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# HORNBILL

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## Where Tigers Roam – Bandhavgarh-Sanjay-Dubri Landscape

**Sharad Kumar, Kedar Gore, and A.J.T. Johnsingh** narrate their experiences in the land of the tiger – Madhya Pradesh. From the narration, the importance of these forested landscapes becomes obvious to anyone with an inclination towards conservation.



# 10

## Being a Biologist in a Wounded World

Time and again, we have been alerted about the alarming and deleterious human impact on the planet. **Giovanni Bearzi** hopes that we will start to seriously ponder on this issue, take steps to prevent further damage, and contribute to environmental healing. Thus we would secure a better heritage for our future generations, sparing our fellow humans as well as wildlife some of the suffering.



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## ‘Pandemic Reflections’ and Looking Ahead

The world continues to suffer due to the COVID-19 pandemic, and India is no exception. All BNHS field stations have, since April, been attending to priority work only. Several BNHS employees and their families tested positive, but thankfully all have recovered and are doing well. Life came to a virtual standstill in the past few months, and now there is a debate on how life should be post COVID – how humans can work towards nature-based solutions, reduce their carbon footprint by adopting new work styles, focus on and monitor zoonotics, aim for a climate neutral economy, and enhance health and agriculture infrastructure.

BNHS has shared digital versions of the last two issues of *Hornbill* with members, who have appreciated this move. While there are some who would prefer hard copies, I feel the time is right now to move to a digital version altogether. It is, however, up to our members to decide on the same.

We recently concluded two important projects supported by MoEF&CC, Government of India, titled ‘Temporal changes in the population and behaviour patterns of waterbirds in Point Calimere, Tamil Nadu, with respect to land use and climate change’, and ‘Predictive modelling of climate change and El Niño related impacts of Giant Clams in Lakshadweep Archipelago and its conservation implications’.

Point Calimere is one of the longest running field stations of BNHS. Till now, a total of 272 bird species have been recorded from Point Calimere Wildlife and Bird Sanctuary. Out of these, 107 species are land birds, 33 are raptors and 132 are waterbirds. The sanctuary supports 22 globally Threatened and Near Threatened bird species, which adds to its ornithological importance. Studies under the Point Calimere project examined the arrival and departure pattern of 18 common species. The data showed that there were no major changes in the arrival and departure patterns of 16 of these species. However, the number of over-summering birds has increased in recent years, and overall, 13 migratory waterbirds were reported to over-summer in Point Calimere and the Great Vedaranyam Swamp (GVS). The studies also showed an overall population decline in the 17 dominant waterbird species wintering in Point Calimere-GVS. Arctic breeding shorebirds, namely Little Stint *Calidris minuta* and Curlew Sandpiper *Calidris ferruginea* that were the most common species among waders, have declined drastically. A decline of over 60% in population was recorded in Little Stint and over 75% in Curlew Sandpiper in the last four decades. A steep decline in the numbers of other common species, namely Lesser Sandplover *Charadrius mongolus*, Greater Flamingo *Phoenicopterus roseus*, Ruff *Philomachus pugnax*, and Black-winged Stilt *Himantopus himantopus*, was also observed. On the other hand, three waterbird species showed an increasing trend in numbers. For example, Eurasian Wigeon *Mareca penelope*, whose numbers did not exceed a hundred birds during the 1980s and 1990s, was recorded in thousands in the recent years. A maximum of 7,000 individuals were recorded during January 2008. For Spot-billed Pelican *Pelecanus philippensis*, a



maximum of 3,000 individuals were recorded in 2013, which constitutes almost 25% of its global population (as per the IUCN Red List data). There are several other important findings from the completed study. Conservation and restoration of key coastal wetlands like Point Calimere-GVS will be vital for migratory birds of the Central Asian Flyway. BNHS is working closely with the state government to undertake a restoration strategy for Point Calimere-GVS.

Our studies in Lakshadweep assessed the impacts of elevated sea surface temperature (SST) on Giant Clams and coral reefs in the Lakshadweep Archipelago. Our findings, published in *Ecological Indicators*, concluded that Giant Clam *Tridacna maxima* may be facing an uncertain future, with declining density and high risk of quasi-extinction under the prevailing high-incidence bleaching.<sup>1</sup> Severely depleted Giant Clam populations cannot be expected to recover without reintroduction/restocking in future. Mariculture may help to prevent further depletion of stocks (leading to local extinction of *T. maxima* in Lakshadweep Archipelago) and should be considered as an important intervention to secure the future of the species.

We also fear that coral reefs in Lakshadweep may be nearing thermal maxima. How will this affect coral community structure needs to be understood. However, we need to carefully plan restoration policies and undertake reef restoration before it is too late. In this context, declaration of three proposed conservation reserves, covering reef areas of 675 sq. km, assumes great significance. This intervention will provide for participatory reef restoration measures and adoption of reef-friendly fishing practices.

The pandemic has provided us all some time off from field responsibilities, but this time was utilized aptly by our researchers. Several papers have been published by BNHS scientists in the last six months, the latest being a monograph 'Systematic revision of the genus *Peronia* Fleming, 1822 (Gastropoda, Euthyneura, Pulmonata, Onchidiidae)'.<sup>2</sup>

We hope the pandemic will be behind us soon, so we can resume field work and continue to strive towards a deeper understanding of conservation science. Meanwhile we encourage our members to visit our online retail outlet at [www.bnhs.org](http://www.bnhs.org). Your support is vital for BNHS. I am glad to state that despite the worst fears of an economic impact, we have remained relatively unaffected till now, thanks to our supporters and donors who continue to repose faith in BNHS. The next couple of financial years, however, appear to be challenging and we need to continue to work hard to achieve both conservation goals and the financial stability of our institution.

**Deepak Apte**

<sup>1</sup>APTE, DEEPAK, SUMANTHA NARAYANA AND SUTIRTHA DUTTA (2019): Impact of sea surface temperature anomalies on Giant Clam population dynamics in Lakshadweep reefs: Inferences from a fourteen years study. *Ecological Indicators* 107 (2019) 105604. <https://doi.org/10.1016/j.ecolind.2019.105604>

<sup>2</sup>DAYRAT, B., T.C. GOULDING, D. APTE, S. ASLAM, A. BOURKE, J. COMENDADOR, M. KHALIL, X.Q. NGÒ, S.K. TAN, AND S.H. TAN (2020): Systematic revision of the genus *Peronia* Fleming, 1822 (Gastropoda, Euthyneura, Pulmonata, Onchidiidae). *ZooKeys* 972: 1–224. <https://doi.org/10.3897/zookeys.972.52853>

# WHERE TIGERS ROAM

## Bandhavgarh-Sanjay-Dubri Tiger Landscape

Text: Sharad Kumar, Kedar Gore, and A.J.T. Johnsingh

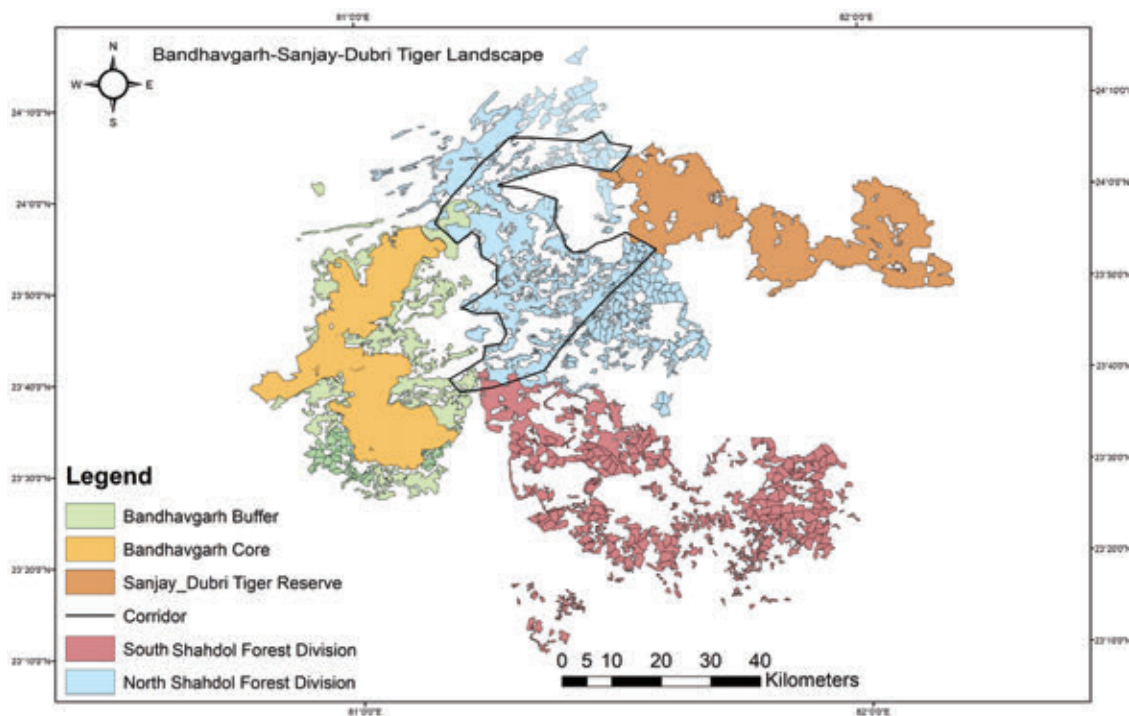
“**B**heem, the largest male tiger in Bandhavgarh, was seen near Khitauli Gate in the morning, and you may see him if you go there for an evening drive.” This was the message we got during lunch time on November 16, 2018 as we were getting ready for our afternoon drive in Bandhavgarh Tiger Reserve.

