Foundation for Ecological Research, Advocacy and Learning

Annual Report
2024 - 2025

Foundation for Ecological Research, Advocacy and Learning

(FERAL)

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Contents

Across India, golden jackals (*Canis aureus*) face localized but growing threats from habitat loss, road mortality, and potential hybridization with feral dogs.

Mandate

FERAL is a public charitable trust founded in 1997 with a mandate to develop sustainable and community centred solutions to address the pressing challenges that affect our natural ecosystems and the services they provide. We rely on interdisciplinary and quantitative methods to understand these systems and provide practical, participatory and gender responsive strategies toward their restoration and management. Our programmes invest in rigorous field studies to track and measure ecological processes over sustained periods. We adopt an evidence-based approach to identify problems, provide frameworks for their resolution and monitor the effectiveness of our interventions. We develop scientific and educational material, technical know–how, provide training, employment and skilling of stakeholders. We believe that addressing the seemingly intractable challenges we face in finding solutions to ecological and environmental problems today is only possible through meaningful collaborations with multiple stakeholders.

Vision

Resilient ecosystems and thriving communities that enjoy a sustainable and equitable future supported by rigorous research, informed advocacy, and inclusive practices.

Mission

To conduct rigorous ecological research, promote evidence-based conservation practices, and strengthen community capacity for sustainable ecological management. We are committed to bridging science and society by generating knowledge that informs equitable environmental policies, empowers local communities with sustainable solutions, and fosters collaborations that advance long-term ecological resilience.

The typical habitat of the brown fish owl (*Ketupa zeylonensis*), a widely distributed species,is forest and woodland bordering streams, lakes or rice fields.

The Year That Was

The past year was an eventful one at FERAL. We welcomed back an old friend, two young researchers joined our fold, the Marine Science Programme saw its current thrust of activities come to a close and we signed an MoU with the Trans-Disciplinary University, Bangalore to launch a doctoral level post-graduate program. Our engagement with conservation conundrums and search for data-driven solutions and strategies to address the challenges of ecosystem management continued under our core programmes – Wildlife Biology and Conservation, Frontier Elephant Programme, Natural Resource Management and Marine Science. Three projects were successfully wrapped up and three new ones were initiated.

We could call the year gone by as the "Year of Women Researchers" at FERAL. Dr. H S Sushma, who had been with us as a young researcher, returned as an established scientist in her field of behavioural ecology and conservation, and initiated a study on mutualistic interactions of fleshy-fruited plants and their frugivores within a mixed-use landscape in the Central Western Ghats. We also welcomed two early career researchers, both of whom initiated studies focussing on impact of human interventions on natural systems – one focusing on the intersection between urban (free-ranging cats) and adjoining green spaces (bird communities) in the environs of Dehradun, Uttarakhand and the other studying the potential of massive afforestation programs for carbon sequestration and their impact on open natural ecosystems in Maharashtra. We also began a conversation with Dr. Divya Panicker to explore the possibilities of starting a new chapter under the Marine Science programme by initiating ecological and conservation work on marine mammals in island ecosystems and along the West Coast of India.

The "L" in FERAL saw a major achievement with the signing of an MoU with the Trans-Disciplinary University, Bangalore to launch a doctoral level post-graduate program. This is a significant step toward realising our mandate to provide training, address knowledge gaps in the field of ecology and conservation science, transfer field-based knowledge and skills and build capacity for ecological research. As we prepare to receive our first cohort of students in the next year, we look forward to building a robust program that will help mentor future leadership in conservation science and natural resource management.

The Wildlife Biology and Conservation programme saw the successful completion of its restoration activities in Manipur. Despite the challenging conditions of working under the cloud of ethnic strife, the communities along the catchment of the Tuivang River successfully restored a site, continued to care for and manage it post project close and declared it as a "protected" area. The project not only contributed to environmental restoration but also strengthened the community's capacity for natural resource management and conservation. It also demonstrated the potential for synergy between traditional stewardship and modern restoration practices.

The crimson breasted barbet (*Psilopogon haemacephalus*) or the coppersmith, a predominantly frugivore, carves out holes in trees to build its nest.

Intensive field work under the Frontier Elephant Program drew to a close. The study on bull elephant behaviour focused on data analysis and manuscript preparation to ensure wide dissemination of findings. The team also continued working with the Karnataka Forest Department, especially in the Ramanagara Forest Division, providing valuable inputs into management plans. The project in the Brahmagiri–Nilgiri–Eastern Ghats Landscape (BNEGL) found that patterns of elephant movement differed across protected and non-protected areas and in different rainfall zones with elevation playing a key role. This, in turn, was an influencing factor in how human-use areas were affected. Mobility—physical, social, and political—of farming communities greatly influenced how elephant encounters were perceived. The interplay of the capabilities and functionings in these contested landscapes showed both elephants and farmers experiencing varied opportunity costs and reduced well-being. The findings also emphasised the need to address human-elephant conflicts as a social justice issue requiring strengthened human capabilities.

Activities under the Marine Science program drew to a close and we bid goodbye to Dr. Divya Karnad and her team. Bringing marine science to the classroom and increasing awareness among seafood consumers of the enormous marine diversity in Indian waters were key activities during the year.

Work in the Nilgiris continued at our long term hydrology–meteorology monitoring site. Data from stream-flows, run-off, evapotranspiration, and soil-properties across grassland, shola and wattle-invaded catchments showed significant differences in stream-flows, especially over the dry spells. The invasion of wattle species was found to significantly alter the hydrological cycle, highlighting the need for effective invasive species management and restoration in these catchments.

This year, we also welcomed Dr. Nachiket Kelker, an ecologist focussing on freshwater ecosystems and biodiversity from the Wildlife Conservation Trust, as an Adjunct Scientist at FERAL.

The Nilgiri flycatcher (Eumyias albicaudatus) is a Western Ghats endemic, found in high-altitude sholas.

Wildlife Biology and Conservation

This programme focusses on rigorous scientific research on wildlife and their habitats, using evidence from both field studies and community engagement to guide on-ground conservation action. Our initiatives integrate diverse biotic and abiotic parameters to understand how wildlife interacts with rapidly changing landscapes. We thus aim to address complex, long-term conservation challenges and develop strategies that strengthen biodiversity protection across natural as well as human-modified environments.

Over the years, our work has involved monitoring of wildlife populations and habitat changes to understand ecological and human impacts, assessing conservation interventions—both successful and failed—to shape policy, and testing innovative solutions to tackle seemingly intractable challenges to wildlife conservation.

This year, we completed our project in Manipur, where we supported a community-driven effort to restore the catchment of the Tuivang river. After successfully raising saplings in the nursery established in the previous year, community members went on to plant these at a designated restoration site in L. Bongjoi, Chandel District. The site was subsequently declared a “protected area” by the village headman, marking a significant step toward safeguarding the landscape.

This year was also the year for women wildlife researchers at FERAL. Strengthening our commitment to nurturing young conservation professionals, we welcomed two women researchers to our team. One studied the impact of domestic cats on urban bird communities, generating insights relevant to urban biodiversity management. The other assessed large afforestation projects in semi-arid savannas in India to understand the motivations, extent, and carbon sequestration potential of these efforts.

We were also delighted to welcome back a senior scientist—who had worked with us early in her career—to FERAL. Her study evaluates how the harvest of wild fruits affects plant–frugivore interactions in the mixed-use landscapes of the Central Western Ghats. Her work contributes to a deeper understanding of how resource extraction intersects with ecological processes in one of the most biodiverse regions of the country.

Often mistaken as common, the bonnet macaque (*Macaca radiata*) is actually in decline and is listed as Vulnerable by the IUCN

Highlights

– A study on the impact of harvest of wild fruits on plant-frugivore interactions was initiated. This work will help our understanding of the long-term sustainability of harvesting non-timber forest produce, and in association, the persistence of these fruiting trees and their dependent frugivores. This is especially important in the case of endangered and endemic frugivores such as the lion-tailed macaque, the largest population of which is found in the area identified for study.

– The study on the impact of free-ranging cats on urban birds found that the species most hunted by these cats were these birds. Young and non-neutered cats were found to hunt the most. Interestingly, cats fed a low-protein diet and those with less playtime with their owners were found to hunt more. These findings were shared through eight outreach sessions with residents and students in the study area, to sensitize them to the extant urban bird communities and how the community can contribute to reducing threats to these birds from their pets.

– The study on open natural ecosystems (ONEs) showed that ONEs have significant soil carbon stocks. Tree plantations were found to have a very low insect diversity compared to that of ONEs. However, herbaceous diversity was low in ONEs, highlighting the need for restoration.

– In Manipur, 0.3 hectare of a degraded site in the Tuivang River catchment area was restored through planting 600 saplings of 9 native species and declared a “protected” area by the village headman and village council. The Manipur restoration site serves as a living example of how local participation, ecological knowledge, and sustained engagement can transform a degraded landscape into a regenerating ecosystem. By integrating traditional stewardship with modern restoration practices, this initiative has laid the foundation for long-term ecological resilience and sustainable livelihoods in the Tuivang River catchment area.

Feeding sign of fruit bats. Ejecta containing intact seeds of *Memecylon sp*..

Impact of harvest of wild fruits on plant-frugivore interactions in a mixed-use landscape in the Central Western Ghats

Project Period: January 2025–November 2026
Supporting Agency: Self Funded
Principal Investigator: H. S. Sushma

Introduction

Plant-frugivore interactions—ranging from seed dispersal to seed predation—are fundamental processes that shape plant community structure, maintain connectivity among populations, and enable regeneration in disturbed habitats. Most tropical woody plants depend on vertebrates to disperse their seeds, while their fruits provide essential resources for frugivores. However, these interactions are increasingly disrupted by human-driven biodiversity loss.

In mixed-use landscapes, effective seed dispersal is vital for plant persistence; however, it is threatened by fragmentation, degradation, and over-harvesting of forest resources. Many non-timber forest products, including wild fruits, are collected for subsistence and livelihoods. Several of these fruits are also consumed by a wide range of frugivores and thus, intensive harvest can reduce food availability and weaken mutualistic interactions critical for forest regeneration.

