



# FERAL

Annual Report  
2017 - 2018

Foundation for Ecological Research, Advocacy and Learning (FERAL)

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Kamal and Saravanan installing a Montana flume in the Nilgiris.



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## Mandate

**O**ur mandate is to address issues of resource management, conservation, environment and health at the grassroots and the policy level. To do this, we implement projects, undertake research and run a variety of courses for both students and practitioners. We 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 the environment. Since then, we have contributed substantially to research and policy in wildlife biology and conservation, natural resources management and to education and skill building in these and allied areas.

We use data driven ecological research and leverage contemporary analytical and visualisation tools for our research. 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 key ingredients to tackling some of most difficult and seemingly intractable challenges we face in this field today.



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## The year that was

**D**uring 2017–2018 we strengthened the new initiatives that were launched last year. We continued ongoing projects and raised resources to continue work on our collaborative wildlife and eco-hydrology projects in the Western Ghats. Collaborations with other research agencies were strengthened and a number of research manuscripts were published in peer reviewed journals.

Our board of trustees was expanded with Prof. K.V. Devi Prasad accepting the invitation to join the trust. He brings with him decades of experience in academia and policy research and will strengthen the natural resources and policy outreach of the institute.



Photo ©Srinivas Vaidyanathan.



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## Wildlife Biology and Conservation

The focus of this programme is to undertake scientific research on wildlife and use the outputs to steer conservation interventions. In the year gone by, a research and conservation programme was started in the Palani Hills landscape in the Western Ghats. One small grant project was completed, three others were continued and an equal number of collaborative studies were carried out.

Our long term research on impacts of infrastructure development on wildlife connectivity and habitat fragmentation produced a collaborative paper on the impacts of future land-use change on tiger populations in the Central Indian Landscape. Our ongoing research on connectivity for wildlife in the Western Ghats has shown the massive inroads made by linear intrusions and its impacts on forest structural connectivity. During this year we also developed computationally intensive agent based models to evaluate landscape permeability. Results generated from this analysis, for multiple species in the Western Ghats and Central Indian landscape, can facilitate policy changes on linear infrastructure in natural areas.

A study on the socio-ecological impacts of small hydro-power projects in the Western Ghats was completed this year. While small hydro-power projects are being promoted as “green alternatives”, there are few studies which have assessed their environmental and social impacts. Other than scientific reports

and peer reviewed papers this study also converted key findings into a video documentary to disseminate results amongst policy makers and public.

Under the Frontier Elephant Programme, “The Elephant in the Towns Commons” funded by the Prince Bernhard Nature Fund was continued. Several innovative technologies to help mitigate human-elephant conflict were developed this year, including an early warning system, automated image recognition for mammals, alternate fences and a portable watch tower.

This year we initiated a long term programme in the Palani Hills landscape, with a focus on scientifically strengthening management and conservation efforts in the newly formed Kodaikanal Sanctuary. The first small step in this programme will be to generate baseline information on mammalian distribution and densities.

Continuing our training efforts this year, we trained over a hundred ecologists, conservation practitioners and forest department staff working in the Western Ghats in the use of Camera Traps, GPS and GIS to analyse data. These training programmes have built capacities of end-users to use spatially explicit data from a variety of sources to address conservation and management challenges. Additionally, we continued to provide support to many researchers pursuing their Masters and PhD programmes.



Aerial view of a small hydropower project in the Western Ghats of Karnataka. Above the weir, the river gets transformed into a lacustrine habitat; between the weir and powerhouse, the river bed is devoid of water flow; downstream of the powerhouse, river flows become highly pulsed and controlled by water released from the dam.



# Assessing the socio-ecological impacts of small hydropower projects in the Western Ghats, India

**Project Period:** April 2016 – August 2017

**Budget:** £5,000.00

**Supporting Agency:** The Rufford Foundation, United Kingdom

**Principal Investigator:** Suman S Jumani

**Web Page:** <http://www.feralindia.org/drupal/node/181>

Various national and international policies are supporting the growth of small hydro-power projects (SHP) as it is assumed that small dams have minimal or no environmental impacts. However, recent studies are questioning this assumption. This project gathered and assessed the broad impacts of extensive small dam development within the Western Ghats – a global biodiversity hotspot that has one of the largest densities of small dams in India. The important outcomes of this project are:

- Mapping all planned and commissioned Small Hydel Projects (SHP) within Karnataka. All existing and proposed SHPs were mapped, and this information will soon be uploaded on an open-source online portal (such as India Biodiversity Portal).
- Identification of conservation priority catchment areas within the Western Ghats of Karnataka.
- Creation of a film, highlighting the current scenario, impacts and policy recommendations regarding SHPs in India. [English](#), [Kannada](#) and [Hindi](#) versions of the film can be accessed on YouTube.

