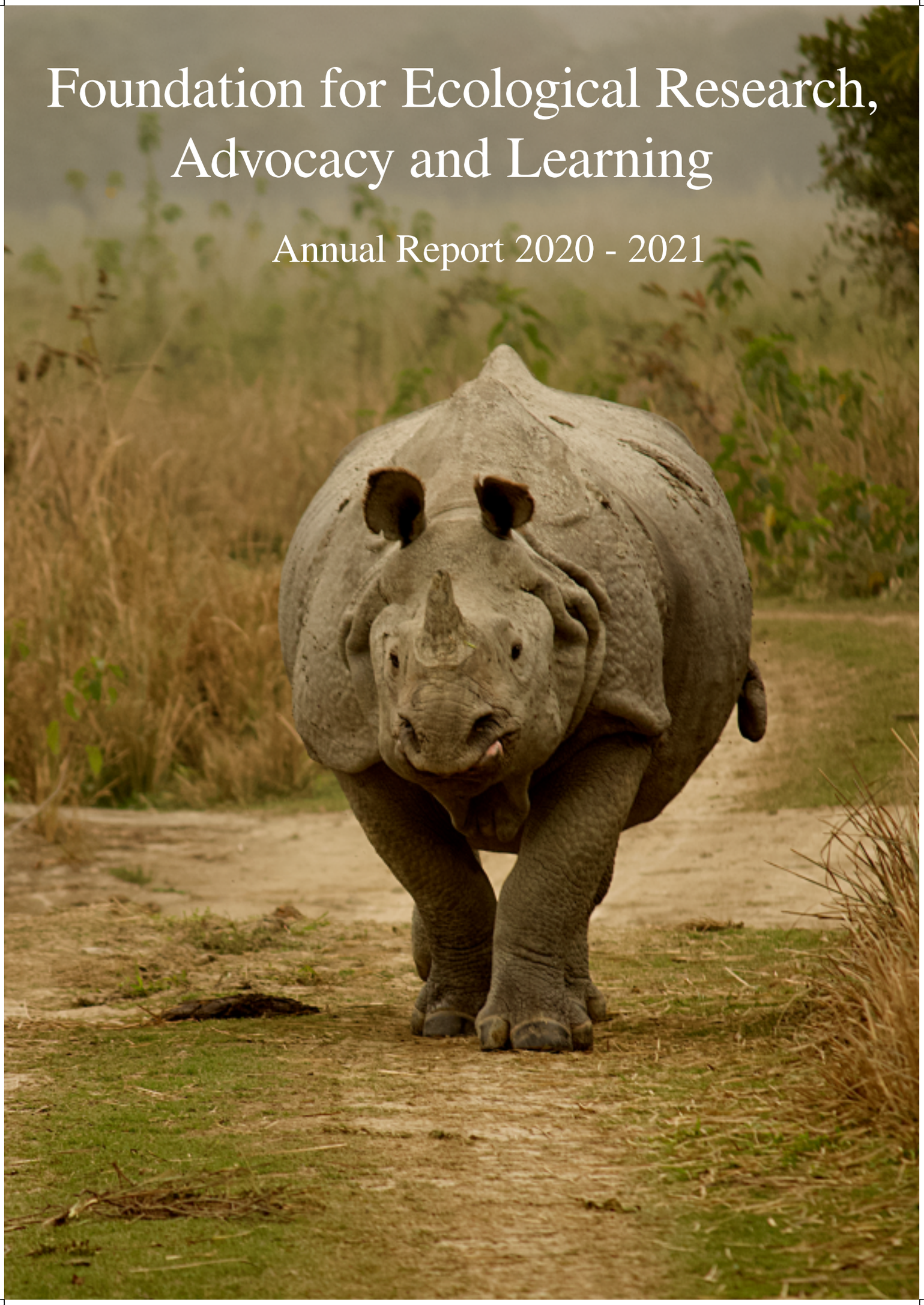
Foundation for Ecological Research, Advocacy and Learning

Annual Report 2020 - 2021



Foundation for Ecological Research, Advocacy and Learning (FERAL)

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Cover image: Venetia Sharanya

Content

Grey herons (*Ardea cinerea*) are commonly found in wetland habitats such as small ponds and wet fields. Image credit: Nicole Pinto

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 this field today is only possible through meaningful collaborations with multiple stakeholders.

The Year That Was

The year of lockdowns and restrictions due to the pandemic affected our field based projects and all staff worked from home. The prolonged break from field activities allowed us to work on our datasets, manuscripts, books and popular articles. Field activities were resumed with caution in January 2021 allowing us to visit field sites, collect data and resume our conservation efforts. During this year a collaboration with the National Centre For Biological Sciences, Bengaluru, carried out an assessment of climate variability and trends and its impact on ecosystem services in the the Nilgiri Biosphere Reserve. Our team and project partners facilitated the creation of two community-managed Fish Conservation Zones one each in Meghalaya and Manipur. We also initiated a new project to examine targeted shark and ray fisheries in Andhra Pradesh, as well as the consumption of shark meat across India. Our projects on fresh water ecosytems in the Western Ghats and North East India, long-term monitoring of streamflow and rainfall in the Nilgiris, and saving sharks along with InSeason fish were also continued.

Malabar pit vipers (*Trimeresurus malabaricus*) are nocturnal snakes endemic to India's Western Ghats. Image credit: Sandeep G

Wildlife Biology and Conservation

The focus of this programme is to undertake scientific research on wildlife and their habitats and use the outputs to steer conservation interventions. In the year gone by, we began a project to raise awareness about urban biodiversity, largely focused on children. The project will also give people a glimpse into the lives of ecologists whose work intersects and revolves around urban biodiversity.

During this year we signed an MoU with National Centre For Biological Sciences, Bengaluru to jointly develop a proposed landscape level action plan for the conservation of the Nilgiri Biosphere Reserve and a roadmap for its implementation. As part of this collaboration, an assessment of climate variability and trends and its impact on ecosystem services will be carried out. Additionally, the impacts of changing land-use land-cover on ecosytem services in the Nilgiris will also be assessed.

We also continued our work on freshwater ecosystems through two projects, one in the Western Ghats that developed and proposed two new indices to evaluate river network fragmentation. Our project in the North East India biodiversity hotspot created two community-managed Fish Conservation Zones, in Meghalaya and Manipur.

An illustration of a common red eye and blue pea from "The Living Museum." Image credit: Sunaina Coelho

An illustration of a jumping spider and a bagworm. Image credit: Sunaina Coelho

Know your urban wildlife

Project period: April 2020 - October 2021
Budget: INR. 4,81,000
Supporting agency: Bangalore Sustainability Forum and National Center for Biological Sciences
Principal investigator: Anisha Jayadevan
Co-principal investigators: Manini Bansal, Ishika Ramakrishna and Janhavi Rajan
Web page: https://www.feralindia.org/node/398

Cities in India support diverse biodiversity that is often ignored and children of the 21st century are becoming increasingly disconnected from nature. The “Know your urban wildlife” project aims to rekindle their interest in nature through an illustrated childrens' book called “The Living Museum”.

The Living Museum imagines nature in cities as though it were a ‘living museum’. It is written and illustrated by a group of ecologists, illustrators and designers. The book is laid out as a museum tour, introducing the ecology and behaviour of 35 species that can be commonly found living alongside us. There are four ‘halls’ of the museum: the house, the garden, the roadside, and the nighttime. Special attention is given to species like bees and bats that are feared or are the subject of superstition.