In the Central Western Ghats, forests near villages experience high levels of resource extraction—fuelwood, leaf litter, and green foliage—leading to localized degradation. Fruiting trees in these areas may receive fewer or different frugivore visitors than those in the forest interior. Understanding how such disturbances affect plant-frugivore relationships is essential for managing mixed-use landscapes and guiding sustainable harvest practices.

This study examines mutualistic interactions of fleshy-fruited plants and their frugivores across a disturbance gradient within the Sirsi and Honnavara Forest Divisions and the Sharavathy Valley Lion-Tailed Macaque Wildlife Sanctuary in Karnataka. This landscape includes evergreen and semi-evergreen forests, moist deciduous tracts, agricultural mosaics, and several villages, and supports the largest population of the endangered, frugivorous lion-tailed macaque (*Macaca silenus*).

Using the seed dispersal effectiveness framework, the study will document mutualistic interactions to assess both quantitative (visitation rates, fruit removal) and qualitative (fruit handling) aspects of frugivore activity. Focal species include community-harvested fruits such as *Garcinia gummi-gutta, Myristica dactyloides, M. malabarica*, and *Artocarpus lakoocha*, along with closely related species like *Garcinia morella, G. talbotii, Knema attenuata,* and *Artocarpus hirsutus* to control for effects of phylogenetic relatedness.

Evergreen forest in the central Western Ghats is home to many endangered species such as the lion-tailed macaque (*Macaca silenus*). Adjoining villages often collect wild fruits, leaf litter, fuel wood, etc. from these forests for subsistence and livelihood.

Objectives

I. Identify frugivores and their interactions with select fleshy-fruited species.

1. Is there a variation in frugivore community structure between harvested and non-harvested tree species?

2. Do plant traits (tree size, fruit and seed size and fruit crop size) and animal traits (fruit handling behaviour and body size) influence interactions between these plant species and their frugivores?

II. Determine the impacts of habitat degradation and harvesting of fruits on plant-frugivore interactions.

1. Is there a variation in frugivore visitation rates to trees along varying distances from villages?

2. Does harvesting pressure on fruiting trees (damage to fruiting trees measured as number of branches lopped) influence frugivore richness and visitation patterns?

3. Are fruit and seed removal rates and deposition away from the crown influenced by disturbance?

Status

The initial phase of this project focused on obtaining permits, finalizing the sampling design, and identifying and establishing study patches and transects for data collection. Presentations on the purpose and importance of this study were made to the Karnataka Forest Department, following which, work permits for the Sirsi and Honnavara Forest Divisions and the Sharavathi Wildlife Sanctuary were granted. Reconnaissance surveys to identify forest patches for sampling were carried out.

Six transects measuring 500 m in length were established in the identified forest patches outside the Protected Area, adjacent to villages. These transects will be used for monthly phenological monitoring of tree species as well as focal tree watches of fruiting trees. Along these transect lines, belt transects measuring 250 m x 40 m will be used for estimating tree densities. Vegetation sampling in one belt transect has been completed, wherein all trees >30 cm GBH (1.3 m) were identified, and their girth measured. One tree each of the focal tree species (*Myristica malabarica*, *M. dactyloides*, *Knema attenuata*, *Garcinia gummigutta*, *G. morella*, and *Artocarpus hirustus*) has been marked for subsequent tree watches.

A pair of Oriental Pied Hornbill (*Anthracoceros albirostris*) in an urban green space. These are predominantly frugivores, and are important seed dispersers.

Assessing impacts of free-ranging cats on bird community in urban green spaces of Dehradun, Uttarakhand

Project Period: April 2024 to December 2025
Budget: GBP 6000 (INR 6,13,200)
Supporting Agency: The Rufford Foundation, United Kingdom
Principal Investigator: Monica Kaushik

Introduction

A previous study investigated the effects of landscape and local-scale factors in explaining the bird assemblages in the urban green spaces (hereafter UGS) of the rapidly urbanizing Himalayan foothill city of Dehradun, Uttarakhand. The findings underscored the value of large and vegetationally complex green spaces in conserving resident and migratory avifauna and highlighted the value of both local and landscape-level variables for urban bird communities. At the landscape level, green space size had an overarching effect on bird species' richness and density. On a local scale, tree and shrub richness within the green spaces shaped bird community structure. Interestingly, the bird community composition was explained by a combination of landscape and local scale factors, including land use types in the surrounding matrix.

To supplement this knowledge on urban bird communities, the current study will quantify the effects of free-ranging (domestic and feral) cats in the UGS of Dehradun. Our previous interactions with the local community revealed increasing incidents of cat predation on birds and nests in home gardens. Loss of avian scavengers, rise in solid waste, and human-subsidized food are potential reasons for the increased population of free-ranging invasive predators in India. To our knowledge, this is the first attempt to quantify the impacts of free-ranging cats on birds and document their diet in an urban setting in India. We believe that many cat owners are unaware of the potential ill effects of their pets on urban biodiversity. Findings of this study will be utilized to sensitize urban residents about the silent crisis unravelling in their backyards.

Objectives

I. To quantify the free-ranging cat density within and around UGS

II. To quantify the hunting pressure by free-ranging domestic cats on urban birds

III. To conduct outreach activities within UGS for the green space users and pet parents.

Status

A city-wide survey to collect information on predation by free-ranging domestic cats was undertaken between August 2023 and February 2025. For this, we used a semi-

Analysis of scats and pellets provides critical information on the dietary habits of wildlife.

structured questionnaire, which was shared with the residents of Dehradun. The survey targeted areas close to the selected green spaces in the study area. In addition, posters about the survey were put up in veterinary clinics and popular cafes. Social media channels such as WhatsApp communities and Instagram were also used to circulate the survey. Household surveys were undertaken near all selected urban green sites in Dehradun. We asked pet owners to provide detailed information including on their cat's demography, neutered status, diet, frequency and type of prey brought home, and engagement duration by pet owners. We surveyed a total of 445 households, of which 71% had pets. Of the households with pets, 29% had cats as pets.

We also conducted eight outreach activities in Dehradun to sensitize the green space users about birds and the ill effects of free-ranging animals, including pets. These outreach programmes were held in the green spaces sampled including the Graphic Era University, University of Petroleum and Energy Studies and the Kendriya Vidyalaya Forest Research Institute, Dehradun. Additionally, we invited established bird watchers to lead bird walks in green spaces around our study area, which allowed us to connect with these networks. In total, we reached out to more than 200 residents and students through these outreach activities.

We also utilized the platforms provided by other institutions—we presented a poster on our research at the Uttarakhand Bird festival and spoke to the public and participants about our project. Our pet survey was shared with the other participants at these events.

We collected 70 scat samples of free-ranging domestic cats from Dehradun during this reporting period and are in the process of analysing the same. Using the microscopy method, we are identifying the prey species through the hair, nails, bones, and any other undigested part. So far, we have processed 60 samples and identified the prey in 40 samples.

This research has been presented at various forums including an international conference on urban ecology in Atlanta, 2025. We presented the initial findings of the work at the Uttarakhand Bird Festival and also at the Bird Monitoring Symposium 2025 (https://www.youtube.com/watch?v=oTdEttuL0bM&list=PLQjZzan_vkeMc9mI2RrLhke0M6dVMeK4m&index=4).

Open natural ecosystem (ONE) in Baramati, Maharashtra. ONEs host rich and unique biodiversity, provide key ecosystem services including carbon sequestration, and supports local communities and livelihoods.

Assessing the motivations for, extent, and carbon sequestration potential of massive afforestation projects in semi-arid savannas in India

Project Period: May 2024–April 2025
Budget: GBP 6,000 (INR 6,29,700)
Supporting Agency: The Rufford Foundation, United Kingdom
Principal Investigator: Anisha Jayadevan
Collaborators and their Institutions: Dr. Jayashree Ratnam, National Centre for Biological Sciences, Bengaluru

Introduction

Tree planting has gained widespread popularity as a 'silver-bullet' solution to limit global warming and restore ecosystems, with tropical open natural ecosystems (ONEs) disproportionately identified for afforestation. In India, colonial-era legacies of classifying ONEs as "wastelands", and climate mitigation ambitions, have led to ~4.3 million hectares of these ecosystems being identified as potential carbon sinks via afforestation. Global studies suggest that practitioners define restoration in different ways, and that trees are often planted for utility purposes. However, few studies have examined the extent to which narratives around "wastelands" and misperceptions of ONEs as degraded ecosystems, drive Indian restoration practitioners to afforest savannas. In addition, it is unclear whether tree planting will consistently increase both below- and above-ground carbon relative to old-growth savannas. Previous global research suggests that naturally increasing tree cover in savannas only minimally increases carbon sequestration. However, this research does not include tree planting or data from Indian savannas, which have a distinct land-use history and management system. This study proposes to assess the motivations driving tree planting as a restoration strategy in savannas in Maharashtra, India, map its spatial spread, and estimate its carbon sequestration potential, quantifying the economic expenditure per unit of carbon gained.

Objectives

I. Understand the motivations for, and implementation of, restoration of open natural ecosystems in India.

II. Understand the carbon sequestration potential of tree plantations in semi-arid open natural ecosystems in Maharashtra, India.

III. Assess patterns of tree cover in afforested semi-arid open natural ecosystems in Maharashtra, India.

30 year old tree plantation in Baramati, Maharashtra. Tree plantations in regions with low tree cover are sparsely planted.

Status

To understand the motivations for, and implementation of, restoration two people each from seven organizations that conduct restoration of ONEs in Karnataka, Maharashtra, Gujarat and Rajasthan were interviewed. Restoration strategies spanned grassland restoration via seeding grasses, afforestation, and agroforestry. In addition to restoration organizations, four funding organizations were interviewed to understand whether funding goals for restoration drive restoration goals of the organizations. Preliminary findings indicate that on-ground restoration strategies can differ based on the motivations for restoration and perceptions of ONEs. The results from this study can aid more focused discussions on future directions for ONE restoration, and highlight areas requiring further consensus on restoration strategies and funding horizons.

