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LESSER STRIPES AMONG TANGLED ROOTS

The challenges and triumphs of the first fishing cat population estimation in the Sundarban.

THE CHIPKO ANDOLAN

Fifty years on, a people's protest remains an iconic movement!

WILDLIFE PHOTOGRAPHERS SPEAK – THE JOURNEY AHEAD

Ethics, conservation, technology, emerging trends and more.





Photo Credit: Dr. Anish Andheria

FOREVER STRIPES

The survival of the tiger and all the creatures that share its habitat, including leopards, wild dogs, elephants, rhinos and uncounted plants, insects, birds and reptiles, depends on whether humans can set aside vast undisturbed wildernesses for nature.

The wildlife conservation movement needs the support of us all. For more information on how you can help, or to pledge your support for those who work round-the-clock to protect our wildlife, write to Dr. Anish Andheria (President, Wildlife Conservation Trust) at anish@wctindia.org or visit www.wildlifeconservationtrust.org

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24

TIASA ADHYA AND JUSTIN JONES



IUCN Cat Specialist Group member, Adhya co-founded The Fishing Cat Project. She has been honoured for her work with several awards. Jones, Deputy Field Director, Sundarban Tiger Reserve, is a naturalist at heart, and is passionate about socio-ecological issues.



32

JOANNA VAN GRUISEN

An early pioneer of wildlife photography in India, she has been part of the conservation scene for several decades, filming, photographing, writing, researching and editing. Based in Madhya Pradesh where she co-runs an eco-lodge, she is active in sustainable tourism and local nature projects.

50

SAGAR RAJPURKAR



A Ph.D. student working under the supervision of faculty of Pondicherry University and Wildlife Institute of India, he is currently working in the CAMPA-Dugong Recovery Programme funded by the Ministry of Environment, Forests and Climate Change (MoEFCC).

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Issued in the interest of wildlife

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58

MAHMOOD AHMED SHAH

A senior Kashmir Administrative Services Officer, Former Director of Tourism, and current Director, Industries and Commerce and Director Handicrafts and Handloom Kashmir, he is an inveterate trekker and geology buff.

On the cover

Amphibious, unlike most cats, the fishing cat *Prionailurus viverrinus* is elusive despite the vast range of the species that has colonised large parts of Asia.

Sighting these cats in the wild is made tougher by their nocturnal habits and often tough-to-access wetland habitats. The photographer's DSLR camera trap set in the Kishanpur area of the Dudhwa Tiger Reserve in Uttar Pradesh, was fitted with a motion-sensitive camera sensor, resulting in this stunning image of a pair of fishing cats in their wetland habitat. *Sanctuary's* cover and cover story offer a window into the fascinating world of fishing cats and their highly-threatened wetland habitats, which are in sharp decline across their range.



Photographer: Shivang Mehta

24 Cover Story

Of Lesser-known Stripes Among Tangled Roots Wetlands are among the richest ecosystems on the planet, providing refuge to a diversity of lifeforms. Fishing cats are intricately linked to these habitats. But the challenges of conducting a population estimation of fishing cats in the difficult Sundarban ecosystem are immense. **Tiasa Adhya** and **Justin Jones** write about the difficulties and triumphs of the first fishing cat population estimation in West Bengal, and the vital need to safeguard the species' future.

NEWS

- 8 World Scan** Microplastics clogging our airways; sea turtles get legal rights in Panama; groundwater pumping causing Earth's axis to tilt; risk of zoonotic diseases from 'animal industries'.
- 9 India Scan** Lok Sabha passes *Forest (Conservation) Amendment Bill 2023*; monsoons strike North India with excessive rainfall even in arid Ladakh; riverfront project planned on Tawi river in Jammu; authorities struggle to house seized, smuggled wildlife
- 10 Climate Watch** First week of July warmest ever recorded; climate refugees sink at sea; Hindu Kush glaciers shrinking irreversibly; birds unable to adapt fast enough to keep up with climate change.

Photofeature

- 12 Enchanting Ephemerals** Short-lived, brief, fleeting... like nature,



12

the word 'ephemeral' escapes a single meaning. All life is ephemeral, when juxtaposed against the timescale of our biosphere, which stretches to billions of years. All species are a brief link in the never-ending chain of ever-evolving life. From orchids and endemic herbs to frogs, we take a look at short-lived species, through an array of images.

People

- 32 Wildlife Hero Abdul Rehman Mir** **Joanna Van Gruisen** fondly remembers the brave and staunch wildlife defender of Dachigam, in Jammu & Kashmir.
- 34 Meet Ruth Sophia Padel** The great-great-grandchild of Charles Darwin, **Ruth Padel** is a celebrated British

writer, poet, singer, viola player, academician and conservationist. She speaks to **Bittu Sahgal** about her life, passions, and determination to be a persuasive voice for the biosphere.

- 72 Memories of MAPS** **Vance Martin** and **Mimi Partha Sarathy** write about the late **M.A. Partha Sarathy**, Chairman of the IUCN Education Commission and champion of biodiversity conservation.

Conservation

- 40 Fifty years of the Chipko Andolan** In the year that Joshimath began to sink, the Chipko Andolan celebrates 50 years. What gave this people's movement its everlasting appeal? **Shatakshi Gawade** and **Bhavya Iyer** write of an incredible movement, its global influence, and its vital relevance today.

In the Field

- 46 The Bird Villages of Udaipur: Menar, Krishna Kareri and Badwai** Bird festivals have boosted wetland conservation in these three villages in Udaipur. **Asad Rahmani** writes about the avian diversity in these areas, and how local communities have come together to protect their biodiverse village wetlands.
- 58 I Finally Saw Brown Bears** Himalayan bears eluded **Mahmood Ahmed Shah** for a decade, until fortune finally favoured him with a glimpse of a female with cubs, in the Ladakh Himalaya.

Species Focus

- 50 Taking to the Skies - Technology to the Rescue** In this photoessay, **Sagar Rajpurkar** shares how Unmanned Aerial Vehicles (UAVs) make studying dugongs, the only herbivorous marine mammals, more accessible, leading to better conservation for the endangered 'sea cow'.

Natural History

- 56 The Pendulum of Life** **Kenneth Lawrence** has a chance encounter and captured the moment when an oriental rat snake (unsuccessfully) raided a Baya Weaver's nest.



50

- 82 The Asian Water Monitor** Ambling by a lagoon in Colombo, Sri Lanka, **Tilan Weerasinghe** stumbles across an Asian water monitor – and watches as it is attacked by a challenger. The two reptiles engaged in battle until a victor emerged.
- 84 Sanctuary Papers** Oddments of natural history with a smattering of scientific discoveries thrown in for good measure.

Wildlife Photography

- 64 Wildlife Photographers Speak - The Journey Ahead** Does wildlife conservation photography merely pay lip-service to nature conservation? Seven photographers speak their mind on emerging trends, and the importance of wildlife photography today.

PhytoFocus

- 76 The Brugmansia's New Home** What happens if a species has no natural home to return to? **Soham Kacker** writes about the intriguing Brugmansia, or Angel's trumpet, and how it survives through human cultivation.

Projects

- 78 Mud on Boots** The latest news from our grassroots Project Leaders and the work they do.
- 80 Updates from the Field** Notes, anecdotes and reports from

Sanctuary Nature Foundation's projects across the country.

Campaign

- 88 On Sinking Land** A fourth of the planet's groundwater is extracted in India alone. Unabated and unregulated pumping of groundwater is causing land subsidence in different parts of the country. Awareness of the major threat posed by land subsidence is growing, together with the imperative of the sensible management of groundwater aquifers.

Birding

- 90 Loving Birds in the Midst of a Pandemic** Cooped up in his home in Delhi during the COVID19 pandemic lockdown, **Shubhobroto Ghosh** and his wife take up birdwatching, and find solace in the beauty of birds all around them.

Book Review

- 93 Shatakshi Gawade** reviews *Marginlands: Indian Landscapes on the Brink* by **Arati Kumar-Rao**.

You Speak

- 95 Networking** What's the buzz on Sanctuary's social networks?
- 96 Reader's Forum** Where you can comment, lament, compliment!

Last Word

- 98 A Slippery Slope.**



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Bittu Sahgal,
Editor, Sanctuary Asia

Not Wise Enough

This is addressed to *all* young people, rich, poor, urban, rural... living in the North or South... regardless of race. I believe there are only two political parties alive on Planet Earth today. 1. The *Bachcha* (Childrens') Party 2. The *Budda* (Old People's) Party. The other countless parties in existence today will soon be forgotten or vilified by history. And the former has inherited a terribly managed, climate-and-biodiversity-wounded planet from the latter.

A wonderful man called Carl Linnaeus gave us the binomial name, *Homo sapiens*, way back in 1758. Not in his wildest dreams could he have anticipated our future capacity for self-destruction, which is why the grandiose name he chose for us was *Homo sapiens* – 'The Wise Human'.

In truth, for all our science and technology, all our inventiveness and self-praise, we have proven to be too clever by half. Were Linnaeus to reappear today to audit our track record, I wager he would replace the descriptor *sapiens* with *stultus*, which implies recklessness, foolishness and irresponsibility. Given the mindless war we continue to wage against the biosphere, upon which our own survival hinges, that signifier surely encapsulates more accurately what we bumped-up monkeys have evolved into today.

Which is why the *Bachcha Party* should consider petitioning world leaders to accede to a more accurate nomenclature for us humans... until we wake up to accept that the biosphere will not obey political and economic dictats, born of our self-congratulatory assessments and imaginary power. Linnaeus and Charles Darwin – born a hundred years apart – would probably agree that the nomenclature *Homo stultus* fits like a glove? But hang on... they (and those whose planet my generation so purposefully trashes) have multiple choices! Take for instance, *Homo stupidus* (dull and stuporous). Or *Homo stolidus* (absurd, dumb, forceless, powerless). Or *Homo brutus*, meaning irrational, dull and imbecilic.

As you can see the *Budda Party's* track record has you spoilt for choice because *Homo sapiens* has chosen *not* to adapt to the biosphere, an imperative that Darwin pointed out was a straight road to extinction.

Over 1,500 Kids for Tigers at the NCPA's Tata Theatre in Mumbai sending a message to their counterparts across India and the world: "अपना फर्ज निभाएंगे, कुदरत के बचाएंगे!" (We will do our duty... we will protect nature!)



WORLD SCAN

MICROPLASTIC-CLOGGED AIRWAYS

Microplastics are in our air, water and soil, in our food, in breastmilk and now even in our airways. A new study by researchers at the University of Technology, Sydney, estimated that we inhale around 16 'bits' of microplastic every hour, which adds up to the equivalent of an entire credit card of plastic each week. This is the first time microplastics have been found in human airways, and the long-term implications for health are grave. These microplastics are likely to clog parts of our airways, particularly the upper airways, such as the nasal cavity and back of the throat. "Global microplastic production is surging, and the density of microplastics in the air is increasing significantly," explained the authors of the study.

LEGAL RIGHTS WIN FOR SEA TURTLES IN PANAMA

In a win for the legal rights of nature, the Central American country of Panama passed a legislation providing sea turtles with the right to live and have free passage in a healthy environment. Citizens, backed by this new law, can now stand for the rights of these marine creatures and defend them legally if required. This is a big step in turtle conservation, as Panama is home to several important nesting sites for hawksbill and leatherback sea turtles. The law also provides sea turtles with protection from pollution and other human impacts that may harm them including climate change, bycatch, extractive tourism, and coastal development. The law is unique as it bans the use of turtles, their parts and eggs, except for subsistence by certain traditional communities and, in conjunction with research and conservation efforts, will help preserve these ancient reptiles. Hopefully more countries will follow this example and pass similar legislations to preserve biodiversity.

- **OVER HALF THE WORLD'S LARGEST LAKES LOSING WATER:** A study using satellite data of the last three decades reveals that overuse by humans, climate change and sedimentations are at fault.
- **BIOMIMICRY – PANGOLIN INSPIRES INVENTION OF A MEDICAL ROBOT:** The polymer-and-metal design can roll up, is flexible despite the hard outer shell, much like the world's most trafficked mammal.
- **WHALE HUNTING BANNED IN ICELAND:** The Icelandic government announced the ban on account of animal welfare concerns; Norway and Japan continue to hunt whales.
- **AI UNLOCKS MASSIVE DATA FROM HERBARIUM COLLECTIONS:** Machine learning can help study plants, from millions of specimens locked in museums; AI can be trained to identify changes on account of climate change.



Animal industries such as the exotic pet trade and roadside zoos pose a significant risk of spreading zoonotic diseases in the United States of America.

GROUNDWATER PUMPING TILTING EARTH'S AXIS

Excessive pumping of groundwater (see page 89) without concern for maintaining water tables can lead to land subsidence and sinkholes, groundwater salinisation, and stream and river water declines. A new study by researchers from the Seoul National University has found that rampant groundwater pumping is altering the angle at which the Earth spins on its axis. This angle contributes to seasonal differences and daylight hours in the northern and southern hemispheres. The ability of water to alter the Earth's rotation was first discovered in 2016; however, the specific role played by groundwater is still being studied. Water has mass and this can impact the Earth's spin. The study found that extraction of groundwater has altered the Earth's spin by nearly 80 cm. between 1993 and 2010, on account of extraction of over 2,150 gigatonnes of groundwater. The latitudinal location of groundwater – and where it is extracted and redistributed to – also impacts this 'polar drift' or shift in the Earth's rotational pole. During the study period, a majority of water redistributed was in western North America and northwestern India. This is yet another example of the unforeseen impacts of excess resource use by humans.

'ANIMAL INDUSTRIES' POSE RISK OF ZOOLOGICAL DISEASE SPREAD

A new study by Harvard Law School and New York University found that 'animal industries' that involve live animals, such as the exotic pet trade, industrial animal agriculture, roadside zoos, backyard chicken breeding, and more, pose a significant risk of spreading zoonotic diseases – infections that can spread between humans and animals. The report analysed over 30 industries in the U.S. and found significant regulatory gaps, which could potentially lead to a spread of pathogens, and possible pandemics in the future. Among the largest producers of pigs and poultry in the world, the U.S. has recorded the highest number of swine flu infections since 2011. Live animal markets or 'wet markets' are common and pose a significant threat of disease spillover from animals to wildlife, with high rates of influenza found among animals and even the air in two markets in Minneapolis, and over 65 per cent of workers testing positive for infection. The U.S. is the world's largest importer of live animals, making it vulnerable to such disease outbreaks, despite the popular belief that such risks are primarily centred around developing nations.



INDIA SCAN

FOREST (CONSERVATION) AMENDMENT BILL 2023 PASSED IN LOK SABHA

Amidst pandemonium about violence in Manipur and objections raised by some Opposition leaders, the lower house of the Parliament passed the *Forest (Conservation) Amendment Bill 2023* on July 26 during the monsoon session by voice vote after a brief discussion. The *Bill*, if it becomes law, will amend the existing *Forest Conservation Act* to allow exemption of certain projects from forest clearances. Strategic projects within 100 km. from borders are among such exempted, as are 'security related infrastructure' on forest land less than 10 hectares, and 'defence related' infrastructure on land less than five hectares in areas with Naxal presence. The *Bill* also renames the existing law to *Van (Sanrakshan Evam Samvardhan) Adhinyam – Forest (Conservation and Augmentation) Act*. The *Bill* promotes cultivation of private forests and agro-forestry projects, ostensibly to increase forest cover. The Minister of Environment, Forest and Climate Change Bhupender Yadav said the *Bill* would help India reach net-zero emissions by 2070, and help in biodiversity conservation; the government claimed that legal changes are required to address 'new environmental issues and political priorities'. Experts have expressed the worry that the amendment will endanger pristine forests and their biodiversity. The *Bill* defines forests only as those recognised in government records, leaving out other forest land. In doing so, it reverses the Supreme Court's jurisprudence in *T.N. Godavarman (1996)*, which expanded protection to land according to the dictionary meaning of forests, whether identified in records or not.

MONSOON STRIKES NORTH INDIA

On July 8 and 9, the cold desert region of Ladakh in northern India received over 100 times the usual rainfall. The event was connected with a rare interaction between a western disturbance and the monsoon system, and also connected to changing weather patterns. Such unusual rain was also seen in August 2010 when, according to *Down to Earth*, India, a "cloudburst event had occurred in Ladakh region, which was attributed to global warming by scientists from the Indian Institute of Tropical Meteorology".

The rainfall damaged Ladakhi homes, not designed for such downpours. Landslides have occurred in the vicinity, and the delicate ecosystem has been impacted. Heavy rains have also led to deaths and devastation in Himachal Pradesh. The rains here have exceeded the record of the past 50 years. Roads and water supplies were disrupted; and tourists left stranded. The loss has been pegged at between Rs. 7,000 and 8,000 crores but may rise. Experts believe that deforestation and unsustainable construction practices have exacerbated the disaster. **Between June 24 and July 10**, a cloudburst, 29 flash floods and 41 landslides were recorded.



Instead of securing the biodiversity that gave rise to our cultures, religions, customs and mores, the Forest Conservation Act Amendment Bill will erode and degrade our natural assets.

RIVERFRONT PROJECT ON J&K'S TAWI

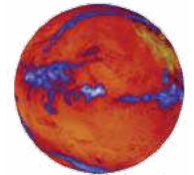
Stating that the riverfront development project on the Tawi river, on whose banks Jammu is situated, will increase the risk of floods that are being exacerbated by climate change, the youth group Friends of River Tawi is opposing the project. The Rs. 530 crore 'beautification' project would achieve the opposite, say activists – the commercialisation and concretisation of the river would end up degrading it when untreated sewage flows into it. This they say mitigates *against* efforts to protect the river. Residents are also worried it will adversely impact the habitat of migratory birds in the neighbouring Gharana Wetland.

Proponents, however, say that the project, fashioned to emulate the Sabarmati riverfront in Gujarat, will bring unique business opportunities and improve quality of life for citizens.

NOWHERE TO GO

Live wild animals seized by the Wildlife Crime Control Bureau and state Forest Departments during smuggling attempts from the neighbouring countries of Myanmar and Bangladesh are housed in mini zoos in northeastern states in India. However, these zoos are running out of space. The Central Zoo Authority has committed to providing financial assistance for the care and upkeep of these stranded animals in shelters in Meghalaya, Mizoram, Tripura and Sikkim. Smuggled animals are transported in ungodly conditions, often leading to their untimely death. Dissuasion, by way of strictly imposed jail sentences and punitive fines, might be a good way to staunch the flow, since merely adding shelters will amount to cruel imprisonment for life for the unfortunate victims and huge costs to feed and care for the seized animals.

- **FOR THE FIRST TIME, INDIA ABSTAINED FROM A VOTE ON THE SALE OF AFRICAN ELEPHANT TUSKS:** Zimbabwe's proposal to sell tusks stockpiled by some African nations was ultimately defeated.
- **STATES AND UTS TO PAY A FINE OF RS. 80,000 CRORE FOR NOT TREATING SEWAGE AND GARBAGE:** The National Green Tribunal has imposed the fine, of which Tamil Nadu at Rs. 15,419.71 crore has the highest penalty.
- **TWO MORE CHEETAHS DEAD IN KUNO, THREE DAYS APART:** Before this, six cheetahs, including three cubs, have died in India's cheetah programme.
- **ACTIVISTS REVIVE THE NEED FOR A TIGER RESERVE IN GOA:** A dedicated Protected Area for tigers was proposed, while opposing the construction of dams that will drown forests through which the Mhadei river flows.



CLIMATE WATCH

FIRST WEEK OF JULY 2023 HOTTEST ON RECORD YET

The first week of July has been the warmest week ever recorded. A global temperature analysis conducted by NASA found that June 2023 has been the hottest month ever on record. Simultaneously, record high sea surface temperatures were also observed over the North Atlantic. Global temperatures are soaring owing to the El Niño Southern Oscillation (ENSO) that has begun in the Pacific Ocean. Scientists are concerned that the ENSO will boost the temperature of an already warming world, and push the planet past the critical 1.5°C warming milestone. This will affect weather everywhere, weakening the monsoon in India, bringing more rain to the southern USA, and drought to Australia. Scientists believe this rising heat should not surprise us at all, and that is likely to get more severe unless greenhouse gas emissions are controlled.

HINDU KUSH GLACIERS SHRINKING IRREVERSIBLY

The Hindu Kush Himalayan region is going through “unprecedented and largely irreversible” changes on account of climatic impacts, which could lead to a loss of 80 per cent of its glaciers by 2100. The report, by the International Centre for Integrated Mountain Development (ICIMOD), observed that several rivers dependent on these glaciers will also likely be affected on account of climate change. The Hindu Kush spans eight countries – Afghanistan, China, India, Pakistan, Nepal, Bhutan, Bangladesh, and Myanmar. They are an important source of freshwater for millions and provide even more ecosystem services to as many as 240 million mountain residents, plus 1.65 billion people downstream. Rivers flowing through India such as the Ganga, Brahmaputra and Teesta will also be affected and the resultant decrease in frozen ground may lead to more landslides.

NATURAL SELECTION SLOWER THAN CLIMATE CHANGE

Scientists studying Great Tits in the Netherlands believe that the birds will not be able to adapt fast enough to keep pace with rapid climate change. Through various genetic experiments to speed up the process of evolution artificially, they modified these birds to lay eggs earlier than or later than usual. When released in

PUBLIC DOMAIN/IBRESHOT



PUBLIC DOMAIN/NASA



The Hindu Kush Himalayan region is going through “unprecedented and largely irreversible” changes that could lead to a loss of 80 per cent of its glaciers by 2100.

the forest, these early birds did not lay eggs significantly earlier than wild Great Tits, suggesting that genetic changes for reproduction to occur earlier are far too slow. Already, the hatching of Great Tit chicks no longer matches the timing of the insects that make up a large chunk of their food. When they miss this ‘caterpillar peak’, they miss out on important nutrients essential to their survival. In the worst case scenario, Great Tits are likely to fall behind, with lower fledgling populations. The team at the Netherlands Institute of Ecology now plans to study the impact of climate change on a larger number of species in the De Hoge Veluwe National Park.

CLIMATE REFUGEES SINK AT SEA

While the lost tourist vessel *Titan*, which was carrying five men to see the remains of the *Titanic*, grabbed the media’s attention, the lost over-crowded fishing trawler *Adrian*, which was carrying 750 people, barely caused a media blip. The *Adrian* was on its way from Libya to Europe, carrying a mixed crowd of migrants – women, children and men, away from the devastating impacts of climate change – floods, crop damage, locust attacks, and glacial melt. The migrants were from Afghanistan, Pakistan, Syria and Palestine, escaping ‘biblical’ disasters that have become mundane, said Pakistani writer Fatima Bhutto. The boat sank near the coast of Greece after standing at sea for 15 hours in the hope of being rescued. The Norwegian Refugee Council has estimated that natural disasters displace three to 10 times more people than war or conflict, and the Institute for Economics and Peace warns that by 2050, there could be a billion climate migrants.

- ECONOMIC COST OF FLOODS AND HEAVY RAINS IN INDIA IS ABOUT RS. FOUR LAKH CRORES, CALCULATES THE NATIONAL INSTITUTE OF DISASTER MANAGEMENT: Meanwhile, the Reserve Bank of India estimated that India has lost \$69 billion on account of climate-related events in 2019 alone.
- CLIMATE ACTIVIST GRETA THUNBERG CHARGED FOR REFUSING TO OBEY POLICE: The 20-year-old was detained with three others during an anti-oil protest.
- USA’S INFLATION REDUCTION ACT COULD SIGNIFICANTLY CUT EMISSIONS BY 48 PER CENT BY 2035: Without the law, the reduction in the U.S. would range between 27 and 35 per cent.
- UN INTERNATIONAL MARITIME ORGANISATION TO REACH NET ZERO ‘BY OR AROUND’ 2050: GHG emissions from international shipping must strive for 30 per cent reduction by 2030, and 80 per cent by 2040 to achieve this.

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Enchanting Ephemerals



'Ephemeral' implies a shockingly short duration of life, with some species living for as little as a few hours, and some for a season. The word, derived from the Greek word 'ephēmeros', meaning 'lasting a day', was first used in the 16th Century as a scientific term in the context of short-term fevers. With time, use of this term altered to mean short-lived organisms such as insects and flowers. This eventually morphed into the meaning of the term as we understand it today – applying to anything that is fleeting, lasting for a brief time. Much like nature, the word escapes an exact definition. In that sense, all life is ephemeral when juxtaposed against nature, which operates on a time scale of epochs and eons, from millions to billions of years. All species are a brief link in the never-ending chain of ever-evolving nature. We bring you the wild in all its fleeting and short-lived glory, from endemic herbs to galaxy frogs.

THE QUIVERING LOTUS

The elegant floral species *Cleome angulata* (synonym – *Corynandra elegans*) is a one-metre-tall herb with a perennial woody base. This Indian endemic is abundant along muddy edges of ponds and rock pools on lateritic plateaus (*sadas* in Marathi) during the monsoon. It was described as a new species from Maharashtra's Ratnagiri district in 2016 and has since been reported from other parts of peninsular India, including Telangana and the Vidarbha region. Locally, it is known as *kapare kamal* in Marathi, meaning 'quivering lotus', an apt name for the delicate trembling movement of thousands of its flowers in the wind. The large and showy flowers are a critical source of nectar and pollen for insects including bees.

ASHOK CAPTAIN/APARNA WATVE



TWINING BLADDERWORT

This pretty face hides a killer secret. *Utricularia reticulata* is a large twining insectivorous herb endemic to India and Sri Lanka. It belongs to the group known as 'bladderworts' because it bears several sac-like inflated bladders on the roots and lower side of leaves, which help it trap minute aquatic animals. Each bladder is like a balloon with a small opening guarded by a trap door, and equipped with sensitive hair.

The species spreads in large colonies on moist lateritic plateaus and rice fields. Aquatic fauna flows into the bladder, guided by gentle water currents, and then the water diffuses out, while the prey remains trapped and is digested by the enzymes. The digested matter is absorbed by the plant. This species, once common in wet areas along coastal plateaux, is a victim of changing land use patterns. Flowers are collected for monsoon festivals in Maharashtra, Goa and Kerala, but decreasing availability is affecting this practice.

ASHOK CAPTAIN/APARNA WATVE



ASHOK CAPTAIN/SANJAY THAKUR



QUEEN FLOWER OF KONKAN

Endemic to the Konkan region of Maharashtra and Goa, India, Konkan dipcadi *Dipcadi concanense* was first described by Nicol Dalzell in the year 1850 from the Malvan region of Sindhudurg district. It was considered 'possibly extinct in the wild' until it was rediscovered in Ratnagiri, Maharashtra, by Mistry and Almeida after a lapse of 123 years. Since then it has been reported from sporadic locations up to Goa. It grows in shallow soils on moist lateritic plateau in the monsoon. The flowers are collected and made into garlands that are sold locally. Seas of white flowers are a sight to behold on some plateaux. Mega-development plans for the Ratnagiri-Sindhudurg region are likely to threaten the extant habitats of this endangered species. In 2022, local organisations in Devrukh organised a Dipcadi festival to sensitise local communities about this 'Queen flower of Konkan'.

MANALI RANE/BOMBAY ENVIRONMENTAL ACTION GROUP



A STICKY PREDATOR

Green drosera *Drosera indica* is an insectivorous plant commonly found in undisturbed rocky areas and grasslands in moist tropical regions. It is seen in tropical and southern Africa, Madagascar, and tropical and subtropical Asia.

The entire plant is covered by gland-tipped hair. Tiny insects are lured into landing on the plant, only to get entangled in the sticky secretions from the hair. The leaf slowly curls over the insects, releasing more and more secretions, which help digest the soft parts. The digested food is sucked into the plant, which then survives on these nutrients, despite growing on nutritionally-poor soils. Large colonies of this species are seen on granitic hills of south India. Quarrying, mining and intentionally-set fires are local threats to this species.

**MUTE BUT CELESTIAL**

Unlike most frogs, the black microhylid frog *Melanobatrachus indicus* does not appear to favour communication by sound – the tympanum (or eardrum) and middle ear are absent in this species, and males do not possess a vocal sac. It is also known by the evocative name galaxy frog, on account of its skin, which appears like a field of stars. This rare species was rediscovered in 1997. It lives amongst leaf-litter, rocks and other ground cover in moist evergreen tropical forests. It is the only remaining genus in the monotypic subfamily Melanobatrachinae.



THE POSTER CHILD

Mayflies of the order Ephemeroptera are the poster child of ephemeral species in nature. These ethereal insects spend between one and two years underwater in their larval stage. Once they emerge as adults, it's a race against time as they take to wing, find a mate, and lay eggs, all before they die within a span of a few hours.



A TREMBLING ORCHID

Nervilia crocififormis or *Nervilia simplex*, known as the trembling Nervilia, is a widespread orchid that occurs in India, China, Nepal, Malaysia, Indonesia, Philippines, Thailand, Vietnam, New Guinea, Australia and Africa.

A ground orchid that has a hysteranthous life cycle, the flowers are seen first, followed by the leaves. In India, flowering and fruiting occur between June and September, immediately after the first few monsoon showers. The flowers are truly ephemeral, seen for a mere four or five days before they wither. This orchid grows in nutrient-rich soils full of leaf litter.



NAMED TO HONOUR

Thalictrum dalzellii was named so to honour Nicol Dalzell, who worked extensively in present-day northern Western Ghats and Konkan Region. It is a herb endemic to the Western Ghats of Maharashtra and Karnataka. The delicate flowers emerge between June and August. The flowers have no petals, but sport petal-like sepals. They are seen growing on steep hill slopes amongst grasses and rock crevices at altitudes ranging between 900 and 1,200 m.



