

HORNBILL

DISCOVER THE LIVING WORLD

JULY-SEPTEMBER, 2024



BNHS
India
CONSERVING
NATURE SINCE 1883

BOMBAY NATURAL HISTORY SOCIETY

BASIC COURSE IN FIELD ORNITHOLOGY AND BIRD MIGRATION STUDIES

ABOUT THE COURSE

This course aims to build a network of birders and ringers to support bird monitoring and conservation along the Central Asian Flyway. It offers hands-on training in bird population monitoring, including bird counts and tracking through marking. Classroom sessions will cover bird migration study techniques to enhance participants' knowledge of migration patterns and monitoring methods.

Venue: BNHS Bird Migration Study Centre, Point Calimere (Kodiyakarai), Tamil Nadu

Resource Persons: Dr S. Balachandran, Dr P. Sathiyaselvam, Mr S. Sivakumar, Mr Paul Antony B and Ms Rose Francis

Topics Covered: Bird Identification; Counting Techniques; Migration and Flyways; Global Importance of Bird Marking Studies

Field Trips: Great Vedaranyam Swamp, Point Calimere Wildlife Sanctuary, Siruthalaikadu Mudflats and Beach

REGISTRATION DETAILS:

Fee: ₹ 10,000 (₹ 9,000 for existing BNHS members)

Includes tent accommodation (two people per tent) with cots, fans, charging points, pillows, blankets food, field visits, entry fees, etc.

Eligibility: Open to all, no age limit. Anyone with an interest is welcome to participate.

Registration Deadline: Closes 7 days before the start of each batch To join us, please fill out the [Enquiry Form](#). Payment details will be provided upon confirmation of registration.

Contact Us: Mr S. Sivakumar: s.swaminathan@bnhs.org | 94088 72745; Mr Paul Antony B: p.antony@bnhs.org | 89511 06860

COURSE SCHEDULE (2024–2025):

- Batch VII : December 13 – 15
- Batch VIII : December 20 – 22
- Batch IX : January 10 – 12
- Batch X : January 18 – 20
- Batch XI : January 24 – 26

**Join us for this
incredible opportunity to
engage in bird conservation and
gain hands-on experience in ornithology!**



BOMBAY NATURAL HISTORY SOCIETY
Hornbill House, Dr Sálím Ali Chowk,
S.B. Singh Road, Mumbai 400 001,
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Editors

Kishor Rithe

Vibhuti Dedhia

Consultant Editors

Bharat Bhushan

Gayatri W. Ugra

Isaac Kehimkar

Editorial Assistant

Sonali V. Vadhavkar

Design & Layout

V. Gopi Naidu

Sanchita S. Kadge

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by Mandar Datar

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For more information on the Society
and its activities,

write to the Honorary Secretary,
Bombay Natural History Society,
Dr Sálím Ali Chowk, S.B. Singh Road,
Mumbai 400 001, Maharashtra, India.

Tel.: (91-22) 2282 1811

Fax: (91-22) 2283 7615

E-mail: info@bnhs.org

Website: www.bnhs.org

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Human actions often have unforeseen consequences. While we fragment forest habitats, our bridges have the opposite effect – they enable both humans and animals to cross. When animals use these bridges, they can reach the territories of related species, creating opportunities for interbreeding. **Asad R. Rahmani** reminds us, “As we grapple with the challenges of conservation in an increasingly interconnected world, we must be mindful of the delicate balance we strive to preserve.”

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Kokkare-Bellur in southern India is home to a vibrant heronry where waterbirds adorn the landscape. **Aksheeta Mahapatra** had the extraordinary opportunity to witness the intimate courtship rituals of painted storks up close. This is the story of one particular pair, whose journey she followed throughout the breeding season.

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Editorial...

I recently returned from Ladakh, where the black-necked cranes have migrated to their wintering range, which includes parts of southern China and Bhutan. Brown bears are busy gaining weight in preparation for hibernation as winter approaches. The northern high-altitude landscapes of India – particularly the Union Territory of Jammu & Kashmir and Ladakh, along with the state of Himachal Pradesh – are unique in their rich biodiversity. You can appreciate this through the article “Wild Symphony of Pheasants”, which explores koklass and cheer pheasants in the Shimla Water Catchment Wildlife Sanctuary in Himachal Pradesh. Researchers Rupali Thakur and Deputy Conservator of Forests N. Ravishankar Sarma highlight important aspects of this high-altitude sanctuary.

Primates have always fascinated humans, including common langurs and macaques. Dr Asad Rahmani, former Director of the Bombay Natural History Society (BNHS), who travelled extensively in India to study floricans and bustards, also fell in love with the golden langurs of Assam. He recounts his most unforgettable journey in 1985, crossing the Sankosh River in Assam’s Manas National Park and encountering the golden langur. He reminds us that human actions for development often have unforeseen consequences, such as fragmenting forest habitats. However, certain linear infrastructure projects without wildlife mitigations can also facilitate wild animal movements, albeit with great risks to their life. Dr Rahmani aptly notes, “As we grapple with the challenges of conservation in an increasingly interconnected world, we must be mindful of the delicate balance we strive to preserve.”

Waterbird populations respond to the status of their habitats. In spite of several threats, some habitats in India show improvements in their management. Kokkare-Bellur in southern India, for example, hosts a vibrant heronry where waterbirds thrive. In her article “Whispers of Affection”, Aksheeta Mahapatra, a Ph.D. scholar at the Wildlife Institute of India, explores the captivating courtship rituals of painted storks. Combining her research, conservation expertise, and community engagement, she follows the journey of a particular pair throughout the breeding season, offering insights into protecting waterbirds and their habitats.

Hornbill readers eagerly await reviews of new publications. This time, M.R. Maithreyi’s review of *BURNING BRIGHT* by Harnihal Singh Sidhu will encourage you to explore the book. Another highlight is *THE BEAUTIFUL MAMMALS OF INDIA* by BNHS Life Member Nelson Rodrigues, reviewed by Anwaruddin Choudhury. Additionally, *A TRYST WITH NATURE: LABOUR, SELF, AND LANGUAGE* by Savyasaachi, reviewed by Ambika Aiyadurai, will further nurture your love for nature.





We invite you to contribute to the BNHS 150 Years Omnibus of Natural History – *Systema Naturae*. Please submit your articles, field notes, and photographs to the Editors of *Hornbill* at systema150@bnhs.org. Contributions can range from in-depth research on species or ecosystems to brief notes on behaviour or conservation concerns observed in the field. Photographic documentation, whether professional or amateur, adds a valuable visual dimension to your work, capturing the beauty and complexity of our natural world.

This issue also features articles such as “Dancing Cranes and Declining Wetlands: The Story of Sarsai Nawar” by BNHS researcher Omkar Joshi, “Chambal Badlands” by our scientist Parveen Shaikh, and “A Lifelong Affair with Odonates” by Neha Mujumdar. These articles exemplify the depth and quality expected for *Systema Naturae*.

You will also find interesting observations about the recent sighting of a blue-and-white flycatcher by Sachin Pawar and insights about a baza by Vijaya Bharat in the Readers’ Space.

Since the December 2023 issue, we have introduced a page from the diary of a BNHS scientist/researcher. These entries spotlight the hard work of BNHS researchers, often unrecognized and underappreciated. In this issue, “A Day in Tadoba with Vultures and Tigers” by young biologist Bhanu Pratap Singh will surely inspire others to join BNHS as biologists or volunteers and contribute to wildlife conservation.

We also pay tribute to former BNHS scientist Dr Robert Grubh (April 26, 1943 – September 25, 2024). *Hornbill* remembers his invaluable contributions, including the major project “Ecological Study of Bird Hazards at Indian Aerodromes” (1981–1989) and his tenure as a Governing Council member from 2000–2002 and 2010–2012.

For the past year, I have been sharing conservation notes focusing on high-priority concerns. This issue addresses the conservation of marine megafauna, particularly efforts to prevent whale and dolphin strandings on the west coast. We highlight the probable causes, potential solutions, and BNHS initiatives like collecting sighting data through a mobile application – JALCHAR, which is available on Play Store. We hope you will join and support these crucial conservation efforts.

Enjoy reading this issue!

Kishor Rithe

Monkey with a Golden Fleece

Text: Asad R. Rahmani

Working with floricans and bustards took me to many corners of India. One of the most unforgettable journeys was crossing the Sankosh River in Assam's Manas National Park in 1985. This adventure led us into Bhutan, where we sought

out the fabled “monkey with the golden fleece” – the golden langur, as it is locally known. Accompanied by Usha Lachungpa and Ravi Sankaran, our venture into Bhutan not only revealed the nation's deep conservation ethos but also its unmatched hospitality.

Before dawn, our Bhutanese hosts, undisturbed by the early hour, guided us to a troop of golden langurs. The monkeys, serenely nibbling on tender leaves, observed us with curious eyes, confident in their sanctuary. For an hour, we watched as a group of 20, spanning all ages, moved gracefully through the trees. Mothers cradled their young, while juveniles energetically leapt from branch to branch. It was a magical experience, set against the rising sun, a deep dive into the heart of wildlife. But soon, it was time to return to India. I believe it was my second ‘foreign’ trip – and that too, without a visa!



ASAD R. RAHMANI

➤ Raimona NP,
February 18, 2024

Why the Name ‘golden langur’?

The epithet ‘golden langur’ is derived from the monkey’s stunning coat, a radiant golden-orange during the breeding season, glowing in the soft light of dawn and dusk. Photographers and naturalists alike find its beauty breathtaking, especially when the morning sun casts a backlit glow on its coat. The langur’s allure remains undiminished even outside the breeding season, when its coat shifts to a more muted offwhite.

The golden langur is one of India’s last large mammals to be formally recognized by science. In 1956, Dr H. Khajuria of the Zoological Society of India described this remarkable animal based on six specimens in the *Annals and Magazine of Natural History* (Vol. 9, Issue 98: 86–88.). The discovery of the golden langur has a fascinating backstory that deserves to be told.

Dr Khajuria noted in his paper, “It is noteworthy that, although the species is quite common and has been observed by visitors for some time, it has curiously escaped the notice of many collectors who collected extensively in Assam.” Interestingly, the visitor’s book at the Raimona Forest Rest House contained numerous observations of this langur, yet it had eluded official collection by the Bombay Natural History Society’s Mammal Survey.

Edward Pritchard Gee, a British tea planter and hunter-turned-naturalist based in Assam, first brought attention to the species in the early 1950s, delivering a lecture at the Zoological Society of London in 1954 and publishing an article in the *Journal of the Bombay Natural History Society* (*JBNHS*) in 1955. However, sightings of the species date back to 1838 when Robert Boileau Pemberton reported a certain Griffith observing these monkeys near Tongso in central Bhutan. Unfortunately, Pemberton’s account was forgotten until the 1970s. E.P. Gee might not have been aware of this earlier documentation or mentions by other naturalists like Edward Osborne Shebbeare, a British naturalist, mountaineer and forest officer in the Imperial Forest Service, retired as Chief Conservator of Forests of Bengal, who referred to ‘cream-



ASAD R. RAHMANI

Golden Langur

coloured langurs,’ or Thomas Caverhill Jerdon, Scottish (British) physician, zoologist, botanist, ornithologist, and naturalist, who wrote about a langur variety, distinct from the common langur in Assam’s terai forests, occurring in the jungles of the terai in Assam. Incidentally, William Thomas Blandford and Eugene William Oates, famed for starting *FAUNA OF BRITISH INDIA* series in 1889, considered golden langur as a subspecies of common langur *Presbytis entellus*.