A little past 15:00 hrs, we entered Khitauli Range of the Reserve and our driver drove us to Amliyawah *jheel*, one of the most scenic locations in Khitauli, where the chances of seeing wildlife, including the tiger, were greater. There were two Red-wattled Lapwings and one Lesser Adjutant feeding along the edge of the waterbody, and a lone Little Grebe



A.J.T. JOHNSINGH

Bheem crossing the path of our vehicle, November 16, 2018, Bandhavgarh Tiger Reserve



Bandhavgarh-Sanjay-Dubri Tiger Landscape

foraging in the middle of the wetland. There was also a group of 10 female Chital peacefully browsing in the nearby meadow. They did not show any sign of nervousness, and we concluded that possibly Bheem was not in the vicinity. A noisy flock of Plum-headed Parakeets flew restlessly over us, and a Brown-headed Barbet called from one of the dry trees overlooking the *jheel*.

As we continued our drive, we sighted Bheem calmly padding along the road although he was followed by a van full of excited wildlife tourists. We too followed Bheem, who, after some distance, walked into the forest. Our driver and guide were experienced and after driving for some distance, they parked the vehicle near a well-used wildlife trail, saying that Bheem would take this trail to go to a waterhole nearby. One of the finest and most exciting experiences for any wildlife lover is to wait for a tiger in the jungle when its movements are indicated by the alarm calls of animals such as Northern Plains Grey Langur, Chital (Spotted Deer), and Sambar. Such a sighting can give you goose bumps, and we experienced them that evening! As expected, Bheem came along the trail, heralded by langurs and Chital, glanced at us once as he majestically walked past our vehicle into the forest. We were told he was heading towards

a waterhole. We observed him – a magnificent animal weighing several kilograms over 200 kg. He was reported to be a little over 10 years of age and had a cut on his nose, indicating his struggle to retain the *numero uno* position among his rival males in Bandhavgarh. Since he was past his prime, we wondered how long he would be able to hold onto the core area in the Reserve – the average territorial tenure of an adult male tiger is about five years.

We were in Bandhavgarh to attend the annual meeting of The Corbett Foundation (TCF), and we made use of this opportunity to know more about the landscape of Bandhavgarh and Sanjay-Dubri tiger reserves (along with the corridor connecting both the reserves). Bandhavgarh Tiger Reserve occupies an area of 1,536.94 sq. km (including 716.90 sq. km of core and 820.04 sq. km of buffer zones) and Sanjay-Dubri Tiger Reserve covers an area of 1,674.51 sq. km (including 812.58 sq. km of core and 861.93 sq. km of buffer zones). The corridor forest of North and South Shahdol Forest Divisions connecting these two tiger reserves is spread over 6,000 sq. km. This landscape has over 400 villages, with approximately 3,00,000 people. Administratively, Bandhavgarh TR is divided into six core ranges (Tala, Magdhi, Khitauli, Kallawah, Pataur, and Panpatha) and three buffer ranges



(Dhamokhar, Manpur, and Panpatha), while Sanjay-Dubri TR is divided into four core ranges (Bastua, Dubri, Pondi, and Mohan or Kusumi) and four buffer ranges (Madbas, Tamsar, Beohari, and Bhuimad).

This landscape is steeped in history, with fascinating anecdotes related to the tigers. Bandhavgarh forest was a private game reserve of the Maharajas of Rewa. The most famous white tiger Mohan was caught on May 27, 1951 from Bagdara forest (Sidhi) in Bastua Range of present day Sanjay-Dubri TR by Maharaja Martand Singh of Rewa. There is a signage in Panpatha Wildlife Sanctuary (Pataur Range), 12 km from Tala on the Tala-Barahi road, with an inscription on a stone pillar which marks the location where the Maharaja shot his 100th tiger on March 21, 1954. Hunting continued until 1968, when Bandhavgarh was constituted as a national park. In 1993, Bandhavgarh was declared a tiger reserve under India's most successful conservation programme – Project Tiger.

In Bandhavgarh TR, we explored two buffer ranges (Dhamokhar and Manpur) and Tala Range, the prime core of the reserve. We also visited the Bandhavgarh-Sanjay-Dubri Corridor (BSDC) area to see the excellent conservation work being carried out by TCF in collaboration with the Madhya Pradesh Forest Department. One notable achievement of TCF is the creation of solar-powered waterholes: 10 in the core area of Bandhavgarh TR and 22 in the BSDC. Another valuable attempt TCF has initiated is the establishment of five vegetation restoration plots totaling 83 ha, protected by chain

link fencing. The species planted are all native trees such as Burmese Silk Orchid tree *Bauhinia racemosa*, Indian Rosewood or Kala Sheesham *Dalbergia sissoo*, Banyan *Ficus bengalensis*, Gular *Ficus glomerata*, Mango *Mangifera indica*, Pongam Oil tree *Milletia pinnata*, Emblic Myrobalan or Amla *Phyllanthus emblica*, Jamun *Syzygium cumini*, Arjuna *Terminalia arjuna*, and Baheda *Terminalia bellirica*. The presence of such vegetation cover in the corridor will facilitate the movement of large mammal species between the tiger reserves. However, protection of these restoration plots will be a challenge, as the pressures from livestock and people would be enormous, particularly when there is profuse growth of grass in the enclosures.

The first buffer range we visited was Dhamokhar Range. It was on November 16, 2018 that we drove into the range from Parasi Gate. As the range was added to the Tiger Reserve in 2014, it had not yet recovered from the past unregulated impacts by local people and livestock. The Sal *Shorea robusta* forest was sparse without much regeneration, but Dwarf Date Palm *Phoenix acaulis*, only nibbled by wild ungulates, was common. The road network was good, there were many waterholes, and a tigress with three cubs was reported to use the area. We saw the site where a buffalo had been killed by a tiger two days earlier. Large-billed Crows (or Jungle Crow) were descending from the trees to feed on the kill, which possibly indicated that the tiger was not in the vicinity. If they are resting nearby, tigers usually do not tolerate such intrusions. Indian Grey Hornbills flew around and Five-striped Palm Squirrels chirped, indicating that



Waterhole created by TCF in Sanjay-Dubri Corridor



Sharad near the restoration plot protected by chain-link fence

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Crested Hawk-Eagle, on the way to Sanjay-Dubri TR



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Cattle seen on the way to Jabalpur

some danger, possibly a bird of prey, had alarmed them. In one place we came across five Yellow-wattled Lapwings, maybe parents with three chicks, which indicated the dryness of the range, as these birds are partial to dry habitats. We came out of the range satisfied with the sighting of five groups of Chital. Their numbers could not be counted, as they were moving amidst the invasive *Lantana camara* bushes.

On 18th evening, we walked in Manpur Range that is adjacent to the core zone of Tala Range. The area being close to villages Bihariya and Tala, signs of biotic pressure were exceedingly high. Even large Sal trees had been cut down and taken away. Sal and other trees are in great demand by the local people for fencing and firewood. We saw two men carrying axes going into the forest. Cattle dung was everywhere, and interestingly, there were also dung piles of Nilgai, the largest antelope in India, and pellet groups of Chinkara or Indian Gazelle. The area also harbours Golden Jackal and Indian Fox. We found a large Mahua tree that was host to the parasitic Mistletoe *Loranthus*. The beautiful red flowers of *Loranthus* attracted a number of nectar-feeding birds such as the Thick-billed Flowerpecker. Other bird species that we saw on their 'hunting spree' were a female Verditer Flycatcher, Small Minivets, White-bellied Drongos and a group of Indian White-eye. Noisy

Plum-headed Parakeets flew overhead. An Oriental Honey-Buzzard flew over us and landed atop a dense canopied Haldu *Haldina cordifolia* tree. A lone male Purple Sunbird, adorned in its eclipse plumage, was chirping its heart out.