At the end of the tour, the book covers different ways in which people can engage with the Living Museum by observing it, understanding the great changes it is going through, and contributing data to national and global citizen science initiatives. To serve as an inspiration for those who want to be even more closely involved, the book gives a short glimpse into the professional work of a few people, that intersects with urban biodiversity.

The book is written, illustrated, and designed by: Anisha Jayadevan, Ishika Ramachandra (CWS), Janhavi Rajan (NCF), Manini Bansal (Dakshin), Sunaina Coelho (Babakiki Studio).

Objectives

1. Write a children's book on urban biodiversity and nature journaling.

2. Make short video clips on nature-based citizen science initiatives in India.

3. Conduct nature walks in Bengaluru.

Status

The text of the manuscript for the book is complete. We are in the process of working on the layouts and colored illustrations. Our initial proposal of a short film and nature walks had to be changed due to constraints posed by the pandemic.

Dewatered stretch of a small dam in the Western Ghats, Karnataka. Image credit: Suman Jumani

An index-based approach for basin-wide river conservation and restoration planning

Project period: October 2019 - September 2020
Budget: £6,000
Supporting agency: Rufford Small Grant Foundation
Principal investigator: Suman Jumani
Web page: https://www.feralindia.org/node/397

With over 125,000 large and small dams across the world, freshwater ecosystems are among the most threatened globally. Resultant fragmentation, flow alteration, and changing sediment cycling regimes, have adversely influenced freshwater biodiversity, which has extinction rates five times that of terrestrial animals. Ecologically rich developing countries, like India, are witnessing a proliferation of river infrastructure projects and the unscientific proliferation of this infrastructure is adversely impacting most rivers, their ecosystem services, biodiversity and local communities. The dearth of hydrologic data availability has precluded effective basin-wide development planning, further exacerbating the issue.

This project aims to propose an index-based framework to assess the cumulative impacts of dams to facilitate freshwater habitat protection and basin-wide development planning.

Objectives

1. Develop an index-based approach to assess the impacts of existing and proposed river infrastructure projects.

2. Validate the above approach using empirical data of freshwater fish communities across a gradient of fragmentation.

3. Assess the trade-offs of river infrastructure development under various scenarios of dam development using the empirically validated indices.

4. Develop a Google Earth Engine application to visualise and download time-series trends in surface water area across India's rivers and basins.

5. Collaboratively develop a citizen-science web application to collect information on India's community-based fish sanctuaries on the Our River Our Life website.

Status

We have proposed two new indices of river network fragmentation the Catchment Area-based Fragmentation Index (CAFI) and the Catchment Area- and Rainfall-based Fragmentation Index (CARFI). We also collected data on freshwater fish communities across a gradient of fragmentation between January 2021 and March 2021 for index validation.

Setting up a rain guage. Image credit: Tarun Nair

Documenting fish species present in the river. Image credit: Srinivas Vaidyanathan

Saving the fish from Mekong to Meghalaya

Project Period: November 2019 - December 2021
Budget: INR 27,37,000
Supporting Agency: Critical Ecosystem Partnership Fund and Ashoka Trust for Research in Ecology and the Environment
Collaborator: FISHBIO
Principal Investigator: Jagdish Krishnaswamy (ATREE) and Srinivas Vaidyanathan
Web Page: http://feralindia.org/node/399

Unsustainable fishing practices (such as electro-fishing and poisoning) have replaced traditional fishing practices in many areas affecting people's livelihoods. In addition, rivers, their biodiversity and ecosystem services, are relatively undervalued, neglected and exposed to pollution, habitat degradation and over-exploitation. The few remaining free-flowing rivers and streams in India are under serious threat of transformation, possibly resulting in altered flow regimes. Dearth in the knowledge of the conservation status of riverine biodiversity and spawning sites, and a lack of stakeholder participation, have made conserving freshwater biodiversity challenging.

This project seeks to establish community-based fish conservation zones (FCZs) in Meghalaya and Manipur, and build upon the existing experience of hydrologists, fishery biologists and aquatic ecologists to define ecological flow regimes and include it in the management of FCZs.

The FCZ model of conservation is adopted from Laos where fisheries management is largely decentralised.

Project Objectives

1. Generate baseline data on aquatic biodiversity and estimate ecological flow regimes for two rivers covering a stretch of about 35 km.

2. Demarcate fish conservation zones in two rivers.

3. Build capacity of villages, community members, researchers, and civil society organisations to aid conservation efforts, by building their knowledge on fish taxonomy, biology and hydrology.

4. Replicate community-based fish conservation zones in freshwater ecosystems.

Status

A series of consultative meetings with the Khengjang and Yangoulen communities and village chiefs were held to decide on the stretch of the Tuivang river to be demarcated as a fish conservation zone. The communities and village chiefs also decided on the rules and regulations to manage and monitor the fish conservation zone. As a result of these meeting, a 2.47 km

Setting up a water level recorder on the Tuivang River. Image credit: Srinivas Vaidyanathan

Recording the velocity of the river using a pygmy meter. Image credit: Srinivas Vaidyanathan

stretch along the Tuivang River was jointly declared as a community-managed fish conservation zone on the 27th of January, 2021, by the chiefs of Khengjang and Yangoulen villages in the presence of the local communities, the project team and guest from neighbouring villages.

The project team has also surveyed 10 km of the river to assess its status and health in the dry season and has begun monitoring the river's biodiversity and hydrology to develop an optimum ecological flow regime. In the first half of the year, a mobile application was developed to record fish species and the project team used this to opportunistically document fish present in the river and sold in local markets.

In addition, an online hydrology workshop for researchers, grassroots organisations and the public was conducted along with the project partners.

A signboard indicating the location of the fish conservation zone and general guidelines. Image credit: Srinivas Vaidyanathan

Developing a conservation plan for the Nilgiri Biosphere Reserve

Project period: August 2020 - September 2021
Budget: INR. 3,50,000
Supporting agencies: National Centre for Biological Sciences
Project investigators: Srinivas Vaidyanathan and Rajat R. Nayak
Web page: https://feralindia.org/node/404

The Nilgiri Biosphere Reserve, noted for its rich biodiversity and endemism, was established in 1986 to address concerns of biodiversity losses. However, there is still a gap in our knowledge of how these tropical forests function given the vagaries of climate change.

This project will address this gap by studying the long term trends in climate and ecosystem services in the Nilgiri Biosphere Reserve and the influence of climate variability and land-use land-cover on ecosystem services.

The results of this project will help develop a landscape-level action plan to conserve the Nilgiri Biosphere Reserve.

Objectives

1. Assess climate variability and trends and impacts on ecosystem services in the Nilgiris landscape.

2. Assess land-cover change and impacts on ecosystem services in the Nilgiris.

3. Use existing and accessible remotely sensed and climate data to map hotspots of ongoing phenological change in forests and grasslands in the Nilgiri landscape.

4. Interpret impacts of these changes on ecosystem services and implications under future climate change.

Status

Our study suggests significant changes in rainfall and temperature patterns in the Nilgiri Biosphere Reserve. We found a significant decline in annual rainfall during the southwest monsoon with a reduction in the number of rain days between 1951 and 2007. However, there was a slight increase in total rainfall and the number of rainy days during the northeast monsoon. The mean annual temperature has also witnessed a significant increase from 1961 to 2015, in line with future climate change predictions.