Gee’s note in the *JBNHS* in 1954 was not considered an official species description since no specimen was collected and deposited in a museum. According to the International Code of Zoological Nomenclature, the protocol for scientific naming requires type specimens to be collected and housed in a recognized museum, ensuring the species name is universally accepted. Dr Khajuria fulfilled this requirement, collecting six specimens: one adult male, one subadult male, three adult females, one young one, and scientifically describing the species. He graciously named it *Presbytis geei* in honour of Gee. Later, the species found its place in the genus *Trachypithecus*, aligning it with other lutungs, langurs, and leaf monkeys of Southeast Asia. It is sometimes referred to as Gee’s golden langur.

A Journey Across Borders

The golden langur's habitat spans approximately 30,000 sq. km across India and Bhutan, with its range defined by natural boundaries such as rivers and forests. Its distribution is confined by the Black Mountains in Bhutan to the north, the Sankosh River to the west, and the Manas River to the east. The mighty Brahmaputra River marks its southern boundary, limiting its range.

According to Dr Anwaruddin Choudhury, "The golden langur is fairly widely distributed in the evergreen and semi-evergreen forests of south-central Bhutan, with its stronghold in the Black Mountains." He further notes in a 1989 *Oryx* article that in Assam, the langur's range is limited by the Sankosh and Manas rivers, but in Bhutan, these rivers do not pose barriers, allowing the monkeys to inhabit both banks and the ravines of their tributaries.

In India, western parts of Manas were once known for golden langurs, but the newly established Raimona National Park in Kokrajhar district is now perhaps the best place to see

them. On February 18, 2024, I spent the day in Raimona NP with Dr Hillolyoti Singha of Bodoland University and Bablu Dey of the Forest Department. We observed 5–6 troops of golden langurs, locally called '*mukbra gupur*' (*mukbra* = monkey; *gupur* = white). Protected by socio-religious beliefs, these langurs showed no fear of humans, allowing us to observe their leaf-eating, playful juveniles, and the protective behaviour of mothers wary of a large male rhesus monkey. The langurs moved fluidly through the tree canopies, always alert to their companions and any signs of danger.

Interestingly, Raimona was where Edward Pritchard Gee first identified these langurs during a visit to Jumdur Bungalow in the late 1940s. It was also here that Dr Khajuria collected his specimens. Gee noted that the langurs in the area had a distinctive golden sheen to their fur. In his book *THE WILDLIFE OF INDIA*, (p. 169) Gee writes, "From time to time in the later forties and early fifties, I had been told about the existence of these cream-coloured langurs near the Sankosh River. So, I decided to visit Jumdur and find out



ASAD R. RAHWANI

Golden Langur being fed by pilgrims

if these monkeys were a new species or not”. He further adds, “In November 1953, I visited Jumdur and was delighted to find two troops of these golden langurs on the east side of the river, close to Bhutan.”

On February 18, 2024, I revisited Jumdur. Sadly, the historic bungalow had been burnt down during the Bodo agitation in the early 1990s, along with the register recording old hunting records. The site is now dominated by an unremarkable concrete structure, masking the place’s historical significance.

Golden langur Beyond Borders

Chakrashila Forest, covering about 50 sq. km, is another excellent place to see golden langurs. Kakoijana Reserve Forest, around 18 sq. km near Abhayapuri in Bongaigaon district, Assam, hosts about 450 golden langurs. However, the future of isolated troops in Kokrajhar district’s small, fragmented forests remains uncertain due to increasing human pressures.

In 1984, the golden langur was introduced to Peacock Island in the Brahmaputra River near Guwahati, where the famous Umananda Temple is located. Like other temples in northern India where grey langurs or macaques are fed by pilgrims, Umananda had a small troop of golden langurs. I visited the island about 15 years ago and saw 5–6 animals in poor condition, likely due to inbreeding or an unhealthy diet, or both. The last individual, a male, died in February 2020, 36 years after the species was introduced to the island.

In another out-of-range introduction, golden langurs were released into the wild in Tripura’s forests in 1988. One of the groups, released into Sepahijala Wildlife Sanctuary, has survived and adapted. However, such introductions run counter to the ethos of wildlife conservation, particularly when the species is doing reasonably well, with over 7,400 individuals in India, according to the latest census.

In Bhutan, the golden langur is fully protected in three areas: Royal Manas National Park (1,033 sq. km), Phibsoo Wildlife Sanctuary (266 sq. km), and Jigme Singye Wangchuck



Golden Langur in its natural habitat

National Park (1,723 sq. km). Despite this, threats remain from habitat fragmentation due to roads and dams, and occasional deaths by electrocution. A more insidious threat is hybridization with the capped langur *Trachypithecus pileatus*.

Millions of years ago, when the Indian Plate collided with the Himalaya, a small population of capped langurs became isolated by the large rivers mentioned earlier, leading to the evolution of the distinct golden langur. However, recent human activities, such as building permanent bridges across the Chamkar Chhu, a tributary of the Mangde Chhu in Bhutan, have allowed the capped langur to cross into golden langur territory, leading to hybridization. Bhutanese researchers have reported fertile hybrids between the two species in a 350 sq. km zone in Zhemgang district, which breed among themselves and with both parent species.

Human Actions and Conservation

Sometimes, the consequences of human actions are unpredictable. We know that roads



Jamdur Anti-poaching camp, in Raimona

fragment forest habitats, with wider roads posing more significant barriers for animals. But bridges on large rivers have the opposite effect, enabling both humans and animals to cross. When animals cross bridges, they can reach the territories of related species and interbreed. Without the bridge over the Chamkar Chhu, the golden langur would have remained safe from hybridization.

The loss of Raimona Forest Rest House, where Gee wrote about the golden langur, and the tragic fate of Jumdur Bungalow, where the golden langur was discovered, are sobering reminders of the lasting impact of our actions. The golden langur itself, with its ethereal beauty, is a symbol of nature’s fragility and the consequences of our intervention. As we grapple with the challenges of conservation in an increasingly interconnected world, we must be mindful of the delicate balance we strive to preserve.

A study in March 2024 by five organizations, the Primate Research Centre NE India, Assam Forest Department, Bodoland Territorial Council, Sâlim Ali Centre for Ornithology and Natural History (SACON), and Conservation Himalayas, revealed that India is home to about 7,400 golden langurs, with Bhutan’s population estimated between 4,000 and 6,600. A 2013 study in *Primate Conservation* (Vol. 27: 77–83), suggested Bhutan’s

population could exceed 6,600 bringing the total in India and Bhutan to around 14,000 individuals.

Is the species thriving? Only long-term studies can tell. While the forests in Bhutan seem relatively intact, despite new roads, dams and bridges, the forests on the Indian side are fragmented and many small populations may not survive long. However, there is renewed hope with the establishment of Raimona National Park where previously neglected forests are now undergoing habitat restoration. It is hoped that the golden langur population will increase in Raimona. Fortunately, the species does not face significant targeted poaching due to socio-cultural factors. With increased focus on rewilding and wildlife corridors, the future of the golden langur could shine as brightly as its golden coat in breeding season. 🐼



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

The Wild Symphony of Pheasants

Text: Rupali Thakur and N. Ravishankar Sarma



VIVEK SARKAR

Koklass



NIKHIL CHOPALE

Cheer Pheasant

Pheasants are just beautiful birds with striking plumage. They are also vital indicators of environmental health. Because these birds are sensitive to changes in their habitat and the impacts of human activity and serve as early warning systems for ecosystem health. Their significance extends beyond ecology, as they hold deep cultural value in many local communities, celebrated for their vibrant feathers and mesmerizing displays.

However, despite their importance, there's still much we do not know about pheasants, largely due to the challenging terrains they inhabit. The Shimla Water Catchment Wildlife Sanctuary, located in the heart of the Shimla district, stands out as a key conservation area for the koklass pheasant. This sanctuary, with its temperate coniferous forests dominated by deodar trees and interspersed with a rich variety of oaks, spruces, firs, and medicinal plants, provides a perfect habitat for these birds. Spanning altitudes from 1,915 to 2,750 m and temperatures ranging from -4°C to 32°C , this sanctuary is a biodiversity hotspot that deserves our attention.

Both koklass and cheer pheasants are facing global population declines due to various threats, making conservation efforts within the sanctuary critical. Regular population surveys, like the one conducted

in June 2022, are essential for understanding their numbers and developing effective management strategies.

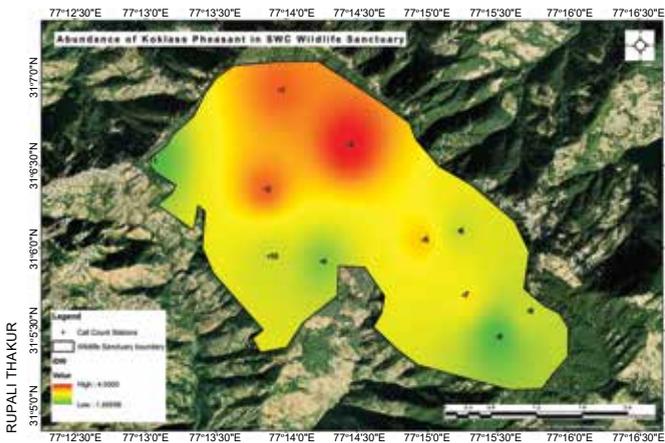
A Glimpse into Pheasant Populations: The June 2022 Survey

To estimate the populations of koklass and cheer pheasants, a survey was conducted over three days

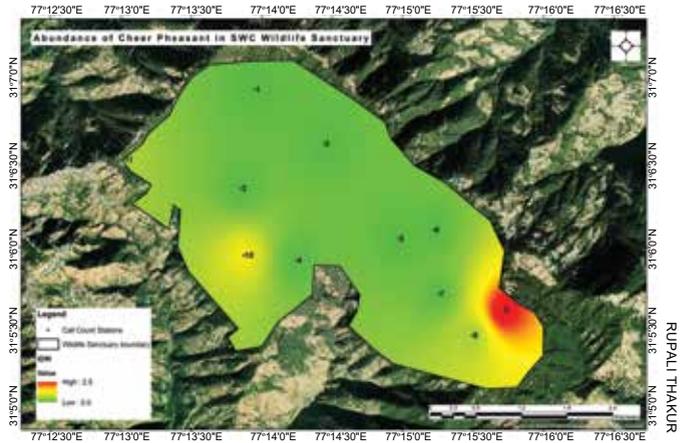


N. RAVISHANKAR SARMA

Shimla Water Catchment Wildlife Sanctuary



Abundance of Koklass Pheasant in Shimla Water Catchment Wildlife Sanctuary



Abundance of Cheer Pheasant in Shimla Water Catchment Wildlife Sanctuary

in June 2022 within the Shimla Water Catchment Wildlife Sanctuary. Researchers employed the call count method, a technique where the number of bird calls is recorded at specific stations. These stations were strategically placed along a 14-kilometre trail, ensuring coverage of the sanctuary’s diverse habitats.

The survey was conducted during the early morning and evening hours when pheasants are most vocal. Observers were stationed at 11 different points, each at least 500 metres apart, to listen for calls. Over the survey period, a total of 5 cheer pheasants and 28 koklass pheasants were recorded. While cheer pheasants were only heard at four stations, koklass pheasants were detected at all 11 stations, highlighting a stark contrast in their distribution.