We are currently examining the relationship between SHP construction and human-elephant conflict levels in 11 forest ranges in the state of Karnataka. Crop compensation data for the last two decades has been compiled from these ranges and analysis to look for trend after construction of SHPs is ongoing. As expected, periods of SHP construction were seen to coincide with periods of increased human-elephant conflict in Sampage, Kollegal, Rampura and Hannur ranges. All these ranges are characterised by presence of elephant habitat, SHPs and moderately undulating terrain. However, no consistent trend was observed for the 7 ranges in Mandya Division. The Malavalli and Maddur ranges, characterised by 3 and 1 new SHPs, respectively, were most severely impacted during the 13-year period (with 1205 and 68 conflict records respectively). Two ranges (KR Pet and Srirangapatna) had very low conflict levels despite having new SHPs being constructed. The remaining 3 ranges had very low conflict levels (less than 20 over the 13-year period) and were characterised by the absence of SHPs. Since the administrative boundaries of Mandya Division were altered, all data post 2013 have to be re-examined.



*The penstock pipe diverting river flows from the weir to the powerhouse. Such linear structures are insurmountable barriers and drastically impede the movement of wild animals such as elephants.*

## Survey to establish baseline estimates of herbivore and carnivore mammalian species in Kodaikanal Wildlife Sanctuary, southern India

**Project Period:** June 2017 to March 2019

**Budget:** ₹12,87,611.00

**Supporting Agency:** Kodai Friends International and individual donors.

**Principal Investigator:** Srinivasan Vaidyanathan

**Project Manager:** Dhruv Athreye

In 2013, ~610 km<sup>2</sup> 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 available 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 baseline findings of the human-wildlife interface, FERAL began an 18-month project in

January 2018 to establish baseline estimates of the presence, distribution, and abundance of mammals in KWS.

With the help of a grid-based survey and occupancy modelling, we will establish the presence and distribution of 11 ground-dwelling and 5 tree-dwelling herbivores, and 5 ground-dwelling carnivore species. A total of ~100 grid cells will be surveyed in KWS to collect data on the presence of animals and environmental and anthropogenic variables that may have influenced the presence of anim-

als in grid cells. The environmental variables included: ground cover, leaf litter, soil type, canopy stories and height, invasive species, and anthropogenic activity.

In the first 60 grids surveyed, 17 different mammalian species had been directly seen or indirectly detected on 3931 occasions. Signs of gaur were the most abundant followed by elephant. Animals directly sighted have been

mostly arboreal species, primates and squirrels. By the end of the project, we also plan to survey the Upper Palanis—the southwest region of KWS that is >2000 m and supports the shola-grasslands ecosystem—using camera traps to establish the presences and density of large carnivores such as tiger, leopard, and dhole. The project has been managed and conducted by Dhruv Athreye and Dorai, and includes over six months of fieldwork thus far.



*Navigating through thick cover in riparian forests of Kodaikanal Wildlife Sanctuary.*



*The Northern Slopes of the Kodaikanal Wildlife Sanctuary.*

# Assessing the impacts of infrastructure development on forest fragmentation and potential connectivity for large mammals in the Western Ghats

**Project Period:** June 2016 – March 2018

**Budget:** ₹14,67,500.00

**Supporting Agency:** Center for Wildlife Studies, India

**Principal Investigator:** Srinivas Vaidyanathan

**Co-Investigator:** Rajat Ramakant Nayak

**Web Page:** <http://www.feralindia.org/drupal/node/391>

Connectivity for large mammals is seriously hampered by linear intrusions within the Western Ghats. Currently, there is no comprehensive assessment of connectivity that has been carried out across the Western Ghats. However, site specific studies/reports indicate the lack or poor connectivity for large mammals across roads and railway lines, especially for elephants and tigers in several locations within the Western Ghats. At these locations not only the movement of dispersing individuals is restricted, but also leads to mortality of animals due to collision with vehicular traffic. Restoring and enhancing connectivity in these locations will greatly improve overall connectivity across the Western Ghats. Apart from the looming threat to dispersal of wild animals, associated impacts of habitat fragmentation due to linear infrastructure are poorly known/evaluated across the Western Ghats.

