do not produce seeds, instead they turn into a nursery for the developing offspring. With this single act of depositing eggs, the female wasp dies of exhaustion. With time, the wasp eggs develop into adult males and females, and these start to mate. The wingless males help the winged females (now carrying fertilized eggs, and also smeared with pollen) to escape by drilling a small hole through the fig, after which they die by tumbling down from the tree (as they have no wings) or get predated by parasitic wasps and ants. The female flies off and seeks another fig tree. Like her female parent, she detects pheromones from the flowers of fig trees that are ready for pollination, and upon landing on one, she squeezes through the tiny hole in the fig called the ostiole. During this process, she loses her antennae and wings and is now a prisoner in the fig cavity containing the flowers, which gets pollinated by the pollen from another fig tree. With this, the life cycle of one fig wasp ends and another one begins. With time, the syconium becomes large, bears seeds, and turns bright yellow or red to attract fig-eaters to help disperse the seeds far and wide.

Figs – A Keystone Resource

Fig trees produce large fruit crops, and can produce fruit at different times of the year. Due to this asynchronous fruiting pattern, they produce fruit during periods of fruit scarcity in the forest (when other plant species are not in fruit). It has been estimated that more than a thousand species of birds and mammals feed on figs. Due to their abundant fruit crops, and fruiting during periods of scarcity, besides supporting a wide variety of vertebrates, figs are fittingly called keystone resources. The term keystone comes from architecture – it is the central stone in a building that holds the other stones in place and supports the entire structure. If the keystone resource is toppled, the entire link is disturbed, leading to a cascading effect on the entire ecosystem.

Barbets, hornbills, and fig-eating mammals

Barbets and hornbills (among birds) and fruit bats (among mammals) are specialized fig feeders, and loss of fig trees could lead to local elimination of some of these animals. In Umfalozi Nature Reserve in South Africa, the loss of fig trees after a cyclone resulted in the local disappearance of avian frugivores. Wherever figs are in fruit, barbets are not far behind. If it is a dry open plain, you can sight the Coppersmith Barbet; if it is a dry deciduous forest, then the Brown-headed Barbet; and in a moist forest up in the hills, it would be the White-cheeked Barbet and Malabar Barbet. The relationship between figs



VIVEK SUDHAKARAN

Coppersmith Barbet



VIVEK SUDHAKARAN

White-browed Bulbul



VIVEK SUDHAKARAN

Malabar Grey Hornbill



SHIJAN KAKARA / SOURCED FROM: WIKIMEDIA COMMONS

A young strangler fig begins by sending aerial roots down to the ground; once firmly anchored it enters a growth spurt, plundering the moisture and nutrients that the host tree needs. The strangler fig's roots encircle the host tree's roots, cutting off its supply of food and water, ultimately killing the host tree

and barbets is so strong that barbets travel several kilometres in a day seeking fruiting fig trees. A radio-tagged Yellow-crowned Barbet in Malaysia was found to fly several kilometres each day to feed on figs. In Sriharikota, the Copper Smith Barbet was seen wandering throughout the island in search of figs, and four species of figs: *Ficus benghalensis*, *F. amplissima*, *F. microcarpa*, and *F. racemosa* constituted more than 99% of its fruit diet. It is, hence, likely that the loss of fig trees would lead to the disappearance of Copper Smith Barbet from the island.

Another group of birds that have a strong affinity with figs are the hornbills. It is unusual for a large-bodied frugivorous bird to seek and

eat a small-sized fruit. Yet they do. Figs are rich in calcium, and perhaps it is this quality that attracts birds and mammals to figs. Like in the barbets, different species of hornbills eat figs and disperse the seeds in different habitats. In the lowlands and dry plains, figs are visited by the Indian Grey Hornbill, while the moist hilly areas, they are frequented by the Malabar Grey, Malabar Pied, and Great Hornbill. In moist deciduous forest, there is vertical stratification – the Malabar Grey uses the under-storey and mid-storey, while the Great Hornbill uses the canopy.

While surveying for birds in the Eastern Ghats areas of Tamil Nadu, at a place called Hassanur, I saw a fig tree laden with red fruit. Asian Fairy-Bluebird, White-cheeked Barbet, and various species of bulbuls were feeding on them. Suddenly, a huge bird flew out of the thick foliage and landed on an adjacent tree. Through my binoculars, I saw the bird perch high up on the tree – it was a Great Hornbill. I wondered how the hornbill had found the fruiting fig tree in this narrow strip of riparian vegetation, surrounded by crop fields, away from its usual range in the Western Ghats. It is hypothesized that these birds carry a mental map of all fig trees in their range, and visit these trees frequently to see if they are in fruit. Or do the ripe figs emit scent in the form of esters or other signals that help the hornbills to home in on them? If this is so, it would be another amazing feature of fig-eating birds.

Among mammals, fruit bats, and primates are the primary fig feeders. Fruit bats are especially fond of figs. Our observations in Mumbai indicate that the smaller of the two fruit bats, namely the Greater Short-nosed Fruit Bat *Cynopterus sphinx* has the habit of picking fruits and dispersing them more efficiently than the larger fruit bat, i.e. Indian Flying Fox *Pteropus giganteus*. The wandering nature of fig-eating animals results in seeds being dispersed far and wide. Some of them will survive the gauntlet of competition – seed and seedling predators – and grow into another remarkable fig tree.

Figs and Religion

Figs find mention in many religious texts. According to Jewish rabbis, the forbidden fruit of knowledge that Adam and Eve ate in the



PRASHANTH N.S. / SOURCED FROM: WIKIMEDIA COMMONS

A strangler fig starts out growing on the trunk of another tree. The host tree eventually dies and rots away, creating such a hollowed-out trunk the 'strangler' is famous for

garden of Eden was in fact from a fig tree (not an apple as is generally said). It was under a Peepal *Ficus religiosa* tree that Gautama Buddha attained enlightenment. To the Vedic people, Peepal was a tree of strength and destroyer of enemies. Its wood is used in Vedic rituals to ignite fire and prepare a hallucinogenic drink. Stories like this abound in all cultures throughout the world, linking figs with gods and spirituality.

However, it is their strange trait of producing fruit in any season, that too in thousands and thousands, and also fruiting during periods of fruit scarcity, that makes me link figs with the divine. For it is during periods of scarcity in our life, the periods of emptiness and periods of fear brought about by scarcity, that we seek divine intervention, don't we? I feel that an invisible force speaks to us through signs that caution us, direct us, and discipline us. But the signs are subtle or sometimes hidden. It is for us to untie the Gordian knot to solve the puzzle. In solving the puzzle, or in trying to understand, we have to walk through a maze and walk the right path to reach the end. I have not reached the other side – I am still walking through the maze. I have

discovered figs (perhaps a part of the puzzle; the sign) that makes me take the next step to seek more.

Postscript

When I was making a presentation at BNHS on my PhD thesis "Frugivory by Birds and Mammals in Sriharikota Island, southern India", the eminent wildlife biologist Dr. A.J.T. Johnsingh asked "What if figs take over an entire forest?" Well, that is a question for me to ponder and work on next. 🙏

Note: Some of the information has been extracted from the book "Ladders to Heaven" by Mike Shabnahan.



Patrick David is a consultant cum researcher based in Madurai. He is interested in bird surveys and plant-animal interactions.

MANIPUR BUSH-QUAIL: Lost, Found, Lost?



ASAD R. RAHMANI

Grassland in Kobochoporti

Text: **Asad R. Rahmani**

Leonardo DiCaprio is a popular Hollywood actor, made famous by the movie *Titanic*. But what has he got to do with bird conservation? Well, he is one of the very few actors who are concerned about Earth's health. He founded *Re:wild*, an organization that brings together some of the topmost conservationists of the world, influential leaders, NGOs, corporates, local people, conservationists, and governments to protect and re-wild Nature.

In 2017, *Re:wild* made a list of 2,100 species of animals and plants that are no longer recorded in nature. Another programme was "Search for Lost Species", which identified the 25 most "wanted" species to serve as "flagships for conservation, to catalyze action on the ground." The Pink-headed Duck was included in this list. The last confirmed record of the species was in June 1935 by C.M. Inglis, from Bhagownie, Darbhanga District (in present day Bihar), when a trapped bird was brought to him.

And in December 2021, *Re:wild*, in collaboration with BirdLife International and American Bird Conservancy, launched 'The Most Wanted' list of ten birds that have not been seen for decades, but could be surviving in remote corners of the world. These have not been officially declared extinct by IUCN/BirdLife, hence the search. Two out of ten birds in this list are endemic to India. The Himalayan Quail and Jerdon's Courser, both endemic to India, find a place on this list – definitely no reason to celebrate. The Himalayan Quail has not been seen since 1878, and Jerdon's Courser was last sighted in 2009.