The results were mapped, revealing specific areas where each species was most abundant. For cheer pheasants, the area around Kufri emerged as a hotspot, while koklass pheasants were more widely spread throughout the sanctuary. This data not only provides a snapshot of current populations but also serves as a baseline for future monitoring efforts.

The Road Ahead: Conservation and Beyond

The findings from this survey are promising, particularly the detection of cheer pheasants, which were scientifically recorded for the first time in this sanctuary. The data collected is a crucial step toward establishing a long-term monitoring programme that can track population trends over time.

Moreover, this information is invaluable for understanding how climate change might be affecting these birds. As temperatures rise, species may shift to higher altitudes in search of suitable habitats. By continuing to monitor pheasant populations and their habitats, conservationists can better understand these shifts and develop strategies to protect these species in a warming world.

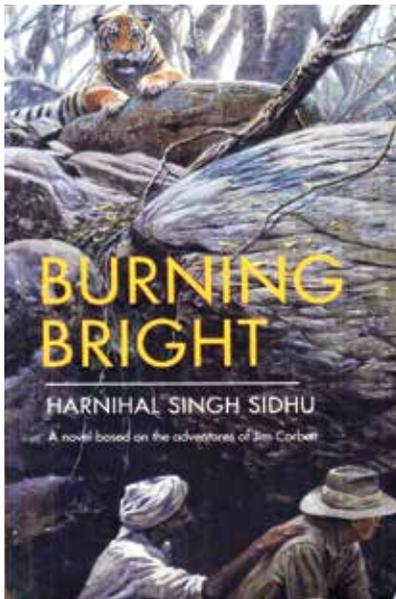
In essence, the work being done in the Shimla Water Catchment Wildlife Sanctuary is about more than just counting birds. It’s about preserving a delicate balance in nature, safeguarding cultural heritage, and ensuring that these majestic creatures continue to thrive for generations to come.



Rupali Thakur, Project Associate at the Wildlife Institute of India, holds a Master’s in Wildlife Conservation. She is interested in studying mountain landscapes, ecology, culture, and human dimension, particularly in the Western Himalaya.



N. Ravishankar Sarma, from the 2019 batch of the Indian Forest Service, previously served as the Deputy Conservator of Forests for the Shimla Wildlife Division. He is currently posted as the Deputy Conservator of Forests for the Rohru Forest Division.



Burning Bright

By: Harnihal Singh Sidhu

Published by: Natraj Publishers, 2021

Size: 20 x 12 cm

Pages: 304

Price: ₹ 499/-

Paperback

Reviewed by: M.R. Maithreyi

If Rudyard Kipling's stories from the Indian jungles were fiction, Jim Corbett's were factual accounts that sounded more like fiction. He shared unique relationships, not just with his co-workers and the locals, but even with the man-eaters he hunted. These stories continue to thrive, inspiring researchers to retrace Corbett's footsteps and writers to recount his adventurous life in the Kumaon region of today's Uttarakhand, India.

BURNING BRIGHT by Harnihal Singh Sidhu is one such fictional account based on Corbett's adventures. From the shotgun days (when young Jim had his first leopard kill at the tender age of ten) to his last double-barrelled rifle days (at sixty-three) when he shot the elusive and fearful Thak tigress, the book chronicles Corbett's journey as 'Carpet Sahib' and an adept hunter, with a keen sense of observation, a great love

for the jungles and empathy for all life forms, including the man-eaters of the United Provinces in British India that he was constantly summoned to kill. For instance, the dreaded Champawat man-eater, whom he silenced with his high-powered rifle and the help of no less than two hundred men for such was the indomitable power of the tigress that had killed hundreds of people.

Corbett did not rest with merely killing the animals; he sought evidence that may have led them to become man-eaters. Almost always, the evidence pointed to humans, whose actions had driven the cats to hunt human prey. In case after case, as the man-eaters flinch while biting the bullet, you flinch too. And when you learn that 'a killing had been unnecessary', as in the case of the Pipal Pani tiger, you flinch even more.

To the people around him, Corbett was not merely a saviour from man-eaters but also someone who helped them navigate a society full of hierarchies. As 'Carpet Sahib', the name given to him by railway workers, he exhibited a deep sense of fairness and justice. His interventions, while seemingly not confronting caste issues head-on, often dented societal norms. For instance, the way he made Chamari, an 'Untouchable', the headman of the coal gang.

At a time when cholera was dreaded and people from the 'lower' castes were the worst hit due to issues of caste pollution, Corbett personally attended to them, educating people that cholera was not a death sentence and did not discriminate among castes.

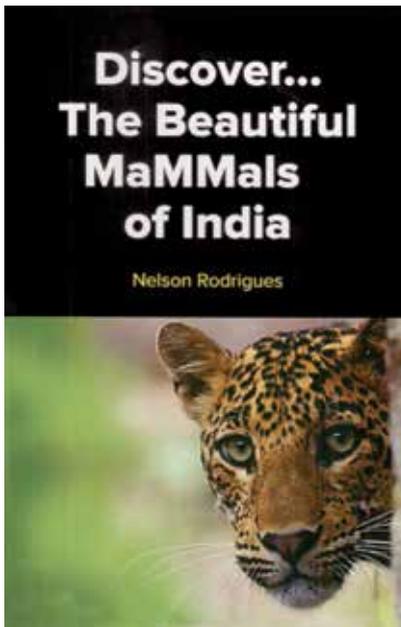
Corbett's deep faith in and respect for the jungles are best illustrated in one of Sidhu's recreations. When two children go missing in Choti Haldwani, Corbett's half-sister Mary Doyle fears the worst, imagining the children must have wandered into the jungle. Corbett debunks her fear, saying, 'the jungle is a safe place – for those who mind their

business', and indeed the children are found unharmed.

For someone who roamed the dark forests alone and unafraid, who picked up scents and recognized tigers from their pug marks, who spent nights on trees while the cats roamed close by, Corbett had his share of adventures bordering on the supernatural. At Champawat, while resting the night on a charpoy in a government bungalow, Corbett is aroused by an unfamiliar perfume, a 'hot jungle aroma'. From the door at the end of the charpoy, he hears a whisper in Hindi saying, 'Come with me...' He looks up to see a pair of 'black eyes in a beautiful face with a full-lipped smile', wearing 'a silk bodice and a blue sari', beckoning him to follow. Was it really an apparition or a figment of his imagination? Sidhu leaves it inconclusive, just as Corbett did in his writings.

The detailing is so vivid, the accounts so true to Corbett's writings that one forgets *BURNING BRIGHT* is meant to be a 'fictional account'. It slides like a camera lens, capturing details from Corbett's life to the end, when he turned to his pen and camera to recount his jungle lore, and later, the India he left behind.

Sidhu's urge to capture the man in full detail does not stop there. In the Afterword, he follows Corbett and his sister to Africa, where they established their new home and where Corbett eventually died. He retraces how Corbett's ideas of conservation found sanction from the Indian government, how Hailey National Park was renamed Corbett National Park, and how Corbett's cottage at Kaladhungi transformed into the Corbett Museum. Apart from Corbett's own account, numerous books have retraced his life and work. Sidhu's *BURNING BRIGHT* is yet another addition to this collection, indicating the enormous influence Corbett continues to wield even today. 🐾



**Discover... The Beautiful
MaMMals of India**

By Nelson Rodrigues

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Pages: 364

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Reviewed by:

Anwaruddin Choudhury

The foreword of this book is written by Dr A.J.T. Johnsingh, one of the most well-known authorities on Indian mammals. The book is authored by a dedicated nature enthusiast who states at the outset that the aim of this work is “to help people, especially the younger generation, discover and protect the wildlife of India.”

As the author notes, the text is straightforward, accompanied by approximately 600 photographs, which are sure to attract many wildlife enthusiasts. Most species

occurring in India have been covered, with the exception of bats and murid rodents, which are only partially addressed. Readers will appreciate the glimpse into Indian mammals, many of which are illustrated with multiple photographs. The text begins with common English and Latin names, followed by measurements and IUCN status. Brief accounts of different species cover their morphological features, ecology, and behaviour, with their range in India provided at the end. The photo reproduction is generally good. Another positive aspect is the acknowledgment of photographers by listing their names alongside the photos, which is preferable to the common practice of grouping all photographers’ names at the end, where they often go unnoticed – an injustice to the photographers.

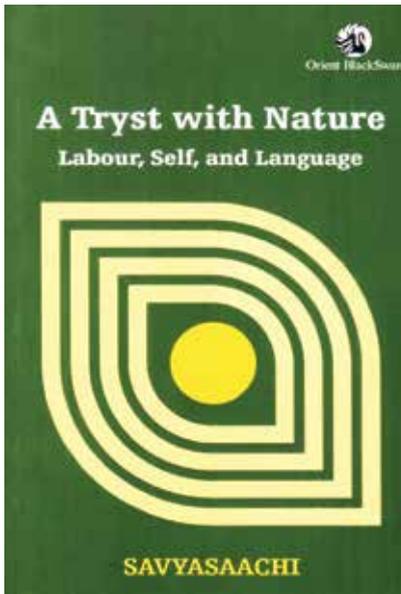
The book includes a short contents page, and also provides a species index with corresponding page numbers. This is followed by an alphabetical index with page numbers. However, some group names are inconsistently presented, such as “MACAQUE”, under which all macaque names appear without the suffix “macaque” (that is fine) but listing “Markhor Kashmir” under this section, caused some confusion. Similar issues arise in the sections for cats, foxes, hyenas, leopards, rats, squirrels, tahrs, and whales. The younger generation, one of the key audiences for this work, might mistakenly think that stoats or ermines are a part of the squirrel family. This could have been clarified with a slightly longer

contents page and by consolidating the indices, as there is another index of Latin names at the end (pp. 350–351).

The text is generally well-written. However, wherever specific quantitative data is used, the question of sourcing arises. For example, on page 200, the gestation period of the Indian pangolin is mentioned, as it is in several other instances. If citing references within the text is to be avoided, it would have been helpful to mention in the introduction that data on reproduction and other subjects are adapted from specific sources.

After the brief species accounts, there is an index of Latin names, followed by references. While not presented in the conventional format, this approach is acceptable for a book aimed at popular audiences. There is also a glossary and a list of photographers, though the latter might have been unnecessary since the photographers’ names already appear alongside their photos.

The quality of text printing and binding is satisfactory. This book is a valuable addition to the literature on the mammals of India. While there are very few editorial errors, some minor mistakes are present. For example, the red serow *Capricornis rubidus*, is listed as the Himalayan serow (pp. 92-93); wild yaks are incorrectly stated as being found in Arunachal Pradesh (p. 112); and wild buffalo herds are described as reaching up to 100 individuals. (p. 108). These errors stand out in an otherwise well-executed work of over 300 pages. 📖



A Tryst with Nature: Labour, Self, and Language

By: Savyasaachi
 Published by: Orient BlackSwan,
 2023
 Size: 21.5 x 14 cm
 Pages: xx + 203
 Price: ₹ 820/-
 Paperback

Reviewed by: Ambika Aiyadurai

This book addresses the question, “What is nature?” and explores its various meanings and values. The author highlights the challenges of understanding nature, noting how interpretations vary across communities, cultures, and regions. Savyasaachi, a former professor of Sociology at Jamia Millia Islamia University, New Delhi, draws on decades of engagement with the Koitor forest dwellers of Bastar, as well as other forest communities in Phulbani and Mayurbhanj, Odisha. The book eloquently discusses the contradictions and conflicts that arise from differing notions of nature.

