

Foundation for Ecological Research, Advocacy and Learning

Annual Report 2019 - 2020



Foundation for Ecological Research, Advocacy and Learning (FERAL)

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Cover image: Sandeep G

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Bandipur National Park a forested reserve in the southern Indian state of Karnataka. Image credit: Sandeep G.

Mandate

Our mandate is to address issues of natural resource management and conservation of natural areas and the environment at the grassroots and policy level. To do this, we implement projects, undertake research and run a variety of courses for students and practitioners. We also collaborate with other research and development institutes in India and abroad and engage with stakeholders through awareness campaigns, workshops and seminars.

We are a non-profit trust founded in 1997 to address the need for applied research and training in ecology and environment. Since then, we have contributed substantially to research and policy in wildlife biology and conservation, natural resources management, as well as to education and skill-building in these and allied areas.

For our research, we use data-driven ecological research and leverage contemporary analytical and visualisation tools. We strive to involve major stakeholders in the identification and resolution of problems emerging from environmental degradation and loss of natural habitats. We believe that building the skills and capacities of stakeholders and testing out-of-the-box approaches are necessary to tackle some of the most difficult and seemingly intractable challenges we face in this field today.

The Year That Was

During the initial part of the current financial year 2019–2020 we continued to work on ongoing wildlife and conservation projects. Divya Karnad, who has been working with small-scale fishermen who use sustainable fishing practices to enhance their livelihoods was awarded the Future for Nature Award for 2019. Collaborations with other research agencies were strengthened and a number of research manuscripts were published in peer reviewed journals. However, towards the end of this financial year, with the onset of the novel coronavirus we were forced to slow the pace of much of our work.



A venomous viper snake called saw-scaled viper (*Echis carinatus*) shedding its skin. 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 work on a project in Manipur and Meghalaya to conserve freshwater fish species in the region. This model of conservation is based on a practice followed in Laos known as fish conservation zones.

During the year, we also completed a study in the Kodaikanal Wildlife Sanctuary wherein we used camera-traps to determine baseline estimates of wildlife within the sanctuary. Through this study we have established the presence of resident tigers, leopards and wild dog within the sanctuary. We also initiated two new fresh water ecology and conservation projects, one in the Western Ghat which is developing an index to measure the cumulative impacts of dams and the other in North East India which aims to create community managed Fish Conservation Zones.

A long term research and conservation programme called the Frontier Elephant Programme that was initiated the previous year is ongoing. This programme is currently running two grant projects - one project aims to protect elephants and improve people's livelihoods through community empowerment and reduction in poaching and conflict, and the second project is working on analysing data to assess the proximate factors that influence decision-making in elephants in order to build predictive models of conflict around Bangalore that can inform future developmental activities.

A number of research papers were also published during the year, among them being the study of "All-Male Groups in Asian Elephants: A Novel, Adaptive Social Strategy in Increasingly Anthropogenic Landscapes of Southern India", "Looking beyond Protected Areas: Identifying Conservation Compatible Landscapes in Agro-Forest Mosaics in North-Eastern India" and "Land-Sharing Potential of Large Carnivores in Human-Modified Landscapes of Western India".



Forest department staff assisting in camera-trap surveys.



Indian muntjac, also called the southern red muntjac and barking deer, is a deer species native to South and Southeast Asia. Image credit: Srinivas Vaidyanathan

Estimates of wildlife in Kodaikanal Wildlife Sanctuary

Project Period: June 2017 to March 2020

Budget (lakh): Rs. 12.87

Supporting Agency: Kodai Friends International and individual donors.

Principal Investigator: Srinivas Vaidyanathan

Web Page: <http://feralindia.org/node/394>

In 2013, ~610 km² of the Palani Hills were formally designated as the Kodaikanal Wildlife Sanctuary (KWS). The Palani Hills host diverse habitats, flora, and fauna, including many species endemic to the global biodiversity hotspot Western Ghats region. There exists, however, little data on the status of wildlife in the Palanis. A study from October 2016 to June 2017 established the status of the interface between wildlife and people living along the boundary of KWS. To complement these findings of the human-wildlife interface, this study to determine baseline estimates of wildlife was initiated.

In the year 2020, we completed a camera-trap based study covering an area of ~175 km² in the upper Palani's. Photographs of sambar were the most abundant followed by gaur and muntjac. Our study has also established the presence of tigers, leopards, and dholes within KWS. Detailed analysis of data collected so far using different sampling techniques is ongoing.



According to an official count there has been a sharp rise in India's leopard population in recent years.



The fishes of the Tuivang River in Manipur are threatened from over-fishing and unsustainable fishing practices. Image credit: James Haokip.



Fishing in the Rhymben River in Meghalaya. Image credit: Bashida Massar.