In this article, I want to bring to attention a long-neglected bird that goes by the name Manipur Bush-quail. It was last authentically reported in 1932, a few years before the last Pink-headed Duck was reported. It has an interesting history of discovery as it was described to science twice, with a gap of 30 years, from two different localities. In an ornithological expedition to

Manipur, the reputed ornithologist, A.O. Hume (who was also one of the founders of the Indian National Congress), collected a specimen that he found to be a new species. He named it Manipur Bush-quail *Perdica manipurensis* in the 1881 volume of *Stray Feathers*, a journal that he used to edit. Later, W.R. Ogilvie-Grant in 1909 described a similar quail from Goalpara, Assam, which he termed *Microperdix inglisi*. It was soon realised that both were subspecies of the same species.

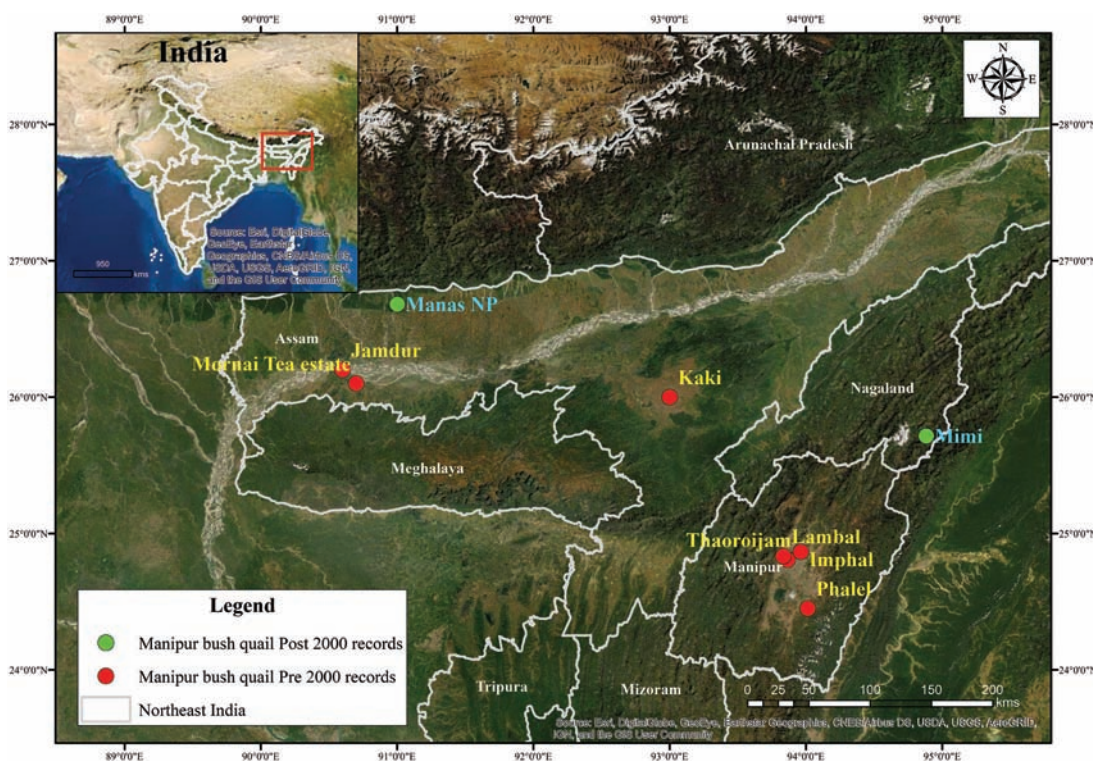
Most of the old records of Manipur Bush-quail after these were based on hunting or trapping, legal in those days. Nearly 100 years ago, the species appears to be not uncommon. For example, a certain Captain H.S. Wood in 1899 wrote in the *Journal of the Asiatic Society of Bengal* that he shot 80 individuals during seven years of his posting in Manipur. He adds "It is by no means such a rare bird as Hume thinks."

Writing in the *JBNHS* (Vol. 37, 1934), J.C. Higgins mentions that in Manipur, it is called



SOURCED FROM: A HANDBOOK TO THE GAME BIRDS, VOL. 1

Manipur Bush-quail was last authentically reported in 1932



There are unconfirmed reports of sightings from North-east (Map prepared by: Rohan Bhagat)

sorbol amuba (the black quail). All quails in Manipur are known as *sorbol*, corrupted sometimes as *soibol*. In Bengali, the Manipur Bush-quail is known as *kalo gundri*. He writes, “This sporting little bird appears to be getting scarcer – as the last 13 years have only produced 93 birds – the same numbers as the four seasons 1915–16 to 1918–19. The decrease is probably due to increasing population and the consequent spread of cultivation. None have been shot in the past two years, and I have not even seen one.” He further writes, “I have seen these birds in the bogs and swamps in the

south of the valley and also in the glens which run into it.”

There are five specimens of Manipur Bush-quail in the BNHS collection: four from Goalpara, Assam and one from Manipur. According to Dr G. Maheswaran, Scientist-E and in-Charge, Bird Section, there are at least 5 specimens in the collection of the Zoological Survey of India. According to Alex Bond, Principal Curator Bird Group, there are ten specimens of *P. m. manipurensis*, and four of *P. m. inglisi* in the Natural History Museum, Tring, London. They also have a clutch of four eggs from the nominate subspecies.

Manipur Bush-quail is endemic to north-east India. There were unconfirmed records from Chittagong Hill Tracts and Sylhet districts of Bangladesh. It is a small bird of about 20 cm, with marked sexual dimorphism in the plumage. Due to its distinctively colourful male (see images), Sálím Ali and S.D. Ripley in their 10-volume tome, HANDBOOK OF THE BIRDS OF INDIAN AND PAKISTAN, called it Manipur Painted Bush-quail. They also recognized two subspecies: Assam Painted Bush-quail *Perdica manipurensis inglisi* reported from the duars of West Bengal and grasslands of Assam,



A typical habitat of the Manipur Bush-quail

ASAD R. RAHMANI

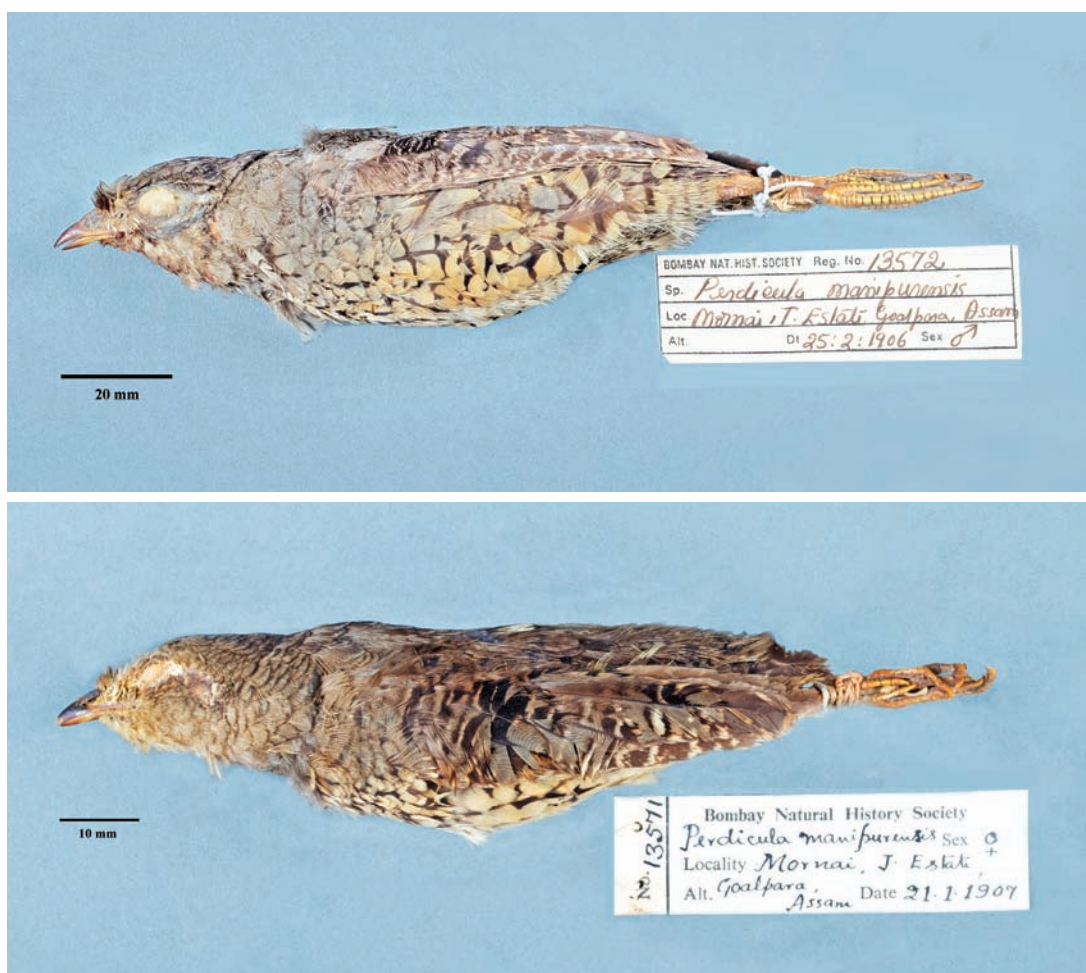
north of Brahmaputra River up to Sadiya; and Manipur Painted Bush-quail *Perdica manipurensis manipurensis*, resident south of Brahmaputra River, Manipur, Meghalaya, and Nagaland. The only difference was in the bold marking of the upper surface in the latter, fainter in the former.