Over the last two decades, we found changes in ecosystem services in the Nilgiri Biosphere Reserve in response to climate variability. We have also observed a decline in total annual

Vegetation in large parts of the Niligiri Biosphere Reserve has remained stable over the last two decades, the spread of invasive plants species remains a concern. Image credit: Kamalraj

carbon sequestration rates in most parts due to the long term influence of water stress, with evergreen and deciduous forests declining up to ninety percent. Our results also suggest that water stress alone might not be a significant driver of productivity.

Trends in vegetation greening and browning showed large parts of the landscape remaining stable over the last two decades with a net greening. The influence of rainfall on greening remained stable across all elevations and land-use land-cover types except for moist deciduous forests in the lower and mid-elevation zones which has witnessed a consistent decline in sensitivity. Temperature showed no directional trend on greening/browning across vegetation categories. However, the influence of temperature was higher than that of rainfall, especially in dry deciduous forests, the savanna, and grasslands. Trends in the proportion of rainfall available as surface water flows and groundwater suggested an increase from 2000 to 2015 and a decrease thereafter. In large parts of the Nilgiri Biosphere Reserve, hydrological services were more sensitive to trends in rainfall than to temperature trends.

Analysis of tree cover trends suggested that the majority of the landscape remained stable with a slight net increase in tree cover over the last two decades. We provide results on areas that are undergoing rapid changes in terms of ecosystem services and their response to a changing temperature and rainfall, these hotspots need further investigation and should be prioritised for conservation and management actions.

Nearly forty percent of the rainfall is converted into surface and ground water in the Nilgiri Biosphere Reserve. Image credit: Kamalraj

Daechir, a mature Asian male elephant, returning from a waterbody at night. Image credit: The Frontier Elephant Programme

Frontier Elephant Programme

The Frontier Elephant Programme is a multi-institutional collaborative effort spearheaded by researchers at FERAL in association with scientists from the National Institute of Advanced Studies (NIAS) and the Indian Institute of Science (IISc). The aim of the programme is to conserve individuals and populations of wild Asian elephants that persist in human-dominated landscapes through long-term monitoring and citizen-science initiatives.

The goal of the programme is to harness the behavioural adaptability of elephants to help local communities adopt lifestyles that facilitate their coexistence with elephants while ensuring food security and safety in the region. Along with the long-term monitoring of individual elephants, we are currently running two projects under this programme: my elephant in my village and elephant on the zebra crossing, which deal with diverse issues related to elephant and human interactions.

The “My elephant in my village” project, developed links with the forest department to continue the implementation of seasonal crop protection measures and monitor elephant activity in forest and human-occupied areas. The “Elephant on the zebra crossing” project analysed elephant movement and human and elephant conflict hotspots around Bengaluru and will soon be able to show how movement is likely to be in 2030 given the trends in land-use change.

In the year gone by, three master's students from TERI School of Advanced Studies joined the Frontier Elephant Programme. Each student worked on a separate project: the first study aimed to analyse factors that determine the occurrence of Asian Elephants in a human-dominated landscape using information collected through interview surveys and camera traps. The second study sought to determine the time-activity budget of elephants at water holes by determining various factors such as the overlap or separation between elephants and other domestic animals. Another study analysed the spatiotemporal distribution and behaviour of Asian elephants in musth in the Eastern Ghats landscape.

A forest official and a partner farmer setting up a fence around a cropfield. Image credit: Venetia Sharanya

A snapshot from the farmer handbook. Page illustrated by Prajwal Acharya

My elephant in my village

Project Period: September 2018 - December 2021
Budget: INR. 79,34,000
Supporting agency: US Fish and Wildlife Service
Principal investigators: Srinivas Vaidyanathan and Nishant Srinivasaiah
Web page: https://www.feralindia.org/node/388

In India, more than half of all elephants live outside Protected Areas in and around densely populated agro-pastoral landscapes. Loss of elephant habitat over time, change in land use and archaic farming practices have resulted in increased human-elephant conflict.

This project aims at reducing conflict and conserving Asian elephants in a human-dominated landscape by adopting village-level land use, farming, and lifestyle practices that are compatible with elephant use of the area.

Objectives

1. Form and train village-level teams to reduce loss of property and life.

2. Train and implement site-specific farm-based practices to reduce loss of property and life.

3. Establish and maintain physical structures to reduce loss of property and life.

4. Deploy technology to equip villagers with early warnings to reduce loss of property and life.

5. Develop a framework for site-specific implementation of mitigation action plans at the village level.

Status

In this final phase of the project, we focused on monitoring fences that had been set up around cropfields in areas shared with elephants. We regularly met and contacted farmers, enquiring if any elephants had visited the fence, how it had worked, and if any modifications were needed.

The forest department, which had previously helped set up fences in the second phase of the project, has decided to subsidise the cost of the fence for other farmers who are interested in setting it up. We are now facilitating the set up of these fences between the forest department staff, farmers and various vendors from who we purchased material. As of now, the forest department has subsidised the costs for ten farmers of which four farmers have set up the hanging-wire fence, the remaining are yet to be set up.

In the meantime, we also carried out surveys to understand what the impact of our intervention has been on farmers and carried out a workshop in Bangalore with farmers from all the different villages to give them an opportunity to interact and exchange ideas with each other. Here we

Setting up a camera-trap in a forest waterbody. Image credit: Nicole Pinto

also discussed what more can be done to make living alongside elephants easier. The workshop was attended by farmers, both men and women from the villages that we had worked in.

Additionally, to ensure farmers receive a fair price for their produce, we helped connect them to consumers who are conscious about how their food is grown. This year, we are trying to connect farmers directly to wholesalers who will be able to purchase the bulk of the produce that farmers are willing to sell.

We have completed the handbook detailing how farmers who share spaces with elephants can begin to do so with less conflict. Amidst other activities, we continue to monitor elephants in our landscape both inside the forests and in neighbouring villages.

Female Asian elephants generally live in herds with juveniles and adolescent females help to take care of younger elephants. Image credit: Frontier Elephant Programme

A large group of male elephants taking refuge in a waterbody near a human-use landscape. Image credit: Nishant Srinivasaiah

SAM and TIN, two male elephants, in an agricultural area. Image credit: Nishant Srinivasaiah

Elephant on the zebra crossing

Project Period: August 2019 - December 2020
Budget: Rs. 5,00,000
Supporting agency: Bengaluru Sustainability Forum, National Centre for Biological Sciences
Principal investigators: Nishant Srinivasaiah, Srinivas Vaidyanathan and Uma Ramakrishnan
Web page: https://www.feralindia.org/node/390

The expanding magnitude of human-use areas has brought about an increase in the number of encounters between people and wildlife. Asian elephants generally prefer resource-rich areas away from human activity, but they sometimes stray into human-use areas in search of food and water or as they migrate from one landscape to another.

Through this project, we will analyse our previously collected data on elephants to assess the proximate factors that influence their decision-making to build predictive models of conflict that include future urbanisation in the peri-urban and urban areas of Bengaluru city to inform future developmental activities.

We will be focusing on human-elephant conflict in and around urban habitats, and provide guidelines for agriculture and infrastructure development and town planning in regions that are close to elephant habitats. We also hope to make policy-makers more receptive towards the elephant use of this already fragile forest habitat of southern India.