This two year project builds on the premise that identification of practical, cost-effective, science-based alternatives can lead to solutions that provide connectivity for wildlife while meeting essential needs for infrastructure. Objectives of this project include:

a) Assembling spatial datasets that will be combined into connectivity maps for the

landscapes.

b) Compilation and analysis of datasets to assess the fragmentation impacts of linear intrusions within the Western Ghats.

c) Performing analyses of scenarios of various spatial arrangements, mitigation measures, and intensities of future infrastructure development and the impacts of these scenarios on connectivity in the Western Ghats.

In the previous year we mainly focused on assembling all the spatial datasets necessary for developing fragmentation and connectivity maps for the Western Ghats, finalising fragmentation indices that will be used to quantify fragmentation and connectivity, and preliminary analysis of fragmentation and connectivity for the Western Ghats.

We have extended our fragmentation and structural connectivity analysis to cover entire India and the analysis has been completed. The results highlight the impacts of linear infrastructure on forest structural connectivity. Presently we are working on multi-species functional connectivity models for the Western Ghats. The agent based connectivity models have been run successfully for a few species and the analysis for the rest is ongoing.

## The Frontier Elephant Programme

The Frontier Elephant Programme brings together researchers from the National Institute for Advanced Studies (NIAS), Asian Nature Conservation Foundation (ANCF), Indian Institute of Science (IISc) and FERAL 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 life styles that facilitate their coexistence with elephants in frontier-habitats, while ensuring food security and safety in the region. Under this programme FERAL initiated a project "The Elephant in the Towns Commons" funded by the Prince Bernhard Nature Fund.

## The Elephant in the town's commons: A participatory approach to conserve Asian elephants in a developing country (India) and to mitigate human-elephant conflict

**Project Period:** October 2016 – September 2018

**Budget:** ₹13,09,481.00

**Supporting Agency:** Prince Bernhard Nature Fund (PBNF), The Netherlands

**Principal Investigator:** Srinivas Vaidyanathan

**Co-Investigator:** Nishant Srinivasaiah

**Web Page:** <http://www.feralindia.org/drupal/node/360>

In India, nearly 15,000 elephants (~50% of its population) live outside protected areas in and around densely populated agro-pastoral landscapes. Loss of elephant habitat overtime, change in land-use and archaic farming practices have all resulted in increased human-elephant conflict (HEC). This project is a long-term approach (3 year plan, 2016-2019) to protecting elephants and improving people's livelihoods (safety and food security) through community empowerment and reduction in poaching and HEC. Our main target groups are the elephants and villages affected by conflict and we plan to create elephant-friendly villages through monitoring

and awareness. This project has been initiated under the "Frontier Elephant Program", a multi-institution effort to address elephant conservation in human dominated landscapes.

The objectives of this project are:

- a) Improving the lives of people in villages affected by human-elephant conflict, through real-time monitoring of elephants using camera traps and early warning systems
- b) Promoting lifestyles among villagers that are compatible with elephant use of the region, in order to prevent fatalities on both sides



*Mr. Srinivas Vaidyanathan of FERAL facilitating the mapping exercise with the villagers during one of the village mapping exercises.*



*Mr. Vinod Kumar of FERAL with the forest staff and villagers after setting up an EWS (on the tree) close to the village.*

The project activities included

○ Training local community members and local organizations in the regular monitoring of elephants through direct observations and using camera traps through on-field training sessions. We have trained nearly 70 forest staff and villagers in monitoring elephants from the Bannerghatta National Park, Ramanagara Forest Division and Hosur Forest Division involving 120 participants from across an area of 4000 km<sup>2</sup>.

○ Developing camera-trap based infra-red SMS/GPRS and MMS systems and ancillary sensors/fences to be used on-field for early detection of elephants and to prevent human casualties and crop loss in the three villages. The early warning system includes a camera with data transmission capability to a mobile phone. An image recognition software for mobile phones based on machine learning to detect an Asian elephant in the photographs that are transmitted to the mobile phone was then developed by us. If an elephant has been detected, it would send out an SMS alert stating the presence of elephant at a given camera location and in the preferred local language to a list of phone numbers. The use of Artificial Intelligence in this project, is probably the first in India to detect a wildlife species

and also to send out SMS alerts. .

○ Conducting trials on field-application of early warning mechanisms in order to detect elephants' presence within village limits through active community and Forest Department involvement. The early warning system has been tested at six locations in two villages so far and is continued to be on trial in order to test its efficacy and record, both elephants and farmers response to the same.

