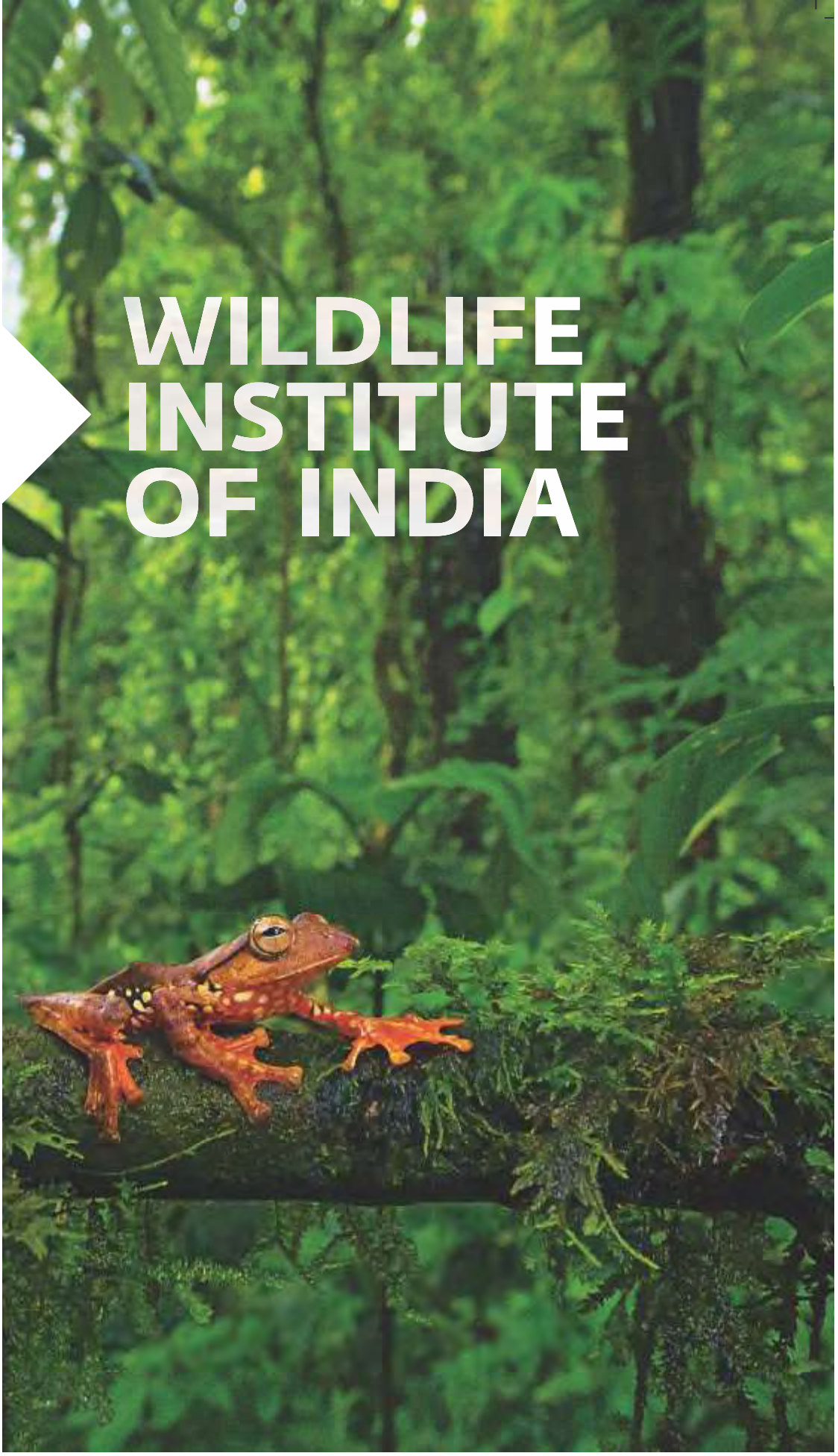
WILDLIFE INSTITUTE OF INDIA



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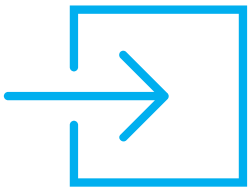
भारतीय वन्यजीव संस्थान
Wildlife Institute of India



ANNUAL REPORT 2018-19

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From the Director's Desk...

I am very pleased to state that the Reporting Period 2018-19 of this Annual Report was full of activities for Wildlife Institute of India. All major programmes and activities were conducted under the supervision of the management and the faculty members. The flagship training programmes like Post Graduate Diploma in Advanced Wildlife Management and the Certificate Course in Wildlife Management were completed as per their schedule.

The Institute in full swing performed the mandated research activities during the reporting year. The ongoing batch of M.Sc. in Wildlife Sciences was being completed. The students defended their dissertation topics which showed their command over the chosen areas. All the laboratories and facilities at the Institute were supporting various activities. The Institute continued to provide a range of advisory services to its stakeholders.

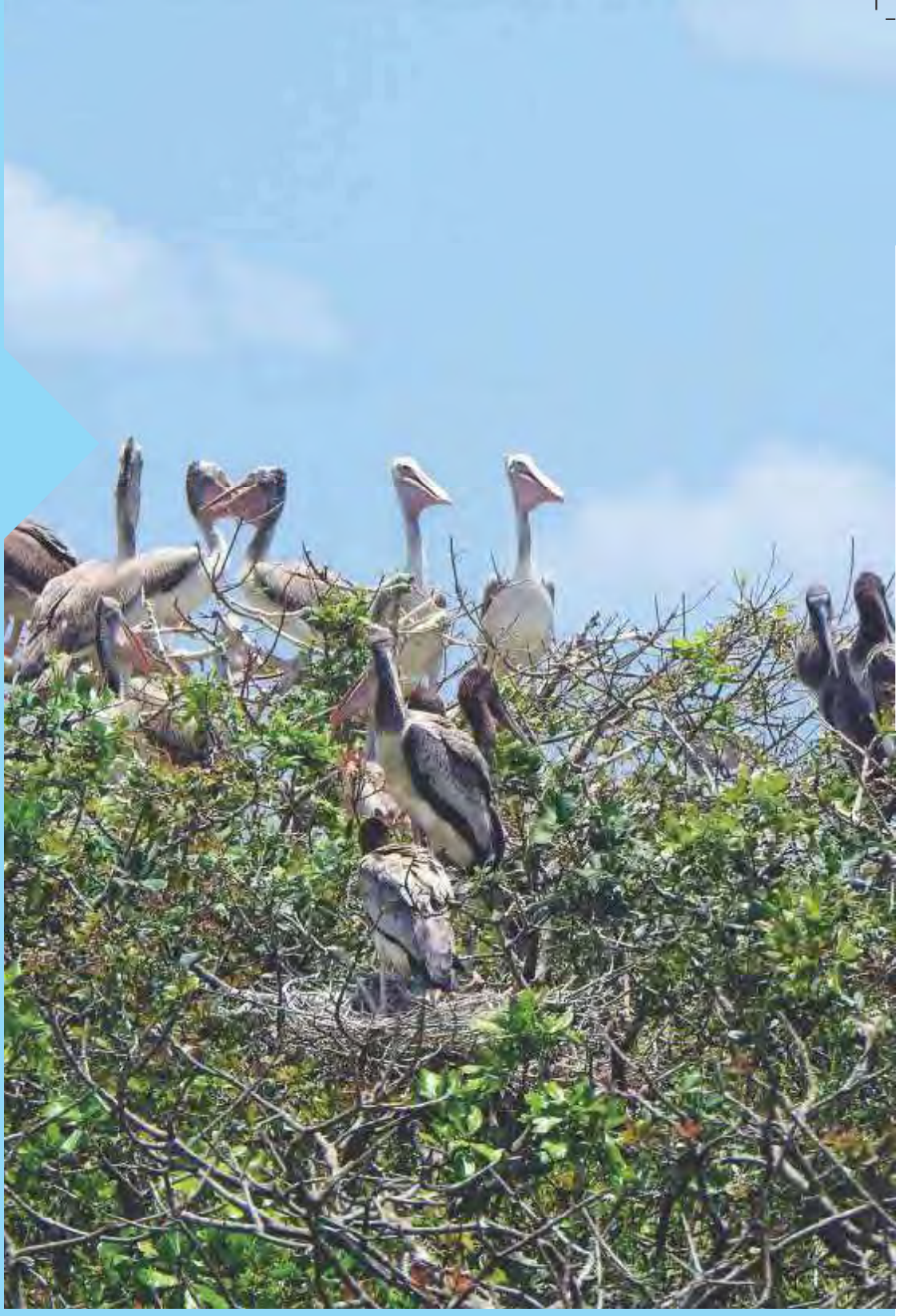
The UNESCO Category 2 Centre on 'World Natural Heritage Management and Training for Asia and the Pacific Region' at Wildlife Institute of India was also preparing to initiate an academic programme of M.Sc. in Heritage Conservation and Management with the affiliation of Saurashtra University, Gujarat. Several short courses, workshops and seminars were conducted during the year.

The Institute is playing its role in the capacity building of the officials and students of countries of Asian region too. A training programme was customized as per the request of Sri Lankan authorities to train their officials. A group of students and faculty members from the Hiroshima University, Japan visited the Institute as part of their on-site training course on 'Nature Conservation and Forest Dwellers' Livelihood.' The Institute also organized a field course in collaboration with foreign agencies, like Zoological Society of London and University of Edinburgh. Institute's research activities especially under CAMPA, NMSHE and Tiger Cell have achieved some important milestones. The Institute along with collaborating agencies was in the final stage of analyzing the data for estimation of the number of tigers in the country. The Institute campus emerged as the winner of Campus Bird Count, 2019 in India reporting the maximum number of species found in a campus in India during the global event - Great Backyard Bird Count.

I would like to thank the Institute's governance and administrative committees for their valuable inputs. I would also like to acknowledge the cooperation of all the stakeholders and faculty colleagues; staff, researchers and students that have helped to successfully fulfil the Institute's mandate and responsibilities during the period of this Annual Report.

(Dr. Dhananjai Mohan)

5 February 2020



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ROLE AND MANDATE

ROLE AND MANDATE

Introduction

During the early eighties of the last century there was a world wide realisation, that the natural resources were diminishing at alarming rate and the environment was degrading very fast. At the same time, the understanding of environmental issues was still a little hazy, and the initial remedial responses to the complex environmental problems had mixed outcomes.

This realization and need for conservation initiatives also brought into focus the inadequacy of skilled human resources for wildlife management and of wildlife biologists to conduct research and overcome the paucity of researched information for promoting proper conservation planning. A need was also felt for establishing an organisation that, through multi-disciplinary research at the field level, could help respond to the challenges of biodiversity conservation and develop holistic approaches for managing wildlife and habitats across the country and the region. This led to the setting up of the Wildlife Institute of India (WII) at Dehradun in 1982.

WII is a premier training and research institution in the field of wildlife and protected area management in South Asia. In 1986, it was granted the status of an autonomous institution of the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India. Since its inception, WII has had the benefit of collaboration with international organisations such as UNDP, FAO, USFWS, IUCN and UNESCO. These partnerships have helped the institute build a qualified faculty and staff through rigorous training and exposure to modern research and analytical techniques.

The institute's wide array of capacity building programme provides a practical and realistic direction to the concept and practice of wildlife conservation. By learning from its own and others' experiences, WII is traversing a path of hope and aspiration, which will help strengthen finding answers in addressing wildlife conservation issues and challenges in the country as well as in the South Asian region.

Our Mission

Mission of WII is to nurture the development of wildlife science and promote its application in the field in a manner that accords with our economic and socio-cultural milieu.

Aims and Objectives

- Build up scientific knowledge about wildlife, their habitat and conservation.
- Train forest personnel at various levels in conservation and management of wildlife.
- Carry out research relevant to management including the development of techniques appropriate to Indian conditions.
- Provide information and advice on specific wildlife management problems.
- Collaborate with international organisations on wildlife research, management and training.
- Develop as a regional centre of international importance for conservation of wildlife and natural resources.

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RESEARCH

01

COMPLETED

PROJECT INITIATED

ONGOING

Monitoring of Reintroduced Gaur Bos gaurus gaurus in Bandhavgarh Tiger Reserve, Madhya Pradesh, Phase II

Funding Source
Madhya Pradesh
Forest Department

Investigators
Dr Parag Nigam
Dr Bilal Habib
Shri Qamar Qureshi
Dr K. Sankar

Researchers
Dr B. Navneethan
Mariyam Nasir

Date of Initiation
April 2015

Date of Completion
March 2018

Objectives

The objectives of the projects were to (i) study the ranging pattern of reintroduced gaur in Bandhavgarh Tiger Reserve (BTR); (ii) study the habitat use of reintroduced gaur in BTR; (iii) study their food habits; (iv) study their health condition; and (v) study the food resource competition of reintroduced gaur with other ungulates and camp elephants in BTR.

Major Findings

During the study period, a total of 1,277 locations were recorded for the six radio-collared gaur individuals through ground tracking and direct sightings in the identified herds (n=4). The annual estimated home range for gaur varied across the years. In 2015 the Minimum Convex Polygon (100% MCP) was 322.6 sq.km, followed by 185.8 sq.km and 281.4 sq.km respectively for gaur herds in 2016 and 2017. The 95% Fixed Kernel Density Estimator (FKD) in 2015 was 187.2 sq.km followed by 102.3 sq.km and 179.1 sq.km in 2016 and 2017 respectively. The overall home range with 100% MCP was 375.8 sq.km, and it was 225.5 sq.km using 95% FKD and 42.5 sq.km with 50% FKD (core area) estimated during the study period. The overall habitat preference of gaurs was observed in the following order as: grassland> riverine> bamboo> open mixed forest> sal forest> mixed forest.

A total of four different herds were identified based on their herd size and body characteristics of individual animals. Reintroduced gaurs were tracked and approached within the visible proximity (<50m) on the vehicle to collect food behaviour data through scan sampling methods during opportunistic sightings. Food habits of gaur were also analyzed through 50 dung samples in each season. The 112 species of food plants recorded to be consumed by gaur comprising 41 trees species, 18 shrub species, 12 herb species, 34 grass species and seven climber species. The study found that gaur and camp elephant have high food resource overlap in Bandhavgarh.

The health condition of reintroduced gaurs was estimated through Body Condition Index scoring. A total of 1,635 body scores were examined for preparing BCI for both sexes of the animal. A total of 77.9% gaurs BCI were found to be in good body condition followed by 20.2% in fair and 1.7% in poor health condition.

Outputs and Outcomes

Using obtained locations (n=1,277) of radio-collared gaurs and identified gaur herds, the overall home range of gaur in Bandhavgarh was estimated. The home ranges for all four herds with 100% MCP were estimated. The gaur with functional radio-collared (n=6), were monitored, and locations were recorded. The home ranges for collared gaurs were at 100% MCP was 147.1 ± 8.9 (SE) sq. km for the study period.

The results of the study indicate that gaur in BTR primarily used grasslands, followed by riverine forest followed by bamboo forests. This is attributed to higher availability of usable biomass in grasslands (forbs and grasses) with gaur being primarily grazers rather than browsers. Herd I and IV used riverine forest more than grassland in their home ranges whereas herd II and III used grassland more than riverine forest. The difference in habitat preferences is attributed to the availability of water resources in ranging areas as gaurs are obligatory drinkers.

A total of 112 species of food plants belongings to 39 families were recorded. Different plants from ten new families were added to the gaur food plant list which was not reported in Bandhavgarh. Similarly, 55 different food plants species not reported earlier in BTR were recorded. The overlap for food resources of gaur with chital was found to be 100%, with camp elephant and blue bull, gaur shared 89% and 81% food resources respectively, whereas the overlap was found to be minimum 73% with sambar. Though large overlaps in food preferences were observed with all sympatric herbivores completion was limited by the small size of the gaur population during the study period.

The assessment of health condition revealed that a majority of the animals were in good body condition indicating the suitability of the habitat for reintroduced gaur. It also indicates that animals have adapted to their new environment.

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02

COMPLETED

PROJECT INITIATED

ONGOING

Monitoring of Reintroduced Tigers in Sariska Tiger Reserve, Rajasthan - Phase II

Funding Source
National Tiger Conservation Authority

Investigators
Dr Parag Nigam
Dr P.K. Malik
Dr B. Habib
Dr K.Sankar

Researchers
Dibyendu Mandal and Debaprasad Sengupta

Date of Initiation
April 2015

Date of Completion
June 2018

Objectives

The objectives of the project were to (i) study the home range and dispersal patterns of the re-introduced tigers and cubs with respect to relocated villages; (ii) assess the habitat use by the re-introduced tigers and cubs; (iii) study their food habits; (iv) estimate the population of the prey species; and (v) suggest management recommendations for effective conservation of tigers in the Reserve.

Major Findings

All the tigers were monitored in Sariska Tiger Reserve (STR) through ground tracking, camera trapping, direct sightings and indirect signs. The Minimum Convex Polygon (100% MCP) technique was used for the analysis of home range estimation, whereas, habitat variables such as terrain, broad vegetation type, distance to the nearest water body, road and human settlement were recorded to evaluate the habitat use of each tiger. Furthermore, scat analysis was used to get an insight into the prey preference of the reintroduced tigers.

All tigers were monitored intensively during the project duration (2015-18). Average annual home range for the adult male tiger was found to be 385.57 sq. km and for adult female tiger it was 61.48 sq. km. A total of eight species were identified through the collected tiger scats. Sambars contributed the maximum to tiger diet followed by chital, cattle, nilgai, buffalo, hare, goat and wild pig. Sambar as the main prey species for tiger in the study area has been re-established. The population densities of wild prey and livestock in the TR were estimated. The present study recorded a 40% increase in the wild ungulate density in Sariska over three years following the relocation of 565 families from the reserve. Additionally, the research team studied the response of wild ungulates and change in livestock population following the resettlement of 565 families (800 sq. km) in the TR. SECR models were used to estimate density directly from the spatial capture histories. Density estimates of leopard and striped hyena were 13.02±2.74 individuals/ 100 km^2 and 11.67±1.38 individuals/ 100 km^2 in the study area. The tigers exhibited crepuscular activity and were primarily active during twilight hours. However, the temporal activity of leopard was observed to be bimodal with a peak early morning and the striped hyena being exclusively nocturnal. Chital, nilgai and wild pig were active during the daytime and spread out throughout the day, whereas, sambar was over served to be crepuscular with peak activity during dusk hours. Due to the presence of 29 villages inside the reserve, human activity inside the reserve was high and limited to the day time. Livestock grazing is spread throughout the day with a peak during afternoon hours. Tiger's temporal activity is found to be overlapped highest with their principal

prey, sambar followed by chital. Temporal activity overlaps with nilgai and wild pig were minimal. Tiger had significant overlap in temporal activity with the striped hyena. However, the tiger's temporal activity overlap with the leopard was comparatively low. Tigers had high spatial overlap with co-predators, their prey and also with human and livestock. However, tigers temporally segregated themselves from the anthropogenic activity which probably enabled them to persist in this landscape without major human-tiger conflict. The present study showed that ruggedness and human disturbance significantly affected breeding and spatial dynamics of tigers in Sariska. While ruggedness positively, human disturbance negatively influenced tiger breeding. Terrain complexity appeared to have masked human disturbance at some breeding sites. Population Viability Analysis (PVA) was used to predict the viability of the tiger population (100 years) under different management scenarios for active management of reintroduced tiger population in Sariska. Simulations show that without supplementation and village relocation working in tandem to create more inviolate space to accelerate recruitment rate in Sariska, the population is vulnerable to extinction in approximately 50 years.

