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It is well-known that mangrove forests serve a multitude of roles; **J. Devaprakash** shares a story of how an idea of creating a mangrove ecosystem translated into long-term benefits for the habitats and biodiversity near a residential colony in Kudankulam.



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Memorable Encounters in the Wilderness

A.J.T. Johnsingh has trekked miles in the wilderness areas of the country. It is therefore not surprising that he has several encounters to narrate. This one is special as it is a collection of some of the most memorable moments spent in the wild. Read on ...

PHOTO FEATURE

An Ant or a Lobster? Nope...

Nature has its own myriad ways of functioning. While some animals exhibit mimicry, others have evolved cryptic coloration that camouflages them to deceive their predators. **Raju Kasambe** tells us of an encounter when an insect mimic baffled him.



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Editorial...

Will Permaculture Save the World?

Agriculture expansion is one of the major driving forces in the destruction of natural ecosystems and decline of species. This is mainly due to increasing human population that has now reached more than eight billion. Do we need to grow more food to feed the growing numbers of one species, at the cost of 'some' environmental damage and decline of several other species with whom we co-inhabit this planet, or do we have alternative options?

While our search for more food has taken us to the highest mountains and deepest seas – one third of the major fisheries of the world are over-exploited and agriculture fields, albeit seasonal, can now be seen up to 4,000 m – the worldwide statistics of food wastage are shocking.

These are the questions that we have to ask ourselves. According to the UN Food and Agriculture Organization (FAO), the world produces about 4 billion metric tons of food per year, of which about 1.3 billion tons goes waste. Food that is not consumed accounts for 38% of total energy usage in the global food system. Food wastage varies from country to country in the form of cooked food, storage, retail, or distribution. Rich countries like the USA waste food at retail (expiry-dated packaged food cannot be sold) or on the table (high-end hotels are notorious for wasting food and hiding this deftly from concerned customers), while in poor countries, stored grain spoilage is enormous, sometimes reaching 20–30% of the total grains produced or imported. In the USA, almost 40% food is wasted.

Food wastage is an enormous concern worldwide, which is why the United Nations Environment Programme has developed a Food Waste Index. Its 2021 report says that nearly 14% of the total food produced globally is lost between the harvest and retail stages. It does not mention food wasted in households and through the catering industry. India's contribution to food wastage, at 68.8 million tonnes annually, is 7% of the global total.

According to some agronomists, worldwide we produce enough food to provide three meals to every citizen in the world daily. With so much food production, is it not ironical that nearly 828 million people go to bed hungry every day, and many more do not get sufficient calories daily? Yet we continue to convert forests, grasslands, and wetlands into agricultural fields to grow more food to feed humans, and simultaneously allow the conversion of prime agricultural land into housing colonies. When I see vultures stripping the last tissue of a natural kill and hyenas chewing the remaining bones in wildlife documentaries, I wish man would learn from nature. Nothing is wasted in the natural world. A dead animal or tree is food for a host of species.

The drive to grow more food often degrades the health of the soil, while contributing to more land degradation and deforestation. There are numerous studies that show how soil fertility is depleting due to modern agricultural practices, so I will not delve further on this. I completely support Sadhguru's campaign for soil health. As he rightly said: "The Save Soil movement is a love affair with the land and life around us." World Soil Day, held annually on December 5, aims to focus

attention on the importance of healthy soil, and to advocate for sustainable management of soil resources. Healthy soil with all its components: organisms, minerals, nutrients, water, and air, means a healthy crop.

This brings us to permaculture, a term coined by Bill Mollison in 1978, from two related words: permanent and agriculture. Permaculture aims to draw inspiration from nature to develop synergetic farming systems based on crop diversity, resilience, natural productivity, and sustainability, i.e., sustainable agriculture that looks after soil fertility and biodiversity, and also provides good, chemical-free food.

Permaculture is not a modern concept, it was practised for thousands of years, particularly in ancient civilizations like Egypt, India, and China. It is nature-centric farming that gives importance to ecology, economics, soil fertility, and sustainability. It is similar to what the celebrated Japanese scientist, farmer, philosopher, and writer, Masanobu Fukuoka propagated through his 'natural farming' theory. Perhaps he went a bit too far, as he propagated no-till, no machine, no herbicide/pesticide use in farming: crop seeds are spread to grow with minimal removal of other vegetation. He became a popular TV personality in the 1970s with his lectures, debates, and books. His farming method may not be possible in crowded countries like Japan, where only 20% land is suitable for cultivation (hence intensive modern farming), but his philosophy to follow nature's principles is accepted worldwide.

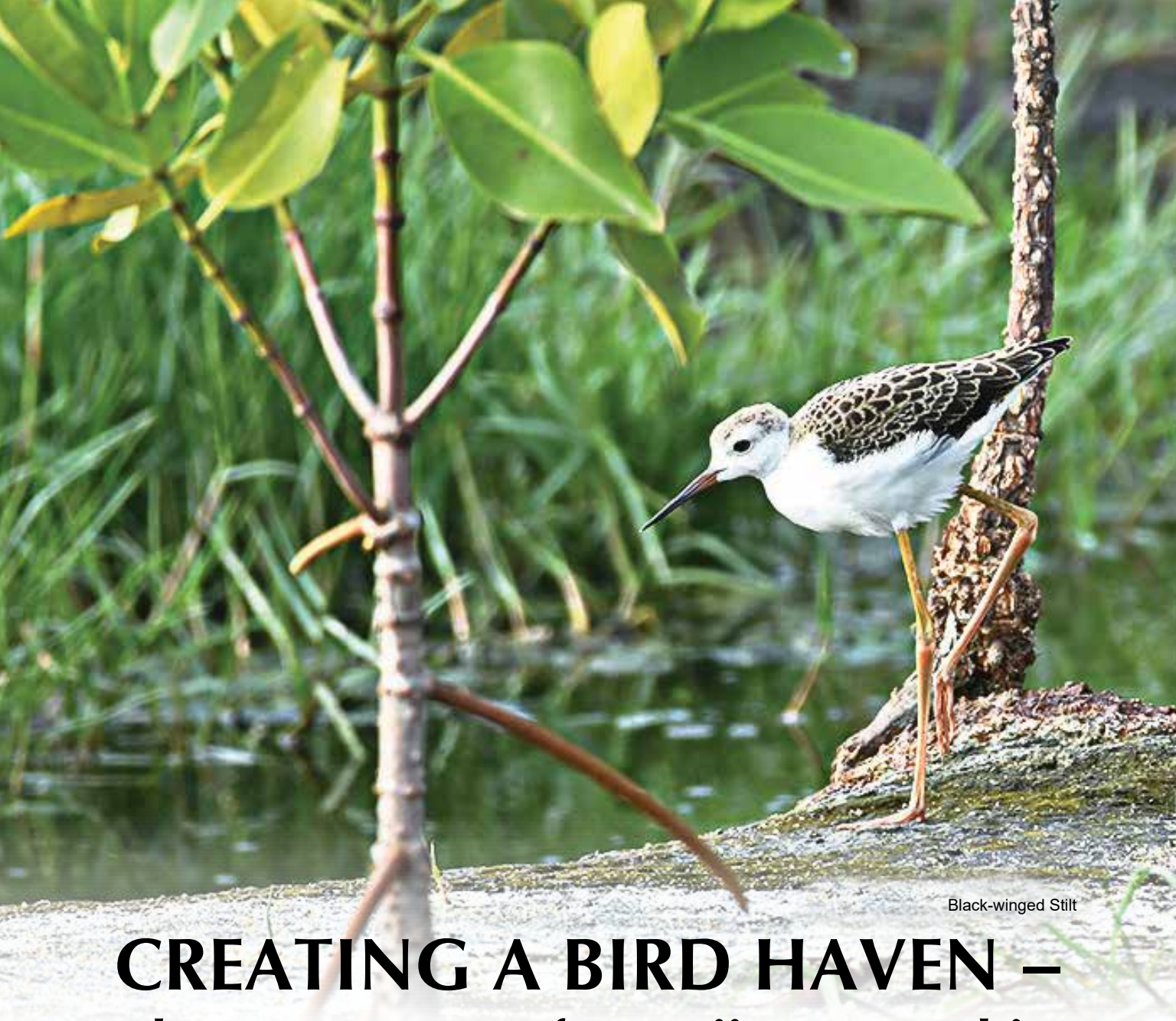
This brings us to Mahatma Gandhi's vision of making every Indian village self-sustained. He wanted villages to develop their economies to meet the basic requirements of the villagers and obtain things that could not be produced in exchange for surplus products from other villages. He believed in organic farming and consumption of local produce, to safeguard the local market for farmers. We can call it locavory, i.e., eating locally produced food.

'Food miles' is a measure of the distance travelled by food items from production to consumption. In a recent paper published in *Nature Food* (2022, 3(6): 445–453), Li and his colleagues state that "global food miles equate to about 3.0 gigatonnes of carbon dioxide equivalent (GtCO₂e) – higher than previously thought. This indicates that transport accounts for 19% of total food system emissions." Another interesting analysis shows that transport of fruit and vegetables contributes 36% of food miles emissions – around twice the amount of greenhouse gases (GHG) released during their production.

