CONCERTED EFFORT FOR CONSERVATION

THE HABITATS TRUST

ANNUAL REPORT 2023-24

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The Habitats Trust

Annual Report 2023–24

Message from Trustees

Nature has given us some of the greatest marvels that humans can see. From the radiant and symmetrical petals of a flower to the concentric rings on a seashell. Nature is made up of all things magical. And they are all interconnected.

India's landscapes reflect this interconnectedness. The Sundarbans' mangroves act as guardians of coastal biodiversity, protecting against erosion and cyclones while providing refuge to countless species. The Himalayan rivers sustain the wildlife and the millions of human lives they touch, with water and fertile soil. The sprawling grasslands of Western India are vibrant ecosystems that nurture unique flora and fauna, from the Indian bustard to pollinators vital to agriculture.

Humans, like other creatures of this world, have coexisted with nature in a delicate equilibrium. Small shifts in this equilibria can result in massive changes. This can endanger critical natural habitats. At The Habitats Trust, safeguarding this equilibrium forms the cornerstone of our work.

Besides their many geographical features, these habitats are lifelines, carefully crafted by nature. When pollinators vanish, forest cover recedes, and water systems degrade. The chain reaction disrupts entire ecosystems, endangering countless species, including humans.

Our mission, at The Habitats Trust, is to preserve and restore this equilibrium. While being rooted in on-ground initiatives, our work extends outwards from the core. Our initiatives expand with every new partnership, project, and impact. Our community-driven conservation programs, innovative partnerships with technology for habitat monitoring, and direct interventions like habitat restoration and species conservation, each action builds upon the last.

As we look to the future, we remain steadfast in our commitment to sustaining this equilibrium. We envision a world where India's natural ecosystems thrive and co-exist with human progress. But, we cannot do this alone. Together, we can ensure that the rhythm of interconnected growth continues, nurturing the circle of life that supports us all.

With hope and gratitude,
Roshni Nadar Malhotra & Shikhar Malhotra
Founders, The Habitats Trust

Message from Head, The Habitats Trust

As we look back at another transformative year, I am filled with immense pride in the strides we've made together as an organisation. This year, we met our goals and exceeded them. We set new benchmarks for innovation. We provided greater support to partners. And we ramped up on-ground action. I am honoured to share the progress we've achieved, and more importantly, the efforts of my colleagues and partners.

At the heart of our journey is a vision, to find solutions to complex problems while creating value that extends beyond philanthropy. To safeguard and build the aspirations of billions. True success lies in our ability to make a lasting, positive impact on the lives of those we serve.

Our focus, this year, has been to extend deeper support and innovation to our partners. Our on-ground approach has allowed us to introduce groundbreaking solutions that meet the needs of today's grassroots realities and anticipate the challenges of tomorrow. Our commitment to technology, regenerative solutions, and excellence has cemented our position as leaders in the field. But our work doesn't stop there. It is our responsibility to think beyond philanthropy and consider the wider impact we have on the world.

Among the most significant achievements this year was the expansion of THT's eight programmes. Our spending has gone up manifold. Our geographical coverage is now in 26 States and Union Territories, and India's Exclusive Economic Zones. Our work now covers most habitats across the country.

We have achieved technological breakthroughs in exploring mesophotic reefs over 100 metres in depth and developed bio-acoustic models for Hoolock Gibbon vocalisation. These are testaments to our unwavering dedication to creating a regenerative future, where economic growth and environmental stewardship go hand-in-hand. We have significantly increased our efforts towards innovation, with strategic investments in design thinking and impact orientation. We will continue to expand our footprint, foster inclusive growth, and inspire trust and collaboration with all our stakeholders.

As we step into the future, our purpose remains clear. To create value that empowers people, strengthens communities, and ensures ecological functionality.

We thank our dedicated employees, partners, and stakeholders who have been integral to our success. Together, we are shaping a future that is both prosperous and impactful.

Here's to the next chapter of growth, impact, and innovation!

Rushikesh Chavan
Head, The Habitats Trust

About
The Habitats Trust

The Habitats Trusts (THT) was founded in 2018 by Roshni Nadar Malhotra and Shikhar Malhotra. The objective was to protect India's natural habitats, and its native flora and fauna. THT's larger mission is to drive concerted efforts toward the conservation and restoration of ecological functionality of the varied natural habitats in the country — tropical forests, swamps, grasslands, deserts, alpine forests, islands and oceans.

After a closer look at the natural spaces around us, Rohini Nadar Malhotra and Shikhar Malhotra discovered that on-ground conservation efforts in India were often restricted to larger mammals. When it came to lesser-known species and smaller mammals, a gap needed to be filled.

Thus began their — now six-year-long — journey to conserve lesser-known species and habitats. It was clear that THT would take a collaborative approach and get all stakeholders on board.

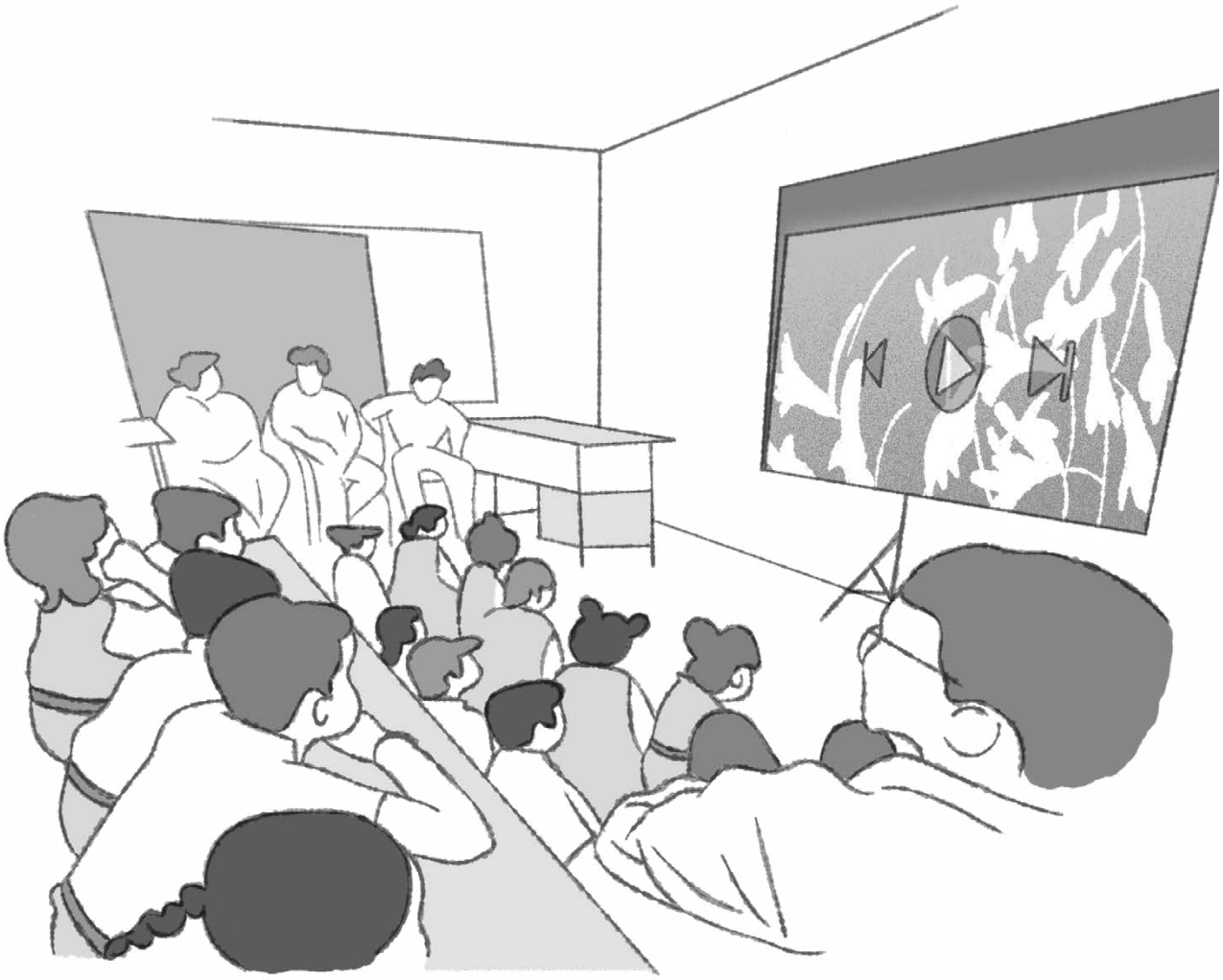
From Lakshadweep's coral reefs to Rajasthan's grasslands and Aurnchal Pradesh's rainforest — THT now operates in 26 states and Union Territories with over 99 on-ground partners. It has enabled the conservation of over 40 species with grants disbursed to 40 organisations and individuals for meaningful impact.

In its sixth year, THT continues to build on its core mission and values through its eight programmes — by facilitating organisations and individuals in their efforts to preserve natural ecosystems and species on ground and underwater. To further this goal, THT has also launched comprehensive, scientific, impact-oriented initiatives.

While counting the year's accolades is essential, THT believes, the conservation of natural habitats is a long and collaborative journey. And we hope that the billion inhabitants of our species, tread with us.

Table of Contents

Communications & Outreach



INTRODUCTION

The goal of the Communications and Outreach programme is to tell the story of The Habitats Trust. And tell the world about the work it does through the many outreach mediums available. Moreover, it is also to appeal to the collective conscience of people, to drive home the message of why it is important to know more about conservation and our natural spaces through science communication and visual outreach — for THT's focus on the visual medium is as old as itself. The hope is to build not just awareness but empathy for the many species and habitats we share a planet with. Every person reached adds to this growing community of change.

GOAL

1) To use outreach — the voice of THT — to talk to the world and tell its story through the mediums at its disposal.
2) To appeal to the collective conscience of the larger public

OBJECTIVES

1) Manage internal communications through THT material and brand strategy.
2) Manage external communications via online and offline means.

Project 1: THT Films

GOAL

The Habitats Trust aims to educate, inform, delight, inspire, and impact change through its films.

KEY COLLABORATORS

Mumbai Tarun Bharat (MahaMTB), Dusty Foot Productions, The Gaia People, Bedi Universal

OBJECTIVES

1) To document people, lesser-known species, habitats, cultures, and conservation efforts.
2) Build empathy for species and habitats.

Starting with *On The Brink Season 1* (back in 2018), THT is now a producer of 190 films in five series, some completed and some under various stages of production.

These films document people, lesser-known species and habitats, cultures, and conservation efforts in India. They are rooted in on-ground narratives, championing local causes and local people. They are also available in 15 different languages apart from English. Films are an important vehicle that connects with people. THT hopes to make films in all major languages of the country.

Here's a glimpse into the series.

***On The Brink:* THT x The Gaia People**

On The Brink, produced in partnership with The Gaia People, delves into species and ecosystems that are rarely seen on Indian television. Grassroots conservationists uncover secrets of the natural world and help the audience understand why species that formerly existed in enormous populations are now literally on the brink.

Both seasons have aired on mainstream streaming platforms and prime television channels such as National Geographic, Discovery's Animal Planet, and Disney+ Hotstar. The third season of *On The Brink*, comprising ten episodes, is now in production.

***Species and Habitats Awareness Programme:* THT x Mumbai Tarun Bharat (MahaMTB)**

Species and Habitats Awareness Programme is a 100-film undertaking co-produced by THT and Mumbai Tarun Bharat. The Trust has completed filming 100 episodes (seven to eight minutes long each) in Marathi showcasing the biodiversity, and conservation issues in Maharashtra.


THE HABITATS TRUST
The Saiva People
ON THE
BRINK
SEASON 1


THE HABITATS TRUST
MTB
KONKAN DIPCADI
Species & Habitats
Awareness Programme


Stories from the Ground: Northeast
THE HABITATS TRUST
DUSTY FOOT PRODUCTIONS
THE TALLEST
RHODODENDRON

The team of Mumbai Tarun Bharat has travelled the state, in search of stories that will give the locals a well-rounded understanding of the place they call home.

The series was launched in 2022 and continues to be released in batches on THT's YouTube channel, with 30 already live. MahaMTB is also conducting education and awareness programmes with these films in rural regions.

***Stories from the Ground: Northeast India:* THT x Dusty Foot Productions**

Throughout last year, THT co-produced 50 short conservation films with Dusty Foot Productions. These stories traverse the region bringing forth many diverse subjects, not just about conservation but about local practices that are in sync with the environment. Made by local filmmakers in 22 local dialects, the films cover 28 districts across the eight states of Northeast India.

The filming and first edits of these films are completed, and they will be screened across 180–200 villages in Northeast India. They will be launched on THT's YouTube channel. Of the completed films, two have bagged awards:

- Runner-up Award, Green Frames: VATAVARAN Short Film Competition and Festival 2023, for 'The Indigenous Seed Keeper: Stories from the Ground, Northeast India'
- Winner, Regional Category, International Water Conclave PSA Video Contest, for 'Chhoskhorong Kho: Stories from the Ground, Northeast India'

NEXT STEPS

A series has been launched with Bedi Universal, with environmental journalist Bahar Dutt conducting viewers through shared spaces in the country. It is currently being shot and will be ready by the end of 2024.

Project 2: Online communications: Social Media and Website

GOAL

To effectively use the online space for communicating THT's work and to build a community of engaged individuals.

INTRODUCTION

THT has categorically changed its social media communication to involve more messaging about its expansion and projects. By 2023, THT had eight active programmes, including THT Grants. The scope was larger, with work spanning cities and states. And the communication channels had to reflect that.

Apart from working on THT's website, the Trust also commissioned artists, designers, and illustrators, to make THT's social media

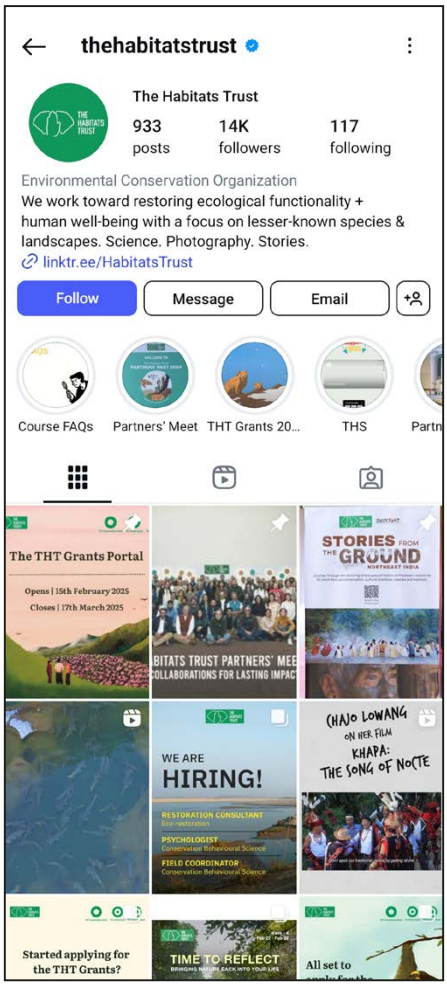


Fig 1.1 (Right) THT's Instagram page

more appealing, and attractive. It also enabled science communication to go beyond descriptions and bring insight, beauty, and humour to online audiences.

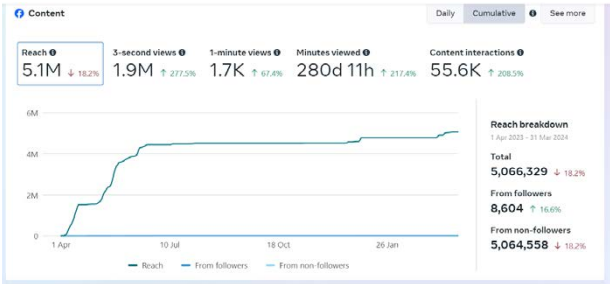
The Trust currently has a presence on Facebook, Instagram, X (formerly Twitter), LinkedIn and YouTube.

OUTCOMES

1) The website was updated to reflect the various initiatives that THT was now involved in.
2) Translation feature added: for articles to be displayed in different languages in the blog section.
3) Posted more updates, films, and field notes on social media to build a steady base. This helped reach a follower count of 10.8k on Instagram from 4k two years ago.
4) Restarted THT's LinkedIn channel, and launched THT's YouTube channel.

NEXT STEPS

- To grow THT's YouTube channel and to make it more active.
- Conduct an audit for THT's website and work towards building a new one.



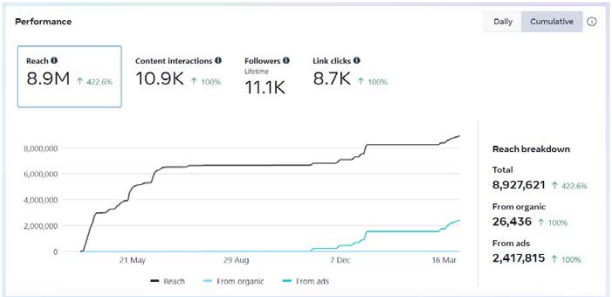


Fig 1.2 (Above) THT's growth on social media

Project 3: Supporting THT Programmes

GOALS

To find different ways to represent THT programmes and their intricate work for the outside audience.

OBJECTIVES

1) To create output ranging from report design to signboards as required for THT programmes.
2) To document THT's projects in different landscapes.
3) To run comprehensive campaigns for THT activities and invite participation.

INTRODUCTION

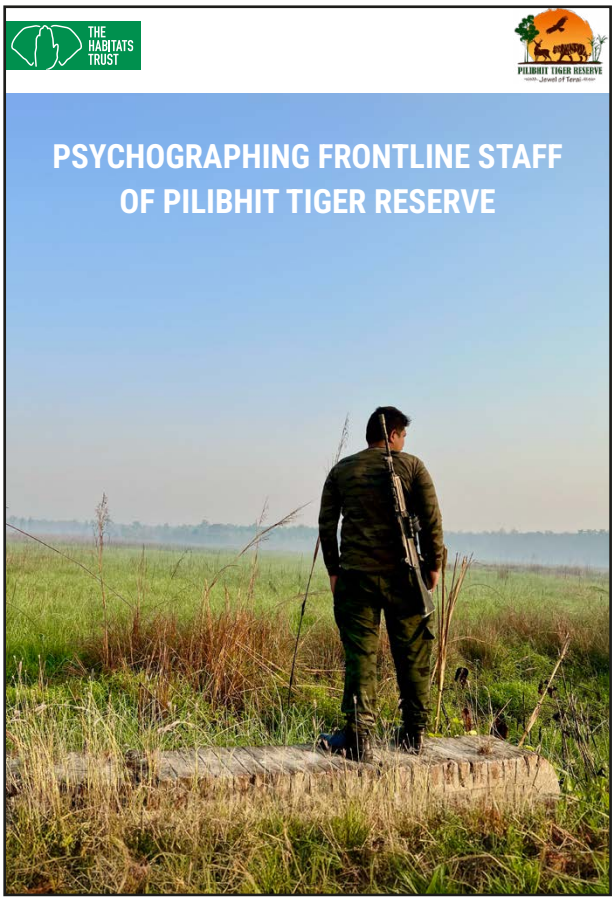
Documentation for the work done under each programme began in earnest this year. The Communications Team delved into different aspects of the specific needs of each programme. This could range from online/social media campaigns to designs for reports and activities like signboards. This also included support for THT events throughout the year.

OUTCOMES

1) A partnership with the Education and Awareness programme helped start the process of creating signboards for the Border Roads Organisation (BRO).
2) Created signboards for an awareness drive conducted in Karwar for the Indian Navy at INS Kadamba to showcase the region's biodiversity with On-Ground Initiatives.
3) Two reports; one on Dudhwa and the other on Pilibhit, were produced by the Communications Team for the data from the psychographic survey of frontline forest staff conducted by the Conservation Behavioural

Science Team. It was distributed to the Forest Department in a lucid, insightful manner. The Pilibhit report will be published in June 2024.

4) For THT Grants, a robust illustrated social media and ad campaign for applications was carried out.
5) Documentation was carried out for the THT Grants Sub-Jury at work. The evaluation process — from the caves of Baratang Island in Andaman to rainforests in Meghalaya and the mountains of Leh to orchids in Nilgiris — was documented. This also resulted in short films being made for the announcement of THT Grants 2023.
6) There were two films made for the Marine Programme's work in Lakshadweep. While one detailed the ROV project and will be published next year, the other told the stories of women biologists on the islands including one of the first women to engage with research on the islands. It is available for viewing on THT's social media channels.
7) For THT's five-year celebrations, a short video was created, followed by event design for THT Partners' Meet 2023. Conceptualisation and event planning for THT's YouTube Launch, production, design, and editing for THT's Coffee Table Book, and support for documentation of THT's International Summit, The Habitats Summit in March 2024 rounded up the year.



NEXT STEPS

- Films on THT's work in Dudhwa Tiger Reserve go into production.
- Creative social media and ad campaigns for Grants 2024 and Conservation Practitioner's Course.
- Detailed documentation for THT Grants Sub-Jury 2024.
- Event designs for THT's Partners' Meet.


THIS YEAR
THE HABITATS TRUST
TURNS FIVE


THT
SUB-JURY
FIELD
EVALUATIONS
2023
THE HABITATS TRUST

Project 4: Offline festivals

GOAL

Join forces to reach out to like-minded people, and allow for interactions between THT and enthusiastic participants.

KEY COLLABORATORS

1) Sustainability Next, All Living Things Environmental Film Festival (ALT EFF)
2) Green Literature Festival: THT x Sustainability Next

A pioneering initiative around green literature, GLF completed its third outing in 2023. As part of a three-year partnership. THT has supported the fest from its first steps. As a body that strives to create connections of understanding between ecosystems and people, THT stepped in with funding to help the festival build its foundation and base.

In 2023, GLF grew in scale and invited authors and readers from across the globe to interact with subjects, and discussions around various themes, as part of a day-long event in November, in Bangalore.

Project 5: THT X ALT EFF

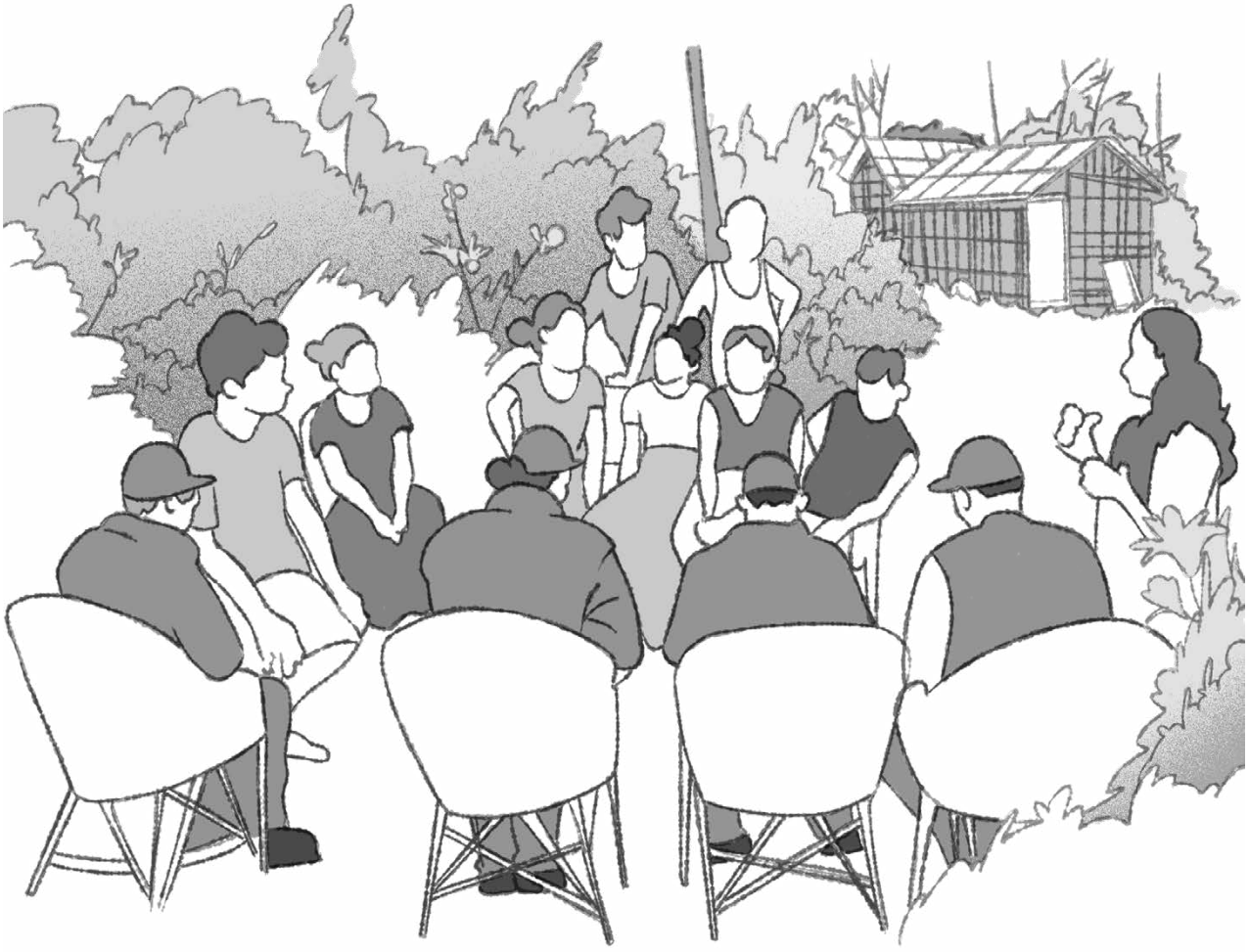
All Living Things Environmental Film Festival (ALT EFF) is an environmental and climate film festival. The aim is to spotlight untold stories of regeneration, activism, crisis, and hope. THT supported the festival financially and used this opportunity to showcase some of its newer films on the festival viewing website. THT participated in the multi-city offerings of the festival. These were some of the ways THT took the partnership with ALT EFF further:

- Select films from Northeast India and Maharashtra were put up on the festival's website under conservation and biodiversity themes. This was a way to engage with the film circuit and for THT to be recognised as a producer of environmental films.
- Workshops were conducted in Goa (coastal walk) and Kotagiri (storytelling).
- Three interactive biomes were set up in Mumbai at Liberty Cinema on the opening night of the festival. Rushikesh Chavan, Head, THT, also gave the award for the 'Best of Festival' film.

These are what some of the numbers for ALT EFF looked like, with eyeballs on THT through each of these avenues:

- 4,300 in-person attendees
- 8,200 online attendees
- 20.8M social media reach
- 12,000 email subscribers

Conservation Behavioural Science



The Habitats Trust

INTRODUCTION

Conservation Behavioural Science is a vertical that works to scientifically understand and model people's mindsets and their conservation behaviours across landscapes. CBS uses this understanding to design compatible interventions.

OBJECTIVES

The Conservation Behavioural Sciences (CBS) vertical of The Habitats Trust (THT) works to:

1) Scientifically understand human behaviour associated with protecting and conserving intact ecosystems, forest and protected areas, and wildlife while maintaining welling, and safeguarding the interests of the communities. Such understanding is essential for developing and implementing social and community-level interventions.
2) Designing an intervention with the highest adaptability and optimal impact is the challenge this vertical faces. It debunks the myth that development and conservation cannot go hand-in-hand.
3) Use the understanding of human preferences and behaviours to feed into public policy.

1. Psychographing Dudhwa-Pilibhit Terai Region

Associated THT Programme: On-Ground Initiatives

INTRODUCTION

India has declared 53 of its national parks and sanctuaries as tiger reserves These national parks and wildlife sanctuaries are guarded by the frontline forest staff (FFS). They ensure on-ground implementation of management practices and protection. Unfortunately, they remain largely unsung and face challenges in enforcing their duties. In India, the frontline forest staff include the Range Forest Officer (RFO), Round Officer/ Forester/ Deputy RFO, Forest Guards, and the daily wage workers. The daily wage workers are employed on a contractual basis. These staff members live on the field and are tasked with various responsibilities such as patrolling, preventing poaching and felling of trees, forest fire management, community interventions, and managing human-wildlife interface. The protected areas are typically divided into core and non-core areas like buffer zone, and territorial zone. Core areas are supposed to be inviolate of any human activity except for management practices and protection. Whereas, non-core areas permit varying levels of human activity. Hence, the work environments vary for employees in these two kinds of areas.

The team also wanted to work with the community in and around Dudhwa and Pilibhit region. For this purpose, it was important to develop measurement instruments and surveys, and then identify villages where this can be carried out. One of the important tribal communities that lives in and around Dudhwa and Pilibhit is the Tharu tribal group. The purpose of this work is to understand conservation behaviour to improve pro-conservation activities from the community side.

GOALS

To develop interventions for the frontline forest staff by understanding working conditions and psychological profile, as well as interventions for community pro-conservation behaviours by understanding drivers of conservation behaviours

KEY COLLABORATORS

To be finalised

REGION

Dudhwa-Pilibhit Terai

OBJECTIVES

1) To develop the psychological profile of frontline forest staff.
2) To develop instruments for measurement

of psychological attributes associated with conservation for community in and around the Dudhwa-Pilibhit region.

3) To understand psychological, social, and economic drivers of conservation behaviours for the community and develop interventions to improve pro-conservation behaviours.

A. Forest Department at Dudhwa Tiger Reserve

April 2023 - March 2024

OBJECTIVES

1) Present the results of the frontline forest staff survey to the forest department.
2) Prepare a report for Dudhwa and Pilibit Tiger Reserve.
3) To prepare the training manual for the Uttar Pradesh government for psychological and motivational training for the frontline forest staff.
4) Carry out work motivation and mental health training in DTR for the frontline forest staff
5) Understanding the structure of the Tharu people who live in very close proximity to the forest and wildlife in and around Dudhwa and Pilibhit Tiger Reserve using Tharu language.

ACTIVITIES

1) The results were presented to the forest department. The field director and other higher authorities were briefed about the results.
2) The report based on psychographic analysis of Dudhwa and Pilibit TR was prepared.
3) The training manual for the Uttar Pradesh government for psychological and motivational training for the frontline forest staff was prepared.
4) The work motivation, leadership and mental health training in DTR for the frontline forest staff was carried out.
5) **The Self-Structure Survey** on-ground data collection was completed with Tharu. Data analysis in progress. This will help understand the construction of the self of the people who are associated with protected areas.

OUTCOMES

1) The THT report 'Psychographing Frontline Staff of Dudhwa Tiger Reserve: Understanding Organisational and Human Resource Aspects, Mental Health, Psychological Well Being, Social Networks, and Personality across Hierarchies of the Frontline Forest Staff' was unveiled by Sunil Choudharyji, APCCF, Forest Department, Uttar Pradesh. The report included actionable points along with recommendations. All participants received handouts in Hindi that they could share with the team. The Divisional Forest Officer of Katarniyaghat Division, the Divisional Forest Officer of North Kheri Forest Division, and the Divisional Forest Officer of South Kheri Forest Division attended the event.
2) The RFO training workshop was conducted based on the empirical findings of the research conducted by The Habitats Trust (THT).

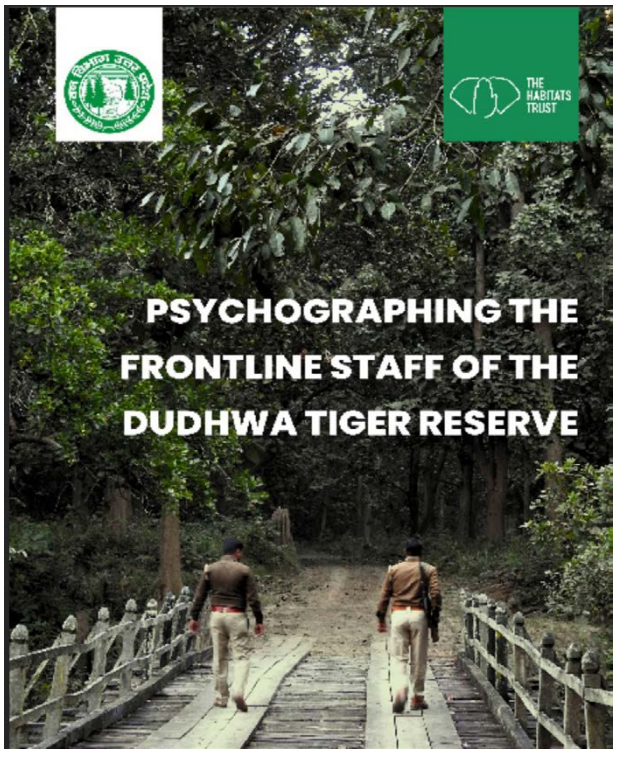


Fig 2.1 (Top) Sunil Choudhary (APCCF) with Katarniyaghat, DFO, N Kheri, DFO, Forest Department Officials, and RFOs during the unveiling of the 'Psychographing Frontline Staff' report

B. Community- Related Work

INTRODUCTION

People around protected areas experience higher safety concerns. This data will show systematically and empirically that compatible incentives need to be provided around project areas for compromising their safety for the public good. This study will also help understand conservation behaviours and map the experience of people living in and around protected areas.