Fieldwork to assess carbon sequestration in grasslands and tree plantations in Maharashtra was completed. Fieldwork was carried out in four administrative divisions (taluks) in Pune District, Maharashtra, at an increasing gradient of rainfall (450–1000 mm). Overall, 12 pairs of tree plantation and ONE sites were sampled. Laboratory work to analyze soil organic carbon was also completed. The data indicated that although tree plantations lead to gains in aboveground carbon it does not significantly increase soil carbon. In ONEs, soil carbon is a more stable form of carbon than aboveground carbon which is susceptible to losses due to drought and fires. Data on aboveground biomass collected as part of this fieldwork will inform further analysis using remotely sensed data to assess patterns in tree cover in afforested open natural ecosystems.

Some of the key learnings from this study include first, an understanding of the carbon sequestration potential of tree plantations across a precipitation gradient in ONEs in Maharashtra, India. Second, the study contributes to our understanding of soil carbon stocks in open natural ecosystems across a precipitation gradient in Maharashtra, India. Third, the study has provided an understanding of the opportunities and challenges associated with the restoration of ONEs in India.

Villagers actively participated in various tasks as part of our restoration effort near L. Bongjoi village in Manipur.

Forest inventory and establishing nurseries for community-based restoration of a river catchment in North-East India

Project Period: October 2022–June 2024
Budget: GBP 5,993 (INR 5,50,217)
Supporting Agency: The Rufford Foundation, United Kingdom
Principal Investigator: Letkhosei Baite
Co-Principal Investigator: Rajat Ramakant Nayak
Collaborators and their Institutions: James Haokip, Sikkim University, Gangtok

Introduction

The Tuivang River in Manipur is part of the Chindwin River Basin and is one of the few free-flowing rivers remaining in the country. The river is important for maintaining aquatic biodiversity and providing various ecosystem services in this region. However, this riverine ecosystem is facing threats in the form of habitat modifications due to logging. Historically, the Tuivang River and its catchment areas have been actively managed and used by local communities, which widely practised shifting cultivation and selective logging. However, over the years, the number of farmers practising shifting cultivation has drastically decreased, and selective logging has been replaced by mechanized clear felling of large tracts of forests. Our project aimed to document floristic diversity in the remnant forest patches and facilitate community-led restoration activity in order to improve forest health along the Tuivang River in Manipur.

Previously, we had documented floristic diversity in the catchment region, conducted awareness and education programs, established a village nursery, and identified site for restoration. This year we completed restoration planting in the identified degraded forested site.

Objectives

I. Increase awareness among local communities on the importance of forests in retaining rainfall and reducing landslides and flood risks in the area.

II. Identify potential sites for restoration.

III. Document species richness and diversity in the area.

IV. Establish village nurseries to aid restoration efforts.

V. Grow Rare, Endangered, and Threatened (RET) plant species in village nurseries, which could be later planted in the restoration sites.

VI. Restore denuded sites to help rejuvenate streams and the river, which will benefit conservation and the sustainable use of water resources in the long run.

The site that was planted as part of the restoration effort along the Tuivang River in Manipur was declared a protected area by the village council.

Status

In the final phase of this project, a major milestone was achieved through the successful plantation of nursery-raised seedlings in a degraded site within the Tuivang River catchment area. This initiative marked the culmination of several months of groundwork and community engagement aimed at community-led restoration and reviving the natural vegetation of the area. The restoration activity was the outcome of sustained collaboration with the local community.

In the earlier phase of the project, approximately 2,000 seedlings of various native plant species were raised in the community nursery established at Kengjang village. The nursery served as a demonstration site for native species propagation and as a practical training hub for local villagers. Through this initiative, villagers gained hands-on experience in seed collection, nursery bed preparation, watering, and transplanting techniques. The nursery not only provided quality planting material for restoration but also strengthened community ownership over the restoration process.

The villagers took the lead in selecting a degraded and barren site of approximately 0.3 hectares near L. Bongjoi village for restoration planting. The area had been subjected to regular slash and burn practices leading to extensive degradation, soil erosion, and loss of native vegetation. After site assessment and community consultations, this patch was chosen as an ideal location for initiating community-led ecological restoration.

In June 2024, a total of 600 saplings belonging to nine different native tree species were planted at this site. The selection of species was based on their rarity and ecological, cultural, and economical values. The planting drive was organized as a community-led event, reflecting the spirit of collective stewardship and environmental responsibility. Over 50 villagers, including men, women, and youth, actively participated in various tasks ranging from clearing the site and digging planting pits to transporting seedlings and planting them in designated plots.

This participatory approach fostered a strong sense of ownership and awareness among the community members regarding the importance of ecological restoration. Following the planting, the villagers continued to care for the saplings by watering them regularly, protecting them from grazing, and replacing any that failed to survive. This sustained commitment extended beyond the formal project period, demonstrating the community's long-term dedication to restoring their environment.

To ensure the protection and sustainability of the restored site, the village headman, along with the village council, formally declared the area a "protected site." Through this declaration, activities such as logging, tree felling, and lopping were strictly prohibited. The decision underscored the community's willingness to safeguard their restored landscape and serve as custodians of local biodiversity. Thus, the project not only contributed to environmental restoration but also strengthened the community's capacity for natural resource management and conservation.

Conflict between humans and the endangered Asian elephants (*Elephas maximus*) is often a result of expanding human-use areas into historical elephant habitats and movement corridors.

Frontier Elephant Programme

Started in 2013, the Frontier Elephant Programme (FEP) is a collaborative initiative aimed at reducing conflicts and promoting peaceful coexistence between elephants and human communities in areas where their habitats overlap. FERAL, in collaboration with National Institute of Advanced Studies, Indian Institute of Science, and the Asian Nature Conservation Foundation, undertakes studies to address complex ecological and social aspects of human-elephant interactions, leveraging a multi-disciplinary approach for long-term conservation impact. Through these initiatives, FEP aims to develop sustainable solutions that benefit both elephants and the local people who share their landscapes.

In the last year, FERAL continued working on two projects in the Brahmagiri–Nilgiri–Eastern Ghats Landscape (BNEGL), which is the home to about 6000 elephants. Through the continuing support of the Katie Adamson Conservation Fund, we furthered our efforts for the conservation of elephants. We focused on consolidating our learnings, preparing manuscripts for publication, and training the next generation of elephant researchers. We also continued our engagement with the Karnataka Forest Department to improve the conservation status of elephants in the Ramanagara Forest Division.

The second project, initiated in 2022, aimed to address human-elephant conflict by understanding the current and future capabilities and functionings of elephants and humans in the BNEGL. The year saw the completion of data collection and analysis of the data, allowing us to better understand the drivers of elephants and human interactions—changes in human and elephant mobility (including physical, social, and political) strongly shape their encounters. Recognising these shifts is key to reducing conflict and promoting coexistence. The next steps of this exercise is to build the capacities of the people and disseminate our learnings. These along with identifying appropriate mitigation measures that minimize the unrealized functioning of the players will go a long way in mitigating conflict in this landscape. This project, supported by the US Fish and Wildlife Service, has been impacted by unforeseen circumstances, affecting the timeline as a result of the stop-work order issued by the US Government. We hope to overcome this set back and undertake these next steps in the coming year.

The Brahmagiri-Nilgiris-Eastern Ghats landscape, which includes both human-use areas and Protected Areas, is the home to about 6000 elephants.

Highlights

– From our work in the Brahmagiri–Nilgiri–Eastern Ghats Landscape, we identified mobility as a key factor for conflict/coexistence between people and elephants.

– Additionally, education was identified as a key factor that may influence tolerance among people towards conflicts with elephants

– Along with our collaborators, under the Frontier Elephant Programme flagship, we are working towards a comprehensive book documenting fifteen years of research on the ecology and behaviour of male elephants in human-dominated landscapes. This forthcoming volume will synthesize the extensive field data, long-term monitoring, and analytical insights to trace how male elephants navigate complex and changing environments shaped by human presence. It will bring together findings on movement ecology, social behaviour, habitat use, and human-elephant interactions, highlighting the adaptive strategies of bulls across varying ecological and anthropogenic contexts.

Use of technology such as camera traps and acoustic recorders are an effective and non-invasive approach to studying wildlife populations and behaviour.

The study and conservation of male Asian elephants in a human-dominated landscape in southern India

Project Period: December 2023–November 2024; January 2025–December 2025

Budget: USD 5,000 (INR 4,12,500) + USD 5000 (INR 4,25,850)

Supporting Agency: Katie Adamson Conservation Fund, USA

Principal Investigator: Nishant Srinivasaiah

Collaborators and their Institutions: Anindya Sinha, National Institute of Advanced Studies, India; Raman Sukumar, Asian Nature Conservation Foundation

Introduction

Anchored in over 15 years of continuous research, this initiative weaves together archival information and contemporary field studies to generate fresh perspectives on bull elephant ecology. By integrating systematic tracking, remote camera monitoring, and in-depth data interpretation, the project examines how male elephants navigate their environments—how they move, interact socially, and select habitats across varied landscapes. Situating present-day observations within a long-term temporal lens enables a rich understanding of shifts in elephant behaviour and distribution, revealing how these animals have adjusted to environmental variability, habitat transformation, and expanding human presence. The outcomes aim to provide a strong scientific basis for adaptive and forward-looking conservation interventions.

Objectives

I. Advancing scientific knowledge: The project aims to generate new insights into male elephant behaviour and ecology through the integration of long-term data with current fieldwork efforts. By elucidating key aspects of bull elephant biology, researchers can contribute valuable knowledge to the scientific community and enhance our understanding of elephant conservation.

II. Informing conservation strategies: By synthesizing historical and current data, the project provides a robust foundation for evidence-based conservation strategies aimed at protecting bull elephants and their habitats. These insights can inform land management practices, conservation planning, and policy decisions to ensure the long-term viability of elephant populations.