DOLPHIN FLOWER

Delphinium malabaricum is the only representative species of its genus in the Western Ghats, with all the remaining species in India distributed in the Himalaya. Endemic to the hill ranges of Maharashtra, this species grows as a herb on exposed rocky hill slopes, standing erect among grasses. It flowers and bears fruit between August and October. The genus name *Delphinium* comes from the Greek word for 'dolphin', on account of the shape of the flowers! Some species in this genus are poisonous to humans.

**THE PETAL LIP**

The winter ephemeral *Eulophia andamanensis* (*Eu* and *lephos* together mean 'beautiful plume' (lip petal) and '*Andaman - ensis*' means 'belonging to Andaman') was first described from the Andaman islands, but is widespread across Southeast Asia in countries such as Cambodia, Laos, Malaysia, Myanmar, Sumatra, Thailand, Vietnam, and in the Andaman and Nicobar Islands in India. This ground orchid flowers between October and March, and grows in coastal evergreen forests.

**HELLO THERE!**

Eulophia pratensis or meadow eulophia is a ground orchid endemic to the Western Ghats. Found in Gujarat, Maharashtra, Karnataka and Tamil Nadu, the plant flowers between December and March and can be found amidst sugarcane fields, marshes, grasslands, damp riverbeds or water channels at elevations between 400 and 1,000 m. Eulophias are also known as corduroy orchids.

AAKASH RAUT



AMIDST THE LEAVES

Zeuxine longilabris or long-lipped zeuxine is a ground orchid found in the leaf litter of semi-evergreen forests at elevations of 600-900 m. It is distributed across India, Bangladesh, Bhutan, Cambodia, Nepal, Malaysia, Myanmar, Sri Lanka and Thailand. A winter ephemeral, it flowers between February and March.

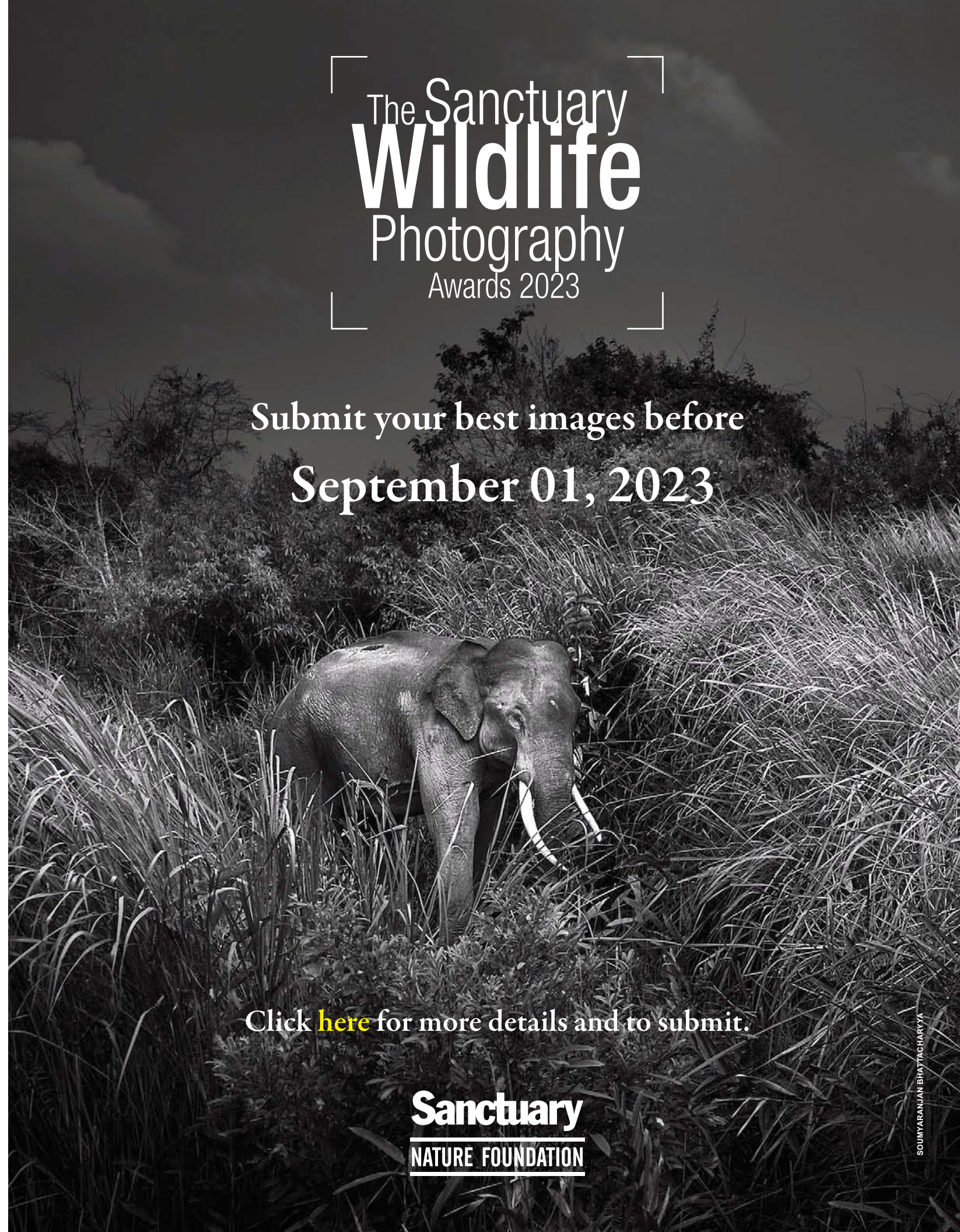
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SOURYARANJAN BHATTACHARYA



OF LESSER-KNOWN STRIPES AMONG TANGLED ROOTS

Tiasa Adhya, co-founder of The Fishing Cat Project (the world's longest running research and conservation project on the fishing cat), partner to Fishing Cat Conservation Alliance, a global cohort of fishing cat experts working across eight range countries and **Justin Jones**, Indian Forest Service Officer, Government of India, write on the experience of orchestrating the first-ever fishing cat population estimation in the state. Much to their delight, in the *Panthera tigris*' mangrove delta home of Sundarban, the team reported a healthy and thriving population of *Prionailurus viverrinus*. The duo outlines how the study became a reality and the vital need to safeguard the species' future.

Not exactly stripes, more like blotches. Not exactly duck-like feet, but its paws are indeed partially webbed. Interestingly, the cat's call, sometimes does sound like the quack of a duck, albeit with a slightly heavier and rougher accent! Other times it brings to mind the bark of an adolescent

dog. Its double-layered fur acts like a 'raincoat' of sorts, and protects the skin underneath from getting totally soaked. It thrives in a world of water and mud, a proposition most cats despise. Such is the fishing cat – an ecological oddity in the charismatic cat family.

FACING PAGE A pair of fishing cats in the mangrove swamps of the Sundarban Tiger Reserve. These adept swimmers are also found at the foothills of the Himalaya along the Ganga and Brahmaputra river valleys, coastal wetlands along the Bay of Bengal, in the Western Ghats, and parts of Southeast Asia.

A Rich, Wet Abode

When early human-like beings were evolving to become *Homo sapiens*, the ancestors of modern cats were also making evolutionary strides. In fact, all the cats we see in our world today evolved into distinct species – about 40, within an incredibly brief timeframe, comparable to the blink of an eye for the universe. That was possibly why we see fewer prominent differences, leading them to look and often even behave like each other. Next time you look at a domestic cat, just compare its features and many of its habits to that of the tiger! The aversion to water is a prominent feature in the small cat family, with two exceptions – the flat-headed cat *Prionailurus planiceps* and the fishing cat *Prionailurus viverrinus*. The former is endemic to Southeast Asia, the latter is found in South and Southeast Asia. Incidentally fishing cats are the size of the average street dog and, yes, they are adept swimmers.

Apart from riverine floodplains and deltas, what one unfailingly observes in the fishing cat's global distribution is the boom in the availability of suitable living conditions around the lower Gangetic floodplain. The incredibly well-adapted felines are found across the entire 10,000 sq. km. Sundarban mangrove delta between India and Bangladesh. And why not? Imagine the might of the Ganga uniting with the strength of the Brahmaputra, bursting forth into endless symphonies of mud and water – from streams and tributaries to ox-bow lakes and from marshes to wet meadows, before forming the wondrous swampland that is the Sundarban, where fresh water finally meets its salty counterpart in the Bay of Bengal. This rich, wet landscape is a global, ecological heritage shared by humans and non-humans alike on either side of the international border.

The fishing cat, intricately linked with these wetlands, is one key face of the landscape. This nocturnal feline is a



ABOVE Tiasa conducting an interview survey on the Hooghly. With its webbed, hook-like claws, double-coated fur, rudder-like tail and fish dependent diet, the species is perfectly adapted to life in wetland habitats.

hypercarnivore – an absolute meat-eater, as are all members of the cat family. The fishing cat’s claws protrude slightly even when retracted, enabling it to catch prey underwater. Wetlands are known to be the richest ecosystems on the planet, providing habitats to a diversity of life forms, unlike any other. In a sense, wetlands are like five-star buffets for predators, offering an assortment of delicious food items. Apart from fish, their prey of choice, fishing cats are known to have an eclectic diet and can take molluscs, crabs, frogs, reptiles, birds and small mammals such as rodents. This predator-prey interaction ties the fishing cat, along with several other species into their chosen food web. Put another way, if a wetland has an abundance of fishing cats, it indicates that the web of life in the system is strong enough to sustain that feline population.

Strength of Numbers and Technology

So how is the Sundarban ecosystem faring? One way to assess that would be to establish that the wetland has a good number of fishing cats. We follow the same logic to differentiate between

fishing cats as we now identify tigers. Every fishing cat has a unique coat pattern! The four to six stripes that start from its forehead and move down its neck start breaking into blotches. It is easy for the trained eye to pick up the differences in the patterns at the point where the stripes break into blotches. Sometimes, unique standalone symbols are created – a slanted N or a broad tick mark. Apart from this, the general arrangement of blotches on the camouflaging grey-brown body, the cheek marks, the half-formed stripes on the legs and the tail are all areas where the uniqueness of patterns are revealed. In essence, clear photographs of the left and right flanks of fishing cats can positively identify and help with enumeration in wetlands.

Using this technique, India’s first systematic fishing cat population survey was conducted in two phases – from March to May of 2021 and 2022 in Odisha’s Chilika, Asia’s largest brackish water lagoon, and India’s first Ramsar site. A similar exercise was also attempted in the Bhitarkanika National Park jointly by The Fishing Cat Project and the Odisha Biodiversity Board, which yielded partial success on account of logistical



Where is it Found?

One end of the fishing cat’s global distribution lies in the Indus delta and the floodplains of Pakistan, and at the other end lies the Mekong delta and its floodplains spanning both Cambodia and Vietnam. *Prionailurus viverrinus* was also historically found on the islands of Java and Sri Lanka. In India, the cat is found in the floodplains of the Ganga-Brahmaputra basin spanning several states, and in the lower reaches of the floodplains and deltas created by east-flowing, peninsular rivers like the Mahanadi, Godavari and Krishna. Protected Areas that are home to the fishing cat in India include the Keoladeo National Park, Corbett National Park, Dudhwa Tiger Reserve, Katarniaghat Wildlife Sanctuary, Kaziranga National Park, Sundarban Biosphere Reserve, Bhitarkanika Wildlife Sanctuary, Coringa Wildlife Sanctuary, and Krishna Wildlife Sanctuary.



ABOVE LEFT and RIGHT Camera trap images of the fishing cat’s side flanks show how each individual’s coat pattern differs.

constraints. Compared to Chilika’s marshlands and fragmented *Pandanus* swamps, mangrove ecosystems are more challenging for the fishing cat. The species has to live with not only two high tides that inundates sizeable portions of its living space per day but also deal with the eccentricity of the tides under the lunar spells of new moons and full moons, each fortnight. Add monsoon to the equation and we start seeing how harsh and strict life can be. What could be their densities in such dynamic ecosystems? There was only one way to solve this conundrum – by taking photographs within a robust scientific framework.

Camera traps are used to get such photographs. Such scientific technology enables us to obtain thrilling insights into the natural history of the non-human world in never before imagined ways. Three decades ago, however, camera trapping was a cumbersome affair. The movement and route of the wild animal had to be anticipated and based on this

intuition, the camera and accompanying flashlight were positioned. Wired to this set-up was a sensor that had to be hidden underneath the soil in the animal’s preferred path. The unsuspecting animal would step on the sensor, triggering the flash and the camera simultaneously. This is how the first camera trapped image (see box on page 28) of a fishing cat was captured from the Sundarban way back in the 80s – a lovely female walking up to pick off a fish hanging from a strategically-placed bait.

Life is (technology-wise) easier now, but field expertise and experience remain non-negotiable skills. Camera traps have become sophisticated, with motion-detecting sensors that offer high-resolution images. But nothing works if the cat’s path is not perfectly tracked. The fishing cat’s pugmarks, are most often found near the water’s edge. But, as we know, life in the Sundarban is not easy! Not for its wild lifeforms, nor for scientists working to document

ABOVE The author Tiasa Adhya’s first introduction to the fishing cat was seeing its pugmarks in the Sundarban Biosphere Reserve during a tiger census. Signs such as pugmarks and scats provide valuable preliminary information about species presence in an area that can be confirmed using camera traps.

them. After all, the ebb and flow of tides, twice a day, creates a complex paradox – instability and certainty at the same. For us, the latter consequence matters – for the waters will engulf the camera traps most certainly twice a day if they are placed by the river banks. Paths must therefore be located on somewhat higher ground so as not to be inundated, and where the camera traps would be safer. However, it is comparatively difficult to find pugmarks on higher grounds that have drier and harder substrates. It is easier to find other evidences here: scats – important markers left by the cats at visually prominent places. That

is how they delineate their territories, guard promising food locations and leave signals for potential mates. One could also, with luck, pick up pheromone scents at scat deposition locations. Only after considering such permutations and combinations do experts choose where to set camera traps. On such routes frequented by the subject, a pair of camera traps will be placed on both sides to perfectly capture both flanks of the fishing cat.

Useful By-catch

A full-fledged scientific survey spanning the nooks and corners of the Sundarban to place camera traps and estimate the fishing cat population is not impossible, but is without doubt a difficult proposition, both logistically and financially. To begin with, a human walking through the dense mangrove forest puts herself, or himself, at risk from

unwelcome encounters with Sundarban's tigers. No matter how big your research group might be, it would still necessitate moving in a single file, not knowing if a predator lurks behind the thick foliage and tangled roots. Of course, a gunman accompanies the survey party – but more often than not that merely amounts to a courage boost! Any way you look at it, it's a daunting task, not for the fainthearted. And then you have logistics to take into account – a huge workforce, the hiring of powerful-engine boats to deploy multiple groups deep into the labyrinthine creeks each day, and, finding the necessary funding for a cat out-competed by the charismatic tiger. But here is the good news – this ambitious dream saw the light of the day thanks to the foresight and determination of the West Bengal Forest Department. They found resonance in the idea of studying the life of West Bengal's

state animal. If the tiger-occupied forests in India could be thus monitored, why not the fishing cats of the Sundarban too? In any event, periodically, camera traps were being set up across the Sundarban to estimate and monitor *Panthera tigris*' populations! Each tiger possesses a unique stripe pattern, as does the fishing cat, and this then became a prestige project for West Bengal. An additional bonus was the fact that all wild animals that used the same trails were automatically also camera trapped. And these 'by-catch' images are now helping the authorities get a better idea of which other animals share the royal Bengal tiger's home. Following this logic, we hope to get a realistic idea of the population size of fishing cats occurring in the world's biggest mangrove swamp. This, scientists and biodiversity experts agree, represents a huge contribution to not only science, but conservation per se.

A First in the Wild

The first camera trapped image of a fishing cat was captured from the Sundarban way back in the 80s by Kushal Mookherjee, one of the best natural historians in the

country. He was best known for his depth of knowledge on birds and often led the waterfowl census in Bengal. He was also keenly interested in smaller, lesser known mammals. He had been part of surveys on

the pygmy hog and the hispid hare, all of which were ground-breaking in India. His interest in fishing cats led him to try and camera trap them for the first time in the wild, in the Sundarban.



ABOVE Kushal Mookherjee orchestrated the first fishing cat camera trap image in the wild, leading to this 'historic' image of the feline trying to grab the fish hanging from a strategically-placed bait.

The Pioneering Watershed Survey

The winter of 2022 brought a slight deviation from the customary annual survey that once focused solely on monitoring tigers – to one that also began to survey Sundarban's fishing cat populations. As always, maps of the four ranges of the Sundarban mangrove forest – National Park East, National Park West, Sundarban Wildlife Sanctuary and the Basirhat range – were overlaid with two square kilometre grids. A total of 573 camera trap pairs were strategically placed over an area of approximately 2,585 sq. km. But the photographs from these camera traps would now be scanned for not one but two sets of data – the tiger and the fishing cat.

Not surprisingly, while disembarking from our boats to place the camera traps on the many islands of Sundarban, we observed tiger trails overlapping fishing cat trails. These trails would lead us to the interior of the islands, which surprisingly were much more open and barren compared to the outside near-impenetrable wall of mangroves and tangled roots. Consequently, deeper into the islands, it was easier to locate scats of both the tigers and fishing cats. Both seemed to choose the higher, drier and open interiors of the islands to defecate and assert their domination of territories. Before alighting, it was customary to burst firecrackers to scare off tigers. But from the moment anyone got down from the safety of the boat and entered the tigers' domain, in search of suitable locations for camera traps (which would be tied to trees on either side of a predicted route) every action involved heightened tension and alertness. We were instructed by our ever-vigilant gunman not to expose our backs to the jungle, or turn our gaze away from the dense vegetation. In the event, our camera traps were swiftly deployed and data on ecological variables noted down as fast as possible. As soon as the bait (smelly meat morsels), was laid out in front of the traps, we beat a hasty retreat back to the safety of the boat. The pungent smell would undoubtedly be a strong attraction for carnivores and when sifting through the camera trap photographs later, we discovered that carnivores would sometimes be drawn to the smell within

five minutes of our departure. On one such occasion, we had to fire into the air to actually scare away a tiger we spotted.

The ubiquitous pneumatophores – mangrove roots that shoot up out of the ground to access air, can be unkind to bare feet, in a hurry. One is bound to carry tell-tale reminders on the soles of their feet – how ill-equipped, and vulnerable, humans are to wander into such untamed wildernesses, where any creature that can be overpowered must assume it flirts with danger. In some parts of the terrain, clothed in deep, soft, wet and very sticky mud, we learned from experience that high-boots, sandals and slippers are impossible to use. The mud and water refuse to let go once it has engulfed a human up to the knees, sometimes the waist! So, when you finally fight successfully against the muddy gravitational pull, and extricate your lower body and legs back out, the

sacrifice of your footwear is the price you pay! Worse, occasionally your feet brush against hidden barnacles that slice the skin, literally allowing the salt from the environs to rub into the wound. All this against the backdrop of that omnipresent fear – a primal emotion that pumps adrenaline into every potential prey's arteries.

350

After months of relentless efforts, our perseverance finally paid off. We manually sifted through thousands of photographs and successfully identified over 350 individual fishing cats. This is a significant finding. The entire Ganga-Brahmaputra floodplains and delta region always suited fishing cats to perfection. It has served as their sanctuary throughout countless geological eras – shielding them from scorching heat and freezing cold, from relentless floods to devastating droughts. In current times, the Sundarban mangrove

Chilika Fishing Cat Survey Results

The fishing cat population estimation exercise in Chilika was a collaborative effort between the Chilika Development Authority, Chilika Wildlife Division and The Fishing Cat Project. Camera traps were placed systematically across 230 sq. km. of the basin area in Chilika. This was done in two phases – the northern part of Chilika was first sampled in 2021 with 49 camera trap pairs and the southern part was sampled in 2022 with 24 camera trap pairs. The camera traps were active in the field in each phase for 30 days. Since the survey area was situated completely outside Protected Areas, it required the cooperation of local villagers all around Chilika. More than 130 individual fishing cats were identified in the exercise.



ABOVE Tiasa Adhya supervising a camera trap being set up along the Chilika lagoon. The involvement and support of local fishermen and villagers has been key in population estimation studies of the fishing cat.

A world without
wetlands
 will be a world starved of
water.



forests represent a subsection within this vast wet landscape, enjoying some level of protection. But out yonder, things are drastically different. The face of this once-teeming wet realm necklaced with winding creeks, intricate channels and beaded with abundant wetlands, is undergoing an unprecedented transformation. It is being turned into concrete and bound into limited, confined spaces. Yet, scattered populations of fishing cats tenaciously hold on. Amidst it all, the Sundarban remains a fortress, where the spirit of this incredible species still burns bright, providing glimmers of hope and resilience to the fragmented populations beyond. For the fishing cat and the Sundarban to thrive, we know, the flow of freshwater must remain unimpeded, cascading into the swamps with unrestrained freedom. It calls for collective global action to confront the challenges of climate change and rising sea-levels, head-on. 🐾

RIGHT Three decades ago camera trapping was a cumbersome affair. The movement and route of the wild animal had to be anticipated and based on this intuition, the camera was positioned. Camera traps have now become very sophisticated, with motion-detecting sensors that offer high-resolution images.



DIVYAJYOTI GANGULY

Wetlands as Climate Security

The term 'wetlands' encompasses a vast array of habitat types where the land is either covered or saturated with water, including marshes, bogs, fens, and swamps; both natural and man-made; freshwater, brackish or saline. Wetlands perform numerous ecosystem services, particularly absorption and filtering of water, and act as nurseries to diverse marine and freshwater life. These wetlands act like huge sponges, absorbing water and reducing flooding. This also helps recharge groundwater aquifers. Wetlands such as mangrove forests also act as buffers against natural disasters such as cyclones, reducing coastal erosion and minimising the damage done. In light of climate change, increased natural disasters, and unpredictable rainfall patterns leading to increased flooding, the role of wetlands in tempering these effects and ensuring water security is even more crucial.



PARTHA DEY

ABOVE The mangrove forests of the Sundarban landscape help mitigate climate change, storing massive amounts of greenhouse gases in their roots and soils. However, they are threatened by rising sea levels as a result of human-caused climate change in addition to being cleared for aquaculture and 'development'.



COURTESY JOANNA VAN GRUISEN

Abdul Rehman Mir

(1956-2023)

By Joanna Van Gruisen,
with inputs from Kashif Farooq Bhat

“Death has nothing to do with going away. The sun sets and the moon sets, but they’re not gone.” – Rumi

Abdul Rehman Mir was one of the first people I came to know after moving to India in 1981. Kashmir was my first abode – peaceful, beautiful, and with a seasonal climate similar to the U.K. – wonderfully distinct autumns, winters, springs and summers. All this made me feel at home and won my heart, but this was also on account of the Kashmiri people – welcoming, gentle, gracious, generous, and safe.

In spite of us being quite far from her and no cubs to be seen, the bear charged. I was the one in the direct line of fire; it was all split-second instinct. Abdul Rehman returned to protect me as I moved to hide behind a tree.

Abdul Rehman Mir had all these qualities and more. At that time, he was a young wildlife guard in Dachigam National Park, and along with his senior, [Qasim Wani](#), was deputed to work with us as we trod the forest making a film on the Kashmir stag, or hangul. Qasim was full of memories and stories of the Maharaja’s time. Abdul Rehman, in his mid-twenties, was from our generation and moved more in the present. But he knew the forest, and his affection for it and the animals drew us together. I was thrilled the first time I actually managed to tickle a trout. He taught me the art of rubbing the underbelly of the fish in a way that put it into enough of a trance to be able to catch it. Of course, we never actually took it out of the water; I think the thrill was more the excitement of developing such an affinity for a creature so different.

Abdul Rehman had respectful empathy for many creatures. I remember one summer visiting his home in Harwan – in those days a beautiful mud and wood structure with no glass windows, only wooden shutters. As the weather was warm, these would be open through the day, and a swallow pair had made their way inside and found the upper story room a most congenial and safe haven in which to build their nest and raise chicks. Far from minding, he ensured that the rest of the extended family kept the window open to facilitate their passage until the chicks had fledged.

I returned to work in Dachigam again in 1999, this time not with a camera but as a consultant/adviser on a New Zealand wildlife documentary production about the Himalaya. Abdul Rehman was there to help again. It was not a long visit, but it was memorable. In the strangely hot spring, the bears we had come to film were not to be found in their expected locations. Indeed it turned out they were not behaving as expected either when we did find one!

Abdul Rehman and I were walking the forests looking for a suitable spot to place a hide for the cameraman when we heard the vocalisation of a bear. He knew there was a female with two large cubs in that area, whom he had seen several times at quite close quarters. This time though, in spite of us being quite far from her and with no cubs in sight, she charged. I was the one in the direct line of fire; it was all split-second instinct. He returned to protect me as I moved to hide behind what I thought was a protective tree (in fact a mere sapling). When I turned back, in front of me was the bear on top of Rehman on the ground. Fortunately, as I stepped towards them, the bear ran off. Blood poured from Rehman’s head and for a dreadful moment I thought the attack had been fatal. Amazingly though, the claws had just missed his eye, his nose and his jugular, and though the teeth wounds in his arm and leg were a little deep, they had not done permanent damage. Even in the face of such trauma he was calm and collected and led us out through the forest until we reached a road and could get to the hospital for treatment. Could one imagine a more invaluable character to accompany one to the jungle! My claw-raked sweater was a tiny reminder of what might have been with any lesser hero.

Unusually on that occasion we were not carrying our ‘bear sticks’. These were wonderfully sturdy but light poles cut by Rehman from *hatab* or *pobu*, *Parrotiopsis jacquemontiana* that when heated over a fire took on a lovely reddish hue. Wildlife filmmaker Ashish Chandola tells me he still has a stick Rehman cut for him all those decades ago. He himself had a close bear encounter at that time. We never walked in the forest without the bear sticks – except on that one fateful morning. Rehman’s cousin, Abdul Qadir, recalls a similar episode but one when the stick was put to good use. He was walking with Rehman in the forest late one night when “a giant bear came down from the tree. Abdul Rehman beat the stick loudly on the ground and saved our life. He was such a courageous person and he was never afraid of anything in his life.”

Abdul Rehman was companion to many visitors to Dachigam, generously sharing his knowledge and love of the forest with everyone. *Sanctuary’s* own Bittu Sahgal regarded him as a ‘soulmate’ and spent much time trekking with him and “sharing quiet moments watching hangul, monkeys, bears, and just once a leopard drinking the glacial waters of the Dagwan stream”. Rehman’s grandson, Kashif Farooq remembers a fairly recent occasion when Bittu and the *Sanctuary* team came to Dachigam. Although his grandfather was not well that day, as soon as he heard they had come, he happily went to meet them and explained the behaviour of the Himalayan black bear and the hangul’s feeding habits and behaviour during the different seasons of the year. Kashif, then a student of agriculture, was not the only one impressed at how well he explained the natural history, “more like a wildlife researcher”.

Abdul Rehman knew many secret spots. I can never forget the wonder of being shown a narrow crack in the rocks of a cliff up one of Dachigam’s several side *nullabs* in which bees had been nesting, perhaps for millennia. Their honey was safe as the opening was so narrow that even the bees mostly walked rather than flew inside; the marvel was that over time the walking bees had actually worn a visible little entry path on the rock.

His colleagues from the Wildlife Department corroborate his knowledge



COURTESY JOANNA VAN GRUISEN

ABOVE Wildlife filmmakers Joanna Van Gruisen and Ashish Chandola with Abdul Rehman, a naturalist and guide extraordinaire, in the Dachigam National Park in Kashmir, in 1982.

FACING PAGE Abdul Rehman and his wife Habla. A devoted husband, father and grandfather, Rehman’s incredible diligence, personal integrity and courage set an example for all who knew him.

and his bravery: “Wherever there was any emergency, we would see him at the front,” they say. Indeed on more than one occasion he was injured in the course of duty. He cared for Dachigam as his home, and they assert that no one served as sincerely nor knew the area as well as he did. He shared his understanding generously and guided others on the trails and wildlife of the park. Ghulam Ahmad, a wildlife guard, was one of those who learnt the mountains’ ways from him. “It amazed me how much he knew,” says Ghulam.

His incredible knowledge, honesty, diligence, personal integrity and extraordinary courage was noted in the citation for the [Sanctuary Nature Foundation’s Wildlife Service Award](#), which he received in 2003.

His prowess in the forest and at work was remarkable, but he was no less exceptional in other areas. He was a man of deep piety and constancy both in his personal relationships and in his faith. For fifteen years he gave the call to prayer in his village as *muezzin*, never missing his congregational prayers even when unwell or travelling and indeed often performed *tabajjud* prayers too. This devoutness was not worn visibly, but perhaps lay as the basis for him standing taller than most, as a family man and a friend. As his daughter

Zareena says, “He always had loving interactions with people around him.” His loving nature and interest in others shone through all his social interactions, and his children all remark on how well he interacted with people. They also remember how much he taught them; his daughter Tasleema remembers walks to Dachigam with him and discussions at every step: “He treated me like a son.” But it was not only forest matters that he was good at teaching; Zareena also remembers, “He would teach me every step of life and when I reached a marriageable age, I knew every single thing about making a home.”

In the true words of his grandson, Kashif: “We unfortunately lost him too early. People like *Dady* can’t be found everywhere.” His wife, four children and nine grandchildren grieve the most. Abdul Rehman’s wife Habla said, “I was the most fortunate wife and I’ve lost everything, and it will never come back.” His son, Mehraj Ahmad, feels the void acutely too: “I feel as if I have lost everything; he was a rock and hope for us all, but now it feels like the support is gone. The loss is too great.”