OBJECTIVES

1) To understand the conservation preferences of communities in and around the protected areas in the landscape.
2) To understand the well-being experience of communities in the landscape.

ACTIVITIES

1) The team has developed the **'Perceived Safety Index of People'**. The index can be used to map the feeling of safety around protected areas across India. It is the first such Safety Index for Conservation in India.
   a. It provides the degree or the extent to which people around national parks or protected areas feel safe.
   b. Researchers and practitioners can use it to compare protected areas and rank them based on the feeling of safety.
   c. The index can be used to track changes over time in the perception of safety among community members. The foundational logic of developing the survey is understanding the well-being experience of communities across the landscape.
2) **Various Psychological instruments are in the process of being developed** for the assessment of people around Terai. They include Urban Aspiration, Place Attachment, Attitude to Department, and Economic Dependence. These constructs help us understand various aspects of conservation preferences, and pro-conservation behaviour.
3) **Economists visit to Dudhwa:** A brief recce visit with Dr Neeraj Hatekar, Professor, Azim Premji University, and the THT team took place in Dudhwa in 2023. Professor Hatekar conducted meetings with villagers from the region around the national park. There were two prominent outcomes; designing an economics survey questionnaire, and using the existing data to help people.

OUTCOMES

1) Development of the Perceived Safety Index of People.
2) Development of various psychological instruments is underway.

NEXT STEPS

- To on-board a psychologist for the community survey in the landscape.
- Complete designing the community survey, and roll it out.

2. Konkan Sadās

Associated THT Programme: On-Ground Initiatives

INTRODUCTION

Large areas across the Northern western ghats and Konkan region (including the study sites - Ratnagiri and Sindhudurg districts) are covered with rocky outcrops. Apart from being home to several endangered, and endemic plant and animal species, new species are being continuously discovered on these plateaus. Rocky outcrops also play a key role in water catchments.

With shifting preferences, governance, and aspirations of the residents, the outcrops on these plateaus are now under risk of being lost. The major threats are anthropogenic such as mining, construction, plantation, industries, tourism activities, burning, and other uses (Watve, 2008). In addition, areas under rocky outcrops are classified as wastelands in government records (Wasteland Atlas of India, 2019).

In light of the conservation significance of large plateaus at risk for being sold and developed, in a landscape otherwise grappling with economic and social challenges, an extensive psychological study of the kind being proposed becomes important for concerns regarding conservation and welfare in the landscape.

GOAL

To model behaviours and their antecedents of stakeholders to design an intervention aimed at the conservation of rocky outcrops of Konkan. To understand the conservation-mindedness of people in the landscape and design an intervention towards the conservation of rocky outcrops and lateritic plateaus in the landscape.

KEY COLLABORATORS

Sahyadri Nisarga Mitra (SNM), Chiplun (partner for on-ground conduction and management of surveys)

REGIONS

Study sites:

1) Talukas from Ratnagiri district:
   - a. Ratnagiri
   - b. Rajapur
   - c. Lanja
   - d. Sangameshwar
   - e. Chiplun
2) Talukas from Sindhudurg district:
   - a. Vaibhavwadi
   - b. Malvan
   - c. Deogad
   - d. Kankavli

OBJECTIVES

1) To understand the conservation behaviours and their drivers (antecedents) of communities in the landscape.
2) To understand communities' relationship with the nature around them and their surroundings.
3) To develop and map a comprehensive psycho-social understanding of the communities of the landscape.
4) To design an intervention using the above models towards the conservation of the lateritic outcrops of the region.

A. Study 1: Psychometric instruments development for human-nature relationships

INTRODUCTION

This work focuses on developing psychometric instruments for understanding human-nature relationships and communities' understanding of conservation.

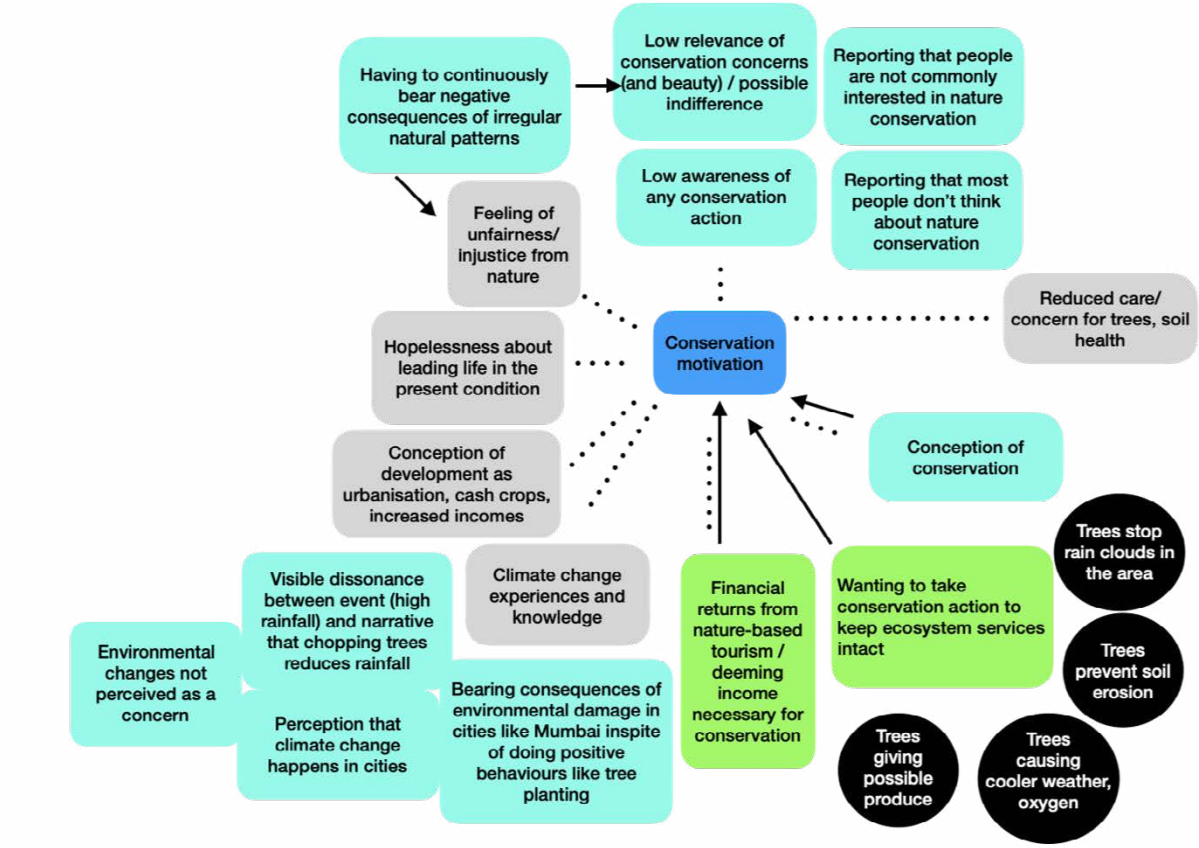
OBJECTIVES

To construct psychometrically valid and reliable instruments to measure conservation identity, the experience of living with nature, the conception of conservation, gratitude towards nature, environmental injustice and conservation motivation. These instruments help map human-nature relationships and people's understanding of conservation as well as conservation preferences.

ACTIVITIES CARRIED OUT

1) Reviewing and finalising thematic maps for constructs for scale development done (sample map below).
2) Item writing based on thematic analysis was done. Each item was reviewed and item modification/culling was done.
3) The scales were sent for expert review to three psychologists in October 2023. Items were culled out based on the review and the scales were finalised for pilot data collection.
4) The scales were converted to be used on the Open Data Kit application: ODK Collect.
5) Visit of Sahyadri Nisarg Mitra (SNM) office was conducted to discuss partnership for on-ground survey conduction and management. Training was given to SNM staff to understand the scales using the application ODK Collect.
6) Training was given to data collectors on-boarded by SNM.
7) Pilot data collection was done during December-January 2023-24. Frequent meetings were conducted with the team for

Fig 2.2 (Top) Data collection through interviews in Sindhudurg



problem shooting, and gathering on-field feedback. The feedback was incorporated and scales were modified. The team collected another round of pilot data following this.

8) Data collection for the validation study was started by the team. Data sent by the SNM team was reviewed.

OUTCOMES

Service agreement signed with SNM Psychometric instruments developed for the following constructs (validation analysis underway):

1) Conservation Motivation
2) Conservation Identity
3) Environmental Injustice
4) Experience of Living with Nature
5) Conception of Conservation
6) Gratitude towards Nature

NEXT STEPS

1) Expanding the on-ground team of data collectors and training them.
2) Large-scale data collection for the scales.

B. Study 2: Study of mapping socio-economic and psychological attributes for habitations in Konkan villages

OBJECTIVES

1) To gain a specific understanding of psycho-social attributes for the unit of habitation or vaadi in Konkan through rapid surveys.
2) To model psycho-social attributes to draw inferences about habitations and villages across the Konkan region.
3) To fill in the gaps in data available at the level of habitation in Konkan.

ACTIVITIES CARRIED OUT

1) Secondary data for the study sites was compiled.
2) The Vaadi survey was reviewed and finalised.
3) Pilot data on the Vaadi survey was collected by the SNM data collectors.
4) Detailed discussions on problem-solving were done during December 2023. The survey was

conducted during April-May 2024 pilot data collection. Changes as required, are being made in the survey.

NEXT STEPS

To finalise the methodology for the survey and move towards large-scale data collection.

C. Study 3: Developing a psychosocial understanding of Konkan

OBJECTIVES

1) To develop an overall socio-psychological understanding of the communities residing in the project area.
2) To understand people's relationship with their surroundings and nature around them.

Data collection, analysis (thematic maps and grounded theory relationship maps) and draft survey were developed in 2022-2023.

OUTCOMES

A comprehensive psycho-social survey was developed.

NEXT STEPS

Large-scale data collection for the survey instrument

ETHICS APPROVAL FOR STUDIES

Proposals for the external committee for the studies: psycho-social understanding of Konkan, psychometric instrument development for human-nature relationships, and an understanding of communities along the Malvan coast were written, and submitted with approval received for all the above studies.

D. Assisting economics visit to Ratnagiri

A brief recce visit with Dr Neeraj Hatekar, Professor of Economics, Azim Premji University, and THT team was conducted in Ratnagiri, in May 2023. Professor Hatekar interacted with people from the district. Following this, the economics team completed a qualitative study on laterite mining. The results were presented by the economics team and discussed in a meeting with the THT team.

OUTCOMES

Completion of qualitative study about laterite mining in the landscape.

NEXT STEPS

On-board economists and conduct a large-scale quantitative economic investigation.

3. Behavioural Science of Conservation Education

Associated THT Programme: Education and Awareness

GOAL

To understand and work towards imbibing environmental conscientiousness in students.

KEY COLLABORATORS

Shiv Nadar Foundation schools

REGIONS

SNF schools

OBJECTIVES

1) To understand present environmental awareness, interest and feelings among students of SNF schools and make recommendations based on this understanding.
2) To understand perceptions of educators in SNF schools regarding environmental and nature education, and make recommendations for better integration of environmental conscientiousness in the schools.

INTRODUCTION

Environmental conscientiousness, also known as eco-consciousness, or environmental awareness, refers to the recognition and consideration of the impact that human activities have on the environment. It involves an individual or collective commitment to making choices and adopting practices that minimise harm to the planet and promote sustainability.

Being environmentally conscientious entails understanding the interconnectedness of human activities with the natural world and acknowledging the finite resources available on Earth. This awareness extends to various aspects of life, including consumption patterns, waste generation, energy usage, and overall lifestyle choices. Environmentally conscientious individuals strive to reduce their ecological footprint and contribute to the preservation of biodiversity and ecosystems.

A. Development of Environmental Conscientiousness Scales

INTRODUCTION

This environment conscience is conceptualised as having the following components:

1) Environmental interests: activities, competencies, and occupations.
2) Attitudes towards climate change.
3) Feelings towards the environment and nature.
4) The CBS and Education and Awareness team members developed psychological instruments to assess environmental and climate consciousness. The validity analysis of the same is in progress.

B. Analysis of teachers' perception survey with the Education and Awareness team

October 2023 to February 2024

The CBS and Education and Awareness team members designed the survey instrument. Consultants from the Education team were trained in qualitative methods of analysis. Additionally, support and supervision were provided to the consultant as he carried out a thematic analysis of the teachers' perception survey responses. Detailed discussions were carried out for the analysis, results, and report structuring.

OUTCOMES

The findings were presented by the team to the schools on March 19, 2024, and the report was submitted to the schools involved. One of the main findings was a lack of resources, unawareness regarding resources for nature education, and difficulty integrating nature education into the syllabus. These were addressed in the report submitted to the schools by attaching a list of freely available resource material, resource people, and sixth to eighth-grade nature integration syllabus.

4. Conservation Behaviours and Marine Ecosystems

Associated THT Programme: Marine Programme

GOAL

To understand people's behaviour towards marine ecosystems and their conservation behaviours towards these ecosystems and coral reefs in particular.

KEY COLLABORATORS

For Lakshadweep: Research and Environmental Education Foundation

REGIONS

For the West Coast: Coastal villages in Goa and Karnataka

PROJECT SITES FOR LAKSHAWEEP

1) Kalpeni
2) Androth
3) Agatti
4) Kavaratti
5) Amini

6) Kadmat
7) Chetlat
8) Kiltan
9) Minicoy

A. Understanding conservation behaviours along the West Coast

OBJECTIVE

The purpose of this work is to understand people's preferences for conservation around the West Coast.

ACTIVITIES CONDUCTED

April 2023 - March 2024

1) A recce visit to Murudeshwar was done in April 2023. This was followed by a recce visit to Goa in May 2023. Qualitative interviews were conducted at both sites.
2) Detailed findings from these interviews were presented to the Marine Team. Discussions between the Marine and CBS teams were undertaken to understand and carve out a methodology for CBS work.
3) A questionnaire for fishing pressure was designed. A meeting where the Marine Team presented their results from the West Coast surveys was conducted, after which the CBS methodology was revised after a few rounds of extensive discussion.
4) The survey design was modified based on the discussion.
5) A visit to Honnvar was done in June 2023 with Professor Amalendra from Azim Premji University. A meeting with the Marine and CBS teams and Professor Amalendra's team was conducted to understand their work and possible overlap.

OUTCOMES

A survey designed for understanding conservation behaviours towards coral reefs along the west coast.

NEXT STEPS

To on-board a project coordinator who can build a team to carry out data collection for the survey designed.

B. Developing a psychosocial understanding of Lakshadweep and developing psychometric instruments

OBJECTIVES

1) To understand communities' behaviour toward the natural environment, coral reefs

Fig 2.3 (Above) Team building and training activities

and marine ecosystems.

2) To develop relevant psychometrically valid and reliable instruments to measure psychological constructs such as environmental injustice, experience of living with nature, safety concerns, fishing drive, environmental identity, conception of conservation, and conservation motivation.
3) To develop predictive models about communities' behaviours toward the natural environment and marine ecosystems.
4) To design and implement an intervention plan oriented towards the conservation of the island ecosystem and prevalent issues.

April 2023- March 2024

1) A visit was made in November-December 2023 to Kavaratti, Kalpeni, Androth and Minicoy. Interns from each of these islands were onboarded and allotted transcription of interviews. A meeting was conducted with the principal of Androth College to discuss the possibility of collaboration for project work/internship offered to the students for data collection and processing for CBS work. The students from the college were briefed about the work.
2) A continuous follow-up was done during the submission of work.
3) A team was set up at Minicoy Island.

OUTCOMES

Qualitative data collection done across eight islands.

NEXT STEPS

Working with the newly-hired field coordinator towards the analysis of qualitative data collected for the development of a survey instrument for large-scale data collection across islands.

Fig 2.4 (Above) Team building and training activities

5. Community and Conservation of Hoolock Gibbon, North East

Associated THT Programme: On-Ground Initiatives

GOAL

To understand communities' conservation behaviours towards the Hoolock Gibbon and its habitat.

KEY COLLABORATORS

Aranyak

REGIONS

Assam and Meghalaya (specific sites to be decided)

OBJECTIVES

A recce visit to Assam and Meghalaya was carried out in April 2023. An online meeting with the local partner Aryanak took place in December 2023 to discuss collaborating, and possible study areas. A list of study areas was emailed to Aryanak to recommend. After further rounds of discussions, the on-ground work is expected to begin this year.

OUTCOMES

On-ground work is expected to begin this year.

NEXT STEPS

Hiring a local field coordinator who can build a team to carry out data collection.

6. Green Minds of India

GOAL

To understand the conservation preferences of people across geographies and to use this large-scale data for public policy.

REGIONS

Across countries since it is online

OBJECTIVES

To map conservation preferences across geographies using psychometric scales and experiments.

This project is for the development of the portal, **Green Minds of India**. The portal wireframe is shared with the developer. The development is expected to be completed this year. This portal will house various conservation-related psychometric scales, personality scales, and behavioural experiments where people across geographical regions can participate online. This will allow the collection of large-scale data regarding the conservation preferences of people across geographies.

NEXT STEPS

Development of the portal along with the developer (external vendor).

7. Eye Tracking of Conservation Behaviours

GOAL

Behavioural experiments across conservation domains and behavioural experiments for different verticals

OBJECTIVES

1) The wearable eye-tracking glasses and equipment were bought from the company Tobii after a thorough research of suitable vendors. A trial was carried out. The trial showed which parts of the THT website are viewed most, and the duration. The results of this trial were presented to Roshni Nadar Malhotra, Trustee, THT.
2) An extensive literature review was done regarding previous work with eye trackers. An initial experiment was designed in December-January 2023. It was reviewed.

Coordination with Tobii is underway to troubleshoot regarding access to begin a trial of the eye tracker for behavioural and field-based experiments.

OUTCOMES

Data from neuro-psychological and behavioural experiments from participants across landscapes can enhance our understanding of the conservation preferences of people.

NEXT STEPS

To problem-shoot with Tobii and begin carrying out behavioural experiments.

8. THT Research Ethics Panel Approval for the following projects of the CBS

What is an Ethics Panel?

An ethics panel is an independent, external body that ensures the ethical conduction of all aspects of any project directly involving human beings before it can be carried out. The panel consists of experienced and senior people from fields like medicine, social science etc. A proposal is submitted to this panel for every project by the team, which is examined and approved if it fits the ethical standards determined by the committee.

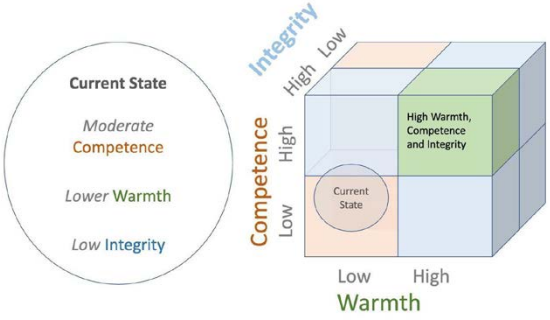
Purpose of forming the Panel:

Since all CBS projects involve interacting and working directly with people who are participants/respondents to our surveys/interviews/ behavioural experiments, it is deemed important to get full approval from an unbiased and expert ethics panel for all the projects. The panel ensures that the methodology is ethical - confidentiality is maintained, no harm is caused to the participants in any manner whatsoever, and informed consent is obtained from all participants.

These are the projects that have been approved by the panel:

1) An understanding of conservation-related preferences of communities along the Malvan coast.
2) Dimensions of Leaders Perceived Personality in the Forest Department: A Psycholexical Investigation.
3) Understanding Personality in a Forest Dwelling Tribal Community: A Psycholexical Perspective.
4) Understanding Psychological and Social aspects associated with the Conservation of Lateritic Outcrops of Konkan.
5) Development and Validation of the Work Environment Survey for Frontline Forest Staff (WES-FFS) in Uttar Pradesh, India.
6) Exploring Predictors of Association with Forest and other work-related psychological aspects amongst Frontline Forest Staff (FFS) in Uttar Pradesh, India.
7) Psychological Instruments Development to assess various aspects of the Human-Nature Relationship for Konkan
8) Development of the Environment Conscience Scales for Adolescents.
9) Understanding Personality in an Islander Community: A Psycholexical Perspective.
10) Development and Validation of the Place Attachment and Urban Aspirations Scale.
11) Development and Validation of the Island Attachment and Mainland Aspirations Scale.
12) Development of a Safety Index for Villages around Protected Areas.

In addition, eight to 10 projects shall be placed for approval by the THT-REC in the next meeting of the committee.



Ecological Restoration Programme

The Habitats Trust

INTRODUCTION

The world's natural habitats, including those in India, have been significantly degraded and destroyed over the last two centuries. The most recent estimates today project that only around three percent of faunally and functionally intact habitats remain. Thus, the Ecological Restoration Programme at The Habitats Trust has the mandate of ensuring critical and endangered habitats are recovered through a combination of securing, rehabilitation, and restoration. Over the last year, the Ecological Restoration Programme has made progress through partnerships and engagements with other organisations, apart from setting up its in-house restoration operations, which include the curation of a knowledge base to streamline its engagements and programs. This last activity comprised compiling lists of native flora for different districts and states of peninsular India, along with ecological, distributional, and other details relevant to ecological restoration.

OBJECTIVES

1) Develop an in-house programme to secure and restore critical habitats.
2) Design and execute new eco-restoration projects in scientifically robust formats, in collaboration with organisations and individuals.
3) Support (technical, technological, and financial) existing eco-restoration projects in India to link up and scale efforts.

1. Baseline Inventory

An understanding of native ecosystems, and in particular the native plant communities, is essential for proper ecological restoration. This knowledge is crucial for assessing the health of ecosystems, deciding what permutation and combination of specific plant species need to be planted, when to collect seeds for different species, and so on, as part of restoration interventions in a landscape. As a step towards this, the team has been building a baseline inventory of plants that are native/local to different eco-regions where we currently operate, using existing literature as well as conducting botanical surveys.

A. Floral Inventory of specific states in Peninsular India

The team used literature, both journal papers and books, extending from the recent to the pre-independence period, along with digitised and non-digitised reports and databases, for this exercise. Excel sheets were created with an exhaustive inventory of all described and taxonomically valid plant species found in four different Indian states, vz Tamil Nadu, Karnataka, Maharashtra and Odisha. Information about their family, the latest accepted binomial name, local common name, habit, nativity status, distribution, habitat, and phenology, among other variables of interest, were added through additional literature reviews. To access specific information from these lists, filters can be used to search through the database. For example, 'herbs,' in the 'Rubiaceae' family in the 'Kanyakumari' district that flower or fruit in 'December.' This database will be updated at regular intervals to reflect any new species and taxonomic additions.

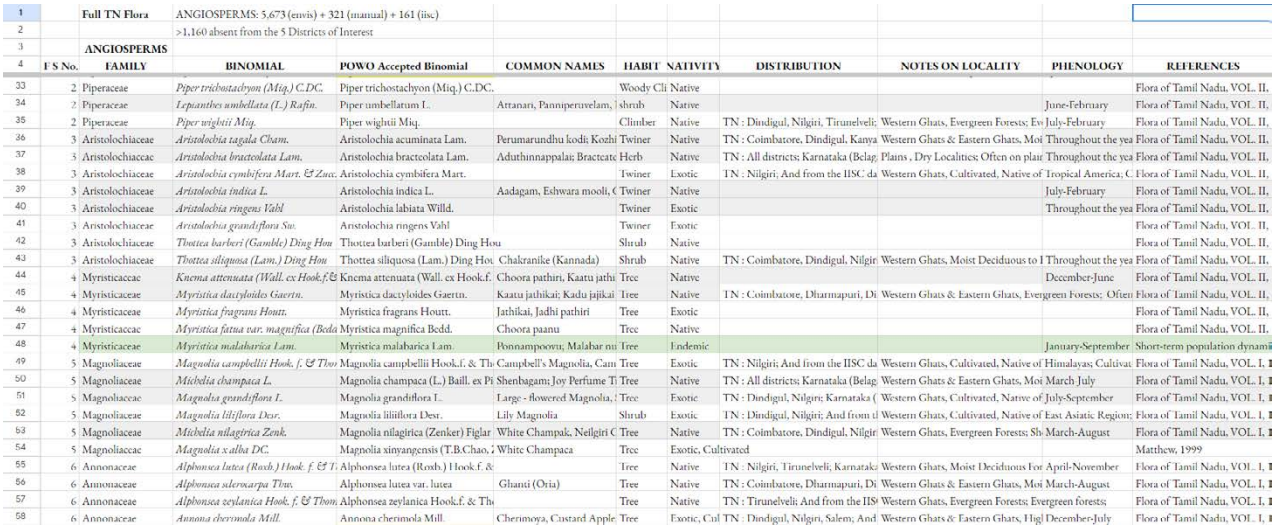
A glimpse of the inventory sheet for Tamil Nadu state is below (Fig 3.1).

a. Tamil Nadu

A compilation of 6,180 angiosperms (flowering plants) with a more detailed break-up for the Kanyakumari, Tirunelveli, Nilgiris, and Thoothukudi districts.

b. Karnataka

A compilation of 5,711 species for the state of Karnataka, including 5,305 angiosperms (flowering plants), two gymnosperms (pine



		Full TN Flora	ANGIOSPERMS: 5,673 (envis) + 321 (manual) + 161 (iisc)							
			>1,160 absent from the 5 Districts of Interest							
		ANGIOSPERMS								
	F S No.	FAMILY	BINOMIAL	POWO Accepted Binomial	COMMON NAMES	HABIT	NATIVITY	DISTRIBUTION	NOTES ON LOCALITY	PHENOLOGY	REFERENCES
33	2	Piperaceae	*Piper trichostachyon (Miq.) C.DC.*	Piper trichostachyon (Miq.) C.DC.		Woody Cli	Native				Flora of Tamil Nadu, VOL. II,
34	2	Piperaceae	*Lepianthes umbellata (L.) Rafin.*	Piper umbellatum L.	Attanari, Panniperuvelam,	shrub	Native			June-February	Flora of Tamil Nadu, VOL. II,
35	2	Piperaceae	*Piper wightii Miq.*	Piper wightii Miq.		Climber	Native	TN : Dindigul, Nilgiri, Tirunelveli;	Western Ghats, Evergreen Forests; Ev	July-February	Flora of Tamil Nadu, VOL. II,
36	3	Aristolochiaceae	*Aristolochia tagala Cham.*	Aristolochia acuminata Lam.	Perumarundhu kodi; Kozhi	Twiner	Native	TN : Coimbatore, Dindigul, Kanya	Western Ghats & Eastern Ghats, Moi	Throughout the yea	Flora of Tamil Nadu, VOL. II,
37	3	Aristolochiaceae	*Aristolochia bracteolata Lam.*	Aristolochia bracteolata Lam.	Aduthinnappalai; Bracteate	Herb	Native	TN : All districts; Karnataka (Belag	Plains , Dry Localities; Often on plair	Throughout the yea	Flora of Tamil Nadu, VOL. II,
38	3	Aristolochiaceae	*Aristolochia cymbifera Mart. & Zucc.*	Aristolochia cymbifera Mart.		Twiner	Exotic	TN : Nilgiri; And from the IISC da	Western Ghats, Cultivated, Native of	Tropical America; C	Flora of Tamil Nadu, VOL. II,
39	3	Aristolochiaceae	*Aristolochia indica L.*	Aristolochia indica L.	Aadagam, Eshwara mooli, (	Twiner	Native			July-February	Flora of Tamil Nadu, VOL. II,
40	3	Aristolochiaceae	*Aristolochia ringens Vahl*	Aristolochia labiata Willd.		Twiner	Exotic			Throughout the yea	Flora of Tamil Nadu, VOL. II,
41	3	Aristolochiaceae	*Aristolochia grandiflora Sw.*	Aristolochia ringens Vahl		Twiner	Exotic				Flora of Tamil Nadu, VOL. II,
42	3	Aristolochiaceae	*Thottea barberi (Gamble) Ding Hou*	Thottea barberi (Gamble) Ding Hou		Shrub	Native				Flora of Tamil Nadu, VOL. II,
43	3	Aristolochiaceae	*Thottea siliquosa (Lam.) Ding Hou*	Thottea siliquosa (Lam.) Ding Hou	Chakranike (Kannada)	Shrub	Native	TN : Coimbatore, Dindigul, Nilgir	Western Ghats, Moist Deciduous to I	Throughout the yea	Flora of Tamil Nadu, VOL. II,
44	4	Myristicaceae	*Knema attenuata (Wall. ex Hook.f.&*	Knema attenuata (Wall. ex Hook.f.	Choora pathiri, Kaatu jathi	Tree	Native			December-June	Flora of Tamil Nadu, VOL. II,
45	4	Myristicaceae	*Myristica dactyloides Gaertn.*	Myristica dactyloides Gaertn.	Kaatu jathikai; Kadu jajikai	Tree	Native	TN : Coimbatore, Dharmapuri, Di	Western Ghats & Eastern Ghats, Evergreen Forests; Often		Flora of Tamil Nadu, VOL. II,
46	4	Myristicaceae	*Myristica fragrans Houtt.*	Myristica fragrans Houtt.	Jathikai, Jadhi pathiri	Tree	Exotic				Flora of Tamil Nadu, VOL. II,
47	4	Myristicaceae	*Myristica fatua var. magnifica (Bedd*	Myristica magnifica Bedd.	Choora paanu	Tree	Native				Flora of Tamil Nadu, VOL. II,
48	4	Myristicaceae	*Myristica malabarica Lam.*	Myristica malabarica Lam.	Ponnampoovu; Malabar nu	Tree	Endemic			January-September	Short-term population dynami
49	5	Magnoliaceae	*Magnolia campbellii Hook. f. & Thor*	Magnolia campbellii Hook.f. & Th	Campbell's Magnolia, Cam	Tree	Exotic	TN : Nilgiri; And from the IISC da	Western Ghats, Cultivated, Native of	Himalayas; Cultivat	Flora of Tamil Nadu, VOL. I,
50	5	Magnoliaceae	*Michelia champaca L.*	Magnolia champaca (L.) Baill. ex Pi	Shenbagam; Joy Perfume Ti	Tree	Native	TN : All districts; Karnataka (Belag	Western Ghats & Eastern Ghats, Moi	March July	Flora of Tamil Nadu, VOL. I,
51	5	Magnoliaceae	*Magnolia grandiflora L.*	Magnolia grandiflora L.	Large - flowered Magnolia,	Tree	Exotic	TN : Dindigul, Nilgiri; Karnataka (	Western Ghats, Cultivated, Native of	July-September	Flora of Tamil Nadu, VOL. I,
52	5	Magnoliaceae	*Magnolia liliiflora Desr.*	Magnolia liliiflora Desr.	Lily Magnolia	Shrub	Exotic	TN : Dindigul, Nilgiri; And from t	Western Ghats, Cultivated, Native of	East Asiatic Region;	Flora of Tamil Nadu, VOL. I,
53	5	Magnoliaceae	*Michelia nilagirica Zenk.*	Magnolia nilagirica (Zenker) Figlar	White Champak, Neilgiri C	Tree	Native	TN : Coimbatore, Dindigul, Nilgir	Western Ghats, Evergreen Forests; Sh	March-August	Flora of Tamil Nadu, VOL. I,
54	5	Magnoliaceae	*Magnolia x alba DC.*	Magnolia xinyangensis (T.B.Chao,	White Champaca	Tree	Exotic, Cultivated				Matthew, 1999
55	6	Annonaceae	*Alphonsea lutea (Roxb.) Hook. f. & T*	Alphonsea lutea (Roxb.) Hook.f. &		Tree	Native	TN : Nilgiri, Tirunelveli; Karnataka	Western Ghats, Moist Deciduous For	April-November	Flora of Tamil Nadu, VOL. I,
56	6	Annonaceae	*Alphonsea sclerocarpa Thw.*	Alphonsea lutea var. lutea	Ghanti (Oria)	Tree	Native	TN : Coimbatore, Dharmapuri, Di	Western Ghats & Eastern Ghats, Moi	March-August	Flora of Tamil Nadu, VOL. I,
57	6	Annonaceae	*Alphonsea zeylanica Hook. f. & Thom*	Alphonsea zeylanica Hook.f. & Th		Tree	Native	TN : Tirunelveli; And from the IIS	Western Ghats, Evergreen Forests; Evergreen forests;		Flora of Tamil Nadu, VOL. I,
58	6	Annonaceae	*Annona cherimola Mill.*	Annona cherimola Mill.	Cherimoya, Custard Apple	Tree	Exotic, Cul	TN : Dindigul, Nilgiri, Salem; And	Western Ghats & Eastern Ghats, Higl	December-July	Flora of Tamil Nadu, VOL. I,

relatives), 252 pteridophytes (ferns), and 148 bryophytes (mosses).

c. Maharashtra

A compilation of 2,246 angiosperm species for the state of Maharashtra. A more focused list of 664 angiosperms for the Tadoba National Park.

d. Odisha

A compilation of 2,672 species for Odisha, including 2,528 angiosperms, 4 gymnosperms, and 139 pteridophytes.