By this time, the half-moon of the day was clearly visible up in the cloudless blue sky and through the fog of the evening; Bandhavgarh Fort atop the distant hills of the Tala Range was faintly visible. We got down into a dry *nallah* with cream-coloured sand and walked along searching for signs of animals. Soon we were pleasantly surprised to see the tracks of a large tiger, possibly a male. As we walked back to our vehicle pleased by this finding, we discussed the possibility of restoring such degraded and disturbed habitat by growing fodder and firewood species in the vicinity of the village, by involving the villagers and also by setting aside some area of the forest along its boundary for such a programme. Enormous effort and dedication for several decades will be needed if one has to be successful in such tasks to reduce the anthropogenic pressures on the forest. But such initiatives are the need of the hour in most of the wildlife habitats in India, including the Bandhavgarh-Sanjay-Dubri TR landscape.

We visited Sanjay-Dubri Tiger Reserve on the 19th, crossing the beautiful Son River that flows along the eastern boundary of Bandhavgarh TR.



KEDAR GORE

There is severe pressure on timber trees used for building houses



A.J.T. JOHNSINGH

The scenic Tala Range covers hills and grasslands

The road traversed a mosaic of natural forest, villages, and large-scale plantations of the exotic *Eucalyptus*. This species is believed to deplete ground water and is unsuitable for local biodiversity, therefore it is best avoided.

Some of us stayed at Sanjay-Dubri TR for the night in the newly built forest rest house in Dubri village. The rest house was in an old campus full of trees such as Neem *Azadirachta indica*, Sheesham *Dalbergia latifolia*, Mango *Mangifera indica*, Kaim *Mitragyna parviflora*, and Indian Kino *Pterocarpus marsupium*. The reserve has 52 villages in its core zone (of which 10 have been resettled and another 30 have received compensation and will be resettled soon) and about 100 villages in the buffer zone. On the 19th and 20th we drove a total of around 70 km in the Dubri Range of Dubri Wildlife Sanctuary, which is a part of the Tiger Reserve, and saw less than 10 Chital and 10 Nilgai. Water was not a problem in the range as the Banas and Umarari rivers flow through the range and numerous *nallabs* had a copious amount of water. Check dams had been built across the *nallabs* with sacks filled with sand and covered with mud and these impoundments merged well with the surroundings. Concrete check dams are an eyesore in a forest area and should be avoided. Our brief stopover at River Banas revealed only one River Lapwing and two Woolly-necked Storks. There was a marked absence of migratory waterfowl.

Our brief observation of the area indicated that the habitat is not suitable for Sambar as the area is full of inedible Kurchi *Holarrhena antidysenterica*, which dominated the understorey. This is a latex-laden species avoided by ungulates. Other common species were Indian Laburnum *Cassia fistula*, East Indian Ebony *Diospyros melanoxylon*, Crepe Myrtle *Lagerstroemia parviflora*, Sal *Shorea robusta*, and Fire-flame Bush or Dhataki *Woodfordia fruticosa*. Mature fruits (pods) of *Cassia fistula* are eaten by Sloth Bear. It appears that even the leaf-eating langurs find it difficult to get enough food, as they were seen on only two tree species – Axlewood *Anogeissus latifolia* and Indian Laurel *Terminalia tomentosa*. Langurs feed on the petioles of the leaves of Mahua and the leaves dropped by the langur are eaten by Chital. Subhash Singh, a local wildlife guide working in this area for the last 15 years, said that a few Sambar are seen only in the Kusumi Range of the reserve, close to the Chhattisgarh border. So in the absence of abundant wild ungulate prey, particularly Sambar, the tigers of Sanjay-Dubri TR primarily live on cattle, the population of which is growing in the country. Based on a study, the Indian Council for Forestry Research and Education estimated that India's forests support 270 million cattle for grazing, against the carrying capacity of 30 million. Uncontrolled grazing of livestock is a serious issue that needs to be tackled on a war footing, using reasonable decisions in livestock management to

ensure the health of forest ecosystems throughout the country.

One vital information we got during the stay in Dubri village was evidence that Jackal are still fairly common in the area (a pair was seen in the forest in the evening) – we often heard them howling all around the village at night. This once common canid has disappeared from many areas in the country, maybe as a result of rampant development, road kills by speeding vehicles, and possibly by the diseases transmitted by free-ranging dogs, so common in our country.

Before leaving Bandhavgarh TR, our final wildlife drive was in the extremely scenic and famous Tala Range, which teems with wildlife. Its hills clothed with dense bamboo, streams, and well-maintained waterholes, picturesque grasslands with an abundant Chital population, make it a great destination for wildlife lovers. We learnt from Shri Mridul Pathak, the Field Director of the Reserve, who was about to retire, that presently four tigresses raise cubs in the 105 sq. km Tala Range and one tigress was even reported to have had five cubs. One of the exemplary field conservation programmes of Madhya Pradesh Forest Department is the reintroduction of Gaur in Bandhavgarh TR from Kanha Tiger Reserve. After the small population of Gaur had disappeared from the area in the late 1990s, the Gaur reintroduction programme was initiated in 2011 with 19 Gaur (14 females and 5 males) from Kanha Tiger Reserve. Soon more introductions followed, and despite predation by tigers, their number has grown beyond 150. Tala Range is one place where one is sure to see Long-billed Vultures, which nest on the cliffs. In most parts of India, these vultures have succumbed to the veterinary drug diclofenac administered to livestock – vultures outside forest areas largely feeding on

contaminated cattle carcasses. In Tala Range, food for the vultures primarily comes from wild ungulate kills of the tiger and leopard (which are free from diclofenac). A vulture population survey conducted by TCF in 2015 estimated 520–640 vultures in BTR.

The importance of forested landscapes like Bandhavgarh-Sanjay-Dubri TRs would be appreciated by anyone travelling by road from this landscape to Jabalpur. On either side of the road in most places one would see vast tracts of a ravaged landscape with the top soil eroded, resulting from decades of extensive grazing by goats and cattle. The vegetation in this stony landscape is primarily *Lantana camara* and *Hyptis suaveolens* (= *Mesosphaerum suaveolens*), both exotics from Latin America. *Nallabs* with some water, or even a little moisture, are infested with *Ipomoea carnea*, another exotic from Latin America, which has the detrimental capability to convert a water body into a terrestrial habitat. Such a landscape will have reduced water holding capacity, which in the years to come would make the life of the people of the area miserable, as they would have to struggle even to get drinking water. We are not sure whether our leaders have the knowledge, vision, and dedication to restore the health of such landscapes. In such a situation, the restoration efforts undertaken by The Corbett Foundation with support from the Forest Department and corporates such as Jet Privilege Pvt. Ltd show the way to nurture and heal such terribly wounded landscapes. Under these circumstances, one may appreciate the worth of forested landscapes such as Bandhavgarh and Sanjay-Dubri. The value of these landscapes, which give rise to numerous streams, becomes even more appreciable as they harbour some glorious mammals – Sambar, Gaur, and Tiger – that make India rightly proud. ■



**Sharad Kumar** has over a decade of experience in research and conservation of large carnivores and mitigation of human-wildlife conflict in and around PAs. He is presently an Asst Professor, Department of Wildlife Sciences, AMU.



**Kedar Gore** has been actively engaged in wildlife conservation and environmental protection work for over two decades. He is currently working as the Director of The Corbett Foundation.



**A.J.T. Johnsingh** is associated with WWF India, Nature Conservation Foundation, and Corbett Foundation. He strives for mahseer, wildlife corridors, and large mammal conservation in the country.





SILVIA BONIZZONI

Atlantic Bluefin Tuna *Thunnus thynnus*, classified as Endangered in the IUCN Red List

# Being a biologist in a wounded world

Text: **Giovanni Bearzi**

By the 1970s, we had been alerted repeatedly about the risks from unsustainable human impact on the planet, and the warnings of upcoming disaster were becoming ever more credible and worrying. However, we were also exposed to the cultural diversions of complaisant media and to the mystifications of industry-driven think tanks that, among other denials, had been deliberately concealing climate change. Under sanitized and distorted cultural scenarios, even the

most compelling evidence of rising greenhouse gases could be downplayed, and the risks could go unperceived. Apart from the climatologists and a few visionaries, not many could discern an immediate climate emergency of the ominous kind that has loomed over us in these last few years. In the face of warnings unmatched by proportionate reactions within our intellectual milieu, many biologists (including myself) went on behaving as if there was still plenty of time to solve the

environmental and climate crisis. Perhaps we just weren't ready to leave our comfort zone and venture into a complex realm of inconvenient truths. My own awakening to these truths happened gradually, then suddenly. And it came as a shock.