Indeed it is, but Abdul Rehman will endure in many of our hearts and live on in the work of all those who continue the legacy of love and protection for Dachigam that he helped inspire. 🐾



COURTESY RUTH PADEL

The Sanctuary Interview

MEET RUTH SOPHIA PADEL

The great-great-grandchild of Charles Darwin, **Ruth Padel** is a celebrated British writer, poet, singer, viola player, academician and conservationist. Wadham College in Oxford University changed its Statutes (which until then only admitted male Fellows), to accommodate her! A path-breaker in every sense, she came to India to experience tropical forests... and ended up travelling through 11 Asian nations to discover whether and how wild tigers could possibly be brought back from the edge of extinction. She is the only writer to be a Fellow of both the U.K. Royal Society of Literature and Zoological Society of London, has served as a Trustee and Board Member of the Zoological Society of London, and as Chair of the U.K.'s National Poetry Society. She is a Trustee of the U.K. charity New Networks for Nature, which brings together zoologists, conservationists and artists, and was Professor of Poetry at King's College London. She speaks to **Bittu Sahgal** about her life, passions, and determination to be a persuasive voice for the biosphere.

I felt compelled to read your book *Tigers in Red Weather*, twice! What makes Ruth Padel tick? That's lovely! I guess curiosity, a longing to go out into the world and discover for myself about new places, people and animals. A love for nature – like climbing a mountain

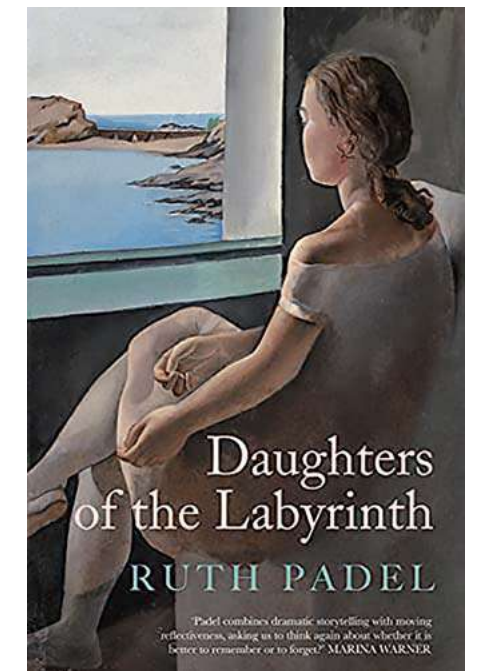
full of hummingbirds in the Cocora Valley in Colombia, but also for singing, for poetry, and for learning from other people and their different ways of thinking. Their different music, if you like: their different dance. Also, a love of history. I love imagining past lives, especially past

creators – composers, painters, scientists. I have written two tiny biographies-in-poems. One of my great-great-grandfather, Charles Darwin, and one of Beethoven, the archetypal creator. My most recent novel, *Daughters of the Labyrinth*, is rooted in history. It is set on the Greek island of Crete, where Europe began, in the Bronze Age. It centres on the Jews of Crete; I am not Jewish but I have lived on and off on Crete since 1970. It is based on a true but little-known story about what happened to the Jews in the Holocaust during the German occupation. But it also looks back to the myths of the Minotaur and the ancient Minoan palaces. I think one powerful impulse in me is to see the past in the present, the present in the past. To discover, or maybe to make, new connections. I love putting things, and people, together.

Does the weight of your illustrious lineage – Darwins, Keynes, Padel, Barlows – ever weigh you down? I am only related to Keynes by marriage! My beloved grandmother Nora Barlow, Darwin's grand-daughter and first editor, had a big influence on me. In her home, as in Charles Darwin's, the garden was a natural extension of the house, and I loved staying with her, looking at plants and wild animals, mainly birds, though occasionally a muntjac would stray in. They are a pest in many parts of south England, though to me as a child it was very exciting. She was born Nora Darwin and was first cousin to Margaret Darwin, who married Geoffrey Keynes. They were both grand-daughters of Charles Darwin: there is no Keynes in my blood; the Keyneses of my generation are my second cousins. Maybe if I had been a scientist, the scientific heritage might have weighed me down. But I did Classics – Greek and Latin, following my father, who taught me ancient Greek. Then I wrote a Ph.D., at Oxford, on Greek tragedies, and what the ancient Greeks thought was inside them – emotionally, demonically, physically. And poetry was always drawing me in, enchanting me, so I did not really notice my scientific heritage until tigers came on the scene. Then, I realised how much I needed it! When I wrote *Tigers in Red Weather*, I had to learn zoology, ecology, conservation – you could probably teach a conservation course out of the index of that book – it

has the fervour of the autodidact! Then, doing poems on Darwin's life, I had to follow the journey of his thinking closely. I feel at home around zoologists. When I was a Trustee at the Zoological Society of London, I curated a series of 'Writers Talks' around endangered animals. I'd invite a well-known author to talk about an animal that fascinated them, as well as that animal's keeper, and a conservation zoologist to talk about its wildlife. So, the audience could watch, for example, a Galapagos tortoise, hear Mark Haddon, author of *The Dog that Barked in the Night*, talking about what he felt about it, then hear the keeper talk about looking after it, then a zoologist talk about its conservation in the wild. It was a way of connecting imagination, from the writer, with the zoology, individual animal on the ground, and the ecology – with its habitat; and how it is under threat. We had a lovely occasion with Susie Orbach, the psychoanalyst who wrote *Fat is a Feminist Issue*, with Sumatran tigers. I said, "write about the jungle of the clinical session," and she talked beautifully about that, but the male tiger interrupted things by roaring, so eventually Susie said to the audience, 'Turn your chairs round to watch him, not me!' Our first event was with the slow loris in the 'Moonlight World'; where a tree anteater is allowed to roam loose. He investigated my handbag while I was preparing my notes to chair the event.

You are a hugely successful writer today, but what was your greatest challenge when starting out? It is still a challenge actually: joining the two paths in myself. The academic, scholarly, getting-the-facts-right side of me, which of course you need, to be a naturalist. And the other, the imaginative and creative, the dreamer, the 'what if' side! They are different voices. You need to find the voice of each book, and poem, that you write. At least I do. In non-fiction, the tiger book was a quest structure and that voice came easily. I wanted to find out what



ABOVE Ruth Padel's most recent novel, *Daughters of the Labyrinth* is rooted in history, and set on the Greek island of Crete.

FACING PAGE Ruth in Crete, Greece, where she has lived on and off since 1970.

I think one powerful impulse in me is to see the past in the present, the present in the past. To discover, or maybe to make, new connections. I love putting things, and people, together.



ABOVE Three year old Ruth Padel in her grandmother Nora Barlow's garden. Ruth recalls wonderful times spent staying with her, and looking at plants and wild animals in the garden.

much harder to find. There were working elephants to consider as well as wild ones; the role of the elephant in human imagination is far more complex; the whole relationship to human beings is suitably enormous! And although my heart is in Asia, I had to consider African elephants as well as Asian ones.

And COVID19 messed up my plans! I was hoping to go out on poaching patrols in Myanmar, where they are now poached for their skin as well as ivory – and investigate rewilding in Laos. So, at first, writing in lockdown, I felt very constrained. A lot of knowledge I really needed was available. There is wonderful video material, and lots of important scientific papers, but my instinct is always to start from the field, from being there – as I did with the tiger. It was extremely frustrating! But then we were *all* frustrated in lockdown. All the same, the structure, as well as the voice, of the book took longer to find. Eventually, I structured it by starting from elephants in the wild (beginning in Borneo), then moving to their biology and cognition (starting with the trunk); then to elephants in human hands (starting from the relation with the *mabout*; I spent a lot of time in Thailand with *mabouts* there), and finishing with elephants in human hearts and imagination. This section begins with religion, at first in northeast Thailand, but of course Ganesha has a starring role. Then I move to what happened to elephants in western countries where they did not live wild: what people did with them, but also thought and felt about them.

In what order would you place your passions... poetry/writing, music/singing and nature conservation, if you were forced to place them on a podium? I can't rank them! I put them all equal. Poetry and music belong together, and nature with them. The first time I went properly guided into a tiger forest was in Panna. The teak leaves were large, crackly and dry and I felt, 'I am at home'! It was a very odd feeling. It was a moment where every one of my senses was on full alert: I was hoping to see, to learn about and understand, the tiger – in its home! It was also like being inside a great poem or novel, a place where I knew what the meaning would be, if I could see it. The

'meaning' of the forest was the tiger. I probably would not see it, but I knew that every single thing there, from a Serpent Eagle to the otter eating a fish, which was the first thing I saw, was connected to it. Magical. Actually, I blame Kipling for this. I so loved *The Jungle Book* as a child that I knew it practically by heart. The poems as well as the stories. I don't know the Disney film, I don't want to see it – the book is so mesmerisingly written. The black panther, with his 'skin like watered silk and voice like wild honey dripping from the bough', had me in thrall. I wanted to be Bagheera! Or if not be him, to marry him. I still have never seen a melanistic leopard in the wild, I would love to. I came very close to it in Bhutan.

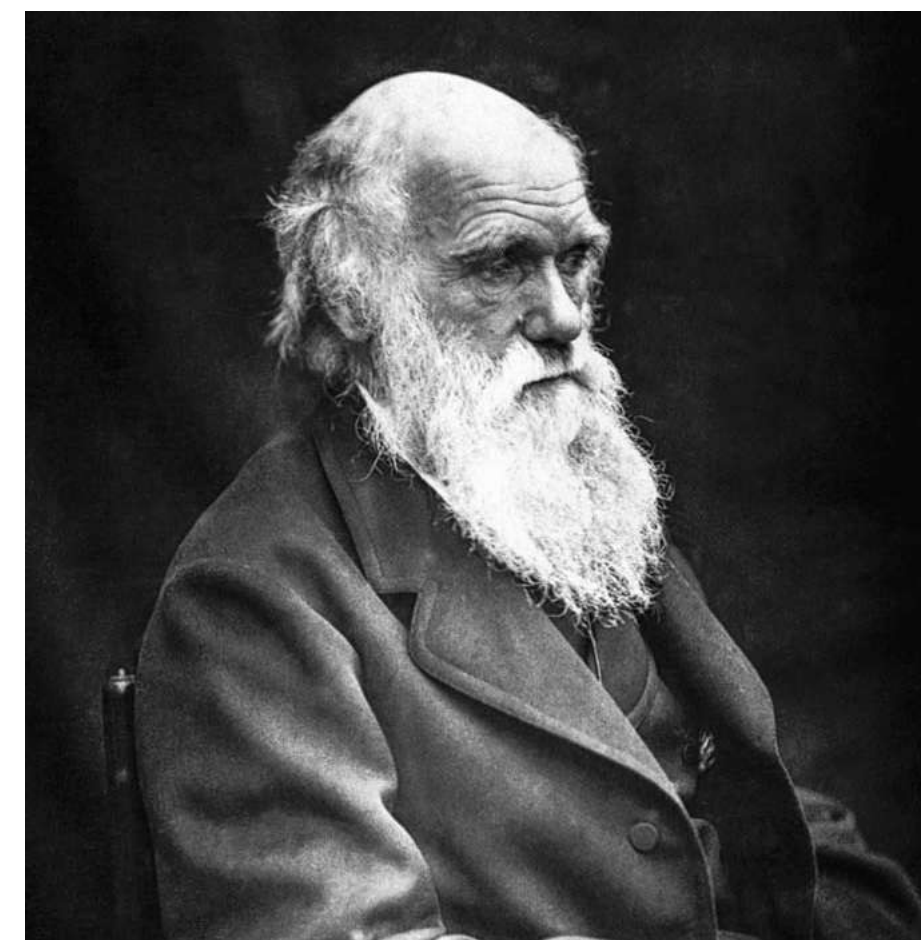
May I reproduce here one of the very moving poems you have written and ask what you feel today about the fate of *Panthera tigris*? Thank you. We all know how hard it is to struggle, one issue at a time, with the many destructive forces threatening *Panthera tigris* – people and corporations who enrich themselves at the expense of the tiger's home. But after researching my new book, *Elephant And Rainbow*, which should come out next year, I realise how even more difficult it is to protect elephants. Because they are nomadic, they migrate, whereas tigers want to stay in a territory if they can. And how can we protect either against climate change? But we have to believe in the forces of good.

Tiger Drinking at Forest Pool

by Ruth Padel

*Water, moonlight, danger, dream.
Bronze urn, angled on a tree root: one
Slash of light, then gone. A red moon
Seen through clouds, or almost seen.
Treasure found but lost, flirting between
The worlds of lost and found. An unjust
law
Repealed, a wish come true, a lifelong
Sadness healed. Haven, in the mind,
To anyone hurt by littleness. A prayer
For the moment, saved; treachery
forgiven.
Flame of the crackle-glaze tangle, amber
Reflected in grey milk-jade. An old song
Remembered, long debt paid.
A painting on silk, which may fade.*

Is it true you might have liked to be an Opera Director in another life? I'd have loved to do that! I can't live



ABOVE A portrait of Charles Darwin, Ruth Padel's great-great grandfather. Not surprisingly, natural history has been part of her family background and her love of poetry is intertwined with her passion for nature.

without making some sort of music. I have always sung, and also played the viola in family music-making. During lockdown I much enjoyed doing a series of talks on Beethoven's life, with his music, for Bengaluru's wonderful Concert Hall, collaborating with a pianist, illustrating moments in Beethoven's passionate and often very tragic life, with music he wrote. They did it beautifully, with all the difficulties of the new technology we had to work with in global lockdown.

But opera combines music, and words, and also theatre, another of my great loves. When Girish Karnad was Director at the Nehru Centre, in London, I often went to plays with him, he gave me copies of his own plays, and when I went off for tiger research in India, he gave me introductions to theatre directors too, especially in the South, in *Koodiyattam*. So there is a drama strand in *Tigers in Red Weather*, thanks to him. I sometimes think opera is rather like *Koodiyattam*. The beautifully costumed gestures may come over as old-fashioned

Charles Darwin was an optimist. He lived in a time of optimism, and was so in love with 'progress' – which then seems so straightforward.



TOP LEFT Ruth and her parents in the 1960s.

BOTTOM LEFT Ruth Padel's family in the Galapagos Islands in 2004 – Ruth (second right) with her mother, Hilda, and her mother's first cousin Sophie (both are Darwin's great grand-daughters), two of her brothers, and her daughter.

music, which I know I will never be able to fathom. Girish said it took him some time to become accustomed to the rhythmic *thinness* of western music. He found it at first almost laughable – until he realised that the subtleties of that music lay in harmony, rather than rhythm.

Which section of Charles Darwin's Beagle Voyage would you most have liked to accompany him? The jungles of Brazil. He took such *delight* in those jungles! There's a lovely story, recounted many years later by his young friend and disciple George Romanes, who was an evolutionary biologist himself. His work laid the foundation of what he called 'comparative psychology', and suggested that processes of thought and understanding were similar in humans and other animals. He was staying overnight with the Darwins. In the evening, they talked about when and where they had felt that feeling it was then fashionable to call 'the sublime'.

Romanes said Darwin told him that the occasion when he was most affected by the emotions of the sublime was when he stood upon one of the summits of the Cordillera, and surveyed the magnificent prospect all around. It seemed, as he quaintly observed, 'as if his nerves had become fiddle-strings, and had all taken to rapidly vibrating.' They talked about other things and went to bed. But many hours later, about 1 o'clock in the morning, Romanes was woken up. The door gently opened and Darwin appeared, in his slippers and dressing-gown and said, "I have been thinking over our conversation. It has occurred to me that I was wrong in telling you I felt most of the sublime on top of the Cordillera. I am quite sure I felt it even more in the forests of Brazil. I thought it best to come and tell you this, in case I should be putting you wrong. I am sure now that I felt most sublime in the forests."

The first time I went properly guided into a tiger forest was in Panna. The teak leaves were large, crackly and dry and I felt, 'I am at home.'



So, characteristic of Darwin, that he should worry that he had misled his friend, he had made a mistake – and had to put it right, even at one in the morning!

Of Darwin's first experience in a South American jungle you wrote: "Vegetation he's never seen, and every step a new surprise. New insects, fluttering about still newer flowers. It has been for me a glorious day, like giving to a blind man eyes."

How, in your view, might Darwin have responded to the voluntary blindness that enables the extirpation of the biodiversity that opened his eyes during his Voyage on the Beagle?

He could not have foreseen it! He was an optimist. He lived in a time of optimism, and was so in love with 'progress' – which then seems so straightforward. When chloroform became available, for women in childbirth, he administered this to his wife himself, for their, I think, seventh child (she bore 10) – and did it so enthusiastically that she remembered nothing about the whole thing! He did not foresee that 'progress' would come at such cost to the earth. He would have been horrified. But he knew very well the sadness of loss in his own life. In the section of *On the Origin of Species*, which most shows the effect upon him of his beloved daughter's death, aged 10, he says, "Nature is not benign." Some people think that the *Origin* has the shape of Milton's epic poem *Paradise Lost*, which

Darwin took with him to read on his five-year voyage around South America. Because the *Origin*, the whole theory of evolution, after all, depends on loss: on the death of previous life forms, like dinosaurs.

What message, in verse, might you wish to leave in a time capsule, addressed to children born in 2050? Maybe Emily Dickinson:

"Hope" is the thing with feathers – That perches in the soul, And sings the tune without the words And never stops – at all.

Because we have to have hope! One of the epigraphs of my elephant book is from the Irish poet Seamus Heaney: 'Hope is not optimism, which just expects things to turn out well, but something rooted in the conviction that there is good worth working for.' I think all readers of Sanctuary will have that conviction. The other epigraph is from the poet Somadeva Bhatta:

May Ganesha protect you, as night comes on and he dances his dizzying dance raising his trunk spraying food and light to the stars.

To contact Ruth Padel, please email her agent Robert Kirby: RKirby@unitedagents.co.uk

ABOVE Ruth Padel is currently working on a non-fiction book on elephants. She has also authored the conservation-based memoir *Tigers in Red Weather*.

I can't live without making some sort of music. I have always sung, and also played the viola in family music-making.

Fifty Years of the Chipko Andolan



It's a dire scene. Cracks reach from end to end across walls and ceilings of dwellings. People flee their ancestral homes, belongings strapped to their backs. The year (2023) that the alarm was sounded on the imminent sinking of Joshimath, a Himalayan town and gateway to many treks and religious destinations in Uttarakhand, is also the same year that the Chipko Andolan turns 50.

The Chipko Andolan succeeded in mobilising hill communities, especially women and students, in the 1970s to save the Himalayan forests from extractive companies, contractors and governments, and protecting their source of livelihood and sustenance. The Chipko Andolan was essentially an economic struggle, with inherent ecological consequences, which are encapsulated in the lines by activist Kunwar Prasun: *Kya hai jungle ke upkaar, mitti paani aur bayaan; mitti paani aur bayaan, zinda rehne ke aadhaar* (What do forests give our lives: soil, water and air; soil, water and air are what keep us alive).

The Andolan is historic for several reasons. Led by social-political workers, women and students, it resulted in positive change for local communities, and it inspired environmental activists globally, including a group of Swedish activists in 1987, and Japanese citizens in 2008, all of whom protested tree felling by nonviolent methods such as tree-hugging. The movement wasn't a sudden upsurge of people, it was a slow awakening, seeping through the valleys and forests, finally upwelling into mass



By Shatakshi Gawade and Bhavya Iyer

community action across the hillslopes of Uttarakhand, resulting in positive change.

THE MAKINGS OF CHIPKO

First the British, then the Maharaja, and then subsequent Acts increasingly restricted access of local communities to the forests. The trees of Uttarakhand, from sal and chir pine to deodar, are of high economic value. Sal was first used for making railway sleepers – two million sleepers were extracted by 1878. The forests were later auctioned to paper mills, plywood factories, for resin extraction and others, often at much lower prices than available for locals. The discontent felt by people at this wholesale destruction of forest tracts, while they were prevented from collecting forest produce, slowly began coming together by the end of the 19th Century. This turned into organised protests and demands for forest rights, demands which were raised during the Indian Freedom Struggle in Uttarakhand, too. These conditions, along with devastating floods, one of them along the Alaknanda in 1970, galvanised people to join the Chipko Andolan.

The expression of the word 'Chipko' was heard first on March 27, 1973 from an agitated Chandi Prasad Bhatt, a Gandhian environmentalist and social activist, when Symonds Company loggers arrived in Gopeshwar. The first marked Chipko action was taken on April 24 at Mandal when ash trees were given to a company to make sports goods; these had been denied to the local Dasholi Gram Swarajya Mandal for making agricultural implements. The activists rose in defiance, declaring that they would never let the trees be cut, and that they would stick to the trees (*Chipko*). This nonviolent act defeated the loggers, the trees were saved, and the first Chipko inspired others to rise for their forests. Along with Chandi Prasad Bhatt, Govind Singh Rawat, Gaura Devi, Sunderlal Bahuguna, Ghanshyam Sailani, Shamsher Bisht, Dhoom Singh Negi, Sudesha Devi Man Singh Rawat and many others drove this resistance in the 1970s and 80s.

A HISTORIC MORNING AT ARENI

Picture this – it was an early morning in the remote Himalayan village of Reni in 1974, when most male villagers had gone to the district headquarters of Chamoli to collect the 14-years-delayed compensation for land

The discontent felt by people at this wholesale destruction of forest tracts, while they were prevented from collecting forest produce, slowly began coming together by the end of the 19th Century.

they had given up to the Army after the Chinese attack of 1962. Only women, seniors and children were in the village when labourers were smuggled into the forest to chop trees. Gaura Devi gathered 21 women and seven girls and marched up the mountain to save their forests, which they considered their *maika* (parents' home). They firmly told the men to leave their forest alone. The women's quiet, nonviolent resistance in the face of a group of unknown, rowdy, drunk labourers shook the men, who were forced to leave the forest. When the men of the village returned, along with other activists such as Chandi Prasad Bhatt, they saw "the women who – ignorant of Marx and Lenin, and almost equally of Gandhi and Vinoba Bhave – had unexpectedly finished the spadework that had been done by male leaders," writes author and historian Dr. Shekhar Pathak (see box on page 42) in *The Chipko Movement: A People's History*.

After the historic Chipko at Reni, the movement continued spreading to

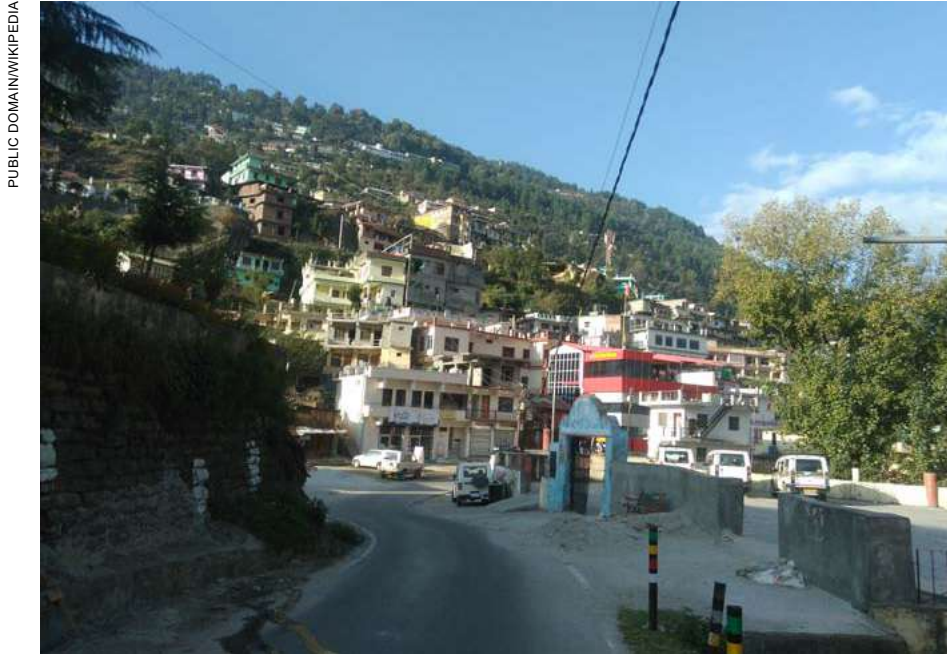
other parts of Uttarakhand. The pressure of tourists on the Valley of Flowers and the extraction of wood for the Badrinath temple were impacting the forests. The villagers of Bhyundhar (Chamoli) successfully drove away the labourers with their agitation. In Almora district, 6,000 trees in the Chancharidhaar forest were saved from Star Paper Mills, and were given to the locals to make their homes and for use in cremation grounds. People used slogans such as '*Pedon par cut jayenge, apne red bachaenge*' (Cut us before the trees, we will save our trees), which made labourers recede in shame.

FACING PAGE *The participation of women in the Chipko Andolan fired the imagination of the world. The tiger too became an evocative symbol for forest protection. Both people and forests continue to be under the threat of short-term, get-rich-quick motives of a greedy few.*

BELOW *Sunderlal Bahuguna (centre), along with several other activists, drove the resistance for forest rights.*



PUBLIC DOMAIN LIVELIHOOD



ABOVE Joshimath, today the gateway to many religious destinations and treks in the Himalaya, is built on old moraine. Unregulated construction and tunneling are causing the town to sink.

Gaura Devi's son, Chander Singh Rana, now 78, talks about the persisting connection between the forest and the people. We still depend on the forest for medicinal herbs, and the most fresh vegetables. He says, "The Chipko Andolan taught us that we must save what nature has given us. The movement was born because there was so much oppression [of people's rights]. Gaura Devi, though she was unlettered, was part of the movement so that the wealth of the forests could be saved for future generations."

Activist Shiv Nayal, who was a college student and journalist for a local newspaper in the late 70s, remembers the month and a half they staked out the Chancharidhaar forest with Bipin Tripathi and associates, despite the fear of bears. They spent the nights in the forest; they feared the contractors would strike then. "The time was such that people used to talk about forest

issues constantly. It was inevitable that the youth would join the Andolan," he reminisces. He adds that the movement became what it was on account of the involvement of women such as Gaura Devi. "Women truly understood the need for the forest, and saved their wealth for future generations. The women were able to rope in their neighbours, children, which took time, but spread and peaked." After that, different expressions of Chipko emerged at Vayali (Uttarkashi), Nainital, Advani and Badiyargarh (both in Tehri), Janoti Palri and Dhyari (both in Almora), Dungari Paintoli (Chamoli) and several other places with unique success through public participation.

THE OUTCOME OF CHIPKO In the late 70s, the Chipko Andolan united Garhwal and Kumaon, the two divisions of the state, like no other cause had before. The Chipko Andolan successfully armed villagers,

Gaura Devi gathered 21 women and seven girls and marched up the mountain to save their forests, which they considered their maika (parents' home). They firmly told the men to leave their forest alone.

especially women, in taking the lead in saving their forests. The social awareness and binding from the Chipko Andolan also trickled into an alcohol ban campaign and the campaign for the formation of a separate Uttarakhand.

The Chipko Andolan did not end with the famous hugging-of-trees protest – it began with it. The next steps of the movement, as laid out by Sarla Behn, Chandni Prasad Bhatt, Sunderlal Bahuguna, Shamsheer Bisht and others were towards making local communities self-sufficient when it came to forest dependence –

greening of the hills by planting trees, which also helped with slope stabilisation; growing fodder plants for livestock, building check-dams, and more. The movement recognised the importance of a healthy environment for the livelihoods and prosperity of people living in the hills.

In the ensuing years, Chipko influenced the implementation of the *Forest Conservation Act* 1980, which disallowed the use of forests for non-forest purposes. The centralisation of power and its problems for local communities were realised only later. The Chipko Andolan

DR. SHEKHAR PATHAK ON THE CHIPKO ANDOLAN

Dr. Pathak, whose book on the Chipko Andolan won the Kamaladevi Chattopadhyay NIF Book Prize 2022, was a student activist and was part of the movement right from the 1970s. A professor of history for three decades at Kumaon University in Nainital, he founded the NGO PAHAR (People's Association for Himalaya Area Research) in 1983, and is also the founder-editor of its annual magazine. His book on the Andolan is a stellar record of a people's movement that continues to inspire.

Have the demands made during the Chipko Andolan been met and stuck to?

The major demands of the Chipko Andolan were met with the end of the contractor system, pan-Indian implementation of the *Forest Conservation Act* 1980, non-renewal of the 20-year agreement with Star Paper Mills to provide timber from Uttarakhand forests, and a ban on felling of green trees above 1,000 m. However, the demands related to the development of forest cooperatives, development of small cottage industries, growth in Panchayati forests with more participation from women and Dalits, and the introduction of forestry in school curriculum, were not met. The Forest Corporation failed in implementing its

charter and simply continued cutting and selling trees. The state still sits on forests, and failed in becoming their custodian through giving more rights to communities by involving them in conservation and fire protection. Now, even the Central government has become indifferent to forests and kind to corporations.

What was the effect of the Movement on natural biodiversity?

Uttarakhand is a Himalayan state and all the bounties and calamities of nature are very much part its landscape. Its wilderness is superb and its fragility is alarming. An earthquake, a landslide, a glacial lake burst, a forest fire or flood can do much destruction here and in downstream areas.

Chipko created awareness about not just forests but about all aspects of biodiversity. The movement highlighted the protection of *bugyals* (alpine pastures), rivers and the higher Himalaya too. It advocated for people's natural forest and democratic rights. It suggested looking at the Himalaya holistically. It further suggested that borders cannot be saved without empowering the communities of borderlands.

How has the Chipko Andolan inspired you, and the new generation?

Fortunately, we think of ourselves as the children of the Chipko generation. As

students we saw, learnt and participated in one or another expression of the movement. Chipko compelled us to grow as good activists, journalists and researchers. It increased our overall creativity and sensitivity. It inspired so many people in and outside of the movement, in and outside of the state and even the country. It also showcased the depth of people's power and had an ever-lasting impact on thousands of individuals of our generation.