B. Woody Species Survey in Odisha and Maharashtra

A ground-truthing survey conducted in Odisha for the Olympic Forest Project during October–November 2023 was used to obtain detailed information on the floristic composition of 38 sites in seven districts, focusing on woody flora. Of the 680 woody species theoretically found in Odisha, 218 were encountered in reference habitats identified for the potential restoration sites. Similarly, for an upcoming restoration project with the Tadoba Andhari Tiger Reserve (TATR), the inventorying process helped arrive at a yardstick for the native diversity of the TATR landscape.

C. Montane Grassland Habitat Inventory

A compilation of plant species occurring in the high-elevation grasslands of the Western Ghats for the districts of Chikmagalur (216 angiosperms), Nilgiris (351 angiosperms), Palnis (228 angiosperms), and Idukki (355 angiosperms).

D. Native Faunal Diversity of two hilly regions in South India

To understand the variation in faunal diversity across the Palakkad gap, information was compiled for the Nilgiri Hills and Anamalai Hills, in the Western Ghats. The compilation of the different vertebrate taxa found in these hills included 61 mammals, 340 birds, 202 reptiles, 122 fish, and 36 amphibian species. This information was obtained from 23 different literature sources and ground-truthing exercises.

2. Collaborations

In addition to the baseline inventory, the team has been collaborating with other organisations engaged in small and large-scale restoration work.

Fig 3.1 (Top) A sample of the floral inventory and database for the state of Tamil Nadu.

A. Odisha Olympic Forest Project

INTRODUCTION

The International Olympic Association (IOC) has teamed up with the Abhinav Bindra Foundation Trust (ABFT) and Odisha Forest Department (OFD) to create Olympic Forests in Odisha across 22 sites chosen by the OFD. To guide the reforestation towards genuine ecological restoration, IUCN directed ABFT to consult THT as a regional expert. As part of this endeavour, a survey was conducted, recommendations were made, and workshops were held.

GOAL

To create Olympic forests based on ecological restoration principles in Odisha.

KEY COLLABORATORS

The International Olympic Association (IOC), Abhinav Bindra Foundation Trust (ABFT), Odisha Forest Department and IUCN.

REGION

Odisha

OBJECTIVES

1) To provide technical inputs for the reforestation process towards ecological restoration, and deviate from a plantation model which was used before partnering with THT.

ACTIVITIES AND OUTPUTS

1) **Survey:** In October-November 2023, THT established a team of 20 plant enthusiasts ranging from seasoned botanists to volunteers to collect fine-grained data on the floristic compositions of the ecosystems in the 22 Olympic Forest sites. An additional 16 nearby reference patches of relatively intact forests were also surveyed. For each of the 38 sites, teams of four to six people carried out Rapid Assessment Surveys (a meandering walk through the site to identify as many woody species as possible) and two 20 m × 5 m plots/belt transects to measure the relative abundance, frequency, and biomass of the different species.
2) **Recommendations:** After the survey, in early December, a report with THT's recommendations was shared with the office of the PCCF, Odisha. Key takeaways from the report were also presented to them later in the month.
3) **Workshops:** Based on the recommendations, the Odisha Forest Department invited THT to conduct a workshop on the principles and practices of ecological restoration. An online workshop was conducted for the District Forest Officers (DFOs) of the seven districts involved in the Olympic Forest Project. This was followed by a two-day on-ground workshop for the ground staff from the three districts closest to Bhubaneswar.

NEXT STEPS

- **Policy changes:** Based on the interactions with Forest Department staff during the on-ground workshop, further recommendations were made to the PCCF office, and a clarification session was held online with the Principal Chief Conservator of Forest (PCCF) office. It was requested that the Olympic Forest sites be free of the constraints of other plantations. This is a prerequisite for genuine ecological restoration on these sites.

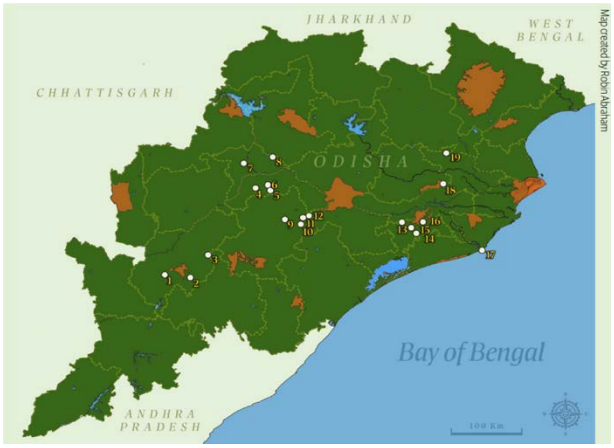


Fig 3.2 (Right) Map of Odisha featuring plantation sites visited by our team for ground-truthing.

ECOLOGICAL RESTORATION PROGRAM

THE HABITATS TRUST

PLAN FOR THE ECOLOGICAL RESTORATION OF NATIVE HABITATS OF ODISHA – THE OLYMPIC FOREST PROJECT

REPORT SUBMITTED TO THE ODISHA FOREST DEPARTMENT

RAPID FLORISTIC SURVEY (10 OCTOBER–06 NOVEMBER 2023)

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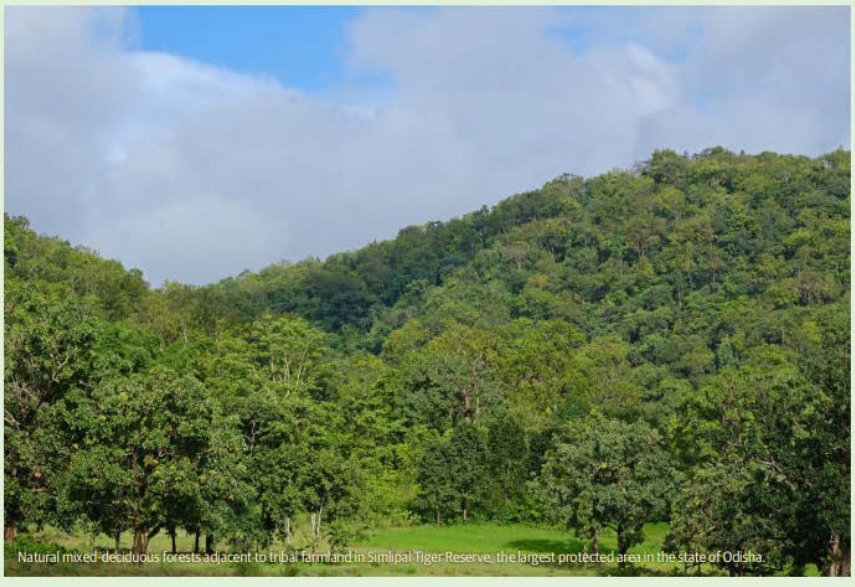


© Robin Abraham

Natural mixed-deciduous forests adjacent to tribal farmland in Similipal Tiger Reserve, the largest protected area in the state of Odisha.

Fig 3.3 (Top) Floristic Survey carried carried out at a reference site.
Fig 3.4 (Above) Recommendation report based on on-ground survey.

Fig 3.5 (Top) Presentation of eco-restoration recommendations to the PCCF by THT.
Fig 3.6 (Middle) Kicking off the on-ground workshop with CCF and DFO.
Fig 3.7 (Above) Field component of the Odisha Forest Department staff training workshop.

3. Capacity Building

Conservation and restoration are complex subjects, and capacity building that takes THT a step closer to its goals, is an important cornerstone of the Ecological Restoration programme. The team has taken a few steps towards this.

4. Other Activities

A. Ecological Restoration Alliance

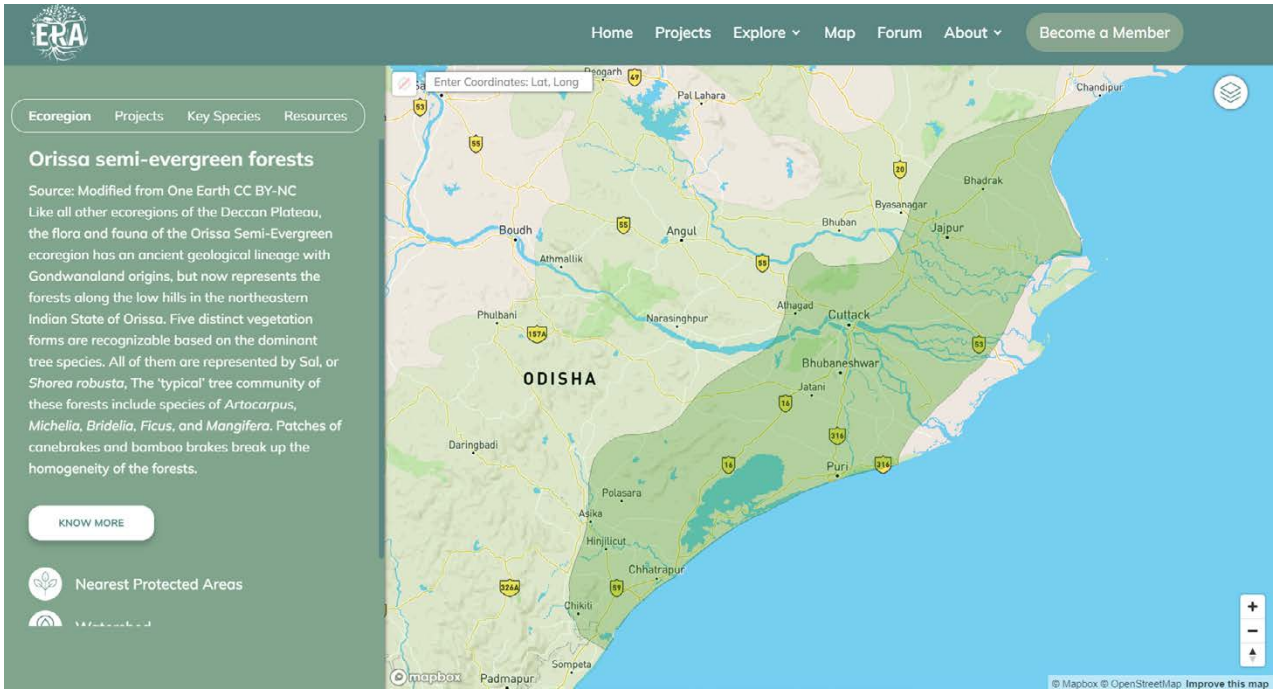
THT has participated in the activities of ERA-India, a consortium of ecological restoration practitioners based in India.

Apart from networking, THT engaged with the following activities:

1) **Presentation:** In early December 2023, at the ERA-India annual meeting at Panchgani, THT's Ecological Restoration Programme's general approach to engagements as well as specific approaches to select projects in Odisha and Maharashtra were shared (Fig 3.9).
2) **Knowledge Sharing:** Findings from the on-ground survey in Odisha are being shared with ERA-India. This is to help expand the collective knowledge base on the eco-regions of India, specifically those in Odisha for which no information exists today.

B. The Global Biodiversity Standard

The ERA-India forum has enabled engagement with other restoration practitioners. One such acquaintance is the Auroville Botanical Garden with its efforts to create an international standard for measuring the success of eco-restoration efforts; The Global Biodiversity Standard (TGBS). A member from the team attended an Assessor Training workshop to learn the method in March 2024; and is now one of nine people in India to be trained in this method.



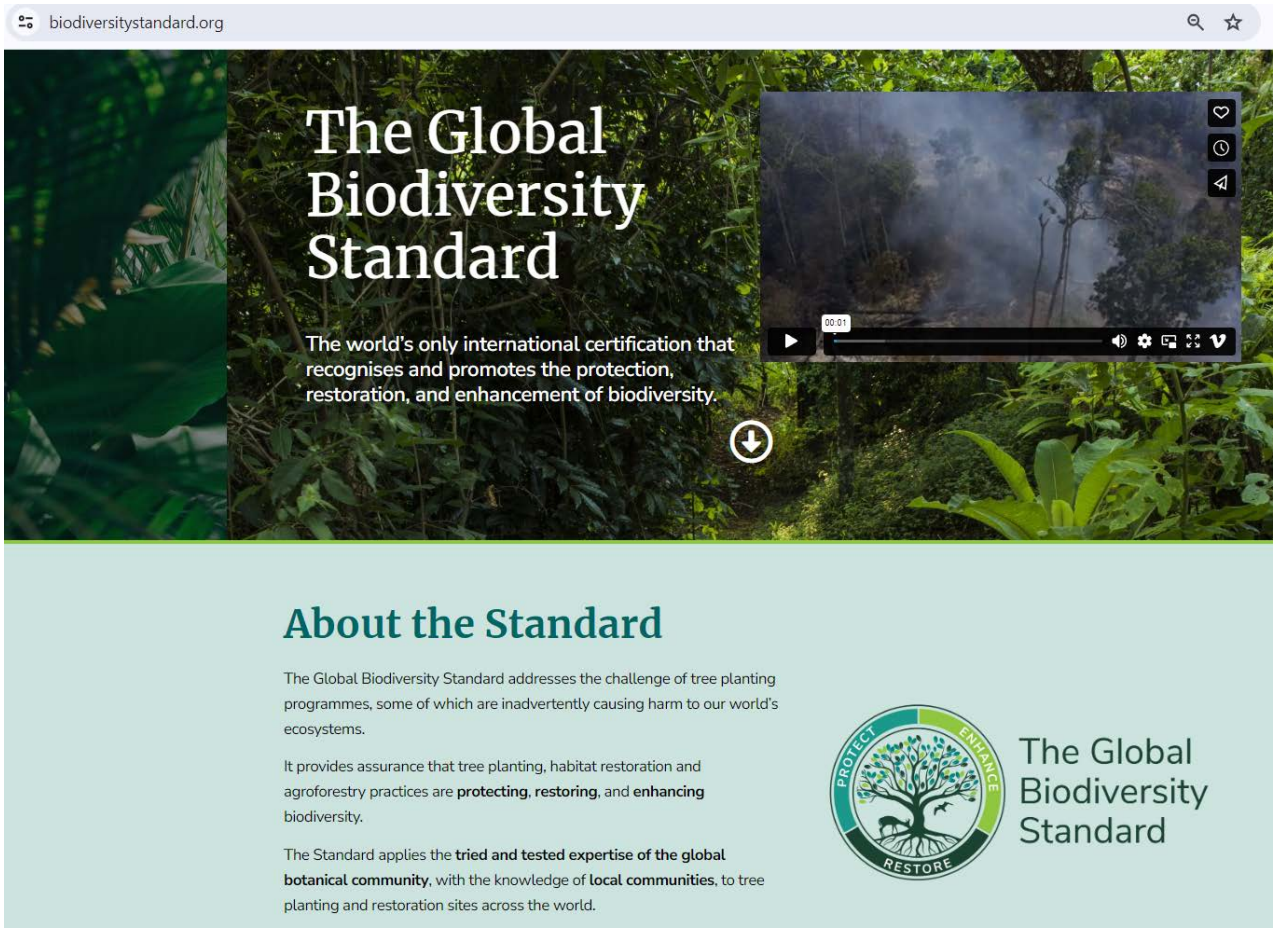


Fig 3.8 (Top-left) Robin Abraham presenting early phase results from the Odisha Olympic Forest Project at the Ecological Restoration Alliance meeting in 2023, in Panchgani.
Fig 3.9 (Top) ERA's knowledge base for the ecoregions of India.
Fig 3.10 (Above) The GBS certification website.

Education and Awareness Programme

The Habitats Trust

INTRODUCTION

In times of exacerbated climate change, environmental degradation, and depletion of natural resources, terms like sustainability and conservation are increasingly relevant. There is an urgent need for individual and collective action to ensure a liveable present and future for both human and non-human communities. THT's Education and Awareness Programme uses a comprehensive approach to integrating environmental education in school education while also focusing on interdisciplinary conservation training for Conservation Practitioners across the country.

OBJECTIVES

1) Enhance Environmental Consciousness
   a. Recognise what drives pro-environment behaviours with the help of scales/ tests developed to assess how students associate with nature and the environment.

2) Nature Integration into School Curriculum
   a. Integrate nature-related examples into the school curriculum to nurture the interconnectedness of nature with the subjects taught in the curriculum.

3) Support Conservation Practitioners
   a. Develop a nine-month, practitioner-focused interdisciplinary course with flexible learning options to accommodate existing commitments.
   b. Ensure accessibility through financial aid and scholarship options.
   c. Provide a certificate for completing the course via a partnership with the Academy of Continuing Education at the Shiv Nadar Institution of Eminence.

4) Upskill Conservation Practitioners
   a. Equip participants with practical skills in study design, data management, intervention implementation, monitoring, and evaluation.
   b. Offer interdisciplinary capacity-building to address the complexities of modern conservation.

1. Environment Consciousness Programme

OVERVIEW

Environmental conscientiousness, or eco-consciousness, refers to recognising the impact of human activities on the environment. This understanding is built on three pillars: knowledge of the environment, interest in the topic, and feelings and attitudes towards environmental information. Environmental education in urban settings aims to help individuals understand the interaction of biological, physical, socio-economic, and cultural factors in shaping natural and built environments. It imparts the knowledge and skills needed to predict and solve environmental problems and fosters values and attitudes to motivate action.

GOAL

The development of environmental conscientiousness among students at the Shiv Nadar Schools.

KEY COLLABORATORS

Conservation Behaviour Sciences Team, Educators at Shiv Nadar Schools, Students of Shiv Nadar Schools

REGIONS/MAPS

Shiv Nadar Schools Noida, Faridabad, Gurgaon, and Chennai

OBJECTIVES

1) Develop a set of scales that measures environmental interests, attitudes towards climate change, and emotions towards the environment and nature.

2) Map adolescents' interests in careers related to the environment and nature through assessment of activities, competencies and occupations preferred by the students.
3) Understand the attitudes of teachers towards integrating nature, environment, and sustainability into their classrooms.
4) Integrate environmental education into the school curriculum, from primary to higher education grades.
5) Develop a database of resource material used across India for environmental/nature education.

ACTIVITIES

1) **Needs Assessment of Shiv Nadar Schools Teachers**

To understand the needs of educators, a series of school visits and discussions with teachers were conducted. The team attended syllabus planning meetings to comprehend the different types of resources used in the curriculum.

2) **Creation of a Repository of Freely Available Materials**

A comprehensive repository of materials on nature, biodiversity, and wildlife in the Indian context was compiled. Information from 56 organisations was gathered to create a resource bank for teachers, facilitating easier access to educational materials.

3) **Survey on Teachers' Perceptions of Nature and Environment Education**

A survey was conducted to understand how teachers incorporate nature and environmental education into their classrooms and the challenges they face. The survey revealed that teachers struggled to find online resources and had limited time for research due to syllabus completion pressure.

Fig 4.1 (Top) The designing of the Conservation Practitioner's Course with the help of Experts from various fields.

4) **Presentation of Survey Findings**

The survey findings were presented to 259 teachers from all four Shiv Nadar Schools (Chennai, Noida, Faridabad, Gurgaon). The findings indicated the need for continuous and consistent nature-related activities beyond special events. In response, a **Nature Integration Syllabus** for all grades was developed, and access to a database of freely available materials was provided.

5) **Integration of Environmental Education into the Curriculum**

Nature integration into the science curriculum for grades 6, 7, and 8 was completed. The syllabus for Early Years to Grade 5 was reviewed for nature integration, streamlining the process for teachers with videos, hands-on activities, group discussions, and assignments.

6) **Literature Review on "Environment Consciousness"**

A literature review was initiated to define the term "environment consciousness" and examine global studies. Four key pillars were identified: knowledge, interests, willingness to build competencies, and emotional association with nature and the environment.

7) **Development of the Environment Consciousness Instrument**

The Environment Consciousness Instrument was designed with the help of trained psychologists to develop a baseline of students' environmental consciousness. It maps adolescents' interests in environment-related careers and activities, and gauges their knowledge of environmental subjects, emotional associations, and willingness to develop pro-environment behaviours.

8) **Ethics Committee Approval**

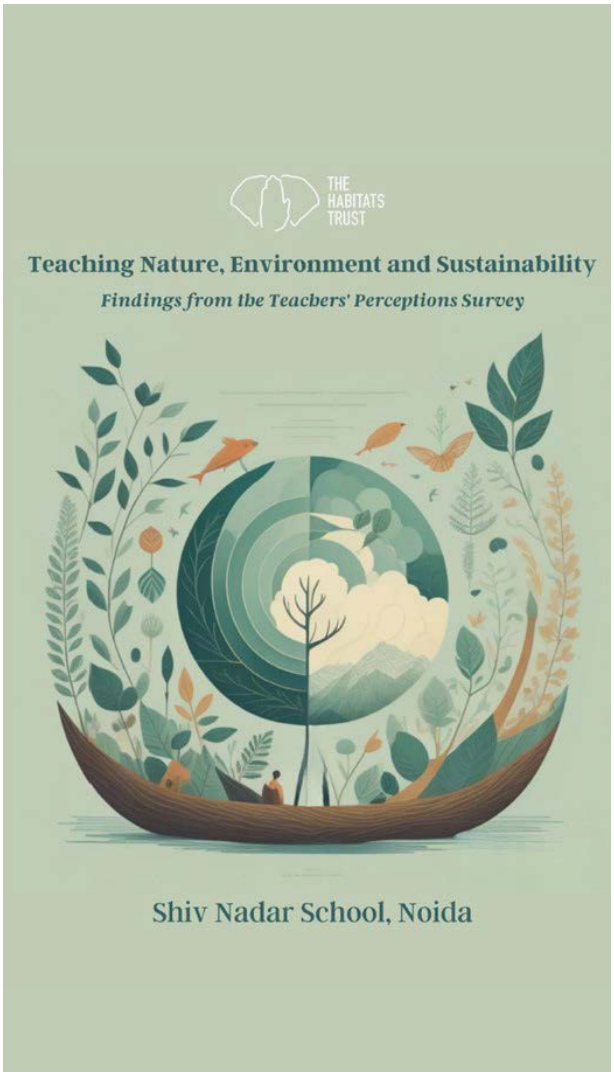
The Environment Consciousness Instrument was presented to an Ethics Committee for clearance to work with adolescent students and received approval.

EXPECTED OUTCOMES

1) To have a replicable scale for understanding the environmental consciousness of adolescents that can be implemented across India.
2) To understand the drivers of pro-environmental behaviour.
3) To design a nature integration programme for the Shiv Nadar School curriculum.

NEXT STEPS

- Complete the pilot of the environment consciousness scale.
- Implement the scale in the Shiv Nadar Schools.
- Implement a Nature integration curriculum across the different grades in the Shiv Nadar Schools.



2. Conservation Practitioners Course

OVERVIEW

Modern conservation poses significant challenges due to limited interdisciplinary exposure and fundamental knowledge across varied disciplines. Practitioners often lack the necessary skills to address conservation issues effectively, impacting critical areas such as study design, data management, intervention implementation, monitoring, and evaluation.

GOAL

To create a Conservation Practitioners' Course for the practitioners to equip them with the knowledge, skills, and tools necessary for conservation issues that require an interdisciplinary approach.

KEY COLLABORATORS

Conservation Practitioners across the country, Shiv Nadar Institution of Eminence, Academy of Continuing Education

REGIONS

Across the country

OBJECTIVES

1) Target the specific demographic of conservation practitioners who have over two years of experience but lack formal training.
2) Launch a hybrid nine-month course that combines social and ecological sciences.
3) Provide access to top experts in conservation, wildlife laws, policy, and technology.
4) Equip students with skills in project management, organisational representation, report writing, and grant writing.
5) Offer scholarships to five students every year and provide travel and accommodation bursaries for on-field travel to the others.
6) Focus on the latest developments in wildlife laws, policies, and field technology.

ACTIVITIES

1) **Compilation of a Directory of Courses and Syllabi**

A directory of post-graduation programs in ecology, wildlife, biodiversity management, sustainable development, environmental sciences, and natural resource management in India was compiled. Ninety courses were identified, most requiring a full-time two-year commitment with limited remote learning or financial aid options.

2) **Syllabus Planning Workshop**

A workshop was conducted with six experts in wildlife, conservation, economics, and psychology, along with two expert members who have run wildlife science courses at an eminent institute. Essential skills and fundamental understanding needed for conservation practitioners were discussed, developing a framework of necessary skills and subject concepts for a holistic understanding of conservation problems.

3) **Course Structure**

The course is designed as a nine-month remote learning opportunity for practitioners, allowing them to remain professionally engaged. It includes a 12-day boot camp for practical learning and connections to expert faculty.

1) **Support for Practising Conservationists**

Capacity building of the conservation community is emphasised, particularly for those who missed formal education opportunities due to financial or time constraints. The course equips conservation practitioners with interdisciplinary knowledge and practical skills through six modules focusing on ecology, economics, psychology, wildlife law, and policy, technology in conservation, intervention design, project management, and writing in conservation. Scholarships and travel bursaries are offered to support students.

2) **Development of the Course Syllabus**

Based on the workshop's output, the course syllabus was created with the help of five

additional experts. The course structure, relevant expert faculty, and flow were planned.

3) **Discussion with Faculty**

Faculty members are currently developing lesson plans for their respective subjects to ensure comprehensive coverage of the course material.

4) **Partnership with the Academy of Continuing Sciences at Shiv Nadar University**

A partnership was established with the Academy of Continuing Sciences at Shiv Nadar University to offer the course as a certificate program, enhancing its credibility and reach.

EXPECTED OUTCOMES

1) Capacity building of the conservation community, particularly those who missed out on formal education opportunities due to financial or time constraints.
2) Equip conservation practitioners with interdisciplinary knowledge and practical skills with the help of six modules focusing on the fundamentals of ecology, fundamentals of economics and psychology, wildlife law and policy, technology in conservation, intervention design, project management, and writing in conservation.
3) Strengthen conservation efforts through well-trained and knowledgeable practitioners.

NEXT STEPS

- Launch the Conservation Practitioners Course.
- Monitor and evaluate the programme's impact on conservation.

Marine Conservation Programme

The Habitats Trust

INTRODUCTION

THT's core mission is to secure and restore marine habitats and ecosystems, both well-known and lesser-known, within and beyond Indian boundaries. It aims to go above and beyond the current state of marine conservation in India.

OBJECTIVES

1) Bridging conservation science and action/ implementation.
2) Addressing complex multi-dimensional conservation problems.
3) Expanding ongoing marine conservation efforts to potentially critical areas and ecosystems off the radar.

STRATEGIES

1) Identifying critical research gaps hindering conservation action, and direct research investment.
2) Building and leveraging a network of grassroots partners for a collaborative effort to optimise each partner's and THT's role toward a common goal.

Marine Conservation in the Lakshadweep Islands

LAKSHADWEEP ISLANDS: AN INTRODUCTION

Located in an area nearly 200 to 400 km, off India's South-western coast, Lakshadweep is a group of 16 atolls and 32 islands. They are the northernmost islands of the 2,550 km long Chagos–Maldives–Laccadive ridge of the Arabian Sea.

Lakshadweep's atolls are made entirely of coral reefs, and most islands are surrounded by shallow lagoons with fringing coral reefs. These reefs support diverse marine life and provide income-generating avenues for nearly 64,471 islanders (2011 census). The picturesque beaches and coral reefs of Lakshadweep have attracted tourism, which is being scaled up for economic growth, in the last few years.

As the Lakshadweep archipelago is just a few feet in elevation, it is highly vulnerable to rising sea levels and extreme weather events from climate change. Combined with anthropogenic pressures, the impact of climate change will not only aggravate but also threaten biodiversity and livelihoods. Therefore, Lakshadweep is one of the focal sites where THT's marine programme has forged multiple partnerships as detailed below, to address these issues.

Project 1: Lakshadweep: REEF Collaboration

Lakshadweep's ecosystem and biodiversity provide vital goods and services including mitigation and adaptation towards climate change, habitat for various flora and fauna, and livelihood opportunities. Community involvement is equally crucial for safeguarding Lakshadweep's natural ecosystems. Lakshadweep's community is culturally homogenous and any intervention can have greater potential with community engagement.

Therefore, THT's work in the Lakshadweep Islands is focused on the conservation of coral reef and lagoon ecosystems, with active involvement from islander communities, using multi-disciplinary approaches. THT-Marine Programme has partnered with the REEF (Research and Environmental Education Foundation), a non-profit organisation run by islanders, to promote sustainable development through research and environmental education. The MoU was signed in November 2022 and project details are listed below.

GOAL

Conservation of coral reef and lagoon ecosystems with involvement from island communities.

KEY COLLABORATORS

REEF

A. Coral reef transplantation and restoration

THT funded the REEF to sustain their ongoing coral reef transplantation projects and scale them. Using fragments of corals, the REEF has established a nursery of 15 species in the lagoon of Kavaratti Island. Fish communities form natural assemblages at the transplanted site once the fragments of corals grow.

EXPECTED OUTCOMES

1) Reduced dive tourism pressure on the Main Reef by redirecting it to the transplantation site.
1) Reduced bait fishing pressure in the Main Reef by redirecting it to the fish communities at the transplantation site.

B. Seagrass restoration

OBJECTIVES

1) Archipelago-wide documentation of Seagrass meadows.
2) Restoration of Seagrass and their faunal communities.

There has been a depletion of Seagrass from a majority of the lagoon meadows in the Lakshadweep. Research so far indicates this is due to an increase in marine turtle abundance and as a result of trophic shifts in the marine ecosystem.

As part of the Seagrass restoration efforts, the REEF has an ongoing project that uses herbivore exclosure cage plots for planted Seagrass. These plots have witnessed healthy growth, and are ready for a larger area with sufficient protection in the form of larger exclosures. The funding from the MoU is being used for this effort.

EXPECTED OUTCOMES

1) Expansion of the Seagrass habitat and its ecological service potential.
2) Restoration of Seagrass faunal communities to benefit lagoon fishers.

C. Marine Biodiversity Documentation

OBJECTIVES

1) Document reef biodiversity across 12 island reefs.
2) Create an inventory of biodiversity in the Lakshadweep archipelago.

A project under the Department of Science and Technology of Union Territory of Lakshadweep, carried out by the REEF, has documented the reef biodiversity of all island marine habitat types, across 12 island reefs. New regional records and descriptions of new species were part of this effort. A portion of the funding from THT will be used to extend these surveys to more islands, and eventually create an inventory of the biodiversity in the entire Lakshadweep archipelago. This will encompass the inhabited and uninhabited atolls and reefs in the Union Territory.

D. Education and Awareness

OBJECTIVES

1) Educational events for islander communities

The REEF conducts educational events and activities with islander communities including school students, village groups, elders, self-help groups, NCC, NSS, fishermen groups, and the local youth. Biodiversity awareness is conducted under the Ocean School program. The project is presently underway in Kavaratti and Agatti islands. The funds from THT will be used to expand this to other islands.

Fig 5.1 (Top-right) A coral nursery managed by REEF in the Kavaratti lagoon.
Fig 5.2 (Right) Seagrass bed in the shallow waters of Agatti.

E. Community Mapping Surveys

Associated THT Programme: Conservation Behavioural Science

OBJECTIVES

1) Conduct community surveys.
2) Gauge islander community interests in conservation efforts.

REEF will play an active role as an implementing partner in THT's ongoing efforts to conduct community surveys, as part of the Conservation Behavioural Science programme. The objective is to gauge the inclination of the islander communities towards marine conservation interventions in the Lakshadweep archipelago.

EXPECTED OUTCOMES

THT and REEF aim to address the pressure of dive tourism and bait fishing on the main reef by redirecting these activities to artificially created coral reef sites. The restored seagrass sites will enable conservation of life forms associated with seagrass meadows which will directly benefit lagoon fishers. Through this project, an inventory of the biodiversity will also be developed for the entire Lakshadweep archipelago that could help monitor the state of species and habitats, and identify the conservation interventions required. The project will also involve participatory approaches of building a knowledge base, to foster a shared commitment to conserve the biodiversity of the islands.

OUTCOMES (2023-24)

1) The REEF completed the data collection for biodiversity surveys and coral reef health assessments at 3 atolls - Agatti, Bangaram, and Kavaratti (data will be analysed together once more atolls are covered in subsequent phases).
2) Installation of coral nursery tables completed in the Agatti and Bangaram lagoons.
3) Seagrass growth experiment plots set up in Agatti and Kavaratti lagoons.
4) Education and outreach activities (such as talks and discussions, field visits, and cleanup activities) were conducted at Agatti and Kavaratti with resident groups, self-help groups, school students, and NSS.