Outputs and Outcomes

Monitoring of all the tigers was carried out during the study period. The study on the home ranges for the tigers in STR following ten years of reintroduction showed marked differences as compared to similar works carried out in other Tiger Reserves (Panna, Pench, Kanha and Sundarban TR). The animals have utilized all the possible areas in the TR. The long-term research indicates recovery of wild ungulate and tiger population following the relocation of 565 families from the reserve. Three of the five reintroduced tigresses in Sariska littered after a gap of 4-6 years of reintroduction and have been effectively utilizing the inviolate areas created after village relocation.

It was observed that six villages with an estimated 5,000 livestock reside inside the national park. Heavy livestock grazing is not only detrimental to the habitat but also creates competition for wild ungulates and can cause human-carnivore conflict. Tigers require inviolate space free from human disturbance for breeding. The presence of villages impedes tiger breeding inside the core area. Once, these six prioritized villages are relocated, management should concentrate on complete removal of livestock from these areas and increase number of guards at four chowkis (Rotkala, Sukola, Kankwadi and Bana) for better protection of these newly created inviolate areas.

Sariska's tiger population is vulnerable to extinction due to its isolation and small size, even if it is effectively managed. Supplementation in a highly managed scenario with human induced no prey loss and tiger mortality will be crucial for the long-term survival of the population. Although the ecological carrying capacity of tigers based on prey abundance is comparatively higher in STR, the findings suggest it may be a gross over-estimate as suitable breeding area is limited to accommodate tigers in Sariska.

03

COMPLETED

PROJECT INITIATED

ONGOING

Development and Maintenance of Studbooks for Selected Endangered Species in Indian Zoos

Funding Source
Central Zoo Authority,
New Delhi

Investigator
Dr Parag Nigam

Researchers
Dr Anupam Srivastav
(Project Consultant)
Nilofer Begum
Neema Sangmo Lama

Date of Initiation
July 2012

Date of Completion
September 2018

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Objectives

The objective of this project was to maintain and develop studbooks for the identified 34 species (update of studbooks of 14 species and initiation of new studbooks for 20 species). The details are placed in the table.

Major Findings

A review of the 34 studbooks developed under the project was carried out. It revealed that for a majority of the species, limited contributions of wild origin animals resulted in poor retention of the genetic diversity sampled from wild populations. It was also observed that for a majority of the species, the total number of living specimens continues to remain small despite spending extended time in captivity. Salient recommendations based on the project findings were the review of existing housing and husbandry practices, improvement in existing record-keeping practices in Indian zoos and an assessment of relatedness between individuals in existing populations.

Group	Studbooks to be updated	New studbooks to be initiated
Canids	Tibetan wolf, *Canis lupus chanco*, Dhole, *Cuon alpines*	Indian wolf, *Canis lupus pallipes*
Felids	Snow leopard, *Panthera uncia*, Clouded leopard, *Neofelis nebulosa*, Asiatic lion, *Panthera leo persica*, Bengal tiger, *Panthera tigris tigris*	
Primates	Lion-tailed macaque, *Macaca silenus*, Nilgiri langur *Trachypithecus johnii*, Hoolock gibbon, *Hoolock hoolock*	Stump-tailed macaque, *Macaca arctoides*, Pig-tailed macaque, *Macaca leonina*, Golden langur, *Trachypithecus geei*, Phayrei's leaf monkey, *Trachypithecus phayrei*
Ungulates	Indian wild ass, *Equus hemionus* khur, Greater one-horned rhinoceros, *Rhinoceros unicornis*, Gaur, *Bos gaurus gaurus*	Serow, *Capricornis thar*, Blue sheep, *Pseudois nayuur*, Mouse deer, *Moschiola indica*, Four-horned antelope, *Tetracerus quadricornis*, Chinkara, *Gazella bennettii*, Sangai,*Rucervus eldii eldii*, Swamp deer, *Rucervus duvaucellii*
Small mammals	Red panda, *Ailurus fulgens*	Indian pangolin, *Manis crassicaudata*
Pheasants	Grey peacock pheasant, *Polyplectron bicalcaratum*	Himalayan monal, *Lopophurus impejanus*, Western tragopan, *Tragopan melanocephalus*, Cheer pheasant, *Catreus wallichi*
Vultures		Long-billed Vulture, *Gyps indicus*, White Backed Vulture, *Gyps bengalensis*, Slender-billed Vulture, *Gyps tenuirostris*
Columbidae		Nicobar pigeon, *Caloenas nicobarica*

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Outputs and Outcomes

The project was successfully completed with the initiation of new studbooks of 20 species and the update of studbooks for 14 species. Besides this, the studbook database for all the identified 34 species based on records made available by the holding zoos was updated till 31st March 2018.

04

COMPLETED

PROJECT INITIATED

ONGOING

Revisiting the Iconic, Century-Old Abor Expedition in Arunachal Pradesh, India

Funding Source
Hem Chandra Mahindra Foundation

Investigators
Dr Abhijit Das, Dr Manoj Nair, Dr Bivash Pandav, Dr Navendu Page, Dhritiman Mukherjee and Boken Pao

Researcher
Vivek Sarkar

Date of Initiation
June 2018

Date of Completion
February 2019

Objectives

The objectives of the project were to: (i) undertake the multi-taxa faunal and floral survey following the historical expedition route to document diversity after a century; (ii) identify and prioritize biodiversity rich areas which have potential for community driven conservation in future; and (iii) sensitize local stakeholders (local village communities, frontline staff of the Forest Department and Students) on the global conservation value through informal discussion and publications.

Major Findings

: Inventory on multi taxa has been carried out in September-October 2018. Final Report of the project has been submitted. Popular articles on the expedition were published in "Saevus Magazine". Posters on herpetofauna and plants were distributed among forest staff and local communities. The scientific reports on rediscovery of lost species reptiles and odonates are underway. All findings will be published in peer reviewed journals.

Outputs and Outcomes

Approximately 400 species of flowering plants including new taxa for India and potentially new species to science were recorded. Two hundred sixty-nine species of butterflies and 14 species of cicadas were also recorded. Sixty-six species of odonates including a new species for India have been reported. Thirty-seven species of amphibians, 35 species of reptiles, and 239 species of birds and approximately 16 species of mammals including slow loris were also recorded. Topotype materials not reported in the last 100 years were also recorded. New record of odonates and plants for India were updated.

Potential new species of insects, herpetofauna and plants were recorded and lost Reptilian and Odonate species were rediscovered.

Long-term Monitoring of Tigers, Co-predators and Prey in Tadoba Andhari Tiger Reserve, Maharashtra

Funding Source
Maharashtra Forest Department and NTCA

Investigators
Dr Bilal Habib and Dr Parag Nigam

Researchers
Anil Dashare, Madhura Davate, Pallavi Ghaskadbi, Lynette Gomes and Nilanjan Chatterjee

Date of Initiation
January 2014

Date of Completion
March 2019

Objectives

The project had the following objectives: (i) Mapping of current Land use pattern, infrastructure, mining areas, villages, roads, power transmission lines, demographic profile, livestock population, dispersal corridors, prey and predator occupancy etc. within landscape surrounding Tadoba Andhari Tiger Reserve (TATR); (ii) Spatial distribution and temporal dynamics of habitat occupancy of tigers, co-predators and prey species. Relationship of these parameters to habitat related variables; (iii) Population density, abundance and demographic structure of Tigers and co-predators in landscape; (iv) Population density and abundance estimation of key prey species in landscape; (v) Estimation of vital rates (survival, recruitment, temporal emigration, dispersal, etc.) of tigers and co-predators; (vi) Study tiger/leopard conflict and socio-economic aspects; (vii) Monitoring of village translocation sites; (viii) To investigate food habits of Tigers and Co-predators in TATR landscape complex; and (ix) Training of field staff for managing human-wildlife conflict and emergency situations..

Major Findings

The TATR long-term monitoring project has been one of the longest ecological studies on the top three carnivores in India. The major findings of this study can be described in brief as follows:

On a population scale, annual monitoring of the population status, density, activity, intensity of space use of tigers, co-predators and prey was executed and reports were submitted to the Maharashtra Forest Department. The population of tigers in TATR has been steady for the last 3 years with the latest (2018-19) estimate at 86 (±4.42) tigers.

Diet pattern pertaining to the diversity of prey species availed by the top three carnivores have been studied using standard macro and microscopic protocols. Scat analysis was carried out and the dietary overlap and prey preference of the three focal species was estimated which showed that tigers preferred larger preys such as sambar and chital, leopards had a wide dietary range and the Asiatic wild dogs primarily preyed on medium sized sambar and chital.

On an individual scale, six tigers, four leopards and five Asiatic wild dogs were radio-collared over five years of the

long-term monitoring project to study their space use, movement patterns, behavioural ecology and dispersal routes. It generated novel data on the species not just for Tadoba-Andhari Tiger Reserve but

contributed to an overall understanding of the species ecology.

With radio-collared dispersing tigers, the research team was able to validate and ground truth the modelled corridors of the Eastern Vidarbha Landscape thereby proving with robust data, the importance of TATR as a source site for tigers.

The village relocations of Pandharpauni and Jamni have contributed to emergence of new grassland areas. Distance sampling conducted with the help of the forest department resulted in understanding population density and abundance of key prey species in the landscape.

Outputs and Outcomes

Novel data on three carnivores has been generated which would further our understanding of their ecology in the landscape. The team was able to understand how the community ecology functions in Tadoba-Andhari Tiger Reserve and the greater TATR landscape.

Scientific reports, popular articles and scientific papers were published from the research conducted in this project. More publications are under review or being written at the end of the 5 years project.

The findings from this study have been the basis of some important management and conservation decisions and policies in the landscape.

Several training programs were conducted for the Forest Department staff on various techniques, like line transect monitoring, RFO trainings, lectures on research in TATR, etc.

Study on Ecological & Socio-economic Impact of Invasive Species, Prosopis juliflora and Lantana camara, and their Removal from Forest, Common and Fallow Land of Tamil Nadu

Funding Source
Tamil Nadu Forest Department

Investigators
Dr K. Sivakumar,
Dr G.S. Rawat,
Dr Ruchi Badola and
Dr B.S. Adhikari

Researcher
Dr Kamalakannan

Date of Initiation
March 2017

Date of Completion
March 2019

Objectives

In 1959, *Prosopis juliflora* was introduced in Tamil Nadu to meet the fuel wood requirements of the rural poor people and to re-vegetate the degraded lands, but it spread at a faster rate and occupied almost all agro-zones of Tamil Nadu. Based on the request of Tamil Nadu Forest Department, WII initiated a short-study in the state with following objectives. The objective of the project was to assess the ecological & socio-economic impact of invasive species, *Prosopis juliflora* and *Lantana camara*, and suggested for their removal from forest, common and fallow land of Tamil Nadu.

Major Findings

The study found that the available nitrogen, phosphorus and organic carbon in the soil were high in highly invaded areas compared to less or non-invaded sites, especially in the Southern Zone. Economic analyses also revealed that the benefits of the *P. juliflora* invasion in the southern zone are higher than the costs. *P. juliflora* and *L. camara* spread can be halted by actions such as clear-cutting/up-rooting followed by burning of the stump of *P. juliflora* and keeping up-side-down of stump of *L. camara*. Alternatively, ways can be found to utilize the existing stands of *P. juliflora* so that frequent harvesting can exert a check on its expansion in the non-forested landscape. Minimum, ten years of the weed management plan should be made mandatory in all Management Plans of all Protected Areas and other reserve forests of Tamil Nadu to successfully halt the expansion of these invasive species so that the native biodiversity is conserved.

Outputs and Outcomes

The final report of the project has already been submitted to the Government of Tamil Nadu to take necessary actions. The study concludes that complete eradication of *P. juliflora* and *L. camara* would be extremely crucial if the native biodiversity of the forested landscapes and protected areas of Tamil Nadu are to be conserved in the long run. However, the study recommended that sustainable management and control of *P. juliflora* may be a better solution than eradication in the Southern Zone.

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07

COMPLETED

PROJECT INITIATED

ONGOING

Ecology and Diversity of Herpetofauna in Panna Tiger Reserve, Madhya Pradesh

Funding Source
Madhya Pradesh State Biodiversity Board (MPSBB)

Investigators
Dr Abhijit Das (WII) and Shri R. Sreenivasa Murthy (MPFD)

Researcher
Vishal Kumar Prasad

Date of Initiation
June 2017

Date of Completion
March 2019

Objectives

The objectives of the project were to: (i) determine the distribution, richness and diversity of herpetofauna in Panna Tiger Reserve; (ii) map and identify the distribution pattern of herpetofauna with respect to their habitats and breeding sites;(iii) Describing ecological and behavioral interaction within species and describe novel characters which be used in species monitoring programs; and (iv) build capacity and create awareness and education amongst the various major stakeholders including forest department, officials, local villagers and students to promote conservation of herpetofauna.

Major Findings

A total of 55 species of herpetofauna belonging to 21 families and 41 genera were recorded. The research team recorded and studied the call of nine species of amphibians. This study presents the comprehensive first-ever systematic inventory of herpetofauna in Panna Tiger Reserve. The workshop was conducted for local stakeholders, and frontline forest staff would help to bring awareness and conservative measures for reptiles and amphibians.

A new species of gecko from Panna Tiger Reserve is under taxonomic description. Natural history and breeding biology records of herpetofauna were recorded.

Outputs and Outcomes

A detail inventory report on diversity, abundance, natural history of each species together with their behavioural uniqueness has been compiled as a final report. This was a first ever detail inventory of herpetofauna of Panna Tiger Reserve.

Additionally, a research paper on the description of a new species of a gecko and another paper on acoustic behaviour and habitat preference of Central Indian anurans were under preparation. Furthermore, the research team is enthusiastic about developing a user-friendly mobile application for the forest staff, naturalists and public to simplify the identification of Central Indian frogs by their calls, photographs and natural history data. This will aid in developing conservation management and built awareness about amphibians in the region.

Movement Pattern and Inbreeding Status of Swamp Deer at Uttarakhand, India

Funding Source
Uttarakhand Forest Department and Department of Science and Technology

Investigators
Dr Samrat Mondol and Dr Bivash Pandav

Researcher
Shrutarshi Paul

Date of Initiation
March 2016

Date of Completion
March 2019

Objectives

The objectives of the project were to (i) find out the swamp deer distribution in the upper Gangetic plains; (ii) find movement patterns of swamp deer in this region; and (iii) find out genetic status and level of inbreeding of swamp deer in this belt.

Major Findings

During the reporting period, the research team looked into the genetic composition of swamp deer using microsatellite markers in the upper Gangetic plains from antler and pellet samples that the team has recovered from various areas of their pilot survey. The team also conducted the radio-collaring operation of swamp deer by using the drive net technique. The collared swamp deer were intensively monitored to analyze their movement patterns. Radio-collaring of swamp deer using drive net was the first of its kind for any species in India. It was exclusively covered in media, and various newspapers reported this finding in June 2018.

Outputs and Outcomes

The research team standardized species-specific markers, sexing markers and a panel of microsatellites. Genetic analysis from 231 antler and 18 samples using a panel of 13 polymorphic microsatellite loci revealed a significant level of connectivity between all the sampled areas from Jhilmil Jheel Conservation Reserve (JJCR) to Bijnor Barrage area of Hastinapur Wildlife sanctuary. The team identified 192 unique individuals in the entire landscape. Two lineages were found in the genetic structure, but the spatial distribution of the lineages was not site-specific. To support this finding, the team also found the distribution of full siblings throughout the landscape, indicating connectivity. The team managed to capture and radio-collar two swamp deer hinds using the drive net technique. Following their movement routes, it was found that the swamp deer moved towards Hastinapur from JJCR supporting the genetic data about effective connectivity. Thus, the study emphasizes the importance of grasslands between Jhilmil Jheel and Hastinapur in maintaining a viable swamp deer population in this landscape.

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Status of Fish Diversity in Sahyadri Tiger Reserve, Maharashtra

Funding Source
Maharashtra Forest Department

Investigators
Dr J.A. Johnson,
Dr K. Sivakumar and
Dr V.Clement Ben

Researchers
Anurag Rokade and
Sutanu Satpathy

Date of Initiation
April 2017

Date of Completion
March 2019

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Objectives

The objectives of the project were: (i) Inventory of fish diversity and assess their status in streams/ rivers/ reservoirs of Sahyadri Tiger Reserve of Maharashtra; (ii) Document the habitat condition and use by rare and threatened fishes; and (iii) Identification and mapping of critical habitat of Central Indian and Deccan mahseers, *Tor tor* and *Tor khudree*.

Major Findings

Total 50 species of fishes belonging to 14 families and 24 genera were recorded. Out of 50 species, 3 of them *i.e.*, *Hypselobarbus curmuca*, *Hypselobarbus kolus* and *Tor khudree* are listed in IUCN threatened categories.

Outputs and Outcomes

Checklist of fish species inhabiting Sahyadri Tiger Reserve was prepared. A pictorial field guide and species account on fishes of Sahyadri Tiger Reserve was produced. The pictorial field guide to the fishes of Sahyadri TR was prepared and sent to the Forest Department for distributing among local youth and frontline staff.

Developing Genetic Database to Understand Metapopulation Dynamics and Connectivity of Tigers and Other Large Predators across Tiger Landscape of Maharashtra, India

Funding Source
Maharashtra Forest Department, Council for Scientific and Industrial Research, NTCA

Investigators
Dr Bilal Habib and Dr Samrat Mondol

Researchers
Shrushti Modi and Shaheer Khan

Date of Initiation
March 2016

Date of Completion
2019

Objectives

The project had the following objectives: (i) develop an exhaustive genetic database of individual tiger, leopard, dhole and sloth bear; (ii) determine population structure, relatedness and sex ratio of these large carnivores; (iii) population connectivity rates and direction of gene flow at metapopulation scale; (iv) identify landscape features, if any, affecting connectivity in this landscape; and (v) understand social dynamics of all these species within this landscape.

Progress

Second round of sampling was conducted in Sahyadri Tiger Reserve and Navegaon - Nagzira Tiger Reserve during the reporting period. With this, field sampling has been finished for this project. A total of 544 fresh scat samples were collected for all the four species, *i.e.* tiger, leopard, dhole and sloth bear. All the samples have been processed and extracted. Species-level and individual level identification have been done for dholes.

Outputs and Outcomes

Microsatellite panel for individual identification of sloth bear has been standardised and validated. A paper was published titled, "Non-invasive DNA-based species and sex identification of Asiatic wild dog, *Cuon alpinus*". A manuscript titled, "Standardization and validation of a panel of cross-species microsatellites to individually identify the Asiatic wild dog, *Cuon alpinus*" has been accepted.

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02

COMPLETED

ONGOING

PROJECT INITIATED

A Study on the Dispersal of Tigers Across the Eastern Vidarbha Landscape, Maharashtra, India

Funding Source
Maharashtra Forest Department

Investigators
Dr Bilal Habib and Dr Parag Nigam

Researchers
Zehidul Hussain and Pallavi Ghaskadbi

Date of Initiation
December 2015

Date of Completion
December 2019

Objectives

The objectives of the project are to (i) understand the movement of tigers in Protected and Outside Protected Area that drives population connectivity on a landscape scale and effect of environmental features on dispersal; (ii) validate the modelled corridors and identify new functional corridor and habitats in a highly dynamic landscape; and (iii) directly aiding effective conservation and management of tigers beyond Protected Area (PA) system as a result of real-time data from radio-collars.

Progress

The research team collared 15 (nine males and six females) tigers of different age and sex classes. Apart from these, two female tigers were collared (GPS plus Vectronics and VHF collars) as part of conservation translocation. During the year 2018-19, the team collared nine sub-adult tigers (five males and four females) in Tadoba-Andhari Tiger Reserve, Tippeshwar Wildlife Sanctuary and Brahmapuri Territorial Division. All the radio-collared individuals were tracked to understand the movement patterns and their space use in both protected and outside the protected area.