Supporters of industrial farming say that while all the talk about organic farming, permaculture, and no-till farming is fine at a small level, how does one feed the growing human population? Can permaculture save the world?

The answers to this complex issue cannot be simple. The answer to preventing global food crisis, and nature conservation lies with us. We can start by not wasting food, by buying locally-grown vegetables and fruits from small shops, so our money goes to the farmer and not to jazzy malls that sell the same product exorbitantly. We should purchase organic food, wherever possible. Whatever the means, we need to begin investing in a system that *restores* the natural ecosystem instead of depleting it.

Asad R. Rahmani



Black-winged Stilt

CREATING A BIRD HAVEN – The Mangroves of Anuvijay Township

In 2008, the Nuclear Power Corporation of India Ltd (NPCIL) which runs the Kudankulam Nuclear Power Project conducted a study on wetlands and waterbirds in and around Kudankulam, led by Dr S. Balachandran of the BNHS, at 18 different wetlands during the peak of monsoon.

It was found that the area lacked dedicated habitats for wintering birds, though the region has several waterbodies. Many of the freshwater wetlands were being used for irrigation and fishing, while most of the saline wetlands were used for salt production, causing incessant disturbance to the birds, both resident and migratory.

Based on the study, Dr Balachandran suggested the creation of dedicated habitats for migratory and resident waterbirds. In 2013, a preliminary study to identify suitable sites for the creation of microhabitats like mudflats was pursued in Anuvijay Township.

A team of experts led by Dr Balachandran studied the area and identified two locations in Anuvijay Township, close to the Uppar River Canal that flows through the township. These were developed into intertidal mudflats, with land and funding from KKNPP. The development began in August 2015, and the mudflats were created by the end of the year.

Text and Photographs: **J. Devaprakash**

One winter morning, Dr S. Balachandran, Deputy Director, BNHS, and a renowned ornithologist, was studying the bird diversity on a bund in a wetland when an exciting thought crossed his mind – “This place is apt for mangroves, as it is so close to the seashore.” The wetland where Dr Bala stood as well as another adjacent one, both in Anuvijay Township, the residential colony built for the employees of the Kudankulam Nuclear Power Project (KKNPP), were

the result of his earlier efforts to develop mudflats that would provide safe roosting habitats for waterbirds. Soon, his idea began to take root and the Mangrove Development Project was initiated as a joint venture of KKNPP and BNHS. At a time when the world is taking note of how important mangroves are for the land, sea, and climate, I was thrilled to be associated with Tirunelveli District’s first mangrove project. KKNPP provided the land for mangrove plantation and decided to fund the project under its Sustainable Development Programme, a component of its corporate social responsibility policy.

At the Anuvijay Township

There are over a hundred species of mangroves in the world, but based on the soil



Most of the planted mangrove saplings are flourishing and over five feet tall

and climatic conditions of the area, Dr Bala selected two mangrove species for plantation, namely grey mangrove *Avicennia marina* and red mangrove *Rhizophora mucronata*. We began planting the saplings by end 2017, after clearing the thorny bushes and deepening and levelling the land. About 3,000 saplings were planted phase-wise near the mudflats. Thereafter, Dr Bala and his team nurtured the mangroves and invited mangrove specialists to contribute their inputs. He took advantage of the proximity

of his hometown Agasteeswaram and visited the mangrove site at Anuvijay Township frequently.

Most of the planted saplings started flourishing, and in nearly three years they grew 4–5 feet tall. While grey mangrove is a shrub, red mangrove grows up to 35 feet tall and 10 feet across. The oval-shaped crown of a mature red mangrove tree looks beautiful. With the mangrove plantation, a small ecosystem came into existence at Anuvijay Township. “To feast on marine organisms, such as fishes and invertebrates



Painted Snipe

Little egret, cattle egret, grey heron, purple heron, painted stork, Eurasian spoonbill, Indian pond heron, striated heron, spot-billed duck, common sandpiper, common redshank, common greenshank, marsh sandpiper, wood sandpiper, black-winged stilt, and barn swallow are some of the waterbirds, while blue-tailed bee-eater, green bee-eater, yellow-wattled lapwing, red-wattled lapwing, and Jerdon’s bushlark are the land birds supported by these mangroves. Bush-dwellers, such as prinias and sunbirds, nest amidst the green foliage.

which thrive in the mangrove patches, many bird species visit the mangroves frequently,” Dr Bala informed us. A study in February 2021 found that the township is home to 88 bird species, and among them at least 25 species could be seen in the mangrove area.

Although the mangroves at the Anuvijay Township are not yet fully grown, they have started attracting wildlife. Along with serving as a feeding ground, the mangrove thickets have become a breeding ground for many birds. One such is the black-winged stilt *Himantopus himantopus*, a slim black-and-white bird with long



Black Kite

pink legs that wades through water to feed on insects, crustaceans, and small fishes with its slender bill. Since 2019, in its breeding season between April to August, this species has been seen nesting on the small bare bunds among the mangroves.

In April 2022, C. Nidhin, a Scientific Officer at KKNPP and an avid birdwatcher, spotted two pairs of greater painted-snipe *Rostratula benghalensis* in a small waterbody near the mangroves. That same evening, another nature lover, V.P. Sunil, sighted them amidst the mangroves. Dr Balachandran almost jumped in excitement when he heard about the sighting of this brilliantly coloured shorebird. “So, the mangrove ecosystem is bringing more species to the township!” he exclaimed. This sighting brought renewed enthusiasm among the nature lovers of KKNPP (*Would you like to hear how a Greater Painted-snipe calls? Here is a link to a recording from Pune, India: <https://xeno-canto.org/species/Rostratula-benghalensis>*).

Lately, mankind has been frantically looking for ways and means to tackle climate change and global warming. Controlling emissions, conserving



African Comb Duck (alt name: Knot-billed Duck)



Painted Stork



Little Egret



Indian Pond-heron



Greater Coucal

resources and ecosystems, and afforestation are some of the methods employed. When it comes to selecting plants for afforestation of coastal habitats, mangroves are among the most favoured plant types, as they absorb huge amounts of

atmospheric carbon dioxide. A mangrove thicket, according to the findings of a research study, can sequester four times more carbon than a rainforest. With their tangled root systems, mangroves are the best shore protectors in nature. Besides,



Spot-billed Duck

Six things you can do to bring back mangroves

The United Nations (UN) Decade on Ecosystem Restoration is a global rallying cry to change our relationship with nature – from degradation to restoration. Here are six things that citizens can do to start bringing back mangroves today:

1. Understand the importance of mangroves.
2. Understand what is driving their loss.
3. Make sustainable choices.
4. Learn how restoration works.
5. Be an advocate and an activist.
6. Make some noise.

What is being done to restore mangroves in your country or abroad? Raise your voice for ambitious action! For more information, visit: <https://www.unep.org/news-and-stories/story/six-things-you-can-do-bring-back-mangroves>



they serve as breeding and nursing grounds for countless species of marine life which make the mangrove thickets their home. The Mangrove Development Project fulfilled a great need in Anuvijay Township, and Dr Balachandran's idea of creating a mangrove ecosystem has translated into positive long-term benefits for the habitats and biodiversity of Kudankulam. 🌳