NEXT STEPS

- Coral reef restoration by out-planting of healthy coral transplants in Agatti and Bangaram islands.
- Monitor bleaching and recovery of corals in the lagoons and outer reef areas, given the 2024 mass bleaching event.
- Seagrass surveys to be expanded in the archipelago and setting up of cages in Agatti and Kalpeni.
- Ghost net removal with the Indian Navy.
- Awareness programs through the Ocean School initiative.
- Development of REEF website, social media, and science interpretation centres.

Project 2: Surveys of deep coral reefs using Remotely Operated Vehicle (ROV)

Associated THT Programme: Tech for Conservation

GOAL

Document the biodiversity of mesophotic coral reefs and assess the anthropogenic stressors that are yet to be understood.

OBJECTIVES

1) Deploy ROVs in unexplored, mesophotic (>30 m deep) coral reef environments.
2) Monitor coral health and assess reef connectivity.

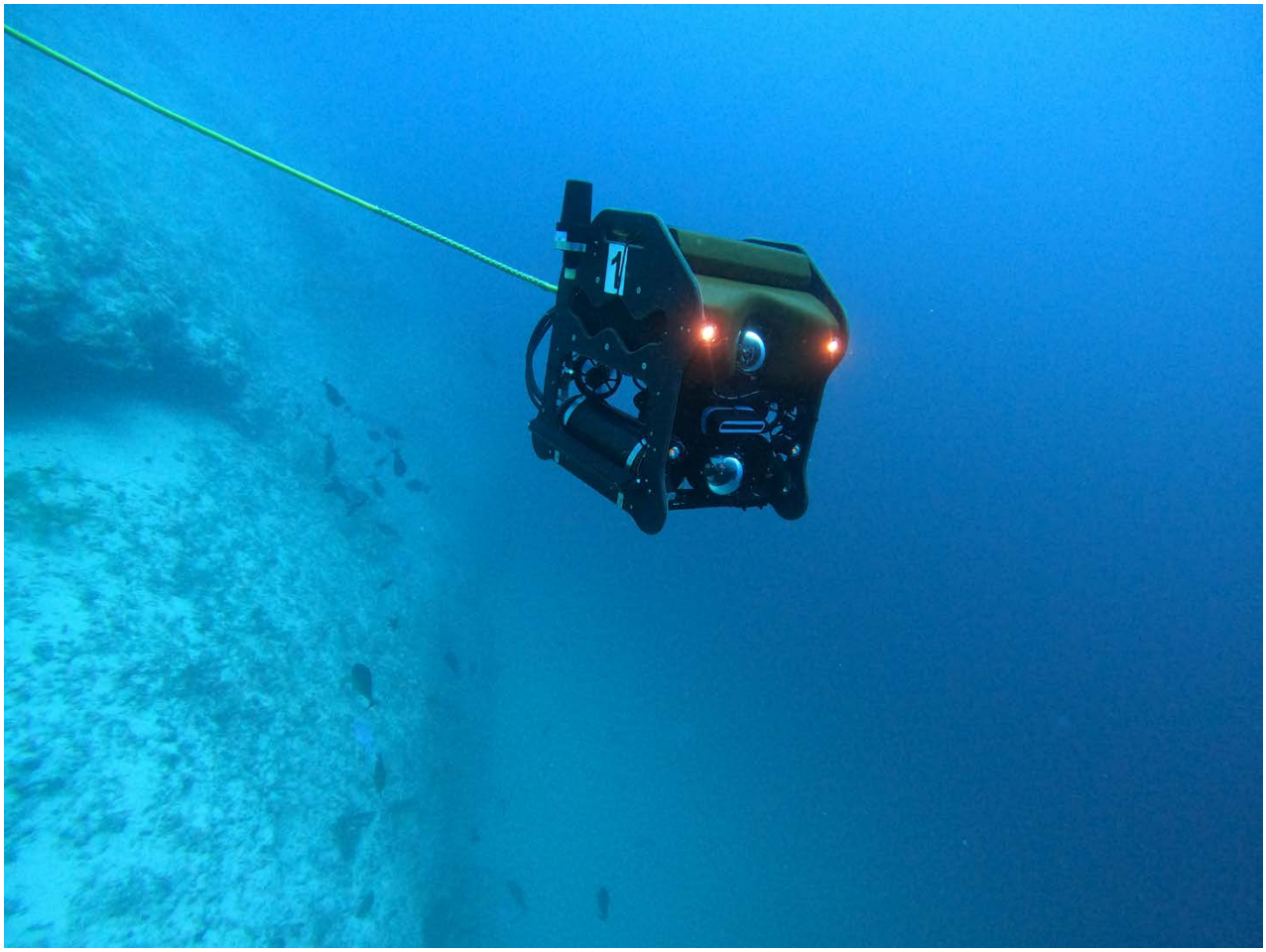
Mesophotic reefs lie below the 30m depth mark and are therefore not suitable to be surveyed using the conventional scuba diving method.

These reefs have recently been found to be extensions of the shallower and better-known coral reefs, with a gradual transition of biotic communities, but often just as diverse and rich as the shallow reefs. Several species do exist across both these zones, but since the deeper mesophotic zone is less affected by heat stress, it is thought to be a safe zone or refugium for some of these species, from which larvae could replenish shallower reefs in the wake of catastrophic climate events. In some parts of the world, mesophotic reefs have been found to host an incredible richness of fish life, much more so than their shallower counterparts.

However, across much of the world including in India, these habitats are poorly known. Whether they need conservation attention, and if so, what the nature of this need is, is even more of a mystery. Many mesophotic reefs lie on the deeper slopes of inhabited islands, and as such, island development could impact them. Others lie on the tops of submerged mountainous features in remote oceanic areas, where they may be threatened by anthropogenic stressors we are yet to understand. Resource extraction from the seabed is another possible stressor, about which we know very little.

THT's marine programme, working closely together with the Technology for Conservation programme, is currently engaged in the use of Remotely-Operated Vehicles (ROV) to explore submerged coral reef environments in undocumented regions in the open seas of India. A successful trial of a suitable industrial-grade ROV for reef exploration was conducted in April-May 2023 in Lakshadweep, following trials with a consumer-grade ROV in Pondicherry in August 2022.

THT has also proposed collaboration with the Indian Navy to deploy the ROV in an undocumented region off the West Coast of India with submerged coral reef environments. These environments are believed to harbour rich reef



biodiversity and remain unexplored for ecology and conservation. They may also be refuges for species stocks vital to the continued resilience of shallower reefs, which face relatively higher pressures.

EXPECTED OUTCOMES

The project will complement THT Marine Programme's (and the larger marine conservation community's) coral reef conservation efforts in the islands and the mainland coastline. It will help understand the distribution, status, and makeup of little-known deeper coral reef habitats that may be remote but ecologically connected to other reef areas, and will help gain a preliminary understanding of their conservation needs.

OUTCOMES (2023-24)

1) A trial using OpenROV Trident was completed in Pondicherry; this ROV model was found to be unsuitable for work, and significant takeaways were noted from this trial.
2) A trial using EyeROV Tuna was completed at Lakshadweep; this ROV model was found to be relatively well-suited for the work but with some improvements and method standardisation. The takeaways were noted.
3) The findings of the EyeROV trial were discussed with a gathering of Lakshadweep researchers at the Lakshadweep Knowledge Summit 2023 (IIT Gandhinagar).
4) Detailed plans were drafted for the next trial, using an upgraded model from EyeROV along with more advanced payloads, at a new mesophotic reef location in the Arabian Sea. This is also being discussed with the Indian Navy as a potential joint expedition under the THT-Navy collaboration

NEXT STEPS:

- Further trials with similar ROV models and more advanced payloads (accessories), to establish and standardise the survey method while simultaneously exploring new locations.
- [Long term] Surveying mesophotic reefs across Indian waters to build a baseline understanding of the ecological value and conservation needs of this little-known habitat type.

Fig 5.3 (Above) Tourism in Lakshadweep, in its current form, raises questions about its sustainability and ecological impact.

Project 3: Lakshadweep-Biomimicry Project

GOAL

Implement a bio-inspired model for land and sea management that will support the well-being and livelihoods of islanders

KEY COLLABORATORS

Biomimicry 3.8

OBJECTIVES

1) Develop a local-context-based model for land and sea management in the context of upcoming tourism in Lakshadweep
2) Support local communities while maintaining ecosystem integrity.

Tourism in Lakshadweep is experiencing a rapid and large-scale expansion, with the development of large-scale beach infrastructure and eased regulations. This brings with it an increased stress on the fragile ecology and structural integrity of these islands, which lie atop submerged coral reefs and also depend on these reefs for a plethora of ecosystem services. Keeping in mind rapid climate change and limited resources, while also recognising the role of tourism in the local economy, THT and Biomimicry aim to develop a local-context-based, bio-inspired model for land and sea management. This will support the well-being and livelihoods of local communities while reciprocally protecting, maintaining, and restoring the ecosystem integrity of the Lakshadweep islands.

THT entered into a MoU with Biomimicry 3.8 as a partner to develop an optimal bio-inspired model of ecological restoration and responsible tourism.

The project is divided into three phases:

1. Scoping Contextual Analysis
2. Discovery (translate biological Intelligence)
3. Create (bio-inspired ideation and concept development)

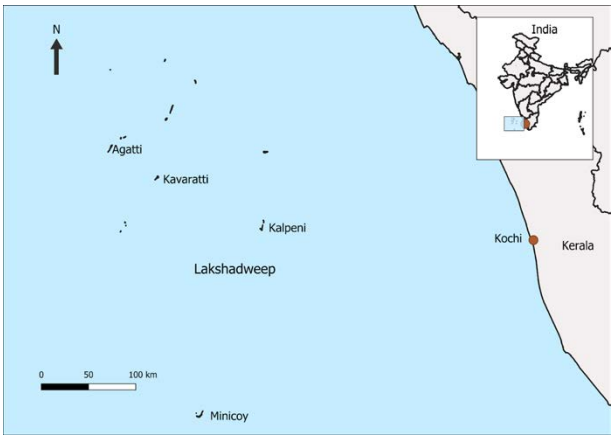
In March 2024, Biomimicry visited Bangaram Island in Lakshadweep to initiate the scoping phase of the project. The team from REEF and THT interviewed islanders in a rapid survey of the ecological and social context in Bangaram and Thinakara.

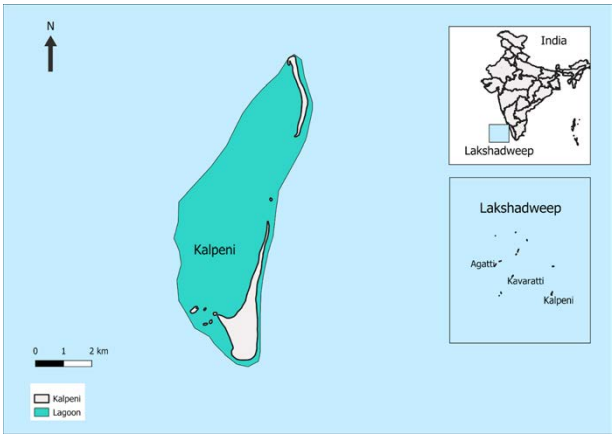
OUTCOMES

The project aims to develop locally attuned, nature-inspired design solutions to address the challenges of land, sea, and resource management for Kalpeni, an emerging tourism hub in Lakshadweep.

NEXT STEPS

The next steps will involve working on the Discovery phase (the second phase of this process) to identify, research, and translate nature's deep patterns and strategies that will solve primary challenges identified in the scoping





phase, to inform the design, development, and implementation of solutions on the ground. In the final Create phase, the Biomimicry 3.8 team will ideate holistic, multifunctional, locally relevant design solutions inspired by nature that align with the specific needs of the scenario.

These outputs will then be used by THT to engage with local stakeholders and the Lakshadweep Administration, to implement sustainable strategies and models with low ecological impact, for the ongoing and upcoming developments in Lakshadweep.

A. Conservation of coral reefs along India's mainland coastline

GOAL

To survey these reefs to assess their resilience potential and understand the interdependence between individual reefs, and human dependencies (for example, fisheries and marine tourism). It will then prioritise critical locations where management interventions can be targeted to achieve the best results for the reef ecosystem across the coast.

KEY COLLABORATORS

Goa and Karnataka – Barracuda Diving India
Maharashtra – Gomantak Scuba
Gujarat – Sustainable Ecology Foundation

REGIONS

Maharashtra, Goa, Karnataka

OBJECTIVES

1) Assess the resilience potential and local threats at each selected coral reef site.
2) Assess the biological connectivity of these various reef sites.
3) Prioritise critical reef sites using a matrix of ecological and psychometric findings.
4) Intervene at local levels using site-specific strategies to boost the resilience of the entire reef ecosystem along the mainland coastline.

Several lesser-known coral reefs lie along the coastline of mainland India. Some like those in the Gulf of Kutch are extensive, while others in Maharashtra, Goa, and Karnataka are small, scattered patches. However, they all host a considerable diversity of marine life and service their ecosystems.

Area	Site	Recruit density	Herbivore biomass	Herbivore diversity	LC cover score	MA cover score	Coral diversity	Diseased col. Prop.	Ecol. resil. score
Goa	Coral Garden	0.202381	0.020077	0.364747	0.977094	0.878635	0.730578	0.282011	0.493646
Goa	Navy Cove	0.666667	0.003003	0	0.648431	0.731115	0.416464	0.556584	0.431752
Goa	Rock & Ridge	0.019841	0.047315	0.308339	0.270027	0.673193	0.874943	0.634921	0.404083
Goa	On the Rocks	0.615079	0.003293	0	0.336966	0.519855	0.855839	0.454952	0.397998
Goa	Freddy's Nook	0.130952	0.108329	0.364747	0.225473	0.858472	0.469413	0.5012	0.379798
Goa	Roanna's	0.126984	0.100132	0.100715	0.212308	0.368614	0.868626		0.29623
Malvan	Tarkarli 2	0.277778	0.813465	0.776999				0.869147	0.684347
Malvan	Dharan	0.43254	0.49385	0.543158				0.689558	0.539776
Malvan	Kings 1	0.285714	0.236712	0.522924				0.791893	0.459311
Malvan	Chiwla Beach	1	0.078815	0.160305				0.568414	0.451884
Malvan	Tarkarli 1	0.079365	0.317122	0.587453				0.716049	0.424997
Malvan	Kings 2	0.218254	0.428233	0				0.837341	0.370957
Malvan	Classroom	0.134921	0.123467	0.237094				0.40455	0.225008
Netrani	North Tip	0.166667	1	0.686647	0.217792	0.824196	0.574629	0.495419	0.566479

Fig 5.4 (Above) An example of resilience scores as a result of the ecological surveys. Green indicates a high resilience score, red indicates a low one (Blank cells are sites where data is being analysed).

Although many species here have evolved to tolerate mainland coastal conditions (turbid waters, higher nutrient loads), they are now threatened by worsening weather patterns, increasing marine tourism in these areas, and coastal pollution. Their inherent resilience can be supported through THT's interventions.

The project aims to survey these reefs to assess their resilience potential and understand the interdependence between individual reefs, and human dependencies (for example, fisheries and marine tourism). It will then prioritise critical locations where management interventions can be targeted to achieve the best results for the reef ecosystem across the coast.

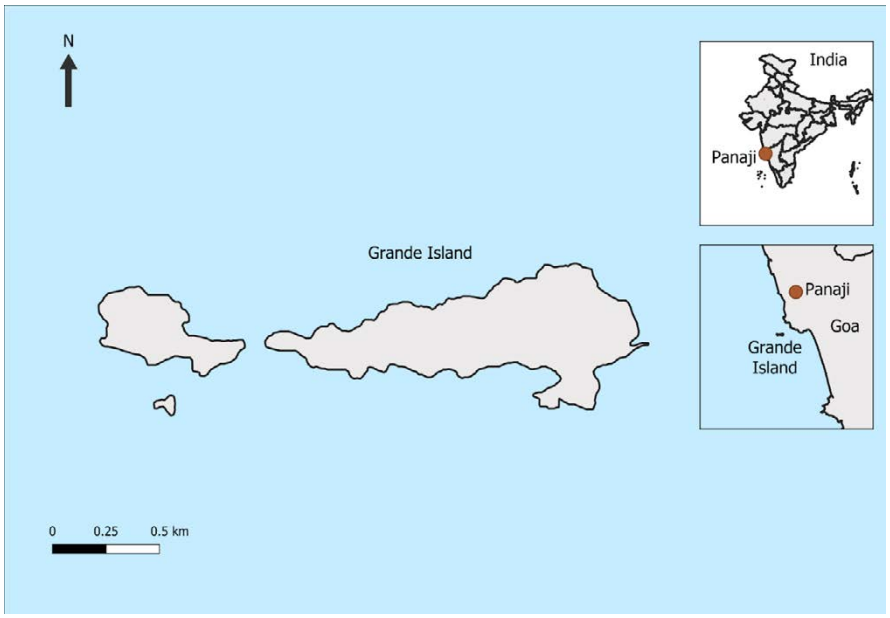
The ecological resilience surveys involve diving and collecting data about species diversity, resilience-based classification of corals, and functional role-based classification of reef fish and other organisms. These and other parameters will help analyse the data to know the resilience potential of each surveyed site. Surveys have been conducted for reefs at Grande Island (Goa), Netrani Island (Karnataka), and scattered reef patches in Sindhudurg (Maharashtra).

Simultaneously, a connectivity analysis between these sites is underway to determine larval dispersal between these reefs on ocean currents. The results could help further identify reefs that are important larval sources to other reefs around them, thus taking the site prioritisation exercise further.

The findings from the ecological analyses and the CBS work will be synthesised to understand the status and needs of each site and to prioritise sites for conservation action accordingly.

OUTCOMES

To prioritise important conservation sites as critical points in the wider coral reef biome across the Indian coast, and then implement locally-tailored conservation strategies at each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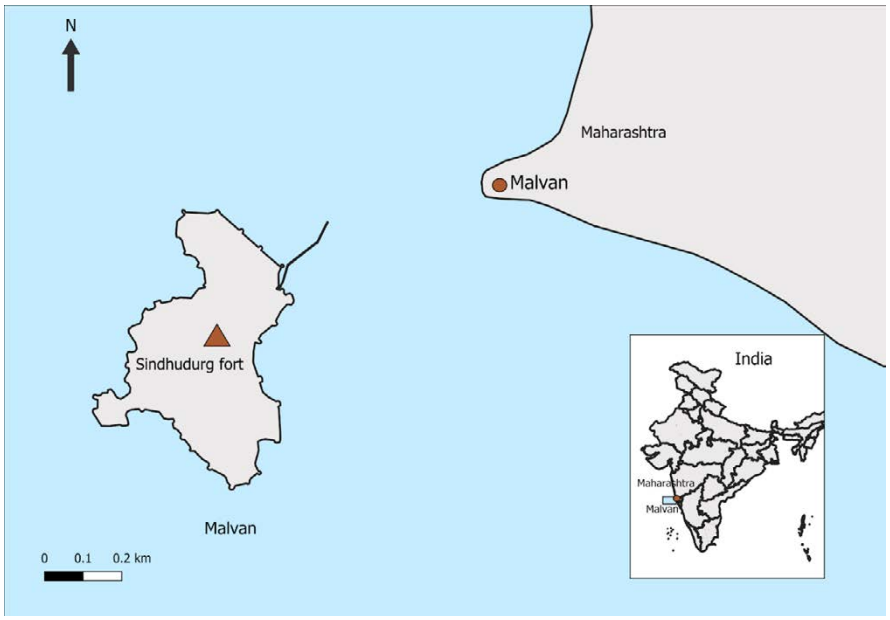
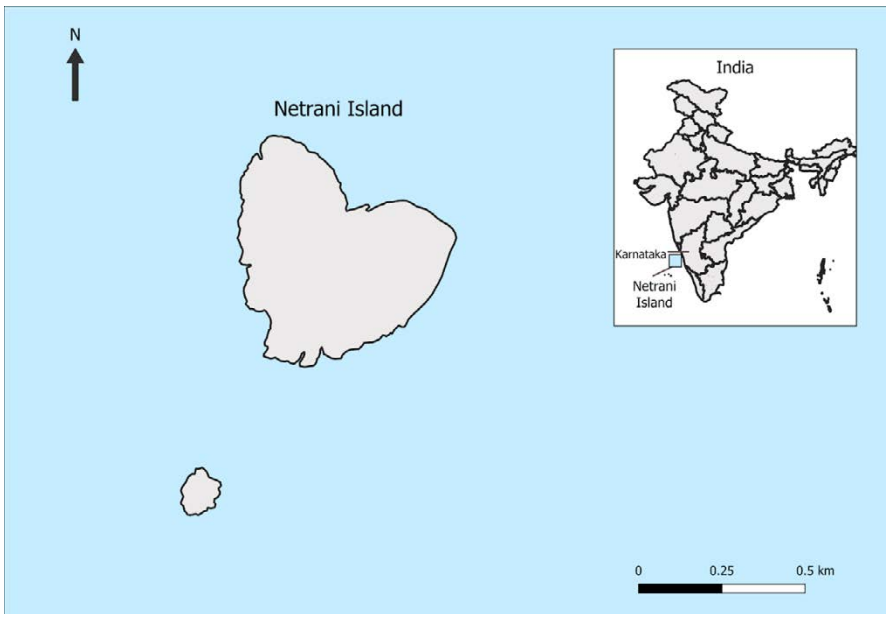

N
Maharashtra
Malvan
Sindhudurg fort
Malvan
India
Maharashtra
Malvan
0
0.1
0.2 km


N
Netrani Island
India
Karnataka
Netrani
Island
0
0.25
0.5 km

target site to produce a positive conservation outcome for the entire mainland coastal coral reef ecosystem in India.

NEXT STEPS

- Surveys for reefs in the southern Gulf of Kutch (GJ) and the Gulf of Mannar/Palk Bay area (TN) are being planned.
- Data from the three regions already surveyed is being analysed in a comparative resilience framework.
- Ecology between all of the above sites is being analysed.
- Social science surveys are being undertaken, the results of which will add a layer to the prioritisation framework to select sites for the most impactful intervention.

B. Indian Oil Sardine Project

GOAL

To bring together knowledge about the Indian Oil Sardine, as a species that is a prominent feature and an important trophic link in the pelagic ecosystem off India's Western coast through a film. Its vital role in the economies, livelihoods, nutrition, and culture of the human communities living here, will also be considered.

KEY COLLABORATORS

Evanescence Studios

REGIONS

Karnataka, Kerala, Tamil Nadu

OBJECTIVES

1) Develop a consolidated understanding of the Indian Oil Sardine – its ecology, changes to its biology, how these are affected by its fishery and trade, and how these changes in turn affect the economy and social aspects centred around this fish.
2) Document the interconnectedness of the Indian Oil Sardine with communities and conservation through a film.
3) Engage in dialogue with fishery decision-makers on the issues concerning pelagic fisheries such as this one.

Fig 5.5 (Above) A large catch of Indian oil sardine on the deck of a fishing vessel off Karwar, Karnataka in 2015; such catch are now few and far between.

The Indian Oil Sardine has undergone drops and recoveries in the past decades, but the drops seem to be getting longer-lived and larger in scale, and the recoveries shorter-lived. The result is that the entire economy centred around this fish suffers, livelihoods and nutrition are affected, and there are likely to be ecological impacts in the sea that aren't being documented.

This is viewed as a story taking place over many decades, through multiple disciplines and from the perspectives of people (fishers, traders, consumers, and researchers) connected to this species in different ways.

These facets and their interconnectedness will be documented as a film, which will be presented not just to the general public, but also to fishers, boat owners, and fishery managers. While conservation and management efforts will be part of the film, it will acknowledge that adverse issues may not be due to a singular cause or the sole responsibility of a particular stakeholder, but many factors, some of which are beyond local control. This could include climate change effects on the species' life history.

EXPECTED OUTCOME

Through the sardine film, THT aims to showcase a consolidated picture of the complex case of Indian oil sardine ecology and fisheries. This output is targeted toward open audiences as well as in a more targeted manner towards decision-makers in the realm of sardine fishing and utilisation.

OUTCOMES (2023-24)

1) A Film partner (Evanescence Studios) has been engaged; scripting, storyboarding done between the partner, THT Marine team and THT Communications & Outreach team.
2) Economics research team engaged for work to be commenced later in 2024.

NEXT STEPS

- Filming of a few expert interviews will be undertaken by August 2024, along with the completion of animated visuals which are underway. The first edition of the film is expected to be completed by October 2024, after which THT will work on communicating it to the desired stakeholders.

C. Mitigate adverse impacts of Indian Navy SONAR pinging on marine mammals

GOAL

Minimise the impact of Indian Navy SONAR on Cetaceans.

KEY COLLABORATORS

Indian Navy

OBJECTIVES

1) Recommend best practices for reducing the impact of Indian Navy SONAR on Cetaceans.
2) Conduct research in association with the Indian Navy to fill critical knowledge gaps, such as habitat use and movement ecology of marine mammals, to inform finer-scale regulations for sonar use

Cetaceans, the marine mammal group that includes whales, dolphins, and porpoises, are threatened globally, and protected by law in many nations including India. Among the 30 species recorded in Indian waters, most are poorly studied, and conservation measures that may be urgently required are impeded by a lack of understanding of the Indian context. Global studies confirm that certain anthropogenic stressors that also exist in Indian seas, can threaten cetaceans.

THT and the Indian Navy are parties in an MoU that, among other objectives, aims to reduce the ecological footprint of Naval operations. The Indian Navy requested THT to draft recommendations for reducing the impacts of SONAR pinging on marine mammals. SONAR (Sound, Navigation, and Ranging) is a technology that, as the term implies, uses the reflections of sound

pulses underwater to detect obstacles and objects of interest.

Since cetaceans use a biological form of this phenomenon for their activities, and other sounds for communication and breeding, they are highly sensitive to strong artificial sounds. Cetacean mortality in connection with such sounds, especially Naval SONAR, has been documented conclusively in other parts of the world. The US Navy has regulations to reduce the impact of these activities. The Indian Navy is keen to adopt similar measures to be used in its exercises and joint exercises that India is party to.

OUTCOMES

THT has compiled an overview of recommended best practices, including SONAR usage regulations, and steps to follow when a cetacean is detected during pinging exercises. A set of long-term collaborative recommendations has also been provided. This includes information that can help the Indian Navy fill the knowledge gaps that hinder more precise, context-specific solutions. This report has been submitted to the Indian Navy and has been received positively.

NEXT STEPS

- Dialogue with the Navy for practical implementation of these guidelines, and simultaneously pitching for research to fill the aforementioned knowledge gaps to help make sonar regulations more relevant to the Indian context while being feasible to execute. THT strives for a long-running partnership with the Indian Navy for the conservation of cetaceans in the relatively unexplored offshore waters of India.

Fig 5.6 (Above) A Bryde's or Eden's whale (*Balaenoptera edeni*) mother and calf photographed off Karwar, Karnataka.

On-Ground Initiatives

INTRODUCTION

India's diverse biogeography presents many habitats across terrestrial and freshwater realms. These habitats support many species, some as unique as the habitats themselves, that lead to forming a functional ecosystem or part of larger ecosystems that contribute to the global processes that govern life on Earth. Many such habitats and species inhabiting them face challenges of survival and persistence in this Anthropocene epoch.

Despite the challenges, India has always been an example of conservation success and co-existence for the world. An important reason for this, along with a vastly tolerant population, is a big community of scientists, activists, and conservationists working tirelessly on addressing the challenges of many such habitats and species.

Yet, many habitats, species, and ecosystems remain lesser known and may disappear before we understand them. These lesser-known habitats and species are often endemic, rare, or specialist, needing attention and care for conservation action. Like the habitats and species, the community that works on them faces challenges in bringing about conservation action and success. These challenges range from lack of expertise, access to technology, and government or institutional support to resources. These challenges often reduce the scope of impact and overall conservation success.

The On-ground Initiatives programme at THT aims to fill these gaps in conservation action, focusing on lesser-known species and habitats. This is achieved through on-ground work and collaborations, enabling those working in focused landscapes to bring about lasting conservation action.

OBJECTIVES

1) Identify and fill broad gaps in ecological knowledge and conservation requirements in terrestrial and freshwater landscapes. This is achieved through research and evidence-based intervention, and if necessary, a network of partners.
2) Establish a strong network of teams across India working with the common goal of human well-being through inclusive biodiversity conservation.

On-Ground Initiatives is the most expansive programme at THT and has in the past year, expanded significantly. In 2023-24, On-ground Initiatives had 11 active programmes with multiple projects, and 12 partners/collaborators working in over 28 states. It has a direct impact on nearly 7,000 sq km of land and an indirect impact on over 50,000 sq km of wild habitats across India.

1. The UP Grasslands Project (Bengal Florican Conservation Project)

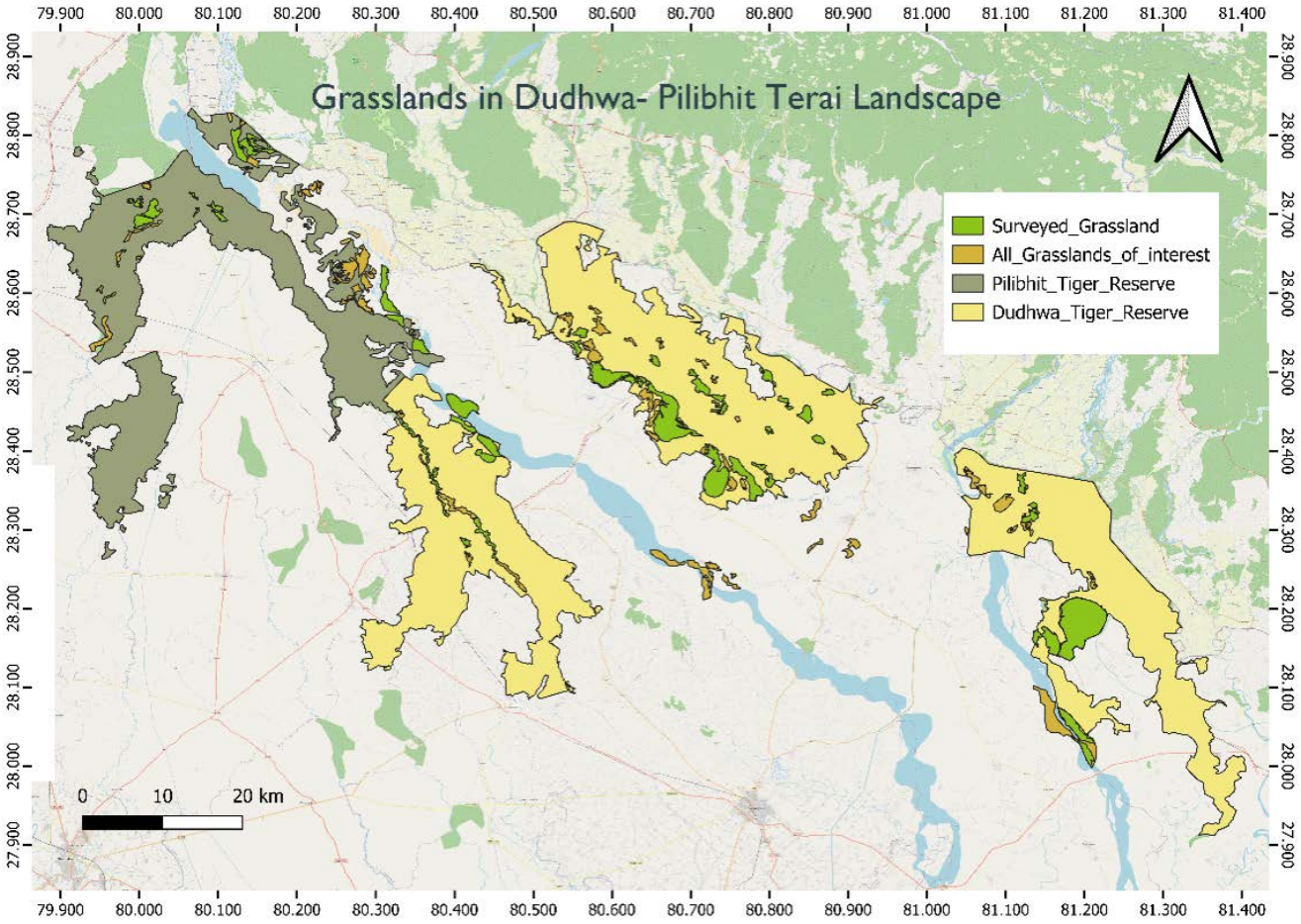
Associated THT programme: Conservation Behavioural Science

The alluvial grasslands of Terai are among the most threatened ecosystems with many grasslands obligate species facing extinction threats. Conserving these grasslands by working with the stakeholders to ensure a healthy and functional habitat is a priority. Grasslands are threatened by rapidly changing ecologies and ill-planned management regimes followed by anthropogenic pressures outside the protected areas. The challenges need to be addressed holistically to ensure the survival of iconic species such as the Bengal Florican and the grassland habitats.