To my dismay, I was becoming aware that living systems and the physical environment had been depleted and disrupted, resulting in losses of biodiversity, mass extinctions, and catastrophic climate and ecological changes. In 1949, one of the fathers of the environmental movement, Aldo Leopold, wrote: "*One of the penalties of an ecological education is that one lives alone in a world of wounds. Much of the damage inflicted on land is quite invisible to laymen. An ecologist must either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise.*" Today's world is, indeed, as wounded as ever, and some of the long-predicted calamities are happening with increasing intensity or frequency (e.g., extreme weather events, bushfires, droughts, floods, glacier melting, sea level rise, heatwaves).

Whether or not these facts are accurately reported by the media or acknowledged by present-day political leaders and their electorates, those who are familiar with the scientific literature know that little time is left to prevent irreversible warming

and avert the risk of a Hothouse Earth pathway. This inconvenient truth is emphasized in signs held by the young people attending global strikes for climate: *Normal is Over, There is No Planet B.*

Nobody should be fiddling while the planet is burning down, certainly not biologists and ecologists who know what is really at stake. As noted by Gary K. Meffe two decades ago, "*The time has long passed when we could merely pontificate in our journals, impress our colleagues, and proclaim that we are above the political fray.*" This rings even truer today. Continuing to live and work as if everything is fine makes change impossible and breakdown inevitable.

The time has come – and indeed passed – to consciously upgrade our values, methods, and behaviour. As our global leaders demonstrate their inability to respond to the crisis and ward off the drivers of self-destruction, it is becoming clear that the ideas needed to reshape our future must stretch beyond the confines of our current system. The question then is: How can we capitalize on our expertise as biologists and ecologists and contribute most effectively to the solutions that need to be taken? What does it take to bridge the gap between conservative scientific disciplines and the global conservation imperatives of our time? Below, I offer a few hints in a spirit of constructive self-criticism (I wish I had done all that is being preached here long ago).



Mediterranean Monk Seal *Monachus monachus*, classified as Endangered in the IUCN Red List

SILVIA BONIZZONI



GIOVANNI BEARZI

A trio of Common Dolphinfish *Coryphaena hippurus* in the Mediterranean

### 1. Proclaiming that we care

To get out of this mess, we must first relinquish our belief in progress as everlasting and unconstrained growth, and replace it with value systems leading to environmental sustainability and social justice. As biologists, we can help envision a world where the role played by humans is consistent with the laws of nature and the reality of a finite planet. Paraphrasing Wendell Berry, we must not only suppose or imagine but loudly proclaim that “*the ultimate standard of our work is the health and durability of human and natural communities.*” We should take responsibility and become conservation stewards who are thoughtful of the consequences of their choices and actions. Such commitment must be placed at the core of our profession – to the point that everything we do truly does have the goal of benefiting the larger community of humans and life on Earth rather than ourselves, our circles or our nation.

### 2. Communicating effectively

For decades, we have been working in a scientific environment that discouraged individual researchers from expressing views that could be interpreted as green activism or have political connotations. However, not expressing one’s opinion and not engaging in activism also is a political choice, as it often implies supporting (or at least not challenging) the status quo and therefore implicitly endorsing it.

Contrary to what we have been conditioned to think, supplying information is not enough. Even climate scientists, whose early warnings

went unheeded in part because of ineffective messaging, have realized that their science does not communicate itself and that high-quality outreach is essential. We, too, need to leave behind jargon and sectarian arguments and enhance our communication, lifting the antiquated taboo on “saving the planet” language and placing emphasis on defending what we love. Our care for the living world should not only be made explicit but also become the core of compelling narratives we use to engage human society. We must aim to tell heartfelt, captivating stories centred on our own experience, bringing to life a capacity to think outside the box and dream big. To reach people at a deeper emotional level, we may even team up with conservation non-governmental organizations and groups of environmental activists or collaborate with designers, art directors, artists, and celebrities, as well as fellow scientists in various disciplines.

### 3. Embracing real sustainability

Because economics and environmental conservation are largely intertwined, we cannot deal effectively with a crisis unless we confront the economic, social, and political reality that generated the crisis. As biologists, we should not only document the threats to life but also help clarify how the extraction, production, and consumption system can be steered away from damaging and unsustainable practices. On a more fundamental level, we should accurately characterize the decisions driven by industrial or



commercial interests and reject any system that sees nature merely as a resource to be pillaged in pursuit of perpetual growth and material wealth. Changing the status quo and tackling the causes, instead of merely mitigating the effects, requires judicious and imaginative planning, leading to thoughtful strategies for research, outreach, and management.

#### 4. Fostering individual and systemic change

Many of us have attended conferences and workshops organized in fancy resorts located in exotic locations that require multiple flights. Conference attendees may even banquet on bottom-dwelling shrimp right after having learned about the damage caused by bottom trawls and shrimp aquaculture. No matter how effective such gatherings may seem to be in advancing conservation biology, they carry an embedded inconsistency, as if those responsible for environmental damage are invariably others, somewhere else. Such inconsistencies are increasingly debated, particularly with regard to restraint in flying (to reduce our carbon footprint) or switching to a plant-based diet (to reduce the environmental and climate impacts of meat and seafood production and consumption).

Biologists and other scientists who appear to overlook their own footprint often contend that individual behaviour does not matter and that it is the system that needs to be changed. That is correct. A change in the system (and a new breed of political leaders) is unquestionably needed to tackle the environmental and climate crises. It is also true that neoliberalism and corporate agendas have conned us into tackling the crisis as individuals, whereas most of the damage originates from the choices of a handful of giant companies and mighty executives. That, however, does not mean that individual and social behaviour is irrelevant.

First of all, the effects of individual behaviour are rarely experienced only by the individual. Our choices affect and influence those around us. This must be even truer for biology professionals, whose actions may be taken as a model by colleagues and students. Secondly, a change in the system can only be instigated through the coordinated efforts of a group of individuals, and more often than not, it is the initiative of a single individual that triggers

collective efforts. Third, one cannot truly choose between individual change and system change. Rather, one can choose to (1) become aware and develop a deeper understanding of a problem; (2) do something about it on a personal level, thus helping to drive market and policy choices; and (3) encourage change in others while pushing for transformation in the system. The latter can be done more effectively by directly influencing political decision-making, lobbying for greener and more responsible leaders, connecting with people and organizations that help us become empowered and engaging in coordinated action. Even if not all of us have the opportunities or the skills to succeed in each of the above-mentioned tasks, any of us can do his or her best, at all levels.

#### 5. Supporting environmental activism

Steering humanity away from environmental and climate disasters requires committed activism, mobilization, and civil resistance. A well-planned environmental campaign can pave the way for significant change. Even the unwavering activism of a single individual sometimes results in an unpredictable uprising, setting in motion perception shifts and changes in collective behaviour. Within one year, the solitary strike for climate of young activist Greta Thunberg developed into a global protest by millions of people. While some may mock or dismiss these initiatives, research shows that non-violent mobilization has enormous potential. *In the past 100 years, non-violent campaigns have been twice as successful as violent uprisings, and the active and sustained participation of just 3.5% of a population can result in important political or societal change.* As biologists and knowledgeable scientists, there is much we can do to support, motivate, and inform non-violent activists who demand policies ensuring that our planet remains habitable. We may even join the protest ourselves.

#### 6. Relinquishing contempt for spirituality

For centuries, humanity's mandate to subdue nature and have dominion over its living resources, as expressed in the Bible (Genesis 1: 26–28), provided a theological and moral justification for exploiting the natural world. This right to dominion and sovereignty over nature has become part of the cognitive foundation of the western

world, as epitomized by Francis Bacon when he wrote, “*Man, if we look to final causes, may be regarded as the centre of the world (...) For the whole world works together in the service of man; and there is nothing from which he does not derive use and fruit (...) insomuch that all things seem to be going about man’s business and not their own.*” These deeply rooted ideas, combined with René Descartes’ portrait of nature as a machine, culminated in the 19th century western vision of humankind engaged heroically in conquering nature, which provided a further justification for reckless exploitation. Such conceptual frameworks are ingrained into modern science and into our culture, which still sees progress as an increased dominion over nature and regards the whole of nature as a commodity.

Acknowledging this theological bias of science or the subtle influence of some religious thinking, however, does not imply that the entire corpus of religion and spirituality should be opposed or discarded within the context of environmental science and conservation. The void of spiritual and ethical values produced by materialism and neoliberalism clearly cannot be filled by science alone. Conversely, values consistent with equality, self-restraint, non-harming, respect for all living beings and environmental sustainability are at the

core of spiritual wisdom dating back thousands of years. Some of the non-theistic and non-dualistic spiritual traditions from the East are often considered closer to the holistic approach needed to divert humanity from self destruction. However, a different interpretation of Christianity also can be envisaged, consistent with the message of the greatest spiritual revolutionary in western history, Saint Francis of Assisi. Francis (born 1181) proposed an alternative Christian view of nature and humans’ relationship to it: the idea of the equality of all creatures, including humans. His message has been ignored for centuries but is as modern as ever – to the point that a different Francis has recently revived this vision in his encyclical *LAUDATO SI’: ON CARE FOR OUR COMMON HOME* (2015).

