



ANNUAL REPORT

2022–23



A YEAR OF RESEARCH AND BUILDING COMMUNITY

I present to you to NCF's Annual Report, covering the financial year from April 2022 to March 2023. It has been an extremely challenging year for conservation in the world, and in India as well. As we continue to lose precious natural ecosystems, and more and more species face the threat of extinction, it's natural to feel overwhelmed by the crises. But I draw hope from my colleagues as they work towards balancing the needs of conservation with people's rights and aspirations—building strong connections with communities and continuing long-term research and monitoring of wildlife.

Through my work on elephants and people in Valparai and Hassan, I have seen first-hand how a bottom-up approach involving local communities and government agencies can save lives—keeping both elephants and humans safe as they share spaces and live together. I see these partnerships with communities as key to many of the projects at NCF, and it gives me hope about the future.

In 2022-23, it is with great pride that I witnessed NCF teams work towards studying and conserving coral reefs, snow leopards and their prey, elephants, hornbills, and other threatened species and ecosystems in India, all while ensuring that local communities are centred throughout their work.

This year, our generous supporters enabled us to carry on with our research, conservation and outreach work across the country—highlights of which you will read in the pages ahead. We thank everyone who stands by us and works with us towards a world where nature and society flourish together.

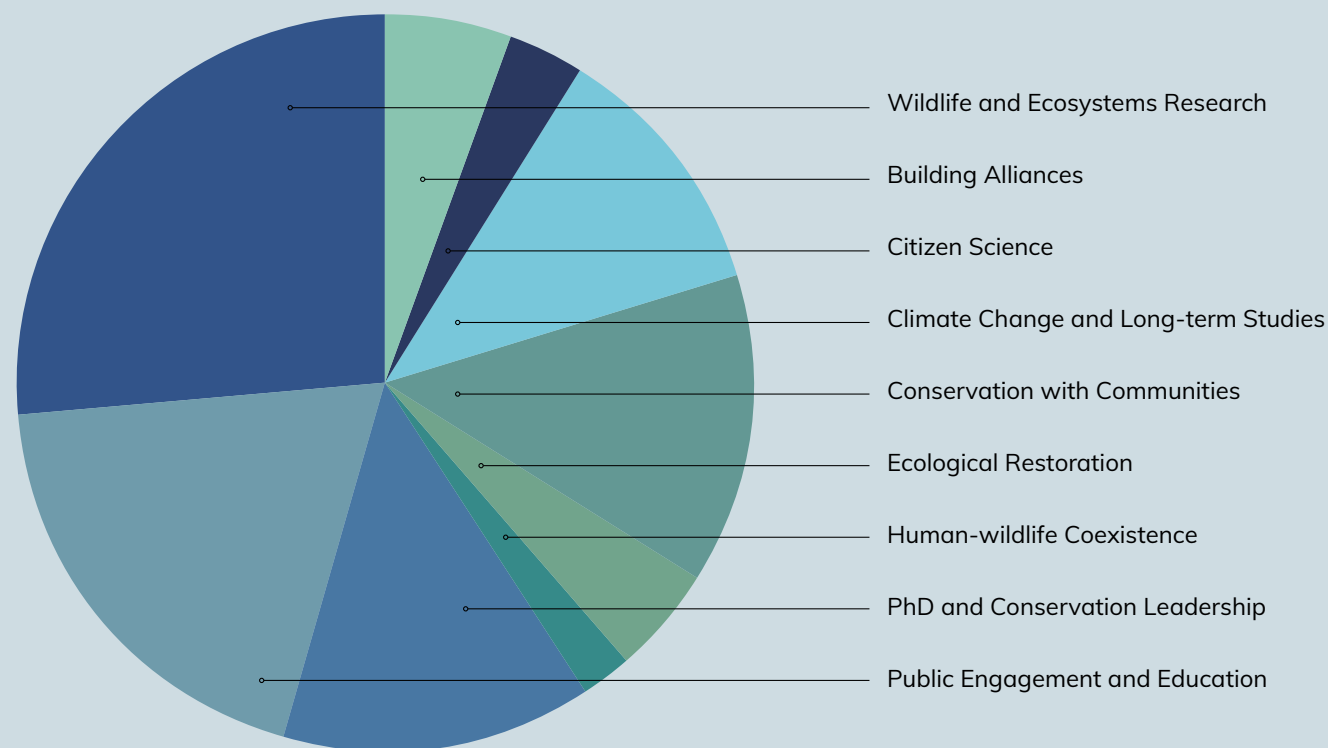


M. Ananda Kumar

Director, NCF & Senior Scientist, Western Ghats Programme

2022-23 *at a glance*

Project Themes



This year, we had 23 projects on wildlife and ecosystems research, 17 on public engagement and education, 12 each on conservation with communities, and as part of our PhD and Conservation Leadership programme, 10 on climate change and long-term studies, 5 on building communities, 4 on ecological restoration, 3 on citizen science, and 2 on human-wildlife coexistence. To see the full list of projects we worked on in 2022-23, head to page 74.

Publications



To see the full list of publications for 2022-23, head to page 66.





ABOUT THE PROGRAMME

We study some of India's most diverse, ignored, and threatened species and ecosystems. Despite our vast coastline and unique oceanic island systems, our understanding of nearshore marine ecosystems is scant. Our team is working to document, understand and conserve marine systems in the Andaman and Nicobar Islands, the Lakshadweep Archipelago and the Indian West Coast. Using long-term monitoring, field-based studies, genetic approaches and policy analysis, we are tracking the impacts of climate change on ecosystems, exploring sustainable fisheries, studying the biology of endangered animals and evaluating the influence of ecological decline on human well-being and survival. Our vibrant outreach programme seeks to engage communities in a joint exploration of the links between local culture, history and the marine ecosystems on which they depend.



PROJECT IN FOCUS

Exploring coral resilience in the Lakshadweep islands

Coral bleaching occurs because of the breakdown of the relationship between coral and their dinoflagellate symbionts, zooxanthellae. In the face of climate change, mass bleaching events are becoming increasingly common, and are perhaps the biggest threat that coral reefs face globally. However, not all coral reefs bleach to the same extent, and research over this past decade has been dedicated towards finding pockets of resistance to bleaching which may serve as coral refugia. Studies from other parts of the world have shown

that environments with highly variable temperatures tend to host coral that are more resistant to warm temperature events.

The lagoons of Lakshadweep are one such environment where the limited flow and shallow depth of the lagoon may result in more variable temperature environments than the outer reef flat. Given the acclimation and adaptation potential of coral in high stress environments, it is possible that certain sites within lagoon environments could

serve as a source of heat resistant coral. To explore this in the field, we tagged and photographically monitored bleaching and mortality in individual coral across the outer reef and lagoon. We monitored individuals of 3 species for a period of 3 months at intervals of ~2 weeks. We found that the temperatures in the lagoon were more variable than temperatures in the outer reef. Counter to our expectation, we saw more bleaching in coral in sites

with high variability in temperature. However, we found partial mortality to be much higher in sites with low variability, for one species—*Pocillopora*. This study serves as an exploration, to further explore coral resilience within Lakshadweep's lagoons.



PARTNER HIGHLIGHT

Cholamandalam Investment and Finance Co. Ltd.

In a series of ongoing studies supported by Cholamandalam Investment and Finance, we are combining a range of in-water and land-based studies to establish the current status of reef ecological processes, freshwater usage and status, and the overall long-term habitability of the Lakshadweep islands. Additionally, we are exploring the social and economic drivers of the emerging commercial reef fishing in these islands and developing novel genetic tools to explore population boundaries of commonly caught fish by industrial fishing along the entire west coast of India.



SPECIES SPOTLIGHT

Giant Guitarfish

The Giant Guitarfish Project was initiated in 2019 to highlight the importance of shallow coastal waters of the Andaman Islands to a Critically Endangered species of giant guitarfish. The project started with collecting local knowledge on the spatial and temporal distribution of juvenile giant guitarfish sightings across the Andamans. This study revealed the widespread distribution of this species across the islands and laid the foundation

upon which the rest of the project has expanded upon.

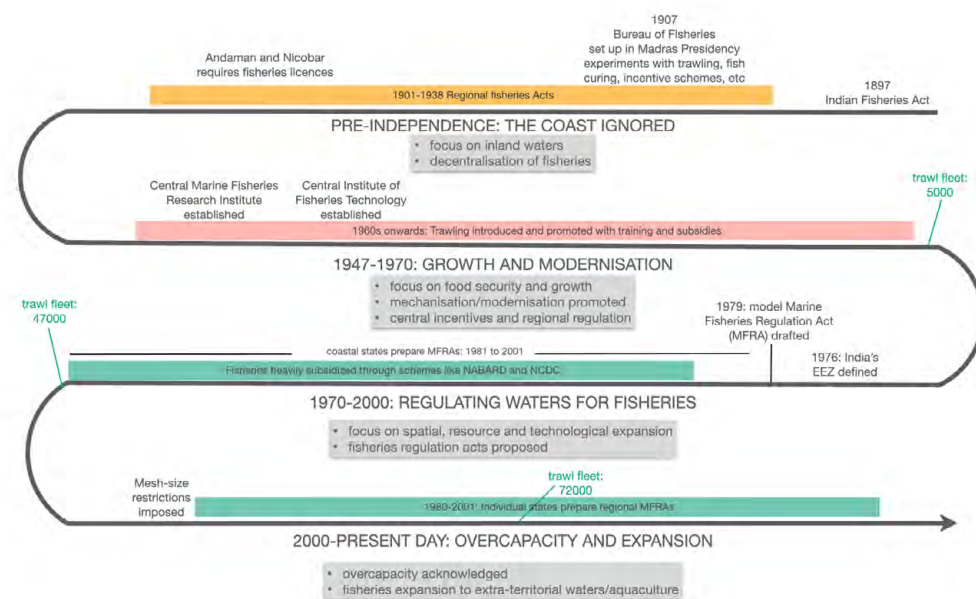
In the year 2022-2023, we have broadened our focus to studying not only giant guitarfish but other species of rays that also use similar habitats. We conducted an island-wide survey across 25 sites to try and understand what makes a habitat suitable for juvenile giant guitarfish and other rays. We collected

fine scale data at each site on nine habitat parameters such as substrate type, water depth, and seagrass cover, to name a few. We also collected data on anthropogenic disturbances such as fishing and boat activity at each site. We will now use this data to identify what habitat characteristics play a role in determining the suitability of different coastal sites across the islands for these species. We will also map out the level of

disturbances and threats at each of these sites. This will serve as an important tool in better managing the allocation of conservation efforts aimed at protecting giant guitarfish, rays and the habitats that they depend on.

How well does Indian fisheries policy engage with fisheries biology?

Exploring the science-policy interface of coastal capture fisheries along the west coast of India



Our paper examines the interface between science and policy in exploring how closely fisheries policy in India is influenced by available knowledge of fisheries biology. Spanning a 75-year time-span from Indian Independence to now, our study is the first systematic work to show the clear disconnect between fisheries policy and science. It suggests that the overcapacity in coastal waters may stem from a failure to engage with fisheries biology while pursuing an un-shifting goal of maximising productivity. While there has always been the suspicion that this must be true, our work is the first

to systematically unpack the mismatch between science and biology with a detailed analysis of all existing policy directives from Indian waters.

India is the world's most populous country which is aiming for massive growth in the fisheries sector, to contribute to the food security and GDP goals of the country. Our study shows that despite more than 20 years of recognition of overcapacity in the coastal waters, little has been done to address this overcapacity. Instead, solutions to coastal overcapacity have been sought with spatial shifts to extra

territorial fishing and aquaculture without addressing coastal over-harvest.

Our study also shows that there are significant gaps in the biological understanding of fish species harvested from Indian waters. There is no policy mandate for any of the managing agencies in India to incorporate known fish biology and to keep policies updated. As a result, the use of fish biology to sustain the fish stocks is rare and ad-hoc and is largely dependent on individual regional management agents who rarely, if ever, coordinate between them. **In a nutshell, we argue that India treats its fish more as a mineral than a biological entity—something that has to be found and exploited rather than something with an organic reproducing biology and ecology of its own.**

Our paper is the first of its kind to evaluate how meaningful Indian fisheries policies are biologically. This scrutiny is critical for future policy makers to make policies biologically meaningful and ecologically sustainable. .

CITATION: Gangal, M., Suri, V., & Arthur, R. (2023). How well does Indian fisheries policy engage with fisheries biology? Exploring the science-policy interface of coastal capture fisheries along the west coast of India. *Marine Policy*, 156, 105796.

PROGRAMME TEAM

Evan Nazareth, Rachana Rao, Kavya Ramesh, Saw Yoayela, Phoolmani Kongari, Elrika D'Souza, Teresa Alcoverro, Rohan Arthur, Mayuresh Gangal, B T Rajeswari, Wenzel Pinto, Al Badush Gafoor, Mayukh Dey, Siddarth Mahesh, Kevin George, Somesh S. Menon, Malvika Tewari, Anandram Krishnan, Radhika Nair

FUNDERS

Cholamandalam Investment and Finance Co. Ltd., Science and Engineering Research Board (SERB), Government of India Long-Term Ecological Observatories (LTEO), Ministry of Environment, Forests and Climate Change, The Rufford Foundation, Save Our Seas Foundation, Arvind P. Dattar

COLLABORATORS

Andaman and Nicobar Islands Environmental Team (ANET), Thanal, Kavaratti, Lakshadweep SCUBA adventures, Centre d'Estudis de Blanes (CSIC), Dakshin Foundation, Mediterranean Institute of Advanced Studies (IMEDEA-CSIC)



ABOUT THE PROGRAMME

We work in India's high-elevation western Himalayan areas to help conserve the diversity of life and landscape, with snow leopards as the flagship species. We do this in a scientifically robust and socially responsible manner by combining research, community involvement, conservation outreach, and policy-level dimensions.