Such clarity in writing is possible only through a deep engagement with theoretical frameworks and rigorous empirical research. The author also draws on his interactions with college students, government officials, NGOs, and activists.

Divided into seven well-crafted chapters, the book takes readers into the world of forests as perceived by the Koitor and other forest dwellers. It offers a unique perspective, helping us to see the forests through their eyes, lives, and bodies. The book explores the values Adivasis attach to the forests and land, contrasting these views of the 'modern' societies. Using numerous examples, Savyasaachi shows how both human and non-human beings in the forests are animated by “*jiwa*” – the life force generated by nature’s self-activity. For the Koitor, forests are both living spaces and shared spaces for humans and other beings. The book explicitly highlights the contradiction between how nature is understood in the laboratory and how it is experienced in diverse landscapes.

The concept of forest dwellers is based on the reflexive labour of embracing the diverse and multiple forms of nature present in forests and language. Moving beyond the romanticism of indigenous perceptions, the book reveals the contradictions and complementary ways in which the work of nature and the labour of forest dwellers rejuvenate the forests. A particularly noteworthy section is “Reading the Forest” in the first chapter, *Reflexive Labour: Koitors and the Universe of the Forest*. For the Koitor, the forest is home, a place, and a condition of work. From birth to death, the forest

remains an integral part of their worldview and relationships.

The book delves into the friction between the Adivasi world and modernity, addressing the consequences for forest dwellers as they are forced to adopt new ways of living without their consent. This includes processes like Sanskritization, industrialization, and evictions from forest areas. The author is deeply empathetic towards the Adivasis and the ongoing degradation of forests, recognizing the intricate link between the two. He poignantly asks, “What is unjust for human beings cannot be just for the natural landscape. Injustice from violence between humans cannot be just for other beings because they are both victims” (p. 40). The scale of injustice inflicted on India’s forest dwellers is unfathomable to elites and urban dwellers. He refers to the injustice as “genocide and ecocide” (p. 62). Few in India write as clearly and boldly about the social issues surrounding forest conservation, which has been especially unfair to Adivasis, Dalits, and other marginalized groups. The author raises crucial questions about social and environmental justice, emphasizing the importance of considering these issues within the context of forest conservation.

Chapter 5, “Caretakers and Conquerors”, is an outstanding section of the book. It focuses on the notion of indigenouness and explores the debates on the difference between caretakers’ reflexivity and conquerors’ instrumentalism. Drawing on conversations with Adivasis from North Bastar in Chhattisgarh and the Hill Kharias

in the Similipal Biosphere Reserve, Koraput, Odisha, he shows how these communities maintain distance from mainstream ideas and practices as a form of “radical assertion” (p. 105). He provides an example of a district magistrate’s visit to a village, where the locals demonstrated the instability and unsustainability of flatland cultivation and expressed their preference for shifting cultivation. Despite the detailed explanations, the government representative failed to understand why the state-imposed system was detrimental to the conditions of production and reproduction. This is just one of the many compelling examples from the ground that make this book engaging.

Another powerful example comes from the Hill Kharias of Mayurbhanj, Odisha, where Savyasaachi reveals that the tiger is not seen as the apex of their forest ecosystem. According

to the Kharias, there is no king of the forest. They assert, “The Queen Bee is at the apex of the forest ecosystem. The forest is a manifestation of the feminine principle, and Mother Earth is the queen of the forest” (p. 108). The Kharias, known for their honey collection, view the forest as a delicate space for this activity. Both shifting cultivation and honey collection for the Hill Kharias are deeply rooted in their ability to listen to and read the forest. The author also emphasizes the caretaking practices of the Hill Kharias, noting that care is integral to the relationship between forest dwellers and Mother Earth. The mutually regenerative relationship between the Kharias and the forests illustrates that “nature needs humans as much as humans need nature” (p. 111). This stands in stark contrast to the conquerors’ story, reflected in the Industrial Revolution, which

escalated deforestation. He powerfully argues that “conservation strategies have augmented the process of capital accumulation” (p. 115). He explains that conservation was designed by the mainstream to control a large portion of the world’s natural resources, leading to the forceful displacement of indigenous people from resource-rich areas.

This book is an invaluable resource for anyone interested in understanding various notions of nature, particularly from the perspective of forest dwellers, and how these views contradict those of the state and neoliberal perspectives. It should be at the top of the reading list for students of sociology, nature conservation, social anthropology, environmental studies, policymakers, conservationists, and NGOs working in nature and wildlife conservation, as well as community-based conservation. 📖

ABOUT THE COVER

Boucerosia frerei

Boucerosia frerei (G.D. Rowley Meve & Liede, commonly known as Shindal Makudi or Shindel Makodi, is a rare and endemic plant species of the Western Ghats in India, primarily found in Maharashtra. It was earlier classified under the name *Freerea indica* Dalz. This plant belongs to the Apocynaceae family and was first described by the Scottish botanist Nicol Alexander Dalzell in 1865. Dalzell, a conservator of forests and superintendent of botanical gardens in the Bombay Presidency, identified the plant while working in India.

Freerea indica begins producing leaves with the arrival of the monsoon season. Toward the end of monsoon, the plant displays beautiful, star-shaped flowers that range in colour from

pinkish-red to deep maroon, followed shortly by fruit production. At the close of the rainy season, it sheds its leaves, leaving only the resilient stems, which often form small clumps that hang from cliff faces. These stems are specially adapted to survive the challenging dry months of winter and summer, when no water is available. Remarkably, *Freerea indica* is unique among plants for having two photosynthetic pathways: the C3 pathway in its leaves and the CAM pathway in its stems, allowing it to thrive in extreme conditions.

The plant’s distribution spans the districts of Ahmednagar, Pune, Satara, and Raigad, with major populations located around historic hill forts such as Shivneri (where it was first described), Sajjangad, and Purandar.



Once considered nearly extinct due to habitat loss and over-collection, *Freerea indica* has made a modest comeback thanks to dedicated conservation efforts, although it remains endangered. ■

Call to Contribute: BNHS 150 Years Omnibus of Natural History – *Systema naturae*



In 1983, the Bombay Natural History Society (BNHS) proudly published the *Encyclopedia of Natural History*, edited by Robert Hawkins, as a tribute to a century of pioneering work in natural history. This endeavour was a monumental achievement, compiling the collective knowledge of India's biodiversity, habitats, and wilderness. Guided by the visionary efforts of legends like Dr Sálím Ali, it was more than just a book – it was a testament to the tireless efforts of researchers and naturalists dedicated to preserving and documenting the living world around us.

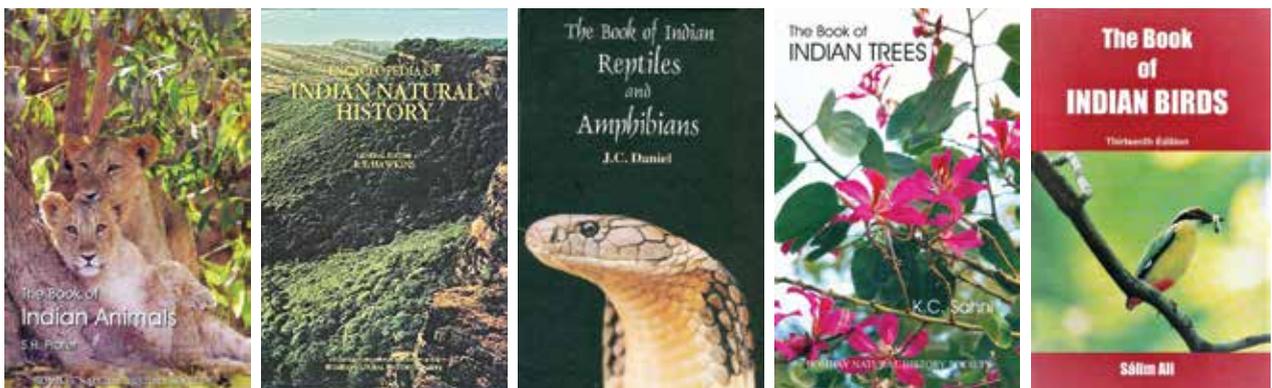
As you are aware, the timeless classic books of India's mammals, birds, reptiles and amphibians and trees were first published by the BNHS from the nation's leading naturalists such as S.H. Prater, Sálím Ali, J.C. Daniel, and K.C. Sahni.

delicate intricacies of insect behaviour, your contribution is invaluable.

The BNHS is eager to embrace this change and celebrate the wealth of knowledge its members have accumulated over the years.

*We invite our members to contribute to an ambitious new project – a collection of articles, notes, and photographs that will culminate in *Systema Naturae*, a futuristic compendium of the natural history of India and the Oriental Region.*

This *Systema Naturae* will reflect unique field notes and will also capture the lesser-known aspects of our natural world – the overlooked species, the obscure habitats, and



Now, as we stand at the threshold of another milestone – the 150 year anniversary of BNHS – it is time to embark on a new approach of knowledge-sharing. The landscape of natural history has changed drastically in the last four decades. With the advent of digital technology, the internet, and the ever-expanding reach of modern media, the scope of documenting natural history has moved far beyond the confines of scientific journals or academic circles. We are now in a intensely vibrant, diverse community effort, where field enthusiasts and researchers alike contribute to the evolving story of nature.

We understand that the practice of observing and documenting wildlife has evolved. Today's wildlifers, birdwatchers, and naturalists have unprecedented access to remote areas and ecosystems, thanks to advancements in travel and technology. Whether you have been studying the migratory patterns of birds, uncovering the secret lives of reptiles, or simply photographing the

the untold stories of animal behaviour, migration patterns, and conservation efforts.

We believe that every observer of nature, whether a seasoned expert or a passionate amateur, has something valuable to offer. Your insights, discoveries, and experiences will add to the richness of this collective endeavour.

We invite our members to submit your articles, field notes, and accompanying photographs to the Editors of *Hornbill* at systema150@bnhs.org. Contributions can range from in-depth research on specific species or ecosystems to brief notes on behaviour or conservation concerns you have observed in the field. Photographic documentation, whether professional or amateur, is highly encouraged, as it adds a visual dimension to the written work and captures the beauty and complexity of our natural world. ■

– Dr Bharat Bhushan,
Hon. Secretary, BNHS

Dancing Cranes and Declining Wetlands: The Story of Sarsai Nawar



Omkar Joshi specializes on bird migration and wetland conservation and safeguarding the Indian Skimmer breeding islands in the Chambal riverscape.

Imagine a serene *jheel* (wetland) coming to life with the flapping wings of thousands of migratory birds, transforming the landscape into a breath-taking display of nature's beauty each morning and evening. This is Sarsai Nawar, an often-overlooked wetland in Uttar Pradesh, home to a rich but endangered ecosystem.

Nestled in Etawah district, Sarsai Nawar is a seasonal wetland that fills with life after the monsoon rains. This oxbow lake, named after the majestic Sarus Crane – revered as a sacred bird and said to have inspired Maharshi Valmiki in the creation of the ancient epic Ramayana – translates to “Sarus’s wetland.”



During winter, Sarsai Nawar becomes a critical refuge, hosting thousands of migratory birds on their long journeys. Travellers from distant lands, including Mongolia, China, Kazakhstan, even the far-flung Arctic region, find sanctuary here. The scene is a delight for birdwatchers, with flocks of ducks and waders bustling about, while eagles and harriers patrol the skies above. The sight of these powerful raptors swooping through the flock, causing a flurry of ducks to take flight in a dazzling display akin to a murmuration, is nothing short of spectacular. With pinpoint accuracy, the sharp-eyed eagle dives into the commotion, targeting the most vulnerable duck.