Outputs and Outcomes

Of the collared tigers, two sub-adults tigers from the core area of TATR dispersed from their natal area during late November and December 2017 respectively. The sub-adult male started exploring and extended its territory from November onwards and dispersed to the nearby buffer area within TATR.

The sub-adult female dispersed from her natal area and travelled approximately 110 km to reach Umred - Karhandla Wildlife Sanctuary (UKWLS) in December 2017 challenging the known ecological knowledge that females do not show long range dispersal like the males. The tigress crossed a highly critical corridor which has canals, nullahs, state highways, power lines,

electrified farm fences, human settlements and Wainganga river through different forest ranges and divisions. Currently, the tigress had established her territory in the Kuhi range of UKWLS covering an area of 44 sq. km.

It was found that the home ranges of males are comparatively larger than female in both PA and outside PAs. Moreover, male and female both have larger home ranges outside PAs than wildlife sanctuaries or reserves.

Milestone

Following the dispersal route of radio-collared tigers in the landscape; the team was able to identify tracts of forest that were selected by animals to disperse acting as important connecting corridors. The data also helped us to validate the functional corridors across the Eastern Vidarbha Landscape.

Data from radio-collared tigers has also helped in identifying critical crossing zones of tigers across linear infrastructure such as National and State Highways. The team identified four sensitive zones on the highways used by collared tigers for movement in the landscape. A report titled "Highway crossing zones identified using telemetry data of tigers in the Eastern Vidarbha Landscape, Maharashtra, India" was published and submitted to the Forest Department.

One of the major threats to tigers in this landscape identified from the radio-collared individuals is that of electrocution in agricultural fields adjoining forested areas. Based on the data from the electrocuted tigers, villages with high, moderate and low potential for electrocution were identified. Both long term and immediate mitigation measures were recommended to curb death of tigers and other wildlife by electrocution. A report titled "Ensuring Safety in the Killer Fields: Identifying potential villages for measures to reduce electrocution of Tigers and associated species in Eastern Vidarbha Landscape, Maharashtra, India" was published and submitted to the Forest Department.

These key findings may aid the managers and in turn, the policy-makers to strongly advocate for a legal protection status for critical areas outside PAs.

03

COMPLETED

ONGOING

PROJECT INITIATED

Human-Wildlife Conflict Resolution Mechanism in the Indian Himalayan Region: Risk Assessment, Prediction and Management through Research and Community Engagement

Funding Source
MoEFCC under National Mission on Himalayan Studies (NMHS)

Investigators
Dr G.S. Rawat, Dr S. Sathyakumar, Shri Qamar Qureshi and Dr C. Ramesh

Researchers
Dipanjan Naha, Sarvesh Kumar Rai, Sayli Suresh Sawant, Nitin Bhushan, Niazul Khan, Suraj Kumar Dash, Abhishek Chettri, Ashish Kumar Jangid and Gaurav Sonkar

Date of Initiation
April 2016

Date of Completion
March 2020

Objectives

The objectives of the project are to (i) develop risk assessment tools and processes for identifying negative HWI in the IHR through investigations on HWI and predict potential hotspots of conflict for regular monitoring and development of site specific mitigation efforts; (ii) understand the biological factors and ranging patterns of selected wildlife species involved in livestock/crop depredation and attacks on people in the IHR; and (iii) develop and implement adaptive management strategies in some of the identified vulnerable areas through community engagement and use of modern science and technological tools and approaches.

Progress

After reviewing the extensive literature on all published and available information on conflicts, four Himalayan states and one hill district of West Bengal (WB) were selected for intensive studies viz., Jammu & Kashmir (J&K), Himachal Pradesh (HP), Uttarakhand (UK), Sikkim (SIK) and Northern West Bengal (WB). Based on the analysis of department records and consultations with the senior officials of the State Forest Departments, the team initiated field investigations and actions at Pauri district (UK), Kugti and Tundah in Chamba district (HP), Darjeeling and Kalimpong districts (WB). For the human-macaque interaction, the team is investigating the level of interaction in the vicinity of 2 km radius around WII campus, Dehradun. So far, the team has found macaque presence

highest on the edges of forest and least in areas far away from the forest. Human-macaque conflict hotspots and four major troops have been identified in the study site.

The research team conducted intensive camera-trapping within an area of 315 km^2 in Pauri district and estimated leopard density to be 4.6 (SE 1.5) per 100 km^2. Based on the field surveys, hotspots of conflict for Central Dooars, North West Bengal were also identified. The team radio-collared three common leopards and closely followed their movement pattern in North West Bengal during December 2017 - February 2018. The average home range of male leopard was estimated to be 146 km^2 (SE 39) whereas for female it was 71 km^2. The team also continued field investigations on bear-human conflicts in and around Kugti WLS, Chamba (HP). In Chandrabani area, the team estimated the population of rhesus macaque using line transects with a range between 250 to 450 individuals. As per roost counts, the number was much lower (138) and as per grid count number of individuals was estimated to be 108. The planning and preparations for radio-tagging macaques and testing of reproductive control methods have been initiated.

Outputs and Outcomes

Human-Wildlife conflict intensity maps and prediction of vulnerable zones in the study sites have been prepared and shared with concerned State Forest Departments for their use in management. The research team has deployed radio-collars on three leopards in North Bengal, and the information on their activity and movement patterns are shared with WB Forest Department for use in their management. The team has initiated testing of flaudrys and fox lights in conflict areas to assess their efficacy as wildlife deterrents.

Milestone

The State Forest /Wildlife Departments of each study state have partnered in this project, and their role would be crucial in devising and implementing appropriate mitigation strategy for human-wildlife conflict.

04

COMPLETED

ONGOING

PROJECT INITIATED

Development of Conservation Action Plan for River Dolphin

Funding Source
National Compensatory Afforestation Fund Management and Planning Authority (CAMPA), MoEFCC

Investigators
Shri Qamar Qureshi, Dr S.A. Hussain, Dr Vishnupriya Kolipakam, Dr Bitapi C. Sinha and Dr Ruchi Badola

Project Scientists
Dr Rashid Raza, Dr Abdul Wakid and Shoavna Ray

Researchers
Vineet Singh, Sunny Deori, Rajat Rastogi, Ashwin Wardurkar, Naman Goyal, Sajal Sharma, Merin Jacob, Kanad Roy, Gargi Roy Choudhary, Harshini Jhala, Hiyashri Sharma, Ramesh Prajapat, Ayan Dutt, Yogi Raj Nobis, Sneha Shivaji Mane, Ishi Narula and Abhishek Chowdhary

Date of Initiation
April 2016

Date of Completion
March 2021

Objectives

The objectives of the project are to (i) develop monitoring protocol for dolphins; (ii) Status of associated river fauna like gharial, otter, turtles and fishes; (iii) Quality assessment of river habitat in terms of water quality, anthropogenic pressure and landscape surrounding riverscape; (iv) Evaluate the status of invasive species in riverscape; and (v) Involve stakeholders to develop a network that will assist in dolphin conservation.

Progress

Ecological Monitoring: Baseline data were collected for long-term ecological monitoring of Ganges River Dolphin and its habitat was conducted on Brahmaputra, Kulsi, Subansiri, and Ganges river system, including Hooghly, Roopnarayan, Kosi and the Farakka Feeder Canal (including Hooghly). Seasonal fish and plankton surveys were also conducted in Kulsi and Subhansiri River of Assam. Along with the dolphin survey, bird surveys were conducted in the stretch of Ganges, Brahmaputra and Subhansiri River.

Community Engagement and Social Surveys

Dolphin oil bait fishery was being investigated in details to understand the extent of dolphin oil use in fishing, the socio-economic conditions of the concerned fishermen and possibility of alternate livelihood provide to prevent the dolphin oil use in fishing in selected sectors Assam. Fishermen interviews were conducted to understand their perceptions and attitude for river dolphin (N=280). Data collection and analysis is ongoing.

In community engagement, 20 trained community youths were involved in monitoring ten important dolphin habitats in Brahmaputra River under Dolphin Conservation Network (DCN). Fishermen awareness campaigns were conducted in collaboration with the Assam Fishery Department.

The intensive social survey has been conducted in and around fishing villages of Farakka and Diamond harbour in West Bengal (N=381) to study the perception about Ganges river dolphin prevailing among the fishing communities along with the fishing practices and reasons for dolphin deaths. Campaigns including posters, pamphlets distribution, Awareness announcements and school activities were done in fishing villages along banks of River Hooghly in Farakka and Diamond harbor.

Pollution Monitoring

A total 58 samples of water, sediments and fish were collected from the highly polluted stretch of the river Ganges starting from Kanpur, Prayagraj and Varanasi covering about 350 km distance in order to estimate the overall river quality at different geographical locations in Uttar Pradesh.

Outputs and Outcomes

An action plan for long-term conservation of Dolphins in Kulsi River. ITC has set-up a soap-biscuit manufacturing plant close to Kulsi-Jagaliya (Batha) confluence. A wall has been constructed right next to the confluence within the flood plain of river, which will affect the flow of water and dolphins. This wall needs to be removed as it is within 15 m of the river, and does not adhere to current legally prescribed standards nor is it ecologically safe.

Data generated from C-Pods indicates that dolphin acoustic activity (clicks/minute) increases with the activity of medium to large-sized mechanized boats in the river as compared to when they are absent. No distinct diel pattern is discernible in the dolphin activity patterns. However, dolphins seem to respond strongly to the tidal phase with their activity rising with rising tides. A new molecular technique developed to extract DNA from oil, as a monitoring tool to detect the presence of endangered species in traditional oil. Dolphin oil is believed to be potent medicine for rheumatic pains. Hence, apart from accidental net entanglements, deliberate dolphin hunting is prevailing. Dolphin carcasses are sold in interior villages; so, fishers perceive it as a natural source of income.

Milestone

Scientifically credible system for monitoring dolphins in Ganga and Brahmaputra has been developed, aided with the use of acoustic technology. The molecular technique designed to extract DNA from oil revealed the continued use of Dolphins for bait fishing, despite a massive campaign to curb their poaching, along with the promotion of alternate oils. In addition, dolphin oils or their alternates, target native catfishes, whose population is already on the decline. The approach of promoting oils needs to be rethought, and more sustainable fishing needs to be promoted. The study gives us a better understanding of dolphin activity in areas with high shipping traffic. Experiments were conducted in Kolkata and Diamond Harbor.

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05

COMPLETED

ONGOING

PROJECT INITIATED

Conservation Action Plan for Manipur's Brow Antlered Deer or Sangai: An Integrated Approach

Funding Source
National Compensatory Afforestation Fund Management and Planning Authority (CAMPA), MoEFCC

Investigators
Dr S.A. Hussain and Dr Ruchi Badola

Researchers
Dr Chongpi Tuboi, Dr M. Vikramjit Sharma, Dr Nengneikim Baite, Dr Sharmila Naosekpam, Ak, Santikumar Singh, Anjali Achom, Mirza Ghazanfar Ullah, Y. Neeraj Singh, S. Rohikanta Sharma, Caroline Akoijam and G. Tennison

Date of Initiation
March 2016

Date of Completion
March 2020

Objectives

The objective of the project was to secure the long-term survival of Sangai in the wild, this proposal primarily addresses (i) strengthening of existing population in KLNP; (ii) establishment of second population in wild; (iii) improved habitat condition and protection measures; (iv) involving community in conservation efforts; and (v) conducting applied research on the ecology of the species.

Progress

Recruitment of project personnel was done during the reporting period. The presence of animal was recorded by the local youths in the form of pellets and antlers. In February 2019, student volunteers from different colleges were trained on population estimation technique. The WII team also participated in the training workshop for the newly appointed forest staff at KLNP.

The population estimation of sangai and hog deer was conducted during March-2019 in Keibul Lamjao National Park, Manipur by the Wildlife Institute of India in collaboration with the Manipur Forest Department. Occupancy of sangai and hog deer was derived based on pellet distribution in the Park. A series of consultation meetings were carried out. A total of 15 village level meetings covering the 36 villages around the Park, two site-level meetings and two State level workshops were conducted in which different stakeholders were consulted. Creating a second home for sangai was also advocated during the workshop and meetings.

Pumlenpat and Thongam Mondum Reserve Forest with an area of 67.98 km^2 was identified as the best site for reintroduction through field assessment and qualitative scoring matrix in terms of ecological factors such as the area of the

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wetland and availability of water and food. During the 6th Meeting of the State Board for Wildlife (SBWL) held at Imphal on 23rd May 2017, the Wildlife Institute of India highlighted an urgent need of a second home for sangai. Following which the State Board of Wildlife chaired by the Hon'ble Chief Minister of Manipur 'in principle' agreed for the Conservation breeding of sangai using modern techniques for reintroduction and advised the Forest Department, Government of Manipur to carry out stakeholder consultation at Pumlenpat as an alternate home for long-term conservation of sangai and to declare it as conservation reserve.

A series of veterinary camps were conducted around Keibul Lamjao National Park 2018-19. Animals were rescued and treatments given for those required before rehabilitation. The Forest Department of Manipur has acquired 10ha land in the adjoining area of KLNP for the establishment of Conservation Breeding-cum-Rescue Centre for the sangai and has fenced the area. The WII team also organised an awareness programme in five different locations in Imphal West and Bishnupur Districts in collaboration with Unique Wildlife Protection Committee (UWPC). Four awareness workshops on zoonotic diseases were conducted around KLNP during August 2018.

Long-term water level monitoring inside the Keibul Lamjao National Park (KLNP) was carried out every week to check the annual fluctuating water level to observe the trend. Pellet distribution survey was carried out during 2018-19 before population estimation in March 2019. Vegetation transects were carried out in Pumlenpat as a part of habitat monitoring for the proposed reintroduction site to generate baseline information on the habitat for developing the release site.

Socio-economic surveys (n=180) were conducted in 36 villages around KLNP. Further, 174 socio-economic household surveys were also conducted in seven villages around Pumlen Lake.

Outputs and Outcomes:

The following outcomes are expected to be achieved: (i) demographically and genetically secured Sangai population in Keibul Lamjao National Park; (ii) demographically and genetically viable second population at the reintroduction site in Manipur; (iii) supportive and proactive park side communities and other stakeholders; (iv) trained the human resources for the conservation management of sangai and its habitat; (v) alternative livelihood options for the local communities; and (vi) effective management regime in place.

Milestone

The following milestones have been achieved: (i) Scientific management regime for the conservation of Sangai at KLNP has been put in place. (ii) Action plan for conservation breeding is in place, and conservation breeding centre is at planning phase. (iii) Site for second home is agreeable to the government; however, some sections of the local communities are apprehensive of their livelihood.

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Recovery of Dugong and its Habitats in India: An Integrated Participatory Approach

Funding Source
National Compensatory Afforestation Fund Management and Planning Authority (CAMPA), MoEFCC

Investigators
Dr K. Sivakumar, Dr J.A. Johnson and Dr Samrat Mondol

Researchers
Anant Pande, PVR Premjyothi, Swapnali Gole, Sameha Pathan, Sohni Dudhat, Rukmini Shekar, Chinmaya Ghanekar, Madhu Magesh, Diksha Dikshit, Sagar Rajpurkar, Himani Saini, Sumit Prajapati, Prachi Hatkar, Swati Sharma and Astha Walia

Date of Initiation
September 2015

Date of Completion
March 2020

COMPLETED

ONGOING

PROJECT INITIATED

Objectives

The objective of the project are to (i) assess dugong population status through advanced census techniques and determine its abundance and distribution, identify critical habitats, classify threats and develop site-specific monitoring plan to reduce hunting and incidental entanglements; (ii) characterize the critical dugong habitats, reduce direct and indirect threats, control modifications in and around the habitat and improve habitat quality through management interventions and participatory approaches; (iii) raise awareness on the species and encourage the participation of the local communities; include other stakeholders like fisheries department and religious heads in conservation efforts; enhance Dugong conservation program by spreading awareness on a national scale; and (iv) enhance the capacity of the State Forest Department staff and develop/implement smart patrolling tools to improve protection enforcement; train forest staff and local communities in underwater surveys for long-term habitat monitoring.

Progress and Outcomes

Sea Cow *Dugong dugon* is occurring in Andaman and Nicobar Islands, Gulf of Mannar, Palk Bay, and Gulf of Kutch in India. Several reasons attributed to their population decline, some of which include sea grass habitat loss and degradation, boat traffic, gill netting, disease, chemical pollutants, consumptive use, and poaching. Therefore, recovering dugongs entails targeted, multidisciplinary research that flows into management actions and advocacy for policy changes. Therefore, dugong recovery program aims at (a) assessing and monitoring Dugong population and habitat status; (b) implementing site specific management actions to recover populations and restore critical habitats; (c) incentivizing participatory conservation efforts involving local stakeholders; and (d) improving the capacity of enforcement and management agencies to promote integrated protection and management of Dugong and associated species.

So far, more than 40,000 school-children and fisher-folks participated in awareness programs and took part in the conservation of dugongs and their habitats in three Range States. Because of these awareness programs, few fishermen in Tamil Nadu, Andamans and Gujarat, who could successfully rescue and release 11 dugongs entangled in their fishing nets, were honoured with incentives. A total of 450 Forest Officers and frontline staff of Forest Department, Fisheries Department, Marine Police and Coast Guard have been oriented towards conservation of dugong and marine biodiversity in India. Of these, 45 frontline enforcement staff members were trained in underwater biodiversity monitoring with scuba diving.

As part of 'Incentive for Conservation Programme', 360 school students were selected as 'Dugong Ambassadors' from three dugong range States/UTs. Education of these 'Ambassadors' was supported with 'Dugong Scholarship,' i.e. Rs. 500/month for two years. Land-based pollutions are one of the threats to sea grass habitat in India; therefore study to understand the impact of pollutions on nutrient contents of sea grass was initiated. Further, genetic analysis was carried out from the samples that were collected from the stranded dugongs to study their genetic diversity and relatedness with global populations. A study on ecosystem services of dugong habitats was also conducted in Tamil Nadu and Andaman. Management Plan of Gulf of Mannar National Park regarding dugong conservation was developed and submitted to the Government of Tamil Nadu. Efforts are also underway to identify and manage the Critical Dugong Habitats outside PAs; assess the population of dugongs using various census techniques and establishment of marine mammals' rescue and rehabilitation facilities in all three states. Detailed mapping of sea grass with its status has been initiated in the Gulf of Kutch region.

A Friends of Dugong network has been established at the three field sites to report dugong sightings, stranding, illegal activities and assist in conducting outreach programs. Further, dugong conservation awareness and orientation workshops were conducted for Indian Coast Guard, Marine Police and other line agencies in all three regions. This multi-faceted approach to conserve dugong in India has helped to reach out to over 5,000 stakeholders, including local communities. Over 250 research surveys have added crucial datasets to understand sea grass health status and mass boat surveys to locate and map dugong habitats. Boats and drones were used to successfully monitor the dugongs in Andamans, Gulf of Kutch, Gulf of Mannar and Palk Bay. Frontline staff of the forest department was trained towards the usage of drones for monitoring sea animals and illegal activities inside the PAs.

Milestone

The Management Plans of the Gulf of Mannar National Park and Rani Jhansi National Park have been prepared through this project. Moreover, chapters related to dugongs and sea turtles of the Management Plan of Gulf of Kutch have been drafted by the project team. Dugong Scholarships to the school going children of fishermen have received the attention of international communities as it helped in the conservation of dugongs in the field.