Saving the fish from Mekong to Meghalaya

Project Period: November 2019 to April 2021

Budget (lakh): Rs. 27.37

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>

Freshwater ecosystems are the most threatened biome globally. Rivers, their biodiversity and ecosystem services are relatively under-valued and neglected, and are exposed to pollution, habitat degradation and over-exploitation. The few remaining free-flowing rivers and streams are under serious threat of transformations, sometimes resulting in altered flow regimes. This also affects the livelihood of people depending on them. Unsustainable fishing practices (such as electro-fishing, dynamiting and poisoning) have replaced traditional practices and led to knowledge gaps in the conservation status of riverine biodiversity and spawning sites, and resulted in lack of stakeholder participation that makes conserving freshwater biodiversity a difficult enterprise.

Fish Conservation Zones (FCZs) have arisen as a popular tool for fisheries conservation in Laos where fisheries management has been largely decentralized. This project seeks to establish such community-based 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.

Project Objectives

1. The project will generate baseline data on aquatic biodiversity and estimate ecological flow regimes for two rivers covering a stretch of about 35 km.
2. Fish conservation zones in two rivers will be demarcated and managed by local communities.
3. Build capacities of villages, community members, researchers, and civil society organisations to aid conservation efforts, build knowledge on fish taxonomy, biology and hydrology, and establish fish conservation zones.
4. Replicate community-based fish conservation zones in freshwater ecosystems.

Along both the Rymben-Borhir river system and the Tuivang River, critical sites in need of management have been identified and the co-principal investigators in both places have held meetings with the local village leaders to introduce them to the concept of FCZs and to request their participation and cooperation. A workshop was held in the Western Ghats to build capacity in fish sampling techniques and stream hydrology.



A dammed and undammed stretch of the same river. Image credit: Suman Jumani.

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

Project Period: October 2019 to September 2020

Budget: £6,000

Supporting Agency: Ruffords Small Grant Foundation

Investigators: 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 have extinction rates five times that of terrestrial animals. In India, where over 9,000 small and large dams have been proposed for further development in addition to the existing 5,100 large and 1,266 small dams. Many of these fall within the Western Ghats – a biodiversity hotspot and freshwater ecoregion, with over 350 fish species (66% endemic) which supports numerous ecological processes and millions of people. However, the unscientific proliferation of river-related infrastructure is adversely impacting most rivers, their ecosystem services, biodiversity and dependent local communities. The dearth of hydrologic data has precluded effective basin-wide development planning, further exacerbating the issue.

We aim to address this gap by proposing spatially explicit indices of river fragmentation and flow alteration to assess the cumulative impacts of dams, with the goal of facilitating freshwater habitat protection and basin-wide development planning. We will validate the efficacy of this approach by assessing their ecological relevance and scale of influence using freshwater fish and macroinvertebrate communities.

Project objectives

1. Development of an index-based approach to assess the impacts of existing and proposed river infrastructure projects.
2. Validation of the above approach based on empirical data of freshwater fish communities across a gradient of fragmentation.
3. Assessment of trade-offs of river infrastructure development under various scenarios of dam development using the empirically validated indices.

Status

We proposed a new measure of river structural connectivity based on physical catchment characteristics to address some of the drawbacks of the widely used connectivity index. Field work to test the ecological validity of our metrics was carried out from December 2019 to March 2020 along the upper reaches of the west flowing Netravathi River.



Elephants cover themselves with sand or mud to protect their skin from the sun's ray and insect bites.

Frontier Elephant Programme

The Frontier Elephant Programme is a multi-institutional collaborative effort spearheaded by researchers at the Foundation for Ecological Research, Advocacy and Learning (FERAL) in association with scientists from the National Institute of Advanced Studies (NIAS), Asian Nature Conservation Foundation (ANCF) and the Indian Institute of Science (IISc), aim to conserve individuals and populations of wild 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 in frontier-habitats, while ensuring food security and safety in the region.

Currently, there are two projects running under this programme: my elephant in my village and elephant on the zebra crossing.



Sample illustrations from the farmer's handbook. Image 1 illustrated by Shruti Pillai, image 2 illustrated by Prajwal Acharya.

My elephant in my village

Project Period: September 2018 to August 2021

Budget (Lakh): Rs. 79.34

Supporting Agency: US Fish and Wildlife Service

Investigators: Srinivas Vaidyanathan and Nishant Srinivasaiah

Web Page: <https://www.feralindia.org/node/388>

In India, nearly 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 all resulted in increased human-elephant conflict (HEC). 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 landscape.

Project objectives

1. Forming and training village level teams to reduce loss of property and life.
2. Training and implementation of site-specific farm-based practices to reduce loss of property and life.
3. Establishment and maintenance of 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. Developing a framework for site-specific implementation of mitigation action plans at the level of a village.

Status

In the first year of this project, we worked with three villages to carry out activities such as maintenance of electric fences along the boundary of crop fields and crop storage areas, receiving and disseminating information received through Early Warning System (EWS) and measuring crop damage.

This year we collaborated with the Forest Department to replicate these initiatives in three more villages where farmers grow crops alongside elephants. The farmers who implemented these activities in the previous year are now helping farmers in the new villages.

In order to reach a wider number of people and make the model replicable, we are creating a handbook for farmers in other villages in the form of a comic book. This handbook will address farming practices, livestock management and methods that can be used to mitigate conflict.