The reeds provide shelter for reed warblers, grassbirds, and cisticolas, their cheerful chirps adding to the wetland's lively soundtrack. Tall trees offer nesting spots for black-necked storks, while Egyptian vultures can be seen resting on the barren lands. The flooded croplands are home to waders, who forage for



food in the mud. Stints, pipers, plovers, and ruffs, seen in their hundreds, diligently probe the mud for hidden morsels, a crucial ritual that allows them to bulk up before embarking on their long migratory journeys.

This wetland, once a refuge for the now-extinct Siberian crane in India, still holds perhaps the largest congregation of sarus cranes. On my visit, I was fortunate enough to witness these magnificent birds dancing at dusk. Their graceful movements against the backdrop of the wetland created a moment of pure magic. As evening descends, this wetland transforms into a scene of tranquil beauty. In the golden hours of twilight, pairs of sarus cranes converge, their silhouettes gracefully dotting the landscape. By dusk, nearly 250 sarus cranes gather around the wetland from surrounding paddy fields. Under the warm glow of the setting sun, these elegant birds perform a captivating courtship ballet, their dances and resonant calls echoing across the water. As twilight deepens, they retreat to their chosen roosts – either the wetland or the surrounding open fields – where they gather in close-knit groups. For bird enthusiasts, witnessing the world's largest congregation of sarus cranes is truly incredible.

However, Sarsai Nawar faces significant ecological threat due to human activities. The area's hydrology is already compromised, with the wetland receiving minimal water from its surroundings. This issue is exacerbated by reduced rainfall, a consequence of climate change. Agricultural expansion has further reduced the wetland's area, limiting its ability to support the large bird congregations it once did. Runoff of chemical fertilizers, pesticides, and sewage has led to pollution and the spread of invasive species like water hyacinth and Typha. Locals revealed additional pressures, such as siltation, which has diminished the wetland's capacity to hold water. The situation in other nearby wetlands, including protected areas like Saman Bird Sanctuary, is no different.

As we marvel at the beauty of Sarsai Nawar, it is crucial to acknowledge the pressing conservation challenges that threaten this vital wetland. The ecological decline of Sarsai Nawar and other wetlands jeopardizes the migrant and resident avian species that depend on them and serves as a poignant reminder of the broader impacts of human activities on natural habitats. Addressing these issues requires a collective effort to balance development with conservation, ensuring that such important wetlands continue to thrive and support their bird communities for generations to come.

Recognizing its ecological significance, Sarsai Nawar has been designated as a Ramsar Site, marking it as a Wetland of International Importance. This esteemed status underscores its critical role in supporting threatened Sarus Crane with



migratory bird species and maintaining global biodiversity. Additionally, the Indian Government has prioritized Sarsai Nawar under the National Action Plan for the Conservation of Migratory Birds. These steps are vital in ensuring that Sarsai Nawar continues to serve as a sanctuary for both resident and migratory birds. ■



Photo credit: Left pg. (L) Rajesh Panwar (R) Sohail Madan / Right pg. Sohail Madan

Chambal Badlands



Parveen Shaikh, Scientist D studies the Indian Skimmer at the National Chambal Sanctuary and the persistent conservation challenges it faces.

In December 2016, I took my first walk along the shores of the River Chambal near Nadgawan village in Agra district of UP. The calm blue waters flowed gently, a serene backdrop to the sunbathing gharials and muggers lining the banks. Nearby, migratory waterbirds rested, and every so often, a Gangetic dolphin would break the surface, accompanied by the graceful flight of a black-bellied tern. The scene was peaceful and utterly captivating.

My goal was to spot Indian skimmers, but they eluded me along the shore. Undeterred, I took a boat to explore more of the river. Chambal's rich aquatic life soon unfolded before me – turtles perched on nearly every rock along the banks. As our boat approached, the soft-shell turtle, *Nilssonia gangetica*, swiftly slipped into the water, while the hard-shell turtles, *Pangshura tecta* and *Batagur dhongoka*, lingered a bit longer, allowing us a better view.

While fellow wildlife enthusiasts on the boat were busy with their cameras, capturing every moment, I was content with my binoculars, absorbing the life around the river. My attention soon shifted to the ravine walls along the riverbank, peppered with small burrows – a colony of grey-throated martins had made their home there. The structure of the ravine walls intrigued me, forming a key feature of the Chambal Valley landscape.

Many tourists and wildlife enthusiasts visit the Chambal River for its biodiversity, but to me, the most





fascinating aspect of this region is its unique landscape. The undulating ravines and gullies create what is known as badland topography, locally referred to as '*Chambal ki ghati*' or '*beehad*.' These ravines, shaped over time by constant erosion from streams in this semi-arid region, hold a history of their own. The landscape, expanded at the intersection of Madhya Pradesh, Rajasthan, and Uttar Pradesh, was once notorious for dacoits. Even today, its rugged terrain offers a refuge for outlaws who evade capture by crossing state lines.

The following week, I explored sections of the ravines on the Madhya Pradesh side at Dangbasai with a local wildlife enthusiast. We navigated through gullies and climbed small mounts though the dry, loose soil made the ascent challenging. Some of the ravines plunged as deep as 80–100 m. Researchers have linked these formations to erosion caused by regional climate, rainfall, temperature changes, and even tectonic activity. Walking through the ravines felt like navigating a labyrinth – it was easy to lose track of the route, and I quickly understood why dacoits once used this landscape as a hideout. The numerous paths leading in and out from a single point made it an ideal escape route.

After a challenging climb, I was rewarded with a mesmerizing view. A vast expanse of undulating ravines and gullies stretched out before me in shades of nude

and brown. In the distance, the calm blue waters of the Chambal River flowed through the valley, creating a striking contrast against the rugged terrain. This intricate network of ravines forms the main catchment area for the river, contributing to its unique ecosystem.

Along the way, we spotted footprints of jackals, hyenas, jungle cats, and even leopards, a testament to the rich wildlife inhabiting these ravines. However, signs of human encroachment were also evident – tractor tracks, flattened ravines for cultivation, and mechanical excavators carving pathways were stark reminders of the ongoing impact on this fragile landscape. Such activities pose a serious threat to the natural drainage and catchment areas. Disrupting these patterns could lead to natural disasters in the future and potentially affect the water levels in the river.

This landscape is unique, with no parallel elsewhere in the country. While the River Chambal and some of the adjacent ravines are protected under the National Chambal Sanctuary, it is crucial that we conserve this habitat from further degradation. I hope that others, like me, have the chance to experience this remarkable example of nature's architectural genius. ■

Photo credit: Left pg. Dhritiman Mukherjee
Right pg. Parveen Shaikh



A Lifelong Affair with odonates



Neha Mujumdar Scientist (Entomology) in the Conservation Department at BNHS, studies the biology of butterflies and odonate.

Dragonflies and damselflies, collectively known as odonates, embody elegance, beauty, resilience, and strength. Watching these creatures is like meditation — at least for me! While charismatic animals like mammals and birds often steal the spotlight, lesser-known insects like odonates offer a world of wonder all of their own. Insects dominate all other animal groups, and a closer look around your home will reveal their astonishing diversity. Among them, odonates stand out, showcasing mastery in aerodynamics and fierce predatory skills. Having evolved even before the time of dinosaurs, they are true ambassadors of adaptation, enduring the test of time with remarkable success.



Elatoneura tetrica

What fascinated me most about odonates was their unique breeding behaviour. Damselflies, with their slender bodies compared to dragonflies, exhibit distinct behaviours during egg-laying. While dragonflies typically release their eggs by briefly touching the



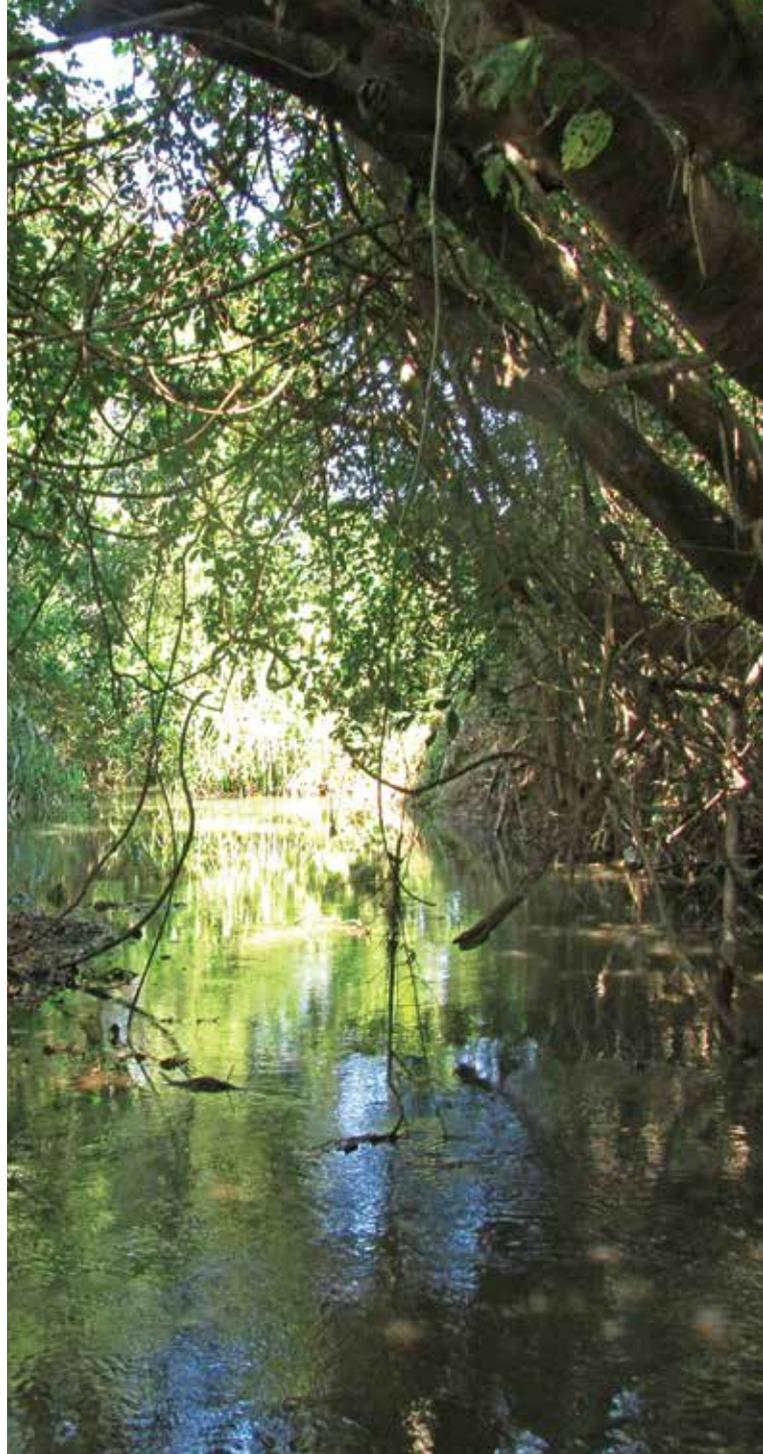
Pseudagrion indicum

water's surface, damselflies engage in a more complex ritual. Male damselflies often accompany and guide females to the egg-laying site, holding on to their necks. The females then land on aquatic plants and insert their eggs into submerged plant tissues using a sharp ovipositor. This behaviour, known as "underwater oviposition", is typical of damselflies. In some cases, females even submerge themselves completely while laying eggs. Witnessing this fascinating behaviour left me in awe of these tiny creatures.