PROJECT IN FOCUS

Working with Changpa herders in documenting and monitoring local wildlife

The eastern region of the Union Territory of Ladakh hosts the Changpa nomadic herders, renowned for rearing Changra goats that produce the finest pashmina. In addition to challenges of harsh conditions above 4000 m, including sub-zero winters, sustaining this traditional vocation is increasingly difficult due to a commoditised wool market. Many are drawn to Leh for a better life. Yet, the herding of Changra goats remains vital to the Changpa community's culture and economy. Coexisting with rare high-

altitude wildlife in Changthang, herders encounter challenges like livestock depredation by snow leopards and other predators. Efforts to minimise risks and provide financial relief exist, but undocumented traditional knowledge could play a crucial role in documenting and monitoring local wildlife, as well as fostering improved coexistence with wildlife. The possibility to deploy this inherent knowledge to document and monitor local wildlife by herders has not been explored. Such methods could be

effective to gather authentic information from across Changthang, and will further strengthen the herders' role in protecting local wildlife.

We worked with a subsection of herders from the Korzok belt in Changthang. We focused on working with them especially through the winter in the Tegazong region (along the Indo-Tibetan border, south-east of Korzok) as this is where the herders from Korzok, Chumur, Sumdoo spend the winter. While there are more than 300 herders in the entire area, they are sub-divided into various valleys, each with a head person (Churpon) that reports to the Goba (village headman). We worked with one of these valleys with a total of 50 herders. After consultations with the Goba and Churpons in Korzok, we selected 50 herders operating under 3 Churpons for our pilot project in Changthang. Identified through mutual consultation, these herders face heightened wildlife depredation and climatic extremities.

A common concern raised by herders was lack of electricity or dysfunctional solar lanterns in the nights which often meant

they cannot ward away predators in the night nor can they get much needed rest to effectively herd the next day. We provided 50 solar-powered lighting units, aiming to enhance their safety and rest. In return, across Tegazong, near the Indo-Sino border, herders agreed to undertake periodic wildlife monitoring. This effort involved collecting data on wildlife presence and livestock losses, contributing to a comprehensive understanding of this landscape.

Herders individually documented data in the local Tibetan dialect and, in some cases, English. The list of species recorded included the Tibetan wolf, Tibetan argali, blue sheep, snow leopard, Eurasian lynx, and Tibetan gazelle. For several decades, the only record for Tibetan gazelle in Ladakh was from the Kalak Tartar (KTT) plateau in Hanle, which is about 150–200 km away from this region. The data recorded two young males, which could mean they are dispersing to new areas. Livestock losses were attributed to hypothermia, malnutrition, diseases, and predation. We have also published a paper to document the entire exercise and the results.



PARTNER HIGHLIGHT

Himachal Pradesh Forest Department

The sustained support from the Himachal Pradesh Forest Department (HPFD) has been instrumental in guiding the planning, execution, and administration of our conservation and research efforts over the years. Together, we formed a strong partnership that led the way in initiating the Snow Leopard Population Assessment (SPA), a pioneering effort in India. This collaboration has not only been pivotal in establishing our presence in the landscape but has also made significant contributions to advancing research and implementing robust conservation initiatives. Recognising the importance of maintaining positive relations with local stakeholders and government bodies, we emphasise on continuing to nurture and expand our collaboration with the HPFD in our ongoing efforts in Himachal Pradesh.



IN THE FIELD

Jammu and Kashmir

For many years, the High Altitude Programme has been actively engaged in Himachal Pradesh and Ladakh, establishing a presence spanning over two decades in Himachal Pradesh. In the fiscal year 2022–23, our efforts expanded to include the Union Territory of Jammu and Kashmir. We initiated multiple rounds of camera trapping covering an area of approximately 3500 sq kms at 3200–4500m above sea level

to comprehensively understand the distribution of wildlife across the various valleys in the region and to gather robust evidence of the presence and abundance of snow leopards.

Camera trapping activities were conducted in the Warwan, Thajawas, Baltal-Zojila, and Gurez-Tulail regions. Following the removal of camera traps in October 2022 from the Baltal-Zojila

region, one of the cameras revealed images of snow leopards, providing conclusive evidence of their presence in the area. Additionally, the cameras captured images of rare wildlife species, including the Kashmir musk deer, brown bear, and Asiatic ibex, among others.

This is a noteworthy feat, significant in determining further work in the landscape. Considering the limited

information available regarding snow leopard occurrences in the Union Territory, this data is immensely valuable, and is paving the way for further research and conservation interventions in the region.

FEATURED PUBLICATION

HimKatha—a newsletter that celebrates human-nature relationships in the high altitudes



We initiated HimKatha, a bi-annual newsletter that celebrates human-nature relationships of communities living in the districts of Lahaul-Spiti and Kinnaur of Himachal Pradesh and the Leh district of Ladakh. The western trans-Himalayan mountains are rich in history and culture. The stories of people, their experiences and their relationship with nature are passed from generation to generation through oral stories. Through HimKatha,

we explore and celebrate local culture, traditions, and practices that have stood the test of time. HimKatha carries stories that are locally relevant and are contributed by community members. Currently the newsletter is distributed in over 70 villages. We are now working to include new methods to record and share the stories coming from these remote areas.



This rich resource of history and knowledge has informed and shaped our work in this region and our connection with the people of this landscape. In 2022–23, we published two issues covering themes of agriculture, nature and local fibres. We also published an issue on water which was circulated through online mediums only.

URL: www.himkatha.org

PROGRAMME TEAM

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FUNDERS

Cholamandalam Investment and Finance Co. Ltd., Conservation Leadership Programme, Rufford, ICICI Bank, ICICI Foundation, National Geographic, Panthera Sabin, The Serenity Trust, Snow Leopard Trust



ABOUT THE PROGRAMME

The Western Ghats as a global biodiversity hotspot is one of the most irreplaceable areas for conservation, with a staggering diversity of plants and animals in a densely populated region. Our work here focuses on human impacts on wild species and habitats, biological surveys, human-wildlife conflict research and mitigation, and ecological restoration. This involves field research in plant and animal ecology, on-ground efforts to reduce human impacts on wildlife and conflicts between people and wildlife, and ecological restoration of degraded areas. We also try to translate our scientific findings to inform and influence conservation policy and practice through engagement with diverse stakeholders.



PROJECT IN FOCUS

Tropical rainforest dynamics in a changing climate

Nearly half the world's forests are within the tropics, and over two-thirds of global biodiversity and about 55% of all the terrestrial carbon is stored in these forests. The dense and moist tropical rainforests, in regions such as the Western Ghats, are particularly important for biodiversity conservation as well as for their tempering influence on global climate. As large tracts of the tropics have been converted, degraded or altered, conservationists have also started looking at the dynamics of

secondary rainforests, besides mature rainforests. In South Asia, there has been limited empirical long-term research and monitoring of vegetation and carbon dynamics. Our project in the Western Ghats focuses on monitoring forest structure, diversity and composition, and carbon dynamics of both secondary and mature rainforests. As part of the Long-term Ecological Monitoring Network – India (LEMoN-India), we have established two 1 ha plots in secondary and mature rainforests of the Anamalai Hills and one

plot in Kadamane, central Western Ghats. Analysis of the first five years of data from the Anamalai Hills indicated that, as expected, mature rainforests had higher tree diversity, carbon stocks and relatively intact composition. However, the post-agroforestry secondary rainforests showed high rates of biodiversity and carbon accrual emphasising their

conservation and climate significance. Mature rainforests showed moderate losses of carbon over the 5-year period, similar to patterns reported in some other mature South Asian tropical forests—a cause for concern under ongoing climate change.



PARTNER HIGHLIGHT

Ecological Restoration Alliance

Ecological Restoration Alliance – India (ERA–India, www.era-india.org) is an informal partnership of individuals, organisations and groups working together to foster knowledge and practice of ecological restoration of natural ecosystems in India. The goals of the Alliance are to collate and share knowledge, experience, and case studies of ecological restoration of natural ecosystems across India. Through this, ERA–India aims to create, expand, inform, and enable civil society, government, and citizenry engaged in appropriate and effective ecological restoration nationwide. ERA–India envisages a future where anyone anywhere in India can restore their native landscapes.

The ERA–India alliance is headed at present by an 11 member steering committee: Anita Varghese, Aparna Watve, Arun V, Divya Mudappa, Paul Blanchflower, Pradip Krishen, Rita Banerji, Siddharth Rao, Suprabha Seshan, T. R. Shankar Raman and Vijay Dhasmana. ERA–India is anchored at the Nature Conservation Foundation and has 7 other institutional partners: Adavi Trust, Ashoka Trust for Research in Ecology and the Environment (ATREE), Auroville Botanical Gardens, The Forest Way, Greenhub, Keystone Foundation and the Wildlife Trust of India. It was formally launched on 1st August 2022 with about 50 members listed on the platform and by end of March 2023, there were about 150 registered members.



IN THE FIELD

Hassan, Karnataka

Our long-term human-elephant coexistence project in the Hassan region began in 80 villages (200 sq km) in 2015 and has expanded to 320 villages (750 sq km) in 2023. The Hassan landscape is primarily dominated by coffee-paddy crops interspersed with monoculture habitats of eucalyptus and acacia and a few forest fragments, supporting around 65 elephants and the livelihoods of over 125,000 people. The intense human-elephant conflict situation resulted in

the loss of 57 human lives between 2010–2023, besides crop damage by elephants, eliciting fear, trauma, and antagonism in local communities towards elephants. To prevent human fatalities due to elephants, early warning systems using SMS and voice call alerts, and digital information boards and alert light beacons in strategic locations, which would warn people about elephant locations have been implemented in 250 villages. These systems have been

well regarded by local communities and resulted in a decline of human fatal incidents from an average of five persons/year to two persons/year in the monitoring villages between 2018–2023. However, over the years, installation of solar powered fences around coffee plantations and railway barricades along the Hemavathi Reservoir in order to avoid elephants entering from the Coorg region, forced a majority of elephants to move into new villages of Sakleshpur

and Belur region that resulted in nine human fatalities between 2021–23. This forced the Karnataka Forest Department to capture six elephants during 2022–23. The prevailing conflict situation necessitates expansion of early warning systems accompanied by outreach programmes in newer areas of Belur and Sakleshpur that may help keep people safe while also reducing pressures on elephants.

Small mammals reduce distance dependence and increase seed predation risk in tropical rainforest fragments



In a forest, plants form the bedrock which supports myriad species of animals. While plants appear to have sedentary and dull lives, the life of a plant in reality is dynamic, fraught with challenges and involves interactions between several players. Each plant has a story to tell—about the journey it took to reach its location, the number of predatory animals and harsh conditions it had to overcome to become a magnificent, tall tree. The tree stands at the centre of activity in a forest, inviting insects, mammals and birds to its flower nectaries, sweet fruits, scrumptious leaves, and unnoticed by many, even to its fallen seeds.

A seed is the most vulnerable stage in the life of a plant. Many mammals like rodents, primates and ungulates feed on seeds, determine their fate, and ultimately play a role in shaping the forest tree community. The composition and abundance of animals in a forest play a role in determining how many seeds of each plant species survive and thus the abundance of plants in a forest. Hunting of animals, destruction and fragmentation of forests changes the animal composition within, which could alter the plant community in these forests.

For this study, published in *Biotropica* and supported by National Centre for Biological Sciences, Centre for Cellular and Molecular Biology, and Nature Conservation Foundation, we examined how patterns of seed predation by mammals are altered in fragmented rainforests. In fragmented forests, large mammals are thought to have less space and food and thus reduce in abundance. On the other hand, small mammals that might have enough food and space, can thrive without the competition from large mammals. But small mammals are major seed predators! So this could mean that seeds face greater



seed predation by mammals in fragmented forests.

To test this, we set out seeds of four rainforest tree species in both fragmented and contiguous forests. At each tree, we laid the seeds in pairs of 'seed plots' (consisting ten seeds)—one plot within a mammal exclosure and the other outside the exclosure. The difference in predation between the plots within and outside the exclosures would tell us the 'mammal effect' on seed predation. We monitored the seed plots weekly for over two months and found that mammals indeed consumed more seeds in fragmented forests than in contiguous forests. To look

at who was eating the seeds, we placed camera traps at seed plots and found that small mammals such as rodents and mouse deer visited seed plots much more frequently in fragmented than contiguous forests. The study showed that the possible changes in mammal composition reduces seed survival and may impact future tree communities in fragmented forests.