Alongside this, we are also monitoring elephant movement through camera traps in these areas.



Elephants move vast distances depending, among other facts, on the availability of resources. Image credit: Nishant Srinivasaiyah.

Elephant on the zebra crossing

Project Period: August 2019 to December 2020

Budget (Lakh): 5,00,000

Supporting Agency: Bengaluru Sustainability Forum, National Centre for Biological Sciences

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, which influence their decision-making to build predictive models of human-elephant conflict, which include future urbanisation, in the peri-urban and urban areas of Bengaluru city to inform future developmental activities.

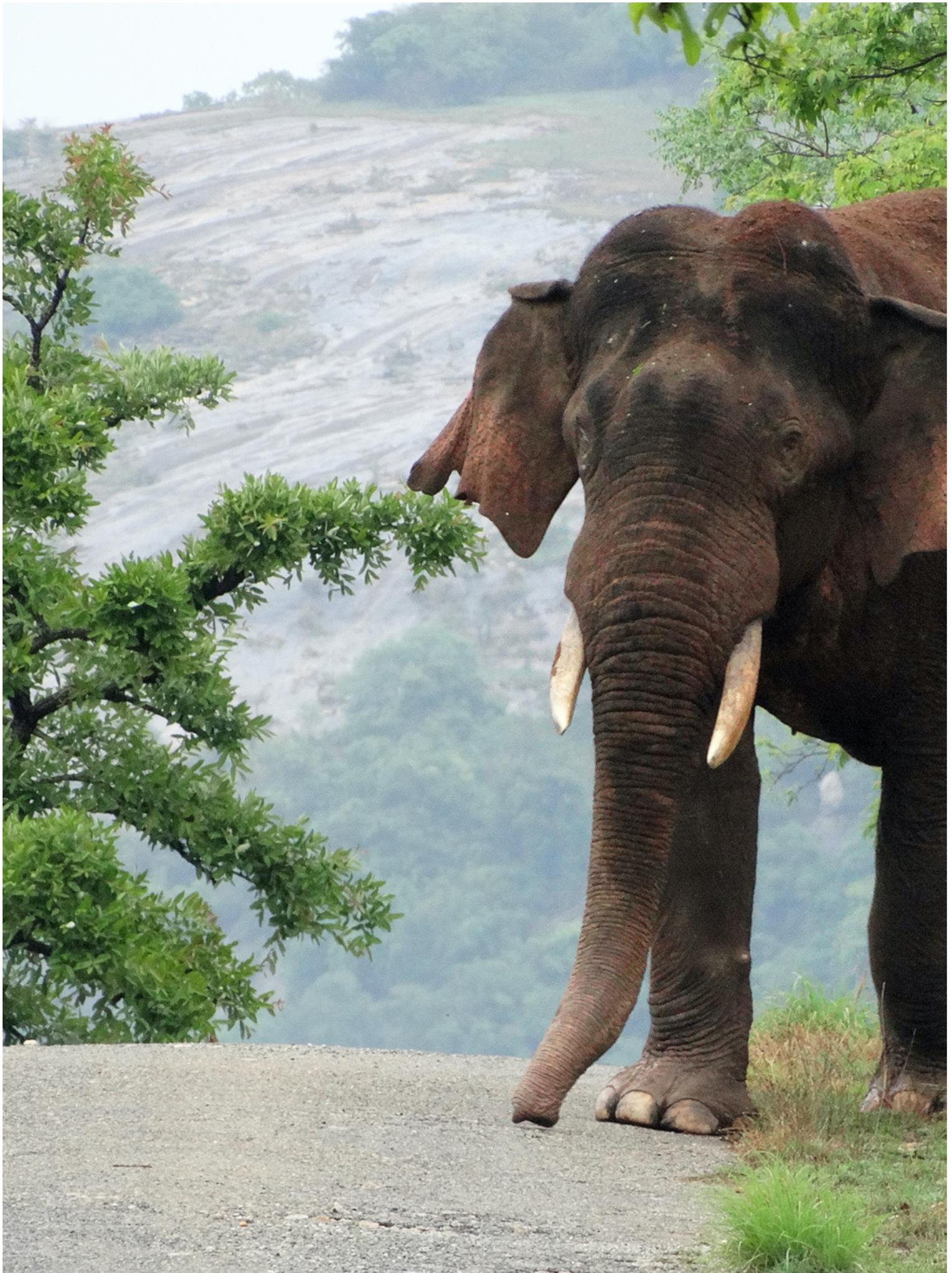
We will be focusing on human-elephant conflict in and around urban habitats, and provide guidelines for agriculture and infrastructure development and town planning in regions that are close to elephant habitats. We also hope to make policy-makers more receptive towards the elephant use of this already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

Project objectives

1. To assess environmental and biological factors influencing the current foraging and ranging decisions by elephants in the peri-urban areas of Bengaluru city.
2. To 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. To develop predictive models of human-elephant conflict, given future trends in landuse 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

We used data collected since 2009, on nearly 200 elephants ranging in and around the Bengaluru district. We analysed contiguity (spatial connectedness) in the study area for 7 different land-use and land- cover (LULC) categories: built-up, agriculture, plantations, forest,



As elephants move from one area to another they have to surmount many barriers such as busy roads, railwaylines and fences. Image credit: Nishant Srinivasaiah.

scrubland, barren areas and waterbodies. We then associated individual elephant locations in the study area with the corresponding contiguity values. We used this combined data of 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 have provided us with the baseline values that reflect decision-making in the individual elephants.