Practically nothing is known about the ecology and behaviour of this elusive species. The HANDBOOK mentions that it keeps in coveys of five or six, and is shy, therefore seldom seen. It comes out into burnt grass patches with new shoots sprouting, in the early morning and late afternoon. Like other quails, it feeds on grass seeds and small insects. It probably breeds between January and May, just before the monsoon. The nest is made on the ground, among grass roots. It is found from the foothills up to about 1,000 m.

As for more recent records, there are a few unconfirmed records from Dibru-Saikhowa National Park in March 1998 and Deobali Jalan

grassland in central Assam. In the last 15 years, we have only four records: one from Nagaland and three from Manas in Assam. In 2006, Dr Anwaruddin Choudhury saw a bird in Manas National Park. The second record is by Peter Lobo (with his friends Jainy Maria, Chewang Bonpu, and Dileep) from Mimi, near Pungro, Kiphire district, Nagaland in 2016. Later, Peter sighted a male in Manas along with Rustom Basumatry, a local birdwatcher, and a few others. Another pair was seen crossing the road in the same area where Anwaruddin Choudhury had seen it in 2006. Both Anwaruddin and Peter are experienced birdwatchers, so we can accept their sight records.

Anwaruddin Choudhury, probably the finest and most well-travelled naturalist of north-east India, and a prolific writer, conducted surveys and interviews with the local people in Manipur from 1988 to 2002, but could not gather any evidence of its existence in the state. In his article, published



Specimens of the bird in the BNHS Natural History Collection

SOURCED FROM: HANDBOOK TO THE GAME BIRDS, VOL. 1



Dedicated field surveys may result in locating this lost endemic bird

in *Emvion* in 2018, titled ‘Eastern Pats: A cluster of less known lakes and marshes of Manipur’, he writes “The grasslands in the *pats* seemed to be vital as potential habitat of the Manipur Bush-quail ... Bulk of the villagers interviewed could identify although there remains doubt about its segregation by untrained eyes from other quails found in the area.”

In areas like Manas, Kaziranga, and Orang, where there are tall wet grasslands, it is not easy to conduct foot surveys due to the presence of rhino, wild buffalo, elephant, and tiger. Historically, Manipur Bush-quail was described as local, but not very rare. In fact, by the 1930s, it was documented as declining in Manipur owing to pressures on its damp grassland habitat. It is difficult to look for this species, but it has certainly declined due to conversion and degradation of its grassland habitat. Earlier the bird was considered to be a ‘gamebird’, thus we have definite evidence of its presence, but hunting is now banned, the best method to look for the bush-quail would be to conduct line transects with multiple people or use ropes to flush it in a grassland and try to net it (to be released after taking measurements and photographs). Dogs are often used to flush birds during hunting, but this is not permitted in PAs.

What would then be the way forward? Ideally, one should start a dedicated project on the Manipur Bush-quail to conduct extensive

surveys in all its former known habitats from the duars of West Bengal to the Assam plains (both sides of the Brahmaputra), and in Manipur. Mimi in Nagaland, where Peter Lobo saw it in 2016, should be thoroughly explored. Besides the famous Loktak Lake and Kaibul-Lamjoui National Park, the eastern *pats* (islands in local language) in Manipur should be given special attention, particularly Kharung, Ikop, Phumlen, Waitthou, and Khoidum. The conservation action needed to protect this ‘lost’ endemic bird of India can then be taken up, based on the outcome of the field surveys.

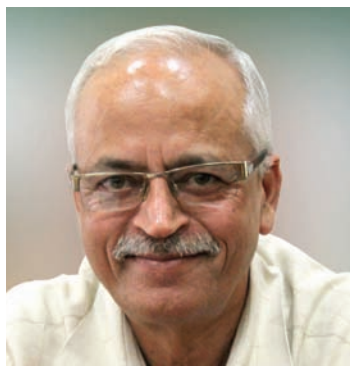
In a country where mega-fauna such as tiger, elephant, rhino, leopard, and snow leopard are given the major chunk of conservation attention and funding, it is difficult to find votaries of neglected species such as the Manipur Bush-quail. This needs to be changed, otherwise many species will disappear unstudied and unsung, a tragedy that our country cannot afford.



Asad R. Rahmani is a renowned ornithologist, and former Director of BNHS. He is now a member of the BNHS Governing Council.

A Tribute

The Vultures and BNHS lost a true friend with the passing of Dr Ram Dhirendra Rao Jakati, on June 15, 2022, at the age of 70. Dr Jakati reached one of the highest positions that a forest officer could aspire to achieve in his lifetime, but remained humble, approachable, and committed to the conservation of forests and wildlife till the end. He superannuated as the Director of Indira Gandhi National Forest Academy, Dehradun, in February



**Dr R.D. Jakati,
IFS (Retd)**

2012. He was the Chief Wildlife Warden, Haryana State, for over nine years, and also worked as the Director General, Forest Survey of India. With over 37 years' experience in the field, his professional expertise included forest and wildlife management, participatory governance, resource assessment, and capacity building. He was conferred with the prestigious Royal Society for Protection of Birds (RSPB) Medal for Outstanding Contribution to Nature Conservation, in 2020, and was awarded an Honorary Conservation Fellowship by the Zoological Society, London, for Vulture Conservation. Dr Jakati was a forward thinking, progressive, upright, and committed forest officer of impeccable integrity.

In 2001, I approached the Haryana Forest Department for setting up a Vulture Care facility, to identify the cause of crash in vulture populations during the mid-1990s. Similar requests were sent to several Chief Wildlife Wardens across India, but only Dr Jakati, then the Chief Wildlife Warden of Haryana, responded positively. A keen wildlife enthusiast, Dr Jakati was aware of the unprecedented crash in vulture populations and understood the importance and urgency of setting up a Vulture Care Centre. He discussed BNHS's proposal with experts, and once convinced, he immediately invited us to visit Haryana to select a site for the Centre. Even before the BNHS team reached Haryana, he had worked out the procedure for acquiring land for the Vulture Care Centre, and permissions to catch and house the birds. Such swift decision-making and efficacy are rare in the Government setup!

Acquiring land to house vultures was not an easy task. Dr Jakati used his skills in drafting the case for setting up the Vulture Care Centre in Haryana, navigated the entire maze of state bureaucracy, and secured clearance from the Chief Minister, all in record time of one month.

When I met him in his chamber in August 2001, his first words were: "You will have all our support in the conservation of vultures in Haryana. Species conservation is our mandate

and you are doing our work, so we are obliged to help you." Once he had given us his word as the seniormost Wildlife Officer, he remained true to it till he retired. Even after retirement, he continued to provide guidance whenever there were issues. He demonstrated incredible efficiency and perseverance in garnering government support for vulture conservation during the early 2000s. He drafted letters for getting clearances from Government himself, spoke to his batch-mates and other officials known to him, to help BNHS conduct vulture conservation all across the country. Dr Jakati's incredible support to the BNHS Vulture Conservation Programme proved to be the single most important reason for its success in the country. He supported the cause of vulture conservation in India as early as 2001, a time when most did not believe that vulture populations were at a serious risk of extinction.

The Vulture Conservation Breeding Centre, Pinjore, has become synonymous with vulture conservation efforts in India, and has provided an anchor to both in-situ and ex-situ conservation of vultures. Without Dr Jakati's contribution, the scale and impact of these efforts would have very likely been sub-par. It is extremely rare to find a senior Government official who would go way beyond the call of duty, as Dr Jakati did, to help the cause of conservation.