CITATION: Krishnan, A., Osuri, A. M., and Krishnadas, M. 2022. Small mammals reduce distance dependence and increase seed predation risk in tropical rainforest fragments. *Biotropica*, 54, 1428–1439. <https://doi.org/10.1111/btp.13137>



PROGRAMME TEAM

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FUNDERS

Rohini Nilekani Philanthropies, The Habitats Trust, Rainmatter Foundation, Arvind P. Datar, Cholamandalam Investment and Finance Co Ltd., Arnold Arboretum of Harvard University, Department of Biotechnology, Science and Engineering Research Board – Department of Science and Technology, On The Edge Conservation, Adesh Jagtap, Vivekanandan Seetharaman, Ganesh Raghunathan, Seema Deshpande, Amith Srinivas, Sunmeister Energy Pvt Ltd, Rajesh Lakshmipathy, Usha Ramakrishnan, Shanmuga Kanthimathinathan, Udain Singh Tomar, Amod Inamdar, Rohit Varma, Shivakumar M, Mrunalini Nandaa Kumar, Shruti Sharma, Raoul Bhavnani, Rohit Rajendran Investments Private Limited, Kandasamy Rathinasamy, Namrata Sukumar, CS Rangavittal, Mr. and Mrs. T R Rajagopalan

COLLABORATORS

Ecological Restoration Alliance - India, AMM Murugappa Chettiar Research Centre, National Centre for Biological Sciences, Harsha J and Payal Mehta, Ashni Kumar Dhawale, Navendu Page, Rohini Nilekani Philanthropies, Rainmatter Foundation, Parry Agro Industries Ltd, Tata Coffee Ltd, Kadamane Estates Company, Harley Estate, On The Edge Conservation, Hassan District Planters Association, Gram Panchayats of Alur, Yeslur, Sakleshpur, and Belur, Karnataka Electricity Board.

ACKNOWLEDGEMENTS

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ABOUT THE PROGRAMME

We have been engaged in long-term research, monitoring and conservation of hornbills, primarily in western Arunachal Pradesh for 20 years and have expanded to sites in Assam and North Bengal from 2017. Research is currently focussed on plant–animal interactions, tropical forest dynamics, tree phenology, hornbill biology, and understanding human impacts on wildlife and forest recovery. Conservation action is focussed on protecting hornbills and tropical forest habitats through community engagement, restoration of degraded habitats, and nature education for children. This is carried out in partnership with indigenous communities and the government. Newer initiatives include a study on the Chinese pangolin using interdisciplinary and participatory methods in central Arunachal Pradesh. A collaborative, rights-based biocultural programme that is led by a group of Idu Mishmi Indigenous People seeks to strengthen Idu cultural and traditional institutions for the existence of Dibang's biocultural diversity in eastern Arunachal Pradesh.



PROJECT IN FOCUS

Conserving the Chinese pangolin through community engagement in Arunachal Pradesh

This research focusses on the Critically Endangered Chinese pangolin (*Manis pentadactyla*) in the Siang River Basin of Arunachal Pradesh, home to the Indigenous Adi people. The species faces threats from illegal wildlife trade, and there is a lack of recent systematic data in northeast India. Urgent research is essential to inform and implement effective conservation strategies. Therefore, we conducted year-long, local knowledge-based interviews with the Adi community to fill this knowledge gap. We investigated species' distribution, status, hunting pressure and socio-cultural beliefs associated with the pangolin using interdisciplinary and

participatory methods. Additionally, we conducted a pangolin-specific camera trap survey in Daying Ering Wildlife Sanctuary, centering on active burrows identified through local knowledge. Local knowledge-based interviews and camera trap findings underscore the complementary nature of indigenous knowledge and scientific conservation efforts, crucial for species like pangolins. While the camera trap study provides preliminary insights, further research with a greater camera trapping effort over an extended research period is needed to strengthen our understanding of the species in this region.



PARTNER HIGHLIGHT

Nature Mates Nature Club

Nature Mates Nature Club (NMNC) is a conservation organisation based out of Kolkata, West Bengal. Their work largely focuses on wildlife research, education and awareness, community upliftment and creating and restoring habitats for biodiversity conservation. NMNC collaborated with the Eastern Himalaya Programme (EHP) of NCF to initiate the first detailed study of hornbills in the north Bengal landscape in 2017. Ever since, this collaboration has expanded the scope of hornbill research and conservation across several protected areas and non-protected areas of north Bengal. Our joint efforts on-ground have led to locating 38 nests of four hornbill species in Buxa Tiger Reserve and three nests of two hornbill species in and around Mahananda Wildlife Sanctuary. Through a park-wide survey over two years, our team has estimated hornbill densities and abundance of four hornbill species in Buxa Tiger Reserve, while the population surveys in and around Mahananda Wildlife Sanctuary are ongoing. We have also identified several roost sites of the Great and Wreathed Hornbill in Buxa Tiger Reserve that are monitored weekly. At both Buxa

Tiger Reserve and Latpanchar, a fringe village of Mahananda Wildlife Sanctuary, we have conducted vegetation surveys and are monitoring tree phenology of key tree species. Apart from this, we have completed social surveys across 10 villages to understand perceptions towards hornbills and resource use and dependency, nature guide training, nature education programmes for local schools in both Buxa and fringes of Mahananda and training for forest department frontline staff on field techniques for monitoring hornbills.

This collaboration with Nature Mates Nature Club has helped us expand our hornbill research and conservation efforts to north Bengal. As a roadmap for the future, we are currently working towards building a partnership with the Forest Department to integrate ecological forest restoration to restore degraded patches in Buxa Tiger Reserve and also to develop a conservation action plan for hornbills in the north Bengal landscape.



IN THE FIELD

Dibang Valley

Dibang Valley (~12,000 km²) of Arunachal Pradesh is the ancestral homeland of the animist Idu Mishmi people whose entire population is under 15,000. It is also home to a newly registered population of genetically distinct tigers, over 550 species of birds, 381 species of butterflies, 90 species of herpetofauna and thousands of other life-forms. Our research has shown that cultural connections between the Idu and the nonhuman world have allowed more tigers to exist in Dibang's community-owned forests than regional tiger reserves. Recent years have seen escalating threats both to Dibang's wildlife (e.g., illegal wildlife trade, large infrastructure development) and cultural traditions (e.g., livelihood transitions,

land tenure and landuse change, weakening traditional institutions, religious conversions). This locally-led, collaborative, rights-based biocultural program seeks to strengthen Idu cultural and traditional institutions to allow for the continued existence of Dibang's biocultural diversity. Four experimental initiatives are currently underway:

Shaman fellowship: Idu shamans (igu) are repositories of ancestral knowledge and spirituality. They safeguard people's well-being and eventually ensure that the vital balance with the nonhuman world is maintained. Shamans are also believed to be shape-shifting tigers. Currently, there are fewer than 65 Idu shamans. Young Idus were not naturally self-initiating

into shamanism, causing anxiety in the community. If shamans disappear, the Idu identity and bio-cultural diversity will follow suit. Run in collaboration with the Idu Mishmi Cultural and Literary Society, the Idu Mishmi Igu (shaman) Program is a pilot practice-based programme which combines the traditional system of shamanic learning with present-day socio-economic realities. Fellows, handpicked by elder igus, shadow their igu guides for a period of two years, assisting them in all the ceremonies they perform. Along the way, the fellows learn shamanic chants and begin the process of self-exploration to harness their spiritual powers. A committee composed of Idu people and anthropologists oversee the workings of the program.

Community-based socio-ecological research: Though we have been documenting wildlife in the Dibang Valley since 2013, a large majority of Dibang's community-owned forests are still scientifically unstudied. Many of these forests are now being earmarked for various state-run developmental and conservation projects. This initiative brings outside scientists together with local people to co-produce socio-ecological knowledge. Joint teams run expeditions and install long-term assessments to create baselines on diversity, distribution and abundance of mammals and avifauna. Idu landowners use scientific technology for eco-cultural mapping of their ancestral forests. Scientific methods and knowledge are

integrated equitably and ethically with traditional ecological knowledge, and all data and knowledge generated are owned by the community.

Traditional story-telling: Idu Mishmi ancestral stories and tales are oral repositories of rich traditional knowledge. They detail the moral relations people ought to have with each other and with the nonhuman world, and form a sense of identity. Sadly, a majority of younger Idus no longer know these stories. They spend time away from home in boarding schools that do not teach traditional cultural and ecological knowledge. This loss of traditional knowledge is impacting the future of Dibang's bio-cultural diversity. This story-telling program takes Idu traditional stories to Idu youth where they currently spend most of their time – the modern schools. Idu teams conduct monthly storytelling sessions in schools in Dibang. Stories of varying detail and complexity are told to different grades with the help of visual aids, multimedia, play and art. Scientific knowledge on species, conservation status, and Indigenous worldviews and histories are integrated wherever appropriate. This programme hopes to place traditional knowledge at par with formalised school education.

Community-based forest and wildlife management: Traditionally, Idu villages maintained exclusive control over their village forests. Wildlife was utilised in accordance with cultural norms, following cultural restrictions. However, with

greater connectivity and other transitions, commercial wildlife trade is increasingly a threat to Dibang's biodiversity. Since 2020, we have worked alongside various clans-people to conduct camera trapping surveys covering more than 600 km² of rugged high-mountainous terrain to generate novel scientific information. Data and results are always given back to the original clans-people. We work with local Gram Sabhas (village councils), village youth and elders to find ways such that the forest and wildlife are used in accordance with traditional principles.

On June 3, 2020, the original four clans of a community forest in the foothills of Dibang passed a resolution to declare their ancestral lands as a Community Conserved Area (CCA). Elopa-Etugu Community Eco-Cultural Preserve (EECEP, 40 km²) is the first CCA in this region, owned and managed entirely by the local community. It is the first community conserved wet tropical grassland in South Asia and hosts several endangered species including the clouded leopard, hog deer, Asian elephant and Eastern hoolock gibbon. Each clan has appointed a community watcher to implement management rules created by Gram Sabhas themselves. In August 2022, Gram Sabhas of several villages in another sub-basin within the Dibang Valley passed democratic resolutions banning outside hunting and commercial trade in wildlife

PROGRAMME TEAM

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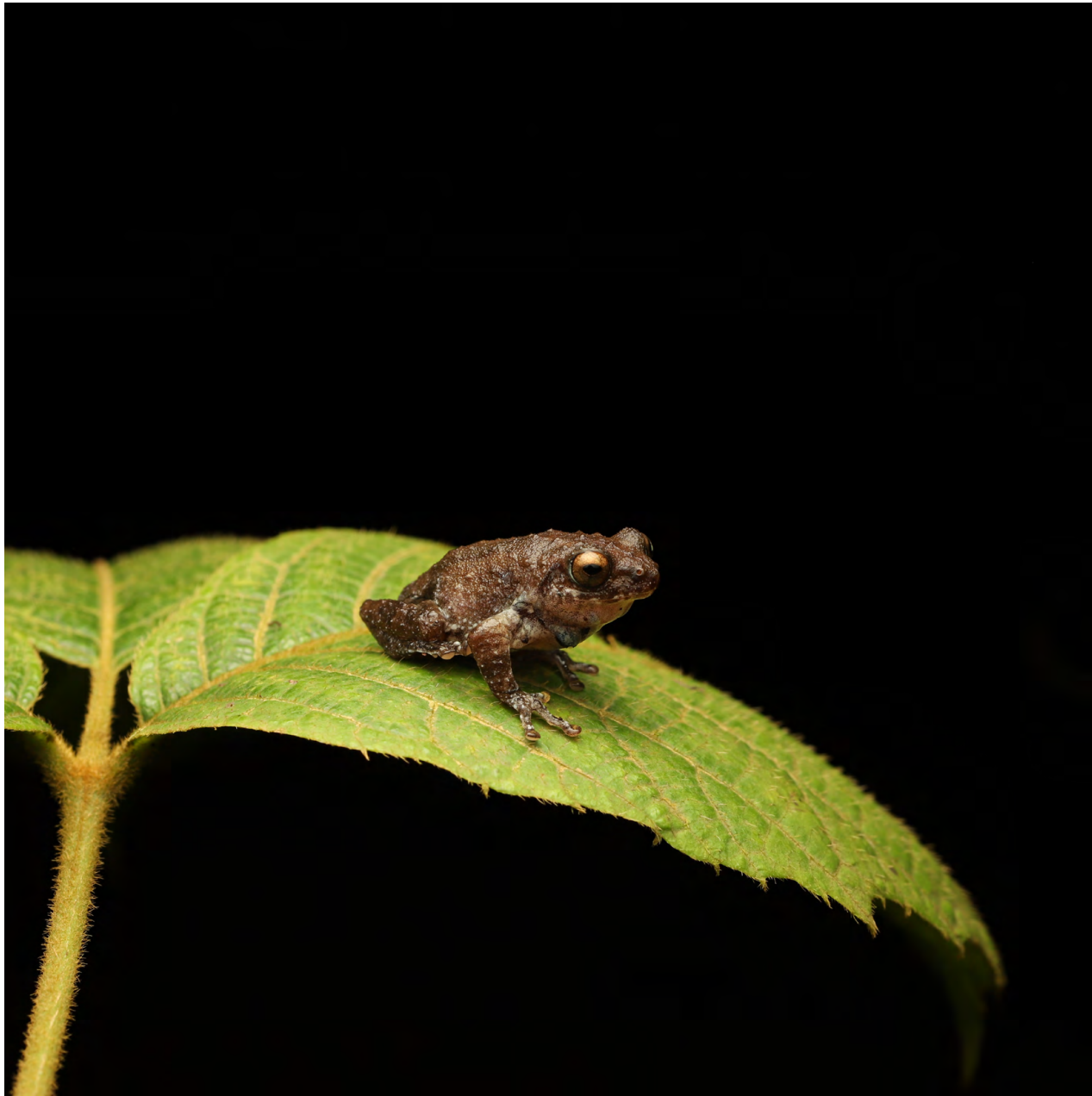
The Serenity Trust, Stop Poaching Fund, Cholamandalam Finance, DTCC India Enterprise Services Pvt Ltd, Rohini Nilekani Philanthropies, Conservation Leadership Programme, Arcus Foundation, Synchronicity Earth, Donald and Lucy Peck, Idu Mishmi Cultural and Literary Society, Savitri Trust, Roddick Foundation, MM Muthaiah Research Foundation, Arvind P. Datar, Uday Kumar, Wildlife Conservation Trust

HNAP DONORS

Aasheesh Pittie, Aditya Bhupendra Maru, Amber Verkade-Jansen and Evert Verkade, Amod Inamdar, Anand Matthur, Anjali Powar Haridass, Anne Pinto Rodrigues, Arindam Ray, Arjan Basu Roy, Astha Gautam, Avik Hazra, Disha Patil, Divya Mudappa, Dr. S. Subramanya, Eashwar Raghuraman, Ganesh Raghunathan, Gopa Marayil, Hummingbird Digital Private Limited, Jaideep Goswami, Janhvi Vyas, Jyotsana Nirula, Kanthimathi Nathan. S, Kaushal Singh, Laurige Boyer, Margaret Kinnaird, Nirupa Anila Rao, P. Manivannan, Ram Gopalakrishnan, Rama Lakshmi Peri (Vibhav Peri), Rohit Varma, Seema Deshpande, Shanthi. G, Sharan Venuturapalli, Shomita Mukherjee, Smt olak Borang Nabum, Sudip Datta, Supratim Deb, T. R. Shankar Raman, Tushita Patel, Udain Singh Tomar, Uday Kumar, Ulhas Anand, Urmila Pingle, Usha Ramakrishnan, Vamsi Rao, Vivekanandan Seetharaman

Zoos: Amiens Zoo (Tresorerie Du Grand), Antwerp, Boissiere Mervent Conservation, France, Rotterdam Zoo, St. Augustine Alligator Farm Zoological Park, Warsaw Zoo.