We used these baseline values as parameters in an agent-based model to simulate elephant movement in current and future land-use scenarios. We have extracted baseline values of 50 individuals of two different age classes, representing the typical structure of the population.

We have modelled current elephant movement for two scenarios: the first acts as a baseline, assuming elephants are within the protected areas of Bannerghatta National Park and Cauvery Wildlife Sanctuary. The second represents the current scenario with elephants across our study area. We are in the process of finalising the future landscape of 2030, that will be used to model future elephant movement.



A herd of elephants migrating. Image credit: Nishant Srinivasaiah.



The Shola Forests are found at an altitude of more than 1,500 metres. The vegetation of these forests comprise of grasslands and stunted trees. Image credit Sandeep G.

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. To this end, we collaborate with other research institutions working in the Western Ghats and along the south-eastern coast of India. We undertake action research and leverage mobile information and communication technologies coupled with low-cost environmental sensors for environmental monitoring.

Programme objectives

1. To unravel and quantify ecological processes that deliver ecosystem goods and services using participatory and multidisciplinary approaches.
2. To demonstrate and develop research tools for decision support in the management of natural systems with a specific focus on scenario building for impacts of climate change and trade-offs between interventions.
3. To use this research to identify strategies and inform and influence policy which will reduce the vulnerabilities of stakeholders and the ecosystems to natural disasters and climate change, and help restore and sustainably manage ecosystem services through community action in habitat restoration, protection and management.

This year, the programme continued the long-term monitoring of stream flow and rainfall using hydromet equipment installed during the Ministry of Earth Sciences supported project. Another short study was carried out to study the resource use patterns of communities around the Kalivelli wetlands.

Divya Karnad, who has been working to create better livelihoods for small-scale fishermen who use sustainable fishing practices as well as to create awareness and advocacy among seafood consumers and chefs, was one of three researchers selected for the Future for Nature Award for 2019, given by the Netherlands-based Future for Nature Foundation.



The presence of invasive species, such as black wattle (*Acacia mearnsii*), and a mix of Scotch broom (*Cytisus scoparius*) and Gorse (*Ulex europaeus*), significantly increases evapotranspiration and reduces dry-season streamflow.

Long term eco-hydrological research in the Western Ghats including the Upper Bhavani Catchment

Project Period: November 2019 to July 2020

Budget (Lakh): Rs. 4.50

Supporting Agency: Ashoka Trust for Research in Ecology and Environment

Investigators: Jagdish Krishnaswamy and Ravi Bhalla

Web Page: <https://www.feralindia.org/node/387>

The hydrologic behavior and response of a watershed to rainfall depends on a number of inter-linked components, among which land-use plays an important part. Large scale changes in land use, such as its invasion by non-native, introduced species, can fundamentally alter natural patterns of stream discharge and water quality. Preliminary investigations in the Upper Nilgiris suggest that the invasion of grasslands by black wattle (*Acacia mearnsii*), and a mix of Scotch broom (*Cytisus scoparius*) and Gorse (*Ulex europaeus*), has significantly increased evapotranspiration and reduced dry-season streamflow.

This study assesses the multidimensional impacts of invasion on the hydrology and water cycling in the region at different scales. Based on the findings, we can make a case for the restoration of these shola-grasslands mosaics and prevention of further invasion to appropriate management bodies.

Project Objectives

The objective of the Upper Nilgiri component of this study is to measure catchment invasion in the Upper Bhavani basin and its impact on the hydrology of the region.



A rain gauge set up in the Upper Bhavani catchment area. Image credit: Ravi Bhalla.



Setting up a soil moisture probe. Image credit: Ravi Bhalla.

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

Project Period: August 2018 to June 2021

Budget (Lakh): Rs. 17.57

Supporting Agency: Ministry of Earth Sciences, Government of India

Investigators: Ravinder Singh Bhalla and Jagdish Krishnaswamy

Web Page: <https://www.feralindia.org/node/47>

Invasive plants are a pervasive problem in most ecosystems, reducing biodiversity and changing ecosystem functioning in irreversible ways. However, little is known about the impacts of terrestrial invasive plants on stream hydrology. This project explores the hydrologic response of three major invasive species in the Upper Nilgiris, namely black wattle (*Acacia mearnsii*), Scotch broom (*Cytisus scoparius*) and Gorse (*Ulex europaeus*).

Project Objectives

1. To compare the effect of three dominant land covers wattle, broom and natural grasslands in the Upper Nilgiris on the water balance in terms of dry season stream-flows, evapotranspiration, and soil moisture.
2. To quantify impacts of large scale removal of black wattle on sediment loads in streams.
3. To investigate decadal trends in areas 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, these species reduce streamflow which has significant implications as it impacts the amount of water stored in reservoirs for power generation and irrigation, as well as water availability 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 potentially can lead to floods further downstream.