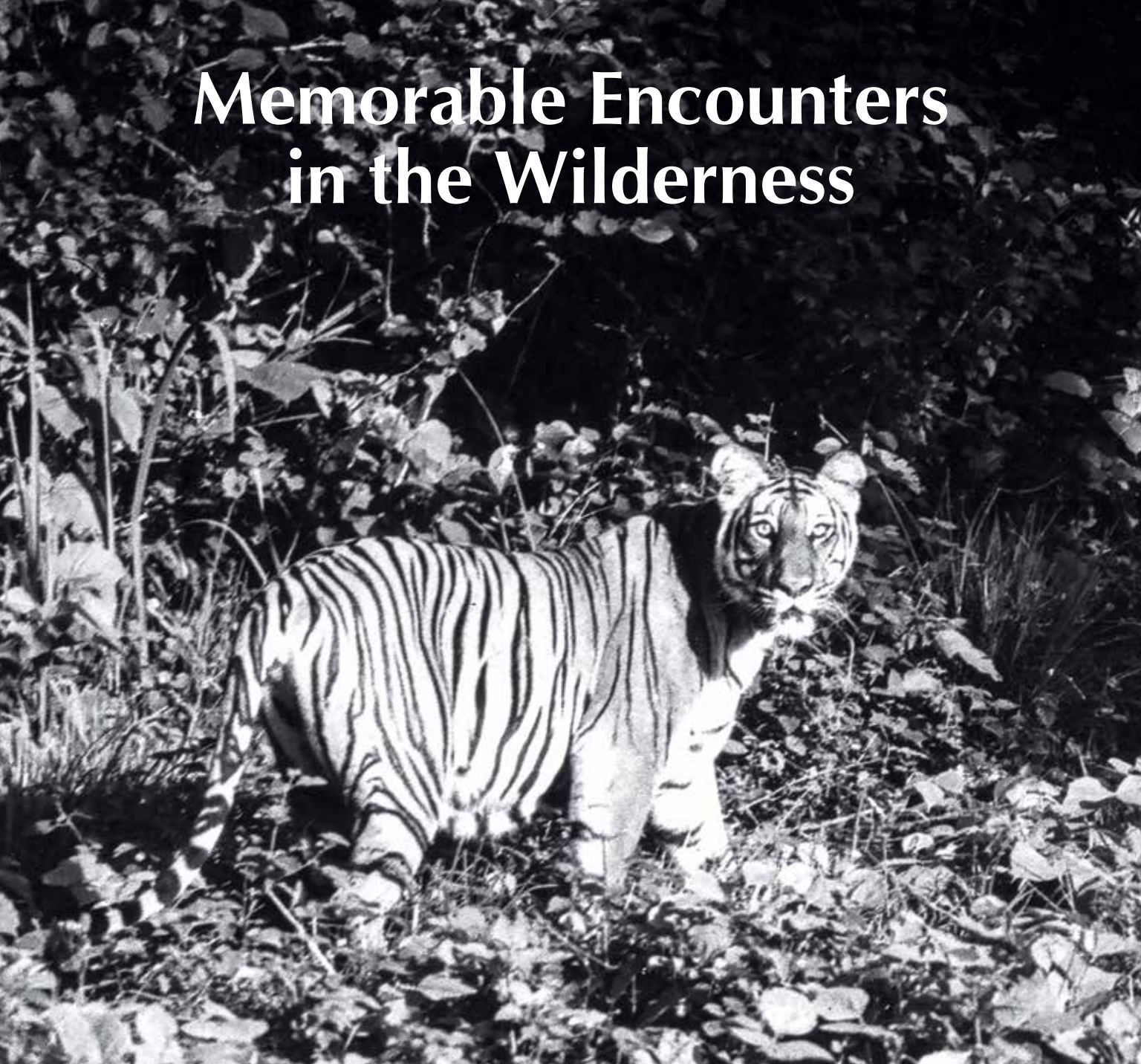
J. Devaprakash is Deputy General Manager, Tarapur Atomic Power Station; he writes about nature, energy, management, and communication.

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ABOUT THE COVER

Nestled in the Sahyadri mountain range, Chorla Ghat is a part of the Mhadei Wildlife Sanctuary and is home to several rare species of flora and fauna. Located at an elevation of 800 m at the intersection of the borders of the states of Goa, Karnataka, and Maharashtra, it is a popular destination in the Konkan region for birders and a living laboratory for students of biodiversity.

Memorable Encounters in the Wilderness



The tiger which was photographed from a mango tree in Bandipur Tiger Reserve in the morning of May 23, 1978

Text and Photographs: **A.J.T. Johnsingh**

The low-lying hill on which I stood several decades ago, bathed in the brilliant morning sunlight under a cloudless blue summer sky, lies to the east of the Kalakad mountains in the southern Western Ghats. The landscape around me was flat, dotted with many large and small drying tanks. The most common tree was palmyra, which, from the hilltop, looked like matchsticks. Across a mosaic of banana and rice fields, the high-pitched calls of grey francolins rang through the air. When I recollect the scene around the hill now, with the knowledge of wildlife acquired in subsequent years, I can visualize what the landscape would have looked like 200 years ago. It must have been, in the past, like a miniature African savannah with the now extinct Indian cheetah hunting the abundant

blackbuck (now an endangered species). Although I grew up in this landscape, which is in the rain shadow of the Western Ghats, my career as a wildlife biologist took me to many other rich and verdant biological landscapes, both within and outside the country. I narrate here a few of the exciting encounters with wildlife that I had along the way.

★ ★ ★

My parents, who worked as school teachers in Nanguneri, a small town in southern Tamil Nadu, were immensely fond of outdoor life. One of our summer holiday hobbies was to retire to the adjacent Kalakad hills, a prime biodiversity hotspot in the country, for a few days. The local Range Forest Officer was informed of our trip, and our destination was the guards' quarters – now in ruins – built by the British on the left bank of the Nambiar river, very close to the forest boundary. Prior to one of these trips, my brother and I happened to come across the Tamil translation of *MAN-EATERS OF KUMAON* by Jim Corbett in the local library. We found the book absolutely engrossing, and after that our trips to the jungle became all the more exciting – we imagined man-eating tigers and leopards all around our camp, and at night, we would talk only in whispers for fear of attracting the man-eaters!

In the 1960s, my father once took me into the forest to shoot junglefowl – this was much prior to the passing of India's Wild Life (Protection) Act in 1972. We left our dog Johnny behind, as we had seen a leopard while coming back to camp the previous night. About two kilometres from the camp, we came to a patch of scrub jungle. Here my father loaded the gun with one reloaded cartridge (a cartridge that has been fired, then cleaned and refilled with gun powder and shot), gave me the gun and one more reloaded cartridge. He positioned me at the eastern end of the scrub and went to the other end to flush the junglefowl towards me. Before leaving, he said that I should shoot the bird only when I was sure to kill it.



When flushed by my father a beautiful Grey Junglefowl and a hen rushed towards me

As his footsteps crunched away, I felt alone and afraid. What if a leopard or a sloth bear or a big wild pig, rather than junglefowl, came rushing towards me and my inadequate weapon? Nevertheless, I sat motionless in my 'hide' between two boulders amidst the bushes. After many, many, very long minutes, I heard a distant clapping – that was my father flushing out the birds – and as I regained my courage and strength, two grey junglefowl, a cock in its beautiful plumage and a hen, rushed towards me. They probably saw me, because when I raised my gun, they both froze at a distance of about 10 m. I took quick aim and fired, felling both the birds in a single shot. I left the gun on the forest floor, to run and pick up the birds. Suddenly, Johnny appeared from seemingly nowhere, leaped in the air and grabbed one of the birds from my hand. He placed it on the ground, and whining, whimpering, and furiously wagging his tail, circled me and my father, who had by this time joined us. Johnny had escaped from the camp compound and tracked us through the jungle! It was a very happy trio that returned to the camp.

★ ★ ★

After completing my Masters in Zoology from Madras Christian College, I joined Ayya Nadar Janaki Ammal College in Sivakasi as a lecturer, and continued my hobby of trekking in the forests.



A dhole in Bandipur Tiger Reserve, which I studied in 1976–78

One turning point in my life was my meeting with Mr J.C. Daniel, Director, Bombay Natural History Society, in the Kalakad hills in May 1971. He encouraged me to take up wildlife studies, which eventually enabled me to do my doctoral research on Asiatic wild dogs or dholes, as they are commonly known, in Bandipur Tiger Reserve during 1976–78. The reserve is one of the finest elephant habitats in Asia, and since my study was carried out on foot, I walked long distances and often sat up in the trees in order to avoid elephants while observing wildlife. Once, on September 6, 1976, I was sitting up in a tamarind tree near Sulli *katte* (*katte* = pond). Suddenly, repeated alarm calls of common langur, chital, and sambar from the lantana patch between Chamanahalla and Ministerguthi roads alerted me. I had started my field study on dholes only two months earlier, so I happily presumed that the alarm calls indicated the presence of the dholes which I was waiting for. I silently got down from the tree and walked briskly towards Chamanahalla road, almost running, all the while carefully looking out for elephants. The alarm calls persisted through the dense lantana thicket. The location of the predator was indicated

by an excited group of langurs jumping up and down, high up in a grove of tall trees amidst the lantana, hardly 60 m from the road. I walked from the road to the edge of the lantana, stood behind a large tree and waited. The alarm calls persisted. I took out an empty medium-bore rifle cartridge and blew into it to mimic the whistling call of a dhole, expecting some response from the dholes. Instead, there was a terrifying roar, followed by the sound of a heavy animal running through the dense bushes to the edge of the lantana patch some 30 m to my left.

Hidden behind the tree, I squinted to see what it was. Then, I saw my first wild tiger – ears laid flat, snarling and growling fiercely. It stood outside the lantana patch for a few seconds, looking around to locate the ‘dhole’ that had whistled. I froze behind the tree, and the tiger eventually retreated into the dense bushes. Elated by this rather unnerving encounter, I walked back to the reception centre of the reserve in the gathering darkness. On my narrating the incident to the staff, they suggested that I record it in the visitors’ book, and I devoted a full page in the register to this encounter.

This chance encounter led to a desire which grew day by day, to take a good photograph of a tiger in Bandipur, something that no one had done by then. It often occurred to me that my study would be incomplete if I left the area without such a picture. In time, I became familiar with the locations that were frequented by tigers, and I selected suitable trees where I occasionally remained hidden, waiting to get my picture. Of these, my favourite spot was a mango tree with a straight bole six metres tall, in Ministerguthi nullah, a water course. The nullah, about 2 km from Bandipur, reeked with the spray of tiger urine and appeared to be the favourite haunt of these magnificent animals. I made a comfortable seat for myself by tying several strands of a thick rope between two branches, eight metres above the ground. My seat was at level with the left bank of the nullah and had a patch of tall grass about 10 m away.