05 CEROS



ABOUT THE PROGRAMME

Our work at CEROS, which stands for Community Ecology and Restoration of the Sahyadri, spans diverse disciplines from genomics to community, population and restoration ecology focusing on understudied taxa and ecosystem functions across the Western Ghats, Eastern Himalaya, and Indo-Myanmar Biodiversity Hotspots.



PROJECT IN FOCUS

Impacts of land-use change on bush frogs, forest-dwelling lizards and arboreal snakes

Open ecosystems are more threatened than wet tropical rainforests. Unfortunately, these ecosystems are classified as wastelands and receive scant public attention. The low-elevation lateritic plateaus are geologically unique open ecosystems in the northern Western Ghats that harbour tremendous endemic diversity. Numerous petroglyphs on these plateaus, which are several thousand years old, depict a long-standing relationship between humans and the landscape.

Animals living on these plateaus experience extreme weather conditions, from extremely dry and hot summers, to extremely wet conditions during the monsoon. Given the vast expanse of the lateritic plateaus in the northern Western Ghats, traditionally, locals have been growing rice paddy in depressions that harbour soil or by dumping soil on the lateritic plateaus and preventing its runoff by lining with loose rocks that are collected from the plateaus. More recently, locals have been blasting

the plateau and planting mango and cashews in the soil-filled pits, making these 'barren' landscapes favourable for agroforestry. The mangoes grown in the low-elevation lateritic plateaus of Ratnagiri are supposed to be very sweet and fetch high prices. The accelerated growth of agroforestry plantations on the lateritic plateaus poses a significant risk to the persistence of these ecosystems. There are ongoing efforts to identify critical sites and protect them with the support of local communities by declaring them as bio-cultural heritage sites. One of the gaps for this was determining how conversion to other land uses is impacting biodiversity on these lateritic plateaus. We conducted three studies to determine the impacts of land-use change on rock-dwelling fauna and the role of microhabitats like loose rocks and rock pools in maintaining biodiversity on the plateau. We found that conversion to paddy and orchards negatively impacts

the availability of large rocks, which provide refuge to animals like saw-scaled vipers and point-endemic white-striped viper geckos. Conversion to paddy and subsequent land abandonment increased soil and water availability, benefiting the fossorial and endemic Seshachari's caecilian. We found that large rock pools provide critical microhabitats for breeding frogs and tadpoles, thereby maintaining frog diversity on lateritic plateaus. However, the availability of these rock pools drops in orchards. In paddy, the entire habitat is homogenised by submergence under water, with negative consequences for frogs. Along with other studies, we highlight the value of critical microhabitats like loose rocks and rock pools for sustaining biodiversity. This is among the first studies to determine land-use change's impacts on lateritic plateaus' biodiversity.



PARTNER HIGHLIGHT

On the Edge Conservation

Support from On the Edge Conservation for the work in the northern Western Ghats has allowed us to fill critical knowledge gaps on the impacts of land-use change on biodiversity in forests and open ecosystems, prioritising areas for ecological restoration and initiating ecological restoration in partnerships with small landowners in the Konkan region. The research demonstrates the value of low-elevation forests, most of which are unprotected. The conservation work allows us to work with private landowners to restore degraded forest patches.



IN THE FIELD

The Sahyadris

Unlike the central and southern Western Ghats, the northern portion of the Western Ghats landscape has a distinct geological history that has resulted in unique landscape features like the lateritic plateaus and canyon-like escarpments of the Sahyadris. Most Protected Areas in this region are on the crest of the Sahyadris, with most forests in low elevations being privately- or community-owned. During our travels in the northern Western Ghats between 2017–19, we saw large-scale degradation and conversion of forests.

While the threats from degradation and conversion continue to increase, these forests continue to harbour threatened biodiversity like hornbills and other lesser-known endemic flora and fauna. We also found significant interest in ecological restoration and biodiversity conservation among local community members.

To prioritise areas for restoration efforts and inform land-management practices, we have been conducting systematic studies to determine the impacts of

habitat degradation and conversion on forest-dwelling biodiversity, including frogs, reptiles, birds and plants and on rock-dwelling fauna of lateritic plateaus, including invertebrates, amphibians and reptiles.

Our research has demonstrated that low-elevation forests, most of which are not protected, harbour a distinct and significant portion of threatened biodiversity. We realise there is an urgent need for ecological restoration efforts in the area. We also found

that microhabitats like rocks and rock pools in the open lateritic plateaus are critical for maintaining diversity. These microhabitats are threatened because of rock removal and conversion of plateaus to orchards.

We have initiated efforts to restore degraded, privately-owned forests in the region in partnership with small landowners. We have contributed our research findings to an effort to declare select lateritic plateaus as bio-cultural heritage sites for long-term conservation.

FEATURED PUBLICATION

Effects of canopy cover on fruiting intensity and fruit removal of a tropical invasive weed



We determined how canopy cover influences fruiting intensity and fruit removal of *Lantana camara*, an alien, invasive plant, in the Western Himalaya. We found that *Lantana* shrubs in open conditions bore more fruit than those in forested conditions. Additionally, the number and composition of seed dispersers that visited *Lantana* shrubs and help disperse the seeds differed in open and closed-conditions. Shrubs in more open conditions had higher visitations of frugivores. This study

highlights that open ecoystems are more vulnerable to *Lantana* invasion, and anthropogenic activities that lead to canopy openings can facilitate *Lantana* spread through greater fruit production and seed dispersal.

CITATION: Taneja, Y., N. Page, S. Kumar, and R. Naniwadekar. (2022) Effects of canopy cover on fruiting intensity and fruit removal of a tropical invasive weed. *Forest Ecology and Management*. 523:120502.



PROGRAMME TEAM

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FUNDERS

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ABOUT THE PROGRAMME

Our programme carries out long-term research on certain threatened birds and conservation of their habitat, and nature education and citizen science.



PROJECT IN FOCUS

Riverine birds of Kaveri and Kollidam in Tamil Nadu

We carry out a long-term study on the birds of the river Kaveri and river Kollidam in Tamil Nadu, with particular focus on threatened riverine birds such as the Black-bellied Tern *Sterna acuticauda*, River Tern *Sterna aurantia* and Lesser Fish-Eagle *Ichthyophaga humilis*.

The Kaveri river originates from Talakaveri in the Brahmagiri range in the Western Ghats, Kodagu district of the

state of Karnataka. It enters Tamil Nadu through Cauvery Wildlife Sanctuary near Hogenakkal, and it empties into the Bay of Bengal near Poompuhar. The entire length of the Kaveri river from its origin in the Western Ghats is about 780 km, of which nearly 450 km is in Tamil Nadu. Most of the river flows through human-dominated landscapes, while for about 60 km of the river flows through the Cauvery Wildlife Sanctuary. The major



Mike Prince/Wikimedia Commons

habitat along the sanctuary is riparian forest and dry deciduous forest. This river is also an important habitat for various other taxa such as the vulnerable smooth-coated otter and several freshwater terrapins.

We conducted a bird survey (point counts) in the Kaveri and Kollidam rivers

in Tamil Nadu. Of the total c.450 kms stretches of the Kaveri and Kollidam rivers within Tamil Nadu, we surveyed c. 300 kms. In total, we have surveyed 527-point locations (every 500 m). From this effort, we recorded Black-bellied Terns only in 12 points (only in Kollidam river). All these locations fell within about 60-70 km of the entire river stretch

surveyed. Apart from this, we conducted a survey in the Cauveri North Wildlife Sanctuary (along a c.70 km stretch of the Kaveri river) from Mekedatu to Hogenakkal to the backwaters of the Mettur reservoir. We recorded River Terns and Lesser Fish-eagles, but did not record Black-bellied Terns there. We have also been conducting regular

monitoring of Black-bellied Terns in the only stretches where this endangered bird has been recorded during our survey, essentially to know the population, habitat requirements, breeding locations and threats.



SPECIES SPOTLIGHT

The Black-bellied Tern

The Black-bellied Tern, *Sterna acuticauda*, is a freshwater bird that occurs in rivers and sometimes in large waterbodies. Due to habitat disturbance, destruction of breeding habitat, and overfishing, it has declined in numbers through most of its range. It is now categorised as Endangered by the IUCN. Our surveys along the River Kaveri and Kollidam

(tributary of the river Kaveri) in Tamil Nadu found that the Black-bellied Tern occurs mainly in river Kollidam in Tamil Nadu, although there are some historical records along the river Kaveri. We have been conducting regular monitoring in the selected stretches (from Mukkombu Dam to Anaikarai Dam, along c.140 km) once a month where we have recorded the

Black-bellied Tern during our survey. We found that within this river stretch, the Black-bellied Tern mainly occupies c. 60-70 km. Within this stretch, we estimate there are only about 4 pairs of Black-bellied Terns. With research permits from the Tamil Nadu Forest Department to conduct survey in the Cauvery North Wildlife Sanctuary, we completed

surveying a c.70 km stretch in January 2023 (from Mokedatu to Hogenakkal to the backwaters of Mettur Reservoir). We did not record Black-bellied Terns there. In March 2023, we found the breeding location of one of the pairs in Kollidam river bed. We hope to continue to search for more nesting locations of these birds.



ABOUT THE PROGRAMME

We work towards increasing awareness about nature and biodiversity among the public, including children, and to involve the larger citizenry in generating information for better documentation and conservation of nature. We believe that deep connections between people and nature arise primarily through first-hand contact with animals and plants; with some kind of wilderness. At this programme, we want to help make these connections, and once made, help nurture and develop them.

NCF has been working in conservation education and outreach at most of our focal conservation sites across India. Through the Education and Public Engagement programme, we reach out to an audience at a national scale.



PROJECT IN FOCUS

Birds of Kumaon (Kumaon ke pakshi)

In 2022-23, our Nature Communications team initiated a new project in collaboration with a community radio station in Uttarakhand. This was a completely new and creative idea and a new experience for the team. We broadcast a series of 10 episodes on Birds of Kumaon (Kumaon ke pakshi) on the Kumaon Vani community radio station, run by The Energy and Resource Institute (TERI) which has 4–5 lakh listeners. The community radio channel reaches people in Kumaon (Nainital, Almora, Bageshwar and Champawat) and Garhwal (Chamoli, Pauri, Dehradun

district) regions. The script was developed by our team in collaboration with Monica Kaushik, Azim Premji University, Bengaluru and narrated by RJ Bahadur from the radio station. Every show was aired every Tuesday, alongside two other live programmes. Listen to the complete series of all episodes that is now up on Youtube here: https://www.youtube.com/playlist?list=PL7QZOdb7t-WxWDq9_85FjN8zYeCuZoZ9p. Through this channel we were able to reach an entirely new audience to build awareness and love for birds and nature through mass media interventions.



IN THE FIELD

Birds of Northeastern India

Through 2022-23 we strove to increase our work, reach and engagement in the north-eastern states of India. One of our goals has been to focus on regions with high bird diversity and low engagement in birding activities—beginning with the North East (NE) Indian landscape, particularly in the hill states. This has been in the form of networking with local birdwatchers and groups, and conducting a series of workshops and field sessions in North-east India. To help with the

outreach and workshops, our team also brought out a pocket guide for this region called “Birds of Northeastern India—a pocket guide to 166 familiar birds”. This work aligns with our goal of diversity and inclusion in the work that we do and over the coming years we plan to engage the local communities and people working in the landscape to identify the need for work and gaps to develop a strategy to expand our work in this landscape.



PARTNER HIGHLIGHT

Indian Music Experience

We partnered with the Indian Music Experience museum to set up the Birdsong exhibition at their centre in Bengaluru. The theme of this temporary exhibition was the diversity of birdsong around us and its function in the life of a bird and its connection with humans. We partnered with the museum team and their collaborators to create content, set up displays and conduct workshops and online webinars to support the exhibit. In five months, the exhibit attracted over 35,000 visitors. This exhibit also traveled to other public spaces in Bengaluru, like the Majestic metro station experiencing a high footfall and outreach to a diverse audience.