Carrying out a mapping exercise. Image credit Ravi Bhalla.



A flock of flamingoes at the wetland. Image credit Gopinath Sricandane.

RUSE - Urban and Socio-ecological Resilience of Pondicherry Bioregion - Kalivelli Resource Use Survey

Project Period: November 2019 - August 2020

Budget (Lakh): Rs. 2.5

Supporting Agency: The French Institute of Pondicherry

Investigators: Ravinder Singh Bhalla

Web Page: <https://www.feralindia.org/node/392>

This is a short study which is part of a large French Institute supported project to study the resource use patterns of communities around the Kalivelli wetlands. The study tries to update similar work done in 2004, and a review in 2011, and involves participatory surveys, including mapping of resource use in 15 villages.

Project Objectives:

1. To conduct a general resource use survey of Kalivelli by communities in the surrounding villages.
2. To contribute to a workshop with stakeholders on resource use.
3. To separately analyse the harvesting and use of reeds from the wetland.
4. To take up water quality measurements across seasons at different locations along the wetland.

Status:

Its findings show a significant alteration of resource use by communities living around the lake on account of restrictions imposed by the forest department. Consequently, the removal of reeds, grazing of cattle, cultivation in the foreshores of the wetland, removal of silt and fishing - all have been significantly curtailed or even completely stopped. These activities probably contributed to the removal of nutrients from the wetlands and could play a key role in maintaining the nutrient balance in the wetlands. Their complete halt may therefore alter the ecology of the Kalivelli wetlands.

On the other hand, the communities feel they have been denied what they considered to be access to traditional rights and practices. Some of the villages have protested against the restrictions and have been allowed to resume their use of the wetland.



Only six or seven species of sharks are on the outdated endangered species list in India, shark trade continues to thrive.
Image credit: Srinivas Vaidyanathan.



India is one of the top shark fishing nations in the world and over 50% of the shark species found in the Arabian Sea are threatened. Image credit: Divya Karnad.

InSeason Fish

Project Period: 2019 - Ongoing

Budget (Lakh): Rs. 40

Supporting Agency: Future for Nature

Principal Investigator: Divya Karnad

Web Page:

InSeason Fish is a sustainable seafood initiative to reduce demand for threatened species and unsustainable fishing practices. The main thrust of this work is on awareness and advocacy among seafood consumers and chefs, but a core component is also the creation of better livelihoods for small-scale fishermen who use sustainable fishing practices. Our engagement with seafood consumers will be conducted in metropolitan cities across India, as well as online. Our engagement with fishermen will be conducted in Tamil Nadu.

We have also completed a survey with seafood consumers about consumption practices and are preparing to publish the results.





Restricted to coasts particularly in mangroves, a collared kingfisher from the Andaman Islands.

Image credit. Srinivas Vaidyanathan

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. This year, FERAL organised two Rufford conferences in Goa and Uttarakhand.

Fostering grass-roots conservation in India - A Rufford Initiative

Project Period: April 2018 – March 2019

Budget: GBP 10,112

Supporting Agency: The Rufford Foundation, United Kingdom

Principal Investigator: Rajat Ramakant Nayak

Web Page:

FERAL in collaboration with the Rufford Foundation, UK, had organised a four-day conference for the Rufford Small Grants recipients between 15 November 2019 and 18 November 2019 at Wandoor, South Andaman, around the central theme of marine and island ecosystems. The Rufford Foundation has played a crucial role in the field of nature conservation in developing countries worldwide. Their small grants have offered immense opportunities to young professionals and amateurs to explore and contribute to the field of wildlife research and nature conservation.

This conference aims to provide a platform for Rufford grantees to meet and learn from each other's experiences to foster conservation. It provides grantees with an opportunity to meet, network and learn from the experiences of other researchers and adopt some successful conservation models in their own area.

There were seventeen presentations by researchers from ANET, Wildlife Conservation Society - India, Ashoka Trust for Research in Ecology and the Environment (ATREE), Dakshin Foundation, Nation Centre for Biological Sciences (NCBS), Society For Integrated Rural Development (SFRID) and Nature Conservation Foundation (NCF).

The research was broadly focused on monitoring projects, analysing fisheries and their impact on marine life, documenting the population of different species and their threats, and raising

awareness among communities about endangered species. Students from Jawaharlal Nehru Rajkeeya Mahavidyalaya and Pondicherry University were invited to interact with researchers and gain insights into ongoing research and conservation projects. Participants were also taken to two fish landing sites where they could analyse what fish were being caught and in what proportion. They were also able to see the kinds of boats and fishing equipment being used. In addition to this, Pooja Powar conducted a workshop on how birdwatchers could use their personal bird-watching logs to help build a global citizen-science database on bird sighting patterns, ranges and population status.



Participants at the Rufford Conference.