The morning of May 23, 1978 was bright and sunny, and I was up in the tree at 0700 hrs. About 45 minutes later, a movement in the tall grass caught my eye. A tiger was walking towards the clearance in front of me. A group of langur feeding in the tall trees on the banks of the nullah, which I had expected would give the much-needed alarm call, had somehow failed to see the tiger. I took several pictures of the tiger as it came out of the grass and walked into the clearing. When the tiger reached a patch of sunlight, I whistled. The tiger froze in its tracks and looked in my direction with a puzzled expression. Uneasy with the clicking of my camera shutter, it slunk off into the cover as silently as it had appeared. But I had got my picture, and one which captured that perplexed look on the face of the tiger. This may be the first best picture for South India and an enlarged version of this picture can be seen in the Guest



My field research on dholes was carried out largely on foot in high elephant density Bandipur Tiger Reserve ... I walked with great care and fear



The goral ridge where my first goral pictures were taken ...
I had to climb the ridge in summer to reach the *Grewia elastica* tree to wait for the goral

Room of WWF-India, New Delhi, kindly put up by Mr Ravi Singh, Secretary General and CEO, WWF-India.

★ ★ ★

I joined the faculty of the Wildlife Institute of India in Dehradun in 1985, and one of my most rewarding tasks at the Institute was to help in training young forest officers in conservation. I also initiated a study on elephants in the adjacent Rajaji National Park and followed them intensively by radio-collaring several animals. As a boy, I had read through the descriptions of Jim Corbett hunting goral, and had always had a desire to see and photograph these mountain goats of the Himalaya, which are often found in the adjacent Shivalik hills. Since Dehradun is in the valley between the Outer Himalaya and the Shivaliks, it offers an excellent opportunity to look for Himalayan goral. In the course of time, I discovered many locations in Rajaji NP where the chances of seeing and photographing this mountain goat



Maybe the best picture of goral ever taken in the wild

were excellent. My favourite place was the ridge opposite the Dholkhand forest bungalow, where I chose a *Grewia elastica* tree, dense with foliage, near a trail frequently used by goral.

Over time, I learnt that photographing goral from a hide in the *Grewia* tree was possible only on summer evenings, when they left the cool cover of the valley and came to the top of the ridge to feed. This, however, necessitated a steep climb for me in the exceedingly hot afternoon sun. The hide could not be used in the rainy season, while during winter, villagers who came to cut grass on the ridge disturbed the goral. One day, I settled in my tree hide around 1500 hrs; it was hot and eerily silent. However, when the sun began to set, I noticed a palpable change in the mood of the jungle. A steady cool breeze made the branches sway. The animals seemed to wake up from their slumber. A group of sambar and even an elephant bull appeared out of nowhere and began to feed on the vegetation in the valley below. The alarm calls of chital, sambar, and barking deer all around the ridge indicated that their predators had shaken themselves awake too.

I heard the distinct footsteps of a goral on the dry leaf litter as it slowly made its way up through the forest towards the grassy slope that I faced. It was a male, and I sat without moving amidst the foliage and allowed him to approach within five metres of me. I then took a photograph of him, which turned out to be the first good image of goral ever taken in the wild by anybody. The sound of the camera startled him and he ran away from me, leaping effortlessly 20 m down the steep slope. He then stood looking in my direction, stamping his forefoot and whistling his alarm to the jungle at large. I froze till he nervously resumed feeding. When the sun touched the horizon, I left the hide and made my way to the bungalow, not as worried about the elephants as about the Punjab terrorists who were then reported to have taken shelter in the Park. Ironically, of all the imagined dangers of the wilds, the ones I feared most were from my own species.

★ ★ ★

Leading a team from Wildlife Institute of India in late January 1987, I was in the Gir forests to radio-collar lions. I immobilized the lions using a tranquillizer gun, either stalking them when they were on a kill; or waiting for the lions up in a tree, over a live bait. One evening, I sat up in a tree with the gun and camera, overlooking a dry river bed where a goat kid had been tied to attract lions. To my right was a meadow with many thorny trees, where a group of langurs was feeding. At around 1700 hrs, there were alarm calls from the langurs. I readied the gun and then found that instead of a lion, a leopard was coming in my direction, and it wasn't coming for the bait but was carrying a langur in its jaws. I picked up the camera, focused, and clicked. The leopard, much more alert than a lion, saw these movements, dropped the langur and ran away. I continued to sit in the tree, hoping a lion would come along, but instead the leopard came back, this time crawling, one eye on me and the other on the langur, and took away its dinner.

★ ★ ★



As I waited up in a tree for the lion, I saw a leopard coming in my direction carrying a langur



Goral in Cheri monastery ... reaching the monastery involved a stiff climb for 45 minutes

Rain clouds drifted past the Kedarnath mountains which were covered with patches of emerald-green vegetation dotted with colourful flowers, and rock massifs shining silvery with the constant drizzle. It was a memorable day in August 2004. In the company of Swati Kittur, who was studying Himalayan Tahr, and K. Ramesh, studying pheasants, I walked from Kanchula Kharak to Shok Kharak and then to Tunganath temple, which is at an altitude of about 3,600 m. A brilliantly-coloured monal pheasant flew across our trail, and there were Himalayan tahr to see in the distant mountains. The drizzle continued unabated, and when we were about to cross the ridge near the temple, we walked into a man clad in a large sheepskin coat. On seeing us, he whistled to alert his companions, and ran down the mountain at an incredible speed. These were obviously tahr poachers – Swati said that she had encountered poachers twice before, and once even saw them firing at tahr. The Tunganath temple and the buildings around are likely to serve

as an abode for poachers, particularly in winter, when the wildlife staff and the villagers descend to the lower altitudes with the first snowfall.

★ ★ ★

Early November 2006: Snow had already descended on the mountain tops of the Great Himalayan Range in Bhutan. Imbibing the cold blowing down from the mountains, in the company of Namgay Wangchuk, Senior Park Ranger of the Jigme Dorji National Park, former Diploma Officer trainee of WII, I climbed to Cheri Monastery, at an altitude of about 2,800 m and about 15 km from Thimphu. My objective was to see the group of tame goral which flock around the monastery. We could see eight of them resting in the monastery buildings and feeding on the lush grass around, unmindful of the scarlet-robed monks passing by. It was probably the breeding season of goral, as the males looked much darker, almost black.

In compassion for life, Hinduism is in no way inferior to Buddhism, and I wondered why the priests of the Tunganath temple were not able to educate the local villagers to protect the wildlife around the temple. We need to win our conservation battles all over the country if we would like our youth to have memorable encounters with wildlife too.



The incidents related here are largely taken from the author's two popular books, ON JIM CORBETT'S TRAIL AND OTHER TALES FROM TREE-TOPS published by Permanent Black, Ranikhet, and FIELD DAYS, A NATURALIST'S JOURNEY THROUGH SOUTH AND SOUTHEAST ASIA published by Universities Press, Hyderabad



A.J.T. Johnsingh, a well-known ecologist, is associated with WWF-India and The Corbett Foundation.

A natural history moment in a residential complex

My housing society is full of high-rise buildings, but living on the ground floor has its own benefits. Our apartment faces a small garden on one side, in a portion of which we allow vegetation to grow naturally. The small garden, which now resembles a mini shrubland, is mainly dominated by large bushes of *tulsi* (holy basil), and several small herbs and grasses. During winter mornings, one can see garden lizards basking on the twigs of these shrubs. This space is also a favourite with birds, such as the ashy prinia, purple sunbird, house sparrow, Indian white-eye, and common hoopoe, which are frequent visitors.

On January 23, 2023, at around 7:30 a.m., while I was preparing my morning tea, some action outside the window caught my attention. A white-throated kingfisher had pounced upon a garden lizard and caught it in its long beak. The lizard was still alive and wriggling when the kingfisher carried it elsewhere. I was sure that the kingfisher would be perched nearby, to kill the lizard before eating it. And so, I immediately picked up my camera, rushed into the garden, and started looking for the bird and its prey on the branches. I finally spotted them on a small shade roof near the entrance of the parking area. The lizard had firmly clutched the lore (area between the nostril and eyes) of the kingfisher with the sharp toes of its hind limb, while the bird was struggling



to kill it by beating it on the surface of the shade roof. If it would loosen its beak, its prize catch would be lost, as lizards are quick runners. Thus, its only option was to first roll down and then beat the lizard on the surface. It took the kingfisher almost two minutes to defeat the lizard. As soon as the lizard loosened its grip, the kingfisher flew away with its prized possession to a nearby tree.

From the ground, I had difficulty capturing this action on the roof top. Nonetheless, whenever the kingfisher appeared on the edge of the roof, I managed to capture some images of this amazing struggle between prey and predator amidst my residential complex. 📷

Debadityo Sinha
Noida, Uttar Pradesh

ABOUT THE POSTER

The Green Avadavat is a globally threatened bird listed as Vulnerable in the IUCN Red List, as it has a rapidly declining population owing to widespread trapping for the cage-bird trade, compounded by habitat loss and degradation through agricultural intensification. A Schedule I species under the Wild Life (Protection) Act, 1972, its hunting and trapping is prohibited in India.