○ Developing and testing a low cost electric fence based on the field teams experience of having seen loose wire electric fencing being used to prevent elephants from coming into crops fields at the village/farm level in Sri Lanka. We interacted with the local organizations and forest staff to try out such a fence to see if it would work as most of the conventional electric fences were overcome by elephants. One of the very progressive Forest Department staff set up a 20 m fence at a point where elephants would cross over into the village from the forest regularly. There are a few design modifications that need to be made to make it elephant proof, such as increasing the height of the horizontal single fence wire. However, the fencing is performing extremely well and may prove to be effective in guarding crop fields against elephants in the near future.



*The FERAL team, Forest staff and villagers establishing a sign board at an elephant crossing point.*



*An elephant walks behind the newly established hanging-wire fencing in the project region.*



Downloading data and cleaning the loggers above the Avalanche site.





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## Natural Resource Management

Restoring and managing natural processes and habitats that sustain communities and provide essential products and services is the primary objective of this programme. Understanding the impacts of climate change on these services and consequently on the vulnerabilities of communities dependent on them is a crucial component of this work.

We collaborate with other research institutions both in the Western Ghats and along the South East Coast of India to this end. The NRM programme continues to explore action research with communities and leveraging mobile information and communication technologies with innovative low-cost environmental sensors.

The objectives of the programme are:

- To unravel ecological processes which deliver important ecosystem services and to quantify these ecosystem services using multidisciplinary approaches.
- To demonstrate and develop research tools for decision support in the management of

natural systems with specific focus on scenario building for impacts of climate change and trade-offs between interventions.

- To use this research to identify strategies and inform and influence policy which will:
  - Reduce the vulnerabilities of both stakeholders and the ecosystems on which they depend to natural disasters and climate change.
  - Help restore, and sustainably manage ecosystem services through community action in habitat restoration, protection and management.

This year, the NRM programme focussed on sustaining the field stations and continue the essential O&M of the hydromet equipment installed during the Ministry of Earth Sciences supported project. Two additional projects are in the pipeline, one to support this long term effort in eco-hydrology and build capacities of institutional partners and the second to explore the impact that exotic evergreen invasive species have on the hydrology in the Upper Nilgiris.



*An explosion of regeneration fuelled by nutrients released after a fire at project site in the upper Nilgiris.*



*Scouting for a suitable site for a stream gauge in the shola.*

## Eco-hydrology initiatives in the Western Ghats

**Project Period:** August, 2016, ongoing.

**Supporting Agency:** FERAL, individual donors.

**Implementing Partners:** Ashoka Trust for Research in Ecology and the Environment (ATREE), National Centre for Biological Sciences.

**Principal Investigator:** R.S. Bhalla

**Co-Investigator:** Srinivas Vaidyanathan

**Web Page:** <http://www.feralindia.org/drupal/node/143>

The Ministry of Earth Sciences project on hydrologic and carbon services in the Western Ghats was concluded in August 2016. This project was implemented by three institutes, namely, FERAL, ATREE and NCBS and had resulted in the establishment of a dense network of hydro-meteorological equipment in two sites in the Western Ghats. This has resulted in an unprecedented data set covering a range of parameters at very high temporal and spatial resolutions. This data has enabled the institutions to measure a number of ecological processes and test various hypothesis pertaining to the linkage between ecosystem processes and climate change induced extreme rain events. Students from these institutes have utilised this data in their

research publications and thesis and a number of new research initiatives are being formulated which build on this research.

It was therefore essential to continue the operation and maintenance of the hydromet network. To do so FERAL and the partner institutions pooled their institutional resources and continue to operate the two field stations at upper Nilgiris and at Heggane (near Sirsi) in the Aghnashini basin. Additional funding to continue these operations is currently being raised which is likely to result in the replacement of older equipment and the installation of additional units to measure parameters such as evapotranspiration and soil moisture across the landscapes.



Arulmigu Manakula Vinayagar Temple Painting at Puducherry with the participants of the cultural outreach tour.



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## Learning and Events

**O**ur Learning programme comprises of formal and informal courses which often overlap with other events and workshops organised as part of conferences in which FERAL participates. FERAL conducted three workshops and a conference this year and scientists from FERAL were resource persons for two workshops and a number of awareness raising events.