FEATURED PUBLICATION

Sustainability & Biodiversity—an activity based learning module for high school



Environment literacy is inextricably linked to biodiversity literacy and can help students understand climate change challenges. Our programme collaborated with Wipro Earthian to develop an activity-based learning module centered on biodiversity. Wipro Earthian is one of India's largest programmes of its kind for schools and colleges and is designed to act as a catalyst for fostering excellence in sustainability thinking and action. It is equipped with worksheets and instructions on using it. Designed for 7–12 grade students, this illustrated booklet includes activities and games that help students connect with biodiversity around them and explore its

interconnections with larger issues, both local and global. Students will have the opportunity to work hands-on as teams, reflect on data collected, and critically analyse issues related to biodiversity. Funded by Wipro Foundation, the Sustainability & Biodiversity booklet was launched on #EarthDay2022.

CITATION: Sustainability & Biodiversity - an activity based learning module for high school (April 2022). Published for Wipro Earthian by Wipro Foundation, Bangalore.

URL: https://issuu.com/wiprofoundation/docs/sustainability_and_biodiversity_booklet

PROGRAMME TEAM

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ABOUT THE PROGRAMME

The academic programme at NCF comprises the doctoral programme, annual courses in conservation leadership and targeted capacity building initiatives. NCF's doctoral programme brings the highest standards of interdisciplinary conservation science to bear on training young conservation scientists and professionals as a basis for building capacity and supporting effective conservation.



PROJECT IN FOCUS

Courses in Conservation Leadership

After a hiatus of two years, when we shifted the courses online, we were back to the classroom and field this year and offered a series of seven courses in Conservation Leadership during April 2022 – March 2023. We received 213 applications from various parts of the country for the courses conducted during February – March 2023. We received 62 applications for the course held in September 2022. Given that individual courses could accommodate between 15–20 participants, overall 76 (48 female, 28 male) applicants attended these seven courses. We based the selection of applicants on their online application and resume, with a focus on those directly engaged in conservation practice and most

likely to put the learnings to work in the field. More than 60% of the participants are conservation practitioners working in conservation organisations, operating at regional and national scales. Targeting this sector increases the probability of the skills being taught actually improving conservation practice in the country. We received feedback on the courses from 72 out of the 76 participants. Responses spanned very positive remarks on the course format, content and delivery, as well as suggestions for improvement. All the participants indicated that their expectations were met with respect to the courses, with 79% willing to pay a small fees to attend the courses, if charged.



IN THE FIELD

Carnivores of Himalayas

The harsh landscapes of the high Himalayas, marked by challenging terrain and scarce resources, pose challenges for carnivore communities. Within this environment, our study examines the diversity of 14 carnivore species, ranging from the brown bear and snow leopard, to the red fox and martens. Contrary to expectations of intense competition for resources, our research provides evidence of remarkable coexistence among six

carnivore species and their key prey. The spatial and temporal interactions of brown bears, snow leopards, red foxes, mountain weasels, and stone martens with their primary prey—blue sheep, Himalayan ibex, as well as smaller species like pikas and rodents—were examined across ten high-elevation sites in Himachal Pradesh, India. The key finding from our study underscores the pivotal role of prey

availability in influencing carnivore assemblages in resource-limited landscapes. Rather than the anticipated competition for resources, it appears that the abundance of prey species plays a more significant role in shaping carnivore communities in these challenging environments. In the light of these findings, sole focus on predator management may not be the most effective conservation approach. Instead,

our research suggests that conservation efforts should prioritise strategies aimed at maintaining and ensuring the health of prey populations. By understanding and addressing the intricate dynamics between carnivores and their prey in the high Himalayas, we can better inform conservation practices and contribute to the preservation of these unique ecosystems.

FEATURED PUBLICATION

Beyond Birdsong: Exploring the Cooperative Choruses of Sarus Crane Trios



As part of Suhridram Roy's doctoral research journey, a novel behaviour of Sarus Cranes has been uncovered in the north Indian floodplains. Using acoustic analysis tools like Raven software and the WarbleR R-package, unison calls of four trios and 15 pairs were turned into visually engaging spectrograms. Turns out, these giant waterbirds have a rare talent for synchronous singing between three individuals—only 0.02% of the time!

Picture this carefully choreographed bird symphony: a female Sarus Crane starts the unison call, the breeding male chimes in, and a third bird joins the chorus. Trios, where three individuals sing and share territory together, play a vital

role in teaming up to protect resources, making life easier for the adult pairs and providing a learning gig for the young ones. The third member plays a unique role, acting as an apprentice, mirroring the adults and acquiring the art of duet singing.

Now, why does this matter? These trios seem to have a secret weapon—their calls are like the low-frequency bass beats in a bird battle. In environments with fierce competition and limited resources, these low-frequency signals might be their way of saying, "This is our turf!" Surprisingly, despite hanging out in suboptimal habitats, trios seem to play it cool, responding less to playbacks than

duos, hinting at a hidden advantage in specific situations. The study unravels the cooperative nature of these trios, providing a glimpse into a world where avian collaboration becomes key to survival.

So, next time you spot a trio of Sarus Cranes doing their synchronised routine, know that you're witnessing not just a bird band but a strategic squad, navigating their way through the ever-changing landscapes of the farmlands.

CITATION: Roy, S., Kittur, S., & Sundar, K. G. (2022). Sarus Crane *Antigone antigone* trios and their triets: Discovery of a novel social unit in cranes. *Ecology*, 103(6), e3707.

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Book Chapters

Alcoverro, T. and Arthur, R. 2022. Trouble on the green. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Bhatnagar, Y. V. 2022. Inclusive conservation with Project Snow Leopard. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Datta, A. 2022. Contested terrain. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Datta, A. 2022. Hornbills: of hope and resilience. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Datta, A. 2022. Journeys in Arunachal Pradesh. In: *Wildlife India @50*. Misra, M. (Editor). Rupa Publishers, India

D'souza, E. 2022. The trails and trials of dugong research. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Jeganathan, P. 2022. Confessions of a crazy birder. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Karkarey, R. and Gangal, M. 2022. Drawing lines in the water. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Kumar, M. A., Raghunathan, G., and Krishnan, V. 2021. Increasing worker safety in tea and coffee estates, India. Pages 82-83 in Gross E, Jayasinghe N., Brooks A., Polet G., Wadhwa R. and Hilderink-Koopmans, F. (editors) *A Future for All: The Need for Human-Wildlife Coexistence*, United Nations Environment Programme (UNEP) and WWF Gland, Switzerland. https://wwfint.awsassets.panda.org/downloads/a_future_for_all_the_need_for_human_wildlife_coexistence.pdf

Kumar, M. A., Raghunathan, G., Krishnan, V, Vijayakrishnan, S. 2022. Conservation is an elephantine journey. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Kumar, M. A. Raghunathan, G., Krishnan, V and Vijayakrishnan, S. 2022. Conservation is an elephantine journey. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Mishra, C. 2022. A snow leopard dies again. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Nijhawan and Mitapo. 2023. Iho and the Dibang Team In Aiyadurai, A. and Pandya, M. (2023). *More than just footnotes: Field assistants in wildlife conservation and research*. Bookwell publishers

Quader, S. 2022. Birders-in-arms. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Raman, T. R. S. and Mudappa, D. 2022. A rainforest restoration story. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Sidhu S, Ramaswami G. 2022. Citizens see the seasons' signs'. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Sinha, A. 2022. The day of the macaque. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Suryawanshi, K. and Bijoor, A. 2022. Snow leopard in the stockade. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Trivedi, P. 2022. A bond rekindled. In: *At the Feet of Living Things: Twenty-five years of working to conserve wild species and landscapes in India*. Datta, A., Arthur, R. & Raman, TRS. (Eds). HarperCollins Publishers India

Books and Booklets

Datta, A., Arthur, R., and Raman, T. R. S. (editors) 2022. *At the Feet of Living Things: Twenty-Five Years of Wildlife Research and Conservation in India*. HarperCollins, Gurugram. 400 pages

Madhavan, A. P., Bhat, K. and Kasinathan, S. 2022. *Last Ones Standing: Eleven Threatened Trees of the Western Ghats Rainforests*. Nature Conservation Foundation, Mysuru. 56 pages. (Illustrated by A. P. Madhavan). Accessible from: <https://www.ncf-india.org/western-ghats/last-ones-standing>

Mehta, P. and Jayaramaiah H. 2022. *Handbook for Nature Guides*. Nature Conservation Foundation, Mysore. 61 pages

Mehta, P. and Jayaramaiah H. 2022. नसिर्ग माण्डरूकांसाठी हस्तपुस्तक. [In Marathi, *Handbook for Nature Guides*.] Nature Conservation Foundation, Mysore. 61 pages

Page, N., Datta, A. and Basu, B. 2022. *Trees of Arunachal Pradesh: A field guide*. Nature Conservation Foundation. January 2022, 591 pp.

P. Jeganathan & Theodore Baskaran. 2022. *Yanaigalum Arasargalum – Sutruchoozal Varalaru* (Translation of *Elephants and Kings: An Environmental History* by Thomas Trautmann). Kalachuvadu Publications Pvt. Ltd., Chennai. July 2022. Pages 1-232

Sustainability & Biodiversity - an activity based learning module for high school. 2022. Published for Wipro Earthian by Wipro Foundation, Bangalore. Url: https://issuu.com/wiprofoundation/docs/sustainability_and_biodiversity_booklet

Conference Proceeding

Thrikk ddadeeri, K. 2022. The impact of the COVID-19 pandemic on bird monitoring in India. Poster: Bird Monitoring Symposium 2022

Datasets

Page, N., Kasinathan, S., Bhat, K., Moorthi, G., Sundarraj, T., Mudappa, D., and Raman, T. R. S. 2022. Data from: A new population record of Critically Endangered *Dipterocarpus bourdillonii* Brandis from the Anamalai Tiger Reserve, Tamil Nadu [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.6799251>

Raman, T. R. S., Mudappa, D., Jeganathan, P., Joshi, N. V. and Sukumar, R. 2022. Data on bird communities and vegetation in relation to altitude and habitat alteration in the Kalakad - Mundanthurai Tiger Reserve, Tamil Nadu, India, Dryad, Dataset, <https://doi.org/10.5061/dryad.41ns1rngj>

Raman, T.R.S., Mudappa, D., Osuri, A. M., Ayyappan, N., Muthuramkumar, S., & Parthasarathy, N. 2022. Data from: Plant Community Structure in Tropical Rain Forest Fragments of the Western Ghats, India [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.7426932>

Raman, T. R. S. 2022. Data on rainforest birds from line transect surveys in the Kalakad - Mundathurai Tiger Reserve, Tamil Nadu, India, Dryad, Dataset, <https://doi.org/10.5061/dryad.0gb5mkm3n>

Raman T. R. S., Mudappa, D., Osuri, A. M., Ayyappan, N., Muthuramkumar, S., Parthasarathy, N. 2022. Plant Occurrence Data from: Plant Community Structure in Tropical Rain Forest Fragments of the Western Ghats, India. Nature Conservation Foundation.GBIF Sampling event dataset <https://doi.org/10.15468/sm8773> accessed via GBIF.org

Raman T. R. S. 2022. List of herbs, grasses, and sedges collected in Guindy National Park, Chennai in 1992. Nature Conservation Foundation. GBIF Occurrence dataset <https://doi.org/10.15468/8nazng>

Raman T. R. S. and Mudappa, D. 2022. Mammal occurrence in Valparai Plateau and Anamalai Tiger Reserve, Tamil Nadu, India (2015-18). Nature Conservation Foundation. Occurrence dataset, Global Biodiversity Information Facility (GBIF), <https://doi.org/10.15468/9cs5sz>

Raman T. R. S. and Mudappa, D. 2022. Mammal occurrence in Valparai Plateau and Anamalai Tiger Reserve, Tamil Nadu, India (2015-18). Nature Conservation Foundation. Occurrence dataset, Global Biodiversity Information Facility (GBIF), <https://doi.org/10.15468/9cs5sz>.