GOAL

To conserve the alluvial grasslands of Uttar Pradesh and its obligate species with Bengal Florican as a model species.

List of Active Projects in 2023-24				
Sl. No	**Project Name**	**Partners**	**States of work**	**Started on**
1	UP Grasslands Project (Bengal Florican Conservation Project)	Uttar Pradesh Forest Department	Uttar Pradesh	Aug 2022
2	Indian Navy Project	Indian Navy	Open Seas Across India, Karnataka, Kerala, Orissa, Maharashtra, Nicobar	Mar 2023
3	Hoolock Gibbon Project	Conservation Initiatives, Aaranyak	Arunachal Pradesh,Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura	June 2023
4	Pygmy Hog and Grasslands Project	Aaranyak	Assam	Feb 2023
5	Deccan Carnivore Project	Holematti Nature Foundation	Karnataka	June 2023
6	Western Ghats Lateritic Rocks Project	Bombay Environmental Action Group	Maharashtra	Sep 2021
7	Armed Forces Project	Bombay Natural History Society Indian Army	Ladakh	June 2022
8	Open Natural Ecosystems Project	MD Madhusudan Pradeep Koulgi	Pan India	Mar 2023
9	Conservation Capacity Building Project	Conservation Action Trust	Madhya Pradesh, Goa, Assam	Mar 2023
10	State of India's Birds	Nature Conservation Foundation	Pan India	Sep 2023



KEY COLLABORATORS

Uttar Pradesh Forest Department

REGIONS

Dudhwa and Pilibhit Tiger Reserves, spread across the districts of Lakhimpur Kheri, Pilibhit and Bahraich in Uttar Pradesh, India

OBJECTIVES

1) Identify important sites and understand the management impact on alluvial grasslands.
2) Support the Forest Department in conserving grasslands and provide technical inputs.
3) Address grassland conservation issues outside protected areas.

WORK DONE IN 2023-24

For the years 2023-24, a systematic survey of avifauna to grassland attributes was conducted across the working landscape and important sites for conservation were identified. Data from the surveys is being used to determine the impacts of management in grasslands and avifauna. For the welfare of frontline forest department staff, the Dudhwa Psychographic Report was unveiled and a 'Leadership and Work Environment' workshop was conducted for Range Forest Officers and Deputy Range Forest Officers. In addition, five bikes were donated to the forest department for patrolling in the Pilibhit Tiger Conservation Foundation.

EXPECTED OUTCOME

1) An informed grassland management plan focusing on overall grassland functionality to support several grassland species.
2) The conservation of grasslands outside protected areas (riverine) and restoration of grasslands under threat.
3) The reintroduction of species like the Bengal Florican in the system to reinstate the ecology and functionality of the grassland ecosystems.

2. Hoolock Gibbon Project

Associated THT programme: Tech for Conservation

The Endangered, Western Hoolock Gibbon is India's only ape that resides in the lowland rainforests of Northeast India. With the expansion of agriculture and infrastructural activities, the rainforest habitat for these gibbons has largely reduced and fragmented thereby threatening the survival and genetic connectivity among the gibbon populations. The habitats used by gibbons are extremely biodiverse and home to many other threatened species. Conserving gibbon habitats will ensure the survival of gibbons and other associated flora and fauna. This will in turn protect functional rainforests that help fight climate change.

GOAL

To secure key Hoolock Gibbon populations and habitats, improve habitat and genetic diversity connectivity, and identify and implement key recommendations for gibbon conservation. To build capacity among the stakeholders to take conservation action.

REGIONS

Rainforests of Assam, Meghalaya, Nagaland, Arunachal Pradesh, Manipur, Mizoram and Tripura.

OBJECTIVES

1) Assess population status and distribution of gibbons in Northeast India.
2) Assess landscape connectivity for gibbons in select conservation landscapes.
3) Assess region-specific threats to gibbons and their habitat.
4) Support community-based conservation.
5) Undertake capacity building of forest frontline staff and local community to take conservation action.
6) Undertake landscape-level habitat change assessment of gibbon populations using geospatial technology.
7) Undertake landscape-level monitoring of gibbon populations using genetic tools.
8) Evaluate physiological stress in gibbons in human-dominated landscapes through enzyme immunoassays-based analysis of faecal glucocorticoid levels.

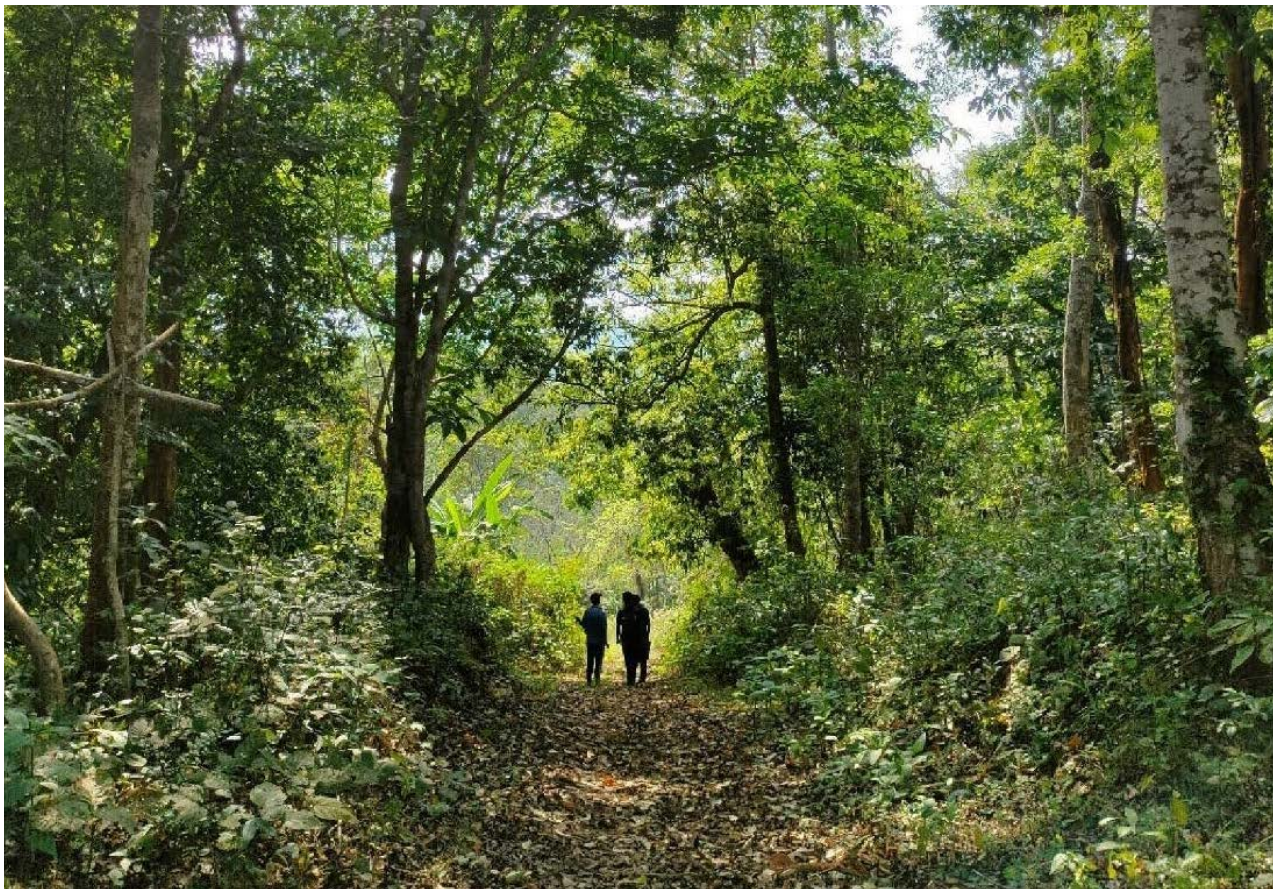
WORK DONE IN 2023-24

For the year 2023-24, a systematic study along with interviews with the community was conducted to assess Hoolock Gibbon populations and identify key areas for conservation in the states of Arunachal Pradesh, Assam, Meghalaya and Nagaland, including the unexplored Karbi-Anglong district of Assam, where a good population was found. To estimate the Hoolock Gibbon population, an experimental study with acoustic monitoring was completed. Community engagement activities were organised in the Hoolock Gibbon sites to improve awareness regarding the species.

Apart from systematic studies, a detailed land use land cover (LULC) map has been generated for all the Hoolock Gibbon habitats in Northeast India. All prerequisites for the genetic study of the gibbon populations have been arranged. Detailed training was also conducted for the Assam Forest Department to understand the Hoolock Gibbon ecology and behaviour to improve monitoring and conservation action.

EXPECTED OUTCOMES

1) The first landscape-level population estimation of the Hoolock Gibbon population in Northeast India.
2) Understanding the genetic makeup of the gibbon populations and drivers of physiological stress among the populations to develop and execute a conservation action plan.
3) A well-informed and capable forest staff and community members to aid in conservation efforts for the Hoolock Gibbon.



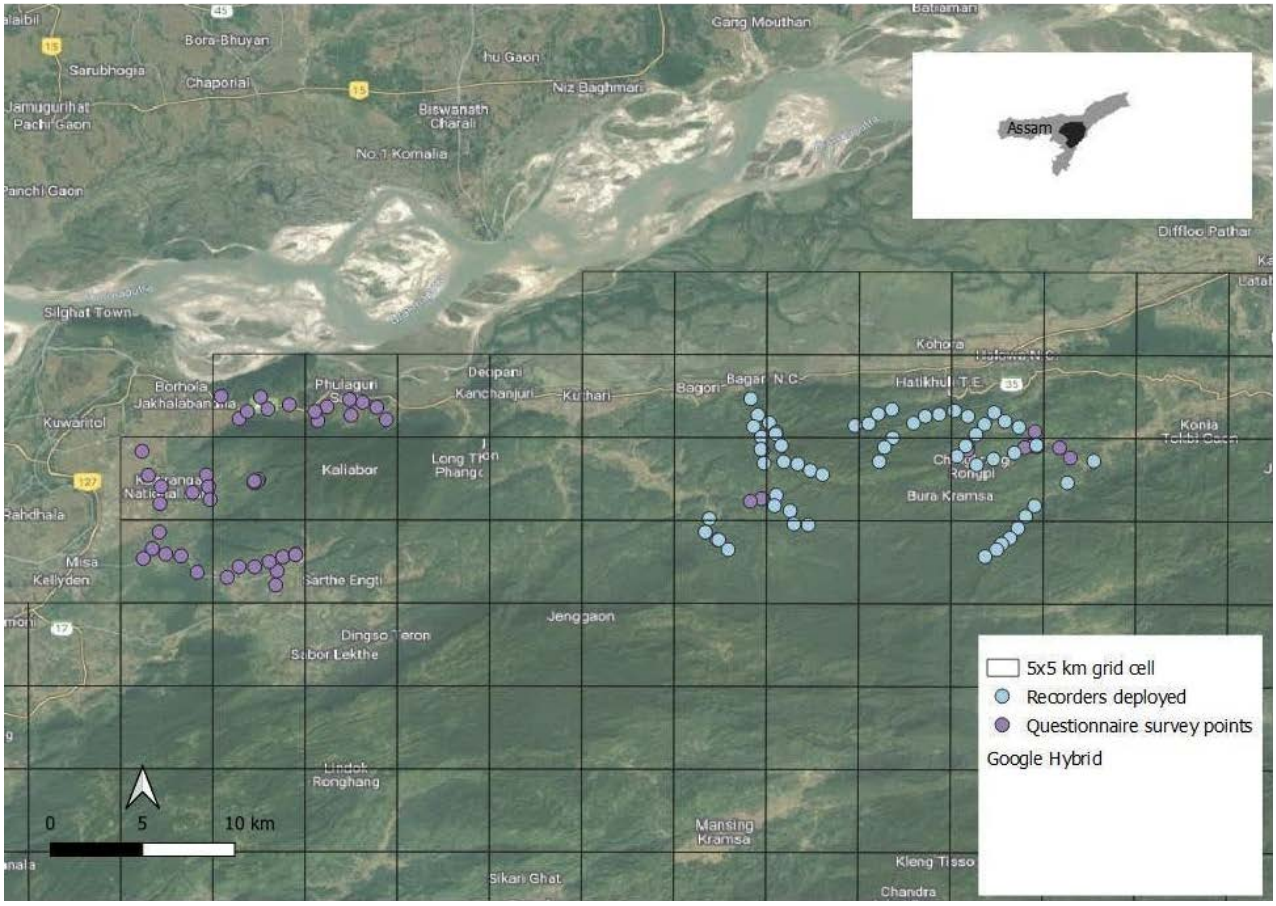


Fig 6.1 (Top) Hoolock Gibbon survey in North-east India.
Fig 6.2 (Above) Map depicting population estimation grids using audio recorders in Karbi Anglong, Assam.

3. Pygmy Hog and Bengal Florican Conservation Project

Pygmy Hog and Bengal Florican are two Critically Endangered grassland specialist species on the brink of extinction, with a global population of around 200 individuals. Sub-Himalayan alluvial grasslands of Assam are some of the last homes for both species. The Pygmy Hog, the smallest wild pig in the world, is extremely susceptible to habitat changes, disturbance, and disease threats.

The Bengal Florican on the other hand is losing its prime grassland habitat to lek and breed and is vulnerable to hunting pressures outside protected areas. Ensuring secure habitats with ideal attributes is critical for the survival of these two species. While the reintroduction of Pygmy Hogs is already underway, the future of the Bengal Florican is yet to be decided.

GOAL

Conserving the rich and diverse sub-Himalayan grasslands for the benefit of dependent endemic species, including the Pygmy Hog *(Porcula salvania)* and the Bengal Florican *(Houbaropsis bengalensis)*, and the communities which rely upon them.

KEY COLLABORATORS

Aaranyak, Durrell Wildlife Conservation Trust

REGION

Manas National Park, Orang National Park, and other Sub Himalayan grasslands beyond Assam.

OBJECTIVES

1) Research and develop best practices for grassland habitat management and restoration.
2) Investigate the feasibility of targeted interventions for Bengal Florican conservation in Assam.

Fig 6.3 (Above) Camera trapping for Pygmy Hog survey in Manas National Park.

3) Habitat restoration beyond Manas NP and investigate the potential for grassland habitat restoration in other sub-Himalayan sites.
4) Community-based biosecurity for Pygmy Hog survival and livelihood resilience.

WORK DONE IN 2023-24

Grassland management activities were conducted to reduce woody invasion in Manas and Orang National Park. Bengal Florican surveys were conducted in the grasslands outside protected areas in the Manas Tiger Reserve landscape and Orang Tiger Reserve. A visit to Dudhwa Tiger Reserve was also made, to assess the feasibility of Pygmy Hog Reintroduction beyond the Manas landscape. A Biosecurity unit was created at the Pygmy Hog breeding facility.

EXPECTED OUTCOMES

1) A well-planned comprehensive management plan for the grassland habitats of Pygmy Hog and Bengal Florican.
2) Restoration of grassland habitats in the sub-Himalayan grasslands associated with both species.
3) Involvement of communities in monitoring and checking disease spread in pig populations.

4. Deccan Plateau Carnivore Project

Wild canids (Indian Gray Wolf, Golden Jackal, Bengal Fox) and hyenas are among the most underrepresented groups of large carnivores in India in scientific research and conservation. The wildlife habitats in the Deccan Plateau where these species thrive, including the rocky outcrops, dry evergreen forests, woodland savanna, and scrub forests, are lesser known and endangered due to a lack of understanding and appreciation about their importance from a wildlife conservation perspective.

Wild canids are important predators in the Deccan ecosystems and hyenas are important scavengers in the landscape. A low priority on their conservation efforts may reduce their populations and eventually lead to disruption of ecological processes in the landscape.

GOAL

Conservation of Wild canids and hyenas in the Deccan Plateau landscape of Karnataka.

KEY COLLABORATOR

Holematthi Nature Foundation

REGION

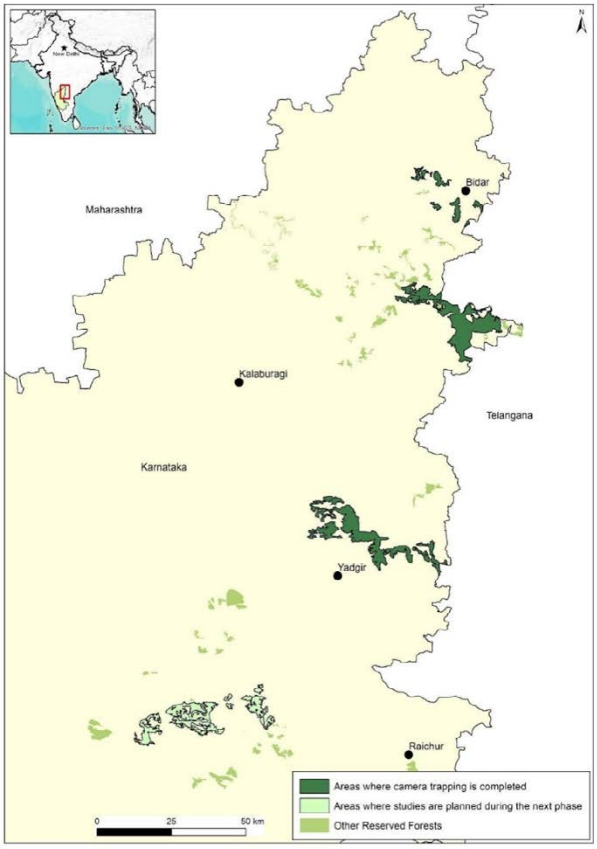
North Karnataka Deccan Plateau

OBJECTIVES

1) Understand the distribution of three canid species (Indian Gray Wolf, Golden Jackal, and Bengal Fox) and the Striped Hyena across the Deccan Plateau in Karnataka.
2) Estimate relative abundance for the three canid species and their prey, and absolute abundance for the Striped Hyena in a few select sites across the Deccan Plateau in Karnataka.
3) Evaluate and identify areas with high conservation potential for wild canids and hyenas for conservation investment and protection efforts.
4) Develop public support and awareness through outreach activities with wild canids and hyenas as flagship species.

WORK DONE IN 2023-24

All priority habitats within the working landscape were identified for the canid study and conservation. A systematic camera trapping exercise helped assess the relative abundance of the three canid species along with the Striped Hyena. For outreach, a conservation short film in Kannada has been charted and discussions for the development of the film are ongoing.



EXPECTED OUTCOMES

1) Distribution maps and population estimates of three canid species and Striped Hyena in the North Karnataka, Deccan Plateau landscape.
2) Identification of key areas that can be included in existing PAs or made into new ones.
3) Acknowledgement and positive perception among the people for these species in the landscape.

5. Conservation Workshops with CAT

Despite many wildlife biologists, scientists, and wildlife enthusiasts in India, only a few in the community are well-informed about methods to approach environmental or wildlife-related challenges. The lack of knowledge of environmental laws, information-gathering methods, and the roles and responsibilities of government bodies often cause hindrances in conservation action or advocacy. Upskilling people dedicated to the field of wildlife and conservation in the above can help them take necessary decisions and actions to carry out conservation activities.

Fig 6.4 (Top) Sampling sites for Deccan Carnivore Project in North Karnataka.
Fig 6.5 (Above) One of the capacity building workshops conducted for wildlife enthusiasts.

GOAL

To carry out three capacity-building workshops for wildlife/conservation enthusiasts to tackle environmental issues.

KEY COLLABORATORS

Conservation Action Trust

REGION

Pench Tiger Reserve, Madhya Pradesh; Goa; Kaziranga Tiger Reserve, Assam

OBJECTIVES

To inform and train workshop attendees on the following topics:

1) Introduction to Forests, Wildlife, Environmental Issues.
2) Legislation — Forest and Wildlife laws, EPA, CRZ, EIA notifications.
3) Roles and responsibilities of Governments, Government agencies, and other statutory authorities.
4) Information gathering techniques — in the field, accessing information from other sources.
5) Documentation of information.
6) Case Studies.

WORK DONE IN 2023-24

Four workshops for wildlife enthusiasts were conducted in Pench Tiger Reserve, Kaziranga Tiger Reserve, Goa, and Kanha National Park. Participants were informed about wildlife laws and policies, the roles of government policies, and techniques to conduct systematic ecological studies. They also learned about strategies for conservation action in various capacities.

EXPECTED OUTCOMES

A set of well-informed and trained people who can take necessary action or assist in conservation activities.

6. State of India's Birds

India is one of the richest countries in bird life. With several peer-reviewed science reports declaring the global decline of birds, special focus is needed to know how the birds in India are faring and the distribution and abundance trends over time. This information is as crucial for common species as for threatened ones to ensure effective conservation action.

GOAL

To provide an assessment of the conservation status of Indian bird species, by estimating their abundance trends. In the long term, this will help with better strategies for conserving abundant and threatened species.

KEY COLLABORATOR

Nature Conservation Foundation (Bird Count India)

REGION

Pan-India

OBJECTIVES

1) To publish and launch a report titled 'State of India's Birds 2023'
2) To build an accompanying website with additional features that make the results, as well as underlying data available in a user-friendly form for a variety of stakeholders.
3) To develop the State of India's Birds project as a continued effort, going beyond the report and website.

WORK DONE IN 2023-24

The State of India's Birds report was created and unveiled at a public event in New Delhi. The report was provided to various authorities. An official website of the State of India's Birds was also developed and is currently active.

EXPECTED OUTCOMES

1) An updated distribution and conservation status report for birds of India.
2) Use of the report to update the IUCN status of birds.
3) Referable document to advocate for conservation action and policy.

7. Open Natural Ecosystems Project

Associated THT programme: Tech for Conservation

India's semi-arid Open Natural Ecosystems (ONEs) are a set of terrestrial habitats with sparse or no tree cover. These include systems, such as woodland savannas, shrublands, grasslands, and sand dunes. Each system has a unique biodiversity that has supported culturally diverse pastoral and agro-pastoral communities for centuries. ONEs have been viewed by the governments as 'wastelands', putting them under the immense pressure of diversion for development and more

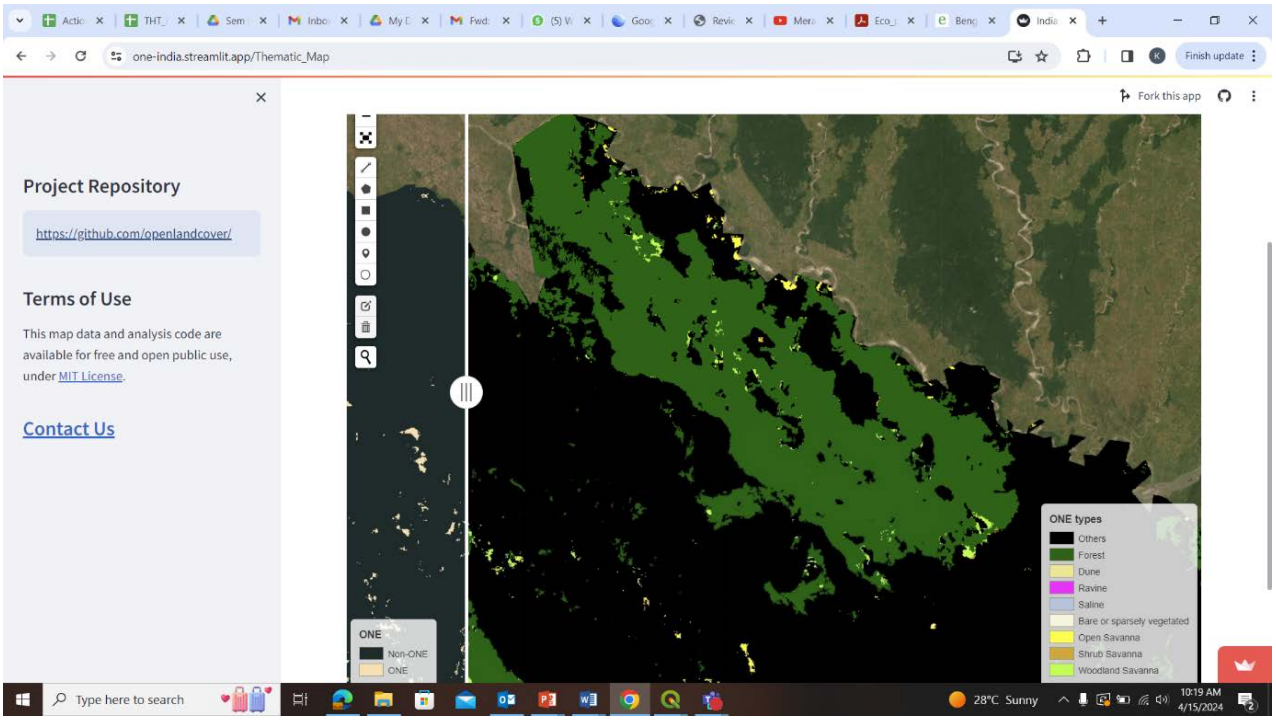


Fig 6.6 (Top) Cover page for the State of India Birds Report 2023.
Fig 6.7 (Above) ONE map application developed by ONE team.

productive land uses such as agriculture or industry. With the potential for ONEs to sequester carbon in the time of climate change and the overall value held by the systems for their ecological and agro-pastoral role, it is important to know the accurate distribution and extent of these for their better management

GOAL

To work towards building a reliable, open-source, spatio-temporal dataset on India's Open Natural Ecosystems (ONEs) that can assist in conserving and managing their biological and cultural diversity.

KEY COLLABORATORS

MD Madhusudan & Pradeep Koulgi

REGION

India's semi-arid zones, spanning 18 non-Himalayan states in mainland India.

OBJECTIVES

1) Better mapping of ONEs across space.
2) Better mapping of ONEs over time.

WORK DONE IN 2023-24

The development and release of a 30 m resolution map for all Open Natural Ecosystems (ONEs) in India. The Development and launch of a limited-use open-source app to make the ONE map available for researchers and conservation practitioners.

EXPECTED OUTCOME

Reliable maps of grasslands across space to advocate and plan for conservation action.

8. Armed Forces Project

India has international land and marine borders stretching more than 22,000 km. These border areas, are critical for national security but are also home to threatened and rare wildlife including the Snow Leopard, Tibetan Argali, Ladakh Urial, Tibetan Antelope, Black-necked Crane, and Brown Bear. While the state and UT Forest departments are the main custodians of biodiversity, there is an urgent need to engage with and strengthen the

Fig 6.8 (Above) Workshop with Indian Army personnel on biodiversity and waste management by Bombay Natural History Society.

other main stakeholders of the bordering regions, including the Indian Army.

GOAL

Long-term biodiversity monitoring and conservation along India's international borders in partnership with the Indian Army.

KEY COLLABORATOR

Indian Army and Bombay Natural History Society (BNHS)

REGION

Ladakh

OBJECTIVES

1) Integrating a module on biodiversity, the environment, and climate change in the Indian Army training curriculum.
2) Reviving eco-cells in each command of the Indian Army and Army Headquarters.
3) Monitoring of Critically Endangered Wildlife.
4) Addressing the issue of feral dogs in the Changthang region of Ladakh with the help of the Indian Army.
5) Addressing the issue of human-Brown Bear conflict in the Drass region of Ladakh.

WORK DONE IN 2023-24

1) Detailed workshops and training classes about biodiversity, the environment, and climate change were delivered to the Indian Army commands in Ladakh.
2) Systematic surveys were conducted to assess the presence of threatened wildlife and their associations with free-ranging dogs. In four villages of Ladakh with a high conflict between free-ranging dogs and wildlife, dogs were neutered under specialised veterinary care to counter the population in the region. Strategies to resolve the garbage issues (the root of the feral dog problem) were further discussed with army officials.

EXPECTED OUTCOMES

1) Reduction in the feral dog issues and bear conflict in Ladakh.
2) Protection and monitoring of threatened wildlife in areas commanded by the Indian Army.

9. Kokan Sada: Conserving the Lateritic Plateaus of South-Western Maharashtra

Associated THT programme: Conservation Behavioural Science

The thin strip of lateritic plateaus in the Western Ghats is a habitat under threat from human pressures. These plateaus in Maharashtra, especially in the districts of Ratnagiri and Sindhudurg, face immense threats from quarrying, plantations, and rapid urbanisation in the landscape that comprises private lands.

These areas are special because of the high rates of endemism in flowering plants and also because they form headwaters of many important rivers in the region acting as the water providers for millions of people. THT's partner from the grants programme, Bombay Environmental Action Group (BEAG), has worked on understanding the uniqueness of the landscape. It was discovered that there is an urgent need to scale up the work and involve all stakeholders of the region to identify site-specific intervention measures for effective conservation.

GOAL

Form a multi-stakeholder partnership and implement effective conservation measures to protect the Kokan Sadas and their bio-cultural heritage.

KEY COLLABORATOR

Bombay Environmental Action Group and other stakeholders of the region.

REGION

Lateritic outcrops in Ratnagiri and Sindhudurg districts in Maharashtra.

OBJECTIVES AND OUTCOMES

1) Identify and bring together various diverse stakeholder groups interested in conserving the bio-cultural heritage of Kokan Sadas.
2) Test various behavioural, economic, and ecological intervention strategies and implement them for the long-term protection of the biocultural heritage of the region.
3) Derive ecological functioning baselines for habitats with Kokan Sadas as a model.

WORK IN 2023-24

Concerted efforts in conserving the lateritic outcrops are ongoing.

10. The Indian Navy Partnership Project

Associated THT programme: Marine & Tech for Conservation

In open seas and on the coasts of India, marine biodiversity is often ignored from the conservation point of view despite being well-explored for mining, oil extraction, and fishing. The sea is home to many threatened species of marine mammals, coral reefs, and other marine fauna. There is a huge knowledge gap about the ecology and movement of marine mammals in Indian waters, and there is a need to bridge the gap to ensure marine mammal conservation in India, and globally.

Many marine species show a declining trend in their population, affecting various trophic

Fig 6.9 (Top) Vegetation on lateritic outcrops (Sadas) in Konkan region in winter.

levels and causing losses in habitat and diversity. Plastics, ghost nets, and pollution are causing habitat loss, including coral reefs, and the deaths of various marine species. The Indian Navy produces a significant ecological footprint through SONAR pinging, waste management issues, and testing arms in ecologically sensitive areas.

GOAL

Undertaking effective conservation measures of India's open seas and coasts with the Indian Navy.

KEY COLLABORATORS

Indian Navy, The Habitats Trust, and HCL Foundation

REGIONS/MAPS

Indian Sea (the Arabian Sea and Bay of Bengal), sunken coral reefs, Lakshadweep, and Andaman-Nicobar Islands.

OBJECTIVES

1) Reducing the ecological footprint of the Indian Navy
2) Conservation of marine species and habitats by bridging gaps through studying their ecology and movement.
3) Restoration of coral reefs and islands.
4) Reducing plastic pollution on the coast and in the open sea.
5) Engage with the Navy Welfare and Wellness Association (NWWA) to educate and scale up the conservation drive.
6) Training Indian Navy personnel on environment and biodiversity conservation.
7) Reducing plastic pollution in the open sea

The collaboration focuses on the conservation of marine fauna and habitats. The main objective of this collaboration is to reduce the ecological footprint of the Indian Navy.