III. Capacity building: The project provides valuable training and mentorship opportunities for young field biologists, equipping them with the skills and experience needed to contribute to wildlife research and conservation efforts. By nurturing the next generation of conservation leaders, the project fosters sustainability and resilience within the field of conservation biology.

IV. Raising awareness: Through scientific publications, outreach activities, and engagement with stakeholders, the project raises awareness about the importance of

Early career ecologists were trained in the essentials of mapping.

bull elephant conservation and the broader challenges facing wildlife and ecosystems. By fostering a sense of stewardship and responsibility, the project mobilizes support for conservation efforts and promotes positive change at local, national, and global levels.

Status

Collaboration with the Karnataka Forest Department continued this year; primarily through inputs towards action plans to improve the conservation status of elephants in the Ramnagara Forest Division. Key components included habitat enrichment strategies that focus on maintaining and restoring the natural environment that supports elephant populations. Furthermore, through large scale implementation of community fences, the plan addresses conflict mitigation strategies to reduce human-elephant conflicts, which are often a source of tension between local communities and wildlife. The plan also outlines monitoring and research activities designed to gather ongoing data on elephant populations and their habitat use, as well as stakeholder engagement initiatives to foster collaboration among local communities, conservationists, and government agencies.

The efforts directed towards mentoring and capacity-building of emerging conservation professionals have been rewarding, with three of the four youngsters mentored having continued their work on elephants. By equipping these four young ecologists with the necessary skills and knowledge, the initiative has successfully fostered the next generation of conservationists who are poised to contribute significantly to elephant research and protection efforts.

We developed a non-invasive camera trap-based method to estimate elephant age and population demographics, strengthening the foundation for effective conservation planning. We also documented elephants' behavioural responses to human-made structures—including fences, roads, and agricultural areas—to inform mitigation strategies that reduce human-elephant conflict.

Using data from previous years, manuscripts are in preparation and will provide new insights into various aspects of male elephant social structure, mating strategies, and interactions with other species. Publication of these findings will contribute to a broader understanding of elephant behaviour, informing conservation policies and practices not only in Karnataka but also in other regions facing similar challenges.

To effectively mitiagate human elephant conflict, it is essential to identify and implement measures that address the unrealized functioning of both agriculturists and elephants.

Capable and functional elephants: a capabilities approach for mitigating human and elephant conflict in the Brahmagiri-Nilgiris-Eastern Ghats landscape of southern, India

Project Period: September 2022–March 2025
Total Budget: USD 208,199 (INR 1,50,38,228)
Supporting Agency: U.S. Fish and Wildlife Service, USA
Principal Investigator: Nishant Srinivasaiah
Co-Principal Investigator: Anamika Ajay and Srinivas Vaidyanathan
Collaborators and their Institutions: Anindya Sinha, National Institute for Advanced Studies, Bengaluru; Raman Sukumar, Asian Nature Conservation Foundation, Bengaluru and Indian Institute of Science, Bengaluru

Introduction

The Brahmagiri–Nilgiri–Eastern Ghats Landscape (BNEGL) is a mosaic of forests and human settlements that hosts an estimated population of 6000 elephants alongside thousands of farming households. A landscape-level approach is needed to understand the well-being ("capabilities" and "functionings") of both agriculturists and elephants. Coarse-scale data (land cover maps and regional census figures) and fine-scale data (household surveys, village-level conflict records, and elephant tracking) together depict the current status of these communities and wildlife. Key socio-economic factors, namely, health, land tenure, migration, and youth employment, shape human capabilities, whereas environmental challenges, including habitat fragmentation and crop-feeding wildlife, shape both human and elephant outcomes. Simultaneously, elephant population traits (demography and group behaviour) and movement rules in this multi-use landscape determine their capabilities to survive and thrive.

As we distilled through the various factors influencing this interaction between wild Asian elephants and the farming communities, we came to understand how a change in the mobility—physical, social and political—of humans and elephants impact their interactions and how best these interactions can be made less negative in order to promote coexistence. The extensive fieldwork to collect both primary and secondary data on the above aspects in the first two years of the project was completed in the current year and the focus shifted to analysis of the data gathered.

Objectives

I. Mapping the current set of basic capabilities and functioning of agriculturists and elephants.

II. Modelling future sets of basic capabilities and functioning of agriculturists and elephants.

Human elephant conflict affects people unequally, with poorer and more vulnerable households bearing the greatest losses.

III. Identifying sets of unrealized functioning of agriculturists and elephants due to human and elephant conflict, both present and future.

IV. Identifying appropriate human and elephant conflict mitigation measures that minimize unrealized functioning of agriculturists and elephants.

V. Capacity building and information dissemination.

Status

The data—including the survey of 1135 households across 17 districts in the BNEGL landscape and location of elephant observations within forested areas (direct and camera-trap-based observations) and the locations of crop-compensation claims records from the Forest Department—were used to examine the current and future capabilities and the unrealised functionings of both elephants (≈6000 individuals) and farmers across three rainfall zones: humid, sub-humid and arid.

Elephants: Protected Areas (PAs) showed higher forest contiguity and lower risks of conflict and thus offered elephants lower resistance to movement and greater physical, social and political mobility than Non-Protected Areas (NPAs). An exception to this trend is the Mukurthi National Park, which showed unusually high resistance to movement despite being a PA. This requires further research to understand the driving factors. In NPAs, resistance to movement was the highest in the sub-humid zone, where conflict risks were also the greatest.

Elephant densities were highest in the sub-humid zone and lowest in the humid zone. High forest contiguity, forest area (up to a threshold) and PA status supported higher elephant densities, in the sub-humid and arid zone, although NPAs such as Gudalur and Mannarkkad in the sub-humid zone stood out, showing elephant densities comparable to those in nearby PAs. The humid zone, in contrast, showed only marginal difference in elephant densities between PAs and NPAs, and maintained consistently low elephant densities regardless of forest size. Forest area was generally positively correlated with forest contiguity across all zones, except in humid zone PAs, where contiguity remained high despite smaller forest sizes.

In the sub-humid and humid zones, larger areas of forest outside protection regimes appeared to encourage elephants to move out of protected habitats in search of additional resources, thereby increasing the potential for human-elephant conflict (HEC). Terrain was another factor influencing elephants. In the arid and humid zones, PAs tended to have steeper slopes than NPAs, suggesting that elephants had been pushed into less optimal, hilly terrains due to agricultural expansion in the plains. Conversely, in the sub-humid zone, PAs exhibited flatter terrain than NPAs, aligning with higher elephant densities and indicating their preference for gentler terrain. Several NPAs in this zone, such as Hosur, Coimbatore, Gudalur, and Mannarkkad, also showed high elephant densities. However, when combined with the high resistance to movement characteristic of sub-humid NPAs, these factors increased the risk of HEC.

Our data on elephant movement and impacted villages show that human settlements and prime elephant habitats heavily overlapped.

Farmers: Farmers' physical mobility had declined across zones due to fear of elephant encounters, leading to stress, health issues, and reduced economic productivity from crop losses. Political mobility varied—rising when farmers united to demand better mitigation and compensation, but declining when bureaucratic hurdles limited access to ex-gratia payments.

Out-migration tended to increase physical mobility, but its effects on social mobility depended on the purpose: education-related migration enhanced mobility, work-related migration either improved or reduced it depending on job quality, and distress-driven migration generally indicated lower social mobility. Political mobility mirrored these social trends.

The distance between home and farm also shaped mobility: larger distances reduced physical mobility and limited timely farm visits, which in turn diminished farmers' social and political engagement. Overall, physical, social, and political mobilities were tightly interconnected and influenced by risk, economic pressures, and spatial constraints.

Data on elephant movement and impacted villages showed that human settlements and prime elephant habitats heavily overlapped, especially in the 560 villages of the sub-humid/transition zone. Because the same land could not meet both human and elephant needs simultaneously, these spatial overlaps created zero-sum situations. A paddy field, for instance, could either feed a farming family or an elephant herd, but not both, resulting in unrealized benefits for one side. Likewise, a village located in an elephant corridor restricted elephant movement, whereas elephant presence limited village expansion or farming. Both experienced opportunity costs and reduced well-being due to competing land-use demands.

Current Capabilities: Our analysis showed that conflict affects people unequally, with poorer and more vulnerable households bearing the greatest losses. Lacking savings, insurance, or social safety nets, pushed them into debt, forced them to withdraw children from school, and trapped them in cycles of deprivation. Without targeted support, these inequalities may deepen by 2031 as better-off farmers could adapt or shift livelihoods, while the poorest are likely to remain in high-conflict areas. Our results, therefore indicated that, addressing HEC was a social justice issue requiring strengthened human capabilities. Elephants also experienced unequal impacts: herds in fragmented, arid edge habitats faced greater risks and lower life expectancy than those in PAs.

Future Capabilities: By 2031, if conflict continued under a business-as-usual scenario, current unrealized functionings for both people and elephants would worsen. Increased land-use overlap, more crop raiding, and rising dependence on government support could leave rural development stagnant and elephant populations stressed. However, with targeted interventions such as dedicated corridors and support for farmer adaptation, the gap between potential and actual well-being could narrow. Safe living, productive farming, and wide-ranging elephant movement would become achievable, laying the groundwork for future interventions.

Safeguarding natural resources is vital to ensuring a resilient, thriving, and sustainable future for all.

Natural Resource Management

This programme aims to understand, manage, and restore landscapes—be they forests, wetlands, or coastal zones—that provide a wide range of essential ecosystem services and are vital for livelihoods, water security, soil health, and overall ecological resilience. The intensified pressures on both ecosystems and people owing to climate change underscores the need to understand how these shifts affect ecosystem functioning and community vulnerability. We follow an integrated approach that emphasizes collaboration (institutions, technical experts and local stakeholders), focuses on rigorous scientific inquiry combined with action research and makes extensive use of affordable, accessible technologies and low-cost environmental sensors to monitor environmental parameters, enabling communities and decision-makers to track changes and respond proactively. Our research aims to develop tools for decision support in managing natural resources and shape strategies and policy interventions that strengthen the resilience of both ecosystems and communities.