Objectives

1. Assess environmental and biological factors influencing the current foraging and ranging decisions by elephants in the peri-urban areas of Bengaluru city.

2. Assess current trends in elephant distribution and human-elephant conflict in the districts of Bengaluru, Ramanagara, Tumakuru and Krishnagiri and to identify human-elephant conflict hotspots.

3. Develop predictive models of human-elephant conflict, given future trends in land use change in Bengaluru city, including Tumakuru, Ramanagara and Kanakapura towns based on the Master Plan 2031 of Government of Karnataka and the identification of Hosur as a special investment region by the Government of Tamil Nadu.

4. To generate guidelines that can act as a policy document to help urban development in regions co-habited by elephants.

Status

The first three objectives of the project that involved modeling elephant movement and human and elephant conflict hotspots is near completion.

Male elephants MAK and SAM near a high-tension wire. Image credit: Nishant Srinivasaiah

For the first objective, using recursive partitioning classification trees, we used data on elephant locations and contiguity, to assess environmental and biological factors influencing foraging and ranging patterns of Asian elephants, especially males, in peri-urban areas of Bengaluru. The results from this exercise provided us with the baseline values that reflect decision-making in individual elephants.

We used these values, based on empirical data, for the second and third objectives to predict elephant movement under three scenarios of land use change:

1. Modeled: future land-use change is modeled based on past land-use change

2. Planned: future land-use change is modeled based on past land-use change, and incorporates planned changes to infrastructure as detailed in the Master Plans

3. Hopeful: future land-use change based on 1) and 2), which incorporates mitigation structures to enable increased permeability to elephant movement.

We are currently running the final model that is going to show us how elephant movement is likely to be in 2030 given the trends in land use change until today and the planned developmental works in and around Bengaluru city.

We are also finalising a draft of a manuscript that assesses the change in habitat selection and daily activity patterns in elephants as they transition across a gradient of forest contiguity in peri-urban areas around Bengaluru. One of the main results from our paper, suggests that when male elephants are in low contiguity areas with little available natural forest, they have modified their behaviour to select water bodies as refuge sites, more than expected based on its availability. In contrast, when they are in high contiguity areas, elephants use forests more than expected based on availability, and adjoining crop fields and scrublands as per availability.

Finally, based on the results from the above three objectives we are looking forward to developing policy guidelines for land use planning that can make the elephant use of these areas more compatible with that of human use.

The Nilgiris Hills connect two important biogeographical regions - the Eastern and the Western Ghats in south India.
Image credit: Kamalraj

Natural Resource Management

The primary objective of this programme is to document, restore and manage landscapes that sustain communities and provide essential products and services. Understanding the impacts of climate change on these services and consequently on the vulnerabilities of communities is a crucial component of this work.

In the year gone by, we initiated one new project, “No more shark bites,” a part of InSeason Fish. This project aims to examine targeted shark and ray fisheries in Andhra Pradesh, as well as the consumption of shark meat across India to aid seafood eaters to switch to shark meat alternatives. Under this project we have assessed sustainability in small-scale fishing practices in Chennai and contacted restaurant owners willing to source directly from small-scale fishing communities. However, this was brought to a halt as restaurants closed due to the Covid-19 shutdown.

Long-term monitoring of streamflow and rainfall using hydromet equipment installed in the Nilgiris was also continued. Using this long term data and other secondary data sources an attempt to develop effecient dam management using artificial intelligence was initiated as part of a collaborative project.

Soil moisture logger installed in a scotch broom patch. Image credit: Girish Varma

The “hydrologic footprint” of major invasive alien species in the Upper Nilgiris

Project period: August 2018 - June 2021
Budget: INR. 17,57,000
Supporting agency: Ministry of Earth Sciences, Government of India
Principal investigators: Ravinder Singh Bhalla and Jagdish Krishnaswamy
Web page: https://www.feralindia.org/node/47

Invasive alien species are a threat to biodiversity and ecosystem functions, as they change community assemblage and structure, and influence ecosystem functions and services. Even so, little is known about the impacts of terrestrial invasive plants on stream hydrology, especially during the dry season when their effect is pronounced. This project explores the hydrologic response of three major invasive species in the Upper Nilgiris: black wattle (Acacia mearnsii), Scotch broom (*Cytisus scoparius*) and Gorse (*Ulex europaeus*). Understanding their relative impact on stream flows, especially during dry season, can inform land-use policy, particularly in headwaters of important basins where large-scale land-cover modifications are implemented.

Objectives

1. Determine the impact of black wattle, Scotch broom, and Gorse on the water budget when compared to natural grasslands in the upper Nilgiris in terms of dry season streamflows, evapotranspiration demands, and soil moisture.

2. Quantify impacts of large-scale removal of wattle on sediment loads in streams.

3. Investigate decadal trends in area under major land-cover and natural grasslands and forests and their contribution to evapotranspiration at a landscape scale.

Status

We found that during the dry season, exotic invasive species reduced streamflow impacting the amount of water stored in reservoirs for power generation and irrigation, and the amount of water available for wildlife and ecosystem processes. We also found that catchments with a predominantly wattle cover tend to retain less water during extreme rain events, causing sudden discharges into streams, which can potentially lead to floods further downstream.

We have conducted soil moisture studies for one dry and one wet season in different land-cover types and found that soil moisture was low in wattle catchments compared to grasslands, indicating a greater transpirational water loss in wattle dominated catchments. The results from evapotranspiration models developed suggest 8-10% higher water loss in invaded woody land-covers compared to the natural grasslands. In the coming months, we will be collecting and analysing sediments from streams across different land covers.

India ranks among the top nations in terms of the highest volume of shark caught annually. Image credit: InSeason Fish

Local markets prefer juvenile sharks, such as this scalloped hammerhead (Sphyrna lewini). Image credit: InSeason Fish

Saving sharks with InSeason Fish

Project period: May 2019 - ongoing
Budget: INR. 40,00,000
Supporting agency: Future for Nature
Principal investigator: Divya Karnad
Web page: http://feralindia.org/node/400

InSeason Fish is a sustainable seafood initiative that works across the supply chain to reduce demand for threatened marine species and support for unsustainable fishing practices. At present, India's marine seafood comes mainly from non-selective fishing gear, which can be destructive to marine ecosystems. The concept of bycatch is almost non-existent with species typically considered bycatch elsewhere in the world feeding low-value supply chains in India and abroad.

Through this project, we analyse these supply chains and try to understand the relationships between domestic seafood consumption and unsustainable fishing. We also examine what types of support systems will work to promote sustainable practices among small-scale fishers. We focus our activities on fishing communities in Tamil Nadu but work with seafood consumers across India.

Objectives

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

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

3) Understand seafood demand and seafood consumption practices in India.

4) Tracing seafood supply chains on the east and west coasts of India.

Status

Assessment of sustainability in small-scale fishing practices has been conducted in Chennai and is on-going in Puducherry and Andhra Pradesh. The data on fishing practices in Chennai will feed into a larger, east coast of India-wide assessment, which is being prepared for an academic publication. Creating more transparent and high-value supply chains to encourage sustainable fishing practices began in early 2020 by getting restaurants in Chennai and Mumbai to source directly from small-scale fishers. However, the COVID-19 pandemic shutdowns brought this to a halt since many of the stakeholders involved shut their businesses or were unable to supply into or source from those supply chains.