My curiosity to explore about their breeding behaviour further led me to various places. One unforgettable experience occurred during a visit to Sindhudurg, Maharashtra. The northern Western Ghats of Maharashtra and the lowlands of Konkan are a treasure trove of wildlife, with some species of plants, reptiles, and amphibians endemic to the region. While exploring the freshwater habitats, such as seasonal streams, I encountered a pair of damselflies on a palm tree at my eye level. The stream had shallow water, vegetation on both sides, and a thick canopy of trees overhead. I spotted this pair on a *Pandanus* palm, known locally as 'kewda'. The male, a small blackish body with faint blue eyes and black lines, was still in tandem with the brownish female – a species named *Elattonaura tetrica*. At first, I thought they were engaged in a mating ritual, but a closer look revealed they were laying eggs.

To my surprise, the female damselfly was laying eggs on a plant well above the water, not beneath it. I watched in amazement as the pair continued this process for at least 25 minutes. I had never seen anything like it before. My mind raced with thoughts about what I was witnessing and whether I had ever read about egg-laying above water. Given that odonates require freshwater for their development from egg to winged adult, this behaviour was unusual. I photographed the pair, their habitat, and the plant to investigate further. Upon reading some research articles, I found that this behaviour has evolved in some damselflies to protect their eggs from drought or parasitism in the water. Damselflies may select plants with soft wood for egg-laying, and when the larvae hatch, they instinctively fall into the water below to continue growing.

I discovered that this might be one of the very few observations in India of oviposition outside water. There are instances where some damselfly species in the Himalaya lay eggs on moss-covered rocks near



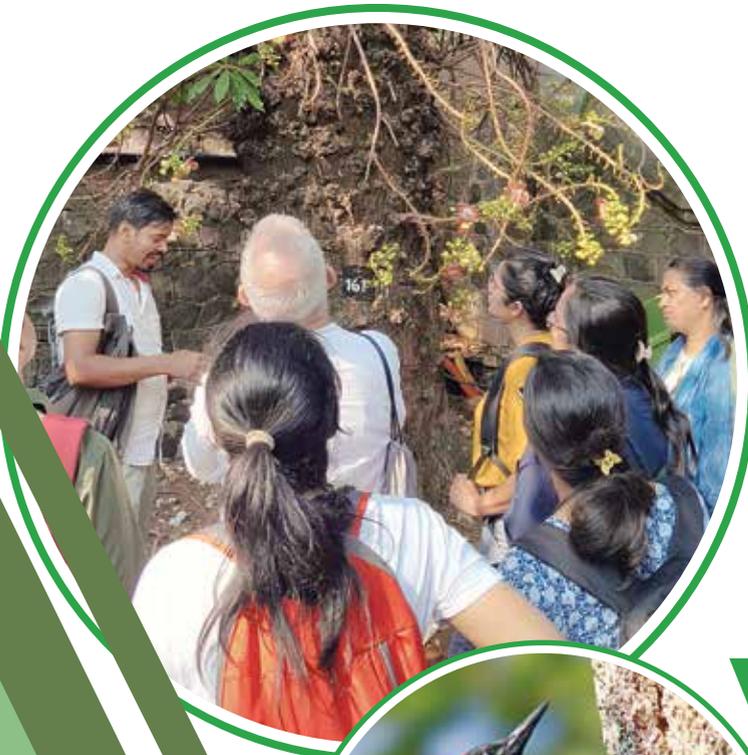
cold streams. Out of eight species of genus *Elattonaura*, five are endemic to India and four of those are found in peninsular region. *Elattonaura tetrica* is an endemic species to the Western Ghats of India, yet we have very little information on its habitat. This random observation turned out to be a significant and memorable experience. It is this curiosity and these encounters that make my observations fulfilling. I am grateful to contribute valuable information about these lesser-known, yet equally beautiful insects. ■

Photo credit: Left pg. Saunak Pal /
Right pg. Neha Mujumdar





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Indian Pitta Resurrects



The Indian pitta is a small bird adorned with vivid colours – a green body, a blue stubby tail, buff underparts, and a striking red patch on its lower belly. This bird typically breeds in the Himalaya and other mountain ranges, migrating to the Indian peninsula during winter. I have occasionally spotted one on the wooded campus of IIT Madras, where I work, but rarely have I seen it elsewhere in the city.

At dawn one morning, I stepped onto the open terrace of my home in Manapakkam, Chennai. My attention was immediately drawn to the unusual cawing of about two dozen crows perched on the parapet wall of my neighbour's house. The last time I had witnessed such a commotion, it was because a cobra had slithered onto the premises. Fearing a similar situation, I scanned the area. To my shock, I found a Indian pitta lying on its back in the middle of my terrace, seemingless lifeless. It seemed unlikely that it had fallen from a tree, as the nearest branches were at least ten yards away. There were no visible injuries, which one might expect if the bird had been dropped by a raptor. With no high-rise buildings or electric cables nearby, the bird appeared to have simply fallen from the sky. It was a heart-wrenching sight, made even more puzzling by the crows' reluctance to approach the bird.

Not wanting to leave the pitta at the mercy of the waiting crows, I decided to move the body. But as I bent down to pick it up, I noticed it was still breathing, albeit faintly. It seemed the bird was on the brink of death.

I called a wildlife rescue worker, who suggested the bird might be dehydrated from its long migration. The heat in Chennai that April had been intense, and if the bird had been migrating at night, it could explain why it was so weakened by dawn. Although the bird appeared lifeless, protecting it from the crows, cats, and the rising sun was easy enough. I gently placed it in a shaded, ventilated corner of the terrace, secured it from predators with a piece of window mesh, and left a bowl of water nearby.

An hour later, to my surprise, the bird was slightly more alert, now curled up on its legs. Its eyes were still dim, and it didn't seem to notice my presence, but there was a glimmer of hope. A couple of hours later, it seemed to be gathering strength. As I approached, the bird suddenly took flight, pushing through the lightly placed mesh with incredible speed. As I watched it disappear into the sky, I couldn't help but think, "Bon voyage, dear bird. Have a safe trip to the Himalaya!" ■

– Manu Jaiswal
Chennai, Tamil Nadu

We are grateful to

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to support the publication of *Hornbill*

WHISPERS OF AFFECTION

Text: Aksheeta Mahapatra

Nestled in lush the sunlit fields of southern India is the village of Kokkare-Bellur. Here, amidst the trees and gentle breezes, lies a bustling heronry – a sanctuary for waterbirds of many kinds, which includes the striking painted stork *Mycteria leucocephala*. It was here, as a curious field researcher, that I found myself watching and learning from these incredible birds, witnessing the story of one pair unfold over the breeding season.

AKSHEETA MAHAPATRA

A New Pair Arrives

It was a warm January morning when I first saw them – a pair of painted storks landing gracefully in a towering tamarind tree. The tree was already a busy hub, with other stork pairs building nests and claiming branches. I noticed a difference in the new pair – the male's longer and more prominent beak, contrasted with the female's shorter one! I could not help but feel a sense of anticipation – this was the start of something special.



MANJUNATHAN JAYASEELAN

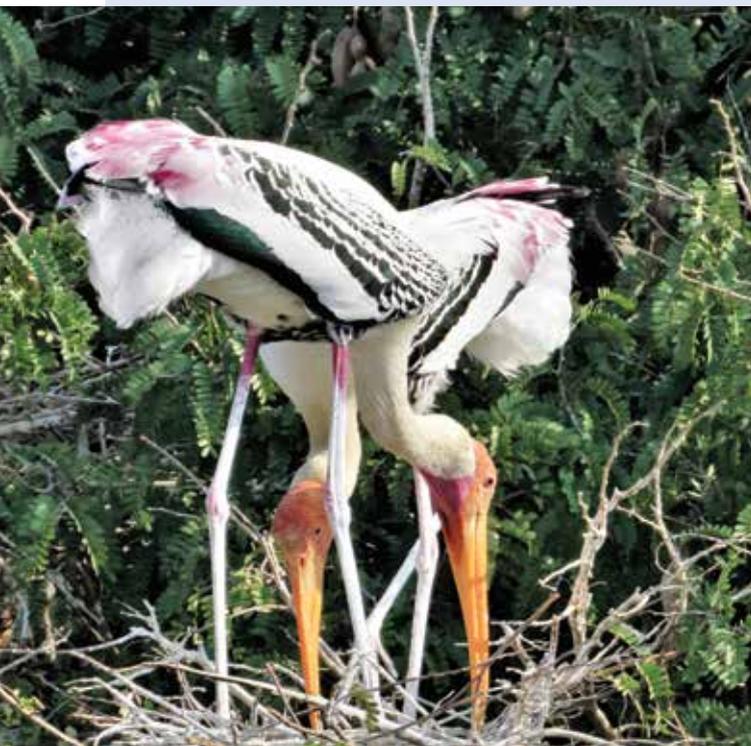
Early Interactions

For two days, the pair remained close, often in physical proximity, as they established their bond. Their grooming behaviours and the male's act of resting his head against the female's neck reminded me of courtship dances of other birds I had seen on nature documentaries, where every move had meaning.

The Dance of Beaks

As days passed, the pair engaged in an intricate courtship behaviour known as billing. They clattered their beaks together in perfect rhythm, a sound that echoed through the heronry. It was not just noise; it was an expression, a physical affirmation of their bond. Watching them, I felt like I was witnessing a quiet conversation, one only they could understand.

VENKATESH RAGHUPATHY



MANJUNATHAN JAYASEELAN

Building the Nest

By the third day, the real work began. The male flew off repeatedly, returning with twigs and branches clutched in his beak. Each time, the female carefully arranged the materials, shaping their nest high in the tamarind tree. They worked tirelessly, pausing now and then to touch beaks or rest side by side. For me, it was teamwork at its finest – two birds building not just a home, but a future.



VENKATESH RAGHUPATHY

The Next Stage

I was fortunate to witness their mating ritual, when the nest was finally ready. The male and female moved with precision, their beaks clattering in a rhythm. The act of mating was brief, but it marked a promise of new beginnings in their journey.

Taking Turns

Over the next week, their routine became clear. The male often stood guard while the female searched for softer materials to line the nest. Their commitment was evident in every action, their roles seamlessly interchanging. Watching them, I began to appreciate just how much effort and coordination it took to prepare for new life.

AKSHEETA MAHAPATRA



Protecting What Matters

As their nest neared completion, the pair faced their first challenge. One morning, other storks, also searching for nesting spots, approached their branch. The male stood guard, ready to defend his territory. When the other stork refused to back down, the male chased it off with fierce determination, flapping his wings and lunging forward. The female added her voice, her sharp beak clattering as if to warn the intruders. Together, they defended their nest, ensuring their sanctuary remained secure.

AKSHEETA MAHAPATRA





Life Takes Hold

Soon, the female settled into the nest, carefully incubating her eggs while the male watched from nearby. They took turns, ensuring the eggs were never left unprotected. Weeks later, the reward for their dedication arrived – two tiny chicks, that were barely audible over the rustling leaves.

➤ *Raising the Chicks*

The days that followed were a whirlwind of activity. The parents alternated between feeding the chicks and keeping the nest safe. The chicks grew quickly, their fluffy down replaced by the beginnings of feathers. It was incredible to see how much effort the storks put into ensuring their chicks had everything they needed.