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 and book chapters

Dahal, Nishma, Sunil Kumar, Barry R. Noon, Rajat Nayak, Rinzin Phunjok Lama, and Uma Ramakrishnan. 2020. “The Role of Geography, Environment, and Genetic Divergence on the Distribution of Pikas in the Himalaya.” *Ecology and Evolution* 10 (3): 1539–1551. <https://doi.org/10.1002/ece3.6007>.

Karnad, Divya, Dipani Sutaria, and Rima W. Jabado. 2019. “Local Drivers of Declining Shark Fisheries in India.” *Ambio* 49 (2): 616–627. <https://doi.org/10.1007/s13280-019-01203-z>.

Kshetry, Aritra, Srinivas Vaidyanathan, Raman Sukumar, and Vidya Athreya. 2020. “Looking beyond Protected Areas: Identifying Conservation Compatible Landscapes in Agro-Forest Mosaics in North-Eastern India.” *Global Ecology and Conservation*, January, e00905. <https://doi.org/10.1016/j.gecco.2020.e00905>.

Majgaonkar, Iravatee, Srinivas Vaidyanathan, Arjun Srivathsa, Shweta Shivakumar, Sunil Limaye, and Vidya Athreya. 2019a. “Land-Sharing Potential of Large Carnivores in Human-Modified Landscapes of Western India.” *Conservation Science and Practice* 0 (0): e34. <https://doi.org/10.1111/csp2.34>.

Majgaonkar, Iravatee, Srinivas Vaidyanathan, Arjun Srivathsa, Shweta Shivakumar, Sunil Limaye, and Vidya Athreya. 2019b. “Distortion of Inferences and Undue Exaggeration of Study Limitations: Response to Shrotriya et Al.” *Conservation Science and Practice* n/a (n/a): e135. <https://doi.org/10.1111/csp2.135>.

Srinivasaiah, Nishant, Vinod Kumar, Srinivas Vaidyanathan, Raman Sukumar, and Anindya Sinha. 2019. “All-Male Groups in Asian Elephants: A Novel, Adaptive Social Strategy in Increasingly Anthropogenic Landscapes of Southern India.” *Scientific Reports* 9 (1): 8678. <https://doi.org/10.1038/s41598-019-45130-1>.

Srinivasaiah, Nishant M. 2019. “Millennial Male Elephants of the Eastern Ghats.” *Hornbill*, no. 2 (July): 30–37.

Srinivasaiah N.M, Vaidyanathan S, Sukumar R and Sinha A. 2020 Elephants on the Move: Implications for Human-Elephant Interaction. *India International Centre - Quarterly*.

Sriramamurthy, Rasikapriya Thanalapadi, Ravinder Singh Bhalla, and Mahesh Sankaran. 2020. “Fire Differentially Affects Mortality and Seedling Regeneration of Three Woody

Invaders in Forest–Grassland Mosaics of the Southern Western Ghats, India.” *Biological Invasions*, January. <https://doi.org/10.1007/s10530-020-02207-7>.

Popular articles

Karnad, Divya. 2019a. “No More an Election Issue.” DNA India, April 14, 2019. <https://www.dnaindia.com/analysis/column-no-more-an-election-issue-2739312>.

Karnad, Divya. 2019b. “Dishing the Dirt on Fins.” DNA India, September 19, 2019, sec. Analysis. <https://www.dnaindia.com/analysis/column-dishing-the-dirt-on-fins-2790807>.