A shark being sold for local consumption in the open market. Image credit: InSeason Fish

Divya Karnad engages with chefs. Image credit: InSeason Fish

Instead, we focussed more on providing rations and relief to fishing communities affected by the pandemic shutdowns. Preliminary indications suggest that small monthly payments (INR 5,000 from the government and rations from our work), combined with the absence of large-scale seafood traders, incentivised fishing communities not to fish beyond subsistence levels.

Our work on seafood demand and consumption from India's metros demonstrated that these metros have undue influence on supporting unsustainable fishing practices. Even while India's tropical seas provide over 100 edible (non-threatened) species, the seafood diversity preferred by urban seafood eaters averages at around six species. Trying to source these six species at the cost of all others creates overfishing in India. The work on tracing seafood supply chains is ongoing in Andhra Pradesh and Goa.

An example of unsustainable seafood catch. Image credit: InSeason Fish

Researcher Meghana taking measurements on the field. Image credit: InSeason Fish

Dried shark fins, mobula gill plates and elasmobranch meat are sold domestically and exported. Image credit: InSeason Fish

No more shark bites

Project period: July 2020 - March 2022
Budget: INR. 16,60,000
Supporting agency: Prince Bernhard Nature Fund
Principal investigator: Divya Karnad
Web page: http://feralindia.org/node/401

Shark meat consumption, including that of critically endangered species like the great hammerhead shark (*Sphyrna mokarran*) and scalloped hammerhead (*Sphyrna lewini*) shark, is rampant in homes and restaurants in India. While shark meat consumption has typically been a part of fishing communities' diet, with India's increasing population especially along the coasts, shark meat consumption is becoming an increasing threat to shark populations.

This project examines targeted shark and ray fisheries in Andhra Pradesh, as well as the consumption of shark meat across India. It also aims to aid seafood eaters in switching to shark meat alternatives by working with restaurant owners and creating a Shark Ambassadors programme.

Objectives

1. Reduce demand for meat from easily identifiable critically endangered sharks by promoting behavioural changes among seafood eaters.

2. Reduce shark harvest and bycatch by working with fishermen to promote local, culturally relevant versions of bycatch reduction technology.

3. Support long-term commitment to reduce shark harvest and consumption by networking 'shark-friendly' fishermen to responsible chefs and seafood consumers.

Status

Through this project, we have monitored shark and ray fisheries in Andhra Pradesh for one fishing season and identified existing fishing and bycatch reduction practices. We are now in the process of promoting by-catch reduction practices in these fisheries.

We have also conducted a survey of shark meat consumption across all coastal states in India. From these, we have identified priority areas to reduce the demand for shark meat. We have also identified chefs in those priority areas to set up our Shark Ambassador programme. We are now planning workshops and outreach activities for chefs and shark meat consumers, respectively.

Nishant Srinivasaiah addresses participants during the networking for elephants workshop. Image credit: Harshit Kathayat

Partners of the project take part in a system's thinking activity, envisioning themselves as elephants, farmers, forest staff and researchers. Image credit: Harshit Kathayat

Learning and Events

Our learning programme comprises of formal and informal courses which often overlap with other events. FERAL also conducts workshops in collaboration with other organisations.

Networking for elephants

Date: March 25, 2021
Venue: J.R.D Tata Auditorium, National Institute of Advanced Studies, Bangalore

The 'Networking for Elephants' workshop under the ‘My Elephant in My Village’ was organised to expose the farmers to the complexities of human and elephant conflict in order to 1) make them realise through role-play that they are not alone in this system and that the actions of the forest department, impact of developmental activities, the research team and the behaviour of the elephants themselves, all play significant roles in determining the occurrence of an elephant in their village or cropfields, 2) to show the farmers that through altering their lifestyle practices either through simple changes in their time-activity budgets or by adopting crop protection measures such as the movable hanging wire fences, much of the crops and lives can be protected and 3) that by increasing their sets of capabilities and functionings, in this case, processing and sale of locally grown produce, through value addition, can help stabilize their finances considerably so as to ensure that any crops lost to elephants can be buffered. In addition, the other objective of the workshop was to introduce the farmers that we are working with in different villages across four districts in the states of Karnataka and Tamilnadu to each other to facilitate an exchange of ideas and cross-learning.

A significant component of the workshop consisted of asking the 30 participants to reflect on the process of human and elephant interactions through the lens of the farmers, forest department staff, elephants and researchers (the stakeholders) through a system’s thinking approach. This was facilitated by the scientists at FERAL and by Prof. Anindya Sinha of National Institute of Advanced Studies and Dr. Arshiya Bose of Black Baza Coffee Company.

At first, farmers were asked to think about their interactions with the stakeholders in the system in the absence of any measures to protect crops from elephants - Reactive Scenario. Under this

Anindya Sinha distributes certificates to partner farmers during the workshop. Image credit: Harshit Kathayat

Participants of the Networking for Elephants workshop. Image credit: Harshit Kathayat

scenario, from the farmer's point of view, it seemed like elephants were intent on overcoming their efforts (bursting crackers and shining torch lights) to dissuade them from entering into the cropfields to feed on crops. The farmers seemed certain that the elephants will feed on the crops, and so their focus was on demanding that the forest department compensate them for their financial loss. The farmers also said that both the forest department staff and the researchers are present and listen to the farmers, but they do not always indicate any specific actions that they will carry out.

After which, the hanging wire fence was introduced as one of the crop protection measures, which was one of the measures introduced under the My Elephant in My Village project across eight villages in which it was implemented - Proactive Scenario. Under this second scenario, once the farmers adopted the fences and made subtle changes to their lifestyle practices, they indicated that the researchers and forest staff were willing to collaborate in the long-run to find lasting solutions, such as, whether the measures that were implemented have worked or not. The farmers were also willing to improve on these methods if the need arises. The farmers seemed convinced that the measures that they have implemented have worked, but feel that the elephants will not stop attempting to feed from cropfields. Hence, constant upgradation of the mitigation measures proactively in response to the behaviour of the elephants was identified as a need for the system to work in the long-term.

Saving the fish from Mekong to Meghalaya

The following events were conducted under this project:

Introduction to fish conservation zones

An online webinar on fish conservation zones was held on the 24th of October, 2020, along with FISHBIO, Laos and ATREE. Co-principal investigators of the project Dr. Bashida Massar and Dr. James V. Haokip spoke about fish conservation in Meghalaya and Manipur, respectively. Erin Loury and Sinsamout Ounboundisane from FISHBIO, Laos, gave an overview of fish conservation zones in Southeast Asia, presented learnings from the Critical Ecosystem Partnership Fund's grantees in Southeast Asia, spoke about project implementation, establishment and challenges of fish conservation zones and reasons for inactive zones.

Twenty-eight participants from various institutions and non-governmental organisations from the northeast region, members from the fishery department in Meghalaya, project staff and community members attended the webinar.