The workshop on spatial epidemiology and the introduction to R were both aimed at researchers and professionals interested in using the R package for statistical computing. The participatory GIS workshop was also aimed at development professionals and introduced some of the increasingly popular field survey tools that utilise mobile information technologies for development.

## Fostering Grass-roots Conservation in India - A Rufford Initiative

**Venue and dates:** Sawai Madhopur, Rajasthan, 23<sup>rd</sup> – 26<sup>th</sup> April 2017.

**Budget:** £9,035

**Supporting Agency:** The Rufford Foundation, UK.

**Principal Investigator:** Rajat Ramakant Nayak.

**Co-Investigator:** Srinivas Vaidyanathan

**Participants:** Grant recipients, researchers and officials from Rajasthan Forest Department

**Web Page:** <https://www.feralindia.org/drupal/node/372>

This was the third conference for Rufford grantees in India and the second organised by FERAL. Held at the outskirts of the Ranthambore Tiger Reserve, the conference was a collaborative effort between The Rufford Foundation, UK, the Forest Department of Rajasthan and FERAL. Its aims were to provide a common platform for the RSG grantees from India to meet at one place and share and learn from each others' conservation experiences. It also provided an opportunity for the grantees to interact with the of-

officials from the forest department, and learn about on ground conservation challenges and opportunities from them. The conference was attended by 32 Rufford grantees working across India. In addition 20 officials and researchers working with Rajasthan Forest Department participated. The grant recipients presented their work as oral presentations or as posters in addition to a new session where grantees presented their work as short video documentaries followed by a panel discussion.



*FERAL team with participants and resource persons.*

# Spatial and Temporal Models in Epidemiology

**Venue and dates:** Ousteri lake, Pondicherry. 8<sup>th</sup> and 9<sup>th</sup> August 2017

**Supporting Agency:** FERAL

**Participants:** Development professionals and scientists working in community health and epidemiology.

**Web Page:** <http://www.birdcount.in/events/gbbc2017/>

This two day workshop covered the basics of spatial and temporal modelling and display of disease data. It was targeted at persons interested in learning about techniques in spatial epidemiology. The topics covered included:

- Mapping disease and other environmental data in R (and a little QGIS).
- Predictive models of disease outbreak in R- classification and regression trees and other predictive models.
- Space Time Surveillance Models in R and SatScan.

- Neighbours and how the spatial components affect results.
- Creating Infographics in Impress.
- Working with Your Data: To help participants who already have data in an advanced stage to analyse and visualise their own data.

Each session briefly covered the theory behind the technique, followed by hands on sessions on the software. Finally, each participant repeated the analysis on a different data-set.



*Workshop participants.*



*Dr. Pelkey walking the participants through a hands on exercise during the workshop.*

## Introducing statistical programming in R

**Venue and dates:** Dept. of Ecology and Environmental Sciences, Pondicherry University.  
8<sup>th</sup> December, 2017.

**Supporting Agency:** FERAL

**Principal Instructor:** R.S. Bhalla.

**Co-Instructor:** Prof.K.V. Devi Prasad.

**Participants:** PhD students of the of Ecology and Environmental Sciences.

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

The R package for statistical computing is quickly becoming a de-facto standard in research agencies throughout the world. This open source software comprises of thousands of contributed modules which makes it ideal for a wide range of statistical analysis and graphics. Much of this flexibility is due to the design of the software as an ob-

ject oriented and functional programming language.

This one day introductory workshop attempted to introduce programming in R to accomplish a range of analytical tasks. The workshop was based on hands-on problem solving using a series of examples and canned datasets.



## Swachhta Pakhwada: Training on Participatory GIS

**Venue and dates:** FERAL campus 10<sup>th</sup> and 11<sup>th</sup> November 2017.

**Supporting Agency:** FERAL

**Principal Instructor:** R.S. Bhalla.

**Co-Instructors:** Kumaran K and Sarvanan S.

**Participants:** Development professionals from government agencies and NGOs.

**Web Page:** <https://www.feralindia.org/drupal/node/381>

Accurate mapping of water supply and sanitation infrastructure and hot spots of solid and liquid waste accumulation can be used to develop a strategy for cleaning and managing our surroundings. FERAL conducted a two day workshop meant for civil society organisations and development professionals involved in water, sanitation and health (WASH) as part of the Swachhta Pakhwada initiative of the Govt.

of India. We conducted a participatory street mapping exercise with village residents in conjunction with smart phone based spatially explicit data collection (using ODK). This data was combined with background layers and visualised on Quantum GIS. The workshop covered mapping of "hot spots" in solid and liquid waste disposal as well as water supply and sanitation infrastructure.