Considering the declining population of the Green Avadavat around Udaipur district, the Rajasthan Forest Department initiated a Conservation Breeding Programme at Gulab Bagh Bird Park, Udaipur, along with BNHS as the knowledge partner on May 12, 2022. This is the first attempt towards conservation breeding of this species. The poster shows the first four captive-bred fledglings of the Green Avadavat that were seen on November 18, 2022, at Gulab Bagh. Three more chicks were born to the same parents and seen out of the nest in mid-January 2023.

The role of zoos and bird parks across India in the conservation of threatened birds has not been pivotal, so far. This is first official attempt by any zoo or bird park in the



Green Avadavat *Amandava formosa*

world to provide a back-up population of Green Avadavat for a soft release programme at a later stage. Through this Programme, BNHS hopes to gather support to improve the conservation status of this colourful endemic finch of Central India in its natural habitat, as we believe that conservation breeding is never the first option to saving a species – it is, in fact, the last. ■

Green Avadavat *Amandava formosa*



Green Avadavat (Adult)



Green Avadavat – making nest in Gulab Bagh Bird Park



Green Avadavat – Aviaries in Gulab Bagh Bird Park

An Ant OR a Lobster? NOPE ...

Text and Photographs: **Raju Kasambe**



Nature has its own myriad ways of functioning! While some animals exhibit mimicry like flaunting “false eyes”, or having bright coloration to warn predators, others have evolved cryptic coloration that camouflages them to deceive their predators.

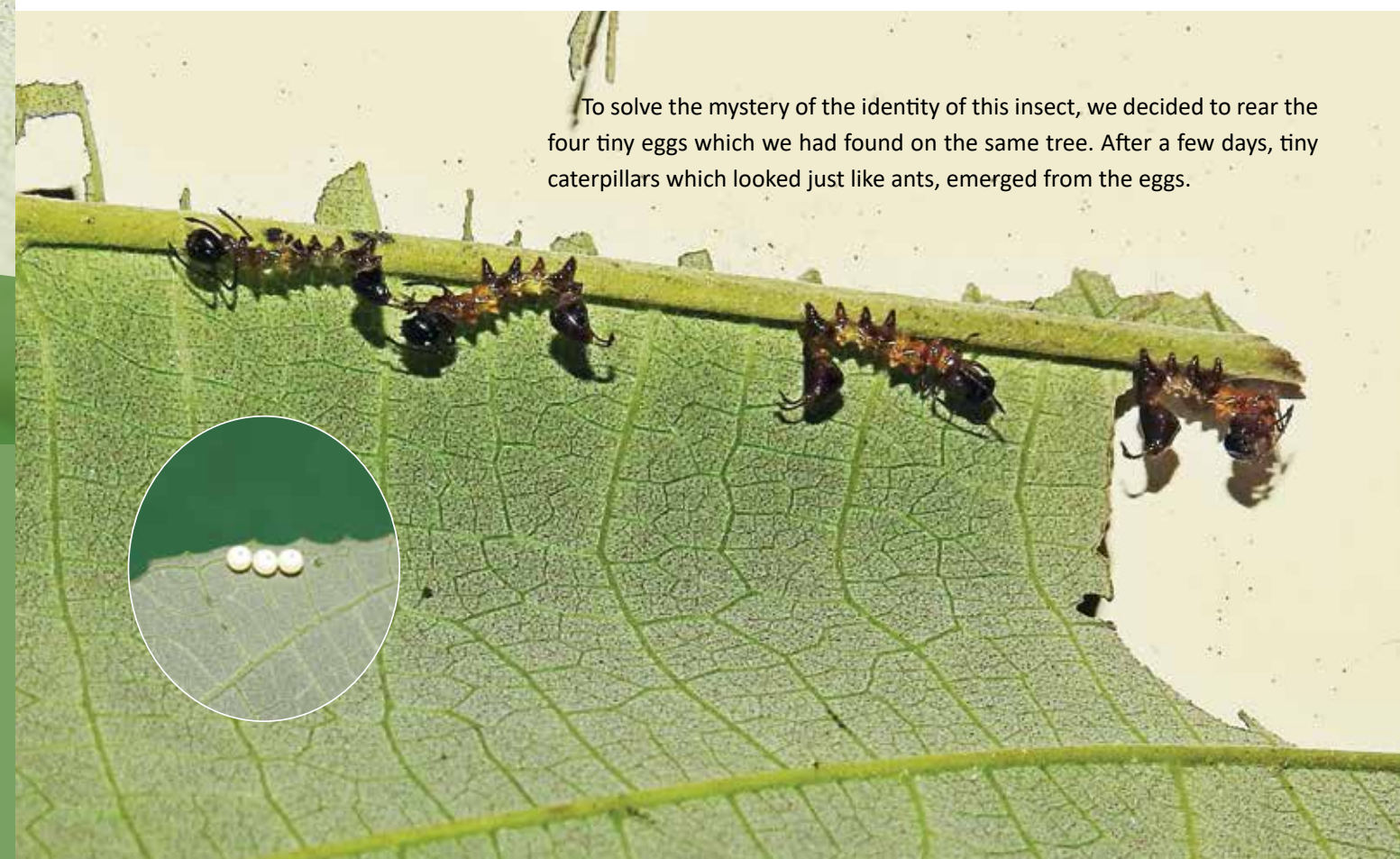
The first time I saw these caterpillars on the leaves of a kumkum tree *Mallotus philippensis* in the BNHS Nature Reserve (Mumbai), I was amazed and left guessing about what I was looking at. Were they ants or spiders?

Much later, I realized that they were the first instars of the Lobster Moth caterpillar. They had unique morphology: the forelegs and caudal appendages, unlike any other lepidopteran caterpillar, were very long. When disturbed they raised the front part of the body and wriggled their forelegs violently, mimicking an irritated ant!



As the caterpillars grew, the side view of the front part of their body, when raised, reminded me of crustaceans such as lobsters or crabs, but with long antennae. While feeding, the caterpillars raised their hind parts and folded them, looking like aliens.

The raised hind part looked like a head with a pair of antennae. This was possible because of the greatly swollen anal segment and modified claspers that resembled long thin antennae. When I asked others to identify which side of the caterpillar was the head, most were deceived and pointed at the hind part!



To solve the mystery of the identity of this insect, we decided to rear the four tiny eggs which we had found on the same tree. After a few days, tiny caterpillars which looked just like ants, emerged from the eggs.



The caterpillars were fed with kumkum leaves. They grew gradually and in about 21–22 days reached the pupation stage, weaving a cocoon of silk threads on large leaves, to protect the metamorphosing pupae.

In 10–11 days, adult moths with feathery antennae and furry heads emerged from the cocoons. These were identified as Lobster Moth *Stauropus alternus*. The immature stages of this moth are also known as lobster caterpillar or crab caterpillar, owing to their deceptive appearance and behaviour resembling a lobster or crab.

Our joy of identifying the insect doubled when we learnt that the kumkum tree was a new record of hostplant for Lobster Moth larvae.

Acknowledgements:
I thank Hrishikesh Ghogare and Dilip Giri for their help in rearing the caterpillars.



Raju Kasambe is Assistant Director, Education and manages the Conservation Education Centre (CEC), Mumbai. His main interests are birds, butterflies, and environmental education.

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ANDAMANS

A TREASURED ECOSYSTEM

Text: Ram Gopalakrishnan



Andaman Bulbul

G. SHAKTIVEL

A group of jewel-like green dots with a fringe of brown sand, appeared out of the mist as I awoke from the slumber induced by an early morning flight to Port Blair: we were on a birding trip to the Andamans. Here awaited a unique admixture of Southeast Asian bird species which are not found on the mainland, and endemic species that have evolved in isolation. We hoped to see the twenty or so endemic species and a few more rarities that are difficult to spot elsewhere.

Birders propose, but weather disposes! The skies opened up on our first day at Sippighat wetland. Nonetheless we decided to go birding from our vehicle and were rewarded with a sighting of the Long-toed Stint and a Red-throated Pipit, which seemed to revel in the rain; a solitary Little Pratincole, a new record for the islands. Pacific Golden Plovers and snipes were ubiquitous, as were the magnificent White-bellied Sea-eagles. The weather cleared up shortly and the sun came out, finally allowing us to step out of the car and soil our boots. We trooped off into the wetland where we saw Common Moorhens, and a flock of Lesser Whistling-ducks, whistling an orchestra as it took off. A few Cotton Pygmy-geese broke the monopoly that the Common Moorhens and whistling-ducks had over the wetland. Bitterns are skulkers and not easy to spot but the Yellow Bittern appeared unabashed, and we managed to get great photographs.