07

COMPLETED

ONGOING

PROJECT INITIATED

Habitat Improvement and Conservation Breeding of Great Indian Bustard: An Integrated Approach

Funding Source
National Compensatory Afforestation Fund Management and Planning Authority (CAMPA), MoEFCC and Rajasthan State Pollution Control Board (RSPCB)

Investigators
Dr Y.V. Jhala and Dr Sutirtha Dutta

Researchers
Dr Sujit Narwade, Dr Tushna Karkaria, Bipin C.M., Arjun Awasthi, Vineet Singh, Srinivas Yellapu, Priyamvada Bagaria, Mohib Uddin, Devendradutta Pandey, Sourav Supakar and Tanya Gupta

Date of Initiation
2016

Date of Completion
2021

Objectives

The declining population of the critically endangered Great Indian Bustard (GIB) and Lesser Florican (LF) need urgent conservation. The main aims of the project are: (i) Conservation breeding of bustards; (ii) Understanding where and how to conserve the species, assessing threats and monitoring management effectiveness; (iii) Capacity-building of implementing agencies and outreach for stakeholder support; and (iv) Pilot implementation of mitigation measures and evaluation of their effectiveness.

Progress

A Tripartite Memorandum of Agreement (MoA) for GIB & LF conservation between Ministry of Environment, Forest and Climate Change (MoEFCC); Government of Rajasthan; and Wildlife Institute of India (WII) was signed on 20th June 2018; and a Steering Committee meeting was held to decide the immediate actions. The sites for GIB & LF Conservation Breeding Centre (CBC) and temporary incubation and hatchery (satellite facility) for GIB were selected at Sorsan and Ramdevra respectively by an expert committee. Construction of the satellite breeding facility has begun. For the main facility at Sorsan, forest land was allocated for conservation breeding, and revenue land allocation is underway. Additionally, a temporary breeding facility is being set up at Sam Chowki in the Desert National Park.

Permission to collect GIB eggs/chicks/birds for conservation breeding has been obtained from MoEFCC and Rajasthan Government. As part of the annual GIB status assessment, a survey was completed in Thar GIB landscape in April 2018. Species and habitat status were assessed using vehicle transects in systematic sampling design. Data on GIB and related species as well as of disturbances such as feral dogs and livestock was collected. A report of this survey was prepared and shared with the Forest Department and MoEFCC.

The abundance of nest predators such as fox, mongoose, cat, pig and dog inside breeding enclosures of GIB were assessed using remote camera traps in Distance Sampling/ Random Encounter Model framework. To enhance the recruitment of GIB, WII recommended local control of nest predators within breeding enclosures of GIB.

Free-ranging dog population near DNP was assessed and monitored. With the help of Humane Society International (HSI), long-term holistic population management and monitoring plan was developed and dogs were sterilized. Dogs were radio-tagged and data was obtained using 24-hour telemetry from January to December 2018 to assess their impacts on wildlife.

On receiving permission for radio tagging of GIB from CWLW, Rajasthan in February 2019, two attempts were made by the project team in Desert National Park with technical collaboration of international bustard tagging experts. A two-day skill development workshop was conducted in February 2019 by the team for forest department staff, nature guides and nature enthusiasts of the area. An exhibition stall was set up at the Annual Desert Festival in Jaisalmer.

Power-line surveys were conducted in Thar and Kutch to assess mortality rates of GIB and associated avifauna. A workshop was conducted on 21 February 2019 by WII and MoEFCC at WWF-India HQ in Delhi which was attended by representatives of power line companies and media to educate on the threat posed by power lines to Great Indian Bustard and its Habitat. Meetings with Indian Armed Forces Officers and local villagers were conducted to educate them on GIB conservation.

The land cover map of Thar and Kutch Landscape was produced to identify suitable GIB habitat. The eco-sensitive zone of Thar landscape was disseminated to Rajasthan Forest Department and National Green Tribunal for necessary actions.

Outputs and Outcomes

The GIB population assessment in Jaisalmer based on 3053 km surveys in 361 cells spread over 9,252 km^2 area showed that the estimated current population size of GIB is 128 (SE 19) individuals. The national LF survey covered an area of ~20000 km^2 and yielded an estimate of 340 breeding males (162-597 95%CI); highlighting the critical status of this species.

One female GIB was tagged on 31 March 2019 and another on 11 April 2019. Telemetry information generated from the radio-tagged GIB in Kutch is aiding in prioritizing power lines for mitigation and a better understanding of the species' biology.

Information based on power-line carcass surveys saw 2 GIB mortalities in 20 km high-tension power-lines surveyed seven times. This was a serious threat that can potentially contribute to nearly 15% of GIB deaths in Thar. Owing to the continued advocacy for power-line mitigation by WII, over 60 pieces of prototype diverters distributed by WII to power agencies and were pilot installed to assess feasibility. As a significant outcome, the 20 December 2018 meeting under the chairmanship of Principal Secretary, Ministry of Power decided to mitigate power-lines prioritized by WII in Thar. The team developed and disseminated a proposal in collaboration with power agencies for this action. Based on communications sent by WII, a circular was issued by the Ministry of New and Renewable Resources in which it directs power line agencies of Rajasthan and Gujarat to retrofit their transmission lines with diverters and paint the vanes of the windmills to prevent bird mortality due to collision. The project also received coverage in several publications.

Milestone

(I) Signing of Tripartite MoU between MoEFCC, RFD and WII. (ii) Allocation of land in Sorsan and Ramdevra for construction of the breeding centre, and commencement of conservation breeding facility construction work at Sam and Ramdevra. (iii) Radio tagging of two female GIB in DNP, Jaisalmer. (iv) National lesser florican status assessment (2018-19) was completed. (v) Permission to collect GIB eggs for conservation breeding was obtained. (vi) Circular by Ministry of New and Renewable Energy directing power line companies to retrofit their transmission lines with diverters and prepare project mitigation plans in consultation with WII. (vii) The first phase of dog sterilization (800 dogs in 23 villages) in/around DNP was completed.

Biodiversity Conservation and Ganga Rejuvenation

Funding Source
National Mission for Clean Ganga, Ministry of Water Resources, River Development and Ganga Rejuvenation

Investigators
Dr S.A. Hussain and Dr Ruchi Badola

Researchers
66 research personnel

Date of Initiation
July 2016

Date of Completion
December 2019

Objectives

The project aims to prepare a science-based aquatic species restoration plan for Ganga River by involving multiple stakeholders. The project has following six components: (i) Establish Ganga Aqualife Conservation Monitoring Centre at WII Dehra Dun for science based conservation planning and dissemination of information. (ii) Prepare biodiversity profile of Ganga River and develop pilot species restoration plans for select stretches and species. (iii) Develop capacity of Forest Department and other stakeholders of the Ganga River States in monitoring of identified species of conservation significance. (iv) Assist NMCG in establishing the rescue and rehabilitation centres for endangered fauna of the Ganga at select sites by developing human resources and infrastructure with support from the Forest and Veterinary departments. (v) Elicit participation of local communities in NMCG initiatives by providing platforms through Panchayati Raj System, capacity development and payment for ecosystem services. (vi) Develop and implement conservation education programmes for the river-side communities of the Ganga River.

Progress

Component 1: Establishment of Ganga Aqualife Conservation Monitoring Centre: On the occasion of the International Day for Biological Diversity on 22nd May, 2018 the Chief Guest the Hon'ble Cabinet Minister of Water Resources, River Development and Ganga Rejuvenation, Shri Nitin Jairam Gadkari released two publications on "Macro Fauna of the Ganga River: Status and Conservation of Select Species", and "Ganga River - State of Biodiversity at a Glance". 'Ganga ki Baat' a series of the talk show was broadcasted by All India Radio, Dehradun at 100.5 MHz for two months. The talk show provided information on the aquatic diversity of the Ganga River, and project personnel shared their experience of working towards Ganga rejuvenation and their interaction with the various stakeholders. Site level stakeholder workshops and analysis was carried out and published as a brochure. Ganga Aqualife Conservation Monitoring Centre (GACMC) was established by integrating and upgrading existing facilities at WII. Online portal developed by integrating with WII Webpage - Link: http://wii.gov.in/nmcg/national-mission-for-clean-ganga. Second review meeting of the Monitoring Committee was held on 24th August 2018, at WII, Dehra Dun.

Component 2: Planning Aquatic Species Restoration for the Ganga River: Ecological assessment of the Ganga River was completed to derive the empirical relationships between river conditions and ecological status of the major aquatic species, which is the foremost requirement for developing the species restoration plan.

Status of various environmental factors such as water depth, physio-chemical water quality, river bank characteristics and anthropogenic activities was observed along Ganga River from Devprayag to Farraka Barrage. The publication "Biodiversity Profile of Ganga River" was released on 27th February 2019, at New Delhi.

Component 3: Capacity Building of Forest Department and other Stakeholders: A total of 11 training workshops with 1,510 participants and 41 sensitization programmes with 2,768 participants have been conducted at various sites of Ganga River states. Around 400 youth have been trained on the methodology for a baseline survey of Indicator species, eco-development activities and conservation education. A total of 642 volunteers were identified during training programmes. The selected volunteers were deployed at field stations to assist the project team and are assisting in piloting the training programmes in the five Ganga states. A total of 200 officials and frontline staff from forest departments of five Ganga States have been trained in wetland management, participatory management, eco-development planning and conservation education.

Component 4: Establishment of Rescue and Rehabilitation Centres: Field veterinary training on rescue and rehabilitation was conducted at Bijnor and Bulandshahar with 74 participants. State-level veterinary training workshops were held for field veterinarians for rescue and rehabilitation of aquatic fauna of Ganga River in April and June 2018. Sixty veterinary officers from Uttarakhand and Uttar Pradesh participated in the training programs Awareness and training programs have been conducted with 25 Ganga Praharis, 20 local fishermen and 20 boatmen at Varanasi for rescue and rehabilitation of aquatic wildlife of Ganga River. Workshop on "Role of first responders in managing aquatic macrofauna" was conducted during December 2018, at Turtle Rescue and Breeding Centre in Sarnath, Varanasi, and 30 Ganga Praharis were trained. A manual "Conservation Reference Guide Rescue and Rehabilitation of Freshwater Turtles and Crocodilians", was released on 27th February 2019, at New Delhi.

Component 5: Community based conservation programmes for species restoration in Ganga River: Interacted with more than 9000 stakeholders in the five Ganga states. The platform created by signing MOAs with 143 village panchayats for their active participation in biodiversity conservation. For capacity building and skill development of local communities and other stakeholders, more than 200 Livelihood Assessments-cum-Training Workshops were conducted. A mobile livelihood centre "Jalaj" has been created at Varanasi. Six skill development centres (three in Varanasi, two in Narora and one at Uttarkashi) have been established. The training centres also provide a platform to facilitate the convergence and cross sectoral-coordination with various government and non-government agencies, subsequently contributing to sustainable village level development and conservation of biodiversity in the area. The establishment of livelihood training centres has received a positive response from the local communities as well as from the district administration and other stakeholders. A functional Cadre of more than 500 Ganga Praharis established. An online web portal for the Ganga Prahari cadre has been developed and integrated with NMCG website was launched on 22nd May 2018 at New Delhi. Ganga Praharis are actively involved in various onsite activities such as Ganga Vriksharopan Saptah, Haritima Programme, Haritima Pad Yatra, awareness programs, alternate livelihood training, cleanliness drives, rescue and rehabilitation organised by various organisations and

institutes. 149 Ganga Praharis from Uttar Pradesh were mobilized for Kumbh Mela 2019.

Component 6: Nature Interpretation and Education For Biodiversity Conservation of Ganga River: First consultative meetings with stakeholders were completed at two sites. Sites were selected for nature interpretation and education centre at Sarnath and Kanpur. Renovation of the interpretation building at Sarnath was completed, and the exhibits for the interpretation were installed. National Geographic Society (NGS) collaborated with the WII for the display of exhibits in the Interpretation Centre at Sarnath, Uttar Pradesh on Ganga river and surrounding areas to raise awareness and knowledge of environmental issues related to the river, including biodiversity conservation.

A knowledge centre "Ganga Darpan" has been established at the Turtle Rescue and Breeding Centre in Sarnath, Varanasi. The vicinity of the centre has four halls, activity area, a TV room and a garden. The interpretation centre provides an insight into the ecology, mythology, biodiversity, threats and possible solutions to overcome the threats to Ganga River in India through text and photographic panels, exhibits, info-graphics, display screens and dioramas, etc. The "Ganga Tarini" and "Ganga Darpan" were inaugurated by Late Shri Arun Jaitley, on 27th February 2019. These centres will act as an information source for school children, locals, tourists/pilgrims, village community members visiting Varanasi and Sarnath. A floating exhibition "Tarani" has been established on a houseboat, which is locally known as "Bajra". Resource in the form of brochures, Teacher's Training Kit and curriculum-based resource pack developed.

Outputs and Outcomes

Ganga Aqualife Conservation and Monitoring Centre established at Wildlife Institute of India, Dehradun. Brochures, booklets, posters have been published under the "Vibrant Ganga" series. Protocols were developed for assessing the concentration of the key pollutants in species of conservation significance, and the analysis is in progress. Various stakeholders have been trained in "biodiversity monitoring"; "monitoring protocols"; "community participation"; and "conservation education". Successful rescue and release operations were carried out at Narora and Sarnath, during various activities in cooperation with Uttar Pradesh Forest Department. The NMCG-WII team facilitated in establishment and activation of self-help groups with the collaboration of Nehru Yuva Centre and National Rural Livelihood Mission at Narora and Varanasi. The team members participated in the "Rafting Expedition" organised by NMCG from Haridwar to Patna in October 2018. 149 Ganga Praharis from Uttar Pradesh were mobilized for Kumbh Mela organised between 15th January 2019 and 4th March 2019.

Milestones

Online web portals for the Ganga Prahari and Pravasi Ganga Prahari cadres were integrated with the NMCG's web portal as

https://nmcg.nic.in/wii/prgbggp.aspx
https://nmcg.nic.in/pravasigangaprahari.html

Establishment of two interpretation centre, Ganga Darpan and Ganga Tarini.

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Status of Tigers, Co-Predators, Prey and their Habitat in India: 2017-19

Funding Source
National Tiger Conservation Authority (NTCA)

Investigators
Dr Y.V. Jhala and Shri Q. Qureshi

Researchers
A team of 55 research biologists & 30 interns

Date of Initiation
November 2017

Date of Completion
August 2019

Objectives

To gauge the success of conservation efforts as well as to channelize the management inputs, it is important to take stock of tiger numbers and their distribution at regular intervals. Keeping this in mind, National Tiger Conservation Authority in collaboration with the State Forest Departments, Conservation NGO's and coordinated by the Wildlife Institute of India conducts a National assessment for the "Status of Tigers, Co-predators, Prey and their Habitat" every four years since 2006. The current project is the fourth cycle of the national assessment aiming at evaluating status and distribution of tigers, co-predators and prey using a robust scientific methodology.

Progress

The countrywide assessment of tiger status uses a double sampling approach to estimate the distribution and abundance of tigers in India. The first component of the double sampling consists of ground surveys (Phase I) of all potential tiger occupied forests across India. The second component (Phase III) of the double sampling consists of scientifically rigorous abundance estimation in select sampling units using a) remote camera trap based capture-recapture technique for estimating tiger and other carnivore abundance and b) line transect based Distance sampling for estimating prey abundance.

Figure: Digitizing the stripes pattern on tigers to make identify the individuals and estimate their populations or movement. It has produced National Tiger Photo Database Library in India.

Before commencement of the ongoing exercise, protocols for conducting Phase I sampling were published as bilingual Field Guides in nine different languages and were integrated with the Ecological Module of program MSTrIPES (Monitoring System for Tigers: Intensive Protection and Ecological Status). Regional training workshops for training of trainers for implementing these protocols were conducted in Pench Maharashtra, Kanha, Mudumalai, Valmiki, Sundarbans and Kaziranga. Trained officers in turn imparted training to the Rangers and frontline staff in their respective states. Additional training was imparted to the frontline staff and computer technicians for North eastern states, Jharkhand, Goa, Rajasthan, Telangana and Madhya Pradesh by WII teams.

Phase I survey was conducted in all potential tiger habitats of 20 tiger range states of the country. GIS shapefiles were customized for 615 Forest Divisions of the country so that the data can be collected using MSTrIPES mobile android application and can directly be imported and/or entered in MSTrIPES desktop software.

As a part of Phase III exercise, camera trapping was done in 136 sites in the entire country (of which 108 sites have tiger photo captures) with 28,064 camera trap locations. A total of approximately 3.42 crore photographs have been received including 42,000 tiger images and 27,400 leopard images.

In extremely low tiger density areas or where camera trapping was not logistically feasible (due to militancy or other reasons), we used fecal DNA to determine tiger presence and minimum numbers.

An image processing software known as CaTRAT (Camera Trap data Repository and Analysis Tool) was developed and used for geo-tagging of camera trap images obtained from field. The geo-tagged images were further processed for segregation. An artificial intelligence (AI) based images processing tool was developed and used to segregate the camera trap images into species wise folders. After the final checking of the segregated species folders, target species (*e.g.*, tiger or leopard) folders were extracted through CaTRAT and imported into ExtractCompare software for individual identification.

Tiger and leopard individual identification is being done using ExtractCompare, a program that uses a combination of algorithms to calculate similarity scores between tiger coat patterns scanned from the images to automate the search for a match to a new image. A three-dimensional surface model of a tiger is used to scan the pattern samples and then to compare images that differ widely in camera angles and body posture.

Outputs and Outcomes

Phase I data received so far from 450 Forest Divisions of the country is currently under process for generating occupancy and distribution maps of tigers, co-predators and prey. Auto-segregation and manual identification of tigers and leopards have been done for 111 sites and ExtractCompare has been run for 45 sites so far. A total of 1,546 genetic samples have been analyzed so far out of which 175 samples were confirmed as tiger positive. A report on countrywide status of tigers, co-predators and habitats is likely to be released by the Honorable Prime Minister during mid-2019.

Milestone

National tiger assessment is one of the largest biodiversity survey being carried out in anywhere in the globe. Data collection, entry and compilation of such gargantuan exercise are always subject to human errors. By integrating program MSTrIPES with the Phase I protocols (both data collection and entry), possibilities of such errors were minimized substantially during the ongoing cycle of assessment.

Long-term Monitoring of Wildlife and their Habitats in Antarctica

Funding Source
National Centre for Antarctic & Ocean Research (NCAOR), Goa, Ministry of Earth Sciences & WII's Grants-in-Aid

Investigators
Dr K. Sivakumar, Dr S. Sathyakumar, Dr S.Mondal and Dr Anant Pande

Date of Initiation
September 2013

Date of Completion
May 2020

Objective

The main aim of this programme is long-term monitoring of selected fauna that are indicators of Antarctic and Southern Ocean ecosystems in connection with climate change and therefore, strengthen the biological data base of the National Centre for Antarctic & Ocean Research (NCAOR). The objectives of this programme are to: (i) Monitor indicator species such as penguins and birds in the Indian sector of operation in Antarctica using satellite telemetry; (ii) Understand the movement of avifauna in and around the Indian sector of operation in Antarctica; (iii) Assess habitat use by the tagged individuals and determine key habitats for the species; and (iv) Monitor any changes in the movement patterns over years correlated with climate change.

Progress and Outcomes

WII had earlier participated in the XIV, XV and XVI Indian Scientific Expeditions to Antarctica (SEA) from 1994-95 to 1996-97 to initiate and implement the Monitoring Programme. During the 28th, 29th, 33rd, 34th, 35th, 36th and 37th In SEA, WII could collect the baseline data on status and distribution pattern of birds and mammals in Larsemann Hills areas and continued the wildlife survey along Princess Astrid Coast. Data collected during these expeditions were analysed and published during this reporting period. Details of nesting ecology, behaviour and habitat of individual birds have been studied. Genetic samples of birds (feathers) have also been analysed and published during this period. Some of the research findings have been published as papers and chapter in the book. Largest snow petrel breeding colony was located at Broknes peninsula followed by Grovnes. Along with snow petrel, south polar skua and Wilson's storm petrel breed in these islands but in low abundances. Adélie penguins did not breed on Larsemann hills' islands but active moulting sites were present in all 11 islands where snow petrels' nest. WII study could find the distinct population structuring that happening in the snow petrels in east Antarctica. For example, the Larsemann hills genetic samples clustered as one population whereas Schirmacher hills and Svarthamaren hills formed another population. Study could standardize the survey methods and identified the nesting areas of seabirds at Larsemann Hills and Schirmacher oasis that need to be regularly monitored on a long-term basis as part of Indian Antarctic Program. Moreover, the study reiterated that the snow petrel breeding populations could be monitored as indicator for change in the Antarctic environment.