Chipko clearly tells us that ecology and economy are closely connected. Only participatory movements can be sustained. It teaches us that 100 per cent successes are impossible in any movement. It also teaches us how to evolve the ability to protest, how to organise each section of society. It teaches us about traditional forest rights and how the forest and pasture land support small agriculture, cottage industries and daily life in the mountains. The oxygen, soil, water, folk gods and folk songs are all closely connected with them. Forests are at the very centre of mountain life.

How do leaders and bureaucracy respond to people's rights over their forests?

The current and past governments at the Centre and in most of the states are essentially anti-forest, anti-forest dweller and peasant, and anti-ecology.

At the same time, they are pro-corporate, pro-privatisation and pro-destruction. Nowadays, creative foresters and bureaucrats are missing, or they are very few, and may be victimised if they speak the truth. The little or non-implementation of the *Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act* 2006, no interest in making the biodiversity register, freeing Van Panchayats of Uttarakhand from the harms done by Joint Forest Management and dilution of Environmental Impact Assessment and labour laws show that there is much pressure from corporate and powerful people on the government.

At the time of Chipko Andolan, a more sensitive government was in power, although it had its lapses and shortcomings too. Even at the time of the Jungle Satyagraha in the 1920s, the colonial government respected the forest movement and returned the 7,770 sq. km. of forests to community out of respect for their *haq-haqoos* (traditional rights).

Today's Uttarakhand is in the worst condition, where unscientific road construction (the Char Dham highways) and mining, construction of big dams, airports, railways and urbanisation have destroyed a large part of forests and

agricultural land, and has encroached into forests, pastures and river beds to such a great degree that landslides and floods have become a regular feature. All-weather roads in Uttarakhand have triggered many tragedies.

Is Uttarakhand's ecological future in peril, especially in light of Joshimath sinking?

On account of an incomplete and fractured model of development, there is much destruction and it will continuously increase in the era of an uncertain climate. The destruction done in the name of development will have deep ecological implications.

Some people remember the earthquake of 1803, a few more the Alaknanda floods of 1970 and more people the 1991 and 1999 earthquakes, the big disaster of 2013, and the flood of February 7, 2021. But the system has learnt very little from them. The 'destruction' pattern is same in the name of 'development'.

Uttarakhand has also become a victim of the system on account of its sacred and beautiful places. The system has given rise to unsustainable pilgrimage tourism. But many people are also dependent on this necessary evil. But evils cannot last long.

Take the case of Joshimath. The small and beautiful village above Vishnu Prayag

first became a small town owing to the end of Indo-Tibet trade and the creation of Chamoli district after 1960. After that, the Army and the ITBP established their units there. Then came a construction boom without following any rules. The regulating authorities never exercised their power. The town became big but did not develop its drainage system. After that came the ropeway project to Auli Bugyal. Many more roads and constructions were done. Finally came the notorious NTPC Tapovan-Vishnugad hydro project, which made the final assault on this fragile settlement. It destroyed the very base of the town by multiple tunnelling. Road widening also contributed to the tragedy. It was forgotten that this landscape was created by a big landslide from Kunwari mountain, and so it had old moraine at the base. From Heim-Gansser to K.S. Valdiya and Navin Juyal, each geologist has reminded us of that fact.


The Joshimath Sangharsh Samiti has been continuously protesting for more than 140 days now, very peacefully and in a participatory way. Their demands have not been considered yet. The tragedy has become a perennial one. The ordinary citizens of Joshimath are in great crisis, though they have contributed very little to the tragedy, and that too was only for their very survival.



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inspired several movements within Uttarakhand such as the Beej Bachao Andolan (Save Seeds Campaign), Maiti Andolan (Tree Planting Campaign), Chetna Andolan, Van Panchayat Sangharsh Morcha, anti-mining and Nadi Bachao Andolan (Save Rivers campaign).

When it comes to the motivations of the Chipko Andolan, what is often forgotten is that a key demand of the movement was the acknowledgement of the rights of local communities to use the forests. Even today, the rights of communities to forests is hotly contested. The *Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006*, often referred to as the *Forest Rights Act (FRA)*, attempts to right historical injustices meted out to forest dwelling communities who, for wildlife conservation or ‘development’, were uprooted from ancestral lands and denied land rights in forest areas. However, implementation of this Act is often patchy, with claimants facing yards of bureaucratic red tape. Meanwhile, large swathes of forest are lost to ill-thought out ‘development’ and infrastructure projects.

THE FORESTS Uttarakhand’s forests, covering 45.44 per cent of the geographical area, are home to sloth bear, leopard, tiger, chital, sambar and hundreds of avian, reptilian and amphibian species. Forests were, and still are, an integral part of the lives of Uttarakhandi people – cattle rearing, farming, material for building homes, water mills, locally run forest industries, all depend on the jungles in the people’s backyards. They are also a source for herbs to treat illnesses, honey, fuelwood, and other natural resources. Even casual conversations with *pahadi* people reveal the deep connection and love they have for their mountain homes and the forests they depend on. Himalayan forests also provide critical ecosystem services – the trees and grasses bind the soil, preventing landslides and erosion; they help recharge groundwater, and of course they are important carbon sinks.

Across the world, forest regions are plagued by persisting tussles over who

RIGHT Chandni Prasad Bhatt, now 89, was one of the drivers of the Chipko Andolan and worked towards making locals more self-sufficient.

The Chipko Andolan inspired several movements within Uttarakhand such as the Beej Bachao Andolan (Save Seeds Campaign), Maiti Andolan (Tree Planting Campaign), anti-mining and Nadi Bachao Andolan (Save the Rivers campaign).

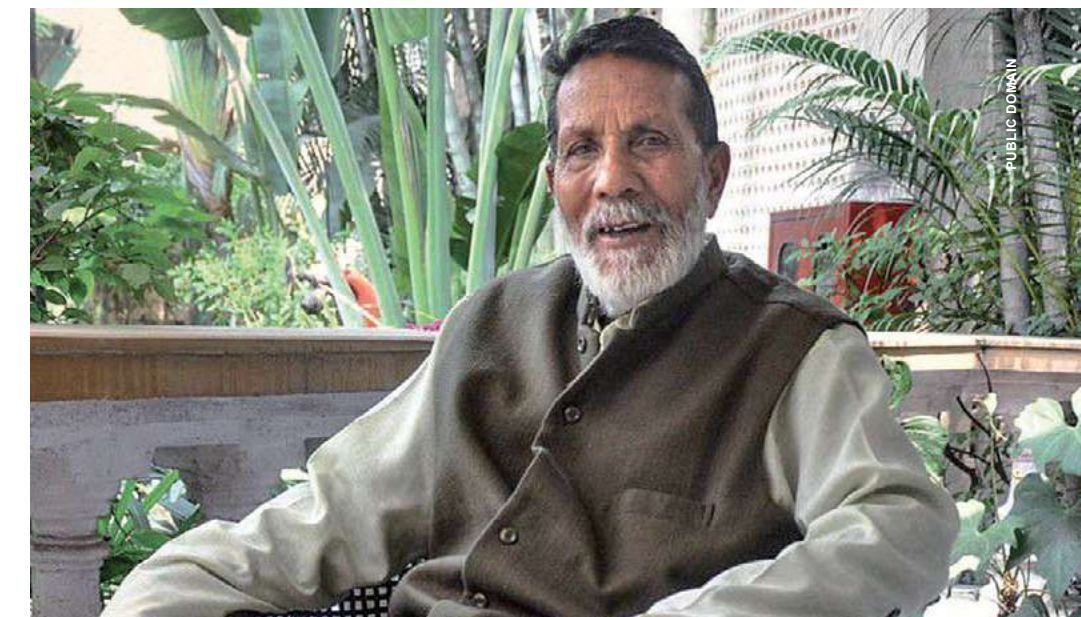
owns the forest and who gets to use resources from it, and how they can be conserved for posterity. Andy White, an expert in land and resource rights, and Alejandra Martin, social movements and climate justice expert, write that increasingly, economic development and environmental protection agendas are converging all over the world. Experts are now acknowledging that the “traditional management practices of Indigenous peoples can be positive for biodiversity conservation and ecosystem maintenance”. In Ecuador, community ownership of forests has worked as a disincentive to converting forests. In Uttarakhand too, communities have developed ways of using the forest sustainably. Dr. Pathak writes that economy and ecology are two sides of the same coin in rural Uttarakhand.

TODAY IN UTTARAKHAND The Himalaya is frequently referred to as the Third Pole, and the source of water for nearly two billion people in the Indian subcontinent. The region is also a stage for geo-political manoeuvring, being of grave strategic

importance for India, Pakistan, China, Nepal and Bhutan. This has translated into an urgency for development in the form of road construction and dam building in parts of the Himalaya, particularly near border regions, such as in Ladakh, Uttarakhand and Arunachal Pradesh.

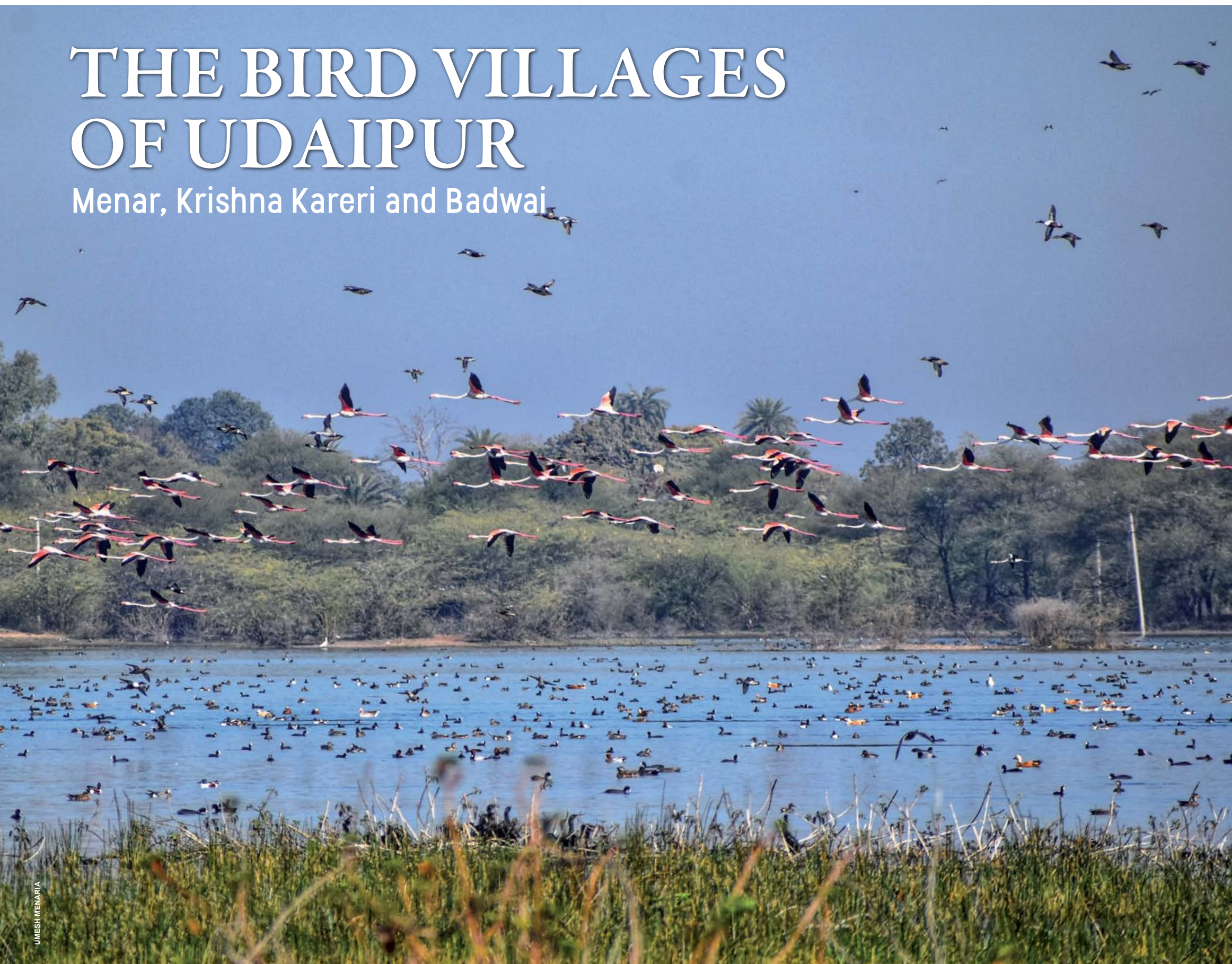
At a time when forests and their conservation are clearly seen as barriers to development, with legislations being passed through to amend the laws protecting our forests – as in the case of the *Forest Conservation (Amendment) Bill, 2023* and references to the Chipko movement being removed from the NCERT curriculum – simultaneously, more people than ever are standing up for their rights to clean and safe environments and the need to safeguard our wilds. The time is ripe for a new movement along the lines of the Chipko Andolan. 🌿

Acknowledgement: The history and understanding of Chipko is based on Dr. Shekhar Pathak’s seminal book The Chipko Movement: A People’s History.



THE BIRD VILLAGES OF UDAIPUR

Menar, Krishna Kareri and Badwai



By Asad Rahmani

My first visit to this birding haven was in 2014, during the first-ever Udaipur Bird Festival. The Menar wetland had always been zealously protected on religious grounds for hundreds of years. Shooting had been strictly prohibited by the village, and the birds here reflected that confidence, and were amazingly fearless, almost tame. The local people stand as a bulwark against poachers and trappers. Migratory birds that otherwise fly or move away from human beings at the slightest disturbance can be found feeding less than 15 m. away. Based on the number and diversity of birds visiting the wetland, Menar was added to our list of Important Bird and Biodiversity Areas (IBAs) in the revised edition of my book of the same name, published in 2016.

I also visited two other wetlands during that visit – Krishna Kareri and Badwai. These have received a conservation boost over the last decade with bird festivals organised by the Forest Department. When local people observed first-hand the enthusiasm of birdwatchers and support from the Forest Department, it encouraged them to provide better protection to their village wetlands. All three wetlands today are among the finest examples of community conservation in India.

NEIGHBOUR'S ENVY, OWNER'S PRIDE Located by the Udaipur-Chittorgarh highway (NH-76), the Menar wetland is easily accessible. When the youth of Krishna Kareri and Badwai saw how the spotlight on Menar benefitted locals, they decided to showcase their wetlands too, both equally delightful avian magnets. Enthusiasm, conservation awareness, Mewari pride, and support of the Forest Department (particularly Dr. N. C. Jain, Rahul Bhatnagar, Dr. Satish Kumar Sharma, and Suhel Majboor), played an important role in rejuvenating these wetlands. There is now even a WhatsApp group called 'Pakshi Vihar – Krishna Kareri', maintained by local youth that send daily updates on wetland birds. I have watched, with great joy, the transformation of young people such as Bheru Lal Purohit of Krishna Kareri over the last nine years. From a callow young man in 2014, he is now an expert birdwatcher, communicator, and popular leader. Bheru now has a team of nearly 50 young girls and boys, trained with a smattering of bird knowledge, who guide visitors around the wetland. A steady stream of officials and birdwatchers have resulted in better facilities and cleanliness in the village. Government *babus* began paying attention to this area when

FACING PAGE Greater Flamingo, Common Coot, Northern Pintail, Northern Shoveler, Eurasian Wigeon, Greylag Goose, Ruddy Shelduck, and other waterbirds such as cormorants and egrets grace the wetland lakes of Udaipur.



ABOVE LEFT Dr. Satish Sharma, Bheru Lal, Asad Rahmani and Ajay Kumar Menaria with volunteers committed to safeguarding the Krishna Kareri wetland that has been rejuvenated with the Forest Department's support. Several youth living near this wetland have been inspired by the power and joy of birdwatching and are training to be nature guides in the future.

ABOVE MIDDLE A flock of Sarus Cranes *Grus antigone* in the Menar wetland, which supports a healthy array of aquatic plants that provide food and shelter to migrant and resident avians.

ABOVE FACING PAGE A Dalmatian Pelican *Pelecanus crispus* flock in the Menar wetland. Around 100 species of aquatic and terrestrial birds have been reported here. This wetland is among the finest examples of community conservation in India.

they found their bosses visiting this non-descriptive village. Such is the strength of birdwatching.

Another small wetland is Badwai on Udaipur-Pratapgarh road. A shallow habitat of 93 acres, it attracts thousands of waterfowl, including up to 300 Bar-headed Geese. In the deadly summer heat, water dries up except in small pools, but the monsoon revitalises the wetland. Good water quality and a profusion of submerged vegetation provides plentiful

Shooting had been strictly prohibited by Menar village, and the birds here reflected that confidence, and were amazingly fearless, almost tame.

food, which attracts waterfowl including Northern Pintails, Northern Shovelers, Common Teal, Gadwall, Spot-billed Duck, Common Coot, waders, and more. Diving ducks are fewer in number as the water is quite shallow. On three sides, the Badwai wetland is surrounded by agricultural fields that form the water catchment of the lake. A majestic old ficus tree near a temple provides shade to travellers, pilgrims, and birdwatchers in need of a break.

Another young man, Bherulal Shrimali with a Bachelor's degree in mathematics, is active in protecting the Badwai wetland, along with a team of 10 volunteers. Some years ago, trapping and hunting occurred periodically, but now no hunter dares to visit Badwai with ill intentions – or guns! The local Panchayat is also supportive, and even bears the cost of pumping water into the wetland in summer. Such small gestures of ownership and acceptance by locals can be a game-changer in conservation.

WETLAND DIVERSITY Of the three wetlands, the best known is Menar. A large Shiv sculpture on the *bund* benignly overlooks the village and the Brahm *Talab* (lake). A two-kilometre earthen *bund* retains the rain water. It has a large catchment area that



extends across several kilometres during the monsoon. Another wetland, Dhand *Talab*, is just as bird-rich. Both *talabs* are situated on the outskirts of Menar village. Fortunately, the water quality is still good, with excellent growth of aquatic plants including *Hydrilla verticillata*, *Ceratophyllum demersum*, *Vallisneria spiralis*, *Potamogeton crispus*, *Azolla pinnata*, *Ipomoea aquatica*, *Trapa natans*, *Spirodela polyrhiza*, *Wolffia arrhiza*, which provide food and shelter to the avians. The lake margins are fringed by *Typha angustifolia*, *Scirpus littoralis*, and *Ipomoea carnea*. Thick growth of *I. carnea* is present along the pond edges. Patches of *Typha angustata*, *Scirpus littoralis*, and other *Scirpus* species are scattered in the shallow waters. On the *bund* and in surrounding areas, thick growth of *babool*, *Acacia nilotica*, *vilayati babool*, *Prosopis juliflora*, mango, and neem, amidst a patchwork of agricultural fields, provide habitat to terrestrial birds, adding to the richness of Menar wetland.

In December and January, between 8,000 and 10,000 waterfowl can be found here. In a year, over 20,000 waterfowl visit this area, many using this wetland complex as a stopover site during their arduous migration. This is demonstrated by the sudden influx of birds for a few days, followed by a quick, sharp decline in their numbers. A detailed, long-term study is necessary to ascertain this observation. About 62 species of aquatic birds have been reported in the Menar's wetlands. If terrestrial birds are included, the total is close to 100 species. Among them, Knob-

billed or Comb Duck, Cotton Pygmy-goose, Indian Spot-billed Duck, and Lesser Whistling-duck are residents. The Great Crested Grebe has been observed breeding in Menar. The White-naped Tit, designated Vulnerable by the IUCN, has been reported in the thickets of *Acacia nilotica* on the banks of the lake. The Eurasian Bittern has also been recorded in Menar. Greater Flamingos too brighten the wetland during their short visit, as do Common Cranes in winter.

THE FUTURE IS HERE The debate between 'community conservation' and 'fortress conservation' has often split conservationists worldwide. Both groups are well-meaning, and present good case to support their point of view. Community conservation requires the involvement of locals in conservation programmes, with accrued benefits shared with the community. Meanwhile, fortress conservation protects ecosystems by isolating them from the community. I take a middle path, and support both approaches on a case-by-case basis. For many species such as the tiger, rhino, panda, Bengal Florican, Black-breasted Parrotbill, and the like, fortress-like strict protection of habitats in the form of boundary-delimited Protected Areas with minimum human presence is essential. For other species, particularly those living in large landscapes, or moving over large areas, such as migratory birds or elephants, community conservation plays a crucial role.

Over the last 10-12 years, I have developed an affinity for Menar and other



Hukka-Paani Bund

An interesting story connected to Menar village showcases the villagers' fierce loyalty to their traditions and birds. In the days of yore, it was customary to provide food and water to travellers. On March 6, 1832, a British man John Teltson arrived from Udaipur with his staff, and camped near the Menar wetland. When he saw thousands of birds, he shot one for breakfast. He wrote that with the gun fire, birds rose like a cloud and darkened the sky. The alert villagers gave him a stern warning to not kill birds, and demanded he shift out of the village. The arrogant Englishman claimed that he had permission from the Maharana, but the resolute villagers forced him to flee with his 50 camp staff. No food or water was provided to them. In Hindi, we call this a '*hukka-paani bund*'. The story still resonates in Menar.

wetlands, and the wonderful people who are protecting their liquid treasure. Not only wild birds, but cattle too are allowed to use the water to drinking and wallow. Thanks to the Menar wetlands, the local water table is high and bore wells are used for drinking water. Each person in the village ensures that no waste contaminates the pond, and all community toilets are located downstream of the catchment area of the wetlands.

I recently read that in the Kukurmara village in distant West Kamrup division in Assam, villagers were involved in caring for an injured female elephant. Despite the

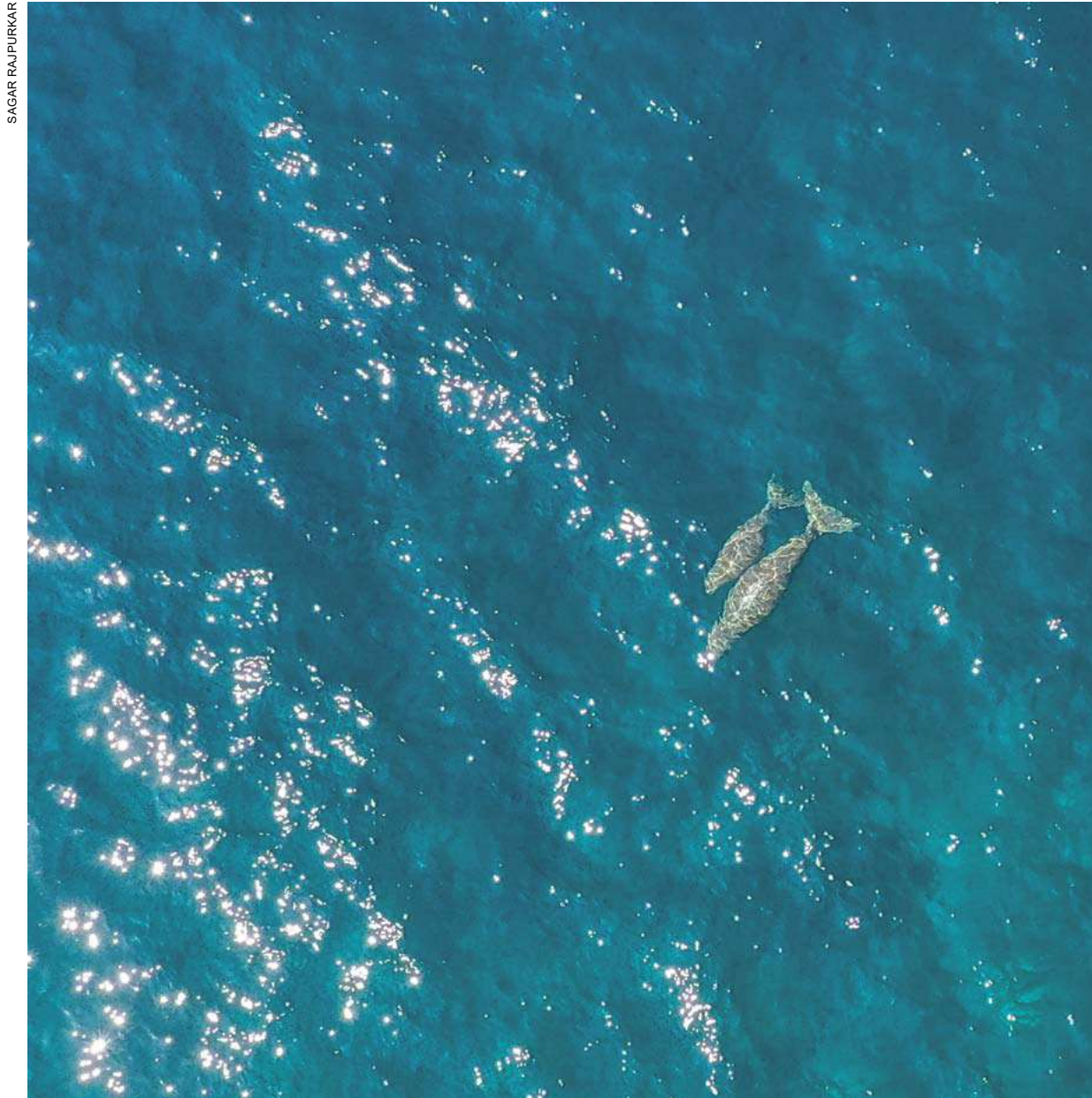
fact that villagers regularly suffer from wild elephant attacks, they came forward to feed a helpless creature. From the wetlands of Udaipur, where young people are carrying forward the tradition of animal protection, to Assam, where villagers value a wild elephant's life, this is the real India, one that should fill us with pride. 🐘

Asad Rahmani, Director of BNHS (1997-2015), has authored several books, scientific papers and articles. His main interest is in grassland and wetland birds. He was also the Executive Editor of *Journal of BNHS*, and other BNHS publications.

During winter, on some days in December and January, between 8,000 to 10,000 waterfowl can be found here. In a year, more than 20,000 waterfowl visit this area, with many using this wetland complex as a stopover site during their migrations.

Taking to the Skies

In this photo essay, **Sagar Rajpurkar** shares stunning images taken using Unmanned Aerial Vehicles (UAVs) of **dugongs** *Dugong dugon*, a species he has been studying for his doctoral research. Belonging to the order Sirenia, dugongs are the only marine mammals that are completely herbivorous and thrive in shallow, coastal waters of the Indo-Pacific region. A population of about 200-250 dugongs has been recorded in Indian waters, scattered along the coastal areas of Andaman and Nicobar Islands, Tamil Nadu, and Gujarat. Sadly, their populations across the globe have seen a steep decline in recent years.



SAGAR RAJPURKAR

Dugongs are closely related to manatees, and are the only surviving species of the family Dugongidae. They are distributed in the Indo-Pacific region from Africa to Southeast Asia, and all the way to Australia. They are classified as Vulnerable in the IUCN Red List of Globally Threatened Species and in India, dugongs are listed under Schedule 1 of the *Wildlife Protection Act, 1972*, the highest protection status in India – on par with the tiger.



DARIUS QUADROS

Also referred to as sea cows, after their behaviour of mowing through patches of marine plants, they are the only living marine mega-herbivores that feed *exclusively* on seagrasses. Their seagrass meadows are also home to a wide array of marine species and are nursery grounds for fish and various marine invertebrates.



DARIUS QUADROS

Studying dugongs is challenging, as they are not surface-active like other marine mammals such as dolphins, that can often be acrobatic when they surface while 'porpoising' or breaching. Unlike dolphins and most other cetaceans, dugongs also lack a dorsal fin. Only their nostrils are visible when they surface to breathe every three to eight minutes. Essentially, their lives are spent underwater, which is why spotting dugongs is difficult practically if only relying on boat-based surveys.



SAGAR RAJPUKAR

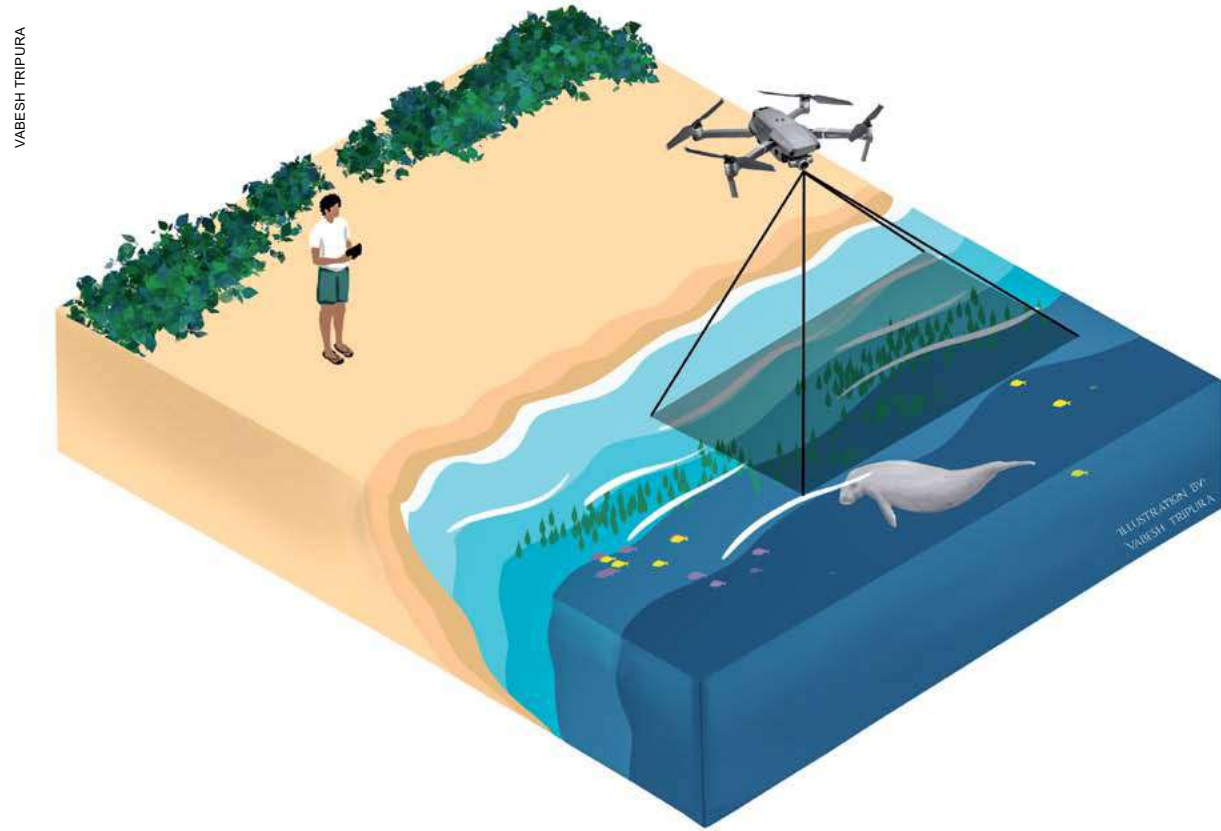
In the Andaman and Nicobar Islands, dugongs are usually found in areas that are isolated, uninhabited, and difficult to access. Some of these marine areas overlap with remote Tribal Reserves and are pristine, making them quite inaccessible.