*Participants and resource persons for the training programme.*

## Culture, Class and Gender Cultural Outreach Tour

**Venue and dates:** FERAL Campus, 29th December 2017 to 11th January 2018

**Budget:** US\$ 3,900

**Supporting Agency:** Juniata College – USA

**Coordinator:** Tara Lawrence

**Faculty Advisor:** Dr. Neil Pelkey

**Participants:** Maria K Greenler, Julia D McMurry, Marybeth J Weihbrecht, Toby A Hollertz

The Culture Class and Gender Cultural Outreach tour section of the Juniata College was a great success for the participants. The tour split time between Phuket and Bangkok, Thailand and Kochi and Pondicherry, India. Yet the participants unanimously requested more time in India and most specifically in Puducherry. The group had interactive sessions with Ms. Anupama Pai and Dr. R. S. Bhalla of FERAL, Dr. Senthil Babu of the Institute Francais Puducherry, and Mr. Ashok Panda of INTACH. The course was brilliantly coordinated by Ms. Tara Lawrence. This was a non-residential trip and participants stayed at guest houses in Pondicherry and Auroville.

Locations and activities

- Sadhana Forest for Ecoliving: Crowd-sourcing restoration and holistic thinking
- Mohanam Cultural Center: Education and Cooking in a Tamilian Village
- FERAL: Understanding the Role of Women in the Modern Indian Culture with Anupama Pai
- FERAL: The development approach used by FERAL for capacity building with Dr. R.S. Bhalla
- Institute Francais Puducherry: Costal Development with Dr. Senthil Babu
- INTACH Cultural Tour of Architecture in Pondicherry Old town with Ashok Panda (?)
- Moratthandi Village Visit with Ms. Tara Lawrence
- Main Market Pondicherry: Economic Roles in a market economy With Ms. Tara Lawrence
- Irumbai Temple: Local and National deities and their role in the cycles of village life
- Arulmigu Manakula Vinayagar Temple: A temple that is both a place of significant worship but also a tourist attraction.



*Airport to Airport Tara kept us moving.*



*Diving in the Andaman Sea at Phuket - Thailand.*

## The Great Backyard Bird Count 2018

**Venue and dates:** Ousteri lake, Pondicherry. 17<sup>th</sup> to 28<sup>th</sup> February 2018

**Supporting Agency:** FERAL

**Principal Instructor:** R.S. Bhalla

**Participants:** Students from Dept. of Ecology and Environmental Sciences - Pondicherry University, school students accompanied by teacher volunteers and FERAL staff.

**Web Page:** <http://www.birdcount.in/events/gbbc2017/>

The Ousteri chapter of the [Great Backyard Bird count](#) was conducted on the 17th and 18th of February, 2018. Experienced birders who were students at the Pondicherry university completed a count on the 17th and uploaded the data onto e-bird. Four

groups conducted simultaneous point counts in different portions of the lake, taking care to avoid double counting.

The second day of the event involved students and teachers from the Study School of Pondicherry who broke into two groups for the count.



*Blyth's Reed Warbler (Acrocephalus dumetorum) at Ousteri.*



*The White-throated Kingfisher (Halcyon smyrnensis) - a common resident around the lake.*





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## Publications

Below is a list of publications for this financial year covering articles, both in scientific journals and popular magazines and news papers followed by technical reports prepared for donors and conference papers presented by the team at both national and international events.