Milestone

First time, the distribution patterns of snow petrel breeding colonies were recorded from Larsemann hills through this study. This study could find the distinct population structuring that happening in the snow petrels in east Antarctica. Study could find the gene flow from Larsemann hills into the central Dronning Maudland populations.

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COMPLETED

ONGOING

PROJECT INITIATED

Assessment and Monitoring of Climate Change Effects on Wildlife Species and Ecosystems for Developing Adaptation and Mitigation Strategies in the Indian Himalayan Region

Funding Source
Department of Science & Technology under the National Mission on Sustaining the Himalayan Ecosystem (NMSHE) Programme

Investigators
Dr V.B. Mathur, Dr S. Sathyakumar, Dr G.S. Rawat, Dr Asha Rajvanshi, Dr Ruchi Badola, Dr Pratap Singh, Dr V.P. Uniyal, Dr K. Sivakumar, Dr K. Ramesh, Dr J.A. Johnson, Dr Gautam Talukdar and Dr Abhijit Das

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Project Assistants
Malvika Pandey, Neha Aswal, Gunjan Gulati, Anjali Uniyal, Anshu Panwar, Tuheina Thakur, Gurpit Singh and Ashish Kumar

Date of Initiation
August 2014

Date of Completion
August 2019

Objectives

The main goal of the project is to develop strategies to mitigate climate change effects on wild animal species and ecosystems in the IHR. To achieve the above goal, the following research /task components have been put forth under the Theme on Fauna and Ecosystems: (i) Identify the drivers of landscape change (climatic and anthropogenic) in the IHR (Ganges River Basin) and their effects on the ecological and social systems; (ii) Conduct focussed research on wildlife aspects (terrestrial and aquatic fauna, micro flora and their habitats) and human dimensions in IHR (Ganges River Basin) for framing evidence-based policy measures; (iii) Develop monitoring and Decision Support Systems (DSS) for indicator species in the IHR (Ganges River Basin); (iv) Undertake climate change scenario analyses and visualization for predicting potential effects on fauna and ecosystems as a strategy to communicate with stakeholders and to influence policy and decision making; (v) Develop spatial and inter-operable database to facilitate and policy decision making; and (vi) Build capacities within WII and of other stakeholders for sensitization and development of action plans for climate change impact mitigation and to enhance capabilities for negotiations at the national and international forums.

Progress

After a detailed reconnaissance survey in 2015, primary data collection is currently being carried out covering an elevation extent from 500m to 5000m in the three Himalayan landscapes, *viz.*, Bhagirathi Basin (UK), Beas Basin (HP) and Teesta basin (SK). The project objectives have been divided in to 4 thematic groups *viz.*, Terrestrial ecology which includes soil microflora, soil microfauna and micro-flora, invertebrates, herpetofauna, birds and mammals; Aquatic ecology; Human ecology covering socioeconomic aspects; and Spatial ecology for development of spatial database, identification of the drivers of landscape change; modelling and scenario analysis, support system for indicator species; 2D and 3D visualization; and Capacity building/ training/ professional inputs including interns and exchange program.

Currently, for the purpose of baseline species richness data generation, the landscapes are subdivided into cells of 256 km^2 (16km x 16 km) according to the average home range of the largest mammal found in the area, the Himalayan brown bear, Ursus arctos isabellinus. Preliminary analysis of species distribution and inventory preparation has been carried out. Research trend and knowledge gap analysis for all the terrestrial and aquatic themes

have been completed. Capacity building of the scientific community within the institute and other stakeholders outside has also been carried out and was also ongoing.

To create a fine scale temperature and precipitation surface model for the entire two basins, data loggers have been deployed in different habitats along the elevation gradient. The abovementioned grid structure was followed to deploy at least one Data logger in a 256 km2 grid, and the number of data loggers in a particular grid was increased according to the diversity of habitat and elevation classes in that grid. For this purpose the research team is using HOBO U23 Pro V2 which can accurately measure the temperature (accuracy level ±0.2°C) and relative humidity (accuracy level ±0.2%).

Outputs and outcomes

Terrestrial Ecology: Faunal groups in relation to the eco-climatic zones have been analyzed. Based on the detailed analyses of distribution patterns, 5 reports have been prepared and draft manuscripts for publication as research papers are under preparation.

Camera trapping efforts confirmed the occurrence of 37 non-volant mammals belonging to 5 orders and 14 families in Bhagirathi basin (Table 1). Carnivora was the most diverse order with 18 species followed by order Artiodactyla (9), Rodentia (4), Lagomorpha (4) and Primate (2). Out of 37 species recorded eight are ranked as threatened (Endangered-4, Vulnerable-4), five are ranked as Near threatened and 25 as Least Concerned in IUCN Red list 3.1 (IUCN 2017-3). The research team recorded four mammals which were hitherto unknown as present in Uttarakhand State. These species are Argali, *Ovis ammon*; Sand fox, *Vulpes ferrilata*; Woolly hare, *Lepus oiostolus*; and Eurasian *lynx, Lynx* lynx. Apart from these new records, noteworthy observations on two endangered carnivores, Asiatic wild dog, *Cuon alpinus* and tiger, *Panthera tigris* were revealed in the camera trap photographs. Presence of wild dog was recently reported from sub-alpine and temperate habitats of Uttarkashi district in Uttarakhand. Tiger was photographed only once in the month of February, 2017 at the elevation of 2,910m in *Quercus semecarpifolia* dominated subalpine broadleaved forest of Bhilangana valley, Tehri Forest Division.

The surveys reported the presence of 303 bird species belonging to 61 families in Bhagirathi Basin. Among these, family *Muscicapidae* had highest number of species (31), followed by *Accipitridae* (22) and *Timaliidae* (17). The focal group of Phasianidae had 12 species present in Bhagirathi Basin. Among all the deployed camera traps, 1,489 photographs of 11 *Phasianidae* species have been captured in 104 cameras.

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Six families, 16 genera, 18 species of reptiles and 4 families, 8 genera and 12 species of amphibians including one new record were documented during the study. Species richness decreases with the elevation. The body temperature of amphibians is positively correlated with surface temperature.

Preliminary assessment led to listing of 85 species of Odonates belonging to 45 genera and 12 families. During the transect sampling, total 64 species were recorded and 21 species were recorded during opportunistic sampling. Results indicated a decreasing diversity with increasing altitude. Based on morphometric analysis and historical data 7 species were recorded for the first time from Uttarakhand but it would be confirmed after molecular taxonomy.

Of the 1,500 samples of lichens from the Bhagirathi basin and around 105 species are identified from Bhagirathi basin with respect to different elevation zones and vegetation types and preserved in the Herbarium of Wildlife Institute of India, Dehradun. *Parmeliaceae* was the largest family with 33 species recorded in the study area followed by *Physiaceae* (11), *Lecanoraceae* (10) and *Cladoniaceae* (9). The majority of *Parmeliaceae* species have a foliose, fruticose, or subfruticose growth form and grows abundantly in the soil, rocks or as epiphytes. Due to diverse nature of adaptability and growth in different substrates, the family was dominant in the region. Maximum diversity of the species was recorded in the montane and subalpine forests. A total of 17 soil nematode genera belonging to seven families and six orders have been recorded so far based on analysis of soil samples (N=56) collected from Gangotri valley and Nelang valley (3,000-5,000m).

Aquatic ecology: A total of 14 species of fishes were recorded in the preliminary survey in Teesta which include species from genera *Salmo*, *Schizothorax*, *Garra*, *Botia*, *Schistura*, *Pseudecheneis*, *Parauchenoglanis*. The study area in Tirthan, Beas was dominated by Salmo trutta fario and *Schizothorax richardsonii* with absence of other species due to higher elevational study area. A *Glyptothorax* sp. has been recorded from isolated lower order streams of the study area, which is new to science and its description is under process. Physico-chemical parameters of all the streams have been noted and will be analysed for the habitat suitability indices for future modeling.

Human Ecology: A total of 1,096 villages in Bhagirathi Basin were identified from 2011 census India dataset and a Twostep cluster analysis was done to classify the villages in different clusters according to altitude, population, village area, disaster severity and remoteness index. A total of 11 sub clusters were found under three clusters and a total of 33 villages representing all the clusters were selected for household level survey. Semi structured questionnaire was formed following the household economy approach and stratified random sampling was carried out to select households for detailed survey. 307 households of 13 villages of Uttarkashi and 279 households of 12 villages of Tehri Garhwal district were surveyed to document the impact of climate change on ecosystem services.

Spatial Ecology: The existing spatial database is currently updated with Global Land Cover 1km data on Land use / Land cover, USGS LCI 0.5 km MODIS driven data on Land cover and HydroSHED data on global river and drainage systems The field data compilation work is in progress. The analysis on identification of spatial drivers of landscape changes for the State of Uttarakhand has been completed. New methodological frameworks for identifying the drivers of land change at multiple spatial scales and a regression model for different climatic and anthropogenic variables affecting the change have been developed.

Climate change projections for all six Indian Himalayan States *viz.*, Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Arunachal Pradesh, Sikkim and West Bengal have been completed. Census of India data on population as well as socio-economic parameters has been collected and modelled along with the relationship between human well-being and ecosystem services in the Bhagirathi catchment of Uttarakhand. A combination of spatial analyses and generalized linear modeling was employed to explore the key drivers of vegetation change and identify the scale-specific climatic and anthropogenic drivers. The results demonstrated that a majority of the landscape (63%) has experienced noticeable increase in vegetation over the last 15 years.

Milestone

Wildlife Watch in the Indian Himalaya (Series IV) - a user friendly guide was published during the reporting year.

Meta-population Dynamics of Tiger in the Terai-Arc Landscape, India

Funding Source
WCT-Panthera, DST-GOI

Investigators
Dr Samrat Mondol, Dr Bivash Pandav and Dr Gautam Talukdar

Researcher
Suvankar Biswas

Date of Initiation
November 2014

Date of Completion
November 2019

Objectives

The project has the following objectives (i) the extent to which tigers occupy unprotected areas within this landscape; (ii) what are the source and sink populations? (iii) population connectivity, by estimating rates and direction of tiger dispersals at meta-population scale; (iv) what landscape features, if any, affect connectivity in this landscape? and (v) social dynamics and tiger population structure within this landscape.

Progress

The research team extracted DNA from collected 1,608 large carnivore faecal samples using a modified Qiagen kit protocol. The team swabbed the outer layer of scats with PBS-soaked sterile cotton swabs to collect the top layer of host cells. Each sample was swabbed twice to maximize the DNA amount, and the swabs were stored in sterile Eppendorf tubes at -20°C freezer. The team decided to extract the second swab after species identification for only tiger samples. For species identification, the team used two separate methods.

Tiger individual identification was carried out using a panel of 13 microsatellite loci. However, the team has standardized these markers as multiplex reactions, making it more useful for individual identification. PCR reactions with respective multiplex primer mixtures were carried out. To validate the genotyping results, each locus has been amplified and scored four times, and only those loci having 75% or more same allele calls have been used for downstream analyses.

For this study, the research team created allele bins for each locus used for individual tiger identification. This process reduces human errors in allele calling and makes the entire data uniform. Genetic diversity of this tiger population was measured by calculating mean number of alleles (MNA) or allelic richness (AR), expected heterozygosity (HE), observed heterozygosity (HO), and allelic size range were calculated. Identical genotypes from multiple samples (or recaptures) were detected using CERVUS.

The overall genetic diversity of this tiger population was measured by calculating mean number of alleles (MNA) or allelic richness (AR), expected heterozygosity (HE), observed heterozygosity (HO), and allelic size range. Hidden population sub-divisions identification and the corridor functionality assessment have been carried out using Bayesian individual-based clustering analysis implemented. The actual population sub-division has been identified by calculating average deviance information criterion (DIC) value for each K. Pair wise sub-populations level genetic differentiation have been computed (Fst value).

So far, 1,608 samples were analyzed, and 743 samples were identified as tiger positive. Genotyped data were generated from 677 tiger samples using 13 microsatellite markers, and 190 tiger samples were excluded because of low amplification success. Five hundred fifty-three tiger samples were analyzed further for unique individual identification as rest did not qualify the minimum cut off amplification success and identified 219 individual tigers which cover 34% of the total tiger population in this landscape. All the 13 microsatellite loci were found to be polymorphic. Results suggest that eight out of 13 existing corridors are functional, Gola river corridor needs immediate attention, Kilpura-Khatima-Surai corridor is non-functional and the functionality of remaining three corridors such as Yamuna river, Kansrau-Barkot and Chilla-Motichur are uncertain. GIS analyses identified the distance from forest has a negative effect on tiger dispersal in this landscape. Result also identified bottlenecks within 12 functional corridors, and those are critical for tiger dispersal.

Outputs and Outcomes

During the reporting period, following two papers were published:

- Biswas S, Bhatt S, Paul S, Modi S, Ghosh T, Habib B, Nigam P, Talukdar G, Pandav B, Mondol S (2019). A proactive protocol for molecular and physiology work from wild herbivore and carnivore faeces. Current Science, 116(11): 1878-1885.
- Bhatt S, Biswas S, Karanth KK, Pandav B, Mondol S (2019). Genetic analyses reveal population structure and recent decline in leopards (Panthera pardus fusca) across Indian sub-continent. BioRxiv: https://www.biorxiv.org/content/10.1101/746081v1.

In addition, the results obtained during the period of the project were presented in two international conferences, the details are given bellow:

- Biswas S, Bhatt S, Sarkar D, Pandav B, Talukdar G and Mondol S (2019). Meta-population dynamics of tiger in the Terai-Arc landscape, India. 20th Student Conference on Conservation Science (SCCS) Cambridge, 26-28 March 2019.
- Biswas S, Bhatt S, Pandav B, Talukdar G, Mondol S (2018). Understanding the functionality of identified tiger dispersal corridors in the Terai-Arc landscape, India. 55th Annual Meeting of the Association for Tropical Biology and Conservation (ATBC), Kuching, Sarawak, Malaysia, 1-5 July 2018.

Milestone

Fine-scale genetic analyses identified Rajaji, Corbett, Pilibhit, Dudhwa, Valmiki TRs, Lansdowne and Ramnagar FDs and Haldwani FD as source and Haridwar, Najibabad, Terai west, Terai central, Pilibhit Social and north Kheri FDs, west-Sohagibarwa WLS and Amangarh TR as sink populations of the tiger in this fragmented landscape. Result also identified corridors Rajaji-Corbett, Kosi river, Gola river, LaggaBagga-Shuklaphanta-Tatarganj, Kishanpur-Dudhwa, Dudhwa-Katerniaghat as critical corridors of functional tiger movement. Proper management of these source and sink populations and the critical corridors which connect these populations are very crucial for long-term persistence of tiger in this fragmented landscape.

Ecological Impact Assessment of Existing and Proposed Road Infrastructure in Select Wildlife Corridors of India for Strategic Planning of Smart Green Infrastructure

Funding Source
National Tiger Conservation Authority, New Delhi

Investigators
Dr Bilal Habib and Dr Asha Rajvanshi

Researchers
Akanksha Saxena, Bhanupriya Rabha and Mahima

Date of Initiation
December 2015

Date of Completion
December 2019

Objectives

The objectives of the project are to (i) Assess ecological impacts (direct, indirect and cumulative) of road infrastructure on select wildlife taxa and their habitats within three landscapes in India; (ii) Evaluate the cumulative impacts of existing multiple road developments on conservation values of landscape and integrity of the wildlife corridors in these landscape; (iii) Assess the implications of future road development in the landscape with special emphasis on wildlife corridor function; and (iv) Provide a regional road development plan based on current and future road development plans to be implemented in the landscape to avoid, reduce and mitigate impacts on areas critical for promoting conservation in the identified landscape.

Progress

Fieldwork to assess the impacts of the state highway 33 or the Mysore-Mananthavadi Highway (MMH) near the Nagarhole Tiger Reserve on wildlife was carried out during December 2018-May 2019. Fieldwork to assess the impacts of the National Highway 37 circumventing the Kaziranga National Park, Assam, on wildlife is underway since December 2018.

In Central India, impacts of the National Highway 44 (earlier 7) are being studied in terms of road-related mortality, behaviour and habitat use. Fieldwork for the same has been going on since April 2017. Monitoring of the animal underpasses on National Highway 44 is being carried out as part of the project since February 2019.

Outputs and Outcomes

An M.Sc. dissertation titled "Impacts of road-related disturbances on mammalian and vegetation assemblages- a case study of SH33 passing through Nagarhole Tiger Reserve, Karnataka" was completed through the fieldwork on the MMH. Fortnightly reports of the underpass monitoring exercise are submitted to the Forest Department of Maharashtra.

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Ecology of Wolves with Emphasis on Dispersal in a Human Dominated Landscape, Maharashtra, India

Funding Source
Department of Science and Technology (DST)

Investigators
Dr Bilal Habib and Shri Salvador Lyngdoh

Researcher
Sougata Sadhukhan

Date of Initiation
July 2016

Date of Completion
July 2019

COMPLETED

ONGOING

PROJECT INITIATED

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Objectives

The project has the following objectives: (i) to study the current population status of wolves in Maharashtra, state; (ii) to estimate the home-range/territorial behavior of dispersing individuals; (iii) to study the dispersal pattern and habitat use of the existing wolf packs dwelling in human dominated landscape of Solapur, Osmanabad, Pune and Ahmednagar districts of Maharashtra, India; (iv) to study the social structure and dynamics of the selected wolf packs for individual behaviors within the pack and their interaction with other wolf packs in vicinity; and (v) to delineate critical habitat patches and factors governing their utilization in a human-dominated landscape.

Progress and Outcomes

Four more wolves were radio-collared during this year. The radio-collared wolves were regularly monitored using VHF tracker. Field data and scat samples were collected during the monitoring.

Table 1: List of collared wolves in Maharashtra

Wolf Name	Sex	Collar ID	Date of capture	Collar type	Area
Finn	M	21592	22.06.19	GPS plus Activity	Ahmednagar
Rain	F	21591	24.06.19	GPS plus Activity	Ahmednagar
Rolf	M	21590	26.06.19	GPS plus Activity	Saswad
Rolfe	F	26137	27.06.19	GPS plus Activity + Proximity	Saswad

The research team conducted 59 howling surveys on three radio-collared individuals from September 2018 to March 2019. The team received the howling response on 34 occasions at the response rate of 58%. The response rate increased up to 65% while only using chorus howls. And increase further up to 70%, while it was done after sunset.

Outputs and Outcomes

The average home range of the three wolves was 239 km^2. Wolf possesses multiple core area in highly human-dominated landscapes. Wolves are more responsive to chorus howls than solo howls. The responsiveness is more frequent in its core home ranges. Howl responses may be affected by other factors such as Sunset, Anthropogenic Noise.

Milestone

The finding includes that as an adaptive strategy, collared individuals establish multiple core area in profoundly human-dominated landscapes. Multiple factors such as sunset, playback howl type (solo/chorus) and place of howling survey (home range/non-home range) significantly affect the response rate of a wolf. This study is also helping to understand the influencing factors of the response rate. Therefore, the efficiency of howling survey for wolf abundance estimation can be increased.