Dugongs are threatened by habitat loss, accidental net entanglement, boat strikes *and* incidental bycatch. Not surprisingly, the vulnerable mammals perceive boats as a potential threat and flee when approached. This adds to the challenge of conducting traditional boat-based surveys.

During the survey, apart from dugongs, other globally threatened marine species such as spotted eagle rays, manta rays, dolphins and zebra sharks have also been observed. These species share habitats similar to that of dugongs. This further emphasises the use and application of UAV technology in the field of marine species' studies and monitoring.



SAGAR RAJPUKAR



VABESH TRIPURA

ILLUSTRATION BY VABESH TRIPURA



ILLUSTRATION BY VABESH TRIPURA

Given their elusiveness, rarity and scattered distribution in Indian waters, a new approach was required to monitor dugongs. Aerial surveys using Unmanned Aerial Vehicles (UAVs) were therefore used around seagrass meadows. These are now categorised as Critical Dugong Habitats identified based on inputs by the Dugong Volunteer Network, which comprises fisherfolk, SCUBA divers, and other seafarers.



SAGAR RAJPUKAR

UAVs have proved to be an effective tool in sighting other globally threatened species like zebra sharks *Stegostoma tigrinum*. Marine species are mostly unfazed by UAVs hovering over them and recording their behaviour. UAVs are also cost effective compared to manned aircrafts, and function on rechargeable batteries, causing no direct emissions.



SAGAR RAJPUKAR

The light-weight UAVs have proved to be so successful that over 100 frontline staff of the Forest Department are now being trained to use these devices for marine wildlife monitoring and surveillance under the capacity building objective of the Compensatory Afforestation Fund Management and Planning Authority (CAMPA) programme.

With UAVs, areas that were earlier difficult to access can now be surveyed with relative ease. With Forest Departments actively adopting this technology and forming drone squads to monitor marine wildlife, we can expect that the integration of new technologies will strengthen dugong and other conservation actions along India's rich marine habitats. The dugong project is under the leadership of Dr. J. A. Johnson and Dr. Nehru Prabakaran from the Wildlife Institute of India and Dr. K. Sivakumar from the Pondicherry University.

THE PENDULUM OF LIFE

When food is scarce, starvation will take you into the treetops to find an alternative.

I was driving through the countryside of Pune to enjoy a little birding, when I heard a loud commotion from the side of the bridge that I was crossing. There were several Baya Weaver *Ploceus philippinus* nests, and all their inhabitants were in complete hysteria; an oriental rat snake *Ptyas mucosa*, a predator of the master weaver, was slithering down one of the nests. Several in the flock were frantically trying to defend the nest. Rat snakes get their name because of their fondness for feeding on rodents and other ground animals. However, the opportunistic, non-venomous snake does feed on birds, insects, amphibians, lizards, and even other snakes.

Baya Weaver nests are designed with a pendulous entrance chamber, which makes it difficult for potential predators, such as the rat snake, to enter. Males woo potential mates by building elaborate, multi-storied nests. Females inspect their potential homes, and if the nest is up to scratch and the lucky male is selected, he completes the construction of the marital abode and adds a funnel-like entrance chamber. The entrance is designed to prevent access to a larger and heavier animal whose weight could stretch and narrow the funnel entrance.

I captured this photograph from my car window, moments after the beautiful serpent raided one of the nests in the hope of finding helpless chicks or unhatched eggs for a tasty snack. Adult birds would be near impossible for the snake to catch as they are alert and swift. Unfortunately for the snake, the nest was empty, perhaps left incomplete by the male or rejected by a female.

Predator-prey relationships exemplify the cycle of life. Success for the snake means death for its prey. And one failure, merely means another hunt until success comes the reptile's way. And, though weaver birds largely consume grain, they are not beyond hunting insects, small frogs, lizards, and molluscs, particularly to feed their young.

And thus swings the pendulum of life! 🐍

PHOTOGRAPHER: Kenneth Lawrence

LOCATION: Pune, Maharashtra

DETAILS: Camera: Canon EOS 5D Mark IV

Lens: Canon EF 200-400 mm. f4L IS USM EXT, Aperture: f/8.0,

Shutter speed: 1/800 sec., ISO: 500, Focal length: 412 mm.

DATE: October 3, 2020, 8:34 a.m.



KENNETH LAWRENCE

I FINALLY SAW BROWN BEARS

By Mahmood Ahmed Shah

THE EARLY BIRD In the summer of 2014, the high-altitude lakes were still under the grip of ice and snow, when we visited the high-altitude lake Chammra sar. Nestled in the recess of Mount Harmukh in the Jammu and Kashmir Himalaya, the lake has a tiresome ascent, and the snow made it even more difficult. On reaching the lake, we took a much-needed break. We ignited the

isobutane stove and prepared lunch, following it up with a hot cup of tea; meanwhile, I set up my camera to capture a timelapse. The weather was pleasant and we enjoyed our stay by the lake.

The next day, I was the first to walk down, a decision I was to sorely regret. After about 10 minutes of descent, I noticed that none of my partners had followed me. I waited for a few minutes,

then decided to return and climb back up to the lake. No sooner did I begin my ascent than I saw the group coming toward me, in a cheerful mood. They excitedly informed me that as I had left, they spotted a brown bear *Ursus arctos isabellinus* with two cubs climbing up the hill on the snowy slopes of the lake. I regretted having missed the family, and from that day, brown bears would elude me for a decade.

HUMAN INFLUENCES IN THE WILD Kashmir was once a famous hunting ground for those seeking big game such as hangul, black and brown bears, ibex, goral, serow and leopard. The markhor goat of the cliffs in particular, offered adventurers of the day a real challenge. Several books have been written on hunting; a few which I have read are *Big Game Hunting – The Sportsman's*



ABOVE A herd of female Himalayan ibex *Capra sibirica* on the cliffs along the Kargil-Leh road.

FACING PAGE Brown bears are found in the high altitude regions of Kashmir and Kargil. They have a thick brown coat that helps them cope with intense cold. The cubs stay with their mother for a few years before separating to live independently.

Guide to Kashmir, Ladakh by A. E. Ward, *With Pen and Rifle in Kashmir* by Otto Rothfield, and *The Markhor, Sports in Cashmere* by Hans Graf Von Königsmarck. Over the years, with changing times, game dwindled and became increasingly elusive. Though hunting was banned, habitat loss and human-animal conflict became more common resulting in faunal decline. Virtually every year, bear maulings and deaths have been reported, while videos of wild animal lynching also appear with just as much regularity.

Each winter, as snowfall bedecks the valley, the animals descend to Dachigam National Park to seek food and shelter. Dachigam, a jewel in the crown of Jammu and Kashmir, was established during Maharaja Hari Singh's rule to offer protection to the majestic animals, and was the royal hunting ground for him and his valued guests. The Maharaja also introduced wild pigs to the park to make his hunts more interesting. As a consequence, an animal not native to the

place has spread across the valley in recent years. CCTV footage reveals wild pigs wreaking havoc in tulip gardens, digging up bulbs and chomping on them.

British officers introduced trout to the wild streams of Kashmir to satisfy their angling pursuits here, and also established the first trout fish farm in Dachigam, which exists to this day and is managed by the Fisheries Department of Jammu and Kashmir. Trout has spread and habituated to all freshwater streams and many high-altitude lakes as well.

Come autumn, animals feed and rut across the valley. This is also the best window to sight Himalayan black bear feeding on acorns in Dachigam. Oak trees were also introduced by Europeans as winter feed for hangul and black bear. One evening, my son and I were able to see several black bears in less than an hour in the company of Nazir Malik, an experienced wildlife guide who often accompanied me on visits to the park before he retired.

Kashmir was once a famous hunting ground for those seeking big game such as hangul, black and brown bears, ibex, goral, serow and leopard.



ABOVE Every year, thousands of birds like these Gadwall Ducks *Mareca strepera* overwinter in the wetlands of Kashmir. By March they begin their return journey to the high-altitude lakes and marshes in the Himalaya.

WONDERS OF NATURE In 2012, I was posted in Gulmarg as Chief Executive Officer of Gulmarg Development Authority, where I would regularly drive out at twilight to spot leopards. One evening, my persistence paid off, and I saw a bear and leopard together feasting on a horse. I could not believe my eyes! I drove past without stopping, and when I drove back, the bear had disappeared into the forest while the leopard was still guarding the carcass. On

my third round, all three had disappeared and the next morning I found the half-eaten carcass in the adjacent forest.

With the onset of winter, the wetlands of Kashmir are abuzz with the arrival of thousands of migratory birds. Kashmir is a birding wonderland. Each winter, at the first sight of coots in Dal Lake I inevitably set off on journeys to our Happy Valley's many wetlands. Hokersar, a Ramsar site, is an exceedingly good birding habitat that has, of late, been made even more tourist friendly by the Wildlife Department thanks to aesthetic and informative signages and informative displays. There is a calm that settles over one as expert boatmen hand-row you to transport you across bird-inhabited waters to a strategically placed watchtower. From here

Maharaja Hari Singh introduced wild pigs to Dachigam National Park to make his hunts more interesting. The non-native animal has spread across the valley, creating havoc in tulip gardens.

if a birder has the patience to remain still, a host of birds literally settle down around you to offer some of the closest and most intimate encounters with a diversity of migratory avians that normally offer little more than brief flashes of visibility.

Wildlife tourism has great potential in Kashmir as a revenue stream and offers great potential to boost wildlife conservation. Of course, much work remains to be done, but I was encouraged to see that young Kashmiris have established a group called 'Birds of Kashmir' to raise awareness of the region's rich avian diversity. Already, we see very proficient Kashmiri youth birders emerging as experts, and visitors from near and far can be assured of help and guidance to visit habitats that offer sightings of endemic birds including the Kashmir Nuthatch *Sitta cashmirensis*, Kashmir Nutcracker *Nucifraga multipunctata*, Kashmir Flycatcher *Ficedula subrubra* and Ibisbill *Ibidorhyncha struthersii*. The Birds of Kashmir group was instrumental in recording rare migratory birds including the magnificent Tundra Swans that



ABOVE The hangul or Kashmir stag is a distant relative of the European red deer. Geographic isolation has resulted in it evolving as a separate species. Kashmir's Dachigam National Park is dedicated to its conservation.

returned to Kashmir after 72 years. Unfortunately, the birds were shot by poachers for a few kilos of meat. Such acts virtually assassinate the potential for the major tourism boost that avians can gift the people of Jammu and Kashmir.

In 2019, when the state of Jammu and Kashmir was designated a Union Territory, the state bird was changed from the Black-necked Crane *Grus nigricollis* to the Khalij Pheasant *Lophura leucomelanos*, a beautiful black bird with striking white eye feathers. I had my first Khalij sighting at Gulmarg, where I unwittingly disturbed a flock while walking through the woods. Watching the birds flying gracefully downhill was a sight to remember.

FORTUNE FAVOURS THE BRAVE My work often took me to Ladakh to secure pashmina wool for Kashmir's artisans. Upshi has the best domestic gene pool of the pashmina-producing Changthangi breed of domestic goat. These animals inhabit the Changthang region of Ladakh, where intense cold causes the goats to grow an undercoat that protects them from the harsh winters. This wool, which is very

fine fibre with a thickness of 11 to 15 microns, is shed with the onset of the summer and is collected and finely woven by talented Kashmir weavers. The wool is hand spun and hand woven to create what I consider to be the finest of shawls the world has ever known. At the farm, I not only witnessed the combing process by which the wool is removed, but also the birth of two kids.

While driving around Ladakh, a keen eye will almost inevitably reveal the region's wild species. Partridges, of course, are a common sight, but I was able to record my first ever *bharal* (blue sheep), Tibetan Snowcock, pika and Himalayan hare en route to Pangong and Tso Moriri. While driving from Leh to Kargil, I was even blessed to come across an ibex herd.

In April 2023, I was in Ladakh, when I was informed about a brown bear sighting at Drass. Thanks to Roots Ladakh, a Kargil-based travel company operating in the Mashkoo valley, Drass, I was advised by them to time my arrival at Hulyal village in the evening. Lo and behold, before me was a brown bear with her cub. I could hardly believe my luck because, after a 10-year wait to see brown bears, I was finally able to sit quietly, blessing my good fortune all the while, for a full 90 minutes. 🐾

While driving around Ladakh, one can always spot wildlife – I sighted my first bharal, pika and Himalayan hare while driving to Pangong and Tso Moriri, and while driving from Leh to Kargil, I saw a herd of ibex.

BOOTS ON THE GROUND

THE SANCTUARY WILDLIFE AWARDS



AWARDS 2018



AWARDS 2019



AWARDS 2022



WILDLIFE LEGEND AWARD 2021
DR. JANE GOODALL, DBE
Legendary scientist, ethologist, conservationist and Messenger of Peace



LIFETIME SERVICE AWARD 2001
QASIM WANI
A retired forest guard from the Dachigam National Park in Kashmir



LIFETIME SERVICE AWARD 2012
BELINDA WRIGHT
Wildlife guardian, visionary conservationist, fearless crusader

Guidelines: Nominations must be kept confidential from the candidate. • Nominations must be proposed and seconded by individuals/organisations who know the candidate well. • A brief note (around 500 words) on the achievements that qualify the candidate for the award should be attached along with a biographical note (around 250 words) and photographs of the candidate at work. • Details of specific instances/examples demonstrating the candidate's commitment together with details of the issue he or she is tackling. • Press clippings/published material, if any, by or about the candidate or the candidate's work may be included. • Any other supporting material for the benefit of the judges may be included.

What an exquisite world we live in. Everyone knows, of course, that our planet faces threats, but what is heartening is the manner in which large numbers of bravehearts have begun to look upon protecting the species and habitats around us not as some kind of charity, but as the very purpose of their lives. Our superheroes come in different avatars – forest officials, policy influencers, lawyers, writers, educationists, activists, scientists, orators, artists and children. These are nature's spokespersons who are determined and committed to making their dreams come true... of leaving behind a planet that someday will not need protecting from our own kind. *The Sanctuary Nature Foundation* honours these inspiring dreamers and promises to support them every step of the way.



WILDLIFE SERVICE AWARD 2022
DR. RAMANA ATHREYA
Ecologist, conservationist and astrophysicist



GREEN TEACHER AWARD 2017
K. S. SMITHA
Spirited educator, environmentalist and inspirational activist



YOUNG NATURALIST AWARD 2021
AYUSHI JAIN
Researcher, community conservationist and student

All awards are subject to conditions
In the event that entries do not meet the judges' standards, the organisers reserve the right to refrain from making an award.



The Sanctuary Wildlife Awards were instituted in the year 2001 to recognise and draw national attention to the contribution of individuals working for the protection of wildlife and natural habitats in India. We invite nominations and entries from Sanctuary readers, which should be sent to reach us no later than **September 1, 2023**. Send entries to: Sanctuary Wildlife Awards 2023, 145/146, Pragati Industrial Estate, N.M. Joshi Marg, Lower Parel, Mumbai 400 011 or email: awards@sanctuaryasia.com

Lifetime Service Award

Criteria: An individual whose life has been devoted to the protection of wildlife species or their habitats on the Indian subcontinent.

We are in search of a true hero; someone whose life's purpose and respect for nature can be held out as an inspiration to the youth of India.

Wildlife Service Award

Criteria: Individuals currently working in the field who have displayed extraordinary courage, dedication and determination in the arena of wildlife conservation.

We are in search of inspired wildlifers, forest employees, researchers, villagers or anyone currently involved in nature conservation in the field who have set personal standards for others to follow.

Green Teacher Award

Criteria: An individual currently working to communicate wildlife and conservation values to students in Indian schools or colleges.

We are in search of an individual with a missionary zeal who is setting an example for other teachers to follow. Creativity, leadership qualities and a proven track record of working with young persons in a rural or urban setting is imperative.

Young Naturalist Award

Criteria: An individual between the age of 16 and 25 on September 1 2023, who shows extraordinary caring and respect for nature.

We are in search of a young naturalist or conservationist, for whom the study and defence of nature is the purpose of life, whose actions speak louder than words and who inspires hope for the future.

Download nominations and entry form, which should be sent to reach us no later than **September 1, 2023**. Send entries to: Sanctuary Wildlife Awards 2023. <https://sanctuarynaturefoundation.org/events/the-sanctuary-wildlife-photography-awards-2023>

Sanctuary
NATURE FOUNDATION

Wildlife Photographers Speak – the Journey Ahead



DR. ANISH ANDHERIA

Sanctuary has not merely been a part of the wildlife and conservation photography era in India but has actively directed the course of its more recent history by mentoring, supporting, inspiring and recognising wildlife photographers. We were among the first to announce upscaled wildlife photography awards in India in 2000. With rapidly-changing technology and increasing interest in this field, we have also strived to hold photographers to the highest standards, encouraging ethical photography that honours our primary goal – wildlife conservation and protection.

As a run-up to the annual **Sanctuary Wildlife Photographer of the Year Award 2023**, we approached seven acclaimed wildlife and conservation photographers to understand their views about emerging trends in this field. **Dr. Anish Andheria (AA)**, **Kalyan Varma (KV)**, **Tasneem Khan (TK)**, **Sushmita Reddy (SR)**, **Dhritiman Mukherjee (DM)**, **Nayan Khanolkar (NK)** and **Steve Winter (SW)** get candid on conservation photography, the advent of AI, technology and social media and its far-reaching effects on this field.

Do you believe that wildlife or conservation photography are merely cliched lines, pretending to be conservation tools?

AA: Wildlife and conservation photography are two separate fields. However, under some circumstances the difference may disappear. Wildlife photography's role is more motivational than direct. So many people who have fallen in love with nature by looking at brilliant images of animals or landscapes have gone on to support conservation action. Magazines such as *Sanctuary Asia* and *Cub*, *National Geographic* and *BBC Wildlife* have influenced several generations of people to become more conscious about natural ecosystems and wildlife. On the other hand, conservation photography, such as camera trapping for population estimation of wildlife or for making an evocative image of an animal in its surroundings, has a direct impact on issues regarding deforestation, illegal wildlife trade, and fragmentation, among others. A photo-essay on a real-life problem faced by a vulnerable habitat or species can create the necessary impetus for immediate corrective action. Images have also influenced the courts into passing a strong judgement in favour of nature and wildlife. To my mind, the role of photography in conservation cannot be overstated.

KV: I define wildlife photography as images of landscapes and animals, and then there is conservation photography, which highlights environmental challenges of our times. Both have a place as conservation tools. Amazing photos make people love and care for nature and with strong conservation images, you can get people to take action. However, most photographers are happy to go on vacation on a safari and come back with pretty images.

I wish more and more people would spend time in and around parks and document environmental issues. Even in a city, taking images that showcase effects of issues such as climate change can help change people's minds. Every year one big metro gets flooded and people forget after it's over. But such images can have a lasting impact.

TK: If practised ethically, wildlife photography is a powerful conservation tool that can create awareness and engage people by opening windows into less-understood worlds that they might otherwise be far removed from. While imagery cannot substitute research or experience, it certainly plays an unmatched role in drawing the attention of *Homo sapiens* – a species that responds to and thinks primarily through visuals. This is beautifully described in an article that I would recommend – 'Photography and The Feelings of Others: From Mirroring Emotions to The Theory of Mind'.

SR: The power of a good story is undeniable. Conservation photography is proof that visual storytelling is not only a powerful medium but an impactful one. It helps tell stories of the past and also unlocks the possibilities of the future. Photographs capture reality, and hold a mirror up to show what could be, if only we do our part – no matter how small. It has the ability to change the fate of an entire species and habitats under threat.

Conservation photography often goes beyond aesthetics and aims to tell stories that highlight the challenges faced by wildlife and the impact of human activities. These visual stories engage people emotionally and intellectually, helping them connect with nature, and understand the need and urgency for conservation. However, it's important to recognise that

photography alone is not a complete solution to conservation challenges. It is a critical cog in the larger conservation effort that involves scientific research, policy advocacy, community engagement, and sustainable practices. Collaboration between photographers, conservation organisations, scientists, and local communities is not just a necessity, but should be the foundation on which meaningful conservation outcomes can be achieved.

The effectiveness of wildlife and conservation photography as conservation tools depends on various factors, including the photographer's intent, how the audience reacts to those visual stories, and the actions that result from the images.

DM: It's not cliched, because photography is a tool. When we communicate about conservation issues for some situations, words are not enough to create a connection with the issue. Visuals make it easy by building an emotional connection and giving information. If I talk about elephants dying on railway tracks, only hearing about it does not make the same impact as seeing a photo, which enhances the power of communication. I conduct many sessions with policy makers. I recently gave a talk in Visakhapatnam with coast guards, the Navy, policy makers,

FACING PAGE An adult male tiger *Panthera tigris* leapt to freedom in January 2010 at the Sundarban Tiger Reserve, after being successfully captured and translocated by the Forest Department from the vicinity of a village that he had wandered into, possibly in search of livestock. Tigers are usually released from a boat as it is safer for both the tiger and humans undertaking the operation. For Dr. Anish Andheria, this image symbolises the Sundarban, its people and the complex human-tiger co-existence and conflict in this mangrove forest.

DHIRTIMAN MUKHERJEE



IAS officers, and other stakeholders, but if I only spoke, the effect would have been 15-20 times less than with images, which engaged them and created deeper emotional connections. I saw them moved by the visuals. They approached me after the talk and asked me how they could help. Images are not only about connecting people but they are evidence. If I tell a story, it might as well be fiction until I show a photograph, which makes it a fact.

NK: Conservation photography used in the right way is definitely a conservation tool. Even a single image can motivate and transform the human mind. And I've seen people changing their opinion after seeing a particular image. In my personal experience, for Aarey's leopards... photography played a vital role in the kind of following and support we received. I've received positive feedback and outcome from this.

SW: I do believe that conservation photography is the answer, because the single image lives on. You can't find the big blue chip wildlife shows adding anything but a small bit of conservation to satisfy critics later on. So photography, that single image, can live on in storytelling.

Does social media deliver enough reach and strength for photographers to turn their involvement into a passion livelihood?

AA: Social media has definitely played a catalytic role in encouraging hundreds of thousands of people to travel to wildernesses that were not known to them earlier. A lot of people are taking to nature and wildlife photography as a result of the exposure and access they get to professional photographers, travellers, hobbyists and conservationists via social media platforms. In other words, the communication barrier between professionals, amateurs and novices has disappeared owing to social media, opening up an unthinkable number of avenues for amateurs and beginners. This has positively impacted people's ability to earn money through photography and allied businesses. Extraordinarily, social media has killed the monopolistic environment where only a handful of well-connected photographers hogged the majority of business in this field.

KV: Unfortunately it is hard to make a living solely as a wildlife photographer. Most people either conduct workshops or tours, or people who have a lot of followers on social media get paid engagements. But at the end of the day, there are less than half a dozen of these photographers who

ABOVE Free-ranging dogs are a major threat to wildlife such as the monitor lizard in India. This image, for Dhritiman Mukherjee, highlights how even remote areas such as the Habalikhathi coastal region in the Bhitarkanika National Park, are not safe from feral dogs, often hunting in packs. This is a pressing conservation and welfare issue that requires serious attention.

are able to fuel their livelihoods through social media.

TK: We need to separate social media and the passion livelihood aspect of this question. For photography to make a tangible impact, both the images and the communication platforms used need to be well thought through, and as wildlife or conservation photographers, we must question and course-correct continuously by asking "What do I stand for?"

The work can at times leave you ecstatic, and at other moments absolutely devastated. Conservation and wildlife photography is a difficult field to earn a living in. Even the most successful conservation photographers have multiple sources of income, whether photography-related or not. One's interests and engagement with the topic has multiple potential entry points and it is up to us to

take a passion beyond an image, so to speak.

As for social media, which most of us acknowledge is a double-edged sword, I return to my inquiry – what am I sharing my images for? Perhaps the goal is to share a window into an experience, a glimpse into a larger body of work, a critical story that must be told, a summary of a larger story told elsewhere in longform or art in nature that you have witnessed. Each is valid and justifiable – the reach and impact we have depends on what motivates a photographer to make an image and how they choose to share it.

SR: What you do for a living, is a choice. A passion for what you do, is a better choice than being passionless at work. Social media is a great tool to communicate and tell stories. However, in order to consistently stay on top, there is a need to continually create and provide content, which might take away an individual's focus from their passion. Are these completely separate? Not necessarily. Nor are these completely intertwined. But the point is to have an equilibrium that works for each individual photographer.

Having a platform to express your passion is really good but making it a livelihood means that you start adding other dimensions

to it like consistency, time commitment, detailing, and putting a part of yourself out there, for the world to see, even when it's not your natural instinct to continuously make your presence known through posts or stories – this has unfortunately become table stakes in order to make social algorithms work in your favour. When that happens, there's a possibility of compromise, which is why it is not for me. That doesn't mean it's not for someone else. I think each person needs to make that conscious choice and understand their equilibrium threshold on their own.

DM: I don't see issues with a focused perspective. There are bad and good things about social media. Social media is a means to reach out to the masses, and in itself social media is a neutral medium. Books and newspapers had a limited reach, but social media has a much wider audience numbering in thousands and even millions. We should use social media for the benefit of conservation, connect with people who are pro-conservation, and create an online lobby in favour of the natural world. We cannot see the immediate impact of destroying a forest, the effect is felt 10-20 years later, hence people are of the opinion that conservation is a myth. In this scenario, we should build a community of supporters.

As for livelihood, I see this as a volatile medium since it is ever evolving into something else, hence if someone is able to earn, it is their own skill.

NK: Definitely yes. Before YouTube or Instagram, or any social media sites, the platform was limited, and the revenue was also limited, but now, if you know how to market yourself, you can exploit that particular platform. I know many people who are making an income with only YouTube videos. Twenty years ago people used to do a job and wildlife photography used to be a hobby, but now, people are spending more time in the field, and they are able to see more things, capture more things. Social media provides reach and

BELOW A wild elephant Elephas maximus being captured in Karnataka. Human-elephant conflict is a major issue around Protected Areas throughout the country. As translocating problem animals to other areas has failed to reduce human-elephant conflict, such individuals are increasingly being taken into captivity. Addressing the root causes of the conflict – habitat loss, degradation and fragmentation – is the need of the hour. Conservation photography can be an effective tool to highlight the environmental challenges of our times.



KALYAN VARMA

strength to photographers and if they want they can make it a platform for themselves.

SW: Some people are making a good living off social media, but it's very few, as certain avenues of journalism that were involved in natural history, which would include conservation photography, are very rapidly disappearing.

Do you feel that organisations such as Sanctuary should continue to encourage an ethics code for wildlife and nature photographers who sometimes go to great – and harmful – lengths for an image?

AA: The code of ethics varies from person to person. It is a byproduct of several factors – grooming, subject knowledge or lack of it, respect for all life, a balanced outlook towards success and failure, urge to make unique pictures, urge to compete, fear of losing, and many more. A forum where people can exchange views about ethics without being judged is the need of the hour. An open, peer-to-peer exchange is essential for sowing the seeds of ethical behaviour in people. Rather than changing the mindset of an individual, it is important to create an environment where ethical behaviour is incentivised. Automatically, a majority of new entrants will imbibe the right value system, where the welfare of the

ecosystem and its inhabitants will come before a photograph.

KV: The Sanctuary Wildlife Photography Awards has always been at the forefront when it comes to ethics. Many others have followed this and do not allow certain images like baited images, nesting birds and so on. But wildlife ethics should be an ongoing discussion and not simple do's and don'ts. Fifty years ago it was totally acceptable to go out and shoot a tiger with a gun. Twenty years ago it was acceptable to use a goat as bait to get a photo of a tiger. Today we cannot imagine these things. What we take for granted today can be avoided in the future too, such as playbacks to attract birds, how we handle tourism in tiger reserves, and more.

TK: Any publishing platform must be clear about their ethical code, that would essentially stem from their purpose – why are they showcasing these stories and images? As a long-standing organisation with a large body of work and involvement in conservation and wildlife storytelling, there is no doubt that Sanctuary should continue to hold photographers accountable and expect a high standard with regard to an ethics code for nature photography. Manipulated images, if

declared so at the very outset, can be viewed as an artistic representation. However, interfering with animal behaviour, ecological processes and sensory pathways of lifeforms that we are yet to fully understand is extremely problematic.