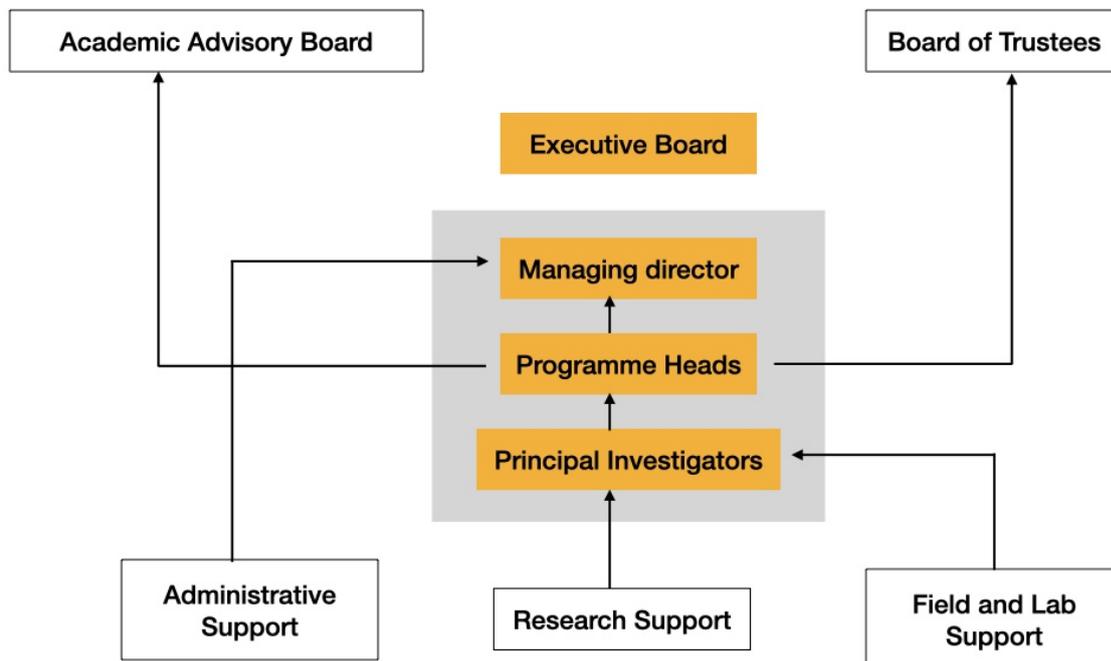


The Curmuca barb (*Hypselobarbus curmuca*), known as Koracha in Kannada is an endangered species of fish as classified by the IUCN. Image credit: Suman Jumani.

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.



FOUNDATION FOR ECOLOGICAL RESEARCH ADVOCACY AND LEARNING
 No .170/3, Morattandi Village, Auroville Post, Tamilnadu - 605101
BALANCE SHEET as at 31st MARCH 2020

(Amount in Rs)

Particulars	Sch.Ref	As at 31.03.2020	As at 31.03.2019
<u>SOURCES</u>			
Corpus	1	9,05,428	11,25,847
Project Asset Reserve	2	2,01,015	2,01,015
Projects Account (Cr)	3	1,03,55,857	60,20,680
		1,14,62,300	73,47,542
<u>APPLICATION</u>			
Fixed Assets (Less) Depreciation	4	6,44,140	7,36,202
CURRENT ASSETS, LOANS AND ADVANCES			
Cash and bank balances	5	1,03,87,901	67,12,575
Loans and advances	6	69,960	33,800
Projects Account (Dr)	3	3,38,256	18
Interest accrued but not due	7	63,055	-
	(i)	1,08,59,172	67,46,393
Less: Current liabilities	8	41,012	1,35,053
	(ii)	41,012	1,35,053
Net Current Assets (i) - (ii)		1,08,18,160	66,11,340
		1,14,62,300	73,47,542
Notes on Accounts	12		

As per our report of even date attached
 For ASA & ASSOCIATES LLP
 Chartered Accountants
 Firm Reg No: 009571N/NS00006

K.VENKATRAMAN
 Partner
 Membership No . 021914



For FOUNDATION FOR
 ECOLOGICAL RESEARCH
 ADVOCACY AND LEARNING

SRINIVAS VAIDYANATHAN
 Trustee



Place : Chennai

Date : 21.09.2020

Advisory board

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

Board of trustees

Mahesh Sankaran, Ph.D. (Managing Trustee), Prof. K.V. Devi Prasad, Ph.D. R.S. Bhalla, Ph.D., and Srinivas Vaidyanathan.

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

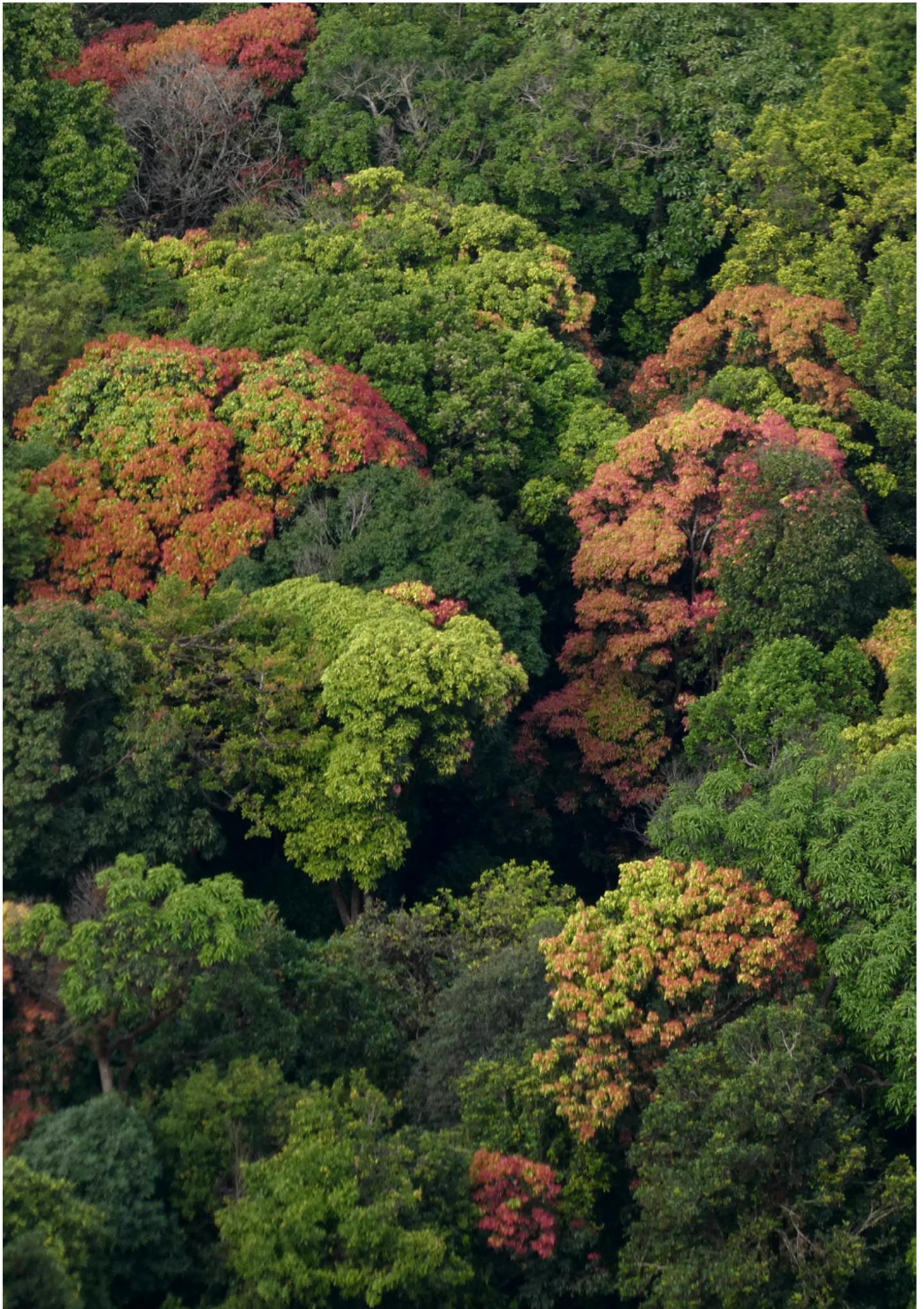
Ministry of Earth Sciences, Government of India (India), Ashoka Trust for Research in Ecology and Environment (India), Bengaluru Sustainability Forum, National Centre for Biological Sciences (India), The French Institute of Pondicherry (India), Critical Ecosystem Partnership Fund (USA), Centre for Wildlife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