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Funding Source
WWF- India

Investigator
Dr Samrat Mondol

Researcher
Tista Ghosh

Date of Initiation
April 2017

Date of Completion
April 2020

COMPLETED

ONGOING

PROJECT INITIATED

Implementing Rhino DNA Indexing System (RhODIS) to Counter Rhino Poaching Threat and Aid Population Management of Rhino in India

© Tista Ghosh

Objectives

The objectives of the project are to (i) establish a set methodology for undertaking rhino genetic studies based on invasive as well as non-invasive samples and generate a DNA data archive on Indian Rhinos; (ii) This DNA data-base will be used to (a) Match confiscated rhino contraband with existing database as scientific evidence of poaching involvement in the court to prosecute wildlife offenders; and (b) Understand genetic status of present population to facilitate population management of rhinos; and (iii) Promoting RhODIS to set better crime scene investigation protocol as Standard Operation Protocol and forest and police personnel's will be trained to adopt the system.

Progress

Fresh dung piles were detected and the top layer of each sample were collected by either swabbing or scraping to avoid any individual cross contamination prevailing in communal dung pile latrine system. All samples (both swabs and scrapes) were collected with GPS coordinates and transferred to the laboratory. In the laboratory, samples were stored -20°C freezer before downstream processing.

DNA was extracted by modifying DNA tissue kit protocol. Genotype profiles created from all collected samples were used to identify genetic recaptures with identical genotypes by using identity analysis module in program CERVUS. The genetic structure between the populations was identified using a spatially explicit Bayesian clustering approach implemented in program TESS.

Outputs and Outcomes

During the reporting period, the research team has standardized dung sampling protocol from the pilot sampling survey in Manas National Park (MNP) and Pobitora Wildlife Sanctuary (PWS) of Assam and Dudhwa National Park (DNP) of Uttar Pradesh. Further in the lab, the research team finalized the dung extraction protocol and standardized the final 14 loci panel with respect to dung DNA samples. Till now, the team has completed data generation from Dudhwa National Park and work with dung DNA samples from MNP and PWS is still in process.

In the last year, the team has received six rhino poaching cases, and all reports are submitted. Out of the six cases, two reports were already used as scientific evidence in court prosecution, and the remaining four are going to be presented as per the announced date.

In the first field sampling sessions, the team has collected 374 dung samples from three protected areas (DNP, MNP and PWS). Out of these, the team has completed the dung data generation from DNP and a representative data has been generated from MNP and PWS. The complete genetic data of DNP was used to give inbreeding status and relatedness ratio. Further, the genetic signatures of the four parks (DNP, MNP, PWS and earlier tissue samples from KNP) were compared by the research team.

The research team has prepared a forensic sample collection kit, and sample kits were sent to all the seven protected areas. In terms of training sessions, the team has already conducted sample collection workshops during the field survey in MNP and PWS of Assam and DNP of Uttar Pradesh.

Milestone

Study of genetic relatedness and inbreeding status will help in population management plans e.g. reintroduction or selective breeding. The reference database will be of major help in rhino poaching crime-related forensic use as it will help to trace back seized horns to their origin.

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COMPLETED

ONGOING

PROJECT INITIATED

Spatial Ecology of Himalayan Torrent Frog, Nanorana vicina in Response to Habitat Dynamics

Funding Source
Grant-in-Aid

Investigator
Dr Abhijit Das

Researcher
Swati Nawani

Date of Initiation
October 2017

Date of Completion
October 2020

Objectives

The objectives of the project are to (i) determine the movement pattern, home range and habitat selection in *Nanorana vicina*; and (ii) study connectivity among subpopulation of the species and identify factors that influence adult, juvenile and larval movement of the species.

Progress

The research team conducted a field survey in Kedarnath Wildlife Sanctuary and Benog Wildlife Sanctuary to document the herpetofaunal species and to identify the potential stream habitat and distribution of the target species, *Nanorana vicina*. Total ten individuals of *N. vicina* were radio-tagged in Benog Wildlife Sanctuary and tracking of the animals is undergoing. All tagged frogs are relocated 2-3 times per day. Observation on the natural history of Himalayan Toad, *Duttaphrynus himalayanus* has also been made in Benog Wildlife Sanctuary. A preliminary report of the project has been submitted to Mussoorie Forest Department. Scientific paper writing is undergoing.

Outputs and Outcomes

Sixteen species of herpetofauna from Kedarnath Wildlife Sanctuary and fourteen species of herpetofauna from Benog Wildlife Sanctuary were recorded. The field study reveals that the target species, *Nanorana vicina* is clearly a species complex.

Ten frogs were fitted with VHF transmitter and tracked from March to August. Animals showed strong site fidelity and their movements were restricted along the streams rather than away from it. Rare Himalayan wolf snake, *Lycodon mackinnoni* from the Sanctuary, discovered from Mussoorie in the year 1906 by Colonel Frank Wall was recorded. Potential new species of the herpetofauna from Kedarnath and Benog Wildlife Sanctuary was also recorded.

Milestone

The current study is first of its kind to look at the spatial ecology of Indian stream frog using telemetry.

© *Swati Nawani*

Development and Implementation of MSTrIPES (Monitoring System for Tigers: Intensive Protection and Ecological Status)

Funding Source
National Tiger Conservation Authority

Investigators
Dr Y.V. Jhala and Shri Qamar Qureshi

Researchers
Ashok Kumar, Ahana Dutt, Anup Kumar Pradhan, Ashish Prasad, Akshay Jain, Debranjan Laha, Kainat Latafat, Krishna Mishra, Ninad Mungi and Papori Khatonier

Date of Initiation
March 2012

Date of Completion
July 2019

Objectives

The objectives of the project are to (i) developing new versions of the MSTrIPES software, so as to include user-friendly protocols, applications, analytics and data archiving; and (ii) implement MSTrIPES and orient filed staff to modern techniques on patrolling and ecological monitoring, which will help in adaptive conservation actions.

Progress

Three android applications (Patrol, Ecological and Polygon search) that can be used without internet or mobile connectivity are developed for Androids version 5.0 onwards, and are freely available (www.mstripes.in) for application across India. These apps are available in ten official Indian languages and are being used by the forest officials and staff for regular use in the Tiger Reserves (TR). Desktop software for data archiving, and statistical and spatial analysis is being used at the division level, where the operators and officials are taking the consensus from the collected information to develop further conservation strategies.

The ecological module was adapted for National Tiger Estimation Program (2018-19), where the tiger ranging states in India used this module to collect the Phase 1 data and archive it on the MSTrIPES server. As part of the ecological module, CaTRAT (Camera Trap Repository and Analysis Tool) has been programmed to archive and analyze the camera trap photographs, based on artificial intelligence and machine learning algorithms By using this module, the users can geo-tag the camera trapped images, and analyze the camera activity, encounter rate, animal activity, occupancy, etc. One more component of the ecological module, The Polygon Search (TPS) has been programmed and used in an area where conventional Phase I and Phase III sampling is difficult (primarily targeting North-Eastern States, the area with political insurgencies and Himalayan region).

Six regional and 16 site-specific workshops were conducted to train more than 3,500 forest officials and staff, for using the MSTrIPES patrol module. Four regional workshops and eight site-specific training programmes were conducted for the ecological module. Computer operators from all Tiger Reserves were invited in four training workshops held in Dehradun. By this, more than 4,000 forest officials are trained for using and implementing the ecological module. Response to about 1,500 emails, 7,000 phone calls and approximately 800 text messages were provided to state forest departments during last one year pertaining to different queries on MSTrIPES patrol and ecological modules. It was in addition to 110 person-days of TeamViewer help needed for virtual

help. This represents the acceptability and success of MSTrIPES at different sites across India.

Outputs and Outcomes

Patrol module has availed the forest staff to record the field data with the geo-tagged photographic information on crimes, animal sightings, animal mortality, etc. This has strengthened the confidence in reporting crimes as the transparency in the flow of information; accountability of the efforts invested and importance of evidence are increasingly recognized. The patrol module is being implemented using mobile applications, or GPS, or manual forms in different protected areas.

More than 400 forest divisions used the ecological module of MSTrIPES during the National Tiger Estimation Program (2018-19) to record data for over 50,000 carnivore sign surveys, and 60,000 line transects. The CaTRAT component was used to analyze the Phase III camera trap data collected across more than 100 sites in India during the year 2017-19. The program has reduced the time required for analyzing the data and has ensured the sustenance of geo-tagged camera trap data for posterity. Polygon search was used by the Dampa TR, Dibang TR, Kamlang TR, Palamau TR, Karbi-Anglong forest division.

Milestone

For the first time, information required for the National Tiger Estimation Program has been hosted on one platform, which is shared between all the involved forest divisions and states. The analysis that is being done for the Tiger Estimation program can be conducted at any site-specific or regional scale.

More than 600 Forest Divisions now have spatially integrated digitized boundaries, and can now use any components on the MSTrIPES program. This has made, for the first, National Digital Library of forest-administrated areas, which is freely available for registered forest officials on the website (www.mstripes.in).

The web-visualization of the ongoing patrol has strengthened the confidence and near-real-time information flow across the forest department's hierarchy. This has reduced the response time to events like poaching or habitat degradation and formed a comprehensive tool to keep the pulse of a tiger reserve. It also provides a platform for sharing the collective responsibility of park protection.

Documentation of Traditional Ecological Knowledge among Indigenous Ethnic Communities of Pithoragarh District, Uttarakhand

Funding Source
Department of Science & Technology, Climate Change Programme (CCP), Ministry of Science & Technology, Government of India

Coordinating Institution
Department of Environmental Sciences, Jawaharlal Nehru University, New Delhi

Investigators
Dr G.S. Rawat and Dr S. Sathyakumar

Researcher
Naveen Chandra Joshi

Date of Initiation
June 2015

Date of Completion
July 2020

Objectives

The project aims to document the existing and publicly available traditional ecological knowledge (TEK) among the two indigenous ethnic communities (IECs), *viz.*, *Van Raji* and *Barpatiyas* of Pithoragarh District, Uttarakhand. Major objectives of the study are to: (i) document the TEK pertaining to use of bio-resources and their management among the two communities, (ii) study the traditional farming practices, and (iii) study the degree of TEK transfer from older to younger generations. The two communities selected for the study were *Van Rajis* and *Barpatiyas*.

Progress

Fieldwork and household surveys pertaining to all the three objectives have been completed. During the current year of study, detailed questionnaire surveys were carried out in all the villages of both the community for an assessment of the livelihood vulnerability due to climate change. The data collected during the last three years of project was also validated and further utilized for the analysis of different traditional uses of bio-resources, the status and richness of traditional ecological knowledge among various age-classes in both the study communities and for the assessment of Livelihood Vulnerability Index (LVI) for *Barpatiya* community broadly based on the three primary IPCC climate change vulnerability framework components *viz.* adaptive capacity, sensitivity and exposure which were further divided into nine major components and 42 indicators.

A total of 342 different uses of bio-resources among Barpatiya and 432 uses among *Van-Rajis* were recorded including plant parts used as ethnomedicine for humans and veterinary healthcare, wild edible plants, a constituent of multi-plant medicine and other uses such as fuel wood, timber, fodder etc. Both the study communities still depend largely on the forest and

forest products and retain a considerable TEK related to use of bio-resources. The knowledge related to traditional farming and livestock rearing is still intact with the *Barpatiyas* whereas, the TEK related to wood carving, use of wild medicinal plants and subsidiary food is still intact with *Van-Rajis*.

Outputs and Outcomes

LVI results indicate that the *Barpatiya* community as a whole is facing the severe threat of vulnerability to livelihood due to climate change, as the composite LVI for *Barpatiya* community was recorded 0.435. The study has resulted in the documentation of detailed ethnoecological knowledge among *Barpatiya* and *Van Rajis* of Pithoragarh District. This study would also help in maintaining the coherent database on TEK of ethnic people of the western Himalayan region along with the estimation of their current livelihood vulnerability due to climatic variations.

Milestone

The study on *Barpatiya* community may help in adopting several traditional agro-pastoral methods related to farming practices, pastoral practices, NTFP's use and management, weather prediction and weaving and knitting. Whereas, the study on *Raji* community will help in documenting the traditional knowledge of this Primitive Vulnerable Tribal Group (PVTG) related to wood carving, use of wild medicinal plants, subsidiary food, fishing and hunting. Assessment of vulnerability level at small scale would be useful for any policy framework, planning infrastructural facilities, prioritization of adaptation interventions and for making disaster management schemes.

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Spatio-temporal and Thermal Ecology of Indian Python, Python molurus molurus Linn. 1758 in Moyar River Valley, Tamil Nadu

Funding Source
Science and Engineering Research Board-Department of Science & Technology (Extra Mural Grant – Individual Centric), Government of India

Investigators
Dr Ramesh Chinnasamy,
Dr Abhijit Das,
Dr Gautam Talukdar

Researchers
Vishnu C.S.,
Thiru Murugan V.
and Karthy S.

Date of Initiation
March 2017

Date of Completion
March 2020

Objectives

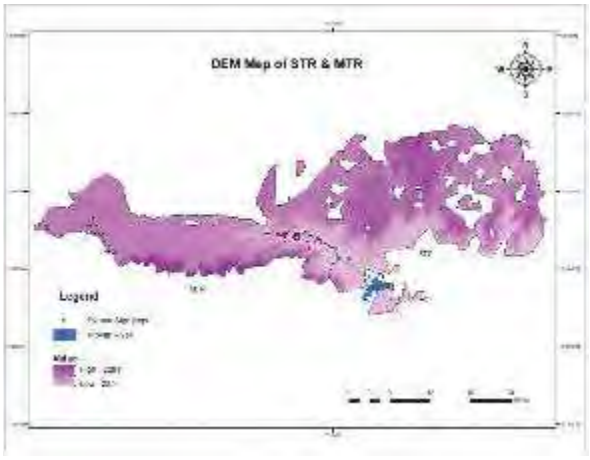
The objectives of the project are to (i) determine movement pattern and home range characteristics of Pythons; (ii) activity pattern and rate of survival of relocated pythons; (iii) document the thermoregulatory behavior and compared the previous study in Northern India; and (iv) generate information of python distribution and people perception towards snakes.

Progress

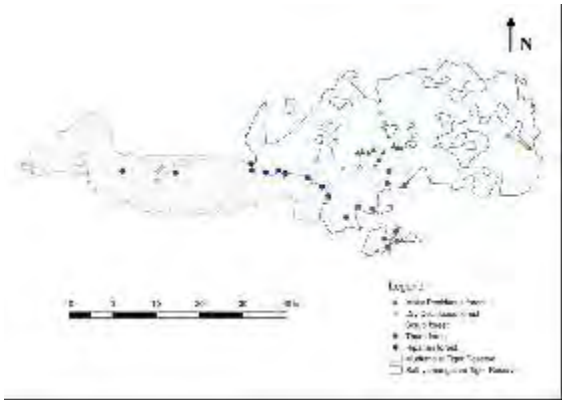
So far, a total of 57 pythons sighting recorded (26 direct sightings + 31 indirect sightings). Their distributional records are shown in the maps of Sathyamangalam Tiger Reserve (STR) and Mudumalai Tiger Reserve (MTR).

Necessary additional training has been given to the Junior Research Fellow and Two Project Assistants to collect the field data to achieve the project objectives. In addition, four Interns have been appointed and necessary training is given to them for project-related activities.

Species diversity and forest structure are often indicating the health of an ecosystem. Multiple disturbances negatively influence on forests; detail information on disturbances due to anthropogenic and biological factors on Tropical forest is lacking. This study evaluates various disturbances influences on tree species diversity and forest structure. Moyar river valley consists of five



major vegetation types, namely Riparian, Southern Thorn, Southern Scrub, Tropical Dry Deciduous and Tropical Moist Deciduous Forest. The elevation ranges 250-1,266m above sea level with the average annual rainfall 600-1,000mm, and average mean temperature 21°C-28°C. One km transect (n=49) consist of ten equally distanced 10m x 10m plots (n=490) were laid randomly in five forest types (10 transects for each forest type, except Moist Deciduous Forest with nine transects). All the trees (?10cm Girth at breast height) were enumerated from the plots. Disturbance intensity, such as human access, invasive species, fuel wood collection, NTFP, logging and Cattle grazing were quantitatively assessed (1-minimum to 10-maximum). Species diversity and tree density were correlated with the disturbance level using spearman rank correlation. A total of 181 tree species and 2,653 trees were enumerated. Among five vegetation types, moist deciduous forest had highest species diversity. Developmental activities, expansion of agricultural fields, Invasive species and other biological disturbance were affecting the forest structure. Immediate management intervention required to control the invasive species spread and reduce the anthropogenic pressure.



Major vegetation types studied in the Moyar river valley shown in the map.

Transmitter implanted pythons named as IP1, IP2, IP3 up to IP8. Along with the radio-transmitter, temperature sensing "i-Button", also glued together using poly-acryl glue. The transmitters implanted within the coelomic cavity at three fourth of its length in the abdominal region. After releasing, in the field, python movement and behaviour were monitored. An ambient temperature sensing Hobotemp instrument was fixed on a tree branch in the same habitat to compare the temperature data.

Outputs and Outcomes

The study generated information on people's perception of snakes. Questionnaire surveys were consisting of 25 questions. Data collected from 30% of the households (n=493) in 15 villages. People's fear of snakes not varied among different villages, gender, age and community ($F=4.48$; $P=<0.05$). Most people were aware of venomous snakes, yet they feel threatened by non-venomous snakes. The survey revealed that, out of five, one person bitten by poisonous snakes. Most people (90%) realized the importance of allopathic treatment.

Milestone

The tagged Pythons (N= 8) were tracked in the field between December 2018 and March 2019. Google earth was used to estimate the home ranges of pythons; the research team connected all GPS locations with the polygon tool and measured the areas and perimeters of python's home ranges.

Influence of Micro-Climatic Variables on Herbaceous Plant Communities in Treeline Ecotone in the Himalaya

Funding Source
NMHS, New Delhi
through CHEA, Nainital

Investigator
Dr B.S. Adhikari

Researcher
Rahul Kumar

Date of Initiation
April, 2016

Date of Completion
March, 2021

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Objectives

The objective of the project was to understand the impact of depletion of snow-melt water on growth of grassland species composition and selected functional processes.

Progress

During the study period, data were collected along an elevation gradient (3,200-3,300m; 3,300-3,400m; 3,400-3,500m; and 3,500-3,600m) across the micro-sites (early snowmelt, ESM and late snowmelt, LSM) at four sites in and around Tungnath. Plant density along elevation zones was higher in ESM micro-sites than LSM micro-sites in all the sites, except at 3300-3400m in Jhabra and 3400-3500m in Ravanshila, where it was higher in LSM than ESM micro-sites.

Outputs and Outcomes

The plant density ranged between 69-626 individuals m^{-2} for 3,200-3,300m; 83-878 individuals m^{-2} between 3,300-3,400m; 60-917 individuals m^{-2} between 3,340-3,500m; and 55-882 individuals m^{-2} between 3,500-3,600m across sites and months. The species richness was higher in ESM for 3,200-3,300 and 3,400-3,500 m elevation while it was higher in LSM for 3,300-3,400 and 3,500-3,600 m. Similarly, it was noticed that the phenological events of a species have a significant impact of snowfall during winter months as well as the temperature within and across micro-sites.