WORK DONE 2023-24

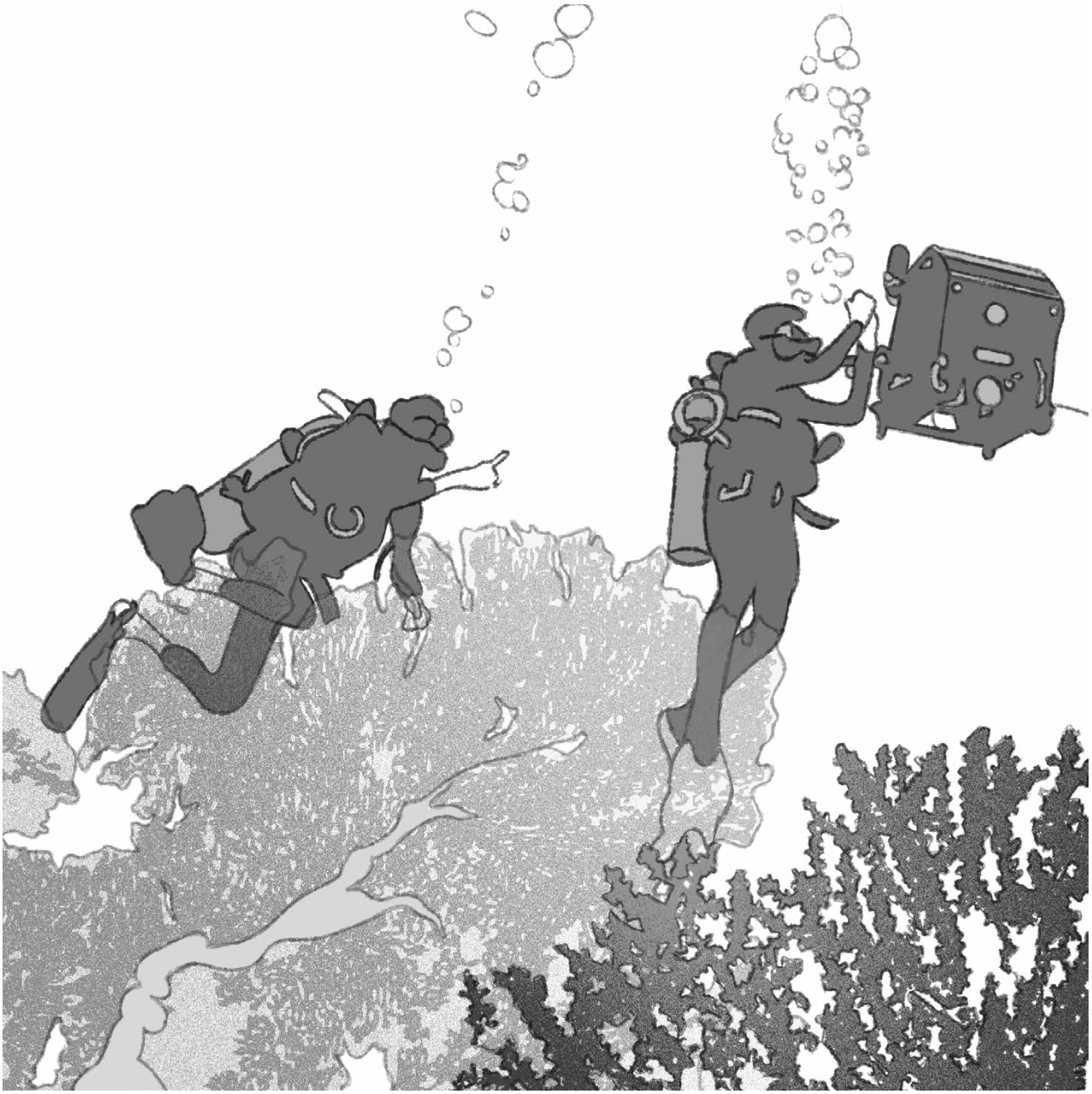
In 2023-2024, THT, the Indian Navy, and the HCL Foundation collaborated to reduce the ecological footprint of the Indian Navy on biodiversity. THT conducted biodiversity surveys, engaging with navy officers, NWWA, and their families to foster conservation at multiple naval bases. A recce survey was conducted in Lakshadweep for coral reef and seagrass restoration. Educational signboards were installed at the Karwar Naval base. Sailors were trained to identify and collect marine mammal data to aid conservation efforts and enhance data on marine mammals in India. World Environment Day and World Ocean Day were celebrated to promote environmental awareness.

EXPECTED OUTCOMES

1) Securing the biodiversity and restoration of critical biodiverse ecosystems within land and sea areas under the Indian Navy's jurisdiction where extractive uses (fishing, mineral exploration, and commercial vessel movement) are not permissible.
2) Filling the massive knowledge gaps in marine wildlife through biological data collected by the Indian Navy on duty (such as marine mammal song data from SONAR pinging, the presence of coral colonies, and areas with a high density of fish) to aid reliable conservation decisions.
3) The Indian Navy taking the initiative to conserve the local environment at an individual level that will contribute towards community-level change.

Fig 6.10 (Top) Biodiversity survey conducted with NWWA.

Technology for Conservation



The Habitats Trust

INTRODUCTION

Technology for Conservation (TfC) at THT aims to innovate, develop, adapt, fill gaps, and procure various technologies to speed up wildlife conservation and research.

It aims to harness the power of technology for the sake of conservation rather than developing or innovating for the sake of technology.

TfC believes that technology can help scale and speed up global conservation efforts.

OBJECTIVES

1) Explore technologies that help break the barriers/limits and take THT to new heights.
2) Identify technological interventions to expedite mapping, monitoring, securing, and conserving various ecosystems.
3) Look for technological solutions established in other domains that can be adapted to the conservation domain.
4) Review various technologies used in conservation and establish their efficacy and relevance.
5) Establish technology as a core component to be considered during conservation design discussion.
6) Horizon scanning for innovation opportunities and to fill the gaps using applicable technological solutions.

1. The Hoolock Gibbon Project

Associated THT Programme: On-Ground Initiatives

INTRODUCTION

Hoolock Gibbon Conservation is one of the largest projects THT supports by engaging various partners working in its range.

There is a lack of reliable population estimates for Hoolock Gibbons. Since Hoolock Gibbons are primarily arboreal animals that spend most of their time in high canopies inside dense forests, surveying poses a challenge, hindering the accurate estimation of their population. At present, monitoring their vocalisations is the best option for understanding their presence and behaviour. Thus, bioacoustics-based surveys conducted by placing audio recorders for a certain period to record the calls of these animals are preferred.

There are reliable methods to understand individual characteristics, behaviour, and estimate occupancy, and population using these vocalisations for species like lemur and other gibbons. To fill the knowledge gap on Hoolock Gibbons, adapting and implementing such approaches is of prime importance and helps in decision-making about their conservation.

THT partner Conservation Initiatives (CI) has been conducting standard field surveys and deploying acoustic recorders to collect data to estimate and monitor gibbon populations. TfC is exploring various ways to understand the characteristics of these recordings and aims to classify gibbons and develop approaches to identify unique signatures among groups.

The project began by exploring the available Machine Learning (ML) approaches in identifying individuals/groups using bioacoustics data. It was found that a more recent and primate-specific unsupervised ML approach published by Dena Clink for classifying Bornean Gibbon females that provided a reasonable accuracy for individual identifications was a satisfactory first step. Simultaneously, detecting and classifying gibbon calls from the recordings, a transfer-learning-based supervised ML framework was established.

A. Unsupervised Machine Learning Approach

GOAL

1) To recognise unique signatures (vocal fingerprints) and identify individual groups.

KEY COLLABORATORS

Exclusive engagement with the Conservation Initiatives (CI) team

REGIONS

Rainforests of Assam, Meghalaya, Nagaland, Arunachal Pradesh, Manipur, Mizoram and Tripura.

BACKGROUND

The primate-specific unsupervised ML approach published by Dena Clink for classifying Bornean Gibbon females was used as reference for this project.

In an unsupervised ML approach, the model is trained using unlabelled data. The TfC team undertook a systematic process involving audio pre-processing, data wrangling, feature extraction (Mel-Frequency Cepstral Coefficients - MFCC), model training, fine-tuning hyperparameters, and validation.

While establishing a pipeline for this group identification model, insights into gibbon acoustics including their frequency band, the kind of vocalisations, the noises that overlapped, and the quality of these recordings, were gathered. Since this evolved over the years, earlier papers had to be referred to understand several steps. After collating the required code snippets and fixing some, a working pipeline for this approach could be established.

OUTPUTS

1) Insights on Hoolock Gibbon vocalisations.
2) Established pipe-line based on this approach.
3) Functional unsupervised model adapted and fine-tuned for Hoolock Gibbons.

OUTCOME

1) Clustering or group identification wasn't accurate or didn't match reference data.
2) The attempts to understand the characteristic features of gibbon groups have led to mixed results.
3) This is because Hoolock Gibbons exhibit high variability when vocalising among the group and with other groups, which demands a large dataset to understand and extract valuable information from the recordings. Furthermore, the recordings used for this analysis were noisy and lacked additional ground truth data.

NEXT STEPS

- The results and inferences from this exercise were discussed with the corresponding author Dena Klink. Considering the limited dataset, noisy recordings, and high variability, a supervised model for group classification will be used.
- Additionally, TfC is exploring the possibility of using approaches like Few-shot Learning.

B. Supervised Species Classification Model

GOAL

1) To detect and classify gibbon calls from recordings.

KEY COLLABORATORS

The project is an exclusive engagement with the Conservation Initiatives (CI) team

REGIONS

Rainforests of Assam, Meghalaya, Nagaland, Arunachal Pradesh, Manipur, Mizoram and Tripura.

BACKGROUND

After the acoustic surveys for the scheduled duration, data from the recorders will be analysed to extract insights. This data analysis step is time-consuming as one has to sit and observe the spectrograms or listen to the vocalisations to identify the data of interest. This process can be sped up by using a species classification model where a machine will automatically identify gibbon calls from any given recording and list out their time stamps which can then be verified

by researchers. This model will assist the CI team in their attempt to understand the occupancy of gibbons in their target landscape.

A transfer-learning approach suggested by Duforq was a reference model for this project.

The transfer-learning approach is where an existing Convolutional Neural Network (CNN) model will be adapted and gradually evolved for a required purpose. This project aims to automatically detect and classify Hoolock Gibbon calls from the acoustic recordings. As a first step, a labelled dataset was prepared for Hoolock Gibbons by annotating call segments with presence and absence labels using Sonic Visualizer software. With labelled data as input, steps such as audio pre-processing (low-pass filter, downsampling), hyperparameter tuning (minimum length of the call, number of samples, test-validation split, learning rate, and number of epochs), model training, validation, and evaluation are followed in iterations to build the final classification model with the required accuracy.

OUTPUTS

1) Standardising the annotation approach for gibbon calls.
2) Annotated dataset for training any supervised model.
3) Gibbon calls classification models - one with 50 percent prediction accuracy and another one with 75 percent.
4) A portable tool that can detect gibbon calls from any given recording.

OUTCOMES

The models are working as expected and this has been confirmed by the Conservation Initiatives team. They were intentionally made with low prediction accuracy (usually machine learning models are tuned for > 95 percent accuracy) as the CI team needed a model with inflated false positives (not to miss any gibbon calls). This model would ease the efforts to establish an occupancy model for these gibbons.

NEXT STEPS

- This model will be built into a portable tool that can be used by everyone (without any elaborate execution procedures).
- Using this base model, gibbon group identification will be attempted.

2. Underwater Remotely Operated Vehicle (ROV)

Associated THT Programme: Marine Programme

A. Coral Reefs Project

THT has an ambitious project to monitor and conserve the coral reefs of India. Right now, efforts are in progress along the West Coast of India and in the Lakshadweep Islands. While various field methods and techniques are being used in this project by the THT team and partners, TfC is exploring various technological solutions to expedite these efforts. ROVs are one such solution that has been experimented with during the last year and a half.

GOAL

1) To extend our understanding of Mesophotic zones.
2) Technological ways to expedite coral reef monitoring work.
3) A solution that is scalable and can be standardised.
4) To map coral reefs along the West Coast of India and in the Lakshadweep.

KEY COLLABORATORS

REEF and IROV team.

REGIONS

West Coast and Lakshadweep

BACKGROUND

Traditionally, coral monitoring or observations to assess their status and health were carried

out by divers carrying cameras and samplers or by fixed observation platforms with scientific sensors. Both these approaches have significant limitations to their scale and efficiency. While human observers are physiologically limited in the duration and depth of their observation, fixed platforms limit the spatial extent of the data collected. Along with this the inherent heterogeneity, size, and in some cases, remoteness of coral reefs, make routine monitoring time and cost-intensive. For instance, diving beyond a depth of 30 mts is difficult, and even if accomplished, the amount of underwater time is too low (a few seconds) to collect any credible ecological data. This limits our understanding of Mesophotic (low light zones) corals that exist beyond 30-35 mts depth.

In recent years, more and more literature suggests that Mesophotic reefs can exist as extensions of the shallower reefs, with some overlaps in community composition. They often harbour significant reef fish diversity and biomass. and can host substantial reef-building coral expanses. However, Mesophotic reefs are comparatively poorly known, largely due to logistical & cost constraints. Knowledge of this zone of atoll reefs gains importance in the current scenario in Lakshadweep.

Several research groups across the globe have been using various underwater technologies to study these zones. At THT, such technological solutions to fill the gap in our understanding of the mesophotic zone, are being explored. While there is a large spectrum of technologies out there, Subsea systems like research capsules (mini-submarines), Autonomous Underwater Vehicles (AUV), and Remotely Operated Vehicles (ROVs) are used for monitoring and managing coral reefs. However, AUVS and Submarines are quite expensive and have many logistical requirements. Considering this TfC wanted to conduct trials with ROVs as they can easily move from shallow depths to deeper regions and are affordable.

Within the ROV space, there are many options (hobbyist to rescue) that come with varied capabilities. To understand the feasibility of using an ROV to fill the knowledge gap and expedite coral reef monitoring, the THT team conducted two trials with two different ROVs. The first one was an entry-level ROV commonly used by hobbyists or wildlife enthusiasts and the other one with a mid-range commercial ROV used for pipeline monitoring, equipment maintenance, and other industrial purposes.

ROV1 – Trident

PARTNER: Technology for Wildlife Foundation

SITE: Pondicherry, East Coast

PAYLOADS: Integrated 2MP camera, depth sensor, and tether that can live stream.

OUTCOMES

1) Went up to 22 mts depth and collected 20- 30 minutes of underwater footage.

ROV2 – IROV Tuna

PARTNER: IROV Technologies

SITE: Agatti, Lakshadweep

PAYLOADS: as listed below

1) Imaging SONAR - assists in seeing objects/ obstacles ahead (up to 20-100 mts)
2) Side-scan SONAR –helps understand the depth profile at a given position.
3) USBL – Underwater Positioning System
4) Low-light HD cameras
5) Depth and temperature sensors
6) LED lights for low visibility areas

OUTCOMES

1) Could collect data from 4 mts to 103 mts depth.
2) The entire underwater movement was live-streamed onto the control panel.
3) Continuous GPS positioning (over-streamed imagery).
4) Continuous data feed from multiple payloads.

5) Live data backup.
6) Approximately five hours of underwater footage gave a good understanding of the sea bed and underwater life.

CONCLUSION

- These trials helped the team understand the challenges of navigating an underwater vehicle to collect ecological data.
- It gave the team a good idea about relevant payloads (SONARs, positioning systems, various sensors, and cameras) to be used for this purpose.
- It was clear that the entry-level ROVs don't come with the capabilities that will be necessary to collect data in a structured manner.
- With the commercial ROV trial, deeper sites can be explored (a depth of 103 mts could be achieved)
- The team got good insights about the presence of various hard and soft corals at different depths along with the details of the seabed type.
- The final video footage overlapped with data from all payloads helped us understand underwater life.

B. Large-scale Semi-systematic Camera Trapping Project

Protected Areas (PAs) have played an important role in the conservation of various species in India. Over the years, efforts have been made to bring these areas under the PA network. However, only nearly five percent of the geographical area is being protected, which is inadequate to conserve all species. Additionally, many of these PAs are too small to sustain populations, especially long-ranging species. Furthermore, these PAs are decimated by habitat loss, fragmentation, degradation, and other anthropogenic threats.

While PAs have always been centred around charismatic large-bodied mammals, there are large and medium-sized mammals (including charismatic ones) that persist in areas outside PAs including buffer areas, corridors, reserve forests, and remnant patches acting as stepping stones amongst others. Along with these, there are many species, ecosystems, and landscapes, that were under-studied or data deficient. Most of these landscapes don't have baseline data to build a case for their conservation. THT aims to change that through the collection of ecological data.

GOAL

1) To understand occupancy and fine-scale distribution of wild mammal species in areas outside PAs specifically in those that may form critical corridors, community-controlled wilderness.
2) Capacity building on long-term camera-based ecological monitoring for THT's local partner organisations.
3) Focused efforts in select landscapes to understand the density/population of target species and implement conservation strategy through suitable interventions. These could include securing landscapes by bringing them under the PA network and CCAs and exploring economic incentives if appropriate.
4) To establish a seamless pipeline to handle camera trap images using the latest technologies to ease data analysis and facilitate quicker inferencing

KEY COLLABORATORS

On-ground organisations in target landscapes.

REGIONS

Pan India

BACKGROUND

THT, through its partner network, is planning to deploy camera traps for collecting data on large, medium, and small mammals in sites that are mostly outside PAs including reserved/state forests, conservation reserves, community conservation areas, community lands (including revenue lands), corridors, and private sanctuaries among others. These deployments will be driven

Table 7.1	
Region/Habitat type	**Probable Targe Species**
Western Ghats	Leopard, Tiger, Sambar, Dhole, Jackal, Leopard Cat, Rusty Spotted, Jungle Cat, Muntjac, Chevrotain, Gaur, Pangolin, Sloth Bear, Marten, Mongoose species, Ratel, Civet species, Porcupine, Otter species, Elephant
Open Savannahs	Wolves, Hyena, Fox, Blackbuck, Chinkara, FHA, Nilgai, Ratel, Hedge Hog, Jackal, Hare, Mongoose species, Caracal, Jungle Cat
Eastern Ghats Dry Deciduous	Leopard, Tiger, Sambar, Dhole, Jackal, Leopard Cat, Rusty Spotted Cat, Muntjac, Chevrotain, Gaur, Pangolin, Sloth Bear, Mongoose species, Ratel, Civet species, Porcupine, Otter species, Elephant, Fox, Hyena, Langur, Macaque
Unprotected Terai grasslands	Tiger, Leopard, Elephants, Rhino, Hispid Hare, Bengal Florican, Fishing Cat, Otter species, Nilgai, Jackal, Hog Deer, Rusty Spotted Cat, Jungle Cat
North Eastern Moist Deciduous	Tiger, Leopard, Clouded Leopard, Elephant, Gaur, Sambar, Barking Deer, Sloth Bear, Wild Pig, Large Indian Civet, Small Indian Civet, Himalayan Crestless Porcupine, Yellow-throated Marten, Leopard cat, Otter Species, Mongoose species, Assamese Macaque, Rhesus macaque

with the help of an identified local organisation. The idea is to establish baselines for sites with diverse habitat types of varying sizes that are geographically distributed across India with each of them harbouring a different set of species. The below table summarises the identified habitat types with their areas and potential species for the pilot run of this project.

C. Camera trapping in Tripura

GOAL

Camera trapping surveys in six Protected Areas of Tripura.

COLLABORATORS

Vivek PARC (Policy and Research Center)

REGION

As in Table 7.2

Completed in April 2024. Data cleaning and analysis are in progress

OUTCOMES

1) **Rowa Wildlife Sanctuary (0.8 sq km)**
   a. The smallest protected area of the state, situated in the North Tripura district.
   b. Forest type: Moist deciduous.
   c. Direct encounters with wildlife including Barking Deer, Crab-eating Mongoose, Phyare's Leaf Monkey, and Rhesus Macaque, along with pugmarks of small cats (probably leopard cats).
   d. Barking Deer is the only mammal to be photo-captured during camera trapping.

2) **Sepahijala Wildlife Sanctuary & Clouded Leopard National Park (13.4 sq km)**
   a. The Clouded Leopard National Park (5 sq km) is situated within the Sepahijala WLS.
   b. A zoological park named Sepahijala Zoological Park is situated within the boundaries of the sanctuary.
   c. Forest type: Moist deciduous along with bamboo and Sal plantations.
   d. Direct sightings of wildlife include

Table 7.2		
Name of PA	**Location**	**Area in sq km**
Sepahijala WLS	Sepahijala district	13.46
Clouded Leopard NP	Sepahijala district (within Sepahijala WLS)	5.08
Trishna WLS	South Tripura, Gumti & Sepahijala district	163.08
Bison NP	South Tripura, Gumti & Sepahijala district (within Trishna WLS)	31.63
Gumti WLS	Gumti & Dhalai district	389.54
Rowa WLS	North Tripura district	0.86
		Total Area: 603.65

Phyare's leaf Monkey, Capped Langur, Pig-tailed Macaque, Rhesus Macaque, and Barking Deer.

e. Camera traps documented Crab-eating Mongoose, Asian Palm Civet, Small Indian Civet, Large Indian Civet, Leopard Cat, and Barking Deer.

3) **Trishna Wildlife Sanctuary & Bison National Park (163.08 sq km)**

a. The Bison National Park (31.63 sq km) is situated within the boundaries of the Trishna Wildlife Sanctuary. The National Park is situated near the India-Bangladesh international boundary.

b. Forest types: Bamboo brakes, moist deciduous, mixed deciduous, and semi-evergreen forests.

c. Direct sightings of the mammals include Rhesus Macaque, Phyare's leaf Monkey, Capped Langur, Hoolock Gibbon, Asian Palm Civet, Gaur, Golden Jackal, and Small-clawed Otters.

d. Camera traps documented species like Leopard Cat, Fishing Cat, Small-clawed Otters, Asian palm Civet, Small Indian Civet, Gaur, Khalij Pheasant, and Crab-eating Mongoose.

4) **Gumti Wildlife Sanctuary (389 sq km)**

a. Geographically the largest sanctuary of the state is situated in the Gumti, Dhalai, and Khowai districts.

b. Forest type: semi-evergreen and deciduous forest with bamboo brakes.

c. Camera traps documented Leopard Cat, Crab-eating Mongoose, Small Indian Civet, Asian Palm Civet, Ferret Badger, and Pig-tailed Macaque.

d. No encounter of wild mammal species during the surveys

NEXT STEPS

- Camera trapping in other four to five pilot landscapes by partnering with local organisations.
- Data management tool with integrated species classification model to speed up the analysis and inferencing

3. The Grasslands Programme

BACKGROUND

Grasslands are one of the key habitats of several specialised species and they cover around 20 percent of the geographical area of the country. They have been among the most neglected habitats in the Indian conservation scenario for centuries, tagging them as less productive landscapes and are often tagged as wastelands.

Here, finding large tracts of arid grasslands and open savannas or other Open Natural Ecosystems (ONEs) is extremely difficult as they are highly modified landscapes either for agriculture or for other developmental activities (habitations, industries, and now renewables).

These are the last remaining habitats for a few of the endangered species of India including the Great Indian Bustard, Striped Hyena, Indian Wolf, Caracal, Blackbucks, and Chinkaras among others. A government report in 2006 identified 53 species directly dependent on the grasslands of India, of which 30 are in Schedule I of the Wildlife Protection Act (WPA) of India.

However, they lacked the required attention from the research and conservation community until recently. They are so neglected that to date there is no credible map for grasslands and nobody knows the exact extent of ONEs in India (unlike forests, rivers, and wetlands) while most of these are classified as wastelands and mapped under the Wasteland's Atlas of India. Moreover, there is a serious issue of disagreement between various expert groups about the way grasslands need to be classified. The TfC team had the following objectives for this project.

OBJECTIVES

1) Deducing the extent of grasslands (Open Natural Ecosystems) in India.
2) Understanding the number of grasslands that are mapped as wastelands.
3) To get critical grasslands declassified from the wastelands tag.
4) Identifying critical grassland patches and prioritising areas for securing and conservation interventions.

A. Extracting grassland extents using existing land use land cover products

GOAL

1) To understand the extent of grasslands using the available Land Use Land Cover (LULC) products

REGIONS

Pan India

BACKGROUND

The first step in understanding the extent of any habitat type would be to check the relevant classifications in freely available LULC products. Several global and local institutions and individual groups such as USGS, ESA (European Space Agency), ESRI, ISRO, and Google which publish LULC products using various satellite imageries. These, mentioned in Table 7.3, are the ones the team decided to use.

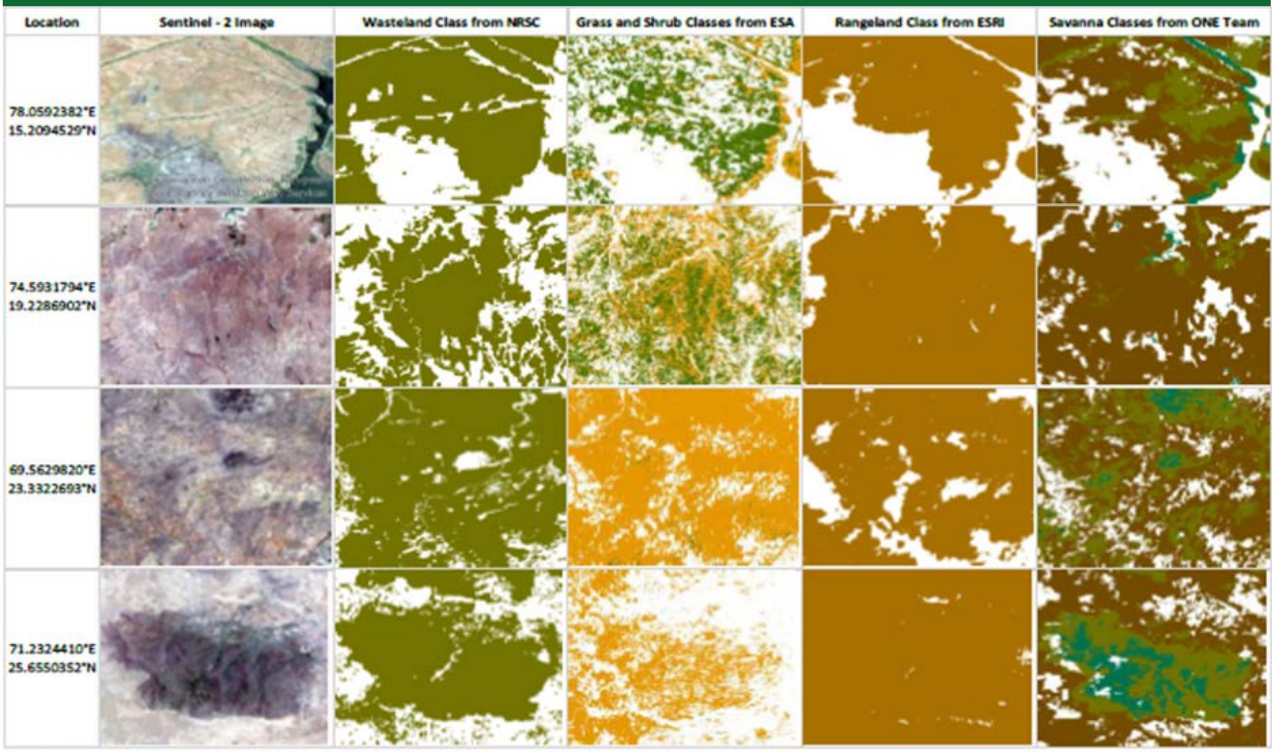
As seen in Table 7.4, there is a lot of variability between these products including spatial resolution, number of classes, training data, and algorithms. Of these, the primary concern was with the classes. It is a known issue with grasslands that their classification has not been harmonised and various institutions or experts have named them differently. The technical documentation of each of these products was further reviewed to understand the class names that refer to the landscapes of specific interest to THT.

Based on this, extents from each LULC product for the considered classes were extracted which was then used to identify the top six states as below in Table 7.5.

Table 7.3

Sr. No.	Name	Provider	Extent	Resolution	Satellite Images	Classes	Link
1	LULC	NRSC	India	24m	AWiFS/ RISAT-1	18	NRSC
2	World Cover	ESA	World	10m	Sentinel-1/2	11	ESA
3	LULC ESRI	ESRI	World	10m	Sentinel-2	10	ESRI
4	ONE Map	Independent	India	30m	Landsat 8	8	ONE

Table 7.4



Product Comparison for Random Locations in India

Table 7.5

Sr. No.	Name	Provider	Classes
1	LULC	NRSC	Grassland, Wasteland
2	World Cover	ESA	Shrubland, Grassland
3	LULC ESRI	ESRI	Rangeland
4	ONE Map	Independent	All

Table 7.6				
State	**NRSC**	**ESA**	**ESRI**	**ONE**
Madhya Pradesh	23324.70	55052.19	75145.13	83332.00
Rajasthan	71132.90	54603.06	157536.22	76187.21
Maharashtra	21090.54	41656.39	63253.53	69448.81
Andhra Pradesh	21324.02	26447.58	36873.79	35196.94
Karnataka	9011.44	22106.22	24793.38	32942.83
Gujarat	20293.27	20048.53	29912.02	30413.70

As evident from the above Table 7.6 there is a large disagreement among the chosen products. To overcome these differences and obtain a reasonable understanding of the extent of grasslands/ONEs, the team decided to extract those that are classified as grasslands by all of them. This was obtained by extracting the intersection of ESRI, ONE, and ESA products for the selected classes and then overlapping the same with the NRSC layer as depicted below.

With this established process, the top 10 districts with the largest grassland areas were obtained.

Sr. No.	District	Area (Sq Km)	State
1	Cuddapah	11228	Andhra Pradesh
2	Chittoor	6855	
3	Ananthapur	10205	
4	Kutch	45674	Gujarat
5	Pune	15643	Maharashtra
6	Nasik	15582	
7	Ahmednagar	17048	
8	Barmer	28387	Rajasthan
9	Udaipur	11724	
10	Jaisalmer	38401	

OUTCOMES

1) Identified areas that are classified as grasslands by all the LULC products.
2) Identified top states and districts with large areas of grasslands.
3) Obtained the extent of grasslands that are classified as wastelands.

NEXT STEPS

- Ground truthing to confirm the structure of identified grasslands.
- Understanding the extent of Protected Areas classified as wastelands.
- Automating the grassland patch extraction.
- Prioritisation of grasslands.

B. Grasslands Ground Truthing (1)

GOAL

To verify if the land parcels identified by the tool, are grasslands.

REGION

Selected sites in Gujarat, Andhra Pradesh, Karnataka and Maharashtra

COLLABORATOR

Gujarat Institute of Desert Ecology (GUIDE)

Fig 7.1 (Above) Ground truthing in the grassland of Andhra Pradesh.

D. Automating the grassland patches extraction

GOAL

Automating the grassland patches extraction

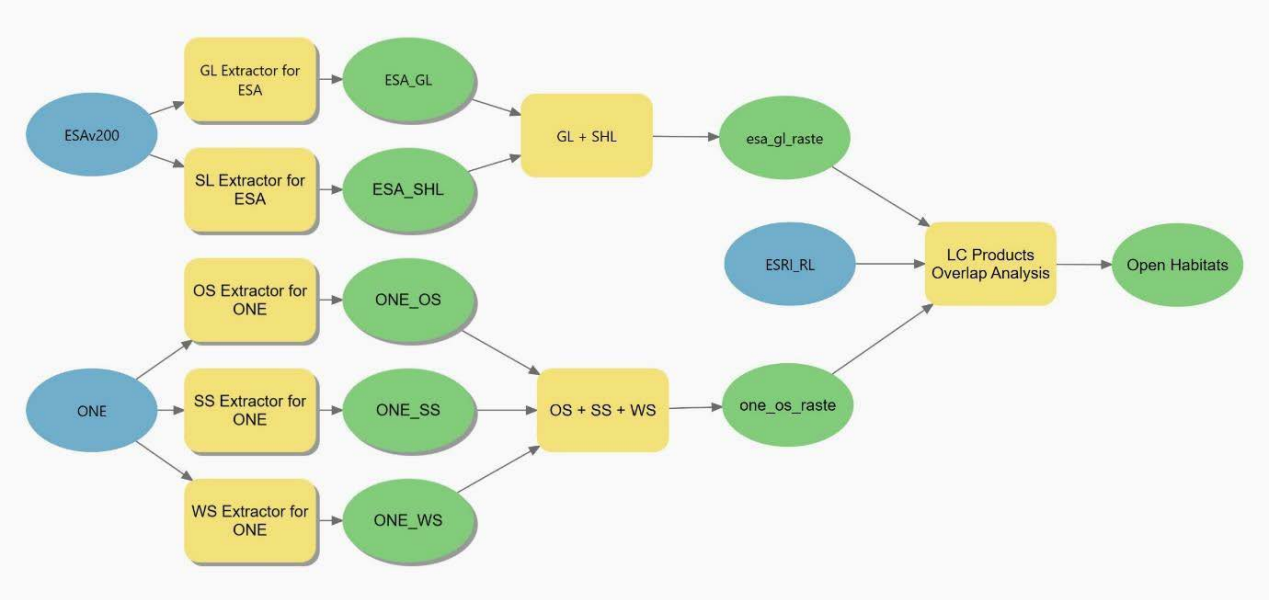
REGIONS

Pan India

During Phase 1 of the grasslands project, a methodology based on the intersection and overlap of various LULC products was defined. Using this approach, top districts with larger areas of grasslands were identified. However, the extents extraction procedure based on this approach has several steps and can be time-consuming as the spatial scale of the analysis is large (statewide). To simplify this whole process and automate multiple in-between steps, an extraction model was built using the ArcGIS Pro software.

OUTCOME

With this model, extraction of grassland patches is now a single-step process. This also reduces the time taken for the extraction along with the reduction in human interference.