Though few modern scientists have expressed interest in pursuing a dialogue between science and religion of the kind advocated by E.O. Wilson (2006) in his book *THE CREATION: AN APPEAL TO SAVE LIFE ON EARTH*, religious leaders and scholars have increasingly embraced environmental conservation (including the Ecumenical Patriarch Bartholomew, Pope Francis, and the Dalai Lama). One religious leader (the Dalai Lama) has even exhibited openness to the idea of modifying



SILVIA BONIZZONI

A Striped Dolphin rides the bow of a yacht in the Gulf of Corinth, Greece



SILVIA BONIZZONI

Common Bottlenose Dolphin *Tursiops truncatus* near Itsea, Greece

obsolete dogma based on scientific evidence. Whereas the approaches, conceptual frameworks and competences of science and religion will remain different, a challenge as great as saving the Creation requires unity and consilience rather than division. In science circles, relinquishing contempt for spiritual teachings that recognize the interconnectedness of all forms of life, and endorsing a more ecocentric and holistic vision, would help advance the biosphere-saving synergies advocated by E.O. Wilson.

### HOPE IS OPTIONAL, ACTION IS NOT

It is almost impossible to grasp, let alone fully accept, the bleak reality of what humans have collectively done to our only home. Being aware of the impending climate and ecological breakdown – and the reckless policies of limitless capitalism – may cause legitimate ecological grief, which includes sadness, hopelessness, fear, and despair. However, nihilism and inaction won't help, and those of us who do not react, or indulge in negativity, risk becoming ourselves a part of the

problem. As Alexandria Ocasio-Cortez put it, “*Hope is not something that you have: hope is something that you create, with your actions.*” In other words, hope is neither blind optimism nor a matter of estimating the odds. It is a choice and a state of mind inspired by the recognition that change is non-linear and often unpredictable.

Even if we cannot avert catastrophes that are beyond our control, as biology and conservation experts we certainly can prevent some of the damage or contribute to environmental healing, thus leaving a better heritage to future generations and sparing some of the suffering to fellow humans and animals. This is and will remain possible – with or without hope. ■



**Giovanni Bearzi, PhD**, Pew Fellow in Marine Conservation, has been studying Mediterranean cetaceans since 1986, trying to promote their protection and reduce human impact on marine ecosystems. He has authored about 150 scientific contributions, action plans for cetaceans and other works. He is the President of Dolphin Biology and Conservation and a Research Associate of OceanCare.

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# Spare a Thought for the House Sparrow

Text: Lt Gen. (Retd) Baljit Singh

In the animal world, there are two creatures that have, of their own volition, cast their lot with humans. It is believed that the dog had made the choice to be “man’s devoted companion”, or live in the midst of humans about 14,000 years ago. The House Sparrow simply moved into human dwellings, probably as early as the hunter-gatherer *Homo sapiens* began transitioning to agricultural settlements, aeons ago.

Coming to the House Sparrow, it is to the credit of human sensibilities to have accepted this special cohabitation, of almost an umbilical kind, with this vivacious avian species and named it *Passer domesticus*! Admittedly, the House Sparrow is a comparatively sober looking bird; nevertheless it makes its presence felt in India by its ubiquitous presence; from Leh in the north to Cape Comorin in the south and from the Somnath Temple in the west to Camorta Island in the Bay of Bengal, at the eastern end.

No matter where in India, you may be sure to spot them entering homes nonchalantly, and chattering non-stop as they set about arranging their personal comfort by adding heaps of straw to any potential nest-site, utterly unmindful of the householder’s presence! No wonder the late Dr Sálím Ali had labelled them as “man’s hanger-on”. So obviously there also was a time when anywhere on the globe, humans could set their chronometer to local sunrise time, simply by listening to the first cheep of a sparrow! This phenomenal genetic ability of the bird is still active and accurate, but we can no longer perceive it because of man-made noise pollution. A day might come when most Indians would perhaps know this bird only through photographs, because I fear that not even one out of fifty Indians may lay claim to having seen the bird *per se* in the outdoors.

Why do so few of us now encounter the bird despite its worldwide spread? Well, the fundamental



V. GOPI NAIDU

Looking for a safe haven? Nesting pair in an old wall

reason is the accelerating shift to new lifestyles (even among the rural communities), which are in severe conflict with the House Sparrow's basic existential needs. In one extreme case, there were the peoples' communes in China that had failed to usher in the Green Revolution, so Chairman Mao simply decreed that the House Sparrow was their crop pest number one, and by about the end of the 1960s, it was totally exterminated from China. Shortly thereafter, by the same black logic, the tiger too was deemed a pest and so ceased to exist in China by the mid 1970s, compounded by other factors.

On the other hand, where change was tempered by reasoned biological science, that very "pest number one" became the angel of progress, when both America and Australia consciously opted for the biological pest control route in agriculture, introducing the hitherto non-existent House Sparrow into their countries, rather than relying on imperilling chemical alternatives. In time, the House Sparrow came to be unequivocally feted by both the continents, and today, the bird figures in their avian literature among their cherished resident-breeders!

No description of the bird will be complete without a mention of the strong streak of tenacity in the sparrow's character. And here I can do no better than quote the master, Edward Hamilton Atkins (EHA who was born in Satara, Maharashtra, around 1845 to Scottish parents) from his book COMMON BIRDS OF BOMBAY (1900):

*"And when a Sparrow makes up its mind, nothing will unmake it except the annihilation of that Sparrow. Its faithful spouse is always, and very strongly, of the same mind. So they set to work to make a hole in the corner of the ceiling-cloth and they tear and tug with an energy which leaves no room for failure. Then they begin to fetch hay and the quantities which a couple will carry in a day is miraculous... I declare solemnly that you might have fed a horse on the hay which I removed daily as most of it tumbled down..."*

And for the precocious nature of this tiny bundle of feathers, I simply have to reproduce an inimitable observation by Dr Sálim Ali:

*"A communal display has been described, consisting of three to four males courting a single female. The group suddenly bursts in from somewhere amidst noisy twitterings and drops down to the ground. The suitors prance and strut around the hen with puffed breast, drooping wings and cocked tail, she now and again making sudden feints at one or the other, sometimes plucking out a feather." Voila!!*



V. GOPINADU

Once feared to be in a decline, the House Sparrow is regaining lost ground due to Citizen Science efforts

Talking of designating names to species, the Persian (also Baluchi, according to Ali and Ripley) found musical virtue in House Sparrow cheeps, and they named it *Ginjishki*, but in our local dialects the closest to the *Passer domesticus* is its name from the tribal belt of Chhota Nagpur, that is, *Garbwa*.

Much like most bird species, the House Sparrow is highly adaptable. Even though its traditional wilderness has been usurped and its living niches inside the once mud-and-thatch human dwellings have been replaced by glass and concrete, the House Sparrow could well be the last on this living planet if humankind were to spare just one hundredth of its cereal intake and put up hedges and indigenous shrubs around homes. I say so based on my wife's daily indulgence over the last 15 years of scattering a mixture of millet, rice, wheat grain, and shelled peanuts on our rooftop, which draws, among other birds, 20 to 30 House Sparrows, always. And House Sparrows live and breed inside the two hedges on either side of our house, as a permanent feature! The much touted artificial nesting boxes and nesting pots simply don't count in the long run to its survival. ■



**Lt Gen. (Retd) Baljit Singh** served in the Indian Army for over 36 years. Concomitantly, he strove to promote conservation of wildlife as a way of life within and by the Indian Army.

# A Trip to Point Calimere

Text: A.S. Bishnoi



SHAKTI BISHNOI

The participants birding in the Great Vedaranyam Swamp

Seeing migratory birds in Visakhapatnam airport in Andhra Pradesh, my curiosity grew day by day. I wanted to have a closer look and learn more about them. And, what better place to fulfill this dream, I thought, than Point Calimere, which is home to thousands of migratory waterbirds from the Palaearctic countries that come to spend the winter each year in the Great Vedaranyam Swamp. Besides, there are the resident waterbirds and land birds that dwell in the forested areas of Point Calimere. Moreover, BNHS has been carrying out intensive bird migration studies here since the 1980s. Point Calimere is one of the mandatory field trip sites for course participants to visit, to qualify for the BNHS Basic Ornithology Course. The course covers all aspects concerned with birds, and in Point Calimere, one gets to see and learn about bird banding and bird migration studies.

## The Journey

What could be more exciting than travelling in your own car all the way to your destination?