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COMPLETED

ONGOING

PROJECT INITIATED

Mainstreaming Landscape Approach to Biodiversity Conservation, Improved Livelihoods and Ecosystem Health in Kailash Sacred Landscape part of India

Funding Source
National Mission on Himalayan Studies, MoEFCC and GBPNIHESD through State Biodiversity Board, Uttarakhand

Investigators
Dr G.S. Rawat and Dr B.S. Adhikari

Researchers
Arti Kala, Soni Bisht and Udita Garbyal

Date of Initiation
May 2018

Date of Completion
April 2021

Objectives

The objectives of the project are to (i) strengthen community institutions and establish convergence for restoration of degraded habitats and management of ecosystems; (ii) harness heritage value of cultural and biological diversity (i.e., wild and domesticated) for livelihoods promotion and conservation; and (iii) identify critical ecosystems/habitats, biodiversity corridors and suggest evidence based management plans Biodiversity Conservation, Improved Livelihoods and Ecosystem Health in Kailash Sacred Landscape.

Progress

A community-based conservation programme on orchids was initiated in Lower Gori valley. An Orchid Conservation Society (OCS) was formed and a patch of forest (ca. 5 hectares) near Lumti, adjacent to Jauljibi – Madkot road has been selected for in-situ conservation area as Orchid Conservation Area (OCA). The site is covered with 50% rocks and 40% weeds. It harbours a good population of orchids such as *Aerides multiflora*, *Bulbophyllum affine*, *Bulbophyllum reptans*, *Coelogyne ovalis*, *Cymbidium iridioides*, *Dendrobium fimbriatum*, *Eria lasiopetala*, *Gastrochilus inconspicuous*, *Liparis viridiflora*, *Oberonia acaulis*, *Oberonia ensiformis*, *Oberonia pachyrachis*, *Pholidota articulata*, *Pholidota imbricata*, *Thunia alba*, and *Vanda cristata*. The major host tree species are *Engelhardtia spicata*, *Pinus roxburghii*, *Sapium insigne*, *Machilus odoratissima*, *Litsea monopetala*, *Mallotus philippenis* and *Toona ciliata*.

Restoration of riverine forests (Orchid Conservation Area)

With the help of Biodiversity Management Committee (BMC) and OCS invasive alien species Kala Bansa or Crofton weed, *Ageratina eupatoria*, which has infested the riverine forest, especially the OCA was uprooted to make better for *in-situ* conservation.

Milestone

Participatory Natural Resource Management (PNRM) plan was prepared with the help of BMC at Harkot.

Ecology of Clouded Leopard, Neofelis nebulosa in an East Himalayan Biodiversity Hotspot

Funding Source
Department of Science and Technology, Govt. of India, New Delhi

Investigators
Shri Salvador Lyngdoh and Dr Bilal Habib

Researcher
Urjit Bhatt

Date of Initiation
November 2016

Date of Completion
November 2019

© *Camera Trap Image*

Objectives

The objectives of the project are to (i) estimate the population and abundance of clouded leopard and other carnivore species within selected areas of Manas National Park; (ii) determine prey choice and foraging habits of the clouded leopard in the National Park; and (iii) assess temporal activity and space use of clouded leopard and other sympatric carnivores.

Progress

Total of 438 camera traps was deployed systematically in a 1X1 sq. km grid in all three ranges. Relative Abundance Indices (RAI) was calculated as a total number of independent photographs for each species divided by total trap nights and then multiplied by 100. Multiple photographs of single individuals within a 30-min period were considered as one effective photograph, and subsequent photographs were removed. Spatial overlap between species was assessed through Pianka's Niche Overlap Index. The activity periods of species were classified as diurnal (day-time), nocturnal (night-time), cathemeral (day and night-time) or crepuscular (twilight). Temporal overlap among sympatric carnivores and potential prey species was assessed through kernel density estimation in R platform using overlap package.

To study the effects of different moon phases on mammals, the research team classified the moon phase of records, according to the percentage of visible moon surface using moon phase SH software, version 3.3.

Outputs and Outcomes

A total of 35 species (17 carnivores) were recorded with 16,214 independent records over the whole sampling period of 7,337 trap nights. Total 16 photographs of clouded leopards were photo-captured, and the team identified nine individuals. In the present study, all the photo-captured small carnivores were either mainly nocturnal. Out of the five large-medium carnivores; three (tiger, leopard, and Asiatic black bear) were cathemeral, dhole was diurnal, and the clouded leopard was nocturnal. Analysis of activity patterns throughout the 24-h cycle revealed a high degree of temporal overlap (>60%) among most of the sympatric species; however, differences in the activity peaks were found between most of the species pairs. The study showed that clouded leopard activity was predominantly nocturnal. However, the overall activity pattern from radio-telemetry studies (n=4) indicated two peaks at 18:00-02:00 hr and 08:00-12:00 hr.

The present study also found a bimodal pattern but with different peaks at 21:00-23:00 hr and 2:00-4:00 hr. In case of its prey, the study found the high temporal overlap with sambar and Himalayan crestless porcupine as compared to the other prey species. The activity of small carnivore was influenced negatively by moonlight. The result suggests that large carnivores were active non-differentially across moon phases; however, small carnivores showed significantly high activity in darker nights. These patterns indicate that small predators may differ their activity temporally possibly as an anti-predator strategy or otherwise to increase their foraging efficiency.

Milestone

Intensive fieldwork will be done to collect multi-season data. Density estimation of clouded leopards and other carnivores will be calculated. Prey choice and foraging habits will be determined using scatological techniques and also by examining carcasses of prey killed in the field. Activity patterns of clouded leopards, as well as their spatial and temporal overlap with other sympatric carnivores, will be calculated season-wise.

© Camera Trap Image

Atlas of Colonial Nesting Waterbirds in the East Coast States of India

Funding Source
Grant-in-Aid

Investigators
Dr Gopi G.V. and
Dr Bivash Pandav

Researcher
Frank Sadrack
Jabaraj D.

Date of Initiation
April 2017

Date of Completion
April 2020

Objectives

The objectives of the project are to: (i) conduct a state wide survey for documenting the existing nesting waterbird colonies; (ii) raise base line ecological information about each of the nesting colonies; (iii) assess the conservation threats to these identified colonial waterbird colonies; and (iv) distinguish key colonial areas based on number of species as well as number of threatened species.

Progress

With the commencement of the October 2018 - March 2019 breeding season, the survey was continued. A total of 43 heronries were recorded during (October 2017- May 2018) breeding season. This included the survey across the 33 districts of Tamil Nadu. Since most of the previous sites were lost due to various reasons, the survey included both PAs (Bird Sanctuaries) as well as the Non-PA's which encompasses both natural as well as human-made wetlands spanning across the state of Tamil Nadu. During the current season fieldwork was continued and new heronries are being documented from the rest of the districts. This included the collection of data pertaining to each and every individual heronry; it's ecological as well as conservation threats that are associated with it. With the current breeding season continuing, the team is focusing on other probable remote areas with nesting.

Outputs and Outcomes

A total of 28 heronries were identified in the current season (October 2018- March 2019 (cont)) in addition to already existing sites 43 sites (October 2017- May 2018). Each site was visited and details with regards to the number of species nesting, nests trees used, nesting area, activity period of the birds in the particular area, the total number of birds, predominant nesters and threatened species were collected. Apart from the ecological data other details pertaining to ownership and maintenance such as type of wetland, age of the water body, purpose of the wetland, regular maintenance, infrastructure around the water body, villages around and dependence of people were also collected for each nesting sites.

Detailed photo documentation of these nesting sites and species were recorded to be showcased in the atlas. A network with the birders across the state of Tamil Nadu has been developed for conservation-related aspects.

Milestone

All the districts of Tamil Nadu are taken into account and survey is being conducted in almost all the districts covering most of the water bodies. Most of the recorded heronries during the current study were recorded for the first time when compared with the previous studies in the state of Tamil Nadu. Among the 26 colonial nesting waterbird species in India, 19 have been already recorded in Tamil Nadu, and with the addition of another species, the total of the number of nesting species now stands to 20.

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COMPLETED

ONGOING

PROJECT INITIATED

Conservation Management of Elephants in Chhattisgarh: Capacity Building Initiative on the Dispersal and Ranging Patterns of Elephants for Effective Management of Human-Elephant Interactions

Funding Source
Government of Chhattisgarh

Investigators
Dr Bivash Pandav and Dr Parag Nigam

Researchers
N. Lakshminarayanan, Ankit Kumar and Jayjit Das

Date of Initiation
June 2017

Date of Completion
May 2020

Objectives

The objectives of the project are to (i) assess home range, dispersal and movement patterns of elephants through satellite telemetry; (ii) create a photographic identification manual of individually recognized elephants for use in estimating re-sighting based home ranges and behavioral details; (iii) identify genetic structure of elephants in Northern Chhattisgarh using non-invasive faecal samples; (iv) assess contexts and circumstances leading to elephant attacks on people; and (v) enhance the capacity of forest department frontline staff on monitoring elephant populations through structured training programs and develop possible early warning measures by engaging local communities and field staff.

Progress

The period, April 2018 to March 2019, marked the end of the second year of the long-term study of Human-Elephant interactions in the state of Chhattisgarh. During this period, the research team continued to regularly monitor the two elephants CGM001 (Behradev) and CGF010 (Gautami) that were collared during the previous year. These elephants provided details on Home Range patterns; elephants use the forest patches in Balrampur, Surajpur, Jashpur, Surguja and Dharamjaigarh Forest Divisions and seasonal movement within Home Range. Home ranges estimated using 95% MCP for CGM001 was 1,170 km^2 (for 13 months). For the female elephant CGF010 that operated with a herd, 95% MCP home range for 13 months was 2,337 km^2. CGF010 and its group of elephants have also provided valuable insights on the inter-state movement of elephants between Chhattisgarh and Odisha.

Further, during this period, the research team has also managed to collar three more elephants. Two elephants were collared in Surajpur FD, and one elephant was collared in Tamor Pingla WLS. Of the three elephants, the bull CGM003 (Pyare) was collared during November 2018 and its Home Range estimate for the nine months was 997 km^2. Of the five elephants that were collared, two elephants dropped their collars soon after deployment.

In addition to collared elephants, the team has been monitoring some of the individually recognized elephants to understand their ranging patterns using a re-sighting approach. Home range estimates of two groups of elephants; CGF002 and CGF003, for which multiple re-sighting locations were estimated using MCP approach. The Home Range size of CGF001 (Torn Ear family) was 8,484 km^2 and CGF003 (Wave Ear) was 385.49 km^2. The individually recognised elephants have also helped in documenting the recent dispersal of elephants from Chhattisgarh into Bandhavgarh and Sanjay Tiger Reserves in Madhya Pradesh.

The research team has been investigating human deaths due to elephants as they continue to be a significant cause of concern for the management. During the current year, the group continued to collect fine-scale details of human deaths due to elephants. In total, the group recorded 46 cases of human deaths due to elephants. Of the victims, 46% (n=37) were elderly (>50 years). Human deaths due to elephants occurred all through the year. There were more deaths during dusk (24%, n=11) and night hours (50%, n=23). Human deaths mostly occurred in the vicinity of houses (30%, n=14), agricultural fields (30%, n=14) and forests (28%, n=13). Male elephants were responsible for over 60% (n=27) of human deaths.

Outputs and Outcomes

The research team collected elephant faecal samples (dung) to understand their social organisation through non-invasive DNA analysis. A total of 258 elephant dung samples were analysed in the laboratory. Additionally, 10 tissue samples and four blood samples of elephants were analysed too. Tissue samples were used for standardising genetic markers. Using 14 microsatellite loci, 55 unique individuals with 21 recaptures were identified from the dung samples. The subsequent analyses showed that elephant population in Chhattisgarh has moderate genetic diversity.

Whilst the aforementioned activities are part of the organised work plan, elephant conflict management involves site- and time-specific issues - some of which are emergency in nature, where timely intervention is crucial and helpful for the management. Enlisting the advisory activities here will be exhaustive.

Four reports and manuals were prepared during the project period.

Milestone

Annual movement of elephant groups mapped and pattern of their movement has been established. This will help in prediction and prevention o human-elephant conflicts.

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COMPLETED

ONGOING

PROJECT INITIATED

Study on Ecology and Migratory Patterns of Golden Mahseer, Tor putitora in River Ganga using Radio Telemetry Techniques

Funding Source
Grant-In-Aid

Investigators
Dr J.A. Johnson and
Dr K. Sivakumar

Researcher
Bhawna Dhawan

Date of Initiation
September 2017

Date of Completion
September 2020

Objectives

The objectives of the project are to (i) investigate the breeding migratory patterns of golden mahseer inhabiting in western Himalaya; (ii) document the habitat use of golden mahseer during different life history including spawning and growing; (iii) estimate the breeding and non-breeding home ranges of mahseer inhabiting the main river channel; and (iv) estimate the weighted usable area and flow requirement of golden mahseer using PHABSIM model.

Progress

Intensive field studies were performed during three seasons to collect inventory data of golden mahseer habitats in Kosi and Kohlu rivers of Uttarakhand. Nursery and spawning grounds of young mahseers were located and mapped. Their habitat utilization was studied. Radio-tagging was performed to achieve the main objective of this study; ten adult mahseer individuals were tagged with radio tags followed by regular monitoring and tracking.

Outputs and Outcomes

Based on this one-year study, habitat location and their use by different life-history stages of golden mahseer in these rivers were documented.

Milestone

Monitoring and tracking of the tagged golden mahseer individuals will remain to continue for the coming research year to map their home ranges, movement and migratory patterns. In addition, the compilation of preceding as well as forthcoming studies data will be done to file the results for the proposed objectives.

Diet, Foraging Behaviour and Habitat Factors Affecting Breeding Success of Riverine Island-Nesting Birds in the National Chambal Sanctuary, Uttar Pradesh

Funding Source
Grant-in-Aid

Investigators
Dr Bivash Pandav (WII) and Dr Gopi Sundar (NCF)

Researcher
Rohit R.S. Jha

Date of Initiation
December 2017

Date of Completion
November 2020

Objectives

The objectives of the project are to (i) study nesting biology of four focal river-island nesting species (Black-bellied Tern *Sterna acuticauda*, Indian Skimmer *Rhynchops albicollis*, River Tern *Sterna aurantia* and Little Tern *Sterna albifrons*); (ii) undertake surveys in the National Chambal Sanctuary during the nesting season (Feb-Jun) to identify key nesting sites for the four focal river-island nesting birds; and (iii) determine inter-annual variation of the above two aspects over three years.

Progress

The four focal species *i.e.* Indian Skimmer, Black-bellied Tern, River Tern, Little Tern commence nesting activities after spring from late March-onward on river-islands in the National Chambal Sanctuary (NCS). The research team identified key nesting sites, monitored nest fates (egg laying until their known outcome) of more than 150 nests, and collected data of island-level variables hypothesised to affect nest survival of the focal species within an approximately 75 river-km stretch of the Chambal river within the NCS, Uttar Pradesh, from upstream of its confluence (at Bhareh) with river Yamuna. The team also identified some of the threats that were responsible for chick mortality and egg depredation, based on both direct and indirect evidence. During January-February 2019, the team did river-wide boat surveys in the NCS (within UP and parts of MP-Rajasthan) to identify locations where our focal species (especially Indian skimmer) gathered before beginning nesting activities and observed courtship rituals and pair-formation. The team also enumerated all birds encountered during such boat surveys. In future, the team plan to combine field observations with camera trap footage to determine the time-activity budgets of the focal bird species during the breeding season. The team plan to assess the efficacy of various conservation measures towards enhancing nest survival of the focal species at sites where they nest in relatively large numbers.

Outputs and Outcomes

Field data suggests that the most serious threat to the focal river-island nesting birds came from opportunistic and unfamiliar predators such as domestic/free-ranging dogs and jackals, *Canis aureus*, which ventured onto such river-islands as they became connected to either bank due to continuously decreasing water level in the river as the dry season progressed. Based on these findings, the team suggested the deployment of "nest-guards" from local villages near nesting sites to the UPFD to discourage human activity in and around such river-islands during the breeding season (March to July) and to ward off unfamiliar predators.

Milestone

The team submitted an annual report to the UPFD in December 2018 and a short report on wetland birds in the NCS, UP in January 2019 to the Deputy Conservator of Forests, NCS, UP.

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COMPLETED

ONGOING

PROJECT INITIATED

Genetic Connectivity at Landscape Scales for Large Carnivore Populations in Tiger Habitats

Funding Source
National Tiger Conservation Authority, Delhi

Investigators
Dr Y.V. Jhala, Shri Qamar Qureshi and Dr Vishnupriya Kolipakam

Researcher
Shweta Singh

Date of Initiation
January 2016

Date of Completion
August 2019

Objectives

The objectives of the project are to: (i) carry out genetic identification of leopard, *Panthera pardus*; dholes, *Cuon alpinus* and sloth bear, *Melursus ursinus* in the study area, from their faecal DNA extracts; (ii) investigate the metapopulation structure of large carnivores in the country using microsatellite loci genotypic data; (iii) investigate the level of genetic structuring between local populations and across the country; and (iv) identify any ESU's or isolated populations that merit special conservation attention.

Progress

Wild Dog: A species-specific primer based on the cytochrome b region of mitochondrial DNA was designed to amplify an area of 310 bp, like leopard and tiger specific primers. DNA was isolated from a total of 700 scat samples and using the dhole specific markers. In all, 391 scat samples were identified as belonging to that of dholes. A panel of twelve polymorphic markers was used to identify individual dholes from these dhole positive scats. The observed heterozygosity for all landscapes was found to be significantly lower than the expected heterozygosity. Three significant clusters were identified across India using Bayesian model-based clustering algorithm; North-eastern, Central Indian and the Western Ghats. Northern-Western Ghat populations showed affinity to Central Indian populations, and North-east populations were distinct from the rest of the Indian dhole populations. While there are sampling gaps, current results of population structuring support biogeographic understanding of dhole distribution.

Leopard: A leopard specific primer was designed, and the results were subsequently published. A total of 1,147 putative leopard/tiger faecal samples were chosen for extraction of DNA. Out of these, 718 faecal samples successfully amplified with tiger and leopard specific primers and yielded a total of 432 leopard positive faecal samples. Based on the distribution of the positive leopard samples, out of the 430 faecal samples, a total of 230 leopard positive samples were chosen for genotyping with a set of 11 microsatellite loci. Genotyping and scoring of positive 230 samples were done. Other relevant analysis like individual identification, population structure is in process.

Sloth Bear: A total of 442 sloth bear faecal samples were chosen for extraction of DNA. Out of these, 387 faecal samples were successfully amplified with sloth bear specific primer. Genotyping of these samples is ongoing.

Outputs and Outcomes

The leopard specific primer (LSP) designed is also the first non-cross amplifying leopard specific primer designed in India. The previous primers designed have been known to cross amplify with other sympatric carnivores. The wild dog specific marker designed in the study is the first wild dog specific primer available till date and is able to differentiate wild dog faecal samples from those of domestic dog and other sympatric carnivores through gel-based electrophoresis. Minimum number of dholes in protected areas was also generated across India.

With the completion of the analysis for all three species, the team hoped to have a dataset where it would be easy to compare the genetic structure and gene-flow of these major species, alongside tigers. This would give an insight into how effective current management practices are for non-tiger species, and if there need to be specific inputs adapted for the conservation of leopard, wild dogs and sloth bears.

Milestone

This dataset on dholes currently forms the largest and most diverse sample set. Further information generated through the project can help inform management recommendations on conservation inputs for this data deficient species.