Post his stint with the Haryana Forest Department, he was appointed Director of the Indira Gandhi National Forest Academy. During his tenure, he ensured that the Indian Forest Service (IFS) probationers visited the Vulture Conservation Breeding Centre at Pinjore

to understand the Conservation Breeding Programme. This helped raise awareness about vulture conservation efforts; and as future managers of wilderness, the IFS probationers took positive steps towards vulture conservation.

Dr Jakati had anticipated the concerns that could arise when a Government department and a Non-Governmental Organization work together. He therefore signed a long-term Memorandum of Understanding between the Government of Haryana and BNHS for the Vulture Conservation Breeding Programme. He also helped to establish a Governing Council, headed by the Secretary, Forests, Government of Haryana, which provides vital support for the functioning of the Centre. He also served as Chairman of the Fund Raising, Advocacy, and Communication Committee of Saving Asian Vultures from Extinction (SAVE), an international consortium of conservation organizations working on vultures for many years.

Dr Jakati is survived by his wife, Mrs Vandana Jakati, son Bharat and daughter Avantika. Mrs Jakati has dedicated her life to working for dyslexic children. Bharat and Avantika, both of whom are very talented, are doing well. With the passing of Dr Jakati, we have lost a leading light for vulture conservation in India and the greater community of nature conservationists. His absence will be felt in every activity of the Vulture Conservation Breeding Programme, and he will be sorely missed by BNHS and its vulture conservation team. ■

– Vibhu Prakash

A Caramel Crow



The ubiquitous House Crow *Corvus splendens* has distinct black plumage, grey coloured neck and breast, a black bill and black legs. Very rarely is an albino crow sighted and when seen its white plumage generates curiosity. Albino crows have defective vision that compromises their survival in the wild. This is a report of a buff coloured crow with black face and bill seen in Jamshedpur, Jharkhand, India.

On May 10, 2021, I saw a light coloured bird briskly flying alongside a House Crow. From its colour, I mistook it for a pigeon, until the pair landed on a building. The peculiar looking crow resembled its companion, a typical House Crow, only in its black facial parts. The rest of its body was buff; its legs were brown and there were a few reddish brown patches on its wings. I saw the bird subsequently on several occasions in the same area of the city.

Light brown coloration has been reported in other species of the crow family (Corvidae), especially from North America. Black colour in birds is due to melanin – a pigment produced by cells in the skin and feather follicles. There are two types of melanin in birds – eumelanin that imparts a black, grey, or dark brown colour and pheomelanin that renders a reddish hue or a buff colour. In black coloured birds, eumelanin is predominant and pheomelanin is either reduced, absent, or dormant.

Brown colour aberration is attributed to mutation caused by the expression of a single recessive gene. However, as this gene is linked to the sex-determining chromosomes, this pigment abnormality is expressed only in female birds. The mutation results in the lack of a single pigment in a part or whole of the plumage. The light brown colour is due to suppression or absence of eumelanin and expression of pheomelanin.

In the past, similar buff coloured corvids were given descriptive or implied names such as cinnamon, isabella, fawn, pale morph, non-eumelanic, flavistic, erythristic or schizochroistic. A Google search to identify this particular abnormal house crow led to a blog in which Kaeli Swift, a researcher on Corvidae in the USA, described American crows with similar colour and used the term ‘caramel crow’. The Caramel Crow, seen in Jamshedpur, is a rarity and a mystery waiting to be unravelled, much like a novel of the same name. 📖

– Vijaya Bharat
Jamshedpur



Wings Stretched Out

Author and Illustrator: Manasvi Dadbhawala

Published by the Author through Notion Press, 2021

Size: 23 x 15 cm

Pages: 69

Price: 400/- (INR)

Paperback

Reviewed by: **Katie Bagli**

WINGS STRETCHED OUT is a charming, semi-fictional novella written by 12-year-old Manasvi Dadbhawala about the fun and travails in the life of Winnie – a Eurasian

Golden Oriole. The lucid, conversational language of the book hooks the reader right from the beginning.

The book unfolds the roller-coaster experiences in Winnie's life right from the time she hatched out from her egg. After she was taught to fly and forage for food by her parents, she had to undergo rigorous training for the most difficult phase of her life – migration.

The story beautifully weaves in the geography of the places Winnie flies over, such as the Mediterranean Sea, the Sahara Desert, the River Nile, the Serengeti Savannas, and the Congo Basin rainforests. The various habitats and the biodiversity that Winnie comes across during her long journey make the story a skilful blend of facts and fiction.

Surprisingly, the expressive illustrations that accompany every chapter in the book have also been done by the young author herself. Another unique feature is the QR codes at the end of each chapter. Scan these to reveal a wealth of additional facts connected with the chapter.

Indeed, WINGS STRETCHED OUT is not just an interesting story about the trajectory of a migrant bird, it is also a reflection of the author's flight of imagination, resulting in an informative novella that deserves to be on every youngster's bookshelf. 📖

Suitable for: 9-year-olds and above

Also available as E-book, self-published through Kindle Direct Publishing

Link for E-book: <https://bit.ly/wsoAmazonIndia>

ABOUT THE POSTER

The Gharial or Long-snouted Crocodile can be easily identified from other crocodiles by the long and narrow snout, which ends in a bulbous tip in adult males. Among the largest crocodilians, the Gharial can grow to 7 m in length and has a thick skin covered with smooth epidermal scales that do not overlap. A facile swimmer, it is clumsy on land, propelling itself with its legs in a sliding movement when coming out to bask, which is possibly why it never moves far from the water.

Mating occurs in water, in the cold weather months of December-January. Males are territorial during the breeding season. The nesting season is said not to vary by more than 10 days in any year, and all females in an area nest more or less within a week. Gharials, like other crocodilians, show parental care in the form of nest protection, release of young, and guarding of hatchling clusters. Although primarily fish eaters, some individuals have been known to scavenge dead animals. Young gharials mainly prey on small invertebrates such as insects, larvae, and also small frogs.

Gharial were historically found in the river system of India, Pakistan, Bangladesh, and the southern parts of Bhutan and Nepal. Today, their major populations occur in three tributaries of the Ganga River: the Chambal and the



Gharial *Gavialis gangeticus*

Girwa in India, and the Rapti-Narayani in Nepal. They are known to inhabit deep pools at river junctions and bends, and the deep gorges in hilly country.

Listed in Schedule I of the Wildlife (Protection) Act, 1972 and as Critically Endangered on the IUCN Red List, the species is now rare with a population of around 800 individuals in the wild. The major threats are alteration of habitat, depletion of prey base, harvesting of eggs, and poaching. ■



Gharial *Gavialis gangeticus*



NATIONAL CHAMBAL SANCTUARY – A WILDLIFE PARADISE

Text and Photographs: **Spandana Bhardwaj**



Bar-headed Geese

Present along the course of the Chambal river, the 5,400 sq. km National Chambal Wildlife Sanctuary is spread over three states – Rajasthan, Madhya Pradesh, and Uttar Pradesh. The unsullied Chambal river flows through a maze of ravines and forms a number of sandbanks. The sanctuary provides protection to the Critically Endangered Gharial, Red-crowned Roofed Turtle, Indian Skimmer, and Ganges River Dolphin, and its alluring landscapes formed by red loamy soil and the pristine blue waters of the winding Chambal river, which are home to diverse flora and fauna. And yet, I would not call this

sanctuary a place only for wildlife enthusiasts, but for anyone who plans to take a break from a day-to-day routine.

The National Chambal Sanctuary in Uttar Pradesh lies in Agra and Etawah districts, and has been our go-to spot for birding and wildlife. My father, mother, younger brother, and I have visited the sanctuary four times. My knowledge on birds and riverine wildlife in India is a result of these trips. With over 250 bird species, including 55 avian migrants visiting during the winter, Chambal Sanctuary is a birder's paradise, and one of India's finest biodiversity-rich destinations for nature lovers.

My earliest memory of this place is of the time I was about six, and my mother was posted as Superintendent of Police in the adjoining district of Firozabad. During a boat safari, I saw a gharial for the first time in my life. With its fascinating long snout, a relatively smaller body than the muscular Marsh Crocodile or Mugger, measuring 12–15 ft in length, I found the Gharial a charming reptile – probably the only one which did not terrorize me in my dreams. Although they rarely attack humans, gharials can respond fast when faced with threats. Gharials are among the Critically Endangered reptiles in India, but the population has improved significantly, especially in Ganga, Chambal, and

Ghaghara rivers, after the institution of Gharial breeding centres during the late 1970s – in Kukrail in Lucknow, and one in Katarniaghat Wildlife Sanctuary in Bahraich district.