Raman T. R. S. and Mudappa, D. 2022. Tree occurrence in point-centred quarter (PCQ) plots in Kalakad-Mundanthurai Tiger Reserve, Tamil Nadu, India. Nature Conservation Foundation. Sampling event dataset, Global Biodiversity Information Facility (GBIF), <https://doi.org/10.15468/4bcqeg>

Taneja, Y. V., Page, N. V., Kumar, R. S., and Naniwadekar, R. 2022. Effects of canopy cover on fruiting intensity and fruit removal of a tropical invasive weed [Dataset]. Dryad. <https://doi.org/10.5061/dryad.6t1g1jx2j>

Educational Materials

A Pocket Guide to Birds of LBSNAA and Mussourie, by Abhiram Sankar, Rutuja Dhamale and Garima Bhatia, Oct 2022. [developed for LBSNAA]

Birds of Chhattisgarh – a pocket guide to 167 familiar birds, by Garima Bhatia, Rutuja Dhamale and Praver Mourya, Nov 2022. [developed for CT forest department, for the Kanger Valley Bird Survey]

Birds of Coastal Maharashtra – a pocket guide to 140 familiar species, by Jayesh V, Sailee G, Hrishikesh R, Siddhesh S, Manas M, Rutuja D and Garima B, June 2022. [developed for Mangrove Foundation of India]

Birds of Lahaul and Spiti – a pocket guide to 138 birds of the trans-Himalaya, by Rutuja Dhamale, Garima Bhatia and Shiv Kumar Thakur, July 2022. [developed for Lahaul forest division and UNDP]

Birds of Northeastern India – a pocket guide to 166 familiar birds, by Ashwin Vishwanathan, Rutuja Dhamale and Garima Bhatia, May 2022

Birds of Ottu Lake – a pocket guide to 137 familiar birds, by Vivek Goyal, Sanjeev Goyal and Garima Bhatia, Feb 2023. [developed for Sirsa forest division, Haryana]

General and Popular Articles

Datta, A. 2022. Are hornbills in danger due to extreme weather conditions? *Frontline* (<https://frontline.thehindu.com/environment/hornbills-feel-the-heat-in-danger-due-to-extreme-weather-conditions/article65507078.ece>)

Jeganathan, P. 2022. Arittapatti enum palluyirkalam (Article on Aritapatti – Biodiversity Heritage Site). *The Hindu Tamil Newspaper*

Jeganathan, P. 2022. *Thamilhattin Atrupogum Abayathil Ulla Paravaigal*. Series of 30 short blogs posted on thirty threatened birds of Tamil Nadu during Birdnov online campaign on creating awareness on birds. <https://uyiri.wordpress.com/tag/birdnov2022/>

Jeganathan, P. 2022. *Arunkatchiyagangal En namakku avasiyam?* (Why do we need Museums?) 18th May 2022. *The Hindu Tamil Newspaper*

Jeganathan, P. 2022. India 75: *Thattalikkum Kattuyirkalum Vazidangalum* (Very brief history of Indian Wildlife and its habitat after Independence). 26th August 2022

Jeganathan, P. 2022. *Irupathu Ore oru boomithan* (Article on World Environment Day). *The Hindu Tamil Newspaper*.5th June 2022

Jeganathan, P. 2022. *Karukap Pogum Kadugal*. Book review of English book 'Fire of Sumatra'. 7th May 2022. *The Hindu Tamil Newspaper*

Jeganathan, P. 2022. *Merkuth thodarchi malai oor arimugam* (Long article - An Introduction to The Western Ghats). *Manorama Year book* 2023. January 2023

Jeganathan, P. 2022. *Theninthiya iyarkai saarntha aangila vazi noolkaal - oor Arimugam* (Nature writings in English from South India – An Introduction). *The Hindu Tamil Newspaper*. 4th June 2022

Jeganathan, P. 2022. *Vattara Paravai Kaiyedulalin Avasiyam*. Book Foreward for Tamil bird field guide on Birds of Tiruvannamalai. *The Hindu Tamil Newspaper* on 5th November 2022

Jeganathan, P. 2023. *Marakandru Naduthal: Ariviyal poorvamagathan seyalpadukiroma?* (Are we doing scientific way of tree planting?). *The Hindu Tamil Newspaper*. 19th March 2023

Madhavan, A. P. 2022. On remnants and scarce jewels – Reflections from surveys for endangered trees in the Anamalai hills of the Western Ghats. *Current Conservation* (September) 16(3): 10-11. <https://www.currentconservation.org/on-forest-remnants-and-scarce-jewels/>

Muhil.S.'When citizens get involved in science' Pg 47-49, December 2022, *Teacher's Plus* article, Azim Premji University

Nature Classrooms Team: *Samuhik Pahal* - a monthly journal by Wipro Foundation:Nature Education, June 2022, https://issuu.com/wiprofoundation/docs/samuhik_pahal_vol_2_issue_9

Nazareth, E. 2022. A refuge amidst peril: Giant Guitarfish in the Andaman Islands, India

Pinto, W. 2022. Acroporid Affiliations in the Lagoons of Lakshadweep. *Roundglass Sustain*

Pinto, W. 2022. Fringe Ecosystems: The Rhizophora Mangals. *Roundglass Sustain*

Pinto, W. 2022. Life in a Seagrass Meadow. *Roundglass Sustain*

Pinto, W. 2023. Moray Eels: Top Predators with an Arsenal of Defences. *Roundglass Sustain*

Tai, B., and Tachang, T. 2022. From hunters to nest protectors: Why the Nyishi tribe saves hornbills. *India Development Review* (IDR).(<https://idronline.org/ground-up-stories/from-hunters-to-nest-protectors-why-the-nyishi-tribe-saves-hornbills/>)

Journal Articles

Alexander, J. S., Bijoor, A., Gurmet, K., Murali, R., Mishra, C., & Suryawanshi, K. R. (2022). Engaging women brings conservation benefits to snow leopard landscapes. *Environmental Conservation*, 1-7

Alexander, J.S., Murali, R., Mijiddorj, T.N., Agvaantseren, B., Lhamo, C., Sharma, D., Suryawanshi, K.R., Zhi, L., Sharma, K., and Young, J.C. 2023. Applying a gender lens to biodiversity conservation in High Asia. *Frontiers in Conservation Science* 4:19

Anujan, K., Maradian, J., Luo, C., Ramraj, R., SeasonWatch Citizen Scientist Network, Tasic, H., Akseer, N., Ramaswami, G. 2023 "Environmental correlates of tree phenology in a tropical state of India - insights from a citizen science project". <https://www.biorxiv.org/content/10.1101/2023.03.24.533907v1>

Arvind C, Joshi V, Charif R, Jeganathan P, Robin VV. Species detection framework using automated recording units: a case study of the Critically Endangered Jerdon's courser. *Oryx*. 2023;57(1):55-62. doi:10.1017/S0030605321000995

Divan Patel, F., Pinto, W., Dey, M., Alcoverro, T., & Arthur, R. 2023. Carbonate budgets in Lakshadweep Archipelago bear the signature of local impacts and global climate disturbances. *Coral Reefs*, 1-14

Gala, M., Ongole, S., Pyle, P. 2023. Fork-tailed Drongo-Cuckoo (*Surniculus dicruroides*), version 2.0. In *Birds of the World* (G. M. Kirwan and B. K. Keeney, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. <https://doi.org/10.2173/bow.asidrc2.02>

Gangal, M., Suri, V., & Arthur, R. 2023. How well does Indian fisheries policy engage with fisheries biology? Exploring the science-policy interface of coastal capture fisheries along the west coast of India. *Marine Policy*, 156, 105796

Home, C., Bijoor, A., Bhatnagar, Y. V., & Vanak, A. T. 2022. Serosurvey of viral pathogens in free-ranging dog populations in the high altitude Trans-Himalayan region. *Journal of Threatened Taxa*, 14(5), 21025-21031

Jani, M., Caleb, J.T.D, Kapoor, V., Kulkarni, S., Uma, D. Aliens in the society: foreign arthropods and small vertebrates associated with the social spider *Stegodyphus sarasinorum* Karsch, 1892 (Araneae: Eresidae) *Journal of Arachnology* 51(1), 57-62, (15 March 2023). <https://doi.org/10.1636/JoA-S-22-004>

Jha, A., Praveen J, Nameer, P.O. 2022. Status of Galliformes in Kerala: findings from the Kerala Bird Atlas. *Mor - A Journal of World Pheasant Association* 46: 1-6

Karkarey, Rucha, Rohan Arthur, Kirsty L. Nash, Morgan S. Pratchett, Mahesh Sankaran, and Nicholas AJ Graham. 2022. Spatial decoupling of α and β diversity suggest different management needs for coral reef fish along an extensive mid-oceanic ridge. *Global Ecology and Conservation* 36: e02110

Khamis, A., Abdulla, A., D'Souza, E., Kelkar, N., Arthur, R., Al Khalifa, E. et al. 2023. Long-term persistence of large dugong groups in a conservation hotspot around Hawar Island, Kingdom of Bahrain. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 33(6), 592–605

Khanyari, M., Dorjay, R., Lobzang, S., Bijoor, A., & Suryawanshi, K.R. 2023. Co-designing conservation interventions through participatory action research in the Indian Trans-Himalaya. *Ecological Solutions and Evidence*, 4(2), e12232.

Khanyari, M., Dorjay, R., Lobzang, S., Sonam, K., & Suryawanshi, K. R. 2023. An update on the conservation status of Tibetan Argali *Ovis ammon hodgsoni* (Mammalia: Bovidae) in India. *Journal of Threatened Taxa*, 15(3), 22803-22812

Khanyari, M., Robinson, S., Milner-Gulland, E. J., Morgan, E. R., Rana, R. S., & Suryawanshi, K. R. (2022). Pastoralism in the high Himalayas: Understanding changing practices and their implications for parasite transmission between livestock and wildlife. *Pastoralism*, 12(1), 1-16

Krishnan, A., Osuri, A. M., and Krishnadas, M. 2022. Small mammals reduce distance dependence and increase seed predation risk in tropical rainforest fragments. *Biotropica*, 54, 1428–1439. <https://doi.org/10.1111/btp.13137>

Krishnan, A. and Osuri, A.M. 2023. Beyond the passive–active dichotomy: aligning research with the intervention continuum framework of ecological restoration. *Restor Ecol*, 31: e13828. <https://doi.org/10.1111/rec.13828>

Maheswaran G., Praveen J., Naskar A., Alam I., Majumder, A. 2022. Notes on certain interesting specimens at the Zoological Survey of India, Kolkata. *Indian BIRDS* 18 (2): 48–51

Mendiratta, U., Khanyari, M., Velho, N., Suryawanshi, K.R., NU Kulkarni. 2022. Key informant perceptions on wildlife hunting in India during the COVID-19 lockdown. *Current Science*. (00113891) 122 (4)

Murali, R., Bijoor, A., Thinley, T., Gurmet, K., Chunit, K., Tobge, R., Thuktan, T., Suryawanshi, K.R., Nagendra, H., & Mishra, C. (2022). Indigenous governance structures for maintaining an ecosystem service in an agro-pastoral community in the Indian Trans Himalaya. *Ecosystems and People*, 18(1), 303-314

Naniwadekar, R., A. Gopal, N. Page, and S. Ghuman. 2022. Fruit exocarp removal: a unique foraging behaviour in Narcondam Hornbills. *Hornbill Natural History and Conservation*. 3:38-40

Osuri, A. M., Mudappa, D., Kasinathan, S., and Raman, T. R. S. 2022. Canopy cover and ecological restoration increase natural regeneration of rainforest trees in the Western Ghats, India. *Restoration Ecology* 30(5): e13558. <https://doi.org/10.1111/rec.13558>

Page, N., Kasinathan, S., Bhat, K., Moorthi, G., Sundarraj, T., Mudappa, D., and Raman, T.R.S. 2022. A new population record of the Critically Endangered *Dipterocarpus bourdillonii* Brandis from the Anamalai Tiger Reserve, India. *Journal of Threatened Taxa* 14(8): 21651–21659. <https://doi.org/10.11609/jott.7860.14.8.21651-21659>

Pawar, P. Y., Mudappa, D., and Raman, T. R. S. 2022. Nest monitoring and nesting status of sympatric hornbills in the Anamalai Hills, Western Ghats, India. *Hornbill Natural History and Conservation* 3(1): 17–27

Piaopiao, T., Suryawanshi, K. R., Lingyun, X., Mishra, C., Zhi, L., & Alexander, J. S. 2023. Factors shaping the tolerance of local Tibetan herders toward snow leopards. *Journal for Nature Conservation*, 71, 126305

Pienkowski, T., Keane, A., de Lange, E., Kapoor, V., Khanyari, M., Ravi, R., ... & Milner-Gulland, E. J. 2023. Psychological distress and workplace risk inequalities among conservation professionals. *Conservation Science and Practice*, e12918

Pienkowski, T., Kiik, L., Catalano, A., Hazenbosch, M., Izquierdo-Tort, S., Khanyari, M., ... & Sandbrook, C. 2023. Recognizing reflexivity among conservation practitioners. *Conservation Biology*, 37(2), e14022

Praveen J., Jayapal, R. 2022. Taxonomic updates to the checklists of birds of India, and the South Asian region—2022. *Indian BIRDS* 18 (1): 1–3

Praveen J., Jayapal, R. 2023. Taxonomic updates to the checklists of birds of India and the South Asian region—2023. *Indian BIRDS* 18 (5): 131–134

Praveen J., Karuthedathu, D., Sankar, S., Duraiswami, H., Yobin, Y., Baruah, R. 2022. What is the identity of the Spelaeornis wren-babbler that occurs on the slopes of Mugaphi Peak in south-eastern Arunachal Pradesh? *Indian BIRDS* 18 (4): 107–113

Praveen J., Maheswaran, G., Naskar, A., Alam, I, Majumder, A., Khot, R. 2023. The Oriental Cuckoo *Cuculus optatus* in South Asia– An analysis of museum specimens *Indian BIRDS* Vol. 18 No. 5 150-152

Praveen J., Vijayalakshmi, P. V. 2022. Mapping historical records to the bird specimens in the Thiruvananthapuram Museum. *Malabar Trogon* 20 (2&3): 1-24

Ranade, D. and Isvaran, K., 2022. Inferring Social Interactions Over a Lifespan from Space-Use Patterns in a Tropical Agamid. *Journal of Herpetology*, 56(2), pp.164-171. <https://doi.org/10.1670/20-068>

Roy, S., Kittur, S., & Sundar, K. G. 2022. Sarus Crane *Antigone antigone* trios and their triets: Discovery of a novel social unit in cranes. *Ecology*, 103(6), e3707

Taneja, Y., N. Page, S. Kumar, and R. Naniwadekar. 2022. Effects of canopy cover on fruiting intensity and fruit removal of a tropical invasive weed. *Forest Ecology and Management*. 523:120502

Vattakaven, T., Barve, V., Ramaswami, G., Singh, P., Jagannathan S., Dhandapani, B. 2022. Best practices for data management in citizen science - an Indian outlook. *Biodiversity Informatics* 17:27-49