AKSHEETA MAHAPATRA



AKSHEETA MAHAPATRA



AKSHEETA MAHAPATRA

Trials of Nature

In April, a powerful storm swept through the heronry. Winds tore through the branches, and many nests were lost. With help of a coordinated rescue effort, about 140 chicks were rescued, of which 112 eventually matured and took flight. Such episodes highlight the vulnerability of birds and other wildlife to environmental disturbances and the significance of conservation interventions.

A Quiet Farewell

By late spring, the chicks were ready to leave the nest. They stretched their wings, testing the air, preparing for their first flights. The parents, once inseparable, began to spend more time apart, their roles shifting as their chicks grew independent. The nest, now empty, stood as a quiet reminder of their incredible journey.

Lessons in Conservation

As I left Kokkare-Bellur, I could not stop thinking about the storks and the effort they put into every stage of their lives. It made me realize how important it is to protect places like this, where life can thrive. Conservation is not merely about protecting species; it is about preserving the intricate relationships that sustain them. Our efforts are essential for maintaining the ecological balance that sustains biodiversity and the intricate life cycles within it. The painted storks taught me that every act of care, no matter how small, matters in the grand story of nature. Their story is one of resilience, teamwork, and hope – and one I will never forget. ■



Aksheeta Mahapatra, a PhD scholar at the Wildlife Institute of India, combines avian research, conservation expertise, and community engagement to protect waterbirds and their habitats.

A Day in Tadoba with Vultures and Tigers

Text and Photographs: **Bhanu Pratap Singh**

I awoke to the rising sun and the melodious calls of the common hawk cuckoo and the Indian pitta – a summer visitor to the region – while staying at a forest rest house in the Tadoba-Andhari Tiger Reserve in Maharashtra.

Still groggy, I grabbed my camera and quickly left the rest house, determined to capture the elusive Indian pitta on film. Known as the “Navrang” or “bird of nine colours”, it’s a delight for photographers. I followed its calls, but to my dismay, the sounds faded, and the bird remained out of sight. However, on my way back, something else lifted my spirits—a jungle owlet’s call. This tiny bird, with its endearing appearance, remarkable hunting skills, and distinctive calls, is a prized sighting.

This time, luck was on my side—the calls led me straight to the owlet, perched conspicuously on a tree branch. I spent considerable time observing and photographing the owlet, jotting down notes on its behaviour. At one point, it locked eyes with me, a moment that left me spellbound before it returned to preening its feathers. Soon, it closed

its eyes, signalling that it was time for me to bid farewell to this nocturnal creature and return to the rest house.

Our rest house, my temporary home shared with colleagues from the BNHS, is nestled within the bamboo-dominated forests of the Tadoba-Andhari Tiger Reserve. This reserve is a slice of paradise in Maharashtra’s Chandrapur District, a region heavily industrialized with numerous mines, making it the hottest district in the state. The Tadoba National Park, part of the Tiger Reserve, is Maharashtra’s oldest and largest national park. Today, the Tadoba-Andhari Tiger Reserve is home to around 97 tigers and is renowned across the country for its stunning beauty and rich biodiversity.

It was now time for some hard work. I needed to draw water from a well near the rest house for bathing. A few days earlier, a fierce thunderstorm had damaged the solar power system, leaving us without electricity and unable to pump water to the taps. After a refreshing bath, I enjoyed a cup of black tea with my colleagues, Bhaskar Das and Hemant Bajpai. The addition of lemongrass leaves made the tea incredibly refreshing – a perfect start to the day.

After breakfast, we set off in a car driven by the ever-cheerful Mithun from the forest department to the field station, about ten kilometres away. The field station is where we conduct our vulture monitoring activities. Ten white-backed vultures, bred in captivity at the BNHS Vulture Conservation Breeding Centre in Pinjore, Haryana, have been brought here for future release into the wild. The goal is to restore vulture populations in the Vidarbha region of Maharashtra, which, like the rest of the country, has suffered a near-complete loss of these scavengers due to the extensive use of vulture-toxic veterinary drugs like diclofenac and other NSAIDs. This project is a joint venture between the BNHS and the Maharashtra Forest Department to revive these crucial birds.

The ten white-backed vultures are housed at our field station in a pre-release aviary. A monitoring room allows us



Jungle Owlet

to observe their daily activities via CCTV footage without disturbing them. We closely monitor their health, feeding habits, activity levels, and responses to environmental conditions. Additionally, we conduct research to ensure that when the vultures are released, they find an environment conducive to their survival in the wild.

As usual, my colleagues and I began our day at the field station by monitoring the vultures' activities and noting our observations. Today was exceptionally hot, with temperatures soaring above 45 degrees Celsius. A life-threatening heat wave was sweeping outside, and the metal roof of our monitoring room made it almost unbearably hot inside. We only had two wall fans to provide some relief from the heat. Even the drinking water at our field station had become so warm that it was undrinkable. Fortunately, the forest department's fire-watching staff came to our rescue with cooler water from another source, allowing us to quench our thirst from their bottles. Meanwhile, we closely monitored the vultures' responses to the extreme heat to ensure their well-being.

While at the field station, we also handled tasks requiring internet access and cell phone signals, as our rest house is in a remote area without such amenities. We made sure to charge our laptops, cameras, phones, and power banks since the rest house had no power supply.

We packed up around 6:00 p.m. after making our final vulture monitoring entry and drove back to the rest house. This time, however, we weren't alone. A magnificent tiger was walking in front of our vehicle. Maintaining a respectful distance, we followed the tiger for about 500 meters before it vanished into the dense bamboo thickets along the roadside.

Upon returning to the rest house, we enjoyed a good cup of tea and spent time chatting with our cook, a local from the nearby village who works for the forest department.



White-rumped Vultures



Tiger (female)

There's always something new to learn from the locals about the forest, wildlife, and how they coexist with the wild animals around them. Every day, he travels a kilometre to Kolsa Village to access a network connection, allowing him to call home and check on his family. Otherwise, he remains mostly out of touch with his loved ones.

During dinner, which tasted heavenly after such a long day, I could hear the distant calls of nightjars. Paying closer attention, I distinguished the sounds of four different species: the Savanna nightjar *Caprimulgus affinis*, Indian nightjar *Caprimulgus asiaticus*, Jerdon's nightjar *Caprimulgus atripennis*, and jungle nightjar *Caprimulgus indicus*.

After dinner, we all went up to the terrace to sleep since the fans weren't working in our rooms due to the power outage. Lying beneath a star-studded sky, I realized that while our day was ending, the forest's nightlife was just beginning. The peaceful atmosphere, the sounds of nature, and thoughts of my loved ones back home soon lulled me into a deep sleep. A new day would dawn tomorrow, another day spent in the lap of nature, experiencing its raw and enchanting beauty. This thought filled me with hope and happiness as I drifted into the world of dreams. ■



Bhanu Pratap Singh is a conservation biologist and passionate photographer with a master's degree in wildlife science.

It was 1983, and I had just about completed my Master's degree, contemplating a career path with no clear direction in mind. A brief newspaper advertisement in *The Times of India* led me to apply for a Junior Field Biologist position at the Bombay Natural History Society (BNHS) – though I had not the slightest idea where this might take me. After an engaging interview with the senior management at BNHS, I had no inkling that BNHS would soon become the foundation for an exciting career. I was initially selected to work on an Asian

Elephant field project. However, due to my frail and lean physique, it was assumed I might not be the best fit for such physically demanding fieldwork. By a twist of fate, I was instead assigned to a project on Bird Hazards to Aircraft, marking my first interaction with Dr Robert Grubh.

Our initial meeting was unremarkable. I was still coming to terms with the shift in my career focus from large mammals to birds. But soon, Dr Grubh became my first professional mentor, guiding my future path. While I had always been interested in ecology and the environment, it was Dr Grubh who ignited my passion for ornithology, especially in the applied field of Bird Hazards to Aircraft. I still vividly remember those early days in February and March 1983 when I admitted to him that I knew nothing about birds and expressed my uncertainty. He admonished me for my lack of confidence but also took on the role of a patient mentor, dedicating days to teaching me – and my colleagues – about the critical role of birds in ecosystems. His commitment was evident: he genuinely wanted to train us to become the country's next generation of ornithologists.

At a time when the IT revolution was underway, a few of us chose the unconventional path of ecology. In this journey, Dr Grubh was a guiding force, teaching me the fundamentals of ornithology, from understanding field study dynamics to grasping Indian ornithology as a whole. Under his mentorship, we explored every aspect of Indian ornithology in detail.



Dr Robert Grubh
April 26, 1943–September 25, 2024

Dr Grubh's style was both simple and firm. He was uncompromising in his ecological principles and epitomized the essence of a classical ornithologist. His distinctive personality was particularly evident during field visits, especially when identifying bird species. Whether studying raptors – his particular forte – or smaller passerine birds, he was equally adept. Working on the Bird Hazards to Aircraft project under his supervision for many years taught me invaluable lessons. This project took me to various field sites across the country, and with each of Dr Grubh's visits, we gained more from his deep insights – not only into bird biology but also in studying entire ecosystems. His intricate knowledge of vultures and their ecology stood out, particularly as we collected data on their foraging sites and behaviour. He set clear expectations for each of us in three areas: discipline, commitment, and the aspiration to become true field biologists. As he often reminded us, there were no shortcuts to field studies; the hard work was essential.

I am grateful to Dr Grubh for laying the groundwork for an enriching career in ornithology. Without his vast knowledge of avifauna and his approach to integrating applied research into ornithology, I would not have truly grasped the meaning of interdisciplinary studies.

There were times I wondered if it was all worth it – traveling across the countryside with binoculars, studying ecosystems, and hoping to record rare sightings. Yet Dr Grubh, in his own way, taught us that patience was an essential virtue. Today, as I reflect on his legacy, I remember the core aspects of his character that shaped who we are and continue to inspire us in our pursuit of a sustainable future. To me, he will always be my first and most important mentor.

We will miss him dearly.

– Prakash Rao

Deputy Director, Symbiosis Institute of International Business &
Head - Symbiosis Centre for Climate Change and Sustainability
Symbiosis International University, Pune, India
Former Scientist, BNHS



Preventing Whale and Dolphin Stranding on the west coast?

Sperm whale

Text: **Kishor Rithe**

In November 2023, a 35-foot-long whale calf was stranded on the coast of Ganpatipule in the Ratnagiri district of Maharashtra. After 40 hours of tremendous effort, the calf was finally pushed back into the sea. This rescue operation was supported by local fishermen, NGOs, the Coast Guard, JSW, and the forest department. Unfortunately, the whale calf did not survive, but the incident attracted significant media attention, the government, Coast Guard, Indian Navy, and other stakeholders, highlighting the broader issue of marine megafauna stranding. Often, some marine animals, like whales or dolphins, die at sea and are carried to land, which is not considered a stranding. In this case, however, it was a live animal, making it a clear example of a stranding.

However, this was not the first such incident along the west coast near Mumbai. In 2021, a 40-foot-long, 30,000 kg whale washed ashore in Palghar, Maharashtra. Another whale, weighing over 30 tonnes, was found dead on

Mardes Beach in Vasai, also in Maharashtra, and attracted attention due to its enormous size. In August 2015, locals discovered the decomposed remains of a whale on Malpe Beach, believed to have sustained injuries from a ship. In September 2016, a 47-foot-long blue whale was successfully rescued from a beach in Maharashtra and returned to deeper waters near Madban village in Ratnagiri district. That same year, in October, a 35-foot-long blue whale's decomposed carcass washed ashore at Guhagar Beach in Ratnagiri, marking the second such incident in a month and the fourth in 2016. In February 2021, a moderate-sized false killer whale was found dead on Mogaveera Patna beach in Karnataka, marking the first report of a false killer whale stranding in the state. In some of these incidents, the animals found were already dead, so it could not be confirmed that they were alive when they drifted to the coast; therefore, they cannot be considered stranded animals.