Over the past year, we continued our hydrological monitoring in the Nilgiris—work that has now spanned more than a decade. The Nilgiris, India's first Biosphere Reserve, is a fragile and ecologically rich biodiversity hotspot and a crucial catchment for perennial rivers such as the Cauvery and Bhavani. In addition to its conservation significance, the region plays an essential hydrological role: capturing monsoon rainfall, regulating streamflow, and ensuring year-round water security for wildlife and millions of people downstream. However, accelerating land-use change and the spread of invasive alien species are driving biodiversity loss and degrading ecosystem function. Our ongoing project seeks to understand how wattle, across a gradient of invasion, affects hydrological processes, providing insights that are vital for restoration and long-term watershed management.

Highlights

– The invasion of wattle species has significantly altered the hydrological cycle in the Nilgiris. There is an urgent need for effective invasive species management and large-scale restoration of natural grasslands.

Using acoustic-based water level recorders, we monitored stream levels across a gradient of wattle invasion.

Assessing the hydrological impacts of invasive wattle across a gradient of invasion in the Nilgiris

Project Period: November 2023–December 2025
Supporting Agency: Self funded
Principal Investigator: Srinivas Vaidyanathan
Co-Principal Investigator: Jagdish Krishnaswamy, Indian Institute for Human Settlements, Bengaluru

Introduction

Since 2012, we have been studying hydrological cycles and the influence of different vegetation-cover on the run-off and water budget in the Nilgiris. This is an important catchment for several perennial rivers including the Cauvery and Bhavani, on which, large human populations are dependent downstream. The natural vegetation in the Nilgiris is threatened due to invasion by exotic plants, which are affecting ecosystem processes and services. Exotic tree species such as wattles, *Acacia mearnsii* and *Acacia dealbata*, and woody shrubs like broom grasses, *Cytisus scoparius* and gorse, *Ulex europaeus*, have invaded natural grasslands in the Nilgiris. Our earlier study in this landscape has shown a reduction in stream-flows as a result of excessive water-losses through transpiration by woody invasive species during drier periods. Similarly, we observed increased run-off in invaded catchments as they were unable to retain much of the rainwater. Reduced stream-flows has a greater impact on availability of fresh water for wildlife and natural ecosystem functioning. It also impacts the availability of drinking water and water for power-generation in the drier periods.

In the current project, we are collecting baseline data on stream-flows, run-off, evapotranspiration, and soil-properties across catchments with different levels of wattle coverage. This study aims to provide benchmark data on ecosystem function indicators and physical condition indicators at reference grassland sites, which would help in assessing the impact of wattle invasion and for monitoring the success of grassland restoration activities in the future.

In the previous year, we instrumented eight different catchments with water level recorders and monitored the stream level in the drier period. This year we continued collecting stream level data, measuring stream profile, monitoring soil moisture, and calculating soil infiltration rates.

Objectives

I. Monitor stream discharges across different catchments with varying densities of wattle.

II. Monitor stream discharges from grassland and shola catchments.

III. Assess the impacts of wattle invasion on stream flow by comparing it with flows

Flumes were installed to measure stream-flows during the dry periods.

from natural catchments of grassland and shola forests.

IV. Understanding the impact of wattle on soil physical (soil moisture, water holding capacity, infiltration rate) and chemical properties (nutrient status) across seasons.

V. Generating long-term, reference hydrology and soil data with grasslands and shola forests as benchmark sites.

VI. Generating soil-loss models that could help in developing Invasive Removal and Restoration Planning (IRRP) to minimise soil loss.

Status

We continued collecting stream level data from the eight instrumented catchments. Of these eight catchments, two catchments are high density wattle catchments (>50% wattle cover), three have low to medium wattle densities (20–30% wattle cover), two are grassland catchments (>79% grassland cover), and one is a shola catchment (>50% shola cover).

We collected data on stream levels. Pygmy current meters were used to measure stream velocity in all the streams installed with water level recorders. We also noted the stream profiles at these locations. Velocity readings along with stream-profiles will be used to develop stage-velocity curves and calculate stream flows.

We have collected rainfall data from the rain gauges that were installed in the landscape in our previous projects. Soil infiltration rate in different land-covers is being monitored using a mini-disk infiltrometer. We have started monitoring the soil moisture in areas with different land cover during the dry season using WATERMARK soil moisture sensors (IRROMETER).

We will analyse the diurnal streamflow variations and develop diurnal variation-based evapotranspiration loss models for the study catchments in the coming months. Monitoring of stream-flows and rainfall in the landscape will continue over the coming monsoon to generate baseline and reference data that could help in assessing the success of restoration activities in future.

Our data to date shows that grassland catchments recorded the least reduction in water levels, whereas shola and high-density wattle catchments had a greater reduction in stream level during the dry spell. An analysis of diurnal variation in streamflow for the drier spell, revealed that wattle-invaded catchments had greater mean diurnal variation in streamflows than did the grasslands.

Conserving coastal and marine ecosystems is essential to sustaining biodiversity, strengthening climate resilience, and supporting the well-being and economies of millions of people.

Marine Science Programme

Partnering with fishing communities, we promote sustainable, science-based co-management of traditional and artisanal fisheries. The lack of systematic, spatially and temporally explicit data is a major stumbling block to scientific fisheries management and marine and coastal conservation in India. Our action-research addresses these gaps and involves local communities in all aspects of research and conservation.

In the last year, two projects focusing on elasmobranchs were completed. Following one of our core values, of being a launchpad for young researchers, the programme team that had been supported at FERAL for the last five years moved on to explore other research avenues. This year, we bid adieu to the marine science team under Dr. Divya Karnad, who has moved ahead in her career as an established marine scientist. We wish them the best for the future.

As part of this change-over, we took a hiatus to assess our future direction and focus. We will continue to support young researchers by providing a platform to develop and contribute to marine and coastal conservation. As a next chapter, we are exploring possible ecological and conservation initiatives on marine mammals, and on Island ecosystems, with an initial focus on the Lakshadweep Islands and the West Coast of India. This initiative is being planned with Dr. Divya Panicker, with whom we look forward to developing the Marine Sciences programme further. Additionally, we will continue our long-term commitment to understanding and conserving coastal ecosystem, both on the east and west coast of India, through fresh collaborations and focused goal-based initiatives. Engaging with local communities at various levels, training of local conservation stewards, and empowering communities to better understand coastal and marine systems to safeguard their livelihoods and environment are some focal areas.

Artisanal fishing and coastal ecosystem protection are intrinsically linked.

Highlights

– Designing education programmes for mainstream schools and integrating these within their syllabus is often difficult. This is largely due to the amount of time taken up by the prescribed syllabus, unless the school has a particular gap (such as absence of a teacher due to maternity leave) that allows us to integrate the programme. Collaborating with NGOs in the education space created a pathway for our education programmes in a way that we could not have on our own.

– Media—especially movies and animations—play an important role in influencing the attitudes and opinions of children about sharks. Over half of the students believed sharks are dangerous to humans and were "man-eaters". However, after our awareness interventions, they shifted away from these negative views.

– A clear difference in familiarity with marine mammals was seen between children from private schools, who were more familiar with marine animals not native to India and those from after schools, who showcased a stronger connection to local marine life. Children from both schools showed a lack of understanding of the ocean as well as marine life, indicating a gap that needs to be filled in creating awareness and achieving sustained conservation goals.

– Through the five years of work of the InSeason Fish project, we grappled with the fact that qualitative impacts are not so simple to measure; however, such impacts can be important for conservation in the long-term, and need to be documented.

The project team worked with fishermen to understand the impacts of fishing practices on elasmobranchs.

Saving sharks with InSeason Fish

Project Period: June 2019–March 2025

Budget: Euro 50,000 (INR 40,00,800)

Supporting Agency: Future For Nature Foundation, The Netherlands

Principal Investigator: Divya Karnad

Collaborators and their Institutions: Dr Debayan Gupta, Department of Computer Science, Ashoka University, Sonipat

Introduction

Achieving marine sustainability requires coordinated action across the entire seafood supply chain. This project seeks to identify the key gaps and priority interventions needed to reduce the ecological impact of India's marine fisheries, with a particular focus on conserving elasmobranchs and teleost fishes, many of which are increasingly threatened.

In the first phase, we examined domestic supply chains, concentrating on patterns of seafood consumption and the implications of unsustainable fishing practices. Our work highlighted the need to support Indian seafood consumers in diversifying their choices and avoiding threatened marine species. During this phase, we identified a critical gap: the absence of a practical, accessible tool to help the public accurately recognise the wide range of fish species landed in India's marine fisheries.

To address this need, the second phase of the project leveraged the multi-year dataset on fish catches to develop a machine learning based application capable of identifying the most commonly caught species in near real time. Extensive data is required to train such models effectively, for which, we established a collaborative programme that incorporates a citizen science component. This approach will also deepen public engagement and awareness of the remarkable marine biodiversity found in Indian waters.

In the final months of this project, we tried to identify cultural and market impacts of the project.

Objectives

I. Assess small-scale fishing practices, levels of sustainability, and regulations along the Coromandel Coast.

II Create incentives for sustainable fishing practices by connecting fishermen using more sustainable fishing practices to higher value, transparent supply chains.

III. Understand seafood demand and seafood consumption practices in India.

IV. Trace seafood supply chains on the east and west coasts of India.

Data was collected on species diversity by documenting catch through the project period.

V. Assess fish catches for species diversity along the Coromandel Coast.

VI. Document relative differences in species diversity and create a rubric to help consumers identify what they are eating.

VII. Create a technology-based tool to help seafood eaters choose diverse seafood and the most sustainable choices among the options available to them.