Viswanathan, A. 2022. Indian Bushlark *Mirafra erythroptera* can have fully white outer webs to its outermost tail feathers. *Indian BIRDS* 18 (2): 38–42

Surendra, A. & Raman, T. R. S. 2022. Forest bird decline and community change over 19 years in long-isolated South Asian tropical rainforest fragments. Preprint. *BioRxiv* 2022.10.22.513365; doi: <https://doi.org/10.1101/2022.10.22.513365>

Preprint

Talks	Dey, M. 2023. Corals of India - The Underwater Wonders of Color and Life. Hindustan Times	Wikipedia pages	Baccaurea courtallensis (A tree endemic to Western Ghats) - https://en.wikipedia.org/wiki/Baccaurea_courtallensis
	Jeganathan , P. 2003. Introduction to the birds of Tamil Nadu. 11th February 2023. For the students of Sacred Heart College, Tirupattur, during a one day workshop on birds and birdwatching		C R T Congreve (Author of the book - The Anamallais) - https://en.wikipedia.org/wiki/Cecil_Ralph_Townshend_Congreve
	Jeganathan, P. 2022. Language and Ecology Communicating Nature Through Local Languages. Why and How?. 19th September 2022. Talk duration 1 hr. Online Workshop for SCCS-Bangalore participants		Wikipedia Editors (2022-3) <i>Cryptocarya anamalayana</i> , <i>Diospyros paniculata</i> , <i>Dipterocarpus bourdillonii</i> , <i>Drypetes wightii</i> , <i>Dysoxylum malabaricum</i> , <i>Myristica beddomei</i> , <i>Orophea thomsonii</i> , <i>Palaquium ravii</i> , <i>Phyllanthus anamalyanus</i> , <i>Syzygium densiflorum</i> , and <i>Vateria indica</i>
	Jeganathan, P. 2022. Searching for graves and other interesting remnants of the past in Ooty surroundings. 5th June 2022. For the Nilgiri Natural History Society members, Kothagiri		<i>Xylaria culleniae</i> (a species of fungus) - https://en.wikipedia.org/wiki/Xylaria_culleniae
Technical Reports	Pinto, W. 2022. Reefs and Seashores: Islands of Lakshadweep. Deshbandhu College, Department of Zoology. Online virtual tour of the island ecosystems for the students		
	Basu, B. 2022. Neglected mutualists of the Eastern Himalaya: defining the vital roles of medium-bodied and large mammals (carnivores and ungulates) in seed dispersal. Interim report submitted to Department of Environment, Forest and Climate Change, Arunachal Pradesh		
	Borawake N., Datta A. & Naniwadekar R. 2023. Tropical forest restoration in the Eastern Himalaya. Progress Report 2014-2022. Nature Conservation Foundation. 44 pages		
	Chaplod, C. 2023. Pakke Annual Nature Camps. Pakke Nature Education Program Report, September 2022-March 2023		
	Datta, A., Borawake, N., & Pradhan, K. 2022. Long-term monitoring of hornbill breeding, tree phenology and relationship with climate in Pakke Tiger Reserve (April 2021- May 2022). Interim report submitted to Arunachal Pradesh Forest Department, Itanagar for the research project titled “Long-term monitoring of hornbill breeding, tree phenology and climate in Pakke Tiger Reserve, Arunachal Pradesh”. Nature Conservation Foundation. 39 pp. June 2022		
	Naniwadekar, R, A. Jayanth, and N. Page. 2022. The South Andaman plant-frugivore community project. A report submitted to the Andaman and Nicobar Forest Department on 15 July 2022		
	Naniwadekar, R, V. Sadekar, S. Biniwale, and N. Biswas. 2022. Effects of forest conversion to agroforestry plantations on sympatric sunbirds in south-western Maharashtra. A preliminary report submitted to Maharashtra Forest Department in October 2022		
	Pila, C. 2022. Conserving the Chinese Pangolin through community engagement in Arunachal Pradesh, India. Interim report submitted to Department of Environment, Forest and Climate Change, Arunachal Pradesh		
	Pradhan, K., Mandal, S., Ganguly, D., Mahato, S., Dukpa, K., Dewan, S., Datta, A., Basu Roy, A. 2023. Study of hornbills in the forests of Himalayan foothills of West Bengal with emphasis on their foraging habit, mate selection and breeding preferences. 2022-2023 Interim Report submitted to the West Bengal Forest Department		
	Pradhan, K. Tachang, T., Tai, B., Keyang, K., Kino, N., Tayem, N., Tok, P., Gyadi, R., Waru, S., Wage, T., Tachang, T., & Datta, A. 2022. Hornbill Nest Adoption Program (HNAP) Annual Report, 2022. 23 pp.		
Theses	Biswas, N. 2022. Effect of land-use change on the taxonomic diversity of birds in the northern Western Ghats. Master's thesis submitted to St. Xavier's College (Autonomous), Kolkata, India		
	Taneja, Y. 2022. Open to Invasion? Patterns in fruiting phenology and seed dispersal of <i>Lantana camara</i> across different habitats in North India. Master's thesis submitted to Wildlife Institute of India		

10 Projects

CEROS	Plant-Seed Disperser Community Assembly Project
	Impacts Of Chronic Human Disturbance On Plant Communities
	Impacts Of Land-Use Change On Bush Frogs, Forest-Dwelling Lizards And Arboreal Snakes
	Determining Drivers Of Evergreen And Deciduous Forest Transitions In Andaman Islands
	Impacts Of Land-Use Change On Rock Outcrop Fauna
	Impact Of Forest Loss And Hunting On Hornbills
Eastern Himalaya	Long-Term Monitoring Of Hornbill Breeding, Tree Phenology And Climate In Pakke Tiger Reserve, Arunachal Pradesh
	Hornbills And People: Building An Alliance For Conservation In The North Bengal Landscape, India (Conservation Leadership Programme Project)
	Hornbill Nest Adoption Programme (HNAP) In Arunachal Pradesh
	Conserving The Chinese Pangolin Through Community Engagement In Arunachal Pradesh, India.
	Community-Led Research And Conservation — Dibang Valley
	Idu Mishmi Igu (Shaman) Fellowship — Dibang Valley
	Elopa-Etugu Community Eco-Cultural Preserve — Dibang Valley
	Tropical Forest Restoration Project In Arunachal Pradesh And Assam
	Understanding Factors Influencing Natural Regeneration For The Restoration Of Logged Forests In The Eastern Himalaya - Ph.d. Project
	Understanding Mammal Plant Interactions In The Tropical Forests Of The Eastern Himalaya - Ph.d. Project
	Nature Education Programme In Arunachal Pradesh And North Bengal
	Taju Taye (Ancestral Storytelling) — Dibang Valley
	Hornbill Research And Conservation In North Bengal

Education and Public Engagement	A Platform To Host Resources For Young Students Interested In Bird Research: Ornithology.in
	Birds Of The World Partnership
	Bird Alliance
	Bird Monitoring In India Symposium - A Platform For Individuals Interested In Bird Monitoring Across India
	Directory Of Ornithologists
	Bird Count India
	Seasonwatch
	State Of India's Birds
	Climate Change Educators — A Community Of Educators Brainstorming
	Campus Phenology Network
	Birding Buddies Network Of Educators
	Research Projects: Children And Nature In The City
	Nature In Mass Media - Articles
	#Naturelive Webinars
	India Tree-Walks Network
	Young Birders' Network
	Digital Media Partnerships
	Suttha Muttha Project
	Nptel Course On Basic Ornithology
	Communities In Practice In Nature Learning
	Training Programs And Engagement With School Teachers, Educators
	Key Questions In Ornithology

	The Flock — A Newsletter About Birds And Nature		Intertidal Seagrass Species Assemblages In The Andamans
Endangered Birds	Monitoring The Endangered Black-Bellied Tern And Other Riverine Bird Species In Tamil Nadu, India	PhD and CLP	Tracking The Decline And Recovery Of Seagrass Meadows Grazed By Green Sea Turtles In The Lakshadweep
	Jerdon's Courser Recovery Plan		Factors Affecting Forest Succession And Opportunities For Restoration In Abandoned Coffee Plantations In The Western Ghats
High Altitudes	Foundation For The Future: Building India's First Comprehensive Model For Snow Leopard Conservation	Western Ghats	Role Of Past Climate, Geography And Anthropogenic Threats On Hornbill Populations In India
	People For Snow Leopards: Local Community Action Integrated With National And Global Strategies To Combat Illegal Wildlife Trade		Neglected Mutualists Of The Eastern Himalaya: Defining Vital Roles Of Carnivores, Herbivores, And Squirrels In Seed Dispersal.
	Augmenting Livelihoods Of Changpa Herders Of Eastern Ladakh		Assessing The Bio-Physical Limits To Atoll Habitability In The Wake Of Climate Change
	Sustainable Ladakh Pashmina - Towards Sustainable Livelihoods And Mountain Ecology		Effects Of The Environment And Humans On Himalayan Riverine Birds
	Securing Livelihoods To Foster Coexistence Of People And Wildlife In Upper Spiti Landscape		Rainforest Anuran Community Responses To Variation In Land-Use And Climate In The Western Ghats, India
	Putting The Ghosts Of Our Past Behind: Population Estimation Of Snow Leopards In Jammu & Kashmir, India – An Understudied Region In The Species' Distribution Range		How Do Frugivores Coexist?
	Leaving The Ghost Of Our Past Behind: Finding The Lost Snow Leopards Of Kashmir		Understanding Factors Influencing Natural Regeneration For The Restoration Of Logged Tropical Forests In The Eastern Himalaya
Oceans and Coasts	Long-Term Monitoring Of Birds In Spiti Valley Of The Indian Trans-Himalaya	Western Ghats	Long-Term Tropical Rainforest And Carbon Dynamics
	Long-Term Monitoring Of Snow Leopards In Himachal Pradesh		Long-Term Rainforest Tree Phenology In The Anamalai Hills And Malenadu
	Long-Term Monitoring Of Seagrass Meadows In The Andaman Islands		Online Nature Guide Training Course
	Long-Term Seagrass Monitoring: Tracking Changes In Tropical Inter-Tidal And Shallow Subtidal Seagrass Meadows		Conflicts To Coexistence: Mobile Phone Technology For Human Safety And Elephant Conservation In Modified Landscapes Of South India
	Freshwater Flux In Oceanic Atolls		Ecological Restoration Of Degraded Tropical Rainforests In The Anamalai Hills And Malenadu
	Consequences Of Reef Accretion In Lakshadweep		Effects Of Ecological Restoration On Tree Seed Dispersal In Fragmented Rainforests
	Reef And Reef Fish Responses To Climate Change Induced Disturbances		Field Experimental Assessment Of Direct Seeding And Weed Removal In Ecological Restoration
	Nature Food Dynamics In The Lakshadweep		Barriers To Recovery And Opportunities For Ecological Restoration In Abandoned Coffee Plantations
	Climate Change Outreach In The Lakshadweep		Habitat And Climatic Factors Structuring Rainforest Amphibian Communities In A Coffee-Dominated Landscape
	The Giant Guitarfish Project		Using Nature Art In Public Spaces To Enhance Nature Appreciation And Support Wildlife Conservation
	Booming Commercial Fisheries In The Lakshadweep		Hornbills And Bird Communities In A Landscape Of Fragmented Rainforests And Plantations
	From Production Seascapes To Biological Systems: Redefining Coastal Waters		Conservation Of Globally Threatened Tree Species In A Fragmented Plantation Landscape In Western Ghats, India

Bird Communities And Plant-Frugivore Interactions In Rainforests And Shade Coffee Farms

Monitoring Nocturnal Flying Insects And Assessing Their Contribution To Coffee Pollination

Dead Wood In Tropical Rainforests: Biodiversity, Carbon, And Nutrients

11

Financials

FORM 10B ACKNOWLEDGEMENT

Acknowledgement Receipt of
Income Tax Forms
(Other Than Income Tax Return)



e-Filing Acknowledgement Number / Quarterly Statement Receipt Number	Date of e-Filing
413758200161023	16-Oct-2023

Name	:	NATURE CONSERVATION FOUNDATION
PAN/TAN	:	AAATN1542Q
Address	:	# 1311, Amritha,12th A main, Vijayanagar 1st stage,Mysore,Vijaynagar II Stage S.O,Mysuru,Karnataka,INDIA,570017
Form No.	:	Form 10B (A.Y. 2023-24 onwards)
Form Description	:	Audit report under clause (b) of the tenth proviso to clause (23C) of section 10 and sub-clause (ii) of clause (b) of sub-section (1) of section 12A of the Income-tax Act, 1961, in the case of a fund or trust or institution or any university or other educational institution or any hospital or other medical institution
Assessment Year	:	2023-24
Financial Year	:	-
Month	:	-
Quarter	:	-
Filing Type	:	Original
Capacity	:	Chartered Accountant
Verified By	:	022573

(This is a computer generated Acknowledgement Receipt and needs no signature)

SI No	Attachment Name	Size(bytes)	Hash value of Attachment
1	NCF BS.pdf	2700255	701d669d36810b5fd4d4859cae22ab2c9628a6b59f010ea20f1386dbf16f61dd
2	NCF I&E.pdf	1150546	c817acc74600feb79aef1cba23fd8ee83019030bd414e10b9408f0ae81a0183

BALANCE SHEET

NATURE CONSERVATION FOUNDATION
#1311, "Amritha", 12th Main
Vijayanagar 1st Stage
Mysuru-570017, India