Field methods in hydrology

A two-day online webinar, attended by 20 participants, on field methods in hydrology was organised by ATREE and FERAL on the 17th and 18th of December 2020. The workshop

Inaguration of the Khengjang - Yangoulen fish conservation zone in Manipur. Image credit: Tarun Nair

Member of women's self help groups addressing the gathering during the inaguration of the fish conservation zone. Image credit: Tarun Nair

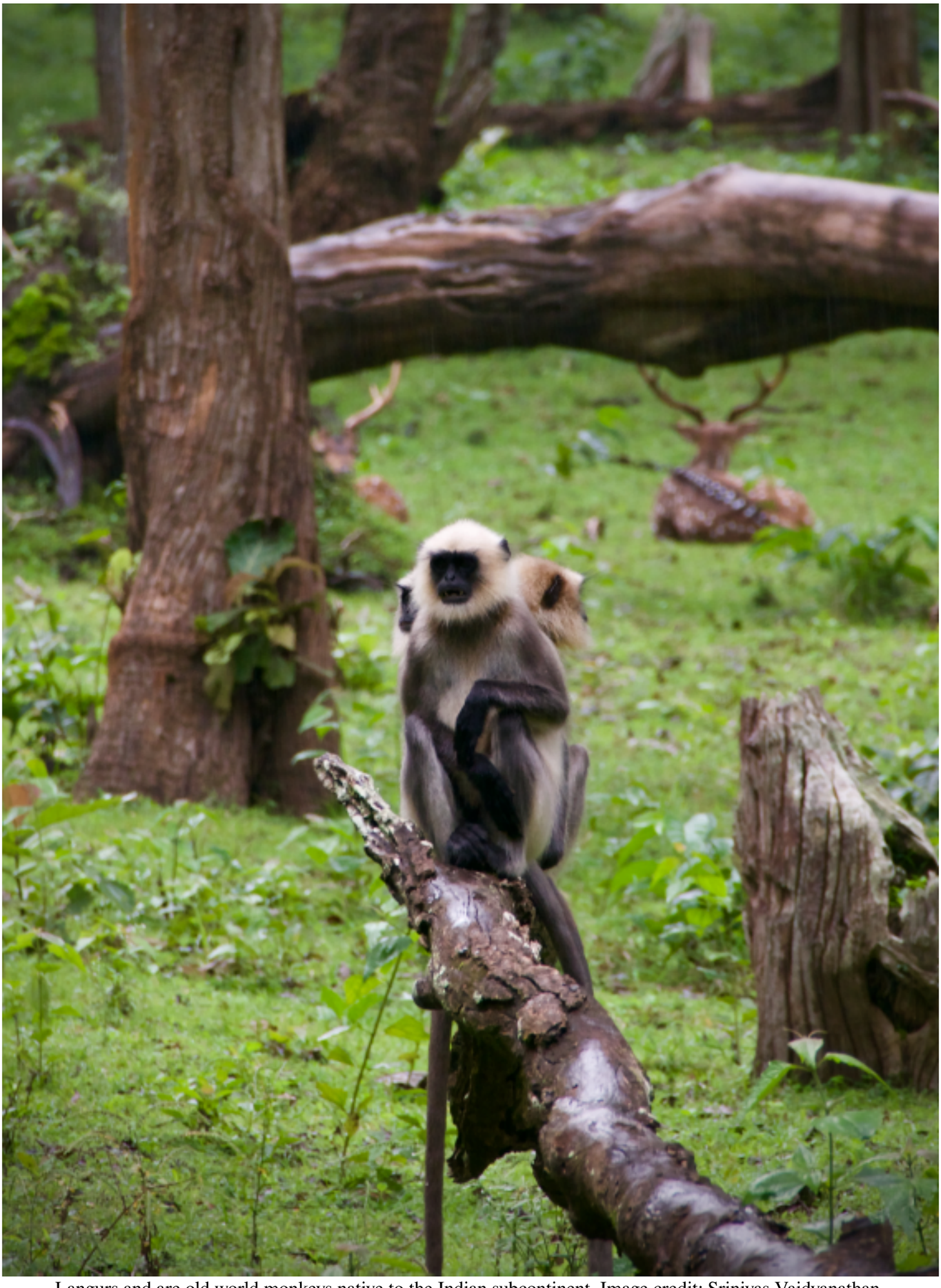
introduced researchers and civil society members to concepts of river monitoring, such as an introduction to hydrologic cycles and water balance, measurements of rainfall and streamflow, visualisation of rainfall, stream flow data and exploratory analysis. Jagdish Krishnaswamy and Shrinivas Badiger from ATREE, Manish Kumar from Centre for Ecology Development And Research (CEDAR) and Srinivas Vaidyanathan from FERAL conducted the workshop.

Inaugurating a fish conservation zone

The Khengjang and Yangoulen fish conservation zone along Tuivang River was formally inaugurated on the 27th of January, 2021, by the village chief of Khengjang Mr. Thongpum Haokip, the village chief of Yangoulen Mr. Thanglet Haokip, and Mr. Tongkhoson Haokip, the village chief of Molcham. Community members from both the villages also attended the event.

During the event. Dr. James Haokip spoke about the importance of free flowing rivers and how destructive fishing practices have reduced fish stock in the Tuivang River. Srinivas Vaidyanathan spoke about community-managed fish conservation zones and how they have been instrumental in reviving fish populations and promoting sustainable fishing in other parts of the world.

Participants of the workshop introducing fish conservation zones. Image credit: Srinivas Vaidyanathan



Langurs and are old world monkeys native to the Indian subcontinent. Image credit: Srinivas Vaidyanathan

Publications

Below is a list of publications covering articles, in scientific journals, popular magazines and newspapers, followed by technical reports and conference papers presented at various national and international events.

Journal articles

Bhalla, R.S., Krishnsawamy, J., Chappell, N.A., Kumaran, K., Vaidyanathan, S., Nayak, R., & Ghatwai, P. 2020. Daily rainfall, stream discharge and hydraulic conductivity of soils from catchments dominated by different vegetation types, Western Ghats, India, 2014-2016. NERC Environmental Information Data Centre. https://doi.org/10.5285/9257a999-2844-4be1-80d1-fd29e2ccf9ef

Jayadevan, A., Nayak, R., Karanth, K. K., Krishnaswamy, J., DeFries, R., Karanth, K. U., & Vaidyanathan, S. 2020. Navigating paved paradise: Evaluating landscape permeability to movement for large mammals in two conservation priority landscapes in India. Biological Conservation, 247, 108613. https://doi.org/10.1016/j.biocon.2020.108613

Jumani, S., Deitch, M. J., Kaplan, D., Anderson, E. P., Krishnaswamy, J., Lecours, V., & Whiles, M. R. 2020. River fragmentation and flow alteration metrics: A review of methods and directions for future research. Environmental Research Letters. https://doi.org/10.1088/1748-9326/abcb37

Nayak, R., Karanth, K. K., Dutta, T., Defries, R., Karanth, K. U., & Vaidyanathan, S. 2020. Bits and pieces: Forest fragmentation by linear intrusions in India. Land Use Policy, 99, 104619. https://doi.org/10.1016/j.landusepol.2020.104619

Pinto, N., Vaidyanathan, S., Varughese, S., Krishnaswamy, J., Massar, B., & Haokip, J.V. 2021. Establishment of community-led fish conservation zones in Meghalaya and Manipur, India. Oryx, 55, 493-494. https://doi.org/10.1017/S0030605321000338

Punjabi, G., Jayadevan, A., Jamalabad, A., Velho, N.,Bandekar, N., M., Baidya, P., Jambhekar, R., Rangnekar, P., Dharwadkar, O., Lopez, R., & Rodrigues, M. 2020. On the inadequacy of

environment impact assessments for projects in Bhagwan Mahavir Wildlife Sanctuary and National Park of Goa, India: A peer review. Journal of Threatened Taxa, 12, 17387-17454. https://doi.org/10.11609/jott.6650.12.18.17387-17454

Wang, X., Nair, T., Li, H., Wong, Y.S.R., Kelkar, N., Vaidyanathan, S., Nayak, R., An, B., Krishnaswamy, J., & Tambe, M. 2020. Efficient Reservoir Management through Deep Reinforcement Learning. arXiv preprint arXiv:2012.03822.