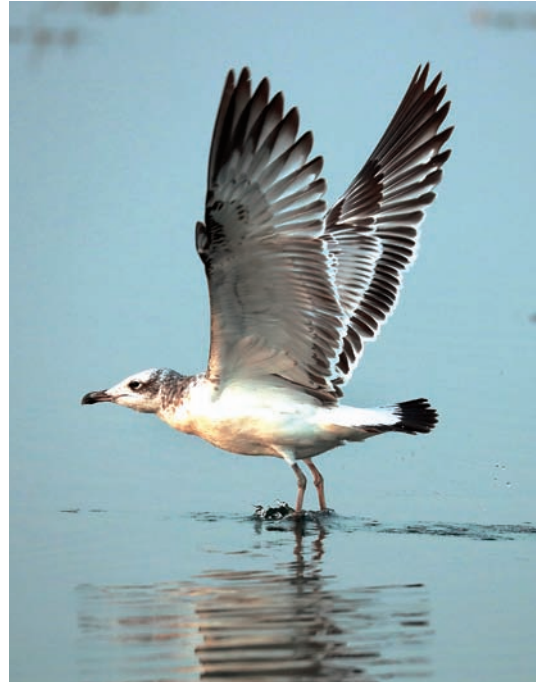
In December 2021, during our winter holidays, when the COVID-19 pandemic was slackening, our family planned a quick trip to Chambal. The place – Nadgawan in Bah tehsil in Agra district – is around eight hours away from Dehradun, so we stayed at Agra for a day and then proceeded to the beautiful Chambal Paradise Resort, which is surrounded by agricultural fields, less than two hours from Agra city. It was sundown by the time we reached the resort. A few old heritage-style cottages and some recently built ones are sprawled across the 20-acre campus. The stables have been converted into a well decorated dining area, and an open-pit bonfire gave the resort the feel of a home nestled in a small forest. The resort had a large number of old Neem, Jamun, Peepul, and Banyan trees, where owls, mynas, babblers, and parakeets had made their home. I loved the hammock under a Neem tree, in front of the lawn where lunch was served. Peacocks were everywhere, and Common Indian Hare were seen jumping around in the grass after sunset. The resort was an ecosystem in itself, with more than 125 bird species, according to a local naturalist.



Gharial



Painted Stork



Greater Black-headed Gull

Early next morning, we woke up to the calls of peacocks and Rose-ringed Parakeets. After a cup of hot chocolate, we set out for the day, passing through the rural landscape enveloped in light fog, through ravines and rough jeep tracks, to reach the banks of the Chambal where the boat we had booked awaited us. The boat skimmed

through the clear waters of the river, which forms the boundary between Uttar Pradesh and Madhya Pradesh. It was breathtaking to glimpse hundreds of migratory birds like Ruddy Shelduck, Bar-Headed Goose, Coots, Pintails, Redshanks and Greenshanks, Red-crested Pochards that had flown from Central and East Europe, and



Greater Cormorant

North Siberia. The Bar-headed Goose flies over the Himalaya from Central Asia to reach here! Rare Indian Skimmers are also seen in Chambal Sanctuary and are known to breed here during March to May on the sandy islands. The Pied Kingfisher enthralled us for 20 minutes, as it relentlessly hovered in the air before diving down to catch its prey. Egrets, cormorants, Grey Heron, Asian Woollyneck, and Painted Stork were seen on the sandy mud islands or rocky outcrops which emerged from the water. We spotted River Lapwings, Great Indian Thick-knee, wagtails, and larks. A pair of Indian Skimmers was sitting close to a female Gharial basking on the cool sand at the edge of the river. They took flight, occasionally, to skim the water with their bright orange beaks to catch fish, and returned to rest. Just then, our guide jumped with excitement, pointing at a bird flying above. It was an Osprey – a master fish hunter. The majestic Osprey has bright yellow eyes, brown feathers with slight white spots near the breast, and a Mohawk-like crest. The bird hovered for a while before sitting on a dry branch jutting into the river, and began surveying the waters for fish. Our guide told us that from January to early March, one can also spot Greater Flamingo here.

We had switched off the boat engine while having breakfast; a splash in the water behind us got our guide excited, and he shouted “It’s a dolphin!” We forgot our sandwiches and looked around in all directions for the dolphin to emerge again. In the following 10 minutes, we spotted six splashes, one just 20 ft from the boat. Our guide told us that this was a family of five, including two calves, and they are active early in the morning and late in the evening. I couldn’t believe that I had watched our national aquatic animal so close.

We spotted a submerged 14-ft male Gharial, with only the tip of the snout with its huge knob and pair of eyes above the water, keeping a close watch on a nursery of young gharials, like a doting father. He ensured that no predator came close to them, and was known to charge at boats if they came too close. The presence of young gharials meant that the new generation was well-protected and surviving at National Chambal Sanctuary. We spotted a few muggers and gharials basking nearby, some of them with eyes closed, looking



Ruddy Shelduck

like they were meditating. Alongside were waders like Ruff, Common Ringed Plover, sandpipers, Pied Avocet, and other birds like Red-naped Ibis, Great Thick-knee, and River Lapwing. As our boat approached a bend in the river, one skittish Marsh Crocodile swam alongside. I spotted a few young crocodiles and roofed turtles basking on a small muddy island that had a vertical wall against the river. Our guide told us that the holes in the vertical wall were for the crocodile hatchlings to hide from predators; they bask just outside and run to safety at the slightest danger.


After going a stretch of 4 km on the river, our boat turned around and went back on the same path. We occasionally spotted egrets, kingfishers, and a large flock of up to 150 Bar-headed Geese. We noticed over 30 muggers and 20 gharials. As the sun shone brighter, their number increased. Many of them had their snouts wide open, revealing razor sharp teeth on both upper and lower jaws, like dinosaurs of a past era. An apparently relaxed mugger can pounce on a potential prey with deceptive speed, and hence maintaining a safe distance is necessary. The turtles were shy and would dive into the waters, only to resurface a little distance away. During the boat safari I also spotted Bonelli’s Eagle, Short-toed Eagle, and Egyptian Vulture.



Marsh Crocodile

The waders had become more active and were looking for insects. The soothing sunshine, a light cool breeze, and clear blue Chambal waters were tranquil and refreshing.

I returned to Dehradun with great memories of sighting a variety of colourful birds, an incredibly beautiful landscape, some ferocious looking reptiles, and a close encounter with Ganges River Dolphins in the Chambal. I have visited Chambal Sanctuary in the past, but its wilderness never fails to amaze me each time. I wish to return sometime in future, take more photographs, and spend more time with these treasures of nature,

learning about their behaviour and resilience that enables them to survive in their changing habitat. 



Spandana Bhardwaj is a student of Class 11 at City Montessori School, Lucknow. She has a keen interest in wildlife and photography, and has travelled widely in major national parks of India.

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ABOUT THE COVER

Lepidagathis mahakassapae sp. nov., an endemic from the plateaus of Satara district, was first described by Sushant More, Sharad Kamble, Mandar Sawant, Rohit Mane, and Harshal Bhosale in 2022. *L. mahakassapae* spreads up to 250 cm like a mat and blooms only once in its entire life; it dies after its seeds are dispersed. Listed as Endangered under IUCN, human-induced fires and construction are the major threats to this new species.

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Magenta Ghost Flower *Christisonia tubulosa*

The Angel of the MOUNTAINS

Text and Photographs: **Prashant Awale**

On an offbeat trek route in a secluded place amidst the wilderness of Kerala, there lived a beautiful 'angel'. I had met her once many years ago and had promised to visit her again. I had felt a yearning to meet her again and was waiting for an opportunity to do so.

When We First Met

Our first encounter had been in October 2006, near the picturesque town of Munnar in Kerala. It was love at first sight and an experience beyond my wildest dreams.

We had heard that the Neelakurinji *Strobilanthes kunthianus* shrub was in full bloom and the mountain slopes of Eravikulam National Park had changed in colour from green to blue. Along with a group of enthusiastic nature-lovers, I started immediately to Munnar via Cochin to witness this spectacular marvel, a rare event that occurs once in 12 years.

We could feel a distinct change in the weather as we approached Munnar; the hot and humid atmosphere of Cochin giving way to the cool and pleasant climes of Munnar. The terrain too changed gradually, lined with pristine forest, evergreen trees, lianas and shrubs. Along the way, the sight of milky white water gushing down the hillside took our breath away.