CONSOLIDATED IT

Balance Sheet as at 31st March, 2023

Figures in INR

Sources of Funds	Schedule No	31.03.2023	31.03.2023	31.03.2022	31.03.2022
Corpus Fund	22		7,74,39,836		7,70,17,586
Corpus Grants/Corpus Donations					
Opening Balance		27,51,88,969		25,04,25,165	
Add : Grants received					
Grants Under Foreign Contribution Regulation Act	4	4,60,59,855		5,29,11,537	
Corpus Donation Received	7	15,06,944		27,04,913	
Local Grants Received	5	12,50,71,006		8,02,32,278	
F C R A Donations	6	12,40,428		11,23,833	
Donation received -U/s 35	8	66,71,992		62,69,277	
Bank Interest Received	9	8,36,392		6,53,237	
Sub-total		45,65,75,587		39,43,20,240	
Less : Grants utilized - Project Expenses	14	15,18,82,990		11,85,56,661	
Less : Grants Returned	18	4,98,400		5,74,610	
Closing Balance			30,41,94,197		27,51,88,969
Field Advance	23		11,41,545		16,61,654
Current Liabilities	13		53,90,653		(3,23,394)
Total			38,81,66,231		35,35,44,815
Application of Funds	Schedule No	31.03.2023	31.03.2023	31.03.2022	31.03.2022
Fixed Assets	21		3,06,11,134		2,94,04,627
Other Advances	24		49,12,545		41,63,760
Income and Expenditure Account Deficit Balance B/F		7,25,57,862		6,37,66,076	
Less: Surplus /(Deficit) for the year		(1,12,58,823)		(87,91,786)	
Balance C/F			8,38,16,685		7,25,57,862
Field Advance	23		63,19,161		1,11,58,538
Current Assets :					
Fixed Deposits and Investments	19	23,71,65,012		20,81,94,948	
Cash & Cash Equivalents	20	2,50,20,535		2,77,81,456	
Income Tax Refund Receivable	3	2,14,240		1,49,113	
Grant Receivable	5	1,06,920	26,25,06,707	1,34,510	23,62,60,028
Total			38,81,66,231		35,35,44,815

As per our attached report under Section 10B of the Income Tax Act, 1961

For **Rau & Nathan**
Chartered Accountants
Firm Registration #003178S

Narayanamoorthy Vaidyanathan
Partner
Membership No.022573

Place : Mysuru

Date : 16.10.2023

For Nature Conservation Foundation

T.R. Shankar Raman

T R Shankar Raman
Trustee



NATURE CONSERVATION FOUNDATION
#1311, "Amritha", 12th Main
Vijayanagar 1st Stage
Mysuru-570017, India

CONSOLIDATED IT

Income and Expenditure Account for the Year Ended 31st March, 2023

Figures in INR

Income	Schedule No.	31.03.2023	31.03.2022
Interest Received on Savings Bank Account	9	5,87,892	4,57,085
Interest Received on Fixed Deposit	9	1,637	1,571
Interest on Gratuity Fund	9	2,46,863	1,94,581
Sub Total		8,36,392	6,53,237
Less: Transferred to Respective Grants		8,36,392	6,53,237
Interest on Income Tax Refund	9	2,855	7,125
Donation Received	7	1,26,982	76,068
Total		1,29,837	83,193
Expenditure	Schedule No.	31.03.2023	31.03.2022
Administration Expenses	15	39,93,065	35,26,926
Depreciation	21	61,06,979	53,48,052
Assets Destroyed by Wildlife / Lost	21	12,88,616	-
Surplus/ (Deficit) Carried to Balance Sheet		(1,12,58,823)	(87,91,786)
Total		1,29,837	83,193

As per our attached report under Section 10B of the Income Tax Act, 1961

For **Rau & Nathan**
Chartered Accountants
Firm Registration #003178S

Narayanamoorthy Vaidyanathan
Partner
Membership No.022573

Place : Mysuru

Date : 16.10.2023

For Nature Conservation Foundation

T.R. Shankar Raman

T R Shankar Raman
Trustee



THE STORY CONTINUES

NATURE CONSERVATION FOUNDATION

#1311, "Amritha", 12th Main
Vijayanagar 1st Stage
Mysuru-570017, India

CONSOLIDATED IT

Receipts & Payments Account for the year ended 31st March, 2023

Figures in INR

Receipts	Schedule No.	Amount	Amount
Opening Balances :			
Fixed Deposits & Investments	1	20,81,94,949	
Cash & Cash Equivalents	2	2,77,81,456	23,59,76,404
Grants & Donations Received :			
Grants Under Foreign Contribution Regulation Act	4	4,60,59,855	
Local Grants Received	5	12,49,64,086	
F C R A Donations	6	12,40,428	
Corpus Donations	7	15,06,944	
Donation towards Field Assistants' Fund	22	45,000	
General Donations	7	1,26,982	
Donations Received under Section 35	8	66,71,992	18,06,15,287
Grant receivable in FY 2021-22			1,34,510
Income Tax Refund Received - FY 2020-21	3		38,195
Bank Interest & Interest on Income Tax Refund	9		8,39,247
Surplus on Redemption of Investments	10		5,02,250
Field Advance	11		3,51,10,590
Other Advances Recovered	12		40,08,152
Current Liabilities	13		12,51,30,163
Sale of Fixed Assets			45,563
Total			58,24,00,363
Payments	Schedule No.	Amount	Amount
Project Expenses	14		15,18,82,990
Administration Expenses	15		39,93,065
Field Advance	16		3,07,91,322
Current Liabilities	13		11,94,16,116
Other Advances Paid	12A		47,56,937
Capital Expenditure	17		86,47,665
Other Payments	18		6,23,400
TDS for the FY 2022-23	3		1,03,322
Closing Balances :			
Fixed Deposit and Investments	19	23,71,65,012	
Cash & Cash Equivalents	20	2,50,20,535	26,21,85,547
Total			58,24,00,363

As per our attached report under Section 10B of the Income Tax Act, 1961

For Rau & Nathan
Chartered Accountants
Firm Registration #0031785

Narayanamoorthy Vaidyaathan
Narayanamoorthy Vaidyaathan
Partner
Membership No.022573

Place : Mysuru
Date :



For Nature Conservation Foundation

T.R. Shankar Raman

T R Shankar Raman
Trustee



The year ahead promises to be busy and urgent for the **Oceans and Coasts** programme. There is a super-El Niño headed to our waters, and we are gearing up to track its effects on Lakshadweep's coral reefs with some trepidation, and exploring potential pockets of resistance in lagoon coral. The return of the El Niño reinforces the importance of our ongoing work on island habitability, where we are measuring freshwater budgets, reef accretion potential and sediment dynamics of atoll systems. In Lakshadweep, we have a series of other studies planned on the effectiveness of seagrass refugia against green turtle overgrazing, the growing commercial reef fishery and documenting the impacts of modernity on local food culture. Our outreach programmes in the Lakshadweep (**Melem Keezham**) will build on its earlier momentum and we are busy developing another exciting component to it to celebrate ways of life in Lakshadweep with a series of documentary shorts. Meanwhile, in the Andaman Islands, we will be documenting long term changes in multi-species intertidal seagrass meadows and evaluating the importance of these shallow-water environments for marine megafauna like guitarfish, rays, turtles and dugongs. Alongside this, we will be measuring other services these systems provide, and documenting people's attitudes towards these forgotten habitats. We are also testing the use of passive acoustic methods in studying dugong presence and movement in seagrass meadows. Along the west coast of India, our studies of coastal fisheries will work to develop a comprehensive framework that incorporates genetic stock boundaries and interstate management mismatches to evaluate the vulnerability of target fish stocks along the coastline.

We intend to continue and extend our long-term rainforest research and monitoring efforts in the southern and central **Western Ghats**, with a renewed focus on understanding ecosystem functions and dynamics, identifying trends, and assessing the effects of climate change. We plan to take ahead our efforts with the Ecological Restoration Alliance – India by building the community and resources related to restoration, while fostering collaborations and interactions. We are also working towards continued sharing of our datasets, information, media, and learnings with the wider community through citizen science portals, Wikipedia and Wikimedia Commons, and the Global Biodiversity Information Facility. In our human-wildlife interactions research and field efforts in two landscapes, we aim to continue to engage with a wide set of local stakeholders to achieve coexistence goals.

In the coming year, as part of the **PhD and Conservation Leadership** programme, we intend to regularise admissions every two years, add more institutional fellowships, provide

competitive seed grants to help students initiate their doctoral projects independently, and provide annual travel grants to enable students to attend academic/conservation conferences. The next round of courses in conservation have been announced and will be held between January to March 2024. We are offering eight courses this year covering essential skills for conservation practitioners.

As part of the **CEROS** programme, on the conservation side, we are excited to monitor the fate of saplings planted during our first restoration effort in June 2023 and prepare for next year's planting to restore 3 ha of degraded forests at the foothills of the northern Western Ghats. On the conservation science side, we look to synthesise and consolidate the multi-taxa study on the impacts of forest degradation and conversion on biodiversity in the northern Western Ghats and Andaman Islands. We will build upon the past work on river birds in Eastern Himalaya and monitor multiple drainages to determine the impacts of fishing and boulder and sand mining on river birds. On the science side, we see the end of the fieldwork for the multi-site plant-frugivore community assembly project wherein we have collected interaction data between fleshy-fruited plants and their avian seed dispersers from six sites spread across southern Thailand, north-east India, Andaman Islands and the Western Ghats. We will finish fieldwork for the hornbill phylogeography and population genomics study in North-east India and the Western Ghats. We are excited to host three Master's students whose dissertations will build upon our previous work and engage on topics ranging from understanding the value of remnant forests and native trees amidst monoculture tree plantations for birds to understanding drivers of vertical stratification in frugivore communities and determining differing contributions to seed dispersal by individuals in Lion-tailed Macaque troops.

In the coming year, as part of the **Education and Public Engagement** programme, we plan to deepen and broaden our work in outreach, education, communications, and citizen science. We will expand our collaborations with the mass media, covering more languages and geographic regions; and will explore new ways of reaching large audiences. As part of our work bringing birds and nature to children and adults, we will launch a self-paced introductory course called Wonder of Birds to be hosted on an online learning platform. We will expand our fellowship programme for educators working locally with communities in different parts of the country. In our citizen science work with birdwatchers, we aim to increase engagement in under-represented regions while growing the overall knowledge base. The accumulated information will be analysed to produce distribution and trends of India's birds in the second edition of the State of India's Birds report, a multi-institutional collaboration. We will contribute to the launch of the Bird Alliance website, a directory of all things birds, built for a diverse set of audiences, and accompanied by the monthly newsletter, The Flock. We will start a Campus Phenology Network, setting up phenology monitoring for trees across college and university campuses across the country.

In the **Eastern Himalaya**, our ongoing research on hornbills in north Bengal has highlighted the importance of this landscape for hornbills. Our research has also identified threats to hornbill populations in this landscape and opportunities for conservation. We plan to use our ecological research to serve as a baseline to set goals and objectives and guide future conservation action for hornbills in this landscape. For this, we will be organising a multi-stakeholder workshop to develop a conservation plan with participation from the forest department, local communities, other government agencies, non-government organisations, independent researchers, academia and local administrative units. The workshop will be moderated and facilitated by a trained Conservation Planning Specialist Group (CPSG) and will be held in February 2024. This exercise is expected to help protect the existing population and habitat of hornbills and improve overall hornbill conservation in north Bengal by establishing alliances and a collaborative conservation network of key stakeholders. In Dibrang, we plan to conduct the bi-annual census of hoolock gibbon families in and around the Elopá-Etugu Community Eco-Cultural Preserve (EECEP). We are starting a systematic vegetation survey to understand the structure and composition of the forests in EECEP that gibbons depend on. Finally, we will be expanding the Taju Taye program to more schools.

For our efforts to conserve **Endangered Birds**, we will be planning our regular monitoring work on the riverine birds and Black-bellied Tern in particular in the Kaveri-Kollidam river stretch where it is regularly seen. We will be expanding our search for nesting locations of Black-bellied Terns as well as other ground nesting birds that depend on the riverbed in the Kaveri-Kollidam rivers. We have created a website <https://tnbirdgapfilling.wordpress.com> to aid birdwatchers to locate areas that are less frequently birded. We are planning to conduct targeted bird surveys and outreach in the places where there are fewer birdwatchers and birding efforts in Tamil Nadu through community partnerships. To understand the change in the vegetation structure and to assess the habitat quality in potentially suitable Jerdon's Courser habitat, we are planning to carry out vegetation sampling and monitoring of habitat.

For the **High Altitudes**, addition to our long-term conservation efforts in Himachal Pradesh, we intend to initiate a project specifically focused on women's participation in the region through our 'Women in Conservation' project. Our commitment to expanding our initiatives beyond Spiti, into Kinnaur and Lahaul, remains steadfast for the upcoming year. Having received excellent data from our camera trapping efforts in Jammu and Kashmir, we plan to cover other valleys and concurrently build local capacity for research and conservation. In Ladakh, where we have been at the forefront of participatory research and conservation actions alongside partner communities, our focus will continue to remain collaboratively designing and developing interventions that are locally relevant. Our ultimate goal is to ensure the widespread adoption of these efforts in the region.

The year ahead, as you can imagine, is going to be busy, and we look forward to it!

TRUSTEES

Dr. Rohan Arthur

Trustee & Senior Scientist

Dr. Charudutt Mishra

Trustee & Senior Scientist

Dr. T. R. Shankar Raman

Trustee & Senior Scientist

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Dr Yashveer Bhatnagar

International Union for Conservation of Nature (IUCN)

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Haridas Bhat

M Shivakumar

Sunil V.

Suma P.

Shivani Jain

Sagar V.

Saraswati

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