Books

Kumar, N.S., Karanth, K.U., Nichols, J.D., Vaidyanathan, S., Gardner, B., & Krishnaswamy, J. 2021. Spatial Dynamics and Ecology of Large Ungulate Populations in Tropical Forests of India. Springer.

Book chapters

Kumar, N. S., Karanth, K. U., Nichols, J. D., Vaidyanathan, S., Gardner, B., & Krishnaswamy, J. 2021. Introduction: The Conservation Issue. In Spatial Dynamics and Ecology of Large Ungulate Populations in Tropical Forests of India (pp. 1-33). Springer, Singapore.

Kumar, N. S., Karanth, K. U., Nichols, J. D., Vaidyanathan, S., Gardner, B., & Krishnaswamy, J. 2021. Development of Hierarchical Spatial Models for Assessing Ungulate Abundance and Habitat Relationships. In Spatial Dynamics and Ecology of Large Ungulate Populations in Tropical Forests of India (pp. 35-82). Springer, Singapore.

Kumar, N. S., Karanth, K. U., Nichols, J. D., Vaidyanathan, S., Gardner, B., & Krishnaswamy, J. 2021. Model-Based Assessment of Ungulate-Habitat Relationships. In Spatial Dynamics and Ecology of Large Ungulate Populations in Tropical Forests of India (pp. 83-165). Springer, Singapore.

Kumar, N. S., Karanth, K. U., Nichols, J. D., Vaidyanathan, S., Gardner, B., & Krishnaswamy, J. 2021. Assessing Threats to Ungulates and Management Responses. In Spatial Dynamics and Ecology of Large Ungulate Populations in Tropical Forests of India (pp. 167-184). Springer, Singapore.

Kumar, N. S., Karanth, K. U., Nichols, J. D., Vaidyanathan, S., Gardner, B., & Krishnaswamy, J. 2021. Conservation of Tropical Forest Ungulates: The Way Forward. In Spatial Dynamics and Ecology of Large Ungulate Populations in Tropical Forests of India (pp. 185-195). Springer, Singapore.

Srinivasaiah, N.M., & Sinha, A. 2021. The elephant in the city: The trialectics of space in the rurban elephants of southern India. Urban Environments as Spaces of Living in Transformation, 11. Urban Environments Centre, Rachel Carson Centre, University of Munich.

Reports

Vaidyanathan, S., Athreye, D., Gangaraju, S., Kamalraj, S., & Ram, S. 2021. Baseline estimates of the presence, distribution, and abundance of wildlife populations in the Kodaikanal Wildlife Sanctuary, southern India. Final technical report WL/(A)/38714/2017, Permit No. 71/2017.

Popular articles

Jayadevan, Anisha. “Fragmenting Forests, Hubballi to Ankola.” Sanctuary Asia 40. July, 2020. https://sanctuarynaturefoundation.org/article/fragmenting-forests%2C-hubballi-to-ankola

Karnad, Divya and Teerthala, Meghana. “Healthy fisheries, sustainable trade.” Deccan Herald, December 23, 2020.
https://www.deccanherald.com/spectrum/healthy-fisheries-sustainable-trade-930743.html

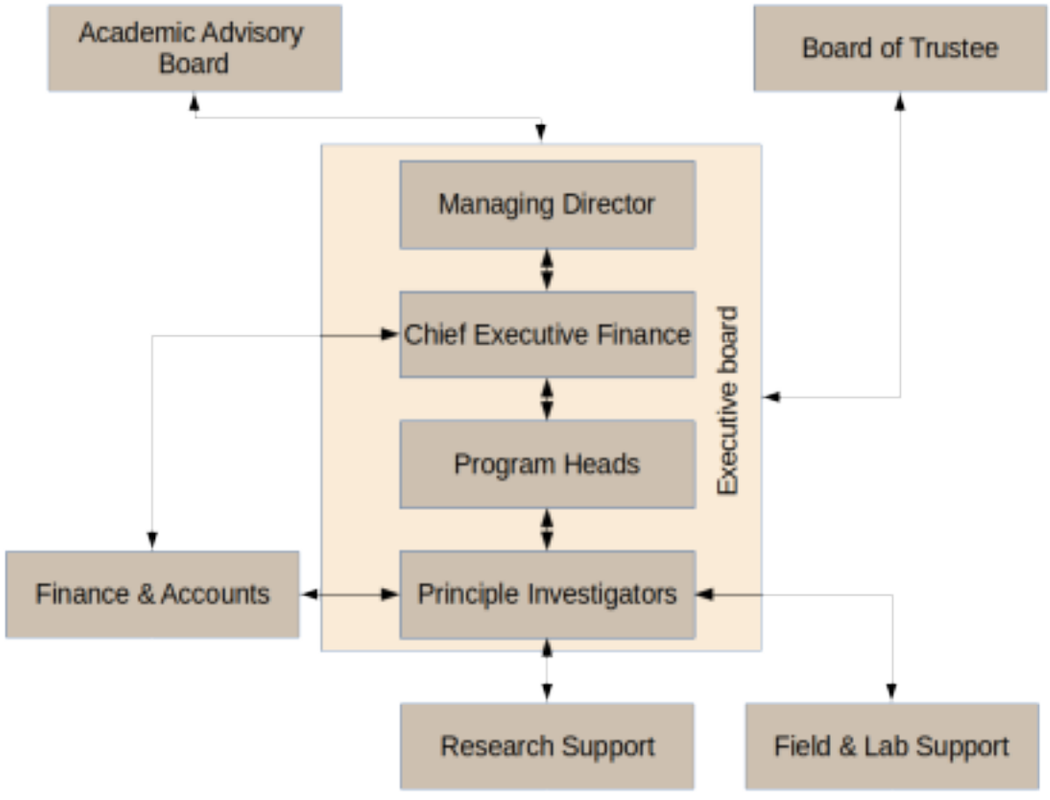
Pinto, Nicole. “The Ecological Cost of Increasing Infrastructure in Forests.” Sanctuary Asia 40. August, 2020.
https://sanctuarynaturefoundation.org/article/the-ecological-cost-of-increasing-infrastructure-in-forest

The population of sambar deer have drastically fallen in recent generations, and they are now listed as "vulnerable" on the International Union for Conservation of Nature red list. Image credit: Srinivas Vaidyanathan

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 contribu- tion 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.