G. SHAKTIVEL

Andaman Drongo



RAM GOPALAKRISHNAN

Andaman Coucal



G. SHAKTIVEL

Ruddy Kingfisher



G. SHAKTIVEL

Andaman Masked Owl



G. SHAKTIVEL

Hume's Boobook



G. SHAKTIVEL

Andaman Woodpecker

Our next destination was Garacharma wetland, where seemingly inconsequential swiftlets were circling overhead. Our group leader Nikhil Bhopale indicated that some swiftlets did not have a pale belly like the Glossy Swiftlet: these were the

Edible-nest (White-nest) Swiftlets, whose nests are unfortunately widely harvested. As the sun sets early in this part of the country, it was soon dark and we set off to look for owls at Chidiyatapu. Hume's Boobook obliged us with good sightings



G. SHAKTIVEL

Mangrove Whistler

on three occasions, but the Andaman Boobook took off instantly. The name 'boobook' comes from their two tone call, *boo-book*: they are also called hawk-owls because of their hawk-like body, short wings and appearance in flight.

Next morning, we went back to Chidiyatapu, the tropical evergreen and deciduous reserve forests here are home to more than 120 species. We steadily encountered the endemics of Andaman here: woodpeckers, treepie, drongo, bulbul, coucal and serpent eagle. The large black Andaman Woodpecker hopped gracefully from tree to tree. In the Botanical Garden at Chidiyatapu, home to some magnificent old behemoths like the padauk tree, we had good sightings of the Freckle-breasted Woodpecker, Long-tailed Parakeet, White-headed Starling and Blue-eared Kingfisher – a rare forest dweller.

A stroll on Badabalu beach at Chidiyatapu did not yield a sighting of the much sought after White-breasted Woodswallow. Nevertheless, the waves of the turquoise sea along the uninhabited beach and blue skies more than compensated for it as we sprawled on the sand, casting a lazy eye on the White-bellied Sea-eagles and needletails circling overhead. Our photograph of the White-throated Needletail is a new record for the Andamans. However, as we set off again, we

were brought down to earth, quite literally, by the mud bath showered on us by our own vehicles as they climbed uphill, groaning through the slushy mud. Any complaints were quickly drowned by whoops of delight when our guide Shakti Vel showed us the Oriental Scops-owl within a minute of hearing its call!

Next morning, we took a ferry to Bamboo Flat jetty and headed to Shoal Bay, where we were greeted with 25–30 Andaman Teals. This increasingly threatened endemic species, whose freshwater pool habitats are facing rising threats owing to urban development, is down to a population of approximately 1,500 individuals. Birding at Kalatang forest was a thrilling and rapid-fire: exposure to birds – an Andaman Drongo, with its constant metallic cackle that sounded like a background orchestra, the Andaman Shama and other endemics such as the Andaman Green-Pigeon, Andaman Flowerpecker, and Bar-bellied Cuckooshrike. We also heard the piercing whistle of the Mangrove Whistler, that later stepped out of its mangrove habitat almost as if to oblige us! The Black Baza, a tropical canopy specialist, was greedily photographed at close range. Overall, it was quite a productive morning!

We spent the afternoon in the nearby wetland, where there were two rare sandpipers – Curlew



RAM GOPALAKRISHNAN

The idyllic Badabalu beach at Chidiyatapu

and Broad-billed, and a Chinese Egret, with a nuchal crest and distinctly lighter bill and legs than the Little Egret. We ended the day with a sighting of the Andaman Nightjar – we walked into its habitat and waited until sunset, to listen to its peculiar *chuck-chuck-chuck* call!

Next morning before breakfast, we headed to a wetland to spot reed warblers, which I must say are bigger and easier to identify than the arboreal ones. The smaller Black-browed Reed Warbler looked as if it had on eyebrow liner, but differentiating the Clamorous Warbler from the Oriental Reed Warbler was not an easy task. If reed warblers are not your cup of tea, you could simply gaze at and photograph the Andaman Teals languorously feeding in the morning sunlight. In the unlikely event of getting bored in this peaceful monotony, you could take a break



G. SHAKTIVEL

Black-browed Reed-Warbler

to see a Blue-eared Kingfisher here or a Ruddy-breasted Crake there.

On a hot afternoon in Port Blair, Shakti had parked us on a grassy bank near a large tree bordering a wetland. We wondered whether we were there merely to watch mynas and crows. But Shakti said, 'Just wait, the Daurian Starlings, Southeast Asian vagrants to the Subcontinent, will surely come to roost.' And just like a flight arriving at the right time, a bunch of Daurian Starlings with pale heads and blue-black wings, banked and swirled before settling down in front of us.

All is not hunky-dory on this island paradise. Rampant wetland filling and deforestation, in the name of development, will surely decimate its unique biodiversity and steal the birding appeal of Port Blair and its environs in the years to come. One doesn't foresee any succour for the environment or bird diversity, given increasing commercial growth along with unsustainable tourism.

So, what are you waiting for? Before the wetlands and the birds are gone forever, pack up your bags and visit the Andamans. This treasured ecosystem is just a flight away! 🐦



Ram Gopalakrishnan is a physician practising in Chennai. He enjoys birding in remote locations and hopes to stimulate love for nature and its conservation through his writings.

DIPPERS:

SONGBIRDS THAT FORAGE IN STREAMS

Text: Asad R. Rahmani, Syed Intesar Suhail,
and Khursheed Ahmad



White-throated Dipper

SYED INTESAR SUHAIL

In 1620, the Mughal Emperor Jahangir visited Kashmir. There he spotted a brown dipper, which he described in his biography, *Tuzuk-e-Jahangiri*:

“... in this stream, I saw a bird like a saaj. It dives and remains for a long time underneath and comes up from a different place. I ordered them to catch and bring two or three of these birds, that I might ascertain whether they were waterfowl and were web-footed, or had open feet like land birds. They caught two ... One died immediately and the other lived for a day. Its feet were not webbed like a duck’s. I ordered Nadir-ul-Asr Ustad Mansur to draw its likeness.”

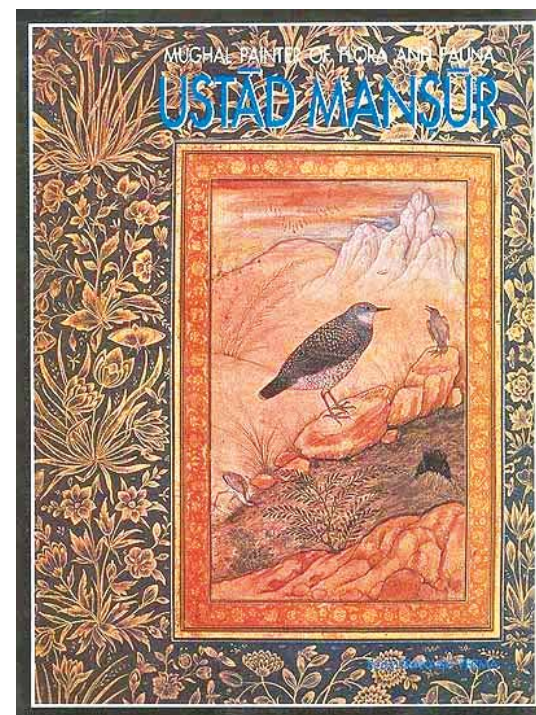
On October 3, 2021, we too observed the brown dipper in a lovely stream flowing through the enchanting thick forest of Daksum in Kashmir. In the dappled light of the early morning sun, it was not easy to locate this dainty bird as it flitted from stone to stone, frequently diving underwater to search for prey. On August 15, 2022, during our search for the ibisbill in Zanskar Valley in Ladakh, we found another friendly dipper – the white-throated – foraging in a small stream near Sani Lake. We call it ‘friendly’ because it was so engrossed in foraging that it reached barely 5–8 m from us, unmindful of three naturalists with cameras and binoculars. First, it dipped its head in water as if to look for or listen to prey, then dived for a few seconds, and finally emerged with its prey. The stone and pebble-covered stream provided it many places to eat its quarry. Within seconds, it was ready for

another search. In an hour of watching, we found that it was almost 80% successful in finding food. Though literature indicates that small prey items are eaten underwater, we have no proof to say that ‘our’ dipper in Zanskar was doing the same. Occasionally, it emerged with a tiny fish fingerling that it manipulated clumsily before eating.

Songbirds belong to the order Passeriformes, or perching birds, which generally live in trees, bushes, shrubs, grasslands, and mangroves. They have a distinct toe arrangement that helps them grasp branches or grass stems. But are you aware of any songbird that spends most of its life on moss-covered boulders and slippery stones, and dives underwater in swift-running streams to collect food? Well, five species of dippers found in the world can do exactly this. Despite their unique behaviour and habitat preference, dippers are surviving quite successfully, which can be proved by their wide distribution and conservation status. All dipper species, except one, are surviving well.

The white-throated or European dipper *Cinclus cinclus* is found in the Palearctic region, and in the Atlas Mountains of Morocco in north Africa. Its American cousin, *Cinclus mexicanus* is widely distributed from Alaska to Panama on the eastern coast, but is largely absent in the great plains and western coast. The white-capped dipper *Cinclus leucocephalus* and rufous-throated dipper *Cinclus schulzii* are found in South America. The rufous-throated dipper, found in the Andes, Bolivia, and Argentina is categorized as Vulnerable by BirdLife International and IUCN, as its habitat is under threat. The brown dipper *Cinclus pallasii* is found in Asia. All dippers live in fast-flowing, clear, boulder-strewn streams in hilly forests and high mountain ranges. white-throated and brown dippers are found in the torrential streams of the Himalaya and Trans-Himalaya.