And so, on October 28, 2012, my wife Shakti and I started the journey to Point Calimere from Vizag, that is Visakhapatnam. The journey commenced with us driving through the Eastern Ghats ranges that run through the Vizag area, and as we drove further south, we passed through scenic stretches of paddy fields and villages (some vibrantly active and others serene amidst the tranquillity of nature). We reached Point Calimere after three days, with halts at Rajahmundry, Chennai, and Pondicherry. On arrival, we headed straight to the BNHS Bird Migration Study Centre in Kodiyakadu, one of the two villages in the sanctuary area, the other being Kodiyakarai. As we had reached late in the night, after braving Storm Neelam that had hit the coast, we were exhausted and slept like logs.

## Field Outing

Point Calimere Wildlife and Bird Sanctuary is situated in Nagapattinam district of Tamil Nadu and is the only Ramsar site (i.e., wetland of global importance) of the state. The Sanctuary is a unique



mix of tropical dry evergreen forest, grassland, brackish-water creeks, mudflats, and beaches with sand dunes. There are also salt pans, spread across a huge area.

The next day, we were refreshed and all ready to start. After a steaming hot south Indian tiffin, we proceeded to the Sanctuary with our team leader, Dr S. Balachandran, who was instrumental in establishing this Bird Migration Study Centre. We saw herds of Spotted Deer during our walk to the Great Vedaranyam Swamp. Land birds sighted included Indian Paradise-Flycatcher, Indian Pitta, Brown Shrike, Red-vented Bulbul, White-browed Bulbul, Barn Swallow, Black Drongo, Rose-ringed Parakeet, and Indian Roller.

Our excitement increased as we approached the swamp that was brimming with waterbirds, and we watched intently with our binoculars so as to not miss out on any species. The birds reported from Point Calimere include Spot-billed Pelican, Spoon-billed Sandpiper, Black-headed Ibis, Asian Dowitcher, Lesser and Greater Flamingo, and Oriental Darter. We could hear screeching seagulls and terns, an assortment of waders, Painted Stork, Brahminy Kite, Lesser Flamingo, and Spot-billed Pelican, among others.

While birdwatching, we were being constantly briefed on the birds and their habitat by our ever smiling guru, “Bala Sir”, a living encyclopedia on migratory birds. We were walking joyously in mud, in water, and in the rain. No one complained, as Bala Sir himself was leading us through all the rain, mud, and slush.



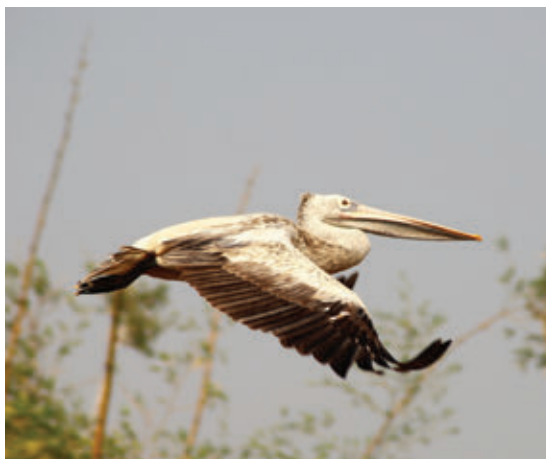
The BNHS Bird Migration Study Centre at Point Calimere

### Seasons at Point Calimere

**October to January:** This is the best time for birding as the backwaters and swamps are full of migratory waterbirds such as ducks, terns, waders, and flamingos. The north-east monsoon turns the landscape a pleasant green at this time of year, but be warned: vehicles can get stuck in marshy areas after heavy rain.

**February:** Flamingos depart by late January, but February is still a good time for other birds. The weather is pleasant with light breeze, clear skies, and day temperature around 25 °C.

**March to August:** Summer temperatures range from 30 °C to 37 °C, occasionally reaching even 40 °C. It is hot and humid, but a good time to see mammals such as Blackbuck, Spotted Deer, Wild Pig, and feral horses.



SHAKTI BISHNOI



SHAKTI BISHNOI

Large flocks of Spot-billed Pelican and Painted Stork may be seen in the Great Vedaranyam Swamp, especially during winters



N. RAVEENDRAN

The Blackbuck in Point Calimere WLS occurs in the grassland-like habitat in the southeast

**Bird Ringing or Bird Banding**

From the third day onwards, we started participating in the bird ringing/banding operations carried out by Dr Balachandran and his colleagues Ms Tuhina Katti and Dr Ranjit Manakadan. We observed migratory birds such as Black-tailed Godwit, Common Redshank, and Common Greenshank, and resident birds including Indian Pitta, Common Tailorbird, Indian Paradise Flycatcher, as well as bulbul and warbler species being ringed. The captured birds were fitted with BNHS metal rings and their biometrics recorded. Bird ringing helps in obtaining information on the population, lifespan, breeding origin, migratory routes, and stop-over sites of migratory birds, besides other data.

We learned about bird trapping methods using mist nets and clap traps, and how to remove birds

from mist nets without injuring them. Birds are tagged with rings of different sizes depending upon the circumference of the tarsus bone. Accordingly, we would select the appropriate ring to fix on their legs while holding them safely. We were also taught about sexing and ageing of birds by observing the morphological features, plumage, and by examining the cloaca. We also learnt about moulting in birds. We practiced recording morphometric measurements, namely wing, bill, tarsus and tail lengths, using measuring devices and making data entry in the record sheets. After ringing, the birds were released at the place of capture, ensuring that there were no predatory birds like Brahminy Kite around. BNHS has captured, ringed, and released over 200,000 birds during the course of several years at Point Calimere, and the work is continuing.



SHAKTI BISHNOI

Spotted Deer occur in the tropical dry evergreen forest part of Point Calimere WLS



SHAKTI BISHNOI

Two Common Redshanks waiting for their turn to be ringed!



SHAKTI BISHNOI

An immature Black Drongo on the lookout for prey

### At the beach

One evening, as the clouds were floating away and the sky became clear, we marched toward a quaint old beach to the south of Point Calimere. It was fun to see Lesser Black-headed Gull, Brown-headed Gull, Caspian Tern, Lesser Crested Tern, Large Crested Tern, Whiskered Tern, and many other pelagic birds flying about or sitting at the beach front. We were glued to our binoculars for at least an hour, with Bala Sir constantly guiding us and helping us to identify the species. We also used a book *A FIELD GUIDE TO THE BIRDS OF POINT CALIMERE* authored by him. Here we witnessed terns catching fish in the sea. To the south and east of Point Calimere, the sea is home to sea turtles and dolphins; the turtles also nest along the beach.

We returned contented at dusk, and had a delicious dinner prepared by the dedicated staff of the Centre. We had discussions post dinner on various topics related to bird conservation and studies, and the initiatives undertaken by BNHS. The participants, coming from various fields of expertise, shared their experiences of Point Calimere. The next morning, with heavy hearts we

started the journey back home – some preferred to stay on for a day more. And why not? Given the opportunity, a bird lover would definitely prefer to stay on, as Point Calimere is enthralling and enchanting, and above all, it is an avian paradise.

We headed towards Chennai with a day's halt near Guindy National Park, Chennai. The next day, we visited Pulicat Lake situated to the north of Chennai. Pulicat is an important wintering ground and **stop-over** site for migratory birds. We spotted good numbers of Lesser Flamingos, besides other waterbirds, and after that reluctantly headed back to Vizag. Point Calimere was an incredible and fulfilling life experience for both me and my wife. ■



**A.S. Bishnoi** is a passionate wildlife photographer, avid traveller and is in the Armed Forces. He is an ornithologist and has been participating in bird census at Chilika since 10 years.

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## One Tree at a Time

We are taught to save trees and the environment. But the concrete jungle around us provides very little place for nature to flourish. So for me, environment became another subject to be learnt at school, until I shared my dilemma with my grandmother a few years back.

My grandparents live in Bramhapuri in Chandrapur district of Maharashtra. A retired Professor of Botany, my grandmother has passionately worked on issues of environmental concern for over 40 years – tree planting and anti-polythene drives, to name a few. During one visit, she asked me to drive with her on her Kinetic Honda, and along the way, she showed me trees she had been planting over the years. There were hundreds of them and if she had planted them all at one site, Bramhapuri would have had a small forest of its own. I was surprised and wondered how she did it. All she said was, “I don’t know, I planted one tree at a time over the years.” This was my eureka moment. I realized that all I needed to do was just plant one tree at a time to make a small difference. And thus began my journey.

Since then, for the past four years, I have been planting trees. I travel to Bramhapuri twice a year; my tree count till date is 55, and growing. I plant trees in areas permitted by the municipality, which are close to where people stay. Day to day care, including watering of plants, is done by the people staying closest to where I plant trees. They do it without fail and without expecting anything. Sometimes just a photograph with them and some sweets I carry for them is enough. They promptly inform me if there is



any problem with the growth of the trees or any other unexpected issue.