Every nature photographer has at some point, intentionally or unintentionally disturbed or caused interference to some degree – it is critical that we learn from this and take the time to understand the nuances of our subjects and location in order to avoid any negative impact. Publications and production houses that promote or sponsor these images need to adopt a top-

BELOW Few people would associate the bustling metropolis of Mumbai with forest and diverse wildlife, let alone the presence of a large cat in the by-lanes of the city. Yet, the Sanjay Gandhi National Park (SGNP) is home to more than 42 wild leopards *Panthera pardus fusca*. With limited wild prey in the park, free-ranging domestic dogs make up a majority of the diet of these adaptive cats. This is among the only places in the world with big cats co-existing with humans in the middle of an urban landscape, and both at incredibly high densities. The park, a green lung of this megacity, is threatened by ill-planned development. Such images bring the wild to people's doorsteps, and are the first step in creating awareness and encouraging action by citizens.



STEVE WINTER

down approach that is conscious of the time limitations and output pressure that contribute to photographers cutting these ethical corners.

SR: Governments, business owners, and now photographers – all operate in very grey areas. As something starts to flourish, it becomes essential to establish certain guardrails. As photography – particularly wildlife conservation photography – gains more prominence, recognition, and becomes a mainstream profession for many, it is imperative to have guidelines. Having an ethics code for photographers can serve as a foundational stone for setting those guardrails. This could be done by placing boundary conditions in terms of what is acceptable in order to get that image, and be the visual storyteller that they choose to be without compromising wildlife safety and the habitats they are passionate about.

DM: This has to be done very smartly, as a guideline and not as an authority. It should not be a finger pointing exercise, but something inclusive. Prepare a non-blaming narrative, where information is shared with stakeholders. It is important to present facts and encourage people to make their own moral decisions.

NK: Definitely yes, because as more people are venturing into wildlife photography without any such ethics code or guidance and purely motivated by Facebook or Instagram posting, people might opt for shortcuts for quick results.

Secondly, passing off AI-generated images comes under a separate category of photography ethics. More serious are ethics where wildlife is concerned, like baiting. According to the *Wildlife Protection Act* or rules of a sanctuary or national park, there are certain do's and don'ts. If these rules are violated, it is definitely a punishable offence. People should be aware of and abide by rules and ethics.

Once you get an image, there is a separate set of ethics for post-processing. There are many competitions that ask for RAW files for verification. Both sets of ethics, post-processing and capturing, are essential, without which there can be violation or malpractice.

SW: I think Sanctuary and other organisations have to promote an ethics code for wildlife and nature photographers. You want to put AI in something, put it in some arty category, and if it is at the cost of species and damage to destinations, that's something that has to be controlled by the people that run these organisations and parks. You don't want

ABOVE "There's no cat like him," says Nat Geo photographer Steve Winter. "He was a celebrity in the land of celebrities." His image of P-22 under the Hollywood sign took 15 months to capture using a camera trap. The image made the cougar famous – and made Angelenos realise the plight of urban wildlife living off scraps of disconnected habitat. This now-iconic image played a key part in creation of the \$87 million Wallis Annenberg Wildlife Crossing, the largest project in the world, which broke ground this year. Winter marvels: "P-22 birthed a wildlife movement in L.A. that is only going to grow and grow."

people to not see or experience the wonder and healing power of nature, and so it has to be controlled and restricted. AI has to be in an art category, and we have to somehow keep photojournalism and journalism sacred. People most likely don't even know what those rules are. So this maybe needs to have a whole dedicated issue of the magazine. Be the leaders, step out in the front, show the world what's true and what needs to be told.

How is technology transforming wildlife photography? Is it making it the bastion of the few who can afford the best equipment?

AA: Technology pretty much influences everything we do. Photography is no exception. Several disruptions have come about in this field in the past two decades

NAYAN KHANOLKAR





SUSHMITHA REDDY

TOP LEFT Olive ridley turtles *Lepidochelys olivacea* often end up as bycatch in fishing nets in the poverty-stricken coastal areas of Andhra Pradesh. But this fortunate turtle was gently untangled by the fisherman from the clutches of the net, to return to the sea. For the photographer, this image represented 'a sea of hope' for coexistence. She says, "Despite the many challenges the sea turtle faces to simply survive, I believe that the kindness of people, the work of passionate conservationists and governments will ensure the evolution of the turtle stays on course."

BOTTOM LEFT This image titled 'Beyond the Swamp' was part of a larger body of images on 'Swamp Storytelling' that captured temperate freshwater ecologies and the public perceptions of swamp lands. If practised ethically, wildlife photography is a powerful conservation tool that opens windows into less-understood, remote worlds.



TASNEEM KHAN

equipment as well as very affordable, yet phenomenally impressive digital imaging tools (such as our phones, hand-held endoscopes and so on). Technology has undoubtedly transformed the image-making world and now more than ever before we have a vast array of image-capturing devices, artistic software, lenses, lights and processors that allow us to push our creativity in ways that were unimaginable before. As is the case with all tools, the ability to expand our output lies in the vision, motivation and improvisation of the maker. Of course, this accessibility also enables the creation of very realistic fakes. The tools that will be developed to counter this, also lie in technological development.

SR: Most conversations boil down to man vs. machine, which is not necessarily the case. In technology itself, there's this logic of copiloting, which Microsoft came up with.

I think technology will be a copilot for photographers and their creativity. While you can take a great photograph, the advancements will help it happen more remotely, seamlessly, without impacting the wildlife and habitat. Likewise, if we consider the aspect of visual storytelling, how to write better stories that go with the photographs, by leveraging AI tools such as ChatGPT will help optimise for time and effort. In the same way, we have Generative AI tools for visuals, Adobe tools to augment, enhance, and more, and cameras on phones are getting more powerful. What it is doing is where we have citizen developers, we have citizen photographers. So the whole construct of visual storytelling will go to a whole new level with technology.

and going forward, the frequency of disruptive tech will only increase. Some of the most advanced gadgets are exorbitantly expensive and out of reach of most, I believe photography is far more accessible now than it was before the major tech-shift from analogue to digital. Today a Rs. 15,000 mobile phone comes equipped with a decent wide-angle camera that can shoot videos, stills, portraits, landscapes and close-ups. There are many more photographers today than in the 1990s, and technology – computers, mobile phones, AI and machine learning, digital camera tech, mirrorless tech, social media, drones, etc. – has had a big role to play in this transformation.

KV: Tech has come a long way in transforming wildlife photography. The most recent cameras can shoot in very low light conditions (thereby not disturbing an animal with the flash), have become very light, and new gadgets such as drones and camera traps are opening up a whole new world on how we see wildlife. Most of all, I am a big fan of new generation mobile phones. Almost everyone has a decent quality camera in their pocket all the time and because of this people in rural areas are able to document and tell their stories of conservation.

TK: Technology has thrown open the world of photography in both directions – into the realm of highly specialised and expensive

Yes, equipment and access to tools are expensive and create a divide. At the same time, free AI tools and access to equipment by the hour makes it accessible for those who have constraints with affordability. The most crucial aspect to keep in mind is that the quality of equipment does not solely determine the outcome or success in any field. Talent, dedication and creativity play a significant role.

DM: With the evolution of technology cheaper devices are available to make good images. However, for certain photography techniques, you do need specialised equipment. But if you are passionate about your craft, this is a long journey of patience. I would say this is also a journey of your own willpower. You can achieve success as has been my own case, where I've come from a background of very little means. It's a difficult journey but it is not impossible for those who are truly passionate about this craft.

NK: Technology has definitely changed the face of wildlife photography, enabling you to capture moments which were impossible or very difficult to achieve earlier. What we thought of as challenges 25 years ago have ceased to be so now. The wildlife photography benchmark has been raised much higher. The job has become much easier, but what hasn't changed or will never change is your desire to highlight a story, and that sense of pointing the camera in the right direction.

There are certain things beyond the scope of the camera, such as human creativity; the camera is only an objective tool, it is your subjective preference, which will always matter. If you use light to your advantage and infuse your creativity, there will always be scope for individuality – you can always create a signature or your own style irrespective of advances in technology.

I don't think equipment is a restricting factor, because we just think about high-end cameras when we think about this issue, but there is a wide second-hand market where second and even third-hand cameras are available at a cheaper rate. In fact, what I feel is that 25 years ago, it was difficult to do photography since things were not easily available. If you are bothered that every month a new camera is launched or a new lens is announced, which are exorbitantly priced, it is true that photography will be

out of reach. After the digital revolution, the photography industry has been growing phenomenally. If you are a dedicated photographer, you will work hard or strive to go to the next level. So I don't believe this is restricted to a few people, there is always a way around.

SW: A lot of the awards that I've won have been with cameras that were the

cheapest out there. So it's all about your unique vision. Many of them do have better equipment than I've got, but I won Wildlife Photographer of the Year with the cheapest DSLR that Canon sold, and I won several other awards with inexpensive equipment. So it's not the equipment, it's that unique vision and the storytelling desire that you have within you. 🐾



Anish Andheria: A Carl Zeiss Conservation Awardee, he is a large carnivore biologist with field expertise in predator-prey relationships. A

wildlife photographer of repute, he has photographed some of the remotest wildlife reserves in India. He has co-authored two books on Indian wildlife and contributed to several other national and international publications.



Kalyan Varma: An Emmy-nominated wildlife filmmaker, photographer and a conservationist, he has, over the last 15 years, worked on over

30 wildlife films for broadcasters around the world such as BBC, National Geographic, Disney and Netflix. He recently produced and directed 'Wild Karnataka', which won two national awards and became the first wildlife film to be aired in cinemas. He actively uses the power of storytelling to communicate issues related to our environment.



Tasneem Khan: Founder of Earth CoLab in India and Sea School in Ireland, she is a diver, sailor, photographer and adventurer. She has

been designing and teaching immersive, experiential learning adventures for the past 15 years. As a dedicated teacher and learner, she is most often immersed with a group of students in watery spaces. Her formal training is in marine zoology with extensive research and field-work



Steve Winter: A wildlife photojournalist who specialises in big cats and has been contributing to *National Geographic* for nearly 30 years, he has been named BBC Wildlife Photographer of the Year and BBC Wildlife Photojournalist of the Year. In 2013, National Geographic Books published his work *Tigers Forever: Saving the World's Most Endangered Cat*, with text written by Sharon Guynup.



Sushmitha Reddy: A passionate visual storyteller who seeks to make a difference in environmental conservation through her imagery, she is an

avid traveller, who aims to shine a light on the best human-animal collaborations for a better tomorrow.



Dhritiman Mukherjee: A Carl Zeiss Conservation Awardee, RBS Earth Hero and the Kirloskar Vasundhara Mitra awardee, he has travelled all over the world, photographing

wildlife and nature in the most challenging ecosystems. His work has been published in respected websites and publications including *BBC Wildlife*, *National Geographic Traveller*, *Lonely Planet*, *Biographic*, *New York Times* and many more. He has co-authored the book *Magical Biodiversity of India* and was one of the co-founders of nature and wildlife magazine *Saevus*. Dhritiman was nominated as one of the jury members of the 6th National Award for Photography by the Government of India.



Nayan Khanolkar: A self-taught nature photographer, he has been documenting Indian wildlife for over 15 years. His background as a biology educationist

supplements his on-field photography assignments. Following a decade-long career in bird photography, he is now documenting big cats in urban areas. He aims to sensitise people to animal behaviour and promote conservation through his photographs.



COURTESY VANCE G. MARTIN

MEMORIES OF MAPS (M.A. PARTHA SARATHY)

By Vance G. Martin

The conference room in Montreal was full. It was the mid 1980s, and most of the participants were members of the International Union for Conservation of Nature (IUCN). As President of WILD Foundation, a non-profit organisation working to save Earth's life-saving wilderness, I had registered WILD as a member of the IUCN and was focused on a strategy that would make it the first global institution to recognise 'wilderness' as an official, distinct category of natural, Protected Areas. It was an uphill battle, even within the conservation world – but we eventually succeeded in 1992.

As soon as protocol allowed, I stepped forward and introduced myself. He smiled and looked at me, extended his hand and said, "I'm Partha Sarathy. Just call me Partha!"

At the point I was in that conference room in Montreal, we had already worked for 10 years through our World Wilderness Congress (WWC) to move this process forward. I was in Canada to continue pushing that stone up the hill as we planned the fourth WWC for Denver in 1987. The World Wilderness Congress is the longest-running, public environmental forum to build awareness and support for wilderness, and strengthen wilderness policy from grassroots decision-making to national policy. It combines culture with science, policy and economics and enables collaboration between communities and world leaders to build a collaborative global wilderness community.

MEEETING PARTHA During that meeting I noticed a distinguished man, past middle age yet youthful, possibly of South Asian descent. Slight of build but with a radiant energy, he walked purposefully through the main conference room, scanning the aisles with laser-like intensity, obviously searching for someone specific. At the coffee break I saw him again, having captured his target, and now in deep discussion in a corner.

RIGHT TOP MAPS chairs a panel on the importance and possibilities of collaboration between human rights and conservation that featured activist Medha Patkar (right) at the sixth World Wilderness Congress (1998), the very first to be conducted in India, in Bengaluru.

RIGHT MIDDLE MAPS presents a Global Wilderness Hero award to Dr. Ian Player at the sixth WWC, founder of the World Wilderness Congress.

RIGHT BOTTOM MAPS, Andrew Muir (CEO, Wilderness Africa; on his immediate right) and Vance G. Martin (President, WILD; third from left) with delegates from India, Sri Lanka and Pakistan at the sixth WWC.

FACING PAGE MAPS and Vance G. Martin with a jury member of the Global Environmental Film Festival. His appreciation for making movies made him evangelise the importance of film festivals dedicated to wildlife.

Though a young man and a somewhat new face in the formal global conservation sector, I was on a mission and needed to enlist others with energy and enthusiasm to our wilderness cause. It was no time for me to be a wallflower. I had been in and out of South Asia, particularly India numerous times starting in the early 70s, I loved the region and its cultures, and I wanted to meet this man. So, as soon as protocol allowed, I stepped forward and introduced myself. He smiled and looked at me, extended his hand and said, "I'm Partha Sarathy. Just call me Partha!"

So began a friendship and conservation collaboration that endured until he passed away in 2013.

In Montreal, Partha and I huddled together. He wanted to know exactly what I was up to. We quickly discovered a characteristic we had in common that was uncommon among our colleagues, mostly all of whom were talented, science and policy-driven conservationists – we both understood and worked in ways that celebrated and insisted upon culture being an equal partner in conservation, along with science, economics and policy. We both held firmly to the knowledge that this was essential if solutions to the growing environmental crisis would endure, and that it was possible and necessary at every scale, from local to global. He quickly and eagerly agreed to be involved with the fourth WWC.

Two years later he came to Denver as a featured presenter among 1,800 delegates from over 60 countries, including Prime Minister Brundtland of Norway (of Brundtland Report fame), and some 17 assorted ministers of Environment, State and Finance. We accomplished many practical achievements at that Congress, such as starting the process that led to the creation of the World Bank's Global Environmental Facility (which has since become the world's largest funder of biodiversity conservation); producing the first [global inventory](#) of remaining wilderness (done by Mike McCloskey, Chairman of the Sierra Club, and his team using large paper jet navigation maps, rulers and slide rules – pre-digital, of course, imagine that!); and much more.

One of my clearest and most precious experiences of that Congress, however, was meeting M. A. Partha Sarathy – MAPS, as he was often called, again. He came up to the main platform and first presented me with a garland of fresh flowers, and spoke of the tradition of nature worship in India. He then introduced the special guest he had brought from India, the great classical Indian dance master, Dhananjayan, who then performed a traditional *Kathakali* dance before the assembled delegates, the first time that



COURTESY VANCE G. MARTIN



COURTESY MIMI PARTHA SARATHY



COURTESY VANCE G. MARTIN

MAPS contributed significantly to the IUCN. He was Chairman for many years of what was called the IUCN Education Commission.

anything such as this had occurred during the plenary of a global conservation gathering.

A MAN OF ACTION MAPS contributed significantly to the IUCN. He was Chairman for many years of what was called the IUCN Education Commission. In that role, he was the spark plug in igniting the drive towards an appropriate change in the name to Commission on Education and Communications, exhibiting a cutting-edge awareness of the rapidly-increasing importance of media and communications as a key tool for public environmental awareness.

Partha served on the board of directors of the WILD Foundation for many years. It was at the fifth WWC (Norway, 1993) that he pulled me into a corner and said, "I noticed on your

global map of the WWC locations there was a blank spot in Asia." With a distinct gleam in his eye he then said to me, "We need to fix that. I'm in for 6WWC in India!" And he was, and therefore it convened in his hometown of Bangalore (now Bengaluru) in 1998. He also organised the Global Environmental Film Festival and Awards at that sixth Congress, and continued doing the Festivals and Awards at the seventh WWC (South Africa, 2001) and eighth WWC (Alaska, 2005). So, the story continued.

My memories of MAPS are many, as a bright light and a driven conservationist, a successful businessman, and a cultural maven who was at once as urbane and globally charming as he could be childlike. On that important quality of innocence and child-like enthusiasm, I finish with one final story.

In the late 1980s, Partha brought his wife and two young children to the States, on one stop of which they visited with my young family in Fort Collins, Colorado. I toured them around the Rocky Mountain National Park and elsewhere.

On the quest to give them a quintessentially American, pop-culture experience, I took our combined four young children and four adults to 'Chuckee-Cheese', a kitschy and splashy pizza restaurant nestled within a gigantic children's playground of huge electronic, moving and talking animals, and other games. One of the games was a large pit of plastic balls in which the children could play. Without a second thought, MAPS grinned widely and dove into the pit of yellow plastic balls as if it were a swimming pool, and started freestyle

swimming with balls flying everywhere, all the while laughing uncontrollably. One of his two young children on that trip was Mimi Partha Sarathy (see box), now a force in her own right who combines a love of nature, a commitment to culture and spirit, and a professional financial acumen. The apple doesn't fall far from the tree. 🌱

Vance G. Martin created and built-out the WILD Foundation and its mission for wilderness, wildlife and people, serving for 40 years as its President and also the Global Director of the World Wilderness Congress. He now continues his work as President (Emeritus) of Wilderness Foundation Global, an international alliance born-and-based in the Global South.

MY 'WILD AND WONDERFUL' FATHER

by Mimi Partha Sarathy



Be fearless and dream big – these are the two most important things I surely learnt from my father. 'Partha', as he was fondly known among friends and colleagues, was way ahead of his time on many subjects – be it conservation, wildlife, urban planning and development, or women empowerment.

My Appa – M. A. Partha Sarathy – and I had a special bond. We both loved the movies and cried when they touched us. His appreciation for making movies is what made him evangelise the importance of film festivals dedicated to wildlife as what would make people truly understand and connect to the wonder of nature... We loved going out to eat, and our all-time favourite was travel.

Since my teenage years, I have always referred to myself as my father's 'excess baggage', as I joined him all over the world during his many trips. From IUCN conferences to wildlife film festivals, I was blessed to be part of such events, and meet so many interesting people – many of whom I still know today and experience something truly special. I have travelled in the 'wild' with him in many parts of USA, Africa and Europe, and each trip was a one-of-its-kind experience. We spent some of the best times together when I studied in Geneva, in the early 1990s, when he was Chairman of IUCN's Education Commission in Gland, Switzerland. Our last trip overseas was to Japan in 2004. Not surprisingly, this travel bug is still very much in me.

Appa's compassion and obsession with wildlife and for conservation was truly remarkable. Being amidst nature and experiencing wildlife anywhere in the world is something that he lived for, and he wanted everyone to experience this amazing feeling. He was instrumental in making many young people aware about wildlife conservation through the work he did in India and

LEFT MAPS was instrumental in making many young people aware about wildlife conservation through the work he did in India and around the world.

Since my teenage years, I always referred to myself as my father's 'excess baggage', as I travelled with him all over the world during his many trips.



LEFT Mimi Partha Sarathy helps her father MAPS present awards to the winners of the Global Environmental Film Festival. She joined him all over the world during his many trips, from IUCN conferences to the wilds of Africa, Europe and USA.



RIGHT MAPS and his wife Vedavalli, now 88, on one of their many trips.

around the world, to the extent that even today people remember him for this.

Integrating science with traditional knowledge and techniques for sustainable conservation efforts was important for my father. Understanding, preserving and protecting sacred forests, and blending ancient wisdom and science across cultures and continents were close to his heart. It is so uncanny that my daughter Hamsini, who is 29 years old and now lives in Broome, Australia, has inherited my father's vision and passion for wildlife and conservation, and is a leading ecologist and land management scientist with the NGO Environs Kimberly, working with Aboriginals/Indigenous people in Western Australia on projects related to environment and climate change. I call her my 'Mowgli' as she is truly walking the talk in this very harsh and remote land. I am so blessed to see the next generation be equally committed and dedicated to our planet.

My father saw divinity and spirituality in nature, which touched him greatly. This can be seen in the many wonderful books and short stories he has written, including *Brahma*, *One Way to Benares*, *Live a Little* and *Monkey Girl*. Of course, the magnificent Asian elephant was his all-time favourite!

Appa was one of the best communicators I have ever known. He would speak to anyone and everyone he met, building an instant rapport. Often when I was younger it was a bit annoying, but we all realise how important the power of communication is today.

Everywhere he went he carried his Sony camera, taking videos, making small films to share with others, about wildlife, conservation, or urban planning. He understood the power of visual representation as crucial for sharing knowledge and teaching people the importance of these subjects. Today, with our cell phones being the greatest tool, we have it much easier. It has been more than 10 years since my dad has passed away and believe me, he would have loved to be alive today, and would have rocked even more. I am filled with gratitude every day for my parents who have made me the person I am, and for my daughter Hamsini, who has inherited her grandfather's passion for conservation and nature. Blessed indeed. 🌱

Mimi Partha Sarathy is the Founder Managing Director of *Sinhasi Consultants Pvt. Ltd.* and Founder Director of *Sri Krishna Wellness Yoga Centre*.

My father saw divinity and spirituality in nature, which touched him greatly. This can be seen in the many wonderful books and short stories he has written.

SOHAM KACKER



By Soham Kacker

Contemporary discourse in conservation widely expresses the need to restore species to their natural ecosystems, to offer them protection within their specific habitats or landscapes. But what happens if a species has no native or natural habitat in which it is to be returned? Is it possible that the reason for the survival of a species

rests entirely on its relationship with humans? Does conservation have a place for these supposedly dispossessed plants? To even begin to answer these questions, may I introduce you to one such plant with a remarkable story: the *Brugmansia*, or Angel's trumpet.

In 1753, Carl Linnaeus classified the first species of Angel's trumpet as *Datura*

The Brugmansia's New Home

arborea from Brazil, and later taxonomists shifted it to the genus *Brugmansia* based on differences in morphology. Since the late 1700s, botanists and explorers studying the flora of South America have described more species of *Brugmansia*, but have never found a truly wild population. No herbarium specimens have been found of the genus from that period that were wild collected, and even among contemporary experts, no one has ever claimed to have seen a population in the wild. In the 1970s, American botanist, plant collector, and specialist on *Brugmansia*, Tommie Earl Lockwood suggested that although a wild range could indeed be established using certain features of plants seen *in situ*, the survival of *Brugmansia* has largely been on account of their association with humans via cultivation. All seemingly wild populations have been found to be escapes from cultivation, and likely formed by vegetative or asexual propagation, for instance by the rooting of stem fragments. Without the presence of active seed dispersal and sexual reproduction, a population cannot be said to be biologically viable.

In the absence of a viable wild population, the IUCN Red List lists them as 'Extinct in the Wild', the most critical category of endangerment. Some scientists suggest that the reason for their failure to reproduce is the extinction of their seed disperser – thought to be a large South American mammal. However, *Brugmansias* thrive in cultivation. Since the first reports of 18th Century botanists, their use by South American *shamans* and traditional healers has been studied extensively. They contain many categories of alkaloids and psychoactive substances, which have both medicinal and religious value. But these same substances also make them very toxic – which means their applications are linked to preserving traditional knowledge on how to correctly use them. *Brugmansias* were widely cultivated for these properties; in recent times, the loss of this traditional knowledge has led to a drive to eradicate them from South American gardens because of their toxicity.

Interestingly, their ease of cultivation, quick growth, and abundance of graceful, strongly-scented flowers have made them a popular choice of garden plant very far from their supposed home. In India, *Brugmansias* were introduced for their ornamental value in the 1900s, and have been widely adopted as a form of '*dbatura*' – a name which in Latin and the vernacular usually refers to the flowers of another, native plant – *Datura stramonium*. It is cultivated widely, and has even become naturalised in the Himalayan foothills – and it has been observed being pollinated by native bees.

Most intriguingly though, there are reports of it being dispersed and germinating from seeds – something it does not do in its 'native' habitat. Could the *Brugmansia* have made the long journey from the Andes to find a new home in the Himalaya? No field studies have looked into the natural history of these plants in India, nor at the potential implications on native species of plants and animals, but so far, the species has not become invasive. On a recent drive through Himachal Pradesh, I came across a small *nullah* (stream), the banks of which were festooned with *Brugmansias*. Growing under the native oak and fig trees, shaded by native bamboo, and interplanted with native ferns and flowering creepers, it seemed deceptively... native! Here, *Brugmansia* may form relationships – with humans and other species – which will ensure its survival as part of a new ecology. Conservationists must in turn question the value and validity of these novel ecosystems – and recognise their potential for preserving species, whether or not they may be native. ★

Further Reading

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Soham Kacker is passionate about plants and has apprenticed at the Auroville Botanical Gardens and the Aravalli Biodiversity Park. Based in New Delhi, he is currently a research student at Ashoka University, focusing on plant ecology and conservation.



ABOVE A yellow variety of a *Brugmansia* species (likely *B. suaveolens*), cultivated as an ornamental plant for gardens.

FACING PAGE *Brugmansia suaveolens*, the most common species introduced in India, growing wild in a roadside ditch in Himachal Pradesh. This species is thought to have become naturalised in some parts of the Himalaya.

Sanctuary's MUD ON BOOTS

Bimonthly Report – May-June 2023

DAS SAVES THE DAY

Since January 2023, Project Leader Jesu Das has captured 33 wild mahseer by cast netting and has been raising them at the Mahseer Repository Facility, Bheemeshwari (Mandya district, Karnataka). This healthy stock of mahseer maintained by Das enables research aimed at identifying and understanding the different mahseer species, and informing long-term conservation efforts for the critically endangered humpback mahseer (a freshwater fish endemic to the Cauvery river basin in the Western Ghats of India).

A preliminary genetic analysis of the mahseer stock has matched 11 of the humpback mahseer previously studied in the wild. Just as Das and his team at Wildlife Association of South India (WASI) were rejoicing at this news, an outbreak of fin rot disease (caused by a disruption in water change cycles on account

of an extended power outage), affected nearly 50 per cent of the stock. The team then focused on maintaining ideal water quality parameters through daily water changes and antibiotic treatments. Thanks to these efforts, there was no mortality and the situation was brought under control within three weeks. The Humpback Mahseer stock is now stable and feeding well.

Meanwhile, Das conducted 10 cast net surveys as part of an ongoing study aimed at assessing the abundance of invasive species in the Arkavathi river. So far, he has documented a total of 16 invasive fish and 42 native fish, including humpback mahseer (previously unreported from the Arkavathi River). He and an intern at WASI conducted reconnaissance surveys for a study to assess water quality and habitat parameters around different types of bridges, to understand their impact on the ecology of streams.

Das also trained two students to use cast nets, and taught them the art of throwing a net and using cast netting techniques, to sample fish for ecological studies.

WETLAND BIRDING IN GONDIA

In Gondia district, Maharashtra, Project Leaders Kanhaiyalal Udapure and Shashank Ladekar are continuing their wildlife conservation efforts in the region's wetlands. They organised a first-of-its-kind local summer bird count at Zilmili and Sioni lakes. This event was an extension of the annual winter bird count that the duo has been organising since 2014. During this one-day event, which was attended by 30 participants (members of the Gondia Forest

Division, NGOs, and bird lovers), a total of 25 different species of birds along with breeding pairs of Sarus Cranes (at Zilmili Lake) were sighted and recorded.

Following this, Kanhaiyalal and Shashank attended a workshop organised by the Gondia Forest Division on the occasion of World Environment Day. They held discussions and shared their experiences on identifying nesting sites of breeding Sarus Cranes, and approaches for their protection. Kanhaiyalal and Shashank have been assisting the local Forest Department in Sarus Crane conservation initiatives in Gondia for several years. Their commitment to wildlife conservation has won them the trust and credibility of locals and the Forest Department alike.

The duo also participated in the annual Sarus Crane Census organised by the local Forest Department and SEWA (an NGO). During this two-day event held at Balaghat district, Madhya Pradesh, and Gondia district, Maharashtra between June 17 and 18, 2023, the Project Leaders recorded a total of 17 cranes.

WHEN THE TEACHER IS READY

In Haridwar, Uttarakhand, Project Leader Saddam Husain Lodha, with support from friends at Mae (local NGO), organised a training programme to introduce nature conservation-related job prospects for interested local youth. This first-of-its-kind training was attended by youth who hailed from seven villages around the Rajaji National Park and Jhilmil Jheel Conservation Reserve. They were exposed to training on various aspects of bird identification and monitoring, methods of bird data collection, and basic butterfly identification, among other skills. The participants were also introduced to local conservationists and nature guides, who shared their experiences and learnings from the field, and encouraged the aspirants to consider taking up 'green' jobs.

This first batch, comprising 23 youth, only had one female participant. However, Saddam is hopeful that this is the beginning of a positive cultural change, as young women in the *Van Gujjar* community are usually discouraged from exploring careers outside of the home.

Additionally, Saddam and his friends organised three birdwatching events within mixed forest and grassland habitats for 129 local children. On each day, knowledge of the characteristic

features of birds, and their habitats was shared with the children. The team also created transects for bird monitoring in five locations and recorded a total of 117 bird species from nine sites identified as local bird hotspots.