Status

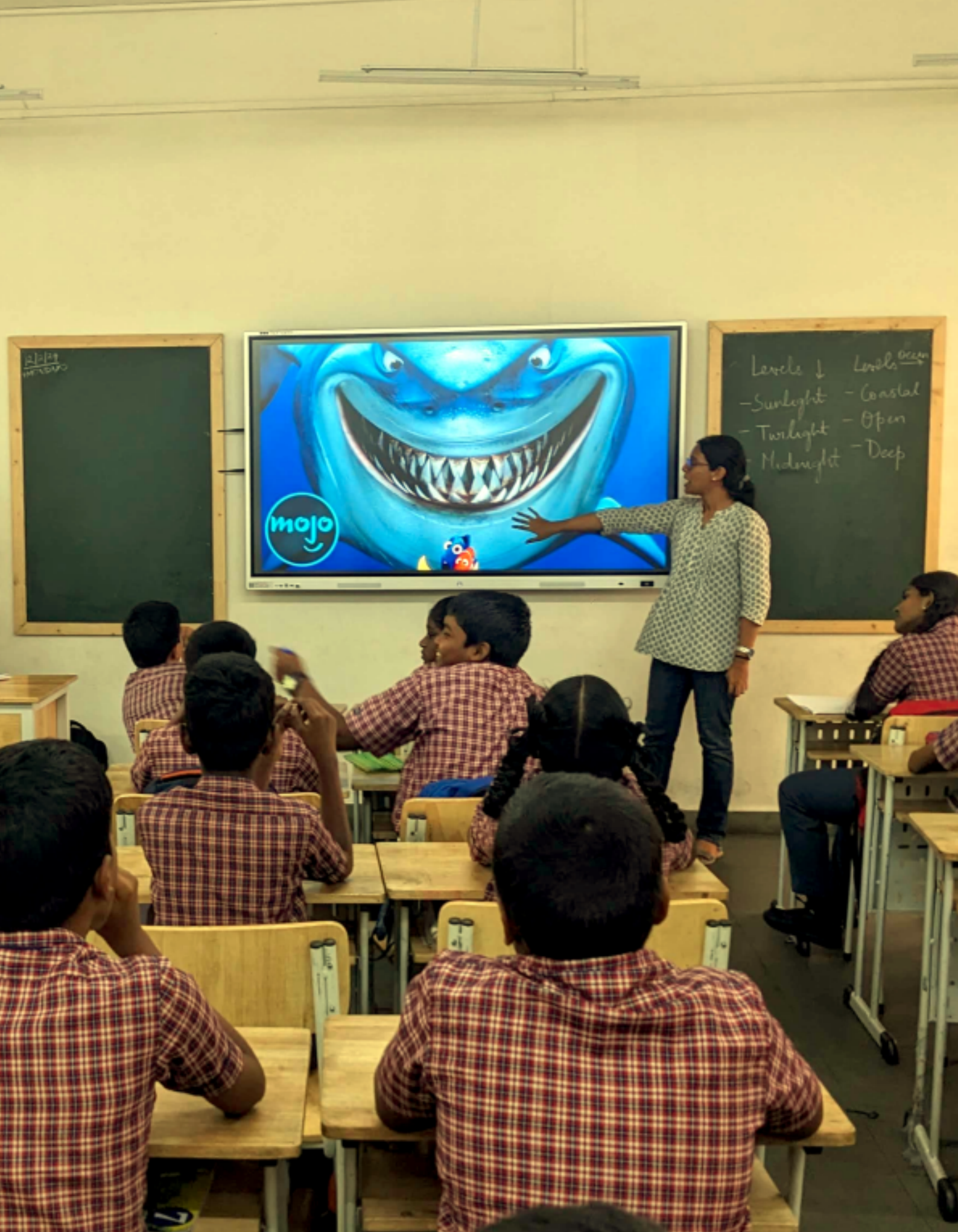
Field data documenting current fishing practices and species diversity were collected through the project period. This dataset is being used to examine changes observed over the project period in all participating fishing communities. This quantitative dataset includes information about gear used, seasonal compliance, bycatch reduction, species substitution, and changes in landing composition.

To understand the adoption of sustainable seafood guidelines at the end of the project period, we developed a semi-structured survey, which was deployed online, to understand consumer behaviour. The exercise garnered 50 responses, from which measurable shifts in purchasing patterns and seafood diet diversification were demonstrated. Alongside, we developed a Sustainable Seafood Scoring Index, a project-created metric summarizing guideline adoption to individual consumers to inform them how they can improve their sustainable seafood choices.

The project contributed to baselines for evaluating marine conservation efforts. Specifically, our fisheries dataset is currently being analysed for species composition, size distribution, and seasonal trends and spatial mapping outputs (participatory mapping of fishing effort) are being integrated into this data to document the impact of current fishing pressure and ecological hotspots. The aim is to make this data publicly accessible, especially to the fishing communities themselves.

Our network map of partner organisations and governmental bodies engaged through the project included 5 NGOs, 15 educational institutions, 3 commercial stakeholder societies and many other commercial entities (some of which are now inactive) and 9 fishing communities.

Some key outputs of the project include, 23 guided tours of fish markets in Chennai, Mumbai and Puducherry to connect urban markets with sustainable fishers. We also trained chefs in 20 restaurants in Chennai, Bangalore, Mumbai and Delhi. More than 11,000 seafood eaters were engaged with through social media.



School students learnt about different species of sharks as part of our education workshops.

Saving sharks through transparent seafood supply chains

Project Period: September 2023–August 2024
Budget: Euros 19,995 (INR 17,46,363)
Supporting Agency: Prince Bernhard Nature Fund, Netherlands
Principal Investigator: Divya Karnad

Introduction

Sharks are among the most threatened groups of species globally. India, home to more than 160 shark species, is currently the world's third largest shark-catching nation. Preventing the capture of sharks in Indian waters is therefore critical to advancing both national and global conservation goals. However, limited monitoring and enforcement have reduced the effectiveness of existing policies meant to protect these species. In contrast, community-based approaches that actively involve fishing communities have demonstrated promising results in pilot initiatives. Our earlier efforts focused on working closely with these communities to identify sustainable and shark-friendly indigenous fishing practices, and the current phase of the project focuses on strengthening awareness on shark conservation.

Across India's extensive coastline, many children living near the sea have surprisingly limited exposure to marine ecosystems. In Chennai, for example, numerous students from government schools—often from families of daily wage earners or fish vendors—live only a few kilometres from the coast yet have never visited the beach. Their perceptions of marine species, including sharks, are often shaped by sensationalised media portrayals, resulting in misconceptions that can persist into adulthood.

This growing disconnect between children and the natural world reflects a broader global pattern documented in multiple studies. Such estrangement poses risks both to vulnerable species—such as sharks and rays, which remain under significant pressure in Indian waters—and to the development of environmentally informed citizens. Although India's 2022 amendment to the Wildlife (Protection) Act extended legal protection to 22 shark and ray species, public awareness of these measures remains limited, including among enforcement agencies. For conservation policies to be effective, it is essential that future policymakers, citizens, and coastal communities develop a deeper understanding and appreciation of marine species.

Objectives

I. Increasing the footprint of our engagement with restaurants.

II. Expanding our experiential awareness programmes for the general public.

III. Create a focused sustainable seafood curriculum for secondary school students and culinary institutions.

Fish catch data provide valuable insights into the diversity, composition, and relative abundance of marine species, serving as an important indicator of ecosystem health and fishing impacts.

Status

In response to the problem outlined above, we developed an ocean-themed educational curriculum focused on shark biology and conservation to strengthen connections between young learners and the marine world.

The comprehensive six-week marine conservation and shark education curriculum aimed at students aged 11–13 developed in the previous year was continued to be deployed in participating schools.

Implementation took place as single sessions across 12 educational institutions and assessed six-week implementation in one formal school—the Union Christian Matriculation Higher Secondary School—and two after-school learning centres, Pudiyador and Yein Udaan, both of which prioritise nature-based learning. Across these institutions, 120 students participated. The diversity of learning environments provided significant insight into how socioeconomic background, language of instruction, and school culture influence engagement. School students often required additional encouragement due to more rigid classroom norms, whereas after-school centres fostered freer discussion and curiosity, making them particularly receptive to the programme.

A pivotal component of the curriculum was the shark module, which used species such as whale sharks and hammerheads to explore broader ecological themes. To support this work, the team developed an online tool, “Sharks of India”, allowing students to browse species information and learn at their own pace. This digital resource helped bridge classroom learning with independent exploration and proved especially popular, as many students had never encountered factual material on sharks beyond dramatic film portrayals.

Throughout the sessions, the team observed a steady transformation in student attitudes. Children who initially expressed fear or scepticism about sharks became increasingly inquisitive as myths were debunked and scientific facts were introduced. Spontaneous comments such as “I want to tell my parents about sharks” reflected growing enthusiasm and ownership of new knowledge. The recent release of a Tamil film featuring a “Megalodon” further sparked lively discussion, reinforcing the importance of culturally relevant engagement.

Outreach materials to promote learning was created and distributed to the students who participated in the course.

Despite these successes, securing long-term commitments from schools remains challenging due to academic constraints and rigid timetables. In contrast, NGO-led centres were more flexible and eager to integrate the programme. The team is currently analysing assessment data to measure changes in knowledge, attitude, and interest across all cohorts. These findings will guide refinement of the curriculum and inform a strategy for scaling the programme to more schools, strengthening public engagement in shark and marine conservation across India.

A GIS workshop for students and researchers working on coastal conservation was held at our campus outside Puducherry.

Learning and Events

This year has been an exciting one for FERAL's learning initiative.

Since 2009, FERAL has been recognised by the Government of India as a Scientific and Industrial Research Organisation (SIRO), reflecting our long-standing commitment to rigorous and impactful research. This year, we reached an important milestone by partnering with the Trans-Disciplinary University (TDU), Bengaluru, to launch a doctoral-level postgraduate programme at FERAL. Through a newly formalised Memorandum of Understanding with TDU, we are now positioned to enrol our first cohort of Ph.D. scholars—mentored by our faculty and registered with TDU—by the end of 2025.

This initiative marks a significant investment in building future leadership in conservation and natural resource management. By drawing on our team's extensive expertise and hands-on field experience, we aim to foster cutting-edge research that not only advances scientific knowledge but also contributes to impactful natural resource management and conservation across India.

We also continued teaching our regular short course in GIS for the conservation community.