### Journal articles and book chapters

- [1] Suman Jumani, Shishir Rao, Siddarth Machado, and Anup Prakash. Big concerns with small projects: Evaluating the socio-ecological impacts of small hydropower projects in India. *Ambio*, 46(4):500–511, May 2017.
- [2] Aritra Kshetry, Srinivas Vaidyanathan, and Vidya Athreya. Leopard in a tea-cup: A study of leopard habitat-use and human-leopard interactions in north-eastern India. *PLOS ONE*, 12(5):e0177013, May 2017.
- [3] Aritra Kshetry, Srinivas Vaidyanathan, and Vidya Athreya. Diet Selection of Leopards (*Panthera pardus*) in a Human-Use Landscape in North-Eastern India. *Tropical Conservation Science*, 11:1940082918764635, January 2018.
- [4] N. Samba Kumar, Mahi Puri, Dale G. Miquelle, Anak Pattanavibool, Abishek Harihar, Sunarto Sunarto, Srinivas Vaidyanathan, and K. Ullas Karanth. Field Practices: Assessing Tiger Habitat Occupancy Dynamics. In K. Ullas Karanth and James D. Nichols, editors, *Methods For Monitoring Tiger And Prey Populations*, pages 71–87. Springer Singapore, Singapore, 2017.
- [5] Muthusankar, G., Proisy, C., Balasubramanian, D., Bautès, N., Bhalla, R. S., Mathevet R. S., Ricout, A., Senthil Babu, D., and Vasudevan, S. When socio-economic plans exacerbate vulnerability to physical coastal processes on the southeast coast of India. *Journal of Coastal Research*, 85(Proceedings from the International Coastal Symposium (ICS) 2018 (Busan, Republic of Korea)), February 2018.
- [6] Prachi Thatte, Aditya Joshi, Srinivas Vaidyanathan, Erin Landguth, and Uma Ramakrishnan. Maintaining tiger connectivity and minimizing extinction into the next century: Insights from landscape genetics and spatially-explicit simulations. *Biological Conservation*, 218:181–191, February 2018.
- [7] Divya Vasudev, James D. Nichols, Uma Ramakrishnan, Krishnamurthy Ramesh, and Srinivas Vaidyanathan. Assessing Landscape Connectivity for Tigers and Prey Species: Concepts

and Practice. In K. Ullas Karanth and James D. Nichols, editors, *Methods For Monitoring Tiger And Prey Populations*, pages 255–288. Springer Singapore, Singapore, 2017.

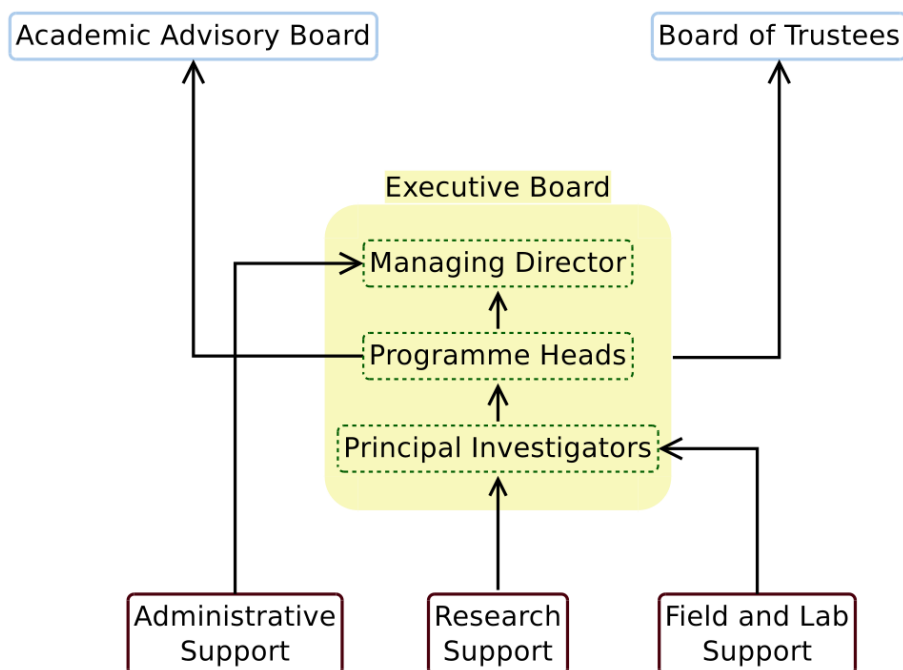
## Reports and conference papers

- [1] Nishma Dahal, Sunil Kumar, Rajat Nayak, Rinzin P. Lama, Barry Noon, and Uma Ramakrishnan. Distribution of Himalayan pikas and modelling impacts of climatic fluctuations. Bangalore, 2017.
- [2] Milind Pariwakam, Aditya Joshi, Sheetal Navgire, and Srinivas Vaidyanathan. A Policy Framework for Connectivity Conservation and Smart Green Linear Infrastructure Development in the Central Indian and Eastern Ghats Tiger Landscape. Technical Report 1, Wildlife Conservation Trust, Mumbai, India, February 2018.

## Administrative Information

FERAL is a non-profit trust founded under the Indian Trusts Act (1882), on 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.