NURTURE IN NATURE

Nature education walks and classes for local *Adivasi* children form an integral part of Project Leaders Chamru Bediya and Sahebram Bediya's conservation approaches in Koynardih village (Ranchi District, Jharkhand). They believe that nature walks around their village are a fun and engaging way to fulfill children's innate need to be in nature and learn about wildlife. It also nurtures their curiosity and appreciation of the marvels of the natural world.

Twice or thrice every week Chamru selects a small group of children and walks with them while watching birds, identifying trees and fallen leaves, flowers and fruits, and conducting nature-based games and art while talking about the need to protect biodiversity. The children attend these nature education sessions after completing their regular tuition classes at the village learning centre run and provided by Chamru and Sahebram's affiliate organisation, *Ekastha Foundation*. Between May and June 2023, Chamru led and conducted eight such nature walks for 38 children.

Meanwhile, the duo is also making sure to document the local biodiversity, and has identified and photo-documented a total of 26 trees, 54 bird species, 12 medicinal plants, 13 shrubs, and two species of mammals. They also organised two meetings with 41 parents and discussed locally-relevant issues such as the impacts of deforestation on local biodiversity and the importance of forest conservation. 🦋



Project Leader Jesu Das trains a student to use a cast net. Das has conducted 10 cast net surveys to assess the abundance of invasive species in the Arkavathi river in Karnataka.



Project Leaders Kanhaiyalal Udapure and Shashank Ladekar organised a day-long summer bird count at two lakes in Gondia, Maharashtra, where 25 species of birds were recorded.



Project Leader Saddam Husain Lodha along with friends and participants at the three-day nature guide training programme in Haridwar district, Uttarakhand.



Sahebram Bediya photographed a kaleidoscope of spot swordtails *Graphium nomius* along the Rabru river in Koynardih, Jharkhand.

PROJECT UPDATES

A Sanctuary Report – June & July 2023

Notes, anecdotes and reports from Sanctuary Nature Foundation's projects across the country.

KIDS FOR TIGERS

Mumbai, Maharashtra

Supported by Anant Bajaj Paryavaran Mitra and Bajaj Electricals CSR

The atmosphere was electric, with over 1,500 children, parents and teachers thronging the halls of the National Centre for the Performing Arts (NCPA) in Mumbai, and hundreds more waiting outside, eager to learn, have fun, participate and be involved! The Kids for Tigers 'Save the Tiger' event roared into action on July 15, 2023, captivating nature enthusiasts, wildlife lovers, and art aficionados of all ages. Set against the backdrop of the magnificent NCPA, the event was a celebration of all things nature, bringing together people from across the city to share their love of the environment, and our national animal, the tiger. With attendance from over 25 schools across the city, the morning left young and old with positive passion and a renewed commitment to support and be part of India's wildlife conservation mission.

From the early hours of the day, until late afternoon, the event was abuzz with an array of activities that sparked a wildfire of



ABOVE Bittu Sabgal and Dia Mirza at the 'Save the Tiger' event at the NCPA, Mumbai. Over 1,500 children, teachers and parents attended the event and were inspired to work to protect nature.

excitement and awareness among young and old. The morning kicked off with a Nature Trail, in the company of expert naturalists leading participants through NCPA's green campus. The immersive experience reminded families of the vital need to protect our delicate wild urban parcels.

All activities were designed to connect children with nature in fun and exciting

ways. Poster Making, Animal Face Painting, a Leaf Art Workshop, Wildlife-themed Fancy Dress Parade, and art installations crafted by students out of recyclable materials, were supplemented by a variety of displays and the screening of the incredible, animated, full-length film *Delhi Safari*, directed by Bollywood Director Nikhil Advani, at the Tata Theatre.

Led by wildlife photographer and natural history consultant with the Sanctuary Nature Foundation, Saurabh Sawant, the Nature Photography Workshop unveiled secrets on how awe-inspiring wildlife images are created in camera. The Theatre Workshop also added dramatic flair, engaging participants with skills to create powerful impacts with performances designed to highlight threats to wildlife, and win public support.

One of the stars of the event, Ellie, the animatronic elephant, stole all hearts. An initiative by PETA India, interactions with AI Ellie blended education and empathy, teaching children the importance of kindness. Voiced by the ever-inspiring actor and environmentalist, Dia Mirza, a United Nations Goodwill Ambassador for India, and Sanctuary's Advisory Board Member, Ellie's poignant story resonated with young

and old alike, adding huge value to the 'Save the Tiger' campaign.

Studded with meaningful diversity, a photo exhibition by Sarmaya, the museum without boundaries, displayed alphabets from A to Z, to showcase Indian wildlife, together with objects chosen from the Sarmaya collection, that depicted flora and fauna of the Indian subcontinent through ancient engravings and coins, Indigenous art, and stunning botanical illustrations.

With the monsoon in full force, a whimsical rain dance session was on the agenda, with the rain god blessing all who attended with a sharp afternoon downpour.

By all accounts, it was an experience of a lifetime for participants. From the exhilarating Nature Trail to roar-inspiring workshops, every moment was a testament to the power of collective action and boundless enthusiasm.

With hearts full of hope and determination, attendees left the event with a deep sense of purpose. The lasting message was the need to protect the natural world and its 'maintenance engineers' – the plants and animals of our biosphere.

Kids for Tigers, the Sanctuary tiger programme launched over two decades ago, has become a powerful movement that has already impacted one generation and is working with the next to make this a better, safer planet!

Bengaluru, Coimbatore, Delhi, Hyderabad, Nagpur and Panna

Supported by IndusInd Bank CSR

Registrations of schools for the new academic year continue in the six cities, with a focus on preparing underprivileged kids to lead the imperative to demand a better world for all life on Earth, including humans.

An educational programme, schools are not charged for any of the activities. In celebration of Global Tiger Day on July 29, 2023, an event took place at Nagpur's VR Mall, to celebrate our national animal and promote awareness about its conservation. The dust may have settled, but the roaring spirit of our young conservation warriors still echoes in our hearts! The enthralling Global Tiger Day celebration brought together students, families, and wildlife enthusiasts for a thrilling day of tiger-centric activities.

Bengaluru too witnessed a roaring affair on Global Tiger Day, as conservation enthusiasts, wildlife advocates, and esteemed



ABOVE Conservation expert Vance Martin spoke to children at the event for Global Tiger Day in Bengaluru. Kids participated in several activities such as face painting, nature skit, poster design and more, at the event.

guests came together to celebrate and raise awareness about tiger conservation. The event featured two prominent figures in the wildlife community – Sanctuary's founder-editor Bittu Sahgal and conservation expert Vance Martin – whose passion for protecting wildernesses and their majestic biodiversity inspired the gathering to join forces for a common cause. Kids participated in various activities such as a Nature Skit, Face Painting, Poster Design, Group Song, and took a pledge for tiger conservation.

Ranthambhore

Supported by Morningstar CSR

Sanctuary Nature Foundation, along with Morningstar India and the Ranthambhore Forest Department, marked World Environment Day on June 5, 2023, with engaging activities under the Kids for Tigers programme in the Ranthambhore Tiger Reserve area. A vibrant art competition was organised for rural students, encouraging wildlife conservation through powerful paintings. Thirty-four enthusiastic students from classes six to eight participated in the competition, creating impactful artworks with messages advocating wildlife conservation.

The day also saw efforts to combat plastic pollution. Under the guidance of the Chief Conservator of Forests, students and Kids for Tigers' volunteers joined hands to collect plastic waste and other rubbish in the Sita Mata forest area. This endeavour resulted in the successful collection of approximately 150 kg. of plastic waste. Mamta Sahhu, a sociologist with the Ranthambhore Tiger Project, addressed

the participants and emphasised the importance of safeguarding waterbodies, forests, and wildlife. Her motivating words left a lasting impact on all present.

Working towards women empowerment, the Kids for Tigers programme organised a visit to the Dastkar Handicraft Centre for women from the Tilak Nagar village. Twenty women were motivated by the creative products showcased at the centre and were encouraged by Ujjwala, the centre's manager, to join them. Thirteen women have enrolled for employment now, reflecting the success of the visit in empowering rural women via new skills and economic opportunities.

Overall, these initiatives demonstrated the significance of engaging young minds in environmental conservation and promoting traditional Indian handicrafts for sustainable livelihoods. 🐅



ABOVE Govardhan Meena (right) speaks to women at the Dastkar Handicraft Centre. Several women were inspired to join the centre, which will help them bring in additional income.



ABOVE Sarmaya, the museum without boundaries, displayed a gorgeous photo exhibition on nature-themed art, including images from the 36DaysOfType series, a collaboration with Sanctuary Asia on social media.

RUMBLE IN THE LAGOON

It seemed like any other morning. Walking by a lagoon near my home in Colombo, Sri Lanka, I sought to photograph birds flitting about. As I walked the urban wetland's edge, I saw an Asian water monitor *Varanus salvator*, basking in the morning sunlight. This wasn't unusual, the large reptiles were a regular sight. But then I noticed something strange – there was a fast-moving ripple in the water heading straight toward the lizard.

Curious, I focused my eyes on what was approaching. To my surprise, I saw another Asian water monitor approaching the one sitting motionless on dry land. It was clear this encounter wouldn't be friendly.

Time seemed to slow down as I waited for the drama to unfold. Just a few seconds later, the two lizards clashed like two wrestlers. I pressed the shutter button at lightning speed, capturing every moment of their epic battle. I kept taking images, capturing their fierce encounter, splashes and all! I was enthralled and though their combat lasted no longer than 10 seconds, the memory will be etched in my mind forever!

One was clearly stronger than the other, and the weaker one wisely backed off, admitting defeat without either of the two reptiles inflicting damage on each other.

Asian water monitors are among the largest lizard species in the world, second only to the Komodo dragon. They make great use of habitat available to them, switching terrestrial, aquatic and arboreal habitats as the need arises. Quick to adapt they are largely unperturbed by human disturbances, and their resilience often enables them to adapt to our growing urbanisation.

Interestingly, these lizards use habitats differently depending on their life stages. A Sri Lankan study suggests that adults and subadults were more associated with aquatic and terrestrial habitats, while hatchlings and juveniles used aquatic and arboreal refuges to reduce risk of predation when young or in competition with older individuals. They predate and scavenge, and males are extremely territorial. What you see on these pages was one such fight between behemoths.

It was an extraordinary moment gifted to me by nature, turning the peaceful lagoon into an arena of exciting drama. I'll always cherish the memory of the water wrestling between the two mighty monitor lizards. 🦎

PHOTOGRAPHER: Tilan Weerasinghe

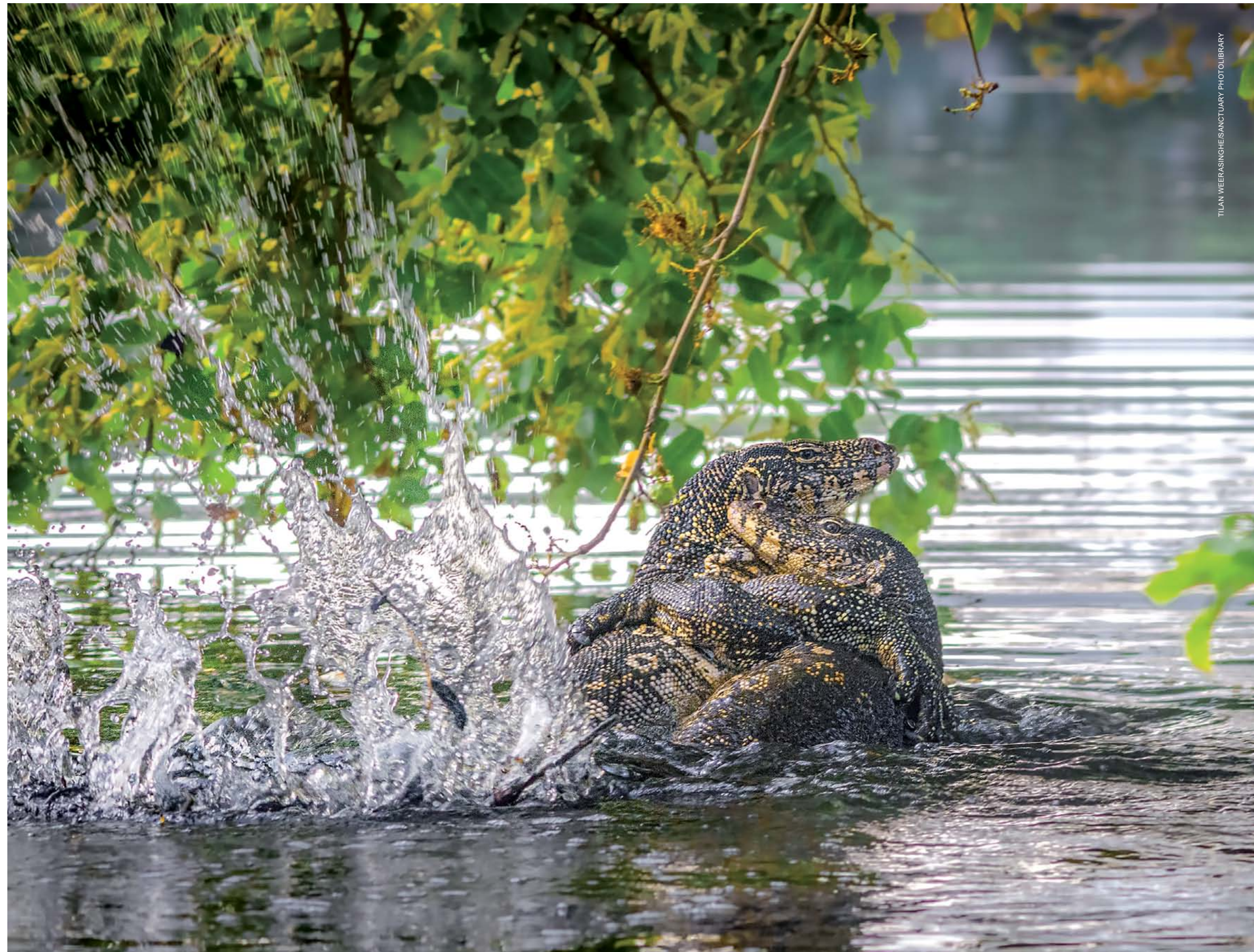
LOCATION: Colombo, Sri Lanka

DETAILS: Camera: Canon 7D Sigma Lens: Canon EF 150-500 mm.

Aperture: f/7.1, Shutter speed: 1/250 sec., ISO: 800

Focal length: 150 mm.

DATE: April 20, 2021, 7:57 a.m.



PUBLIC DOMAIN/FLICKR



NOW YOU SEE ME, NOW YOU DON'T

Hidden in the tropics of Central and South America, the translucent glass frog is a fascinating amphibian. When a predator looks in its direction, it sees through the frog's stomach! Since the glass frog is the most vulnerable when it sleeps, it becomes two to three times more transparent for about 12 hours by gathering about 90 per cent of its blood cells into its pea-sized liver. Like a well-thought-out costume, its liver is covered with minute reflective crystals to hide the red blood. The only problem with this 'invisibility cloak' is that it leaves the seven-centimetre wonder slightly groggy and stiff-jointed when it wakes up at night. Uncirculated blood after all means that the rest of the frog's body is in an oxygen-starved state. An unlucky glass frog that is spotted just as it comes out of its transparent sleep could well become a snack!

THE SANCTUARY PAPERS

TEXT BY SHATAKSHI GAWADE

THE UNGULATES' MAGNIFICENT MIGRATIONS

Every year, post the rains, over 1.5 million wildebeest also called gnus, make their long hazardous annual journey from the Serengeti across to Kenya and Tanzania. Gushing waters carry away calves, crocodiles lie in wait for stragglers, yet the migration is worth every hurdle. It leads them to water and fresh grazing. Other migrating ungulates (mammals with hooves) include Mongolian gazelles in Asia, caribou in the Arctic, and guanacos in South America. Migration is a critical strategy for animals to escape harsh climatic conditions, find sustenance and suitable breeding grounds. Travelling in large congregations has the advantage of enhanced security. Herbivores are an important link in the food web. They depend on vegetative matter and serve as prey for carnivores. Their trampling hooves and bodily wastes help form biotic communities so essential for healthy ecosystems. For millennia, humans have depended on such migrations to survive in otherwise hostile circumstances. The cultures of several traditional communities are still tied to the migration of species across the world.

Today, however, ungulate migrations are threatened by anthropogenic hurdles. Large mammals need continuous, uninterrupted tracts of land. But when we plan linear infrastructures such as roads, fences, transmission lines and canals, we rarely if ever consider the impact on the disruptions we cause. These hurdles have become so severe that Planet

PUBLIC DOMAIN/RAWPIXEL

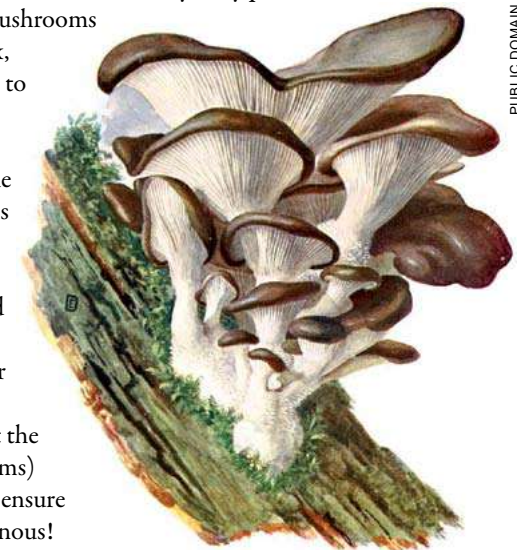


Earth could well lose the ecosystem-defining migrations, even before we have fully understood them. The cascading effect of lost migrations will affect not just the animal kingdom, but the human world too.

HOW COOL ARE THESE MUSHROOMS?

What can be a natural replacement for ice cubes? Mushrooms! Scientists have found that mushrooms, as well as other fungi such as yeast and molds, have body temperatures that are lower than their surroundings. The oyster mushroom *Pleurotus ostreatus* is close to 6°C cooler, and the brown American star-footed amanita is about 1°C or 2°C cooler. Mushrooms contain a high percentage of water, which they release to cool down, something like humans do by sweating. The gill structures below mushroom caps increase the surface area, allowing for greater cooling. Even fungi that live in colonies, such as yeasts and molds, have lower temperatures, more so at the centre of the colony. This condition persists even in freezing climates. An example is Brewer's yeast, used to make penicillin. Single-celled fungi hold this characteristic, showing that cooling is a multi-species phenomenon among fungi. This may help spread spores, for reproduction, but could also be an inherent trait. When the scientists who found that mushrooms are inherently cooler made this discovery, they packed half a kilo of button mushrooms

in a styrofoam box, and installed a fan to blow air from this box into a larger styrofoam box. The temperature of this makeshift cooler dropped by 10°C in 40 minutes, and remained so for half an hour! After such a box is used, you can simply eat the coolant (mushrooms) too, provided you ensure they are not poisonous!



PUBLIC DOMAIN

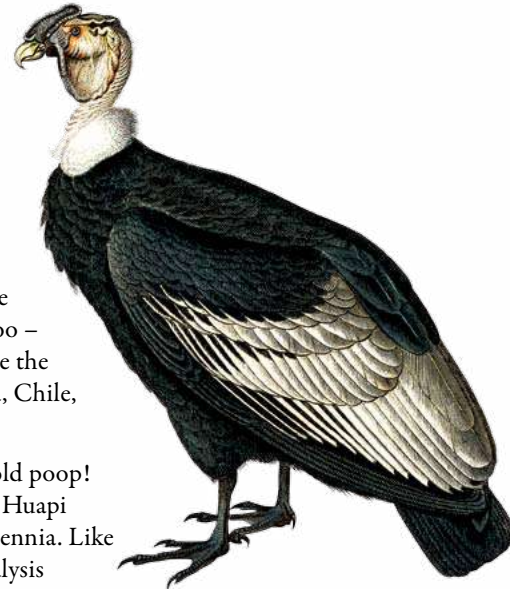
Did You Know?

Floating nonchalantly at 8,336 m. below the surface of the sea, a tiny snailfish juvenile holds the record for the deepest video record of a fish. At this depth, the pressure is a crushing 800 times over that experienced at sea level... over 821 kg. per square centimetre! The hitherto unknown snailfish of genus *Pseudoliparis*, was recorded south of Japan in the Izu-Ogasawara Trench, home to a rich population of deep sea life.

SOARING IN THE SHADOW OF VOLCANOES

Gliding smoothly on the wind, with occasional flaps and a quick twist of the tail for direction, the massive 15-kg. Andean Condor *Vultur gryphus* soars amidst the Andes Mountains in South America. At 3.3 m., it has the longest wingspan among raptors, which helps it to fly to the astounding height of 5.5 km. As the huge raptors have lived around humans for several centuries, they play a role in culture too – Andean Condors are revered by Indigenous South American communities. They are the national birds of not one but multiple South American countries, including Bolivia, Chile, Colombia, and Ecuador.

The history of this scavenger emerged from a very strange source – 2,200-year-old poop! Scientists found this ancient donut-shaped pile on a cliffside in Argentina’s Nahuel Huapi National Park, only to realise that it was a condor nest that had been used over millennia. Like many raptors, Andean Condors use the same site for extended periods of time. Analysis revealed that the accumulation of poop in the nest had thinned between 300 C.E. and 1300 C.E. On investigation scientists discovered that four volcanic eruptions had occurred near Nahuel Huapi around 300 C.E. The repeated use of nests warrants careful protection of these vital sites. Scientists also found that the faeces of current Andean Condors have more toxic mercury and lead than the older samples, and their populations are declining.



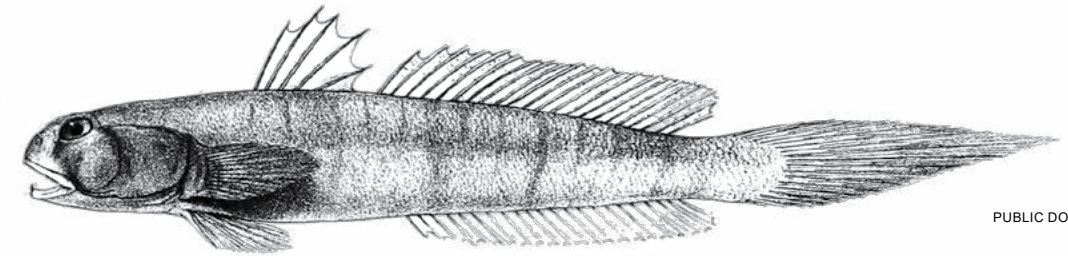
PUBLIC DOMAIN/RAWPIXEL

IN THE EYE OF THE BEHOLDER

Bringing to mind the first organisms that ventured out of the primordial soup, the mudskipper pulls itself out of a squishy hole in the mud, venturing onto land with what looks like determination in its protruding eyes. Mudskippers are fish that spend most of their life on land, breathing air through their skin, and by trapping air in gill chambers.

The fish are found in estuaries, swamps and mud flats from Africa to Polynesia and as far as Australia. As tides retreat, they leave their watery abode in search of mates and food that includes a host of tiny animals and plants found on mudflats and make for squelchingly delicious meals for these amphibious creatures. To survive, however, mudskippers must ensure they remain moist at all times, which accounts for them flopping from side to side in wet mud. Scientists have recorded 23 species of these amphibious fish, all belonging to the goby family. All ray-finned fish, they use their pectoral fins to drag themselves forward while on land.

Scientists recently discovered that mudskippers blink by sucking their eyes down into their sockets using an existing set of muscles. The finding revealed that the evolution of complex behaviour in animals does not necessarily need physical changes, such as new glands and muscles, if the objective can be accomplished using existing anatomy. By comparing fossils of early tetrapods (four-limbed animals) with mudskippers, scientists surmised that blinking emerged as an adaptation to life on land for both groups and helps to perform three complex functions simultaneously – protection, cleaning, and maintaining wetness.



PUBLIC DOMAIN/WIKIPEDIA

STILL WATERS RUN DEEP, AND NOISY

What sounds do you hear near a pond? The croak of frogs, some insects buzzing around, the beating wings of birds landing on the water, or rustle of the leaves as a gentle breeze flows by. But now, researchers have found that the still surface of the lake hides an entire orchestra underneath.

Under the still surface of a pond, different forms of life play operas and sonatas with strange and mysterious sounds – popping plants, scratching aquatic insects, and booming fish! Ponds provide important ecosystem services, and are extremely biodiverse microcosms of life.

During the day, plants dominate the underwater soundscape with buzzes, whines and ticks, all different breathing sounds as they respire during photosynthesis. At night, the insects take over the orchestra. As they compete to attract mates, some rub their genitals on their abdomens (stridulations), to make loud scratching noises. The pygmy water boatman, for instance, can produce the loudest sound while stridulating (when scaled to its body length) at 105 decibels!

The underwater sounds of ponds help assess the health of the ecosystem. The sounds can also be used to identify different species without capturing and possibly harming them.



PUBLIC DOMAIN/BIODIVERSITY HERITAGE LIBRARY

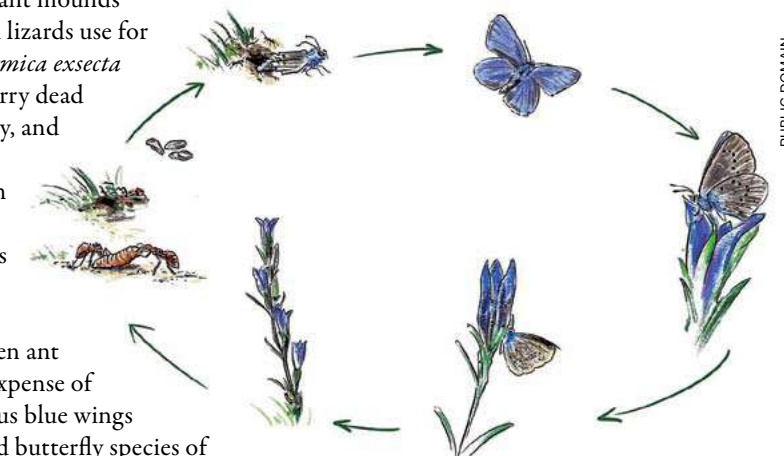
Did You Know?

A 9,550-year-old Norway spruce on Fulufjället Mountain in Sweden is one of the oldest living trees on the planet! Old Tjikko appears to be a stunted shrub just 1.8 m. in height. It managed to survive through vegetative propagation, wherein a new plant grows from the parent’s parts. Carbon dating revealed the age of its root system. Think about it! The tree must have sprouted in 7550 B.C.E., whereas writing was first invented around 4000 B.C.E.

A SENTINEL FOR THE HEATH

Standing innocuously in the middle of the forest floor or a grassland, sometimes almost blending into the surroundings, ant mounds are an integral part of the ecosystem. Worker ants build the mound for their colony by excavating the ground. The dug-up soil gets deposited above ground and can take the shape of towers, craters, or miniature hills depending on the species.

In the Danish heathlands (a type of shrubland habitat), ant mounds warm up the surrounding ground, which beetles, snakes and lizards use for warmth. When ants, such as the rare narrow-headed ant *Formica exsecta* and yellow meadow ant *Lasius flavus*, form mounds, they carry dead animals into their abode, which release heat when they decay, and add carbon and other nutrients to the heathland soil. In a regenerating forest, the seeds of many plants depend on such mounds. A plant growing on a mound is likely to flower earlier than other plants and the extra flowering period helps other insects! The Alcon blue butterfly makes particularly good use of ant mounds. When the caterpillar is sufficiently developed, it emits a scent and a sound that mimics the queen ant larva. This tricks worker ants into nurturing it, even at the expense of their own colony! In spring, the butterfly spreads its gorgeous blue wings and leaves the ant mound. Eleven of the 12 gossamer-winged butterfly species of Denmark thrive in places that have ant mounds.



PUBLIC DOMAIN

Did You Know?

The domestic cat’s nose functions as an extremely efficient gas chromatograph, a tool that separates and detects chemicals in vapour form. The complicated collection of tight, coiled bony airway structures in its nose help the cat quickly detect friend, foe or food. The cat’s nose separates the air it breathes into two streams, one of which is delivered for quick analysis to the olfactory region. Interestingly, alligators’ long noses also function like gas chromatographs!



ON SINKING LAND

By Shatakshi Gawade

Imagine a stacked pile of papers. Every time a single sheet is pulled out from the middle, the top sinks, imperceptibly. More sheets would of course lead to more sinking. In our case, the stack is the Earth's crust, the removed sheet is extracted groundwater, pumped from deep borewells, and the sinking top layer is the surface we are on. Such a sinking surface – land subsidence – is the alarming reality in several parts of the country as groundwater extraction continues unabated.

DEEP IN THE BOWELS OF THE EARTH Groundwater is stored under the surface of the Earth in cracks and pores of rock and soil in structures called aquifers. An aquifer is a water-bearing rock that allows the groundwater to flow into wells and springs, which may flow into streams or lakes.

Water seeping down into the soil recharges these aquifers. But the rate of recharge is different according to the type of rock, which is why the well may run dry if the extraction is higher than recharge, or land may subside.

GROUNDWATER IN (ALARMING) NUMBERS By some estimates, human activities are responsible for 77 per cent of the ground subsidence across the world, of which 60 per cent is attributed to groundwater extraction.

With a fourth of the planet's groundwater being withdrawn in the country, India is the largest user of the underground resource.

Groundwater provides 48 per cent of the water supply in Indian cities. U.S.A.'s National Aeronautics and Space Administration (NASA) has recorded that in just the last decade, the groundwater in north India has decreased by 108 billion cubic metres. Such unabated, often unregulated, extraction of groundwater is causing land subsidence and recent research suggests is even tilting the Earth's axis (see page 8).