BALANCE SHEET

FOUNDATION FOR ECOLOGICAL RESEARCH ADVOCACY AND LEARNING
No .170/3, Morattandi Village, Auroville Post, Tamilnadu - 605101
BALANCE SHEET as at 31st March 2021

(Amount in Rs)

Particulars	Sch.Ref	As at 31.03.2021	As at 31.03.2020
SOURCES			
Corpus	1	7,25,803	9,05,428
Project Asset Reserve	2	2,01,015	2,01,015
Projects Account (Cr)	3	80,69,357	1,03,55,857
		89,96,175	1,14,62,300
APPLICATION			
Fixed Assets (Less) Depreciation	4	5,64,070	6,44,140
CURRENT ASSETS, LOANS AND ADVANCES			
Cash and bank balances	5	80,92,617	1,03,87,901
Loans and advances	6	96,528	69,960
Projects Account (Dr)	3	3,10,995	3,38,256
Interest accrued but not due	7	48,916	63,055
(i)		85,49,056	1,08,59,172
Less: Current liabilities	8	1,16,951	41,012
(ii)		1,16,951	41,012
Net Current Assets (i) - (ii)		84,32,105	1,08,18,160
		89,96,175	1,14,62,300
Notes on Accounts	12		

As per our report of even date attached
For ASA & ASSOCIATES LLP
Chartered Accountants
Firm Reg No: 009571N/N500006

S. SUNDAR RAJAN
Partner
Membership No : 211414

Place : Chennai
Date : December 29, 2021

For FOUNDATION FOR ECOLOGICAL RESEARCH ADVOCACY AND LEARNING

SRINIVAS VAIDYANATHAN
Trustee

Advisory board

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

Ministry of Earth Sciences, Government of India (India), Ashoka Trust for Research in Ecology and Environment (India), Bengaluru Sustainability Forum, National Centre for Biological Sciences (India), Critical Ecosystem Partnership Fund (USA), Prince Bernhard Nature Fund (Netherlands), Ruffords Foundation (UK), Future for Nature (Netherlands) and United States Fish and Wildlife Services (USA).

Individual donors

Dr. R. S. Bhalla and Mr. Srinivas Vaidyanathan.

Collaborating Institutions

Ashoka Trust for Research in Ecology and Environment (India), Lancaster Environment Centre - Lancaster University (UK), Centre for Wildlife Studies (India), Dakshin Foundation (India), Nature Conservation Foundation (India), National Centre for Biological Sciences (India), and National Institute for Advanced Studies (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

Alissa Barnes

Alissa is a marine biologist specialising in shark and ray fisheries along the north-western coast of India. She is interested in understanding the perspectives of fishing communities towards sharks and rays.

Anisha Jayadevan

Anisha is a PhD student at the University of Maryland Baltimore. She is interested in understanding the drivers and consequences of habitat fragmentation, and how best to connect and restore fragmented landscapes.

Chaitanya Krishna

Chaitanya holds a PhD in Wildlife Biology and Conservation. He currently works on a community-based natural resources management and marine programme. His work focuses on the anthropogenic impacts on wildlife, and he has consulted on environmental and social safeguards compliance for industry.

Divya Karnad

Divya works on a community based natural resources management programme and the marine programme. She holds a PhD in geography with a focus on marine fisheries management. She works on sustainable fisheries, sustainable seafood trade and the conservation of threatened marine species, with a current focus on sharks and rays.

Farshid Ahrestani

Farshid is a wildlife ecologist who studies the mechanisms that drive the distribution and dynamics of populations and communities in space and time. He is interested in understanding how species and ecosystems are coping and responding to global change.

Kumaran K

Kumaran works as part of the field team in Pondicherry and in the Western Ghats. He recently completed his Masters degree in Ecology at Pondicherry University and has worked on land cover changes in the Nilgiris with a focus on invasive species in the shola grasslands.

Meghna Binraj

Meghna has a MSc in Conservation Futures from TransDisciplinary University. Her focus is on mobula ray fisheries in Andhra Pradesh.

Narayani S

Narayani has completed PhD in marine biology, specialising in fish and fisheries. Her areas of interests include fish biology, fish feeding ecology and ecomorphology. A nature writer, she has a lot of experience in conducting science programmes for school children.

Nicole Pinto

Nicole is interested in raising awareness about the changing behaviour of animals and the communities who live alongside them. She has a degree in Business Management and a background in writing.

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.

Pradeep Koulgi

Pradeep is a wildlife biologist, with a Master's degree in Wildlife Biology and Conservation. His current work involves using GIS data with large historical earth observation datasets to help understand the status and changes in river systems and natural landscapes.

Rajat Nayak

Rajat has completed his Masters in Wildlife Biology and Conservation. He has a special interest in grassland ecosystems, both low and high altitude, semi-arid and wet.

Ravinder S Bhalla

Ravi works on community based natural resources management and ecosystem services. Monitoring and building resilience among communities to mitigate impacts of climate change on these resources and services is another aspect of his research. He holds a Ph.D. in GIS and remote sensing based tools and models on water resources and watershed management.

Sandeep G

Sandeep mainly works on field based projects, carrying out biodiversity surveys and helping communities live peacefully alongside wildlife. He also works towards raising awareness about different landscapes and their biodiversity. Sandeep has a PG Diploma in Science and Management for Sustainable Living.

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.

Suman Jumani

Suman is pursuing her PhD in the Soil and Water Sciences Department, University of Florida, USA. Her research interests lie in applied freshwater ecology, hydrology, and conservation science.

Sunita Ram

Sunita has an MPhil in Biological Sciences from Fordham University, USA. Her research interests lie in understanding the ecology and distribution of primates and finding long term conservation strategies in the southern Western Ghats.

Surjit Singh

Surjit has an undergrad degree in zoology and is currently surveying rivers and sampling for fish in Khengjang, Manipur. He is interested in community based conservation efforts and assists in the formation of fish conservation zones.

Venetia Sharanya

Venetia has completed her Masters in Environmental Studies and Resource Management. She is interested in animal behaviour, social structures, the factors influencing movement, and human-animal interactions.

Research support

Kamalraj S

Kamal started off at FERAL as a field assistant about a decade ago. He is adept at handling a range of equipment 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.

Khaijamang

Khaijamang works in Yangoulen, Manipur, as a field assistant collecting data needed for river health assessments and for fish monitoring.

Philip

Philip is a farmer by profession, but he also works in Khengjang, Manipur, as a field assistant.

Saravanan S

Saravanan holds a masters in human resources development and coordinates field activities and manages the teams at the Emerald field station in the Nilgiris. He is also the liason between the project and various officials in the Nilgiris and is a resource person for GIS and GPS workshops conducted at FERAL.

Suseelan

Suseelan is a field assistant on the eco-hydrology project based out of of the field station at Nilgiris. He is a capable and dependable assistant, pleasant to be around and with an appetite to learn new techniques. Suseelan knows how to operate and maintain a range of hydro-met equipment.

Interns

Ashvita Anand

Ashvita is a psychology graduate with a keen interest in non-human primate behaviour. She has worked on projects focusing on the Nicobar long-tailed macaque and bonnet macaque.

Harsha K R

Harsha's research interest include analysing the behaviour and distribution of elephants and studying their spatio-temporal distribution in a human dominated landscape. She is currently pursuing her master's in environmental studies and resource management.

Harshit Kathayat

Harshit is a master's student in TERI School Of Advanced Studies. He is interested in understanding the drivers affecting the occurances of the Asiatic Elephant in southern Indian.

Niranjan B

Niranjan is currently pursuing his MSc in environmental studies and resource management. His research interests includes studying interspecific interactions of mammals and their ecological implications, carnivore - herbivore ecology and the role of disease ecology / zoonoses in the natural world.

Vedika Thimmiah

Vedika Thimmaiah is a development graduate from Azim Premji University. She is interested in bridging the gap between science and arts through design, communication and outreach.

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 in commerce and is versatile in the use of a range of accounting softwares.

Sumathi

Sumathi manages the upkeep of the FERAL campus at Morattandi which includes handling the boarding and lodging arrangements during training programmes and events.