E. Land cover change analysis

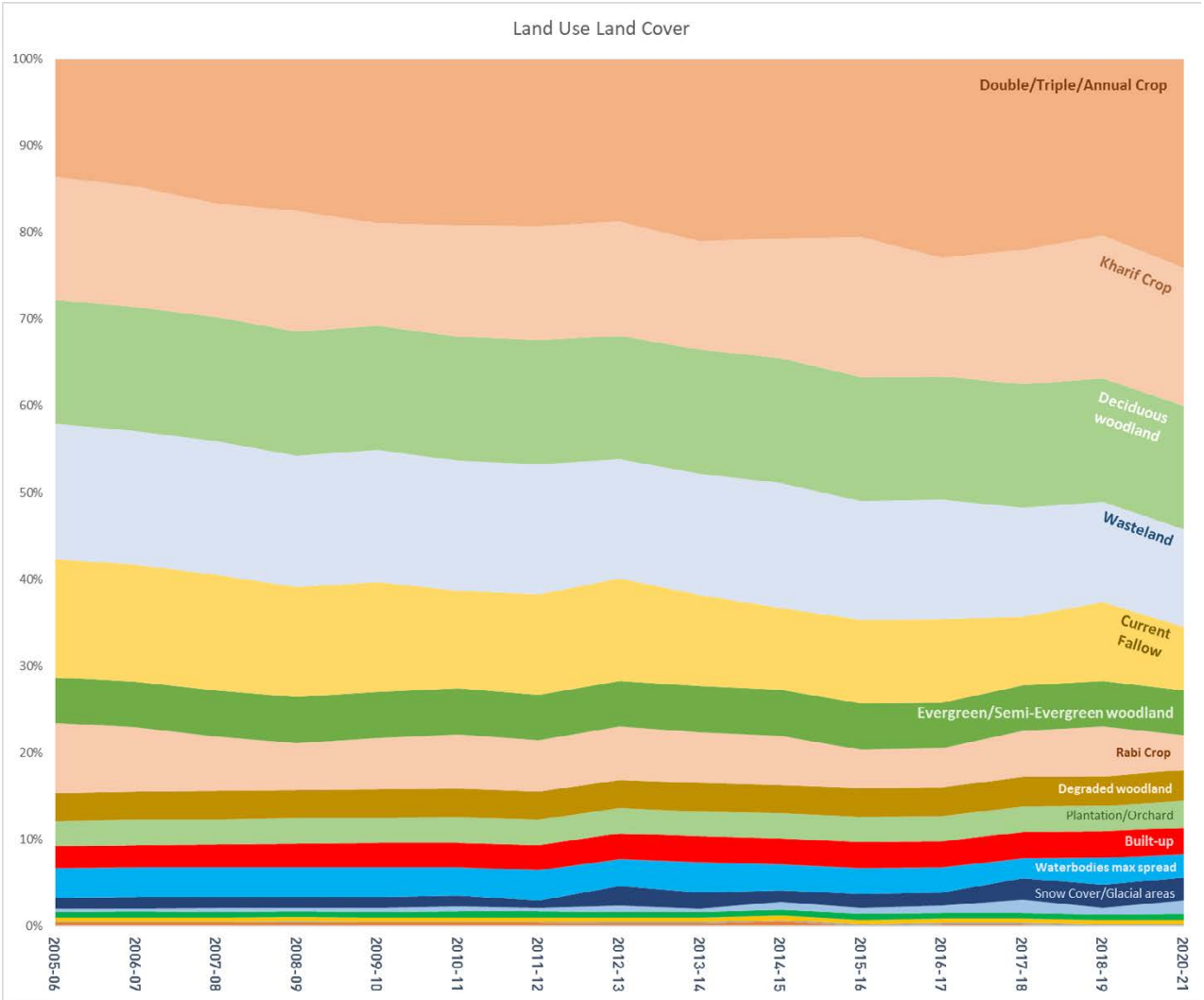
GOAL

To understand the change in the extent of wastelands over the years.

REGIONS

Pan India

National Remote Sensing Center (NRSC) publishes LULC layers regularly and wastelands are one of the classifications in this product. Since most of the grasslands are classified as wastelands, it is imperative to check the change in the area of wastelands over the years. By collating the details of areas of various classes from 2005-06 to 2020-21, it was found that the wasteland extent has changed from 513.00 L/ha in 2005-06 to 370.72 L/ha in 2020-21. Most of the conversion occurred for human-induced activities like Agriculture and Built-up.



F. Protected Areas VS Wastelands

GOAL

To understand the extent of Protected Areas (PAs) that are classified as wastelands.

REGIONS

Pan India

The Wildlife (Protection) Act, of 1972 governs and defines the protected areas in the country including Wildlife sanctuaries, National Parks, and Conservation Reserves amongst others. These areas are home to a plethora of flora and fauna of the country, several of them on the brink of extinction or severely endemic to the land. While exploring the wastelands atlas and LULC layer from NRSC, it was found that parts of many PAs are classified as wastelands.

This exercise was aimed at quantifying the extent of areas within PAs that are listed as wastelands. For this purpose, a Pan-India PA layer was used that had boundary details of 626 PAs.

RESULTS

Table 7.7

Type of PA	No. of PAs	Size of overlapping Wasteland (Sq Km)	Size of total PA cover (Sq Km)
Community Reserve	3	0.90	74.40
Conservation Reserve	15	945.16	2730.10
National Park	95	8816.77	41443.71
Tiger Reserve*	1	199.03	2788.53
Wildlife Sanctuary	512	33007.61	167134.80

Note: *Number of Tiger Reserves is 53 in India; as their boundaries consist of other types of PAs like WLS and NPs, they are not depicted in total number.

Table 7.8

Sr. No.	State	No. of PAs	Total Wasteland in PAs (Sq Km)	Total PA Size (Sq Km)	%
1	Andaman and Nicobar	105	11.36	895.62	1.27
2	Andhra Pradesh	15	1368.45	10759.42	12.72
3	Arunachal Pradesh	13	1977	9859.5	20.05
4	Assam	21	334.73	5519.34	6.06

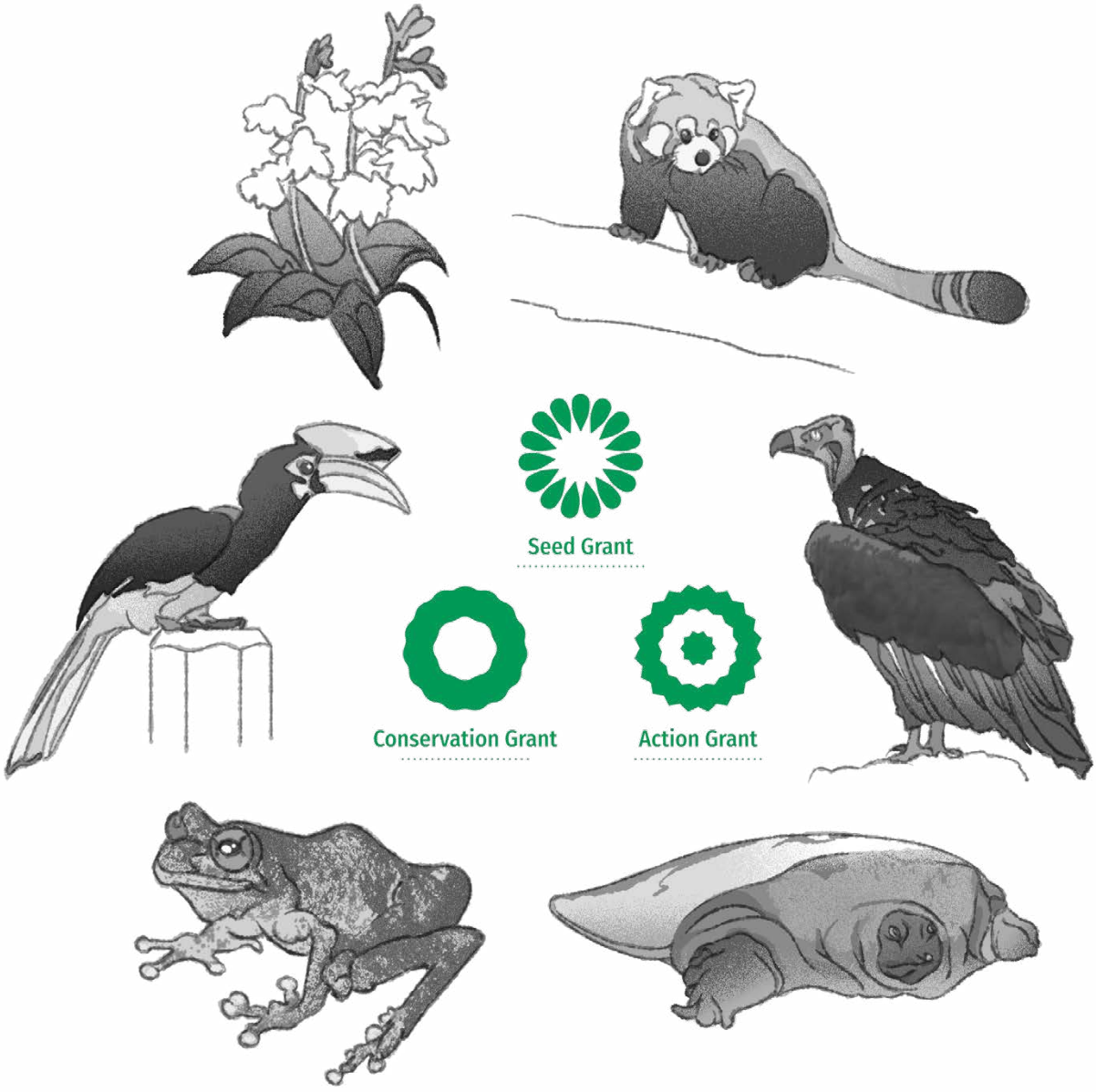
List continued in pg. 89

Sr. No.	State	No. of PAs	Total Wasteland in PAs (Sq Km)	Total PA Size (Sq Km)	%
5	Bihar	13	51.22	3822.03	1.34
6	Chandigarh	1	0	0.03	0
7	Chhattisgarh	14	61.28	7283.97	0.84
8	Delhi	1	1.77	33.77	5.23
9	Diu and Daman	1	4.51	31.16	14.49
10	Goa	7	2.74	774.51	0.35
11	Gujarat	27	1806.04	18976.5	9.52
12	Haryana	13	0.82	494.6	0.16
13	Himachal Pradesh	34	1149.82	7192.43	15.99
14	Jammu & Kashmir	15	25934.53	45724.88	56.72
15	Jharkhand	11	91.11	3574.74	2.55
16	Karnataka	37	279	10381.4	2.69
17	Kerala	23	121.12	2836.3	4.27
18	Lakshadweep	1	0	0	NA
19	Madhya Pradesh	35	718.53	10577.32	6.79
20	Maharashtra	45	1215.81	19144.34	6.35
21	Manipur	2	0.06	215.05	0.03
22	Meghalaya	4	14.44	833.45	1.73
23	Mizoram	10	0.82	798.95	0.1
24	Nagaland	4	0.39	262.72	0.15
25	Orissa	20	209.14	7151.96	2.92
26	Puducherry	1	0	4.39	0
27	Punjab	14	8.27	331.15	2.5
28	Rajasthan	35	2711.22	11519.86	23.54
29	Sikkim	8	975.7	2706.05	36.06
30	Tamil Nadu	19	230.42	7090.41	3.25
31	Telangana	13	609.08	6945.94	8.77
32	Tripura	6	0.85	602.51	0.14
33	Uttar Pradesh	24	329.44	6014.67	5.48
34	Uttarakhand	14	2743.3	7310.75	37.52
35	West Bengal	20	6.51	4501.82	0.14

NEXT STEPS

- To present these results to state forest officials and obtain their support to change the wasteland tags.
- Engage with NRSC to get the Wastelands Atlas of India corrected.

The Habitats Trust Grants



OVERVIEW

Between 2018 and 2023, The Habitats Trust (THT) has allocated around 10.56 crores to conserving habitats and species and promoting ecologically responsible progress. During the last five years, the team has worked across numerous challenges and diverse regions, including the rich biodiversity of the Konkan Sadas, Arunachala Hills Tamil Nadu, selected landscapes in Arunachal Pradesh, Chilika, and the vast expanse of the beautiful Western Ghats. In addition, THT has advocated for policy, conserved biodiversity, and supported coastal and marine conservation activities via grants.

In its fifth edition in 2022, THT Grants categories were changed to make the programme more inclusive, along with launching THT Seed Grant, while also increasing the overall grant purse to INR 2.75 crores from the earlier INR 1.26 crore. In 2023, THT Grants received 600 registrations and 109 quality applications from across the country, of which five were selected through a robust and streamlined evaluation process carried out by sector specialists.

OBJECTIVES

1) Conserving lesser-known species and habitats: To protect species and habitats that are often overlooked and in urgent need of conservation.
2) Capacity building through the Grants: The three categories of grants, such as the THT Action Grant, THT Seed Grant, and THT Conservation Hero Grant, each address different conservation needs.
3) Supporting grassroots conservationists: The grant program recognises and supports conservationists at the grassroots level, helping them expand their efforts and gain more support.
4) On-Ground action and community involvement: The grants support practical conservation work, focusing on a holistic approach involving communities to ensure long-term success.
5) Partnerships and collaborations: The program encourages conservation efforts based on scientific research, teamwork, and policy advocacy to conserve ecosystems and support human well-being by working with a network of stakeholders.

The current grant categories are:

Annual Grants:

1. THT Conservation Grant

The THT Conservation grant is for INR one crore and supports organisations working towards the conservation of lesser-known species and critical habitats. It assists grantees address the critical conservation challenges in India, including but not limited to habitat degradation and destruction, loss of biodiversity, conservation of endangered species, and solutions for human-wildlife conflict. This grant is open to organisations that have a proven record of working in wildlife conservation for a minimum of five years. The selected projects need to be executed over three years. It allows sufficient time for the winners to make the most of the Grant and create a deeper impact on the ground.

2. THT Action Grant

The Action Grant is for INR 25 Lakhs and is open to organisations, and individuals. The Habitats Trust Action Grant supports on-ground work on lesser-known species and/or habitats that require urgent conservation intervention. The selected individuals or organisations should have been working in the field of wildlife conservation for a minimum of two years. The selected project has to be executed over two years.

Recurring Grants:

1. THT Seed Grant (Monthly)

The Habitats Trust Seed Grant was introduced in August 2022. This is a recurring grant that reviews applications every month and supports up to 15 applicants every year. The total amount provided to each selected applicant is up to INR 3 lakhs. This grant is open to organisations and individuals working on small, limited-duration projects or conservation research efforts that tackle issues related to lesser-known species/ habitats, pilot projects in relatively unexplored landscapes or data-deficient species, or testing new methodologies and/or conducting rapid surveys.

Process for receiving the THT Conservation and the THT Action Grants

- Application via the THT Grants portal, on the THT website.
- Once the applications are in, audit partners (Grant Thornton) check for eligibility.
- Eligible applications then move to the next round.
- The Sub-Jury shortlists from the eligible applications for field evaluation.
- THT members and the Sub-Jury proceed for on-ground evaluations.
- Selected applications are then presented to all the members of the Sub-Jury, and scored to shortlist the finalists.
- Once selected, the finalists present proposals to the Jury in December.
- The final recipients are announced at the THT Grants Awards ceremony in December.

Process for receiving the THT Seed Grants

- Application via the THT Grants portal, on the THT website.
- All applications are evaluated monthly / bimonthly by THT's Internal Evaluation Committee.
- The recipients are contacted after the evaluation. THT Seed Grant Recipients.

THT Conservation Grantee 2023

Sr. No.	Individual/ Organisation	Project Title	Location
1	Wildlife Research & Conservation Society	Conservation of Forest Owlet by Multi-Stakeholder Engagement in Madhya Pradesh	Khandwa and Burhanpur districts, Madhya Pradesh
2	Salim Ali Centre for Ornithology and Natural History (SACON)	Conserving the Overlooked Subterranean Cave Habitat: A Sustainability Approach	Andaman and Nicobar Islands

THT Action Grantee 2023

Sr. No.	Individual/ Organisation	Project Title	Location
1	Forest First Samithi	Restoration of degraded critical elephant habitat by supporting local livelihoods	Tholpetty, Wayanad, Kerala
2	Nature Mates Nature Club	Creating Capacities for Hornbill Conservation in Buxa Tiger Reserve	
3	Rimung Tasso (individual)	Empowering Communities through Ecotourism for Red Panda and Takin Conservation	

THT Conservation Grantee 2023

Recipient

Wildlife Research & Conservation Society

Project Title

Conservation of Forest Owlet by Multi-Stakeholder Engagement in Madhya Pradesh

Location

Khandwa and Burhanpur districts, Madhya Pradesh

The Forest Owlet (*Athene blewitti*) is a small diurnal owl species endemic to Central India, categorised as endangered. It is found in teak-bearing dry deciduous forests. It prefers plain regions and avoids hilly areas and high elevations. Its population is localised and dispersed. At present it is found at 12 locations in Madhya Pradesh, Maharashtra, and Gujarat. No estimate is available of its population. It is an obligate cavity-nester; hence removal of cavity-bearing trees can have a serious impact on its breeding. The main threats are deforestation due to encroachment, and forest degradation due to tree cutting, forest fires, and grazing. Production forestry in Khandwa and Burhanpur districts affects the forest owlet by changing the forest structure.

WRCS shall estimate the forest owlet population, to get a definitive idea of its endangered status. They will partner with the Madhya Pradesh Forest Department to develop forestry practices that are helpful in the conservation of the Forest Owlet. They will also engage with the community to co-develop solutions that will reduce the threat to the forest owlet and help in its conservation. The study conducted by WRCS provides detailed insights into the habitat requirements and home range of the Forest Owlet, which will help in its conservation.

OBJECTIVES

1) Declare two Forest Owlet Conservation Reserves and support the Forest Department in preparing draft management plans for both reserves.
2) Co-develop Forest Owlet-friendly timber harvesting practices with the Forest Department and conduct training workshops for the field staff.
3) Estimate the population of the Forest Owlet in Burhanpur and Khandwa divisions.

4) Co-develop a sustainable lifestyle plan in consultation with the local community.
5) Conduct trials of nest boxes for the forest owlet.
6) Distribute improved cook stoves.
7) Carry out a radio-telemetry study of Forest Owlets.
8) Assess the factor impacting the breeding success of the Forest Owlet.

THT Conservation Grantee 2023

Recipient

Salim Ali Centre for Ornithology and Natural History (SACON)

Project Title

Conserving the Overlooked Subterranean Cave Habitat: A Sustainability Approach

Location

Andaman and Nicobar Islands

Protecting surface and underground Karst Ecosystems is particularly relevant to Goal 15 of the UN 2030 Agenda for Sustainable Development. Landforms and caves are mentioned explicitly under IUCN's Category III, Natural Monument or Feature. Furthermore, UNESCO protects Karst systems such as the Biosphere Reserves, Ramsar Sites, World Heritage Properties, and UNESCO Global Geoparks. Therefore, surface karst landforms and caves should be well-documented and explicitly protected.

The research experience in caves and the Karst areas and working with the people pushed SACON to sense the necessity of a holistic approach towards the conservation of the subterranean habitat in the region. The cave habitats on these isolated tropical islands of the Andaman and Nicobar groups need special attention as they hold unique habitats and are under tremendous anthropogenic pressure. Also, as caves and other Karst geo-forms are among the most attractive geo-tourism sites, it is essential to have guidelines for their sustainable use as these tropical islands, with harsh climatic conditions, have limited natural resources for economic development. Therefore, preparing a participatory conservation plan, with a sustainable approach, for the overlooked caves and other subterranean Karst geo-forms is crucial for these islands, which SACON is working on.

OBJECTIVES

1) Collect, process, and evaluate the data required for preparing the cave conservation plan.
2) Identify the constraints, threats, and opportunities for conserving the caves and the surrounding karst areas.
3) Prepare the conservation plan for the select cave and surrounding Karst areas in the North and Middle Andaman Islands.

THT Action Grantee 2023

Recipient

Forest First Samithi

Project Title

Restoration of degraded critical elephant habitat by supporting local livelihoods

Location

Tholpetty, Wayanad, Kerala

Over two years, the proposed project envisages intervening in 50 acres by doing the following:

1) Achieve 15 per cent efficiency thus reducing the cost of manual uprooting Senna spectabilis. The effort efficiency is envisaged to be leveraged for replicating the process of lateral root uprooting by other departments like the Kerala Forest Department and Panchayats.
2) Increase the availability of native grass for wildlife within the restoration site on over 35 acres by invasive management thus mitigating human-animal conflicts.
3) Increase local availability of 25 native floral species in nurseries for restoration.
4) Conserve native floral diversity on degraded lands by planting 50 species in 15 acres thus increasing the potential for wild edible fruits for wildlife and supporting larger biodiversity.
5) Enable training of at least 15 tribals in restoration techniques and seed collection thus leveraging traditional ecological knowledge in habitat conservation.

OBJECTIVES

1) Eradication of invasive species through handheld tools to

improve efficiency thus mitigating human-animal conflicts.

2) Improve native floral species diversity by planting carefully selected local pollinator species, wild edible fruits, RET, riverine, and medicinal plants, to support wildlife and restore degraded habitats, and enable invasive suppression.
3) Build social capital and enable local livelihoods: Creating social capital and encouraging traditional ecological knowledge (TEK) and providing livelihood to forest fringe villages; Setting up native species nurseries for communities.

THT Action Grantee 2023

Recipient

Nature Mates Nature Club

Project Title

Creating Capacities for Hornbill Conservation in Buxa Tiger Reserve

The North Bengal landscape is home to five species of hornbills - the Great Hornbill, Wreathed Hornbill, Rufous-necked Hornbill, Oriental Pied Hornbill, and the Indian Grey Hornbill. The first three species are listed as Vulnerable in the IUCN Red List. Nature Mates Nature Club's research since 2017 has identified key threats to hornbills and their habitat at Buxa Tiger Reserve: poaching at nests, habitat degradation, and fragmentation. Their vegetation surveys revealed that many forest patches have low tree density and basal area both in absolute terms and compared to other protected areas in the Eastern Himalayas which have the same set of hornbill species.

They propose to establish an alliance with the Forest Department to restore degraded habitats through scientific-based forest restoration practices. They aim to provide scientific and technical assistance to the department and build capacities at the ground level. They also propose to continue their ongoing research to understand long-term patterns of hornbill breeding, roosting, and tree phenology to improve ecological understanding of hornbills from this region. They propose focused programmes with nature guides and local schools to increase support and conservation

awareness. The project aims to improve hornbill research and establish a conservation network with key stakeholders at Buxa.

OBJECTIVES

1) Continuation of long-term research and monitoring of hornbill ecology and their habitat.
2) Build an alliance with the Forest Department to improve habitats through forest restoration in Buxa Tiger Reserve.
3) Engage with key stakeholders in the local communities to increase awareness and conservation education.

THT Action Grantee 2023

Recipient

Rimung Tasso (individual)

Project Title

Empowering Communities through Ecotourism for Red Panda and Takin Conservation

The project is designed around the conservation of Red Pandas and Takin by conserving their habitats and reducing forest dependency of local communities on nearby forests in Manigaon. Using responsible ecotourism as a tool, it focuses on capacity building, awareness, and stewardship development to coexist with rare species like the Red Panda, Takin, and other high-altitude species in the region. A responsible tourism model is crucial to uplift the economic status of the villagers sustainably, as well as to set an example for other community members to follow and conserve their forest areas. Inclusive stakeholders and steering committees will be formed for long-term monitoring and evaluation of biodiversity and the activities at the landscape level.

At the end of the project, a network of skilled local stakeholders will be running a responsible ecotourism model in Manigaon that will inspire sustainably coexisting with nature. The committee will also maintain a balance of tourism in the area to inhibit overexploitation of resources from crucial habitats, ensure firewood collection

through the specific plantation sites, and maintain tourism influx as per the capacity of the area.

OBJECTIVES

1) Foundation building for community-based conservation through responsible ecotourism in the community forest of Manigaon.
2) Strengthening of the ecotourism model through multi-stake-holder partnership and sensitisation.
3) To ensure transparency and benefit sharing of models for efficient replicability and sustainability in the future.

THT Seed Grantee 2023

Sr. No.	Individual/ Organisation	Project Title	Location	Month/ Year
1	Yashendu Joshi	Urban Otters: Studies on Behavioural Ecology and Human-Otter Coexistence	Anand, Gujarat	Apr 23
2	Dr Manigandan Selvaraj	Conservation of Red- headedvulture in the Mudumalai-Sathyamangal am Region	Nilgiris, Tamil Nadu	May 23
3	Sudha Kottilill	Empowering the next generation of shark conservationists through ocean curriculum	Chennai, Tamil Nadu	May 23
4	Landscape Research & Conservation Foundation	Database of wildlife mortality along the linear infrastructure in India	Maharashtra	Jun 23
5	Dr Prakash Sanjeevi	Chasing corallimorphari an invaders in the coral reefs of Lakshadweep Archipelago	Agatti & Kavaratti Island, Lakshadweep	Jun 23
6	Rahul Kumar	Community involvementin conservationof wildlife of Rajgir Wildlife Sanctuary	Nalanda, Bihar	Jun 23

List continued in pg. 101

Sr. No.	Individual/ Organisation	Project Title	Location	Month/ Year
7	Dr Swati Diwaker	Diversity of katydids from biodiversity hotspots in India using bioacoustics	Tezour, Mollem & Indore	Jun 23
8	Yomto Mai	Investigate Mishmi Takin distribution and pouching threats in Arunachal Pradesh	Upper & West Siang, Arunachal Pradesh	Jun 23
9	Dr Vidyadhar Atkore	Engaging tribal youths in river conservation in eastern Arunachal Pradesh	Changlatang, Lohit, Arunachal Pradesh	Aug 23
10	Priya Singh	Assessing Small Mammal Diversity in the Siang Valley, Arunachal Pradesh	Siang Valley, Arunachal Pradesh	Oct 23
11	Archi Sehgal	Population Status, Distribution and Nest Monitoring of Vultures In Shimla	ShimlaRural Division, Himachal Pradesh	Nov 23
12	Sanjana Vadakke Kurupath	Assessing Free-Ranging Domestic Dog Population & Wildlife Interface, Western Ghats	Mudumalai Tiger Reserve, Nilgiri District, TN	Dec 23
13	Kaushal Kumar	Initiating Conservation Action for Forest Owlet in lesser-known Dangs Forest	Dangs Forest, Northern Western Ghats, Gujarat	Dec 23
14	Dailu Pilot Dovih	Surveying Namdapha Squirrelsand Initiation of Community- Led Conservation	Namdapha National Park, Arunachal Pradesh	Dec 23
15	Imrana Khan	Learning To Live For The Future: An Environmental Education	Delhi	Mar 23

The Habitats Trust turned five in 2023, and the Trust celebrated this milestone through the year in five different ways.

THT TURNS 5

1. THT Partners' Meet 2023

The Trust took the milestone as an opportunity to bring together all its then 75+ partners from across the country to Delhi, India. This gathering of like-minded individuals was an opportunity to further collaborations among all, and was held at Hyatt Regency Hotel on 15 September, 2023. The evening was an eventful one, and was attended by Roshni Nadar Malhotra to kickstart the celebrations.

2. THT's YouTube Channel Launch 2023

In December 2023, THT took a step further towards its vision for making films about biodiversity and conservation accessible to all by launching its YouTube channel @thehabitatstrust. With a special screening of its films at the iconic Metro INOX Cinema, Mumbai, the channel was launched by Roshni Nadar Malhotra, and filmmakers from Dusty Foot Productions, Mumbai Tarun Bharat and The Gaia People, and actor Mrunmayee Deshpande and Swapnil Rao, were in attendance among others.

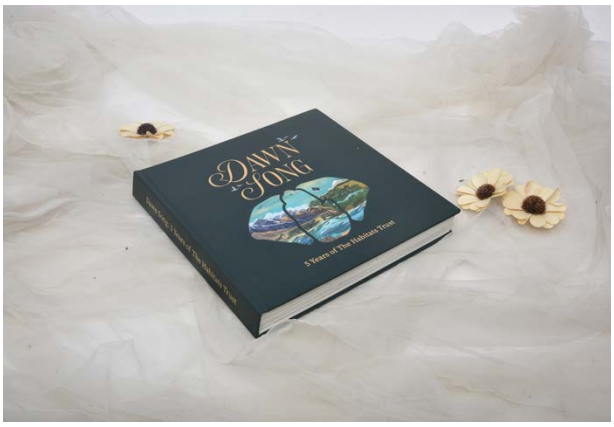
3. The Habitats Summit

THT's year 5 was also marked by its foray into global partnerships – THT hosted The Habitats Summit with the theme 'Mutualisms-in-Nature' at Shiv Nadar Institute of Eminence in March 2024 – a gathering of 27 organisations from five continents to bring forth global change. The 37 delegates from 25 countries engaged in two and a half days of discussions on global conservation challenges and forged meaningful international partnerships in a move towards solutions. There were leadership sessions, panel discussions and unique one-on-one meetings between organisations to get started on collaborations.

4. Art Installation

Under the theme of 'Mutualisms-in-Nature', THT also curated an art exhibit at the Shiv Nadar Institute of Eminence in March 2024. Made by WOLF, a Jaipur-based art collective, the installations were built from waste and scrap materials, and were present during The Habitats Summit as well. Ranging mycelium networks to the mutualistic relationship between bees and flowers, the installations were appreciated by all.

5. THT's Coffee Table Book



What better way to commemorate turning 5 than a look back at the journey? THT's Coffee Table Book *Dawn Song*, does just that. A collection of photos (some clicked through the years, and some by renown photographers like Dhritiman Mukherjee and Tasneem Khan) and custom artwork created by artist Sayan Mukherjee, the book is a thoughtful retelling of the five-year journey.

IMPACT

20,04,018 ha.

THT
direct impact
area

10 of 10

Biogeographic
zones of
India

64,05,321 ha.

THT
area of
influence

26

Number of
Annual
Grants

14

Number of
Seed
Grants

₹34.2 crore

Amount
for all
Grants

26

States &
Union Territories

69

Number of
projects

99+

Number of
partners

1) Psychometric scales developed to understand conservation preferences in India, tested across the regions of Dudhwa, Konkan, Lakshadweep and the Northeast
2) Report on 'Psychographing the Frontline Staff of the Dudhwa Tiger Reserve' published, and training conducted in the Reserve, basis the findings
3) Conservation Practitioner's Course founded to upskill knowledge, skills and tools
4) THT-NCBS Fellowship created to support the development of future conservation practitioners
5) A comprehensive tool developed to assess and encourage environmental consciousness in school students
6) Created effective messaging around wildlife with the Border Roads Organisation
7) First project to assess multiple coral reef sites on the West Coast with a comparative resilience framework
8) An exploration of deep-sea mesophotic coral reefs in the Lakshadweep Islands by a Remotely Operated Vehicle (ROV) which was sent to a depth of 103 metres to collect ecological data
9) Interdisciplinary study initiated to understand sardine fisheries in ecological, economic and social processes
10) Started work to reduce the Indian Navy's ecological footprint through exploration and conservation in distant marine ecosystems
11) Collaborated with the Indian Armed Forces in critical and extreme environments
12) First in-depth assessment conducted of large fauna in granite outcrops of Karnataka
13) Scientifically established the local extinction of Bengal Florican in Uttar Pradesh
14) Bio-acoustics used to create vocalisation models, which will be used for population estimation of Western Hoolock Gibbons, and various programmes initiated for the species' conservation in Northeast India
15) First record of multiple grassland species (Rufous-vented Grass Babbler, Grey-sided Bush Warbler and Chestnut-crowned Bush Warbler) in Dudhwa Tiger Reserve and one fish species off the coast of Karnataka (Dhofar Parrotfish)
16) Assessment, identification and technical advice presented to launch India's first Olympic Forest in Odisha
17) A multi-language YouTube channel (@thehabitatstrust) dedicated to wildlife and conservation launched
18) Awards won by the Trust's films in 2023-24:
    a. Runner-up Award, Green Frames: VATAVARAN Short Film Competition and Festival 2023, for 'The Indigenous Seed Keeper: Stories from the Ground, Northeast'
    b. Winner, Regional Category, International Water Conclave PSA Video Contest, for 'Chhoskhorong Kho: Stories from the Ground, Northeast'

TEAM

Rushikesh Chavan
Head, The Habitats Trust

Communications and Outreach

Sejal Mehta, Lead
Lubna Amir, Manager

Ecological Restoration

Robin Abraham, Lead
Brawin Kumar, Assistant Manager

Education and Awareness

Rutuja Dhamale, Lead

Marine Programme

Abhishek Jamalabad, Lead
Deepika Sharma, Sr Executive
Farai Patel, Executive

On-ground Initiatives

Anup Bokkasa, Lead
Kaushik Sarkar, Sr Executive
Maxim Rodrigues K, Executive

Technology for Conservation

Santhosh SL, Lead
Saket Agasti, Associate Manager
Kishore Panaganti, Associate Manager

THT Grants

Sunaina Mullick, Deputy Manager
Tanya Singh, Associate Manager

PRESS & MEDIA

The year began on an uplifting note for The Habitats Trust, and all its eight programmes. THT's conservation efforts found coverage and partnerships across the media landscape. From big-picture conversations to rare species sightings — THT was in the news. In the year 2023-24, THT was in the news in a total of 712 stories. Apart from traditional media, other social media avenues were also explored to spread the message of THT's mission far and wide. The features ranged from a wide spectrum of publications, here are some highlights.