NAGESH

Cetacean strandings in coastal areas around the world are being reported with increasing frequency. While the exact causes of these strandings remain unknown, various anthropogenic and environmental factors have been suggested as potential contributors

Stranding incidents along the west coast have occurred for a long time, necessitating immediate attention. If these strandings are increasingly reported along India’s coasts, it would be valuable to investigate whether these occurrences are rising. However, this requires access to historical data, which may not be

available or has been underreported due to a lack of awareness. This reiterates the fact that live strandings of marine mammals are a poorly understood phenomenon, and rescuing live stranded animals is very challenging.

During 2020-2021, 109 incidents of stranding were recorded along

Maharashtra’s coastline, with 27 animals washing ashore dead, highlighting the severity of the issue. Often, attempts to rescue these ocean giants fail due to their enormous body weight. While standard operating procedures (SOPs) and rescue protocols may improve the success rate, completely preventing strandings would require understanding their underlying causes. While it is difficult to predict the causes, strandings of whales, dolphins, and other marine megafauna often result from environmental threats or human activities that disrupt marine ecosystems. Available literature suggests that these threats are widespread and cannot be addressed in isolation; they require collaboration among civil administrators, policymakers, coastal communities, the fisheries department, infrastructure agencies, and both state and central governments. While solving this issue may take time, it can be managed to some extent through coordinated efforts.

Managing Strandings

Although it is difficult to completely prevent strandings, they can be better managed through systematic efforts, such as data collection, raising awareness among stakeholders, creating networks of trained teams, including experts for rescue operations, and providing them with necessary equipment. A cross-sectoral approach can be effective in managing marine megafauna strandings. The Ministry of Environment, Forest, and Climate Change (MoEF&CC), Government of India, has issued guidelines on “Marine Megafauna Stranding Management,” encouraging multi-

stakeholder participation. These guidelines call for collaboration between the Indian Coast Guard, Indian Navy, forest officers, trained volunteers, researchers, and the fishing community in managing and preventing strandings.

These guidelines also recommend that coastal state governments establish State Stranding Centers, chaired by Chief Wildlife Wardens (CWLW), and District Stranding Centers in coastal districts. These committees can set up networks to monitor and manage strandings and take regular reviews.

These centres can also build necessary infrastructure, procure

equipment, and train personnel for handling stranding incidents. Coordination with local police for crowd control may also be necessary to ensure that experts can work smoothly. Raising awareness among fishermen and coastal agencies is crucial, and displaying banners and hoardings related to marine animal strandings in key areas could help.

The Bombay Natural History Society (BNHS) has been systematically addressing this issue along the west coast of Maharashtra. BNHS has been working to conserve wetlands, tidal/coastal ecosystems, and marine habitats through eco-restoration, promoting sustainable

coastal eco-tourism, enhancing livelihoods for coastal communities, and adopting an ecosystem-based approach to resource management. In November 2023, BNHS, in collaboration with the Mangrove and Marine Biodiversity Conservation Foundation (MMBCF), organized a seminar at the Mangrove Centre in Airoli, near the Thane Creek Flamingo Sanctuary, to better understand and address the stranding of marine megafauna and other related concerns.

Topics such as marine megafauna strandings (also seabirds, shorebirds) and their habitats were discussed with fishing communities, NGOs, and



DHRIYAN MUKHERJEE

Fisheries bycatch and ghost nets in seagrass meadows appear to be significant factors in the recent strandings of dugongs

experts under the guidance of senior Government officers. Mr Rama Rao, Executive Director of MMBCF, Mr Pravinsingh Pardeshi, President of BNHS, and myself facilitated these discussions and helped create an action plan. Some key decisions included gathering sighting data of marine megafauna (along with the seabirds, and shorebirds) and developing pictorial guides to help fishermen and officers from the Indian Navy and Coast Guard identify marine mammals. It was also suggested that necrological studies be conducted on deceased marine mammals to understand the causes of death/stranding and implement appropriate conservation measures.

BNHS has developed pamphlets on marine mammals and launched a mobile app called JALCHAR to facilitate data collection. This app

enables fishermen and officers from the Coast Guard and Indian Navy to record sightings of marine mammals. This sighting data will help us understand how frequently whales and dolphins wash ashore under normal circumstances, enabling quick responses when unusual events occur. This database will map potential locations in the sea and complement existing databases, such as the one at marinemammals.in. This citizen science initiative will help track the habits and movements of marine species, supporting long-term conservation strategies for seabirds and marine mammals.

In September 2024, BNHS and MMCF jointly organized a workshop in Palghar with all stakeholders, including the fishing community and officers from the Indian Navy and Coast Guard. During the workshop,

materials developed to raise awareness about marine mammals were distributed. MMCF also shared a toll-free number for reporting strandings, along with information on compensation and incentive schemes for discarding ghost nets, rescuing turtles, and protecting marine mammals.

The workshop gathered first-hand information on various threats to marine life. Fishermen pointed out that commercial fishing boats often do not follow regulations regarding mesh size and shape, and they use harmful nets like drag and purse-seine nets, which severely damage the marine ecosystem and harm the livelihoods of local fishermen. Representatives from the fisheries department and fishermen's cooperatives agreed to work on convincing fishermen to avoid using small-sized nets. The



DHRIITIMAN MUKHERJEE

Beached whales often die from dehydration or collapse under their own weight. Having evolved to live in the ocean, their body structure and organs are supported by the surrounding water. When stranded for extended periods, their weight can cause severe damage to internal organs

fisheries department also promised to ask manufacturers of small mesh nets and diamond-shaped meshes to cease production.

Interestingly, fishermen in Palghar perform a traditional pooja before releasing turtles caught in their nets. However, they expressed concerns about commercial fishing boats catching sharks, turtles, and other marine species, and called for stricter legal action to protect marine animals. They also suggested fitting Turtle Excluder Devices (TEDs) to fishing nets. Those who capture protected species like sharks and turtles can be prosecuted under the Wildlife Protection Act of 1972, provided the Ministry of Environment, Forest, and Climate Change (MoEF&CC) or the Forest Department delegates authority to the Coast Guard and Indian Navy through official notification.

Local fishermen acknowledged the dangers of ghost nets, which entangle and kill many marine animals. They also highlighted the issue of plastic pollution. Fishermen's cooperatives decided to launch an awareness campaign to discourage the disposal of ghost nets into the sea. MMCF committed to designing a scheme to reward fishermen who retrieve ghost nets and to offer biodegradable nets at discounted rates. They are also planning a scheme to tackle plastic waste through Corporate Social Responsibility (CSR) initiatives. Local authorities, such as the Maharashtra Pollution Control Board (MPCB) and municipal corporations, can assist by collecting plastic waste at river and creek mouths using net collection mechanisms, with the waste later sent for recycling.



A recent workshop organized by the BNHS and the Mangrove Foundation addressed the growing concerns over marine animal strandings and their broader implications



The JALCHAR application was launched by Mr Pravinsingh Pardeshi, President of BNHS, in the presence of Mr S.V. Ramarao, Additional Principal Chief Conservator of Forests and Director of the Mangrove Foundation, Dr Bharat Bhushan, Hon. Secretary of BNHS, and Mr Kishor Rithe, Director of BNHS

Fishermen also raised concerns about their nets being damaged by marine megafauna. MMCF clarified that a government resolution provides compensation for such damages, and approximately ₹5.5 million was distributed in 2022–23 for net damage. MMCF also offers rewards for rescuing turtles, sharks, dolphins, and other marine animals. Fishermen can claim compensation through the fisheries department, with rewards of up to ₹25,000 for

rescuing sharks and dolphins and up to ₹12,500 for turtles. These compensation details are displayed on posters in prominent locations, including village panchayats.

Oil spills, which affect shorebirds, mangroves, and migratory species, were another concern discussed. The Maritime Board promised to consider these issues in their clearance processes. The Coast Guard, in collaboration with stakeholders like Bombay Port Trust (BPT), Jawaharlal

Nehru Port Trust (JNPT), DG Shipping, and ONGC, can take strict measures to prevent such incidents. Fishermen can be incentivized to report leaks from ships and pipelines.

The workshop also addressed concerns about infrastructure projects along the coast, such as the dumping of overburden in the sea, which damages fishermen's boats in Thane district. The garbage dump at Kanjur Marg was flagged as an issue because it attracts kites and crows that kill other birds and destroy nests. Additionally, silt deposition from the dumping site has led to mangrove intrusion in the creeks, affecting fish catches and migratory shorebirds. Measures to address sewage disposal in the sea, as outlined in the Thane Creek Flamingo Sanctuary management plan, were also discussed to prevent mangrove intrusion. Sewage disposal into the sea impacts the biological oxygen demand (BOD) of seawater. BNHS proposed helping MMCF map fishing villages and shorebird congregation areas outside the creek using remote sensing. Fishermen's representatives can assist in village mapping, while BNHS would focus on mapping shorebird congregation areas and high-tide roosting sites that are at risk due to mangrove intrusion.

In summary, human activities, including fishing, infrastructure development, oil prospecting, and naval exercises, contribute to marine mammal strandings. Reducing these anthropogenic disturbances could be a key step in preventing human-induced strandings.

There was a consensus that addressing these issues and implementing the discussed solutions could strengthen the state's blue economy and enhance coastal resilience through Coastal Zone Management and Shoreline Management approaches. A "whole-of-government" strategy could build resilience, boost blue natural capital, and support livelihoods. Integrated coastal and marine spatial management plans will pave the way for sustainable coastal management by balancing multi-sectoral priorities, restoring tidal and marine ecology, reducing sea-bound pollution, and managing plastic waste. This approach can also promote sustainable livelihoods through investments in the circular economy, eco-tourism, and modern aquaculture, while fostering institutional transformation and capacity building. In the future, best practices from other coastal regions around the world can be adapted to develop local solutions.

The conservation of marine fauna could be further supported by providing alternative livelihoods for fishermen through eco-tourism. MMCF plans to allow eco-tourism boat rides for birdwatching in the Thane Creek Flamingo Sanctuary as outlined in their management plan. These tours, which could also help patrol the sanctuary, would be part of the Shoreline Management Plan (SMP) and Marine Spatial Plan (MSP). BNHS will soon train fishermen in bird identification and encourage them to register with MMCF to obtain guide licenses. If

these initiatives gain traction, MMCF may consider opening more entry points to the sanctuary, which could promote sustainable livelihoods through eco-tourism and modernized fisheries.

These efforts can be financially strengthened through hard and soft investments. Up to 80% of the infrastructure project costs could be allocated for coastal and wetland protection, including mangrove conservation, beach nourishment, and pollution management in ports and fishing harbors. The remaining 20% could be used for advanced monitoring technologies, capacity building, and institutional strengthening. This approach would help achieve climate-resilient shoreline protection, restore critical ecosystems, and stabilize vulnerable coastlines, contributing to marine biodiversity conservation and carbon sequestration, which would support India's Nationally Determined Contributions (NDCs). ■



Kishor Rithe, Director, BNHS, has been working for wildlife conservation through sustainable livelihoods, conservation action, advocacy, and policy for over three decades.



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