Our driver told us that this was the famous Cheeyappa waterfall, a well-known tourist attraction of this region. We halted for a quick photo session and a steaming cup of hot tea at a nearby tea stall. As I looked around, I spotted a small nature trail adjacent to the waterfall going up the hill and vanishing into the wilderness. I could not resist the urge to explore further. I picked up my camera and walked the beautiful trail. With the sound of the waterfall fading into the distance, I could hear the wilderness surrounding me, sounds of birds chirping, the buzz of bees, and gentle fluttering of butterflies. I was mesmerized and wanted to explore, experience and absorb the beauty of this untrodden trail and be one with nature. Just a little ahead, on a sharp bend, almost like a ghost appearing out

of nowhere was nature's 'angel'. She had golden yellow legs and a magenta frock, decorated inside with a white and yellow border. I was spellbound and stopped still in my tracks. I spent almost half an hour photographing this vision from various angles. Uncovering the identification was a challenge for me. Had anyone other than me ventured so deep into the forest and discovered this beauty, I wondered. I eventually had to say goodbye, but promised to return one day.

I trekked back towards the waterfall, almost in a state of trance over my joyful encounter, oblivious to the fact that leeches had attached themselves to my feet and legs. The driver was anxiously waiting for my return, and on spotting me, he shouted, "Sir, what happened, where were you, your legs are bleeding ... there are leeches on your legs and hand ... why did you venture into the forest ... it's dangerous!"

I calmed him down. "Don't worry all is fine," I said. The tea shop owner applied tobacco water on the leeches and to my surprise most of them fell off after a short while, but blood continued to ooze for quite some time due to the anticlotting agents they had injected while feeding on me. Eventually, all was well.

My driver offered me a hot cup of tea, and even while sipping the tea, my thoughts kept returning to my encounter. I kept searching my memory bank, trying to place an identity on what I had encountered. Before long, I remembered that I had seen something similar near Mumbai.

My Second Encounter

It was 2018, the year Neelakurinji was to bloom again after 12 years. Lakhs of tourists and nature lovers



Lurid Coneflower *Strobilanthes luridus*



Pale Sundew *Drosera peltata*



Mysore St John's Wort *Hypericum mysorensense*

Neelakurinji *Strobilanthes kunthianus*Wild Himalayan Cherry *Prunus cerasoides*

were expected to travel to Munnar and nearby regions to witness the flowering spectacle. Munnar was almost completely booked and was gearing to welcome the blue bloom. Flower buds had started appearing on the shrubs on the mountain slopes of Eravikulam National Park.

But then, an unfortunate tragedy struck Kerala with awesome fury. Heavy and incessant rains started pounding the hills and countryside, and continued for almost 15 days during the second week of August. Water was gushing down the hilly slopes and the water level in the dams in Idukki district was rising. Reports of the floods washing away houses from this region were all over the media. Cochin Airport was heavily flooded and had to be

closed down for a few days. Many roads were also closed due to landslides in the hilly region of Munnar. This catastrophe has left a permanent scar on the landscape, which will take many years to heal; Idukki district was the worst affected.

This calamity resulted in a tremendous loss of property and lives, and the tourism industry was badly affected. Whether to call this calamity natural or man-made is a debate, but the end result is devastation beyond imagination. Being nature lovers, we were also perturbed by the damage to biodiversity of the region.

We had witnessed the Neelakurinji bloom in 2006 and had plans to go again. I was equally eager to meet my 'angel' once again. Our travel plan was uncertain as the bridge connecting Eravikulam National Park with Munnar was washed away and the Park was closed. With no clear idea about when normalcy would be restored, we were in a dilemma on whether to call off the tour or wait and watch. We heaved a sigh of relief when Cochin Airport was reopened on 29th August and the Park was opened for tourists from 1st September.

We reached Cochin early morning by Jet Airways. A pre-booked vehicle was waiting for us at the airport. As we started our journey towards Munnar, we were shocked to see the massive devastation caused by the heavy rains and flood. In a flash, my first encounter in 2006 with the 'angel' was replayed in my mind. I remembered the location of the last encounter and kept a sharp lookout for it. Thankfully, this was easy as things had not changed much over the years, and the tea stalls and shanties were still in place near the waterfall.



Tea gardens at Munnar



Many roads were closed for days, due to landslides in the hilly region.
This catastrophe has left a permanent scar on the landscape

The morning was still fresh as it was just 7:00 am when we reached the waterfall. I quickly had a hot cup of tea with some biscuits and then started looking for the old nature trail, which to my surprise was still there, but in poor condition. The scenario around was a bit scary, with landslides on every slope. We started walking the trail, loaded with leeches eager to suck our blood. Our eureka moment was not very far. I saw it around a bend and was ecstatic. I shouted, “*Christisonia*, I’m here, I have made it. I have fulfilled my commitment. I am back only for you.”

Identification Challenge

As soon as I had first set my eyes upon her, I had taken up the challenge to identify this plant. Curiosity and determination can do wonders; the many brainstorming sessions with experts were finally fruitful.

Christisonia tubulosa is a rare endemic parasitic herb, also known as Magenta Ghost Flower. This plant was first discovered by Robert Wight in 1835 and rediscovered after 90 years (in 2003) in the Anaimalai range. The flowers are attractive, tubular, with magenta on the outer portion of the petals. The stigma is whitish and prominent, and the corolla throat is showy with yellow coloration. The herb lacks chlorophyll and is parasitic on grasses. It is endemic to southern India, where it occurs at an altitude of 900–1,200 m. The genus was named after Sir Robert Christison, Professor of Medicine at Edinburgh

I could determine the family, as the flower resembled the Forest Ghost Flower *Aeginetia indica* and Bhui Nala *Christisonia calcarata*, which we usually see during July–August – the flowering season in the Sahyadri range of Western Ghats. I shared my discovery with my friends Mr Tabish and Mr Navendu Page, who are associated with the “Flowers of India” website, who conclusively established the identity of my discovery, as the rare endemic parasitic herb Magenta Ghost Flower *Christisonia tubulosa*, belonging to the family Orobanchaceae, known as broomrapes, comprising mostly parasitic plants.

I was happy that my *Christisonia* had survived nature’s fury. During the course of my travels, I have seen and recorded many flowering plants from the Munnar region. As the adage goes – “Wandering, one gathers honey.” The joy that such explorations deliver can never be explained in words. I am sure that many more species like this ‘angel’ are still there to be discovered in the forests of Munnar. 🦋

Acknowledgements: I thank my friends Shri D.A. Roy and Dr M. Ramanamoorthi for editorial help.



Prashant Awale is a Scientific Officer at BARC, Mumbai and Chairman, Nature & Adventure Circle, BARC Staff Club, Mumbai. He is an avid trekker and nature lover.



GREEN ENERGY — BOON OR BANE

Text: **Neha Sinha**

Arunachal Pradesh

Photographs: **Dhritiman Mukherjee**

The Case of Dibang – a Jewel under Threat

Arunachal Pradesh is often referred to as the ‘dam capital’ of India, for the many dams planned or existing in the state. The state of Arunachal is part of the Indo Burma biodiversity hotspot and is also known for its seismic activities. Hence, any decision related to dams in this area must take into account the full extent of environmental damage or risk.

BNHS has provided comments to the Ministry of Environment, Forest and Climate Change and its Forest Advisory Committee on an existing proposal to build a dam in Dibang Valley, Arunachal Pradesh. The proposed project involves diversion of 1,165.66 ha, including 91.33 ha underground area, of forest land for the Etalin Hydro Electric Project (3,097 MW) in Dibang Valley District of Arunachal Pradesh by M/S Etalin Hydro Electric Power Company Ltd. BNHS has pointed out that

the proposed project site is merely 14 km from a protected area, the Dibang Wildlife Sanctuary, which is part of one of the most contiguous wilderness areas of India.

Much of this region comes under Dihang-Dibang Biosphere Reserve, which is part of the Mishmi Hills. This entire region is situated in Lower Dibang Valley district, where altitude ranges from 400 to 3,568 m above sea level. The area is irrigated by several streams and rivers; Ashupani, Deopani, Jowe, Enjopani, and Diphu are the main perennial streams flowing through the Reserve. All the streams flow into the Dibang River, which is one of the main tributaries of the Brahmaputra. This region has some of the richest biodiversity on earth, including an array of medicinal plants that are used by the local people for treatment.

Over 6,000 plant species, 100 species of mammals, 680 species of birds, 500 species of orchids, 50 species

of rhododendron, and a large number of butterflies and other insects can be found in these forests. Such a unique diversity of life forms can be attributed to the location, which is at the junction of the Palearctic, Indo-Chinese, and Indo-Malayan biogeographic regions. The vegetation here can be classified into the following types: Tropical Evergreen, Tropical Semi-evergreen, Sub-tropical Broad-leaved, Sub-tropical Pine, Temperate Broad-leaved, Temperate Coniferous, Sub-alpine Woody Shrub, Alpine Meadow, Bamboo brakes, and Grasslands.