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Trans-boundary Tiger Recovery Initiative in the Terai Arc Landscape

Funding Source
IUCN-KfW funded Integrated Tiger Habitat Programme, Zoological Society of London (ZSL)

Coordinating Institutions
Wildlife Institute of India and Uttarakhand Forest Department

Investigators
Dr G.S. Rawat, Dr P.K. Malik, Dr Bivash Pandav, Shri D.V.S. Khati, Dr Gitanjali Bhattacharya and Dr Harish Guleria

Researchers
Ajaz Hussain, Gaurav Sirola, Harshvardan Singh Rathore and Nirdesh Kumar

Date of Initiation
November 2017

Date of Completion
June 2019

COMPLETED
ONGOING
PROJECT INITIATED

Objectives

The overall objective of the project is to secure the trans-boundary Terai Arc Landscape (TAL) to strengthen the recovery of the tiger population through improved management and monitoring of five key tiger sites. The main aims of the project are to: (i) implement robust monitoring of tiger and prey populations in Nandhaur Wildlife Sanctuary (NWS) and informed adaptive management measures; (ii) strengthen effective law enforcement by systematic patrol based monitoring conducted by well-trained and well-equipped frontline staff supported by the deployment of technological tools is in place; (iii) mitigate human-carnivore conflicts designed with inputs from frontline staff and local communities is in place; and (iv) gain support of local communities in tiger conservation through enhanced and alternative livelihood interventions.

Progress

Robust monitoring of tiger and prey populations in Nandhaur Wildlife Sanctuary (NWS)

A total of 65 forest staff from NWS were trained in the basics of ecological monitoring, camera trap deployment and line transect methodology to monitor tigers and prey across NWS. Camera trapping and line transect sampling were led by frontline staff and supported by the project team. Camera trapping identified 27 unique individuals in NWS, with a tiger density of 3.26± 0.64/100km^2 in NWS. The overall ungulate density was estimated at 17±4.06 per km^2, using a distance sampling methodology.

Strengthened law enforcement across NWS

To improve on-site law enforcement (LEM) in NWS, the frontline forest staff was trained in MSTrIPES (Monitoring System for Tigers - Intensive Protection and Ecological Status). A total 1,086 long and short-range patrols were carried out covering 8,636 km by the field staff of NWS from January 2018 to April 2019. Data from four forest ranges of NWS was formally evaluated, revealing a sharp increase in patrol performance and a highly significant drop in illegal activities between January 2018 and April 2019. The systematic patrol monitoring system provided valuable feedback to inform the adaptive management measures adopted by NWS. Regular meetings and exchange visits are being conducted on a regular basis in the transboundary context.

Human-carnivore conflict mitigation

Detailed data on human-wildlife conflicts for the past ten years was collated from Haldwani, Nainital, Champawat and Terai East

Forest Divisions of Uttarakhand forest department records (UKFD). This information helped the programme team to identify patterns of conflict in and around NWS. 10 villages having a high degree of human-carnivore conflict around NWS were identified.

Twenty early warning systems were deployed to protect vulnerable villages adjoining Nandhaur WLS, and this has resulted in 90% decrease in crop depredation by elephants in three different conflict hotspot villages.

Enhanced and alternative livelihoods Local communities: Based on detailed socio-economic surveys conducted in 24 villages around NWS, three villages were identified for interventions to support alternate and improved livelihood generation and development of local enterprises to reduce dependence on forest resources. Key areas of the intervention included training on apiculture, dairy and food processing, eco-tourism and home-stays, fodder production and restoration of degraded village land and a well developed enterprise-led development programme driven by local communities engaged and supportive of tiger conservation is underway. The project has created access to markets for local communities that are supplying their organic products to stores in Haldwani. Enhanced capacity building through training programmes and exposure visits of the local communities and the line agencies, including forest departments of India and Nepal has been initiated.

Capacity Building of Uttarakhand Forest Department Officials in Conflict Mitigation Enhanced

Four officers of Uttarakhand Forest Department participated in wildlife capture and restraint course in Zimbabwe from 9-18 February 2018.

Outputs and Outcomes

The project has resulted in strong collaboration and mutual cooperation between protected area management (UKFD in India and DNPWC in Nepal) and local communities across the trans-boundary landscape.

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COMPLETED

ONGOING

PROJECT INITIATED

Intensive Monitoring of Tiger and Study of Dispersal in Kanha Tiger Reserve (Phase IV)

Funding Source
National Tiger Conservation Authority

Investigators
Dr Y.V. Jhala and Shri Qamar Qureshi

Researchers
Neha Awasthi, Jayanta Kumar Bora Shravana Goswami

Date of Initiation
June 2009

Date of Completion
December 2019

Objectives

The project objectives are to: (i) monitor the source population of tigers in Kanha Tiger Reserve; and to (a) estimate the tiger population within selected areas of the reserve, and (b) obtain survival and mortality information through a mark–recapture study; (ii) monitor prey and co-predator populations and the condition of the habitat in the tiger reserve; and (iii) gain an understanding of tiger dispersal patterns.

Progress

The research team sampled 777 km^2 core area and 502 km^2 buffer area of Kanha Tiger Reserve with an effort of 19,710 camera trap nights in this sampling session. The group gathered 3,337 tiger images of a total of 106 tigers, among which 81 are adults (40 females and 41 males), and 25 are cubs. The group gathered 2,767 leopard images of a total of 100 adult leopards, among which 62 are females, and 38 are males.

Outputs and Outcomes

Tiger density was computed to be 3.76 (SE 0.45)/100 km^2 while leopard density was 8.4 (SE 0.70)/100 km^2 in Kanha Tiger Reserve in 2018 camera trap sampling. Line transect based distance sampling was used to estimate the prey status in Kanha Tiger Reserve. Sampling had been conducted in both the summer and winter seasons. A total effort of 1,200 km were invested in sampling 200 spatial transects with three temporal replicates each. Results are shown in the table below. Chital had the highest density amongst all ungulate species, followed by sambar and gaur.

Milestone

Three adult female wild dogs were collared with GSM collar and GPS-Iridium satellite transmitters. These collared wild dogs are providing interesting insights on movement patterns, dispersal, and general ecology.

Ecological Monitoring of Chambal River Basin with Special Reference to Water Requirement of Key Aquatic Species

Funding Source
Grant-in-Aid

Investigators
Dr S.A. Hussain,
Dr Ruchi Badola
Dr S.K. Gupta

Researchers
Suyash Katdare
Surya P. Sharma

Date of Initiation
October 2016

Date of Completion
October 2020

Objectives

The objectives of the project are to (i) Determine the spatio-temporal distribution and status of key aquatic fauna such as gharial, river dolphin, smooth-coated otter and map their critical habitat along the Chambal river; (ii) Derive the empirical relationships between flow and ecological status of the key indicator species to determine the desired future state; and (iii) Examine the variation in the mitochondrial as well as Nuclear DNA using control region and microsatellite regions to gain a better understanding of the genetic population structure of gharial and other critically endangered species.

Progress

Annual census survey for key aquatic fauna was conducted during the winter season of (2017, 2018 and 2019) to determine the distribution and status of key aquatic fauna. Habitat characteristics were recorded at an interval of 1km to map the critical habitat along the Chambal River. Total count method was employed for population monitoring of gharial and mugger. The survey was further continued the Yamuna River to document the presence of gharial till the Ganga-Yamuna confluence at Allahabad. Thus, a continuous stretch of approx. 900km comprising of three rivers was surveyed in February. Total nest counts were carried out in the post-hatching season to get an index of breeding individuals of gharial.

Gharial Nesting Status

A rapid survey was conducted post-nesting to determine nesting activity in the river. The survey was conducted using an inflatable boat, and on foot, depending upon the conditions. Regular monitoring during the incubation period was carried out to keep an account of any changes, with regards to habitat change, disturbance or nest loss. A post-hatching survey was carried in late May – mid-June using an inflatable boat, and on foot, depending upon the conditions.

Thermal regime of the gharial nest

Studying incubation temperature: The research team continued with the study to understand the thermal regime of gharial nests on the same nesting sites, i.e., Baroli and Nadigaon to add to the data collected in 2017 and 2018. These data loggers were programmed to record the temperature at every 90 minutes for the entire incubation period.

The flow and discharge measurements were carried out using Acoustic Doppler Current Profiler (ADCP) to determine the flow requirement of the critical species at seven sites along the Chambal River. The discharge was computed using the software River Surveyor 4.0.

Sample collection and DNA Extraction

Non-invasive biological samples (eggshell membranes) tissue from dead individuals of gharial, mugger and turtles were collected from different nesting locations. Samples were preserved in 70% ethanol and stored in room temperature initially and then transferred to −20°C until DNA was extracted. Total genomic DNA was extracted using the Phenol-Chloroform method.

Mitochondrial and Nuclear microsatellite-markers

Two mitochondrial regions: (a) partial cytochrome oxidase subunit I (COI); and (b) partial control region (CR) were PCR-amplified. A panel of 26 nuclear microsatellite markers, including 11 gharial specific markers, was prepared.

Outputs and Outcomes

Nesting occurred at 36 different locations in the NCS with a total of 429 nests out of which 312 nests were hatched successfully (72.7%), and 117 nests were unsuccessful. The discharge measurements and the trend in discharge were analysed.

Genetic Diversity

To estimate the genetic diversity, a 580−bp fragment of the CR and 600 bp fragment of the COI from 200 samples of different nesting location were sequenced. Only one haplotype each at COI and CR region were observed.

Out of 26 selected loci, only 18 loci tested positive with gharial samples. Eighteen of the positively amplified markers, 11 markers were shown to be monomorphic and were excluded from further analysis. A total of 149 individuals were identified after removing the samples with the exact multilocus genotypic match. The mean success rate for seven of the polymorphic loci was 96.71% and ranged between 92.93% to 99.48%.

Milestone

This study investigates the level of genetic diversity in the gharial population of National Chambal Sanctuary. The population shows a very low level of variation at both mitochondrial and nuclear DNA as measured by two partial mitochondrial genes (COI and CR) and seven polymorphic nuclear microsatellite loci.

For a more detailed analysis for evidence of a genetic bottleneck, founder effect, gene flow and population structuring additional samples those from different breeding populations and highly informative nuclear microsatellite marker are required for further genetic analyses.

COMPLETED

ONGOING

PROJECT INITIATED

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Development of Landscape Management Plan and Monitoring with reference to Ken-Betwa River Link Project in Panna Tiger Reserve, Madhya Pradesh

© Camera Trap Image

Funding Source
National Water Development Agency

Investigators
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Dr J.A. Johnson
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Researchers
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Nazrukh Sherwani
Priyanka Das
Rahul Gandhi
Priyanka Kumari

Date of Initiation
April 2018

Date of Completion
March 2021

Objectives

The objectives of the project are to (i) undertake landscape level assessment for status of tiger, co-predator, prey species and habitat quality in the entire landscape including as Nauradehi WLS and Rani Durgawati WLS in Madhya Pradesh, and Ranipur WLS and Mahavir Swami WLS in Uttar Pradesh; (ii) map the nest site availability (existing as well as potential) of vultures and their ranging pattern in and around Panna Tiger Reserve; (iii) map surface water resources and study the distribution and abundance of aquatic indicator species in Ken river; (iv) quantify multi-taxa distribution and abundance in Panna Tiger Reserve and map the biodiversity values along spatial context linked to various zones of impact; (v) document and establish a base-line of socio-economic conditions of the people in the landscape.(vi) suggest mitigation measures to reduce/minimize the negative impacts of KBLC project.

Progress

Project personnel were appointed in June 2018. The methodology was developed, and equipment was procured between June and September 2018. Stakeholder meeting and internal review meeting were held on 22 September 2018 and 1 February 2019 respectively at WII. Members from the government bodies, funding agency and experts attended the meeting. The methodology and way forward were endorsed during the meetings. Field activities are ongoing since October 2018.

COMPLETED

ONGOING

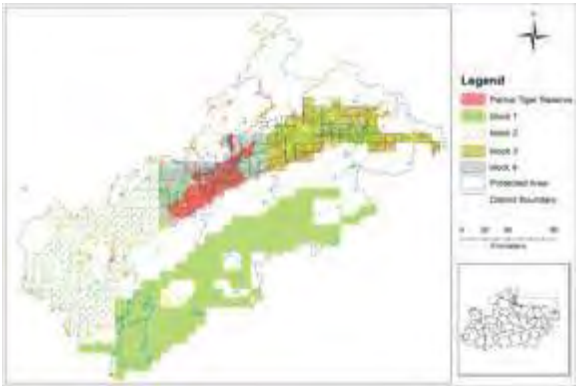
PROJECT INITIATED

The study area for the development of Landscape Management Plan (LMP) includes 12 districts (4 in UP and 8 in MP) and a total area of around 47,620 sq. km out of which 12,125 sq. km area is forested. Process of the first phase of data collection for LMP was divided into five different component's *viz*. camera trapping, line transects and sign survey, vulture assessment, socio-economic survey, and spatial analysis.

Field activities were initiated from Nauradehi Wildlife Sanctuary. They were further carried out in Damoh, Katni, South Panna, Satna, South Sagar, North Sagar, Chhatarpur, Panna Tiger Reserve, North Panna, Rewa, Lalitpur, and Chitrakoot forest divisions. Camera trapping, vulture assessment and line transect survey have been completed in all the blocks. The second phase of data collection has been initiated in June 2019, which focuses on Herpetofauna, Birds, Crocodiles and other aquatic species that will be surveyed in this phase of data collection.

Outputs and Outcomes

This landscape is an important tiger habitat. The current population of tiger in Panna Tiger Reserve is 40 animals (23 adults/sub adults and 17 cubs), and another 19 adults/sub-adults have dispersed in the landscape. During the survey, the presence of tiger was found in South Panna, Chhatarpur, North Panna, Satna and Chitrakoot forest divisions through camera trapping and sign surveys. Pellets of animals such as Chital, *Axis axis*; Sambar, *Rusa unicolor*; Chousingha, *Tetracerus quadricornis*; Nilgai, *Boselaphus tragocamelus*; Barking deer, *Muntiacus muntjak*; Chinkara, Hare, *Lepus nigricollis*: Porcupine, *Hystrix indica*; Golden langur, *Trachypithecus geei*, and *Rhesus macaque*, *Macaca mulatta* were found in the landscape.



Signs of animals apart from tiger such as Leopard, *Panthera pardus*; Hyena, *Hyaena hyaena*; Jackal, *Canis aureus*; Dhole, *Cuon alpines*; Jungle cat, *Felis chaus* and Wolf, *Canis lupus* were found in the landscape.

During the survey period, seven species of vultures were recorded with a total number of 2,904. The seven species were Indian Long-billed vulture, *Gyps indicus*; White-rumped vulture, *Gyps bengalensis*; Red-headed vulture, *Aegypius calvus*; Egyptian vulture, *Neophron percnopterus*; Cinereous vulture, *Aegypius monachus*; Eurasian griffon, *Gyps fulvus*; Himalayan griffon, *Gyps himalayensis*. The socio-economic survey has been completed in 436 villages with 2,696 respondents in the landscape.

Milestone

Landscape management plan for Greater Panna Landscape will be the first of its kind in India. Approximately 12,000 sq. km of forest and 436 villages were surveyed in the first phase of the field survey. Presence of 51 tigers, 2,904 vultures belonging to seven species, 31 mammalian species and 94 tree species in Greater Panna Landscape in the rapid survey was recorded.

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Augmentation and Recovery of Tiger Population in Satkosia Tiger Reserve, Odisha

© Gatikrishna Behera

Objectives

The objectives of the project are to (i) develop an inviolate space of ca. 500 sq. km in the core area and improve habitat quality in STR; (ii) supplement the prey population through appropriate habitat management, translocation and conservation breeding program (if needed); (iii) successfully release 08-10 tigers through supplementation in a phased manner over a period of 10 years in STR; (iv) Monitor and study these introduced tigers in ecological, demographic and management perspectives using radio telemetry (VHF, UHF and GPS/Argos radio collars), and other relevant sampling procedures. This includes monitoring response of co-predators and prey population using scientifically established protocols; and (v) undertake community participation and eco-development activities towards safeguarding tiger population in the long-term.

Progress

Tiger Translocation

A sub-adult male (Mahabeer/MB-2) was translocated from Kanha Tiger Reserve, and a sub-adult female (Sundari) was translocated from Bandhavgarh Tiger Reserve, Madhya Pradesh to Satkosia Tiger Reserve.

Tiger Monitoring in Soft Release Enclosure

The translocated tigers were monitored 24x7 in the soft release enclosure, with the help of CCTV cameras. The daily activity budget was analyzed.

Funding Source
Odisha Forest Department and National Tiger Conservation Authority

Investigators
Dr K. Ramesh
Dr S.K. Gupta

Researchers
Rabi Sankar Pal,
Gatikrishna Behera
Vaishali Vasudeva

Date of Initiation
2017

Date of Completion
2022

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COMPLETED

ONGOING

PROJECT INITIATED

Post-Release Tiger Monitoring
Translocated tigers were monitored 24x7 in the wild using VHF/Satellite telemetry, with the coordinated effort of WII research team, frontline staff and forest officials. Tracking team was provided with necessary information regarding tiger location in the form of shapefiles, maps and kml files on an hourly basis. Prey kills were located, and biological samples (hair/scat) for genetic studies were collected.

Recapture of Translocated Female:
Due to conflict and protests from local community, the translocated female was recaptured and transferred to soft release enclosure and is being monitored through CCTV cameras.

Camera Trapping
34 Paired camera traps were placed in 2 sq. km grid units in April-June 2018, wherein one block was covered. Ninety-nine pairs of camera traps were put in the extended block-1 in December 2018. Along with paired camera traps deployed in each grid unit, 45 single cameras were deployed at strategic positions within the known home range of Resident Female to map its movement, as well as its interaction with T1. The strategic cameras were actively monitored and checked every three days through the study period (April 2018-March 2019) mainly to monitor the tigers.

Line transect study was carried out during post-monsoon (2018) and pre-monsoon (2019) session of herbivore/prey base assessment.

Collection of Existing Baseline Data
Procurement of spatial and non-spatial data (tiger conservation plan/working plans/reports/camera trap photos/shapefiles) from GIS Lab-Angul/and preparation of metadata file.

Creation of Spatial Database
Creation of data in GIS domain in case the data was not available. Mapping of habitat variables- Digitization of road, railway, drainage; mapping of Land Use Land Cover, Forest Type, Forest Density and layers for human footprint.

Data Analysis
Analysis and mapping of tiger movement, home range, habitat preference and prey density etc. were done during the reporting period.

Capacity Building
Training of field level staff in GPS, GIS, map reading and telemetry were conducted. DNA profiling and genetic variation study of resident and translocated tigers was done.

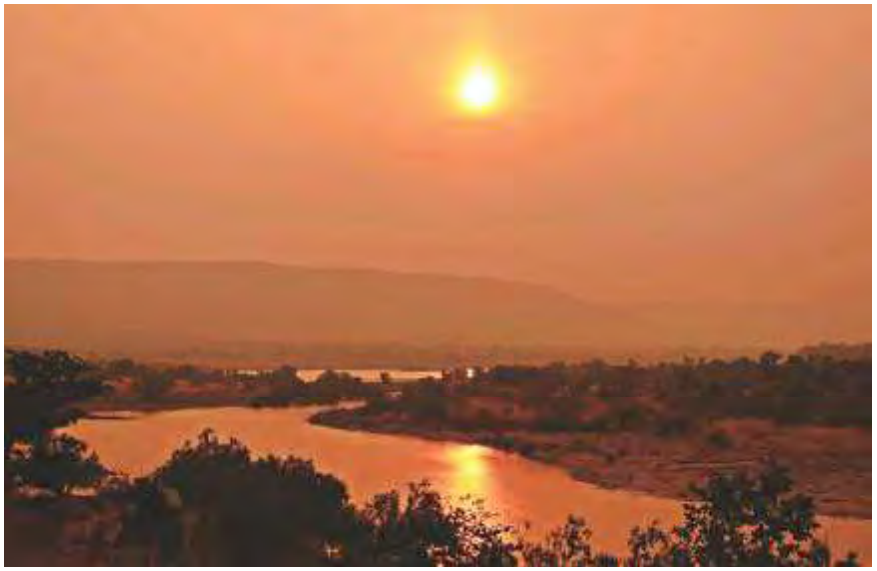
Outputs and Outcomes

The initial response of the translocated animals