Dippers belong to family Cinclidae, and are most closely related to the thrush family Turdidae. Their family name is derived from the Ancient Greek word *kinklos* – owing to their habit of wagging their body. Like the forketails that also live in fast-flowing hill streams (but do



Brown Dipper and juvenile, painted by Ustad Mansur at the behest of Emperor Jahangir

COURTESY: EXOTIC INDIA ART

not dive in water), the body-wagging behaviour of dippers imitates the flow of a stream. Does this help to camouflage them to evade predators, or to avoid detection by their underwater prey? This behaviour is also seen in wagtails and many waders, which forage near water. Ascertaining the reasons for this continuous body-wagging can be an interesting topic for research.

Dippers always seem to be in a hurry, rarely sitting still for more than a few seconds. They enjoy diving, swimming against the current only to be washed back soon to their starting point, submerging their heads and walking underwater using their long legs, hurriedly eating their prey, to quickly go back again into the gurgling stream in search of more food. Such behaviour requires high amounts of energy, which they acquire from their invertebrate prey.

Life underwater for the dipper should have brought about many anatomical changes, but these birds have retained their basic morphology – they do not have webbed feet but their toes are slightly modified to enhance their grip on slippery surfaces and to run underwater in pursuit of prey.



KHURSHED AHMAD



ASAD R. RAHMANI



ASAD R. RAHMANI



SYED INTESAR SUHAIL

Juvenile White-throated Dipper foraging. An adult is seen below on extreme left

Generally, birds have light, hollow bones that help them in flight, but dippers have heavy bones, like those found in penguins, which ‘fly’ underwater. Like penguins, dippers have short, muscular wings that they use as flippers when swimming underwater. A thin layer of bubbles covers their densely packed feathers to prevent them from getting wet. Their preen gland is well-developed, as the oil secreted from this gland is used frequently to cover their feathers for waterproofing. Dippers can remain underwater for up to 30–40 seconds, thanks to the high level of haemoglobin in their blood.

Both white-throated and brown dippers feed on aquatic insects such as the larvae of caddisflies, dragonflies, and mayflies, shrimps and small fish and fish eggs. Small prey is eaten underwater but large prey is brought to a stone or to the stream bank, where it is eaten in small pieces.

Most birds have foraging territories, which they do not share with conspecifics. Dippers have linear territories, as their habitat is linear,

running a few hundred metres in a stream. The length of the territory depends on the season and habitat quality. Dippers occasionally foray into damp forests, but not very far from their favourite stream that provides them food, shelter, and nesting sites. If undisturbed, they can tolerate human presence. For instance, we found a brown dipper in an artificial stream running between the buildings and rooms of the Pahalgam Club and Convention Centre, Kashmir.

During the breeding season in summer, pairs are formed and a nesting site is selected, generally beneath an overhanging boulder, near a log, on a ledge, or in a crevice, away from the maximum waterline. In summer, due to the melting of glaciers, there is more water in the streams than in winter. It is a mystery how dippers, during nest site selection, can predict how high the waterline will rise on the banks, so they manage to avoid drowning. Very rarely, the nest is built in a tree.

The nest is a huge mass of mosses, leaves, and twigs, with a side entrance and a snug cup-

shaped depression covered with soft grasses and feathers. In this cup, four or five eggs are laid and are largely incubated by the female. Incubation starts when the last egg is laid, so all chicks hatch synchronously after 15–17 days. Both parents feed them for another 15–20 days before they fledge. Once the chicks come out of the nest, they hop around on the boulders and wait for their parents to feed them. The family goes back to the nest to roost at night.

Brown and white-throated dippers show ecological segregation, but in some places, their distribution overlaps. While the white-throated dipper is found from Europe to south-central Russia, northern China, and Mongolia, the brown dipper is largely found in eastern Russia, China, Japan, the Himalaya, and Tibet. In India, both the species have been recorded in Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, and northern West Bengal.

The white-throated dipper is a denizen of the ‘tree-less glacier-worn valleys, where rushing streams of ice-cold water tumble and hiss their way past open banks’, as described by R.S.P Bates and E.H.N. Lowther in their eminently readable book, BREEDING BIRDS OF KASHMIR, first published in 1952 by the Oxford University Press. Regarding the white-throated in Kashmir Valley, they write “not common anywhere in our area, being really a trans-Himalayan form ... it occurs, however, sparingly at the high elevations of the Pir Panjal mountains ...”.

The brown dipper is common in the streams of the Kashmir Valley, whether in the forests or



ASAD R. RAHMANI

Brown Dipper on a stream near Daksum Guest House

open country. It is found up to 3,500 m, beyond which its white-throated cousins take over. Both the species are resident, though they show some altitudinal movement in winter. As the running streams do not freeze, and these birds are quite comfortable in icy cold water from glaciers and snow-melt, they find enough food to survive the harsh winters of the Himalaya and Trans-Himalaya.

Dippers are considered to be the barometers of water and stream quality. Unfortunately, no work has been done on these species in India, and Jahangir’s curiosity regarding them remains unfulfilled even after 400 years. As the life of dippers is totally dependent on clear, unpolluted hill streams, their greatest threat is pollution, siltation due to deforestation and/or over-grazing, boulder mining, and the vagaries of climate change. Will these exquisite birds be able to defend their linear territories from humans in the future? Only time will tell. 🐦



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



Syed Intesar Suhail is a postgraduate from the Department of Wildlife, AMU. Currently he is a Wildlife Warden in the Union Territory of J&K.



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Free-ranging Dogs: A countrywide menace

Text: **Kishor Rithe**



NIKHIL GHADIGAONKAR

A Blackbuck hunted down by a dog in Bidar, Karnataka

While most of us are aware of the problems arising from human-wildlife conflict in different parts of India (see *Hornbill* Apr-June 2019), many are not aware of the interspecies conflict that is a cause for concern in forests and wildlife habitats in India. The problem animal here is the free-ranging domestic dog. This menace to wild animals has spread across the country and is a severe problem in some parts. Several reports of such incidents coming from these landscapes indicate the urgent need to address this issue.

Out of a population of c. 60 million dogs found in India, 35 million are suspected to be free-ranging. These FRDs reportedly attack around 80 wildlife species, of which 31 are in various threatened IUCN categories. This issue becomes more serious when attacks are

recorded in the breeding habitats of endangered species. Additionally, such dogs pose a high risk of transmission of zoonotic diseases to both humans and domestic livestock, including canine distemper which has impacted big cats. Among other diseases, WHO stated that rabies alone annually causes around 60,000 human deaths worldwide. The main hotspots of FRD attacks in India are mentioned below.

Rajasthan: There are less than 140 great Indian bustards (GIB) left in India, of which c. 100 individuals are present in Rajasthan. BNHS scientists counted 37 birds in Jaisalmer district, where they observed FRDs destroying bustard nests. The scientists have taken on the additional responsibility of protecting the GIB nests from these attacks.

Karnataka: Blackbuck or Indian antelope *Antelope cervicapra*, a grassland species, is listed in Schedule I of the Wild Life (Protection) Act (WLPA), 1972. Many exotic and invasive tree plantation schemes have converted their grassland habitat to woody thickets, resulting in the abandonment of those areas by blackbuck. These antelopes are forced to feed in agricultural areas, resulting in increased instances of conflict with farmers, roadkills, poaching, and attacks by FRDs.

The Ranebennur Blackbuck Sanctuary, located in Haveri district, Karnataka, had a population of 2,000 individuals, while Bidar district hosted a good number of blackbuck, as estimated variously by Ullas Karanth, M. Singh, and Asad Rahmani during 1981 to 1991. Bidar is the only district in Karnataka state where four antelope species blackbuck, chinkara, nilgai, and four-horned antelope are present, according to a report in *The Hindu* dated June 15, 2021, and a personal communication by S. Sivasankar. However, FRDs hunt blackbuck in packs, which is a serious threat to the Bidar population. BNHS staff has started providing help to Gram Sabha (village council) like meeting some small expenses for transportation, etc. to control the dog population as per WHO protocols or internationally accepted methodologies.

Himalayan region: In the entire Himalaya, the growing population of FRDs poses a major threat to both

Table 1: Proposed areas covered in the BNHS project and affected wildlife species in Ladakh

Proposed Areas	Species of conservation importance threatened due to FRD
Siachen, Nubra, Turtuk, DBO, Karakoram Pass, Suru Valley	Snow leopard
Drass, Mushko, Kill Valley, Suru Valley	Himalayan brown bear
Tsokar, Hanle, Chushul, Markha, Wakha-Mulbek, Bodkharbu	Tibetan wolf, Ladakh urial, Black-necked crane
Hemis National Park, Karakoram Sanctuary, Nubra, Uruchay, Panamik	Eurasian lynx
DBO [Daulat Beg Oldie], Depsang, Chang Chenmo, Kalak Tartar, Hanle	Wild yak, Tibetan antelope, Tibetan wildass, Argali, Pallas's cat, Black-necked crane
Hanle, Kalak tartar	Tibetan gazelle



RUSHIKESH PAMAR

A male Blackbuck chased by a dog in Bidar, Karnataka

wildlife and humans, and has aggravated a biodiversity crisis.