This region is crucial for all biodiversity, especially globally threatened and near threatened species. At least six globally threatened (three Endangered and three Vulnerable) mammal species are found in this region – an Important Bird Area.

About 600 bird species have been recorded from this region, which is about 56% of the total number of bird species of India. Among these, 19 are globally threatened (04 Critically Endangered, 02 Endangered and 13 Vulnerable) and 10 Near Threatened. This makes the area very important for the conservation of globally threatened bird species. It also has three rare restricted-range endemic bird species.

A group of scientists have appraised the ‘Wildlife Conservation Plan for the impact zone of Etalin HEP,

Globally Threatened and Near Threatened mammal species

Species	Global IUCN Status
Hoolock Gibbon <i>Bunopithecus hoolock</i>	EN
Red Panda <i>Ailurus fulgens</i>	EN
Bengal Tiger <i>Panthera tigris</i>	EN
Leopard <i>Panthera pardus</i>	VU
Mishmi Takin <i>Budorcas taxicolor taxicolor</i>	VU
Chinese Goral <i>Naemorhedus griseus</i>	VU
Himalayan Serow <i>Capricornis thar</i>	NT
Asian Golden Cat <i>Catopuma temminckii</i>	NT
Marbled Cat <i>Pardofelis marmorata</i>	NT

EN: Endangered; VU: Vulnerable; NT: Near Threatened

Dibang Valley District, Arunachal Pradesh’ prepared by Wildlife Institute of India and found it lacking. Though the document claims that it was a multi-seasonal replicate study, the survey was done for a brief period of five months, therefore it falls short of being a comprehensive review of the area (‘The Devil is in the Detail: Peer-review of the Wildlife Conservation Plan by the Wildlife Institute of India for the Etalin Hydropower project, Dibang Valley, Sheth *et al.* 2020). It is also pertinent to note that



Bengal Tiger



Red Panda

Globally Threatened and Near Threatened bird species

Species	Global IUCN Status
Bengal Florican <i>Houbaropsis bengalensis</i>	CR
White-rumped Vulture <i>Gyps bengalensis</i>	CR
Slender-billed Vulture <i>Gyps tenuirostris</i>	CR
Red-headed Vulture <i>Sarcogyps calvus</i>	CR
Greater Adjutant <i>Leptoptilos dubius</i>	EN
Black-bellied Tern <i>Sterna acuticauda</i>	EN
Swamp Francolin <i>Francolinus gularis</i>	VU
Chestnut-breasted Partridge <i>Arborophila mandellii</i>	VU
Blyth's Tragopan <i>Tragopan blythii</i>	VU
Slater's Monal <i>Lophophorus slateri</i>	VU
Swamp Francolin <i>Francolinus gularis</i>	VU
Rufous-necked Hornbill <i>Aceros nipalensis</i>	VU
Pale-capped Pigeon <i>Columba punicea</i>	VU
Lesser Adjutant <i>Leptoptilos javanicus</i>	VU
Rusty-bellied Shortwing <i>Brachypteryx hypertyra</i>	VU

Species	Global IUCN Status
Beautiful Nuthatch <i>Sitta formosa</i>	VU
Marsh Babbler <i>Pellorneum palustre</i>	VU
Jerdon's Babbler <i>Chrysomma altirostre</i>	VU
Black-breasted Parrotbill <i>Paradoxornis flavirostris</i>	VU
White-cheeked Partridge <i>Arborophila atrogularis</i>	NT
Yellow-rumped Honeyguide <i>Indicator xanthonotus</i>	NT
Great Hornbill <i>Buceros bicornis</i>	NT
Ward's Trogon <i>Harpactes wardi</i>	NT
Blyth's Kingfisher <i>Alcedo hercules</i>	NT
White-tailed Sea-eagle <i>Haliaeetus albicilla</i>	NT
Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	NT
Great Thick-knee <i>Esacus recurvirostris</i>	NT
River Lapwing <i>Vanellus duvaucelii</i>	NT
Red-breasted Parakeet <i>Psittacula alexandri</i>	NT

CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Near Threatened

even the Environment Impact Assessment of the project was found lacking by the Forest Advisory Committee, Ministry of Environment, Forest and Climate Change.

According to a study conducted by researcher Dr Sahil Nijhawan, six different colour morphs of the

Asian Golden Cat were found through camera traps in Dibang. These include golden, grey, cinnamon, melanistic, ocelot, and one with tightly spaced rosettes. The findings have been published in *The Scientific Naturalist* ("Does polymorphism make the Asiatic Golden Cat the most



Black-breasted Parrotbill



Beautiful Nuthatch

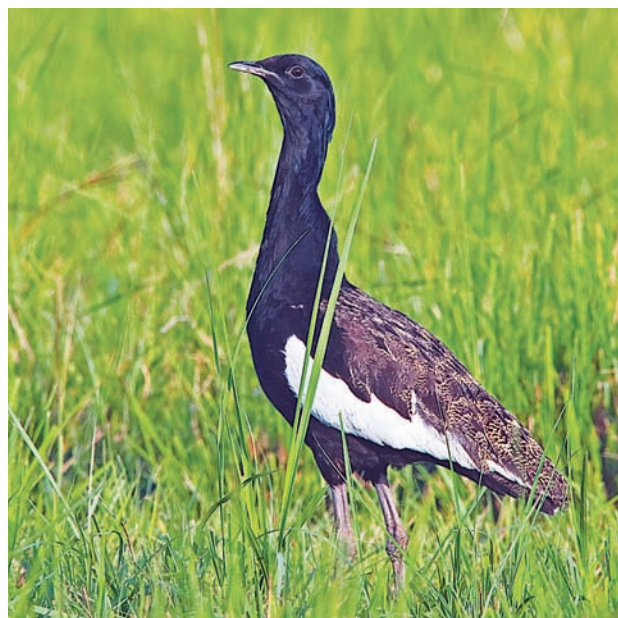
adaptable predator in the Eastern Himalayas?', Nijhawan *et al.* 2018).

It is evident that infrastructure development for the Etalin Hydropower Project at such a large scale will have an irreversible negative impact on the district's fauna, as there is significant overlap between key areas for several endangered species and the sites demarcated for construction of the project. Also, the impacts of this project downstream will be significant as it will alter the hydrology and introduce silt, debris, and other pollutants into the river.

Major Concerns

- This project is in a seismically active zone of the Himalaya (Zone V) – four earthquakes, occurring with decadal frequency, have been reported in Tangon River basin since the 1980s. This makes the area vulnerable to natural disasters, threatening not only the life of people downstream, but also large areas in the Brahmaputra flood plains.
- The project requires 1,165.66 ha of land for actual construction, however, the area of land that will be submerged is not mentioned in the report. The project entails two dams, Dri Limb (101.5 m in height) and Tangon Limb (80 m in height). Together they account for a huge area which will undergo complete submergence.
- This region falls under IUCN management categories III, IV, Endemic Bird Area, Important Bird Area, Global Biodiversity Hotspot, and Key Biodiversity Area, indicating its importance at the global level. In fact, there is more biodiversity in this area than elsewhere in the country.
- The scale of the project indicates generation of large volumes of debris. The report fails to mention the plan for disposal of the debris created during excavation and construction. If the debris is disposed of inappropriately, it will have a significant ecological impact on the entire Dibang River basin.
- The project will certainly block upstream migration of fishes and other associated lotic organisms. This will have an irreversible impact on fish diversity and fish-dependent livelihood of people.
- The conclusion that the area is not significant from a wildlife perspective and that the diversion will have negligible impact on species is misleading, and has not been ascertained by a systematic scientific evaluation.

The regional office of the MoEF&CC in its site inspection report had not recommended the proposal



Bengal Florican

in the present form for forest clearance. It had raised concerns that the enumeration of the trees has not reflected the ground reality, as huge trees (old-growth) are not reflected in the final list. However, the Cabinet has given a nod for the project. The matter is now being considered by the Forest Advisory Committee.

In 2021, India took a leadership role at the United Nations Framework Convention on Climate Change, where it agreed to the Glasgow Climate Pact of 2021.