My journey has been one of great learning. I realized that one has to begin without much ado and then follow one’s passion. Over years, perseverance helps accomplish what one desires. I also understood the importance of community involvement. Tasks like environmental sustainability require commitment and support by all concerned. This experience has opened up a whole new world for me. ■

**Simran Bajaj**  
Mumbai

## IN MEMORIAM

There are people who pursue the best because they wish to prove something to the world. And then there are those who strive for excellence because they know no other way. Mr Adhip Kumar Sarkar was one such person. He was Executive President at *Ananda Bazar Patrika*, a Life Member of the Bombay Natural History Society, and founder of the Nature, Environment and Wildlife Society, Kolkata.

He had a vast library of ornithological literature and a wide variety of books on mountains, trekking, and wildlife. He would patiently wait for the *Hornbill* magazine to arrive, and then read



**Adhip Kumar Sarkar**  
(1950 – 1995)

it from cover to cover. He was happiest miles away from civilization, pitching a tent during a week-long trek, and his heart soared in the mountains. Friends would keenly look forward to accompanying him on trips to reserve forests and national parks, and on treks, where he would surprise them by predicting the birds they would encounter a few miles up the road.

On the occasion of Mr Adhip Sarkar’s 70th birth anniversary, his family extends their best wishes to the BNHS, and a donation towards its conservation activities. We are extremely grateful to them for this gesture. ■

# Environment Impact Assessment



NEHA SINHA

**W**hat is our environmental footprint? Can we measure it, and how? In a developing country like ours, there is immense pressure on resources – wetlands are viewed as potential real estate, forests are seen as mines for bauxite and coal, and national parks as oil reserves. An Environment Impact Assessment (EIA) is undertaken to assess the impact a project is likely to have on the environment. EIAs are done under the EIA notification of 2006, which is derived from the parent Environment (Protection) Act, 1986. The government now intends to replace the EIA notification of 2006 and a draft EIA notification, 2020, has been circulated for comments from experts and civil society.

After extensive consultation with scholars, environmentalists and grassroots conservationists, BNHS has formulated its comments on the draft. It is important to highlight some of the significant changes proposed in the Act, to which BNHS has raised objections.

## a) *Violations*

The draft notification says:

“The cases of violation will be appraised by Appraisal Committee with a view to assess that the project has been constructed or carried at a site, which under prevailing laws is permissible or expansion has been done which can be run sustainably under compliance of environmental norms with adequate environmental safeguards. In case finding of the Appraisal Committee is negative, closure of the project shall be recommended along with other actions under the law including directions for remediation.”

This essentially means that projects that violate the EIA – those that come up without EIAs and therefore without valid environmental clearances – will be shut down only if the “finding of the Appraisal Committee is negative”. This would mean that developers can start projects without valid clearances and resume operations after paying a fine. We are in a scenario where EIA regulations

are often flouted. Even with the EIA notification of 2006, many projects run without valid clearances and this often comes to light only after a disaster occurs. For instance, the Visakhapatnam (Andhra Pradesh) gas leak at a plant run by LG Polymers caused death and injury. And so did the recent gas and oil explosion at Baghjan, Assam. Both the sites did not have the required pollution control or environment clearances.

In order to strengthen the EIA regulation, we should discourage violations, rather than condone them. The draft EIA 2020 allows for post-facto approval – that is clearing a project after it has already started – in case the project ‘can be run sustainably’. However, no definition of sustainability has been provided. In real terms, sustainable development refers to development that is done in a sustainable, phased manner, which does not cause serious harm to the environment. However, a project running ‘sustainably’ can also refer to operations that do not keep environmental degradation at bay. Suggesting that it is okay to have post-facto clearance is like saying it is okay to deem environmental considerations as secondary.

On April 1 this year, the Supreme Court ruled that the Central Government has no power to grant post-facto approval. It said that awarding clearances after projects were underway would be in derogation of the fundamental principles of environmental jurisprudence (*Alembic Pharmaceuticals vs R. Prajapati and others*). Justice Dhananjaya Y. Chandrachud held that ‘environment law cannot countenance the notion of an ex post-facto clearance. This would be contrary to both the precautionary principle, as well as the need for sustainable development.’

b) *Who gets to report violations?*

As per the draft, violations can be reported by government representatives and the project developers.

BNHS questioned why there was no place for experts or NGO representation under the proposed Act to assess for cognition of violations. BNHS urged that for this extremely important issue, the views of experts such as biologists, virologists, conservationists, ornithologists, hydrologists, ecologists, environmentalists, site experts, and other scientific experts be taken.

Towards this end, a separate category of “subject and non-governmental experts” should be added to those who can report violations.

c) *Dredging*

As conservation practitioners and researchers, we often ‘see’ things that others miss. There will be a moth under a bunch of leaves, a bird’s nest in a hole in a wall, and frog eggs in a wet patch. Yet, seeing what is under water is a big challenge for researchers and an even bigger challenge to communicate. Freshwater and marine ecosystems and their conservation needs have been historically neglected. Our rivers are highly polluted, and provisions in the proposed Act will make it worse.

The draft says: “Dredging and de-silting of dams, reservoirs, weirs, barrages, river, and canals for the purpose of their maintenance, upkeep and disaster management” does not require impact assessment.

BNHS has urged the Ministry of Environment, Forests and Climate Change (MoEF&CC) to reconsider this, as river dredging can have a serious impact not only on wild population of species such as dolphins and fish, but also impact fish productivity. Currently, the National Waterways Act 2015 is in operation in India, and extensive dredging has been done to make ‘waterways’ in rivers (such as the Ganga). BNHS notes that all projects in respect of inland waterways have been put under a lower category of B2. It is important to continue having EIAs for river dredging. And it is dangerous for policy planners to turn a blind eye to that which can’t be easily seen – fish, dolphins, gastropods, and aquatic vegetation that live in and under water.

d) *Highways*

The draft EIA 2020 has relaxed provisions for highways. It categorizes highway length of 100 km and a width of 70 m as requiring EIAs within category ‘A’. BNHS has urged that instead we need to do EIAs for highways of 30 km with additional right of way greater than 20 m, involving land acquisition. Particularly, highways passing through or in the proximity of protected areas, wildlife corridors, ecologically sensitive sites/zones (both notified and non-notified), sand dunes, river basins, nesting, roosting, and foraging areas of migratory birds, heronries, salt pans, and Key Biodiversity Areas of the abovementioned length require EIAs. ■



# Wetlands

For years, BNHS has been reiterating that wetlands are not wastelands. Many wetlands of importance get encroached or built upon, and ornithologically important wetlands are not notified or recognized as wetlands.

Recently, the National Green Tribunal has called upon state governments to report on significant wetlands and their status. The court has said:

“We also direct that the National Wetlands Committee may compile data of status of compliance of environmental norms in respect of all significant wetlands in the country to ensure remedial action. The State PCBs/PCCs and State/UT Wetland Authorities in India may give the status of management of wetlands in their respective States to the Secretary, MoEF&CC within three months.”



NEHA SINHA

Bronze-backed Jacana, a beautiful waterbird seen in wetlands in India

BNHS has put out an appeal to citizens and citizen scientists to provide data on wetlands, their status, and appropriate bird and biodiversity information, to assist the state in building up the wetland database. We hope to keep adding to wetland lists, so wetlands are never again considered as wastelands. ■

# Trains and Tigers

The state of Karnataka has been pushing to construct a railway line between Hubballi and Ankola in the Western Ghats. The Hubballi-Ankola stretch is an area with several elephants. It is also close to the Kali Tiger Reserve and is part of a forest corridor between Kali Tiger Reserve and Bedthi Conservation Reserve.

Section 38V (3)(b) of the Wildlife Protection Act says:

[we should have] ecologically compatible land uses in the tiger reserves and areas linking one protected area or tiger reserve with another for addressing the livelihood concerns of local people, so as to provide dispersal habitats and corridor for spill over population of wild animals from the designated core areas of tiger reserves or from tiger breeding habitats within other protected areas.

BNHS has opposed the railway line, as in the context of wildlife conservation, railway lines do not constitute ‘ecologically compatible land uses’. Further, under section 38V (3)(c) of the said Act, provision has also been made to ensure that “the forestry operations of regular forest divisions and

those adjoining tiger reserves are not incompatible with the needs of tiger conservation.” In general, the managerial approach followed in buffer zones is applicable to tiger corridor areas as well. It is not amenable to tiger conservation to have railway lines in tiger corridors and landscapes.

Railways lines are also a serious threat to elephants. According to information provided by the MoEF&CC, 62 elephants died in various parts of India because of collision with trains during the



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A male tiger from Central Indian forest

period 2015–19. Several members of the Karnataka State Wildlife Board have recorded their objections to the proposed alignment of the Hubballi-Ankola line on the grounds that it will cause water scarcity in the Kali river catchment area.