*FERAL's organisational structure.*

## 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.  
Arjun Sivasundar, Ph.D.

## Board of trustees

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

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## 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

Centre for Wildlife Studies, India.  
Juniata College, USA  
Kodia Friends International, USA  
Prince Bernhard Nature Fund, The  
Netherlands  
Ruffords Foundation, UK.  
The Rockefeller Foundation and US  
Agency for International Develop-  
ment via The Nature Conservancy.

### Individual donors

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

### Collaborating Institutions

Ashoka Trust for Research in Ecology  
and Environment, Bangalore, India.  
Centre for Wildlife Studies, India.  
Lancaster Environment Centre, Lan-  
caster University, UK.  
National Centre for Biological Sci-  
ences, Bangalore, India.  
National Institute for Advanced  
Studies, Bangalore, India.  
Wildlife Conservation Society - India  
Programme.  
Centre for Ecology and Rural Devel-  
opment, Pondicherry, India.



# Balance Sheet for the year 2017-2018

FOUNDATION FOR ECOLOGICAL RESEARCH ADVOCACY AND LEARNING  
No .170/3, Morattandi Village, Auroville Post, Tamilnadu - 605101  
BALANCE SHEET AS AT 31.03.2018

( Amount in Rs )

Particulars	Sch.Ref	CONSOL	CONSOL
		31.03.2018	31.03.2017
<b>SOURCES</b>			
Corpus	1	11,75,213	(24,490)
Project Asset Reserve	2	2,01,015	33,55,190
Projects Account (Cr)	3	12,92,904	17,75,951
		<b>26,69,132</b>	<b>51,06,651</b>
<b>APPLICATION</b>			
Fixed Assets less Depreciation	4	8,42,151	20,46,791
<b>CURRENT ASSETS, LOANS AND ADVANCES</b>			
Cash and bank balances	5	15,79,268	28,82,144
Loans and advances	6	3,50,783	5,50,323
Projects Account (Dr)		-	-
	(i)	<b>19,30,051</b>	<b>34,32,467</b>
Less: Current liabilities	7	1,03,070	3,72,607
	(ii)	<b>1,03,070</b>	<b>3,72,607</b>
Net Current Assets (i) - (ii)		18,26,981	30,59,860
		<b>26,69,132</b>	<b>51,06,651</b>
Notes on Accounts	10		

As per our report of even date attached

For FOUNDATION FOR ECOLOGICAL RESEARCH  
ADVOCACY AND LEARNING



**R S BHALLA**  
Trustee

FOR ASA & ASSOCIATES LLP

Chartered Accountants  
Firm Reg No: 009571N/A/150000



**K.VENKATRAMAN**  
Partner  
M.No:200/21914

Place : Chennai  
Date : August 29,2018



Photo ©Srinivas Vaidyanathan.

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## The FERAL Team

**F**ERAL'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).

### Researchers



*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. Farshid is interested in understanding how species and ecosystems are coping and responding to global change. Farshid 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.



*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.



*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.



*Suman Jumani*

Suman completed her Master's degree in Wildlife Biology and Conservation from the National Centre for Biological Sciences (NCBS), Wildlife Conservation Society – India Programme. The current focus of her research is on understanding the ecological and social consequences of small hydropower development in the Western Ghats. She is primarily interested in conducting applied interdisciplinary research on river ecosystems, with the ultimate aim of influencing conservation and policy interventions



*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.



*Tara Lawrence*

Tara holds two Masters' degrees, one in Marine Biology and the second in Marine Environmental Management. Her broad interests lie in the field of marine fisheries ecology and resource management with a specific focus on the role fishermen can play in local fisheries management under an adaptive scientific co-management framework. She also teaches courses on marine ecosystems, fisheries ecology and fisheries management on student programs.



*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, semiarid and wet. He is currently part of the team focusing on the biology and conservation of ecosystems and connectivity for large mammals.



*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.



*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 currently pursuing his PhD at the National Institute for Advanced Studies (NIAS) and he is also 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. He is a guest faculty at the M.Sc course in Wildlife Biology and Conservation at NCBS, where he has been co-guiding students for their Master's thesis. Srinivas uses spatial approaches for finding innovative and practical solutions to conservation problems.

## Research support



*Vinod M.*

Vinod works as part of the field team in the Agastyamali landscape.



*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.



*Kamal S.*

Kamal started off at FERAL as a field assistant about a decade ago. Since then, he has become an invaluable part of our research support through his ability to pick up techniques and accepting responsibilities in field. Kamal is adept at handling a range of field 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, participates in data entry and map digitising.

## 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.