Mapping coastal ecosystems: A QGIS-based introduction to GIS and spatial analysis

Date: 5 February 2025–6 February 2025
No. of Participants: 17
Venue: FERAL Campus, Morattandi, Tamil Nadu

We conducted a two-day training programme to introduce GIS and Spatial Data Analysis using QGIS for researchers, conservation practitioners, and civil society representatives working along the East Coast of India. This ecologically significant region has been a focal landscape for FERAL for over two decades, during which we have undertaken extensive action research on natural resource management and biodiversity conservation.

The training introduced 17 participants to core GIS concepts, spatial data structures, and the application of GPS and QGIS for field data collection, visualisation, data management, spatial analysis, and habitat mapping. Held at our Morattandi campus in Tamil Nadu, the workshop provided participants with essential skills to support evidence-based conservation and landscape-level planning in their respective fields.

Gray langurs (*Semnopithecus hypoleucos*) in the forests of Karnataka. Langurs form a part of the prey base for carnivores such as leopards, dholes, and tigers.

Publications

Journal Articles

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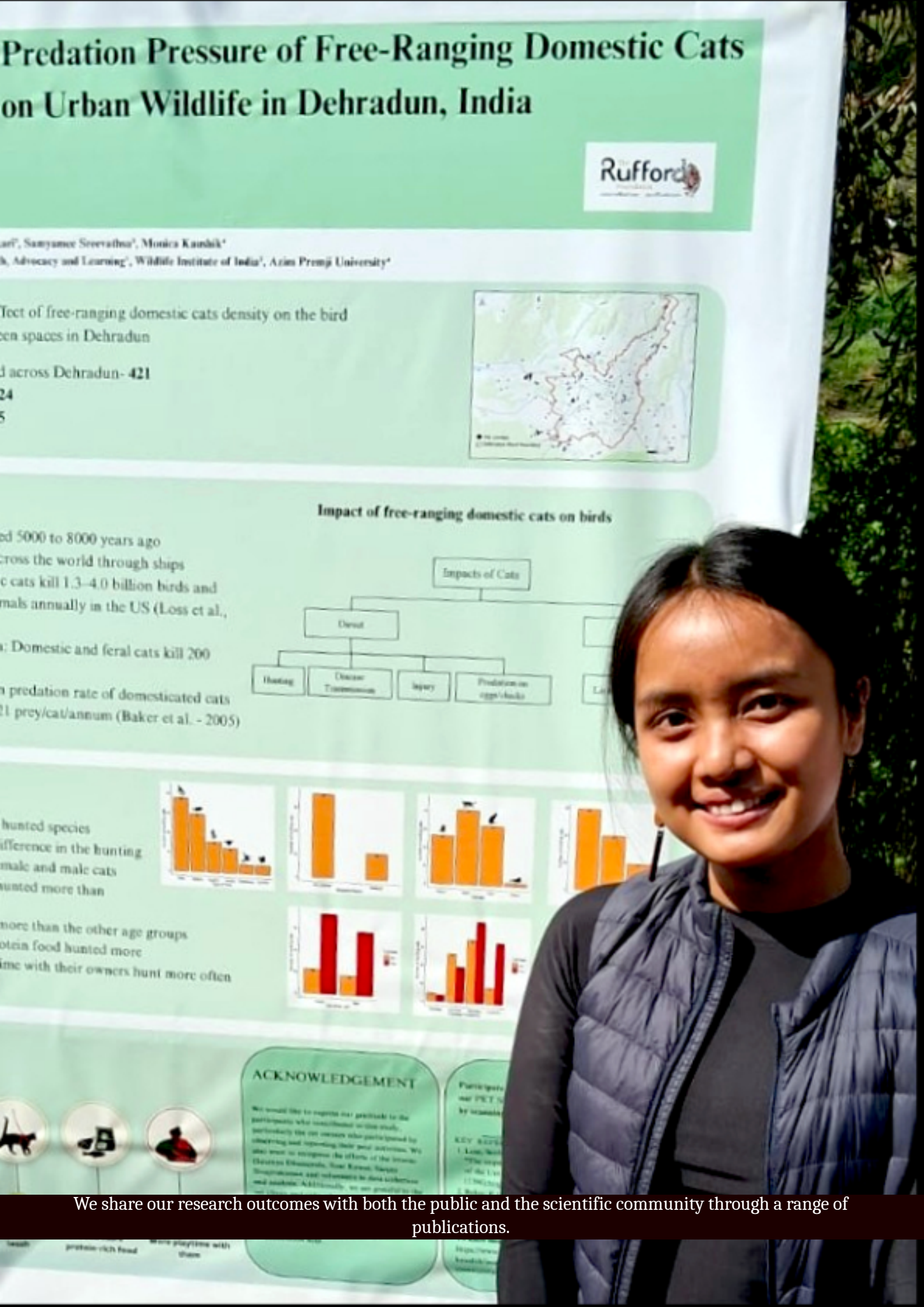


We share our research outcomes with both the public and the scientific community through a range of publications.

Matias Mastrangelo, Daniel Mueller, Robert Mueller, Ranjini Murali, Sofía Nanni, Mauricio Nuñez-Regueiro, David A. Prieto-Torres, Jayshree Ratnam, Chintala Sudhakar Reddy, Natasha Ribeiro, Achim Röder, Alfredo Romero-Muñoz, Partha Sarathi Roy, Philippe Rufin, Mariana Rufino, Mahesh Sankaran, Ricardo Torres, Srinivas Vaidyanathan, Maria Vallejos, Malika Virah-Sawmy, and Tobias Kuemmerle. 2024. An Actor-Centered, Scalable Land System Typology for Addressing Biodiversity Loss in the World's Tropical Dry Woodlands. Global Environmental Change 86:102849. doi:10.1016/j.gloenvcha.2024.102849.

Books/booklets/Book sections

Ramchiary, Aditi, and Monica Kaushik. 2024. A Booklet on Commonly Seen Bird Species in Urban Green Spaces of Dehradun.

Ramchiary, Aditi, and Monica Kaushik. 2025. The Secret Lives of Doon's Cats. India: Foundation for Ecological Research, Advocacy and Learning.

Mathevet, Raphaël, Balachandran Natesan, Anbarashan Munisamy, Elea Desmots, Ravinder Singh Bhalla, and Bubesh Guptha. 2024. Kazhuveli Wetland (Tamil Nadu, South India). Science & Society N°3. Puducherry, India: Institut Français de Pondichéry.

Report

Letkhosei Baite, Rajat Nayak, and James Haokip. 2024. Forest Inventory and Establishing Nurseries for Community Based Restoration of a River Catchment in North-East India. Final Report. Morattandi, Tamil Nadu: Foundation for Ecological Research, Advocacy and Learning.

Others

Karnad, Divya. 2024. Between the City Lords and the Deep Blue Sea. https://ruralindiaonline.org/en/articles/between-the-city-lords-and-the-deep-blue-sea/.

Ramchiary, Aditi, Priyanka Adhikari, Samyamee Sreevathsa, and Monica Kaushik. 2024. Poster: Assessing the Predation Pressure of Free-Ranging Domestic Cats on Urban Wildlife in Dehradun, India.

The little cormorant (*Microcarbo niger*) inhabits wetlands, ranging from small village ponds to large lakes and tidal estuaries across India.

Balance Sheet

Foundation for Ecological Research Advocacy and Learning
No.170/3, Morattandi Village, Auroville Post, Villupuram, Tamilnadu - 605 101

Balance Sheet as at 31st March 2025

(Amount in ₹)

Particulars	Note	As at 31.03.2025	As at 31.03.2024
SOURCES			
Corpus	3	21,81,728	8,89,074
Project Asset Reserve account	4	43,788	2,01,015
Projects Account (Cr)	5	34,86,640	34,89,117
Current Liabilities	6	3,73,197	8,745
		60,85,353	45,87,951
APPLICATION			
Fixed Assets *(Less)* Depreciation	7	11,02,952	3,81,937
CURRENT ASSETS, LOANS AND ADVANCES			
Cash and bank balances	8	48,23,670	39,80,670
Loans and advances	9	1,58,731	1,82,997
Projects Account (Dr)		-	-
Interest accrued but not due	10	-	42,347
		49,82,401	42,06,014
		60,85,353	45,87,951

The accompanying notes are integral part of the financial statements

Brief about the Entity	1
Summary of significant accounting policies	2

As per our report of even date attached
For Yoganandh & Ram LLP
Chartered Accountants
FRN # 0051575 / S200052

N. Sridhar, FCA
Partner
Membership No : 026833

Place : Chennai
Date : 15-10-2025

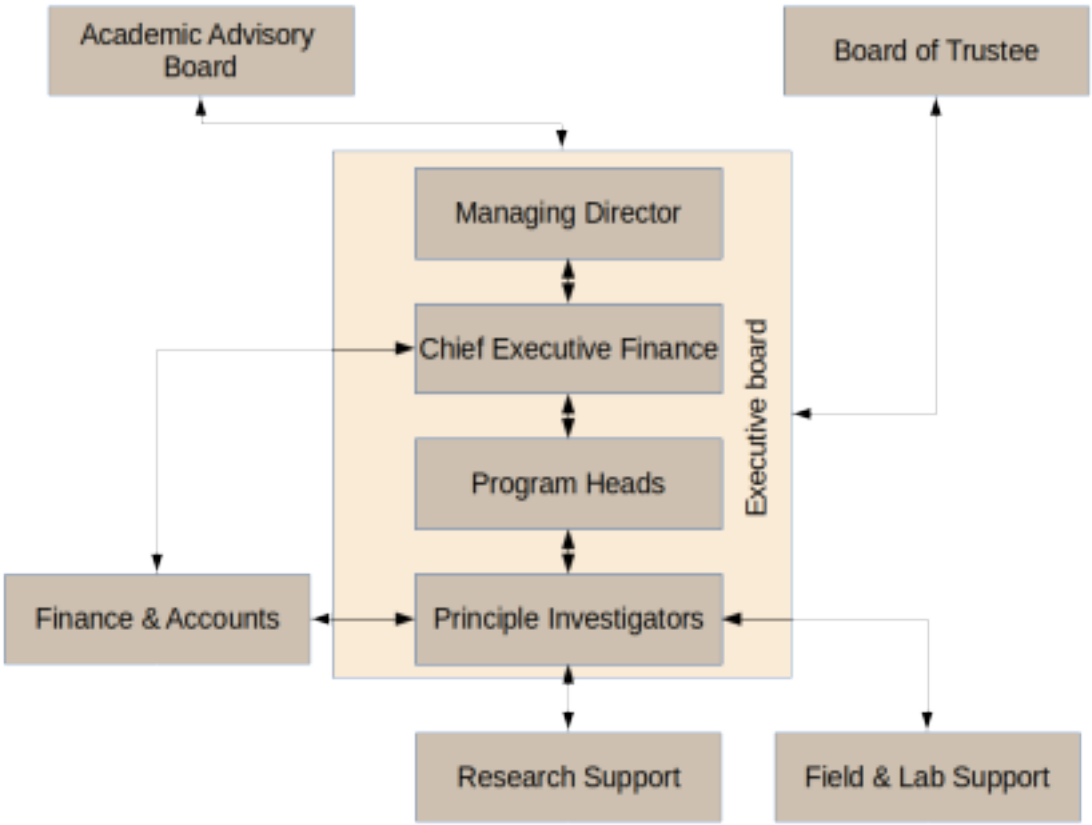
For Foundation for Ecological Research Advocacy and Learning