The population of FRDs in Ladakh has been steadily increasing over the past few years, resulting in an increase in attacks on the endangered wildlife species as listed below:

BNHS has launched a special project “On a war footing: Biodiversity monitoring and conservation with Indian Army in Ladakh”, working with the Indian Army and the Ladakh Union Territory administration through a long-term capacity building, biodiversity monitoring and conservation programme to address the major threats in the landscape which also includes the menace of FRD. We are working with the Animal Husbandry Department of Leh to implement Animal Birth Control (ABC) and sterilization of FRDs in Ladakh as part of this project. We have also started an awareness campaign for the Indian Army and the local community, to address the issue of garbage disposal and management of dog populations by reducing food wastage in defence establishments. The total number of FRDs estimated at various sites in Nyoma was 176. Our team also identified for capture those aggressive dogs that had bitten humans.

BNHS undertook several field visits to Ladakh in September 2022 to initiate dialogue with the main stakeholders, including the Corps Commander at the Divisional Headquarters in Leh, Ladakh, which resulted in a reconnaissance survey of Chang Chenmo Valley, to assess the opportunities and challenges in project

implementation. Chang Chenmo Valley supports summer migrant populations of Tibetan antelope and wild yak, among other wildlife. Marsimik La base camp, Tsog Tshalo, and Hot Springs outposts were visited. The officers and staff were briefed about the measures to be taken at each of these sites like garbage management and ABC of FRD. A rapid survey was undertaken in Kargyam Valley, area adjoining Chushul, Tsaga La, Loma bend, and Niyoma bend, to identify potential pilot sites along the border areas. The Principal Secretary (Forests), Ladakh UT issued instructions to the Veterinary Department to deal with the problems related to FRDs.

Sikkim: This state stands out as the smallest but biologically most diverse Himalayan state in India. Being part of the Eastern Himalaya, almost the entire state is mountainous; its northern and eastern parts are bordered by China and have extensive reserve forests in the altitudinal range between 2,000 m and 5,500 m. The office of the Chief Wildlife Warden in Sikkim rates FRDs as the most serious threat to wildlife in Sikkim, and has planned several measures to control free-ranging dog populations.

The Forest Department, along with partners like WWF-India and SARA (Sikkim Anti Rabies and Animal Health) Program, and the Animal Husbandry and Veterinary Services Department, Govt of Sikkim, have been regularly carrying out sterilizations and vaccinations for FRDs. However, the results are not significant. Growing anecdotal evidence points to these dogs now becoming the dominant predator in the landscape, posing

the biggest risk to biodiversity. Participatory research by ATREE found that in the highest elevations, especially in North Sikkim, FRDs cause severe fatalities among yak calves. This has led to high economic losses to pastoralists, with an estimated 40% of yak calves being lost to FRDs every year. These dogs have become true predators, which can be discerned from camera trap photographs where packs of free-ranging dogs can be seen in niches occupied by the Endangered snow leopard and Himalayan musk deer (Source: Snow Leopard Monitoring Exercise: F&ED & WWF-India).

There are FRDs in all of Sikkim – village dogs in rural areas, abandoned pet dogs around army camps, and street dogs in the townships – and they are all on the hunt for wild animals and birds.

After the 2017 Doklam and 2020 Galwan Valley incidents, the Sino-Indian border areas have been reinforced with more troops and infrastructural development. Dogs, being camp followers, have benefited from these developments, and their population has increased several-fold, because they feed on the food waste around defence establishments, as seen in the photograph of dogs near Tsomgo. In forest areas, these dogs are actually displacing wildlife from prime wildlife habitats. They have gathered enough strength and hunting skills to even displace and occasionally kill a snow leopard. In a tragic incident, a goral was killed near Zaluk in Pangolakha Sanctuary by FRDs on November 20, 2022. Similarly, red pandas were killed in Lachung forests and at Pangolakha. A yak calf was killed by feral dogs in Tsomgo area.



The increasing populations of free-ranging dogs are a threat to humans and wildlife

Free-ranging dogs are known to hunt in packs, preying upon wildlife such as blue sheep, Tibetan gazelle, and Himalayan marmot in the high altitudes of North Sikkim in Mangan district, and on musk deer, Himalayan goral, serow, and red panda in Gangtok and Pakyong districts in East Sikkim. They are a menace to the country's remnant populations of Tibetan gazelle and southern kiang. Sikkim holds 110 Tibetan gazelle, 73% of the total Indian population of 150. Similarly, the entire Indian population of southern kiang (around 25) is now confined to Sikkim. The state also provides breeding grounds for black-necked crane and red panda. Hence the rising population of FRD in the forest areas of Sikkim, especially in the northern and eastern parts, is of great concern. The majority of the FRD population is closely linked to military and paramilitary camps, where they feed on improperly disposed food waste.

India has international land and marine boundaries stretching for about 7,000 km with seven nations. These border areas, while critical for national security, also happen to be home to some of the most fascinating, rare, and globally threatened wildlife, including snow leopard, Tibetan argali, Ladakh urial, Tibetan antelope, black-necked crane, brown bear, great Indian bustard, and several vultures. While the forest and wildlife departments are the main custodians of biodiversity, there is an urgent need for conservationists to engage with and strengthen the main stakeholder of our border areas – the Indian Army. Being the largest standing army in the world, there is a huge opportunity for the Indian Army to contribute towards

mitigating national and global ecological and environmental crises, such as biodiversity decline and extinction, climate change, and emerging threats to humans and wildlife, such as the increasing populations of feral dogs.

Legal aspects: Strays come under the Animal Birth Control (Dogs) Rules, known as the ABC Rules, under which dogs are to be vaccinated and neutered, but can't be removed from the streets even if they are aggressive and have bitten people. Yet, if the same were to happen with carnivores like the tiger, they could be eliminated through provisions under the WLPA.

Environmental law expert and former BNHS Honorary Secretary Debi Goenka feels that the existing law to address the issue of FRDs is ineffective, in that it seeks to reduce stray dog populations and the incidence of rabies, but clearly, neither goal is being achieved though it is 20 years since the rules came into force.

Solutions: Both wildlife and pet animal organizations that are committed to animal welfare and public safety strongly believe that implementing an ABC programme is the need of the hour. The Forest & Environment Department, along with the Animal Husbandry Department, Govt of Sikkim, have regularly carried out sterilization and vaccination of feral dogs using the ABC approach. The coverage in the cold desert of Sikkim in Thangu-Gaigong-Kerang belt was estimated at 44% after two rounds of sterilization in 2020 and 2022. According to WHO guidelines, 70% coverage is needed to control



Crane hunted by a free-ranging dog



A dog with carcass of a Painted stork at Donaj Mangalvedha



Chinkara hunted down by a dog



Free-ranging dogs compete for food with vultures



People using dogs for hunting

the dog population. Hence, the Forest Department now is planning to initiate ABC drives in campaign mode in all the animal husbandry dispensaries of the state. However, mere birth control is not showing desired results, as only a fraction of the dogs get covered. Also, these dogs are wary of humans and very difficult to capture. People also feel that keeping the captured dogs in shelters at the tax payer's expense is not feasible. Elimination may give quick and sustainable results along with ABC, but can be legally contested and will face opposition from animal rights groups.

The Sikkim Forest Department is trying to run an ABC campaign and also working with the security forces to reduce food waste. Free-ranging dogs pose a danger to wildlife and humans, and are required to be eliminated, but only as a last resort. Directions from the Chief Secretary, Sikkim, have been sent to security forces (Army, Indo Tibetan Border Police, Sashastra Seema Bal, Border Roads Organization) for responsible management of food waste. The army has also started funding pilot projects for composting of waste in defence establishments.

Legally, the ABC programme is the prime option for control of dog populations. It is a long-term intervention, and while the sterilization programme is underway, there is a need to upscale it to reach at least 70% of the FRD population. Concomitantly, sensitization of the armed forces to reduce food waste is also necessary to control the dog population.

Hopes from the SC: A writ petition has been filed in the Supreme Court as a public interest litigation by the

Humane Foundation for People and Animals (HFPA), which says that keeping stray dogs on the streets is unkind to them and unfair to people. They should either be adopted or moved to well-managed pounds, as is done elsewhere in the world. It also calls for firm regulation of dog ownership and breeding.

Several similar cases have been filed in courts, resulting in contested orders and judgments. The apex court has had to step in, to bring all stray dog related matters under its purview. HFPA and a host of cases have also highlighted the flaws in ABC Rules. The Supreme Court is hearing the cases against existing ineffective rules, but the threat of free-ranging dogs to wildlife populations has not been highlighted enough. Wildlife NGOs need to bring this to the notice of the court, which may help to get some relief. This issue seriously needs a pragmatic verdict from the Honorable Supreme Court, while NGOs need to highlight the ineffectiveness of current legislation and evolve a prudent solution for the country-wide menace of stray dogs. ■



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