Individual donors

Mr. Anindya Basu (India), M/s – Banyan Tree Advisors Pvt. Ltd. (India), Dr. R. S. Bhalla and Mr. Srinivas Vaidyanathan.

Collaborating Institutions

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

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. He has studied large herbivores (deer, antelope, etc.) for nearly two decades, and is a leading global expert on the ecology of large herbivores in Asia

R.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.

Kumaran K.



Kumaran has been working as part of our field teams 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 focus on invasive species in the shola grasslands.

Rajat Ramakant 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. He is currently part of the team focusing on the biology and conservation of ecosystems and connectivity for large mammals.

Sunita Ram



Sunita has an MPhil in Biological Sciences from Fordham University, USA. She is currently working on factors delineating distribution of langurs in southern India. Her research interests lie in understanding the ecology and distribution of primates and finding long term conservation strategies in the southern Western Ghats.

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.

Srinivas Vaidyanathan



Srinivas is a wildlife biologist 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.

Dhruv Athreye



Dhruv is a Junior research fellow, and has worked in the Palani hills in the areas of biological education, community sanitation and waste management. He is interested in increasing the involvement of tribal communities in conservation and research and the impact of these changes on tribal livelihoods.

Suman Jumani



Suman is currently pursuing her PhD at the University of Florida. She is primarily interested in conducting applied interdisciplinary research on river ecosystems, with the ultimate aim of influencing conservation and policy interventions.

Neil W. Pelkey



Neil is a professor at the Juniata College, Pennsylvania, USA. An expert on GIS and remote sensing, he is an advisor on many of the projects and research proposals of FERAL. He is also responsible for developing the ongoing collaboration with the Juniata College and Keystone Study Abroad Consortium for the undergraduate study abroad programme in India.

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. She currently works on the Frontier Elephant Programme working towards creating shared spaces for elephants and humans.

Nicole Pinto



Nicole is interested in raising awareness about the changing behaviour of animals and the communities who live alongside them. She largely works on the Frontier Elephant Programme, helping communities implement strategies to co-exist alongside elephants, and to raise awareness about the behaviour and lives of elephants. She has a degree in Business Management and a background in writing.

Sandeep G



Sandeep mainly works on field based projects, carrying out biodiversity surveys and helping small 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.

Anisha Jayadevan



Anisha has a Master's in Wildlife Biology and Conservation from the National Centre for Biological Sciences. She is part of the Frontier Elephant Programme, studying elephant movement patterns and land-use change in peri-urban areas around Bengaluru. She is interested in understanding the drivers and consequences of habitat fragmentation, and how best to connect and restore fragmented landscapes.

Research support

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 liaison between the project and various officials in the Nilgiris and is a resource person for GIS and GPS workshops conducted at FERAL.

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 and downloading data. 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.

Suseelan



Suseelan is a field assistant on the eco-hydrology project based out of the field station at Emerald in 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.

Administrative support

Shanthi R



Shanthi is our Accounts Manager handling the day to day accounting responsibilities of the organisation. She is a postgraduate in commerce and is versatile in the use of a range of accounting software.

Sumathi



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



Foundation for Ecological Research, Advocacy and Learning (FERAL)

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

Email: feral@feralindia.org