Researcher Shagun Garg found that land was subsiding in Kapashera, 10 km. from Delhi's airport, at the rate of 17 cm. per year. He also observed sinking land in other parts of Delhi NCR. This corresponds with the over four metre decline in groundwater in some pockets of Delhi, in wells monitored by the Central Ground Water Board (CGWB) in November 2020 compared to the decadal average (2010-2019). CGWB has recorded a decline of about 33 per cent of groundwater in wells across India by upto two metres. A decline of over four metres has been observed in Dehradun, Ghaziabad, Indore, Allahabad, Kanpur, Lucknow, Jaipur, Vijayawada, Chennai, Coimbatore and Madurai.

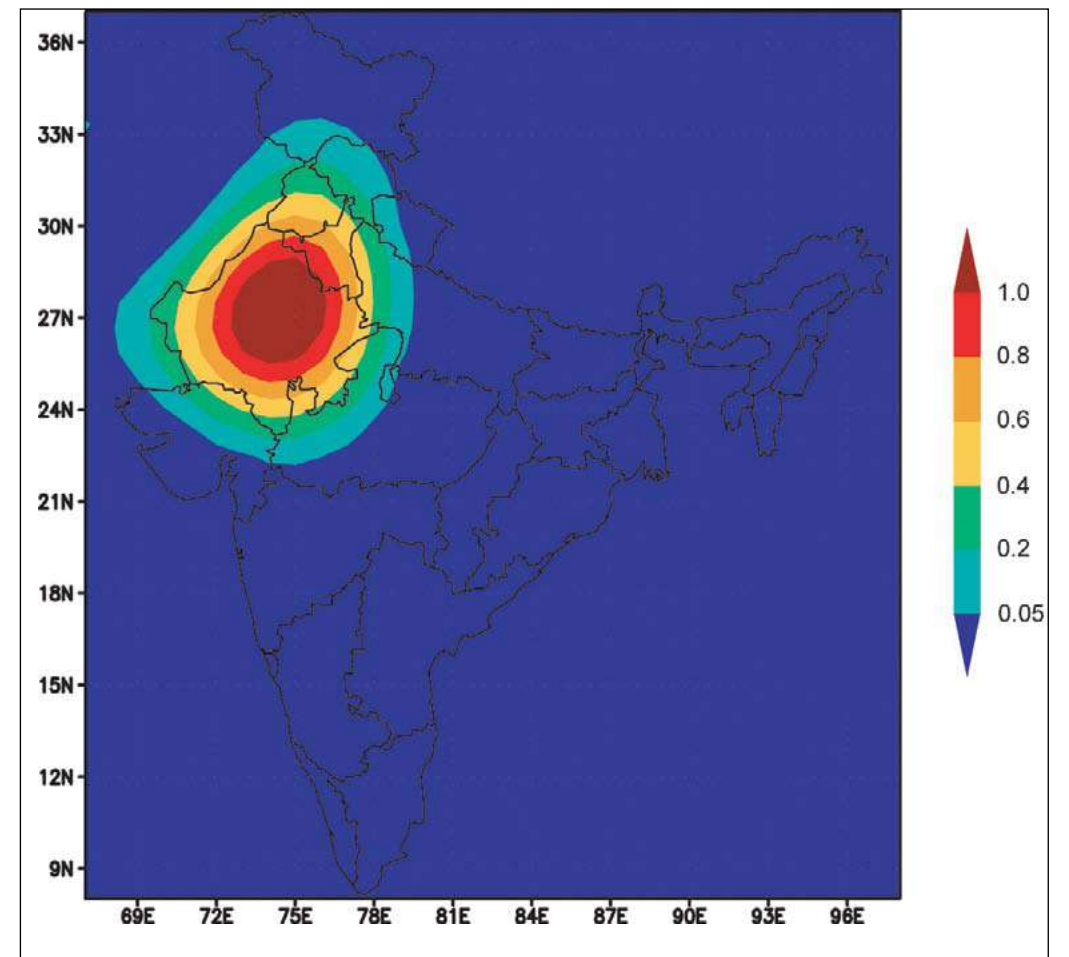
THE PERILS The other causes for groundwater loss are changes in the landscape on account of infrastructure such as building basements, tunnels and metros, which disturb aquifers and recharge and discharge zones.

Land subsidence causes damage to structures, making buildings unsafe, damaging linear infrastructure such as roads

and railways, causing changes in elevation of streams and canals, which may cause them to breach their banks, flooding, and mine inundation. All of these lead to economic losses, and unnecessary loss of human life. Researchers believe that reversing land subsidence is not possible. The only way to arrest this deadly phenomenon is to manage groundwater extraction, and plan infrastructure carefully in a way that does not damage aquifers. 🐾

FACING PAGE Groundwater being pumped at a farm. Human activities are responsible for 77 per cent of the global ground subsidence, of which 60 per cent is attributed to groundwater extraction.

RIGHT The warmer colours in the map of north India show greater sensitivity to groundwater storage changes. NASA found that 109 cubic km. of groundwater disappeared here from 2002 to 2008, at an average of one metre every three years, proving that the current rate of groundwater extraction is not sustainable.



What You Can Do

1. Along with judicious water use, rainwater harvesting (RWH) alleviates some pressure from groundwater and piped dam water use. RWH was made mandatory in 2012 in Delhi, and according to the Model Building Bye Laws 2016, providing RWH systems is required for all residential plots above 100 sq. m. Check the status of RWH systems in your area, and get them implemented.
2. The Advanced Centre for Water Resources Development and Management (ACWADAM) has mapped aquifers of Pune, which can be used to identify recharge and discharge zones to plan wells, infrastructure and building construction.
3. CGWB also has a repository for groundwater management through their project National Project on Aquifer Management (NAQUIM), which one can use for planning.
4. Report instances of illegal extraction of groundwater to the relevant authorities, such as the NGT, CGWB, or Pollution Control Boards.
5. Talk to your neighbours, friends and family about the dire situation of land subsidence on account of groundwater extraction, to help manage precious underground resources much more effectively. Work toward initiating robust groundwater legislation to protect groundwater resources.
6. Write a polite email or letter to Shri Gajendra Singh Shekhawat, Minister, Jal Shakti (minister-jalshakti@gov.in) and to the Central Ground Water Board (CGWB), Ministry of Jal Shakti, Department of Water Resources, Government of India (chmn-cgwb@nic.in) stating the following points:
 - a. India is the largest user of groundwater, a fourth of the planet's groundwater is withdrawn here.
 - b. With the world's largest population, and being the world's largest user of groundwater, it is vital that we adopt sustainable and scientific management of our groundwater resources.
 - c. This is vital to reduce the impacts of climate change-induced disasters that will have a cascading effect on our food security, economy and environment.
 - d. State governments must be supported and encouraged to work with farmers to move away from water-guzzling crops.
 - e. The contamination and pollution of our water resources must also be addressed effectively.
 - f. We must strive to institute strong groundwater legislation to protect this vital resource.

Loving Birds in the Midst of a Pandemic



By Shubhobroto Ghosh

When the Coronavirus pandemic first struck in 2020, it brought to the forefront certain harsh realities that we had not faced before. Among the most compelling of those realities was the fact that, like billions worldwide who were fortunate not to be forced to migrate or exposed to the deadly virus, we had to stay indoors in our flat in Motinagar in New Delhi. Living under confined conditions, it came as a pleasant surprise when certain occasions during this period revealed delightful sights. The presence of birds, many varieties of which I had never thought existed in the area, were initially fleeting distractions that soon turned into prolonged sessions of intensive birdwatching for us.

I observed several species, of which one stands out during the otherwise traumatic time of 2020 and 2021 – Rose-ringed Parakeets. Parrots of all kinds have been my favourites since childhood, and their beauty of appearance, intelligence, and ability to mimic a wide range of sounds, including human speech, have enchanted me. I saw parrots mostly in captivity, in the absolutely brutal tiny cages, where they were hardly ever able to extend their bodies, chained in rings and with their wings clipped. Macaws and cockatoos enchanted me, but the species that I encountered most frequently was the

Rose-ringed Parakeet, a gorgeously-coloured and raucous bird that is still kept illegally as a pet in many homes in India. Bearing the painful memories of these unfortunate captive birds in mind, it was a delight to observe free-living parakeets indulging in all manner of behaviours right in front of my eyes. My wife Payel Biswas and I spent hours observing a whole population of these endearing parakeets that kept us entertained with their antics. One of their refuges was an Ashoka tree *Saraca asoca*, where they would perch and often preen themselves and one another. At a time of grave depression, Rose-ringed Parakeets, treepies, Yellow-footed Green Pigeons, Purple Sunbirds, Red-vented and Red-whiskered Bulbuls, and more, cheered us up even in the midst of the darkest gloom. Payel and I were even able to witness flocks or ‘murmurations’ of Rosy Starlings, also called Rosy Pastors, during their winter migration to India.

Notably, we even saw Painted Storks and Black Ibises flying over the terrace of our home. Not in our wildest dreams had we imagined that some storks and ibises would actually fly above our terrace. Watching birds offers many pleasures, as the late Indian ornithologist *Sálim Ali* also stated; among them is the opportunity to engage in observing the behaviour of creatures that so fascinated humans that it led to the invention of aircraft.

We had to shift our home recently because a new construction came up that led to our flat being damaged. Many parakeets that used to gather nearby also abandoned their retreat on account of the construction. Fortunately, at our new residence at Ramesh Nagar, we noticed a robust presence of birds as well, as evidenced by Payel’s recent sighting of a Blue Rock Thrush.

RIGHT A Yellow-footed Green Pigeon *Tieron phoenicoptera* near the author’s home.



We hope that more people will be able to observe and document the presence of birds and other animals that share our living spaces all across the country. The continued happiness derived from birdwatching in domestic situations also fits in nicely with my professional duties, since the motto of *World Animal Protection* is, “Wildlife Belongs in the Wild.” Birds ought to be cherished flying free, not in cages, that are in truth little more than prisons set up in our homes. 🐦

Shubhobroto Ghosh, Wildlife Research Manager, World Animal Protection in India, is the author of *Dreaming in Calcutta and Channel Islands*.

BELOW (Left) A Blue Rock Thrush *Monticola solitarius* and (right) Rose-ringed Parakeet *Psittacula krameri*.



In Appreciation of our Feathered Bipedes

In August 2022, the Zoological Survey of India (ZSI) published *Birds of India – a photographic field guide to encourage birdwatching and scientific study of birds in India*. **Shubhobroto Ghosh**, World Animal Protection Research Manager, spoke with **Dr. Gopinathan Maheswaran**, Scientist (E) in the Bird Section, ZSI, about this book and how it could enhance the appreciation of avian life in India.

What is the significance of this new book on birds?

This is the first photographic field guide from ZSI in a century and depicts all bird species found within Indian states and Union Territories. We have many field guides in India but a majority of them include drawings rather than images that accompany species’ descriptions. This guide has clear pointers revealing the identifying characteristics of species. The text has been kept to a minimum, but important distinguishing colours and markings will help birders identify birds in the field.

What are the principal features of this book?

It includes all 1,331 bird species of India, including 100-odd vagrants. Wherever possible, we have included photos of both male and female avians, as some species display clear sexual dimorphism. For waders (of which 90 per cent are winter migrants), we have used images depicting winter and summer plumage since many waders develop different colouration in the breeding season, making accurate field identification difficult. Our field guide should help birders differentiate individual species in breeding and non-breeding seasons.

How can this book help people appreciate birds better and pave the way for improved photography?

In India, more people are taking to bird photography as a hobby, thanks to the availability of inexpensive, high quality digital cameras. This encourages more people to take up bird photography, which ultimately supports conservation. Social media platforms too have helped by offering people outlets to showcase their images.

How and why is it important to tackle the bird trade?

Birds have a vital ecological role to play. We have included information on threat levels as listed by the International Union for Conservation of Nature (IUCN). People using this field guide can identify a species that is illegally being sold in the local market, and alert the enforcement authority immediately.

How can this book help encourage the study of birds?

This book will guide both beginners and professional birders in identifying species in the field. Retail price has been kept low to enable youngsters to enter the wonderful world of birdwatching and also to encourage field research by scientists and scientific staff of government-funded institutions to enhance the quality of their science communication.





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NOMINATE NOW FOR 12 AWARDS

www.toftigers.org/AwardsNomination

TOFTigers, in association with Sanctuary Nature Foundation, have collaborated for the 6th TOFTigers Wildlife Tourism Awards 2023. The theme for this year is 'Recognising and Rewarding - The Good Work of Individuals, Business and Communities'. The Awards aim to highlight and reward the very best in the nature tourism field; those individuals and organisations, who are shining examples in naturalists, businesses, environment supporters, wildlife photographers, wildlife filmmakers, service providers, and community enterprises who are leading the way in wilderness destinations in the Indian subcontinent. Each in their own way pioneering new ways to support and inspire wildlife conservation, engage local communities, and help restoration of wildlife habitat through their vision, drive, and actions.



THE AWARDS CATEGORIES 2023

1. The John Wakefield Memorial Award for Eco Lodge (Three Awards will be awarded in this category as per TOFT certification category of Outstanding, Quality & Eco Lodge)
2. The Billy Arjan Singh Memorial Award for Best Wildlife Guide
3. Wildlife Promotion Company
4. Wildlife Tourism Community Initiative
5. Wildlife and Tourism Initiative
6. International Wildlife Tour Operator
7. Wildlife Photography Award
8. Wildlife Documentary Award
9. Lodge Naturalist
10. Wildlife Harmony Homestay Awards (open to non-TOFT lodges as well)

Nominations are invited for all categories.

For Further information visit:
www.toftigers.org/WildlifeTourismAwards

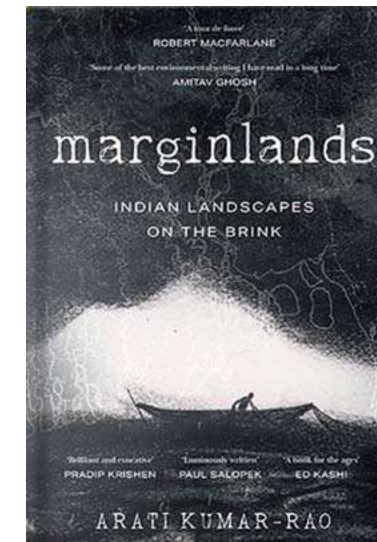
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TOFTigers is formed in 2004, galvanising those most active in the Indian nature travel industry to promote best operating practices. TOFTigers engages with global travel and tourism operators, Indian destination management companies and local wildlife lodges and resorts helping them all adopt practices that promote sustainable business, community support and tiger conservation. By doing so TOFTigers not only helps support the tigers, the parks and local communities, but also helps these companies provide their clients with a more inspired, fulfilling and enjoyable experience. A true 'win-win' scenario.

The Sanctuary TOFTigers Wildlife Tourism Awards are a celebration of what has been achieved so far, and perhaps more importantly, are an inspiration for what can be done in the future.

BOOK REVIEW

With improved technology and a much greater appetite among the young for books to remind them of the wonderful biosphere in which they live, it is heartening to see how many new, high-quality publications are emerging from within India. Here is a book that *Sanctuary* believes should be in every public library and in the homes of all those whose hearts beat to nature's drum.



MARGINLANDS:
INDIAN LANDSCAPES ON
THE BRINK
By Arati Kumar-Rao
Published by Pan
Macmillan India,
Hardcover, 256 pages,
Price: Rs. 699

With *Marginlands*, you hold in your hands a work of evocative long-form reportage complemented by mystical illustrations and beautiful photographs, from parts of the country that rarely feature in public consciousness despite their great wonders or tragedies.

Marginlands is independent environmental photographer, writer and artist Arati Kumar-Rao's first book, though certainly not her first piece of writing. She has been documenting the effects of ecological degradation on humans and their natural environments across South Asia, and often speaks just as eloquently about her work.

The compilation of essays in *Marginlands* swings wildly, as is justifiably necessitated by the length and breadth of the subcontinent's people and ecosystems, from Rajasthan's deep desert landscape in the west to the Ganges delta and Sundarban in the east, continuing upwards to the Himalaya stretched across the north, and into the beating heart of urban India. The opening pages of the book define the conviction of the stories and the storyteller: "For it is my belief that the ancient practice of listening to the land and doing right by it can yet be reclaimed."

Often, just factually told stories of the environment and people's lives are enough to move me, but Kumar-Rao's use of language is fascinating too. She cobbles words to describe the exact picture, such as 'brousse tigrée' or 'tiger bush' – the desert pattern created by alternating sand and vegetation. It's not just a book to appreciate human-nature relationships, but to enjoy the language. She writes, "When we lose an evocative lexicon, when we forget the organic words and their import, we lose what Barry Lopez calls 'the voice of memory over the land.'" Through her book, she stays true to this effort of documenting and deploying language.

Arati Kumar-Rao's style of approaching stories reminds me of the brilliant war photographer James Nachtwey – his strong belief in visual journalism to effect positive change fueled him to capture images in conflict zones. Kumar-Rao's commitment to spotlight stories of people affected by decisions taken far away from

their reality is reflected in her words, images and illustrations. The black and white tones of her images and art quietly highlight the complexities of the landscape – the ferocity of the water, the calm of the shade of a tree, or the menace of free-ranging dogs waiting to pounce on a Sarus Crane egg. The months, and sometimes years, she spends on each piece translate into truly rich stories, many of which are tied together by the recurring theme of water and its many forms – rivers, deltas, rain, storage structures, the sea. She particularly highlights the importance of hyperlocal knowledge to deal with changing landscapes. As is inherent in good environmental writing and photography, the book imparts the urgency to act.

Though the essays in the book are essentially journalistic pieces of work, they are also autobiographical and engaging – for instance, her description of a cup of red tea shared with a shepherd in the Thar desert placed me squarely in her mind and in the moment, imagining the shapes of the clouds that gathered temptingly over the arid land, reflecting on his comment about the wet sand inside a hot sand dune... 'Jahaan lagaav hota hai, wahaan algaav bhi hota hai' (Where there is attachment, there is also separation).

The book has the lucidity of fiction and the factual punches of non-fiction, making the travails of the people of *Marginlands* vividly real. It's like she has created a time capsule, documenting practices that have been handed down over generations, which help people live in harmony with the land, or of people who have lost and lived with the vagaries of nature and human decisions. For anyone concerned with the environment, the lives of people, and the often convoluted business of coexistence in the times of polycrisis, the book is a must read.

Reviewed by Shatakshi Gawade



ABOVE *The Yang Sang Chu, known as the secret river, in Arunachal Pradesh.*

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The Sanctuary Nature Foundation's print, on-ground and online network has grown to over a million caring individuals in India and across the globe. We would be delighted if you were to invite your family and friends to join this purposeful group to celebrate and protect our planet and its utterly miraculous biosphere.



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On Sanctuary Asia June 2023 Issue

[Ganesh Rajgopal](#) Absolutely enthralled by the issue. Keep up the wonderful work. Looking forward to the next!

On the Cover

[rupayan_datta](#) Incredible shot!

On Battle of the Unicorns

[susan_sharma](#) The Burapahar

range is arguably the best range in Kaziranga, especially if you are lucky enough to spot some hoolock gibbons.

[Doug Haass](#) What an amazing encounter to capture and witness! Something you will remember forever.

[apoorv_adityaruler](#) It's not a zoo where the Forest Department will take them for treatment. An injured animal will be easy food for either a predator or a scavenger. If they are taken away you are literally taking away food of the tiger or leopard.

[restoring_wild](#) Perhaps we should interfere because it is our interference that has led to the endangerment of rhinos today. Reserves are no longer natural ecosystems.

On Of Kokum and its Cousins

[Theylanglangtree](#) We grow several *Garcinia* species here in Florida, and a few seedlings of this one here!

They seem to be more cold sensitive than most of our other *Garcinia* but are thriving for now. We still want to grow *kokum*!

[sangeetamkhanna](#) The evolution of seed in this species is so interesting.

[aparajita_datta](#) It would be interesting to study *kokum*'s seed dispersal and regeneration status. Mostly *Garcinia* spp. fruits are consumed and dispersed by primates.

[Nitin Rai](#) did his Ph.D. thesis on looking at the harvest/extraction and the social and ecological consequences of this collection. But the species he looked at was *Garcinia gummi-gutta* - is that the same as *G. cambogia*?

[Sohamkacker](#) That's super cool. I will look up that paper if it is published! Yes, *Garcinia gummi-gutta* is the same as *Garcinia cambogia*.

On Sanctuary June Photofeature 'Tigerland'

[Soumadip Sinharoy](#) Extremely insightful writing plus great images.

[reema_kalani](#) We are the problem. But if we try, we can be the solution too. And I hope this concern doesn't remain a concern only.

[Dr. Subhansu Mishra](#) The striped monk is unfazed and relaxed about what goes on around him. In nature, everyone takes his share, as much as he needs. Even a tiger kills around 40-50 prey a year. When will we humans learn how much is enough for us!

[Anand Madabhushi](#) I spoke about this image to a group of teachers an hour ago while requesting them to read the [Cover Story](#) and [Photofeature](#) in the June 2003 issue for the best information on tigers and their conservation.

[WeNaturalists](#) We need to acknowledge that protecting and preserving biodiversity is not just a moral obligation but a necessary step towards ensuring a sustainable future for our planet. Let us implement measures that prioritise protecting our environment and its inhabitants.

[Bulachakravartyagbo](#) So why is it that tigers are nationally protected but not the leopard, despite the problems being highlighted? I hope that the dire situation for leopards is addressed.

On Sanctuary Asia April 2023 Cover

[Anupa Doraiswami](#) Meena Subramaniam, your artwork is unmistakable! It's beautifully detailed as always and I constantly find little hidden bits in them.



DHRIITIMAN MUKHERJEE

PHOTOGRAPHER: SHIVANG MEHTA

READERS' FORUM

On Changes to the Forest Conservation Act

Whereas we are seeing more nations trying to protect its forests and green areas, India decides to do the opposite. We are ruining our country!

Amit Dawett, Dubai

While birdwatching in Anini near Myodia Pass in Arunachal Pradesh on May 22, 2023, we watched a Blyth's Tragopan family – including a male, female and juvenile – in the backyard of the Maya Hotel. We were surprised to see some locals armed with a gun arriving in a Swift DZire car, with the possible intention of shooting the birds. I followed them on the trails behind the Maya Hotel but was threatened by the group and managed to escape thanks to my guide. We started a small awareness campaign before leaving the region. Later, a fellow birder confirmed that the tragopan family had been killed at the same spot. I hope *Sanctuary* readers, particularly those from the region, and visitors will undertake action so such perpetrators are caught and such activities are stopped.

Sanchari Bhattacharjee, Siliguri, West Bengal

On the NCPA & Sanctuary Save the Tiger Event

Wish Sanctuary more power and strength. Kids are our future and it's vital we sow the seeds of love for nature and wildlife for a healthy future and a green world forever.

Nirmalya Chakraborty, Mumbai



It was inspiring to attend the event and be part of it. Thank you for taking the effort to inculcate values and education into the younger generations. It instils compassion, love and care towards wildlife at an early age. You are amazing, and thank you for inspiring me too!

Saakshi Teckchandani, Mumbai

A cute, pawsome event that clawed love for tigers deep into our hearts! It was sweet to witness these little kids come together to take a solemn pledge to save our tigers and their homes. Dia Mirza, Pooja Bajaj, and Bittu Sahgal had fun at the event, and so did we with these cute cubs!

Animal Planet India

The excitement was infectious! Enjoyed being there and feeling positivity for a change.

Paul Abraham, Mumbai

On Sanctuary Magazine

I was among the first subscribers of both *Cub* and *Sanctuary Asia* magazines when I was a kid. I am now 51 years old. I still remember how good they were and wish I had collected them.

Sunish Singh, New Delhi

I grew up reading *Sanctuary* and I am grateful to my mother who bought me a subscription way back in the 1980s. Now my son is reading it! I remember donating a few copies to the BCS library as well.

Somnath Banerjee, New Delhi

Somnath let's activate our precious BCS kids! – Ed

My interest in nature photography was catalysed by *Sanctuary Asia*. My father used this magazine to help improve my English.

Saikat Chanda, Ujjain

On the image of a leopard kill in the Photo Feature 'Tigerland'

The IIT Guwahati campus is frequented by leopards. In the last five years, there have been multiple sightings and forest officials were able to capture two for relocation.

Dheeraj Pateri, Guwahati

Leopard sanctuaries are vanishing and places like Devalia Safari Park at Gir in Gujarat are expanding like glorified versions of zoos, all in the name of conservation and interpretation zone.

Priyank Shah, Surat

services humankind and its wellbeing depend on.

The authors **Magnus Sylven** and **Karl Wagner** explain cutting-edge science that proves and quantifies how "Animating the Carbon Cycle" through rewilding can substantially increase the sequestration of carbon from the atmosphere.

Meet Prof. Oswald Schmitz

Schmitz, Yale School for the Environment, believes that protecting and restoring wild animals to their natural habitats can be a game changer towards the objective of improving natural carbon capture and storage. He speaks to **Lakshmy Raman** about the role of trophic rewilding as an effective climate solution and how wild species impact the carbon cycle.

Leopard habitats are increasingly hemmed in by human habitations.

Apaarna Bagwa, Mumbai

On the passing away of Abdul Rehman Mir

Gentle. Brave. Dedicated. Loving. Knowledgeable. Protective. Fun. Caring. We have lost someone who will remain a part of our lives forever.

Bittu Sahgal, Mumbai

He will always stay alive in our memories. I'll always remember that one short meeting with him. May his soul rest in peace.

Amandeep Kaur Bamrah, Mumbai

On Sanctuary's June Cover Story 'Tiger Conservation: The Road Ahead'

Superb message by Anish Andheria. Important to learn from the past and plan the strategies for the future. I especially like the point about taking care of frontline forest staff.

Anil Ghelani, Mumbai

The *Sanctuary Asia* June 2023 Cover Story is the perfect introduction to schools in the Kids for Tigers' network whose teachers should know about Project Tiger, tiger reserves, tiger population dynamics, how and why villages have chosen to move out of tiger reserves and more. Simply put, it serves as a virtual textbook for teachers, students and all those interested in keeping natural India safe.

Anand Madabhushi, Hyderabad



DR. ANISH ANDHERIA

Author Speak

The PhytoFocus column 'Of Kokum and its Cousins' in the June 2023 issue of @sanctuaryasia focused on the genus *Garcinia*. Cultivating these species is so important so that their use in traditional food and medicine can continue alongside ecological roles.

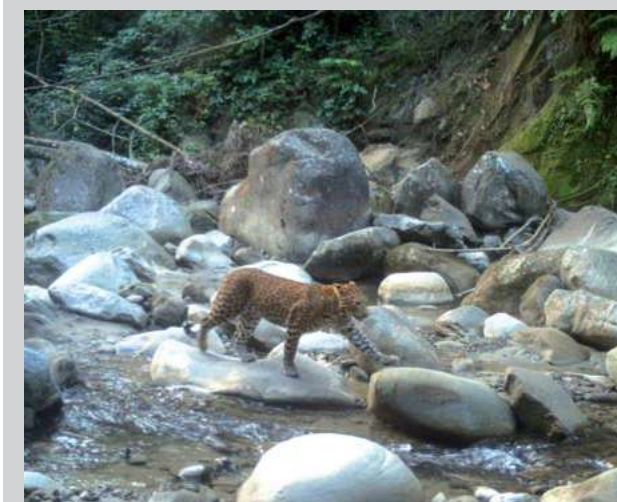
Sobam Kacker, New Delhi



PUBLIC DOMAIN/BISHNU SARANGI

It's ultimately our diaries and journals that make us see the magic of everydayness. Thank you for giving me the opportunity to write about everyday forest encounters (*Rediscovering the Mundane*) – something that we took for granted before the COVID19 pandemic.

Nandini Velbo, Goa



PAKKE TIGER RESERVE FOREST DEPARTMENT

IN OUR NEXT ISSUE...

Island Nation's Ecological Restoration Efforts

Ian Lockwood writes about ideas of rewilding and ecological restoration efforts in the Sri Lankan context. His article and images explore the surprising historical foundations and modern efforts to restore ecosystems across the island nation.

Rethinking Rewilding

Rewilding is about regaining functional ecosystems and healthy animal populations, thereby preserving and strengthening the capacity of nature to deliver all the



PUBLIC DOMAIN/AXEL FASSIOICIFOR



A SLIPPERY SLOPE

By Bittu Sahgal

No one really knows how many snow leopards are left alive on earth. For all the love and admiration showered on these exquisite cats by wildlife aficionados, save for small pockets, poaching for the value of their pelts and retaliatory killings for livestock losses have barely diminished.

Accelerated climate change has reached such catastrophic levels that once-safe mountains are now subject to human intrusions that are changing the very character of slopes now laden with slushy

snow and increasingly prone to killer avalanches.

That's not all. The icy expanses, once the near-exclusive domain of snow leopards, red foxes, wolves and the like, are witnessing climate-induced vertical migrations from carnivores that were restricted to lower altitudes.

The bottom line is that thanks to the climate crisis, *Panthera uncia* and its co-inhabitants now live on a very slippery slope.

Come to think of it, that applies to *Homo sapiens* too!

ABOVE *Snow leopards face a multitude of threats in a warming world from retreating glaciers, permafrost degradation, and shifting treelines to loss of alpine meadows.*

PHOTOGRAPHER: Krishnan V.
LOCATION: Spiti, Himachal Pradesh
CAMERA: Nikon D800,
 Lens: Sigma 150-600 mm.,
 Shutter speed: 1/5000, Aperture: f/8.0,
 Focal length: 450 mm., ISO: 2000
IMAGE TAKEN: February 21, 2015, 5:00 p.m.

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Sanctuary Asia

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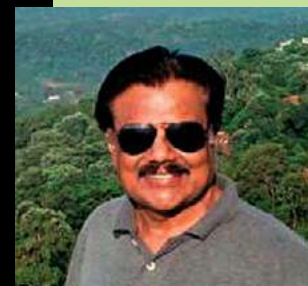
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Trees for life