The mitigation aspect of the Glasgow Climate Pact states:

'Emphasized the importance of protecting, conserving and restoring nature and ecosystems, including forests and other terrestrial and marine ecosystems, to achieve the long-term global goal of the Convention by acting as sinks and reservoirs of greenhouse gases and protecting biodiversity, while ensuring social and environmental safeguards'

In a biodiversity-rich area, the entire thrust of the Forest Advisory Committee should be to avoid diversion of forest land. Since India is committed to the 2021 Glasgow Pact for reducing deforestation and adding additional forest areas, the first task of the Forest Advisory Committee should be to protect the area in accordance with the National Forest Policy 1988.

The role of such places in climate stabilization, and species conservation cannot be undermined. The submergence of such a pristine forest and its biodiversity will be an absolute national tragedy and a loss of an unprecedented scale. For these reasons, BNHS has strongly recommended that the project be rejected.



Power lines dotting the oran landscape are no longer safe spaces for its rare and diverse wildlife

Deg Rai Mata Oran and the Great Indian Bustard

Rajasthan's *orans* (local term for sacred groves) are the lifelines of the desert. "Several villages in Rajasthan are attached to an oran. Every oran houses secure water resources like lakes and tanks, and doubles up as grazing grounds for livestock," says Dr Asad Rahmani, former Director, BNHS. "In return, the villagers safeguard the biodiversity within it." Preserved and untouched over generations, orans are genetic storehouses of the native vegetation and secure homes for wildlife. However, today, with power lines and green energy projects dotting the landscape, the orans are no longer safe spaces for their rare and diverse wild residents.

Deg Rai Mata Oran, in the Thar desert, is one of Rajasthan's largest sacred groves, and also a Great Indian Bustard (GIB) habitat where BNHS has been working actively for some time now. It is a matter of great concern that many birds, including GIB, have died here due to collision with wires laid for new renewable energy projects.

BNHS has worked with Legal Initiative for Forest and Environment (LIFE) to provide inputs for an ongoing court proceeding, in which residents of the Oran are fighting against the installation of a solar plant power line. We have been reading and updating submissions to various stakeholders through our own research findings

and network. The Supreme Court passed an order in April 2021 directing that electric lines in potential and existing GIB habitat be put underground or mitigated. Following this, BNHS and The Corbett Foundation issued a joint statement in support of this visionary order. Next, we worked in consultation with Wildlife Institute of India on a report on GIB and the impacts from renewable energy projects, and the violations of the court order, and made that available to the Supreme Court instituted committee that was tasked with advising on taking the power lines underground. In another order this year, the Supreme Court has reiterated its April order. We are now monitoring the situation on the ground and will continue to give inputs to various stakeholders. ~



Neha Sinha heads Conservation and Policy at BNHS, and is the author of *WILD AND WILFUL – TALES OF 15 ICONIC INDIAN SPECIES*

@ CEC-Nagpur

Teachers' Meet Summer Nature Camps



School teachers from Chandrapur district participated in the meet

CEC-Nagpur arranged a teachers' meet on April 29, 2022, in the Agarzari campsite of Tadoba Andhari Tiger Reserve. Headmasters and teachers from 34 high schools in Chandrapur district participated in this full-day programme. BNHS has selected 50 middle schools in Chandrapur district for conservation education programmes this year. Sanjay Karkare, Asst Director, shared information about BNHS and its activities which are conducted in the Central Indian landscape. Education Officer Sampada Karkare spoke about the importance of conservation education for students and for the community peripheral to the tiger reserve.

Shri G. Guruprasad, Tadoba Andhari Tiger Reserve DCF (Buffer) inaugurated an exhibition of camera trap photos obtained while introducing students to new technologies used in wildlife management, like GPS, camera traps, and drones. The teachers visited the tiger reserve for a safari. This project is supported by Born Free Foundation, UK. Mr Yash Dalmiya, SLTP coordinator for Born Free Foundation was present at the event.



Students and teachers participated in seed ball making

CEC-Nagpur conducted summer nature camps from May 6–12, in nine peripheral schools of Chandrapur, Bramhapuri, and Central Chanda division to encourage students to participate in activities related to nature and teach them the importance of biodiversity.

A total of 250 students, along with teachers, participated. Seed ball making and bird nest making were the main activities conducted. Students were provided seeds of Indian Laburnum and asked to collect seeds of Tamarind to make the seed balls. A total of 2,000 seed balls were prepared by the students; the seed balls will be thrown in the buffer area of Tadoba Andhari Tiger Reserve during monsoon. The students were shown how to make nest boxes from old shoe boxes, and to install them outside their homes to attract sparrows. Shri Dhananjay Pathak, a senior artist from Nagpur, taught the students to make beautiful placards. Earthen pots were distributed to the students to keep water for the birds during summer. The summer camp was supported by Axis Bank Foundation.

@CEC-Delhi: Restoration of Aravalli Forest Centre

BNHS in collaboration with All India Women's Conference and Lady Irwin College initiated a month-long rewilding programme in the Aravallis. The programme started with a short walk through the growing facility, to understand the plants and the habitats in the forest. The collaborators studied the plan and work on assistive regeneration executed by BNHS at Asola Bhatti Wildlife Sanctuary, in partnership with Department of Forests

& Wildlife GNCT of Delhi. The focus of this study was audit of the site where removal of invasive species like Lantana and Vilayati Keekar had been done. Such measures form the backbone of any restoration project, as these invasive species pose a grave threat to the native biodiversity of a forest.

The month-long programme also included activities like seed ball workshop, butterfly park visit, lake drive,



Volunteers actively participated in rewilding of the Aravallis

nature walk, story-telling on trees, and artwork on the native flora of Aravallis. During the programme, over 1,000 saplings of 20 native plant species like Jungli Moringa *Moringa concanensis*, Shahtoot *Morus alba*, Gamhar *Gmelina arborea*, Kanthari *Capparis sepiaria*, Gangeti *Grewia tenax*, Jhadber *Ziziphus nummularia*, and Vajradanti *Barleria prionitis* were planted. Over 500 seed balls of Bistendu *Diospyros cordifolia* and Jungli Karonda *Carissa spinarum* have been prepared.

Forest Range Officer Trainees visit Hornbill House



Capt Mandar Salaye addressed the Trainee Officers

On April 6, 2022, 57 Officer Trainees (including seven lady officers) of the 17th Forest Range Officers Induction Course (2021–23) from Odisha Forest Rangers' College, Angul, visited Hornbill House during their tour of central and western India – an integral part of their course curriculum.

Capt. Mandar Salaye, Deputy Director, HR & Administration, introduced BNHS and its work to the group. The Officer Trainees were taken around the BNHS Natural History Collection Department. This was followed by talks on the importance of the Collection and how BNHS maintains this valuable resource. Saunak Pal, Scientist 'B', spoke about some interesting bird specimens; Neha Mujumdar, Scientist 'A', on insect specimens; and Vinod Patil, Jr Zoological Assistant, on bird specimens. The group also visited the BNHS library.

Resuming Members' Programmes at Hornbill House



(L-R): Mr Debi Goenka, Mr Robert D'souza and Dr Bivash Pandav, Director

On May 17, 2022, after a long break, BNHS resumed members' programmes at Hornbill House. Robert D'souza, a Life Member of BNHS and alumnus of IIT Mumbai, Powai with a Masters in Technology presented his experiences about camouflage, mimicry, and warning coloration with the help of photographs taken by him over the years.

On June 03, 2022, Mr Kishor Rithe, Member of the BNHS Governing Council, spoke about his decades of experience in wildlife conservation. Mr Rithe has been working on environmental education programmes, training, wildlife conservation, community development, alternative livelihoods, as well as advocacy and policy making at the local, state, and national levels for over 30 years. The talks were streamed live for those who could not attend in person.

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"Become a BNHS member and
be a part of our conservation
movement. Let us together
protect India's rich biodiversity."



FOR DETAILS ON MEMBERSHIP PLANS

Write to: Membership Department

Hornbill House, Dr. Sálim Ali Chowk, S.B. Singh Road, Mumbai - 400 001, Maharashtra, India.

Tel: 91-22-2282 1811 (Board) | Fax: 91-22-2283 7615

Email: membership@bnhs.org | Website: www.bnhs.org



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Our founder Abheraj Baldota's core operating principle was 'I am not the owner of wealth, but a privileged trustee to serve the community with it'. Thus it is no surprise that ESG practices are ingrained in our corporate ethos, business strategy and operations since our birth in 1961.

We were the first Indian unlisted company to publish a GRI compliant sustainability report way back in 2006. We are a large producer of renewable power in India. We were also the first mining company in India to get certified for OHSAS 18001:1999 and ISO 14001:2004. Across the years, we have invested more than ₹820 Crore in ESG. From building blood banks to adopting villages and combating climate change, we have been practicing ESG long before it became a buzzword.



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