Srinivas Vaidyanathan
Trustee

Administrative Information

FERAL is a non-profit trust founded under the Indian Trusts Act (1882), in July 1997. We are certified as a Scientific and Industrial Research Organisation (SIRO) by the Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology, New Delhi. Donations made to FERAL attract deduction under section 80G of the Income Tax Act, 1961 and we are registered and authorised to receive foreign funds under the foreign contribution regulation act (FCRA) 2010.

We have a simple organisational structure which provides a supportive framework for our researchers while ensuring them functional autonomy. As per the DSIR and Trust Act rules, we are advised by an academic advisory board for all scientific matters and governed by a board of trustees for overall administration and organisational policy.



Academic Advisory board

Ajith Kumar, Ph.D., Deviprasad K V, Ph.D., Jagdish Krishnaswamy, Ph.D., Mahesh Sankaran, Ph.D, Neil Pelkey, Ph.D. and Senthil Babu, Ph.D.

Board of trustees

Mahesh Sankaran, Ph.D., Srinivas Vaidyanathan and Anand V M

Partners

FERAL's work is made possible through grants from the Government of India and international agencies. Often these grants are made to multi-institutional consortia of two or more partner organisations. The agencies who have supported our work and those who have collaborated in project implementation are listed below.

Supporting partners

Future For Nature Foundation (The Netherlands), Katie Adamson Conservation Fund (USA), Prince Bernhard Nature Fund, (The Netherlands), The Rufford Foundation (UK), The Wild Heart Trust (UK) and United States Fish and Wildlife Services (USA).

Individual donors

Dr. R. S. Bhalla, Ms. Anupama Pai, Srinivas Vaidyanathan, Seth J. Wenger, Benevity UK Online Giving, Global Remittance

Collaborating Institutions

Ashoka University (India), Asian Nature Conservation Foundation (India), Indian Institute for Human Settlements (India), Indian Institute of Science (India), National Institute for Advanced Studies (India), Sikkim University (India).

The FERAL Team

Feral's team is a mix of researchers and professionals from various disciplines who are supported by a small but competent and highly trained team. Below is a short introduction to the people who make FERAL tic (arranged alphabetically).

Research team

Aditi Ramchiary

Aditi Ramchiary is a researcher from Assam with a keen interest in human-wildlife interactions and urban ecology. She holds a post-graduate degree in Environment and Development from Ambedkar University Delhi.

Anamika Ajay

Anamika is a social scientist with a PhD in Development Studies. Her research interests lie at the intersection of political economy of livelihoods and local governance.

Anisha Jayadevan

Anisha Jayadevan is a PhD candidate at the University of Maryland, USA. She is largely interested in how people, policies, and narratives shape land-use and land-cover change.

Aryaman Tiwari

Aryaman is moved by any and all world's wildlife, and harbours a love for literature, long-distance running, and chess. He has a Masters' in Policy. He hopes to someday contribute to fostering human-elephant coexistence in his maternal home region of North-East India.

Dhanush C S

Dhanush holds a deep admiration for nature and wildlife, with a particular fondness for elephants and birds. He has a master degree in wildlife management.

Divya Karnad

Divya holds a Ph.D. in geography with a focus on marine fisheries management. She works on sustainable fisheries, sustainable seafood trade and the conservation of threatened marine species. She is a member of the IUCN's Shark Specialist Group.

Divya Panicker

Divya Panicker is an oceanographer and marine mammal researcher working at the intersection of science,, conservation, and community engagement. She is interested in long-term scientific studies that track changes in marine ecosystems, including how large-scale oceanographic processes influence whales and dolphins.

Kumaran K

Kumaran has a Masters degree in Ecology and Environmental Science. His interests include understanding the impact of changes in land use and land cover, esepcially due to exotic invasive species, on natural habitats and ecosystem services.

Letkhosei Baite

Letkhosei has a Masters degree in Botany from Manipur University. He has worked as a biologist in the fish conservation zone, Manipur since 2020. He is keen on conserving riparian forests and currently handling a catchment restoration project in Manipur.

Monica Kaushik

Monica is an ecologist and conservation biologist studying birds, their habitats, and how they fare in a world dominated by humans. She is also interested in understanding the effects of invasive plant species on native communities and mutualistic interactions.

Neha Maria Babu

Neha has her master's degree in Wildlife studies and has worked on human-bat conflicts before she joined us. She believes in the 'One health' approach and is interested in community conservation of wildlife especially the less charismatic species.

Nachiket Kelkar

Nachiket is an ecologist with a Ph.D. in socio-environmental history of resource conflicts in riverine fisheries, and a M.Sc. in Wildlife Biology and Conservation. He is interested in developing interdisciplinary and long-term understanding of the ecological and socio-political processes that affect biodiversity conservation and human livelihood security in riverine and wetland ecosystems.

Nishant Srinivasaiah

Nishant is instrumental in starting a multi-institution, multi-disciplinary collaboration to manage Asian elephants in India. Over the last decade he has been monitoring elephants, understanding their behaviour and interactions with humans to find solutions to conserve elephants.

Rajat Ramakant Nayak

Rajat has completed his Masters in Wildlife Biology and Conservation. He is interested in understanding the influence of anthropogenic activities and climate change on ecosystem processes and services and wildlife. He currently works on forest fragmentation and its influence on wildlife movement and ecosystem services.

Shruthi Kottillil

Shruthi is a marine researcher interested in finding a balance between marine species conservation and community livelihoods by focusing on sustainable fisheries and policy.

Shruthi Suresh

Shruthi is a multidisciplinary researcher motivated to understand the complexities of interactions between people and wildlife through a combination of ecological, sociological, and psychological methods.

Srinivas Vaidyanathan

Srinivas is an ecologist with an interest in understanding changes in landscape-level processes and structure and how they affect large mammal populations. Srinivas uses spatial approaches for finding innovative and practical solutions to conservation problems.

Sudha Kottillil

Sudha is a marine researcher. Her interests lie in elasmobranch conservation, sustainable fisheries, fisheries management and the marine policy.

Sunita Ram

Sunita has worked extensively on the ecology and distribution of primates in the southern Western Ghats. Her interests lie in contributing to long term strategies for the conservation of wildlife and their habitats.

Sushma H S

Sushma, an ecologist with a multi-disciplinary background, holds a PhD degree from University of Mysore. Her research interest spans the fields of ecology and conservation and includes primate community ecology, frugivory and seed dispersal, landscape-level surveys of endangered species, and systematic conservation planning.

Vidisha Hate

Vidisha's keen interest in animal behavior focuses on human-animal interactions, aiming to bridge the gap between scientific research and real-world solutions. Through her work in behavioral ecology, she seeks to foster improved understanding and sustainable relationships between humans and wildlife.

Research support

Geethika Basappa

Geetika holds a BBM degree with a diploma in Human Resources from Jain University CMS, along with a PADI OWSI certification from Gili Trawangan, Indonesia. She has earlier worked on community-based projects, in hospitality, adventure sports, and management sectors.

Jacob Baite

Jacob likes to work with communities. He assisted with implementation of the community-driven restoration of riparian forests along the Tuivang River in Manipur.

Kamalraj S

Kamal has been working with FERAL as a field assistant for more than a decade. He is adept at handling a range of equipments and data loggers. He is a reliable driver in tough forest terrain and is good with managing field staff and taking over running of field stations at a pinch.

Ngamsei Philip

Philip is a farmer by profession, but also assists our field team in Manipur.

Saravanan S

Saravanan holds a masters in human resources development and is very experienced in undertaking social surveys and in coordinating field activities. He is also a resource person for GIS and GPS workshops conducted at FERAL.

Interns

Chirayu Shinde

Chirayu interned on the project on afforestation in semi-arid savannas and assisted fieldwork in Pune district, Maharasthra.

Lokesh Chauhan

Lokesh Chauhan interned on the project on afforestation in semi-arid savannas and assisted during laboratory analysis in National Centre for Biological Sciences.

Prithviraj Sarnobat

Prithviraj provided assistance during fieldwork in Pune District, Maharashtra on the project on afforestation in semi-arid savannas.

Administrative support

Anupama Pai

Anupama has been associated with FERAL since inception and has wide interests ranging from gender and development, natural resource management and developing study abroad programs. She is the Chief Executive Finance and supports project management.

Shanthi R

Shanthi is our finance manager handling the day-to-day accounting responsibilities of the organisation. She has a postgraduate degree in commerce and is versatile in the use of a range of accounting softwares.

Foundation for Ecological Research, Advocacy and Learning

Web Page: https://www.feralindia.org

Email: feral@feralindia.org