June 2023

NDTV: "Rare Jerdon's Babbler spotted in Uttar Pradesh" - A sighting at the Dudhwa Tiger Reserve.

Instagram: "THT Grants 2023 application portal is now open"

May 2023

Daijiworld: "Cheetahs could spur the revival of India's languishing grasslands: Experts" - Highlighting THT's conservation efforts in the Dudhwa National Park.

The New Indian Express: "The Habitats Trust Invites Applications for its Annual THT Grants, Highlights Success over the Years" - A call for collaborators in THT's mission.

September 2023

The Quint: "Project Elephant and Tiger: A Fresh Look at Terrestrial Conservation?" - Beyond the tiger-elephant conservation paradigm.

The Times of India: "Rare bird Indian Skimmer sighted along Ghaghra" - Spotting the Indian skimmer along the Ghagra river.

The Habitats Trust invites applications for its THT Grants

The Habitats Trust, a not-for-profit organization working towards the protection and conservation of India's natural habitats and their indigenous species, is inviting applications for its annual Habitats Trust Grants 2023. The portal for submission of applications can be accessed from https://www.thehabitatstrust.org and will remain open till 05th June, 2023. The Grants were instituted to encourage and promote conservation efforts by supporting organizations and individuals doing seminal work toward protecting and conserving India's threatened wildlife and natural habitats.

Rare bird Indian skimmer sighted along Ghaghra

TIMES NEWS NETWORK

Lucknow: An endangered specie of birds, the Indian Skimmer was spotted along the Ghaghra river at the Dudhwa Tiger Reserve by a volunteer at the Habitats Trust. Ghaghra, a sanctuary for numerous threatened species, one of the last strongholds for the critically endangered, gharial and Gangetic dolphin in UP. . The sighting occurred 5 kilometers upstream of the Zalim Nagar Bridge on Ghaghra, within the Dhuaraha range in the Dudhwa buffer zone. This indicates the importance of Ghaghra river in Bahraich district as a vital habitat for the endangered Indian Skimmer, suggesting possibility of more inhabiting the upstream areas. Indian Skimmer is an unusual looking bird with a striking red-orange beak, the lower bill longer than the upper. It feeds by opening its mouth and skimming the top of river water with its lower bill for fish, larvae and shrimps.

Tiger reserves benefit us

They are home to clean water and natural resources

Rushikesh Chavan

TOP PREDATOR. Big boon

If there is that one iconic species that we can claim to have saved from extinction, it is the tiger. It has taken us 50 years, millions of dollars, incredible human effort, and out-of-the-ordinary government policies to make it happen. The question is whether all this effort was worth it. While Article 51 A(g) of the Constitution makes it our fundamental duty to protect species and their habitats, it appears that unless it directly benefits us, it is better left on the back-burner. So, does it really benefit us directly? Should the measure of success be limited to the increase in the total number of tigers, or should we cast a wider net to assess the overall benefits to human well-being?

Tigers have adapted to diverse habitats and thrive in areas with high human densities. The ability to breed well is one of the major reasons why this feline could beat extinction.

TROPHIC LEVELS

Beyond their intrinsic value, tigers play a crucial role as top predators in maintaining trophic levels and ecological functionalities. These systems are important for our own well-being. They ensure that we get clean water and air, provide natural resources, keep our economy running, food security, the list can go on and on. And thus, tigers are protected to ensure human well-being. However, the implicit intention and necessity of tiger conservation often take a back-seat to the animal's charisma.

Tiger reserves are home to nearly 50 per cent of threatened bird species of India and many other endangered species that find refuge within them. Moreover, these reserves, encompassing just 2.3 per cent of India's landmass, are the origins of around 300 rivers, supplying water for hundreds of millions of people and irrigation purposes.

A 2019 report evaluating ten tiger reserves based on 27 ecosystem services estimated that their annual monetary value is up to ₹16,202.11 crore. This means, for every rupee we spent on conserving tigers in these reserves, we received a benefit of up to ₹7,488. Additionally, in terms of water provisioning, these tiger reserves provided benefits worth ₹330 billion. A study published in the journal *Nature Ecology and Evolution* revealed that of the 45 tiger reserves assessed, 11 collectively avoided carbon emissions of around 1.08 tonnes, which, if integrated into voluntary carbon markets, would be worth around $6.24 million.

Today, we have more environmental refugees than political refugees fleeing from wars and conflict. A 2021 report by the World Bank estimated that over 200 million people will be displaced because of the climate crisis by 2050. While the Institute for Economics and Peace put the number of people at risk of displacement by 2050 at over 1 billion.

Considering these challenges, it becomes crucial to question whether looking at monetary benefits alone is the right approach to tiger conservation. The climate crisis and biodiversity loss are among the top challenges to our economy. Tigers and tiger reserves ensure security and well-being for all of us; not just the millions who live in and around these reserves but also across the country's borders extending across the sub-continent. We must acknowledge the interconnectedness of human and tiger well-being.

A review of the changing world and increasing challenges reveal that something is amiss with our Earth's systems, negatively impacting us. Many of us must have realised this, but there seems to be no way we can contribute meaningfully to it that goes beyond planting a tree or using less water and electricity. Are there any tangible ways to contribute as an individual?

The answer is definitely not simple, it will demand some sense of sacrifice. While reducing our environmental footprint and being conscious consumers is a good start, we can go further by incentivising institutions, governments, and corporations to protect and conserve the ecosystems and habitats that tigers occupy. This can be accomplished through responsible voting and changing our product preferences.

The writer is Head, The Habitats Trust

August 2023

YourStory: "Human-elephant conflict: finding a peaceful coexistence" - Rushikesh Chavan on THT's long-term project in Valparai.

Daijiworld: "Tiger reserves benefit us" - At the 19th meeting of the National Tiger Conservation Authority.

Daijiworld: "Rediscovery of bird thought to be extinct pinpoints need for grasslands" - A confirmation of the presence of Jerdon's Babbler in the Sharda Riverine ecosystem.

November 2023

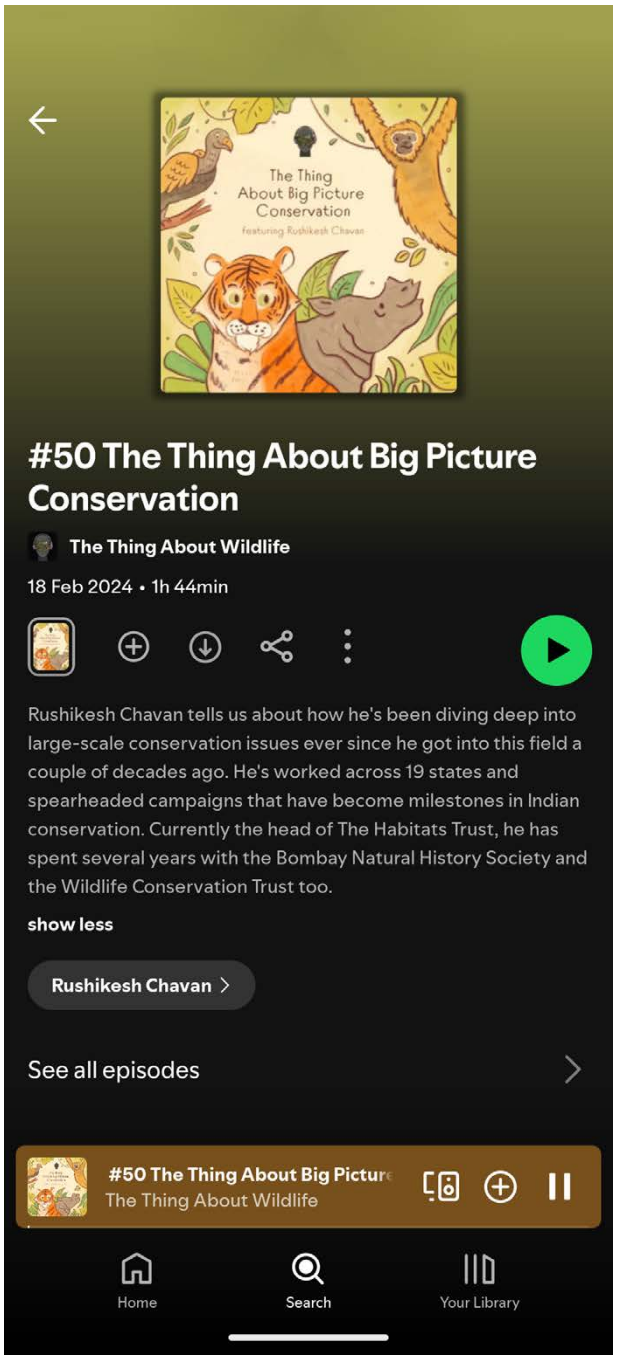
The Hindu: "A festival to promote green literature" - THT at the third edition of India's first Green Literature Festival.

December 2023

PTI: "The Habitats Trust Announces 2023 Grants Winners" - Grant winners announced for organisations and individuals.

The Quint: "The Habitats Trust launches YouTube channel for wildlife conservation in India" - THT's YouTube foray.

Deccan Herald: "The Habitats Trust launches YouTube channel for wildlife conservation in India" - New beginnings on YouTube.



February 2024

Spotify: "The Thing About Big Picture Conservation featuring Rushikesh Chavan" - Talking about conservation on the popular podcast, 'The Thing About Wildlife'.

March 2024

PTI: "The Habitats Trust Kick-Starts Its First Global 'Habitats Summit'" - The Habitats Summit for global conservation.

BUDGET

The Habitats Trust
Balance Sheet as at 31 March 2024
(All amounts are in lakhs of Indian Rupees, unless otherwise stated)

		Note	As at 31 March 2024	As at 31 March 2023
I	**Sources of Funds**			
1	**NPO Funds**			
(a)	**Restricted Funds**		-	-
(b)	**Unrestricted Funds**	3	**43.77**	**(11.92)**
2	**Non-current liabilities**			
(a)	Long term provisions	4	15.14	-
			15.14	-
3	**Current liabilities**			
(a)	Payables	5	216.13	151.93
(b)	Other current liabilities	6	61.72	2.91
(c)	Short term provisions	7	0.92	-
			278.77	**154.84**
	Total		**337.68**	**142.92**
II	**Application of funds**			
1	**Non-current assets**			
(a)	**Property, plant and equipment and intangible assets**			
(i)	Property, plant and equipment	8	59.32	2.68
(ii)	Intangible assets	8	-	-
(b)	Long term loans and advances	9	0.12	0.12
			59.44	**2.80**
2	**Current assets**			
(a)	Cash and bank balances	10	11.45	15.61
(b)	Short term loans and advances	11	266.79	124.51
			278.24	**140.12**
	Total		**337.68**	**142.92**
	Significant accounting policies	2		

The notes referred to above form an integral part of the financial statements

As per our report of even date attached

For **B S R & Co. LLP**
Chartered Accountants
Firm Registration Number: 101248W/W-100022

For **and on behalf of The Habitats Trust**

Rakesh Dewan
Partner
Membership No.: 092212

Place: Gurugram
Date : 5 August 2024

Roshni Nadar Malhotra
Managing Trustee

Place: Noida, UP
Date : 5 August 2024

Shikhar Neelkamal Malhotra
Trustee

Place: Noida, UP
Date : 5 August 2024

The Habitats Trust
Income and Expenditure Account for the year ended 31 March 2024
(All amounts are in lakhs of Indian Rupees, unless otherwise stated)

	Note	For the year ended 31 March 2024			For the year ended 31 March 2023		
		Unrestricted funds	Restricted funds	Total	Unrestricted funds	Restricted funds	Total
Income							
Donation and grants	12	1,805.50	-	1,805.50	1,103.00	-	1,103.00
Other income	13	5.32	-	5.32	1.15	-	1.15
Total		**1,810.82**	**-**	**1,810.82**	**1,104.15**	**-**	**1,104.15**
Expenses							
Staff payments and benefits	14	265.65	-	265.65	-	-	-
Donation and grants	15	498.21	-	498.21	413.24	-	413.24
Project expenses	16	841.82	-	841.82	731.19	-	731.19
Administrative and general expenses	17	125.12	-	125.12	46.37	-	46.37
Depreciation and amortisation	18	24.33	-	24.33	3.05	-	3.05
Total		**1,755.13**	**-**	**1,755.13**	**1,193.85**	**-**	**1,193.85**
Excess of income over expenditure/ (excess of expenditure over income for the year)		**55.69**	-	**55.69**	**(89.70)**	-	**(89.70)**
Significant accounting policies	2						

The notes referred to above form an integral part of the financial statements

As per our report of even date attached

For **B S R & Co. LLP**
Chartered Accountants
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Rakesh Dewan
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Date : 5 August 2024

For **and on behalf of The Habitats Trust**

Roshni Nadar Malhotra
Managing Trustee

Place: Noida, UP
Date : 5 August 2024

Shikhar Neelkamal Malhotra
Trustee

Place: Noida, UP
Date : 5 August 2024

The Habitats Trust
Notes to the financial statements for the year ended 31 March 2024
(All amounts are in lakhs of Indian Rupees, unless otherwise stated)

1. Background

The Habitats Trust ('THT' or 'the Trust') was established in 2018 with the objective to create awareness and sensitivity on biodiversity, advocate for best conservation practices, document and create awareness about biodiversity, to protect our natural habitats, ecosystems and indigenous species, to promote and encourage objectives of the Trust, to facilitate research and learning centres for conservation related subjects, to build partnerships and provide support to organizations working on- ground. The Trust was established with a purpose of conserving natural habitats and species of flora and fauna and will not carry on any activity with the object of earning distributable profits.

The Trust is registered under 12A read with section 12AA/12AB of the Income Tax Act, 1961 (the 'Act'). The management of the Trust believes that the activities of the Trust qualify for exemption under section 11 of the Act and hence no provision for tax has been created.

2. Significant accounting policies

2.1 Basis of preparation of financial statements

The financial statements of the Trust have been prepared under historical cost convention, on accrual basis of accounting, in accordance with the Generally Accepted Accounting Principles in India ("GAAP") including the Accounting Standards issued by the Institute of Chartered Accountants of India ('ICAI'), to the extent applicable.

The Trust is a level III – Small and Medium Sized Enterprises (SME) in accordance with the announcement made by the Institute of Chartered Accountants of India which is effective for all accounting periods commencing on or after 1 April 2014. Accordingly, the Trust is not required to present inter alia, the cash flow statement and segment disclosure, as required under the respective Accounting Standard.

2.2 Use of estimates

The preparation of financial statements in conformity with Generally Accepted Accounting Principles (GAAP) requires the management to make judgments, estimates and assumptions that affect the application of accounting policies and reported amounts of assets, liabilities, income and expenses and the disclosure of contingent liabilities on the date of the financial statements and the results of operations during the reporting period. Actual results could differ from those estimates. Estimates and underlining assumption are reviewed on an ongoing basis. Any revision to accounting estimates is recognized prospectively in current and future periods. Examples of such estimates includes estimation of useful lives of property, plant and equipment and intangible assets, recognition and measurement of provision and contingencies, impairment of property, plant and equipment, etc.

2.3 Recognition of Assets and Liabilities

The Trust presents assets and liabilities in the Balance Sheet based on following criteria:

A liability should be recognised in the balance sheet when and only when:
(a) it is probable that any future sacrifice of economic benefits will be required; and
(b) the amount of the liability can be measured reliably

An asset should be recognised in the balance sheet when and only when:
(a) it is probable that the future economic benefits embodied in the asset will be received; and
(b) the asset possesses a cost or value that can be measured reliably

2.4 Funds

Corpus fund: Corpus fund refers to funds contributed by founders/promoters of the Trust.

General fund: Unrestricted funds other than 'designated funds' and 'corpus fund' are a part of the 'General Fund'. The balance in the income and expenditure account i.e., surplus/ (excess of expenditure over income) is transferred to this fund.

2.5 Property, plant and equipment and depreciation

Property, plant and equipment are carried at cost, less accumulated depreciation and/or accumulated impairment loss, if any. The cost of property, plant and equipment comprises its purchase price, including import duties and other non-refundable taxes or levies (other than those subsequently recoverable from tax authorities), and any directly attributable cost of bringing the asset to its working condition for its intended use. Any trade discounts and rebates are deducted in arriving at the purchase price.

Subsequent expenditures related to an item of property, plant and equipment are added to its book value only if they increase the future benefits from the existing asset beyond its previously assessed standard of performance.

An item of property, plant and equipment is derecognized on disposal or when no future economic benefits are expected from its use or disposal. The gain or loss arising on derecognition is recognized in the Income and Expenditure account.

Depreciation on property, plant and equipment is charged on written down value basis in order to reflect the actual usage of the asset basis the useful life of assets as mentioned below:

Nature of Assets	Estimated useful life
Computers	3 years
Office and other equipments	13 years

The asset's residual values, useful lives and methods are reviewed, and adjusted if appropriate, at each financial year end.

2.6 Intangible assets and amortisation

Intangible assets comprise website. Intangible assets that are acquired by the Trust are measured initially at cost. After initial recognition, an intangible asset is carried at cost less any accumulated amortization and impairment loss, if any. Subsequent expenditure is capitalized only when it increases the future economic benefits from the specific asset to which it relates.

The estimated useful life of website has been revised from 10 years to 3 years w.e.f. 1 April 2021. Accordingly, the website is amortized on a written down value basis on the useful life of 3 years.

2.7 Impairment of assets

The carrying values of assets are reviewed at each Balance Sheet date to determine whether there is any indication of impairment. If any such indication exists, the recoverable amount of the asset is estimated. For assets that are not yet available for use, the recoverable amount is estimated at each Balance Sheet date. An impairment loss is recognized whenever the carrying amount of an asset or its cash generating unit exceeds its recoverable amount. Impairment losses are recognized in the Income and Expenditure Account. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the carrying amount of the assets does not exceed the carrying amount that would have been determined net of depreciation or amortization, if no impairment loss had been recognized.

2.8 Cash and bank balances

Cash and cash equivalents comprise cash balances on hand and balances with banks.

2.9 Donation and grants

Donation is recognized when there is a reasonable assurance that the Trust will comply with the conditions attached if any, and the donations will be received.

2.10 Expenses

Donations given for specific projects are recognized as expense to the extent utilized during the year as per the terms of agreements/arrangements and any amount paid to NGO's/ third parties in excess of aforementioned utilization are carried forward as asset and disclosed as 'Advances to sub-grantees' under current assets until the actual expenditure is incurred.

All the general expenses are accounted for on accrual basis and provision is made for all known losses and liabilities.

2.11 Provisions, contingent liabilities, and contingent assets

A provision is created when there is a present obligation as a result of a past event that probably requires an outflow of resources and a reliable estimate can be made of the amount of the obligation. A disclosure for a contingent liability is made when there is a possible obligation or a present obligation that may, but probably will not, require an outflow of resources. When there is a possible obligation or a present obligation in respect of which the likelihood of outflow of resources is remote, no provision or disclosure is made. Contingent assets are neither recognized nor disclosed in the financial statements. However, contingent assets are assessed continually and if it is virtually certain that an inflow of economic benefits will arise, the assets and related income are recognized in the period in which the change occurs.

2.12 Staff payment and benefits

The Trust's obligation towards various employee benefits have been recognized as follows:

Short term employee benefits

All employee benefits payable wholly within twelve months of rendering the services are classified as short-term employee benefits. Benefits such as salaries, wages, and bonus are recognised in the Income and Expenditure account in the period in which the employee renders the related service.

Provident fund (Defined contribution plan)

The Trust's contribution towards provident fund, which are being deposited with the Regional Provident Fund commissioner, are charged to the Income and Expenditure account in the period in which the employee renders the related service.

Gratuity (Defined benefit plan)

The Trust's gratuity scheme is a defined benefit plan. The present value of the obligation under such defined benefit plan is determined based on actuarial valuation carried at the year end using the Projected Unit Credit Method, which recognizes each period of service as giving rise to additional unit of employee benefit entitlement and measures each unit separately to build up the final obligation. The obligation is measured at the present value of the estimated future cash flows. Actuarial gains and losses are recognized immediately in the Income and Expenditure account. The discount rate used for determining the present value of the obligation under defined benefit plans, is based on the market yields on Government securities as at the Balance Sheet date.

Other long-term benefits

Benefits under the Trust's compensated absences scheme constitute other long-term employee benefits. The obligation in respect of these benefits is provided on the basis of actuarial valuation carried out by an independent actuary using the Projected Unit Credit Method and actuarial gains and losses are recognised immediately in the Income and Expenditure account.

The Habitats Trust
Notes to the financial statements for the year ended 31 March 2024
(All amounts are in lakhs of Indian Rupees, unless otherwise stated)

3. Unrestricted Fund

Particular	As at 1 April 2023 (Opening balance)	Funds received during the year	Funds utilised during the year	As at 31 March 2024 (Closing balance)
Corpus fund	969.31	-	-	969.31
General fund	(981.23)	55.69	-	(925.54)
Total	**(11.92)**	**55.69**	-	**43.77**

Particular	As at 1 April 2022 (Opening balance)	Funds received during the year	Funds utilised during the year	As at 31 March 2023 (Closing balance)
Corpus fund	954.31	15.00	-	969.31
General fund	(891.53)	(89.70)	-	(981.23)
Total	**62.78**	**(74.70)**	**-**	**(11.92)**

4. Long term provisions	As at 31 March 2024	As at 31 March 2023
Provision for gratuity (refer note 21)	7.40	-
Provision for compensated absences (refer note 21)	7.74	-
	15.14	**-**

The Habitats Trust
Notes to the financial statements for the year ended 31 March 2024
(All amounts are in lakhs of Indian Rupees, unless otherwise stated)

5. Payables	As at 31 March 2024	As at 31 March 2023
Creditors		
- Total outstanding dues of micro enterprises and small enterprises*	103.38	7.64
- Total outstanding dues of creditors other than micro enterprises and small enterprises	112.75	144.29
	216.13	**151.93**

*The Trust had sought confirmation from its vendors on their status under Micro, Small and Medium Enterprises Development Act, 2006 ("MSMED Act"). The disclosures in respect of the amounts payable to the micro and small enterprises as at 31 March 2024 and 31 March 2023 have been made in the financial statements to the extent of available information in this regard. In view of the management, the impact of interest, if any, that may be payable in accordance with the provisions of the Act to the enterprises who have not yet responded to the Trust's letter is not expected to be material. The disclosure pursuant to the Micro, Small and Medium Enterprises Development Act, 2006, (MSMED Act) for dues to micro enterprises and small enterprises as at 31 March 2024 and 31 March 2023 is as under:

	As at 31 March 2024	As at 31 March 2023
Dues remaining unpaid to any supplier:		
Principal	103.38	7.64
Interest on the above	-	-
Amount of interest paid in terms of section 16 of the MSMED Act, 2006, along with the amount of the payment made to the supplier beyond the appointed day during each accounting year	-	-
Amount of interest due and payable for the period of delay in making payment (which has been paid but beyond the appointed day during the year) but without adding the interest specified under the MSMED Act, 2006	-	-
Amount of interest accrued and remaining unpaid amount of further interest remaining due and payable even in the succeeding years, until such date when the interest dues as above are actually paid to the small enterprise, for the purpose of disallowance as a deductible expenditure under section 23 of MSMED Act, 2006	-	-

6. Other current liabilities	As at 31 March 2024	As at 31 March 2023
Employee related payables	36.39	-
Statutory dues		
- TDS payable	23.79	2.41
- PF payable	1.54	-
Other liabilities	-	0.50
	61.72	**2.91**

7. Short term provisions	As at 31 March 2024	As at 31 March 2023
Provision for gratuity (refer note 21)	0.01	-
Provision for compensated absences (refer note 21)	0.91	-
	0.92	-

The Habitats Trust
Notes to the financial statements for the year ended 31 March 2024
(All amounts are in lakhs of Indian Rupees, unless otherwise stated)

8. Property, plant and equipment and Intangible assets

Particulars	Property, plant and equipment		
	Computers	Office and other equipments	Total
Gross block			
As at 1 April 2022	10.80	1.82	12.62
Additions during the year	0.82	-	0.82
Disposals during the year	-	-	-
As at 31 March 2023	**11.62**	**1.82**	**13.44**
Additions during the year	15.24	65.73	80.97
Disposals during the year	-	-	-
At 31 March 2024	**26.86**	**67.55**	**94.41**
Depreciation			
As at 1 April 2022	7.38	0.33	7.71
Additions during the year	2.64	0.41	3.05
Disposals during the year	-	-	-
As at 31 March 2023	**10.02**	**0.74**	**10.76**
Additions during the year	10.58	13.75	24.33
Disposals during the year	-	-	-
At 31 March 2024	**20.60**	**14.49**	**35.09**
Net block			
At 31 March 2023	**1.60**	**1.08**	**2.68**
At 31 March 2024	**6.26**	**53.06**	**59.32**

Particulars	Intangible assets	
	Website	Total
Gross block		
As at 1 April 2022	20.45	20.45
Additions during the year	-	-
Adjustments during the year	(20.45)	(20.45)
As at 31 March 2023	-	-
Additions during the year	-	-
Disposals during the year	-	-
At 31 March 2024	-	-
Depreciation		
As at 1 April 2022	20.45	20.45
Additions during the year	-	-
Adjustments during the year	(20.45)	(20.45)
As at 31 March 2023	-	-
Additions during the year	-	-
Adjustments during the year	-	-
At 31 March 2024	-	-
Net block		
At 31 March 2023	-	-
At 31 March 2024	-	-

The Habitats Trust
Notes to the financial statements for the year ended 31 March 2024
(All amounts are in lakhs of Indian Rupees, unless otherwise stated)

9. Long term loans and advances	**As at 31 March 2024**	**As at 31 March 2023**
Advance tax	0.12	0.12
	0.12	**0.12**

10. Cash and bank balances	**As at 31 March 2024**	**As at 31 March 2023**
Balances with banks		
- in savings accounts	11.45	15.61
	11.45	**15.61**

11. Short term loans and advances *(Unsecured and considered good, unless otherwise stated)*	**As at 31 March 2024**	**As at 31 March 2023**
Advance to NGOs	141.61	112.81
Other advances	106.72	0.37
Prepaid expenses	17.59	10.15
Security deposits	0.87	1.18
	266.79	**124.51**

The Habitats Trust
Notes to the financial statements for the year ended 31 March 2024
(All amounts are in lakhs of Indian Rupees, unless otherwise stated)

12. Donation and grants	For the year ended 31 March 2024	For the year ended 31 March 2023
Donation received	1,805.50	1,103.00
	1,805.50	**1,103.00**

13. Other income	For the year ended 31 March 2024	For the year ended 31 March 2023
Miscellaneous income	5.32	1.15
	5.32	**1.15**

14. Staff payments and benefits	For the year ended 31 March 2024	For the year ended 31 March 2023
Salaries and wages including allowances	239.86	-
Contribution to provident fund and other funds	8.18	-
Gratuity expense	7.41	-
Staff welfare	10.20	-
	265.65	**-**

15. Donation and grants	For the year ended 31 March 2024	For the year ended 31 March 2023
Donation paid (refer note 22)	3.58	92.71
Sub-grant expenses	494.63	320.53
	498.21	**413.24**

16. Project expenses	For the year ended 31 March 2024	For the year ended 31 March 2023
Events and exhibition	228.43	73.83
Wildlife promotion	36.37	378.61
Advertisement and marketing expenses	152.50	208.44
Legal and professional fee	236.38	32.75
Travelling expense	188.14	37.56
	841.82	**731.19**

17. Administrative and general expenses	For the year ended 31 March 2024	For the year ended 31 March 2023
Consumables	2.36	4.62
Communication expenses	0.19	0.03
Repair and maintenance	19.01	7.84
Legal and professional fee*	1.89	2.53
Rent	12.08	3.27
Sponsorship expense	70.31	14.72
Subscription and membership	10.70	11.82
Miscellaneous expenses	8.58	1.54
	125.12	**46.37**

***Includes payment to auditors (excluding tax)**

As auditor:		
Audit fee	1.50	1.50
Reimbursement of expenses	0.11	0.11
	1.61	**1.61**

18. Depreciation and amortisation	For the year ended 31 March 2024	For the year ended 31 March 2023
Amortisation on intangible assets	-	-
Depreciation on property, plant and equipment	24.33	3.05
	24.33	**3.05**

Defined benefit plan

General description of defined benefit plan

(I) **Gratuity plan:** The Trust operates a gratuity plan wherein every employee is entitled to the benefit equivalent to 15 days of basic salary last drawn for each completed year of service. Gratuity is payable to all eligible employees of the Trust on retirement or separation or death or permanent disablement in terms of the provisions of the Payment of Gratuity Act, 1972 or as per the Trust's plan whichever is more beneficial. The benefits vest after five years of continuous service except in case of death where no vesting conditions apply.

The following tables set out the disclosures in respect of the gratuity plan as required under AS 15 (revised):

a) The changes in the present value of defined benefit obligation representing reconciliation of opening and closing balances thereof are as follows:

Particulars	**As at 31 March 2024**	**As at 31 March 2023**
Change in the defined benefit obligations		
Opening defined benefit obligation	-	-
Acquisition Adjustment	356,898	-
Service cost	323,561	-
Interest cost	25,768	-
Actuarial loss / (gain)	34,814	-
Benefits paid	-	-
Closing defined benefit obligation	**741,041**	-

b) Expense recognized in the Income and Expenditure account:

Particulars	**Year ended 31 March 2024**	**Year ended 31 March 2023**
Acquisition Adjustment	356,898	-
Current service cost	323,561	-
Interest cost	25,768	-
Net actuarial loss / (gain) recognized	34,814	-
Expenses recognized in the income and expenditure account under head "staff payments and benefits (note 15)"	**741,041**	-

c) Experience adjustments:

Particulars	**As at 31 March 2024**	**As at 31 March 2023**
Defined benefit obligation (net deficit)	741,041	-

d) Principal actuarial assumptions in respect of provision for gratuity at the balance sheet date are as follows:

Particulars	**Year ended 31 March 2024**	**Year ended 31 March 2023**
Assumptions		
Discount rate	7.22%	-
Salary increase	10.00%	-
Attrition rate		
- Upto 30 years	2%	-
- From 31 to 44 years	6%	-
- Above 44 years	3%	-
Retirement age*	58 years	-
Mortality Rate	100% of IALM (2012 - 14)	-

* Corporate staff: 58 years

The estimates of future salary increase, considered in actuarial valuation, consider inflation, seniority, promotion, and other relevant factors, such as supply and demand in the employment market.

(II) Compensated absences

The Trust provides for the liability for the leave encashment and/or compensated absences on the basis of actuarial valuation at the year end. As per actuarial valuation carried out, defined benefit obligation for compensated absences in respect of the employees of the Trust as at 31 March 2024 is INR 8.64 lakhs (previous year INR NIL). The Trust has accordingly charged off INR 9.61 lakhs (previous year INR NIL) to the Income and Expenditure Account.

22. The Trust has given donation to the following with the approval of the trustees:

Party name	**For the year ended 31 March 2024**	**For the year ended 31 March 2023**
Care Earth Trust	-	5.00
Madras Crocodile Bank Trust	-	5.00
Wild Life Protection Society of India	-	5.00
Sahjeevan	-	5.00
Indian Grameen Services	-	2.00
Maharashtra Education Society	-	2.00
Joshi Pankaj Narayan	-	2.00
Rajani Mani	-	2.00
The Shola Trust	-	2.00
Zoo Outreach Organization Trust	-	2.00
Palani Hills Conservation Council	-	3.00
Shiva Enterprises	-	6.00
Dudhwa Tiger Reserve	-	51.71
Pilibhit Tiger Conservation Foundation	3.58	-
Total	**3.58**	**92.71**

For **B S R & Co. LLP**
Chartered Accountants
Firm Registration No.: 101248W/W-100022

For and on behalf of the Board of Trustees of
The Habitats Trust

Rakesh Dewan
Partner
Membership No.: 092212

Place: Gurugram
Date: 5 August 2024

Roshni Nadar Malhotra
Managing Trustee

Place: Noida, UP
Date: 5 August 2024

Shikhar Neelkamal Malhotra
Trustee

Place: Noida, UP
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