BNHS has urged that this plan be dropped. Usage of other existing railway lines increases commute time between Hubballi and Ankola by about an hour and thirty minutes, but this time will save the biodiversity and forests of the area. ■

## The ‘Ecosystem’ Around Coal

Recently, the Government announced the auction of 41 sites for coal mining as part of its stimulus package during COVID-19. Most of these are in central and eastern India, and many are located around elephant reserves. Other than actual mining, it is also important to look at the infrastructure around coal, such as railway lines or ports to carry the coal.

Dr Haripriya Gundimeda from Indian Institute of Technology, Bombay, stresses that coal has ‘hidden costs’ – such as transportation, damage to public health, and high fly-ash content. In this context, it is also important to consider the recent findings of a National Green Tribunal (NGT) committee.

The NGT constituted a multi-member committee to investigate coal mining in the North Karanpura landscape in Jharkhand. The Committee comprised representatives of MoEF&CC, Central Pollution Control Board, Jharkhand Pollution Control Board, and Dr Sharad Lele of ATREE. The committee, which submitted its report on September 14, 2020 to NGT, found large scale violations in the coal mining undertaken by South Eastern Coal Field Ltd. The findings could have important implications, given that a significant number of the new coal blocks auctioned are in the North Karanpura landscape. The report stressed that we must focus not just on individual mines but also on cumulative impacts of mines in the region, and the impact of coal is also in the transportation of it, which is likely to be polluting. For instance, the people of Goa have complained on air quality deteriorating because of trucks carrying coal, dispersing coal dust.

The report says:

‘The cumulative environmental impacts of these developments cannot be understood through individual EIAs or investigations of individual



NEHA SINHA

Forest stretch in Chhattisgarh, a region which sees intensive coal mining

projects. In particular, coal transport outside project premises on public roads or via common railway sidings used by multiple projects. Similarly, in a region rich in rivers, the impact of cumulative forest loss and mining activity on rivers and groundwater hydrology can only be understood at the catchment or sub-basin level.

While studying the environment, we must fully understand the value and costs of the energy path India takes. Doing cumulative or landscape level studies and EIAs is one valuable way of understanding such costs, and making sound, scientifically robust decisions.’ ■



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She has a special interest in the intersection of politics and conservation.

## Learn from Home



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While everyone has been busy working from home during the past few months, BNHS reached out to nature lovers through a 'Learn from Home' initiative.

BNHS-ENVIS Resource Partner on Avian Ecology and CEC-BNHS have been conducting a series of free webinars, which were attended by thousands of participants from across the globe. The sessions included talks by eminent experts from BNHS and outside.

Under the Green Skill Development Programme (GSDP), BNHS-ENVIS organized a Certificate Course in People's Biodiversity Register (PBR). This technical training course was designed for the youth of rural areas where local communities depend heavily on bio-resources. A short documentary showcasing the training provided to the youth on how to put together a PBR is available on BNHS YouTube channels in Hindi and Marathi (with

English subtitles). The documentary received more than 1,000 views within two weeks.

CEC Mumbai designed and initiated new online crash courses on 'Introduction to Birds', 'Introduction to Butterflies and Butterfly Gardening', and 'Introduction to Plants', for amateurs. The seven-week long certificate courses, consisting of seven webinars and study material, were attended by 159 registered participants. The popular course 'Introduction to Birds' was oversubscribed, and a second batch had to be announced. CEC Mumbai has started admissions for the Basic Course in Ornithology (11 months), Leadership Course in Biodiversity Conservation (11 months) and Basic Course in Herpetology (4 months). About 85 participants have registered for these online courses. ■

## World Environment Day, a Digital Celebration



ACCENTURE

A blog titled 'Amidst the Lockdown, Birding Soars' was released by Accenture Labs and BNHS on World Environment Day, celebrated on June 5, and is available on the BNHS website. The Internet of Birds mobile

application, a BNHS-Accenture Labs collaboration, blends technology with biodiversity to identify birds from the Indian subcontinent, and helps amateurs connect to backyard birding. Accenture Labs has provided *pro bono* services to design and build this program. Anyone can contribute to this citizen science platform by downloading the app which is available in Google Play Store and Apple App Store.

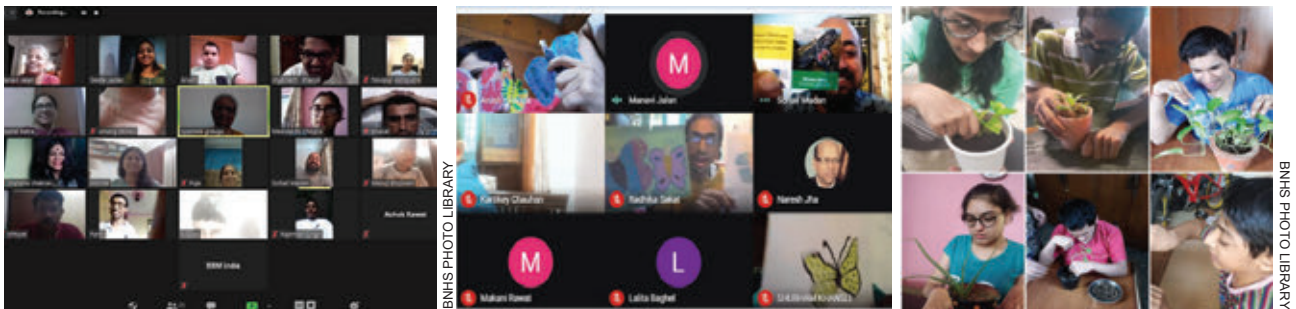
BNHS-ENVIS Resource Partner on Avian Ecology celebrated World Environment Day by releasing a series of digital posters and publications. The theme for 2020 was 'Biodiversity', which was celebrated by online poster releases on the State bird, mammal, insect, flower, and tree of Maharashtra, and Kingfishers of India. An online quiz contest on birds was conducted, informative matter on COVID-19, and a poem titled 'Fallen Dynasty' was shared. The day ended with a webinar on the Central Asian Flyway. ■



## Climate Change and the Ethics of Birdwatching

A training workshop for ecotourism guides was organized by BNHS in Barsey Rhododendron Sanctuary, Sikkim from June 19–22, 2020, in collaboration with Mr Ugyen Sherpa of Kyilkhoh Homestay, Okhrey. The workshop was aimed at engaging the youth of Sikkim to enrich their knowledge of the local biodiversity and enable them to pursue a career in ecotourism. During the workshop, Mr Atharva Singh from the BNHS Climate Change Programme team spoke about the potential of bird tourism in the sanctuary, and about the avian diversity of Sikkim. Considering the COVID-19 scenario, a limited number of youth were invited to attend the workshop, and strict safety protocols were maintained. Webinars on ‘Climate Change – Its Impact on Biodiversity’ and ‘Ethics of Birdwatching’ were also held, with support from the BNHS-ENVIS team. Watch the webinars at <<https://youtu.be/46Afn1qk5T0>> ■

## Wildlife in My Backyard



Online environment awareness courses conducted by BNHS-CEC, Delhi

BNHS Conservation Education Centre, Delhi conducted an online course on ‘Environment Awareness’ for the students of Action for Ability Development and Inclusion (AADI) in July, 2020. The course consisted of 10 sessions, featuring topics like ecosystems, mapping backyard diversity, air, water, soil, vegetables, flowers, insects, and birds. There were exciting home tasks for which the participants brought some innovative ideas to

the table. A digital valedictory function was organized to present e-certificates.

Some other online courses with participants from all over India were: ‘Your Vegetable Garden’, June 13 to July 5, 2020; ‘All about Butterflies’, June 20 to July 6, 2020, with BNHS Conservation Education Centre as a knowledge partner. An online course on butterflies was conducted for Delhi Bird Foundation and The Delight Factory. ■

## The Butterfly Effect



Butterflies, like this Red Helen, are indicators of a healthy environment

Scientists from BNHS and Somaiya Vidyavihar University published a research paper ‘Finding the forgotten gems: Revisiting the butterflies of Matheran after 125 years, with an introduction to the novel colour barcode for depicting seasons and activity of the Indian butterflies’ in the community peer-reviewed *Biodiversity Data Journal*. The article summarizes eight years of fieldwork and usage of colour barcoding by Mandar Sawant, Nikhil Modak, and Sagar Sarang in the forests of Matheran. The scientists recommend the use of colour coding while uploading records on open databases, which help to convey information on the seasons and activities of butterflies. Butterflies are not just beautiful creatures, but also indicators of a healthy environment and ecosystem. Their long-term study will help to assess and conserve the health of the ecosystem. The paper is available at <<https://bdj.pensoft.net/article/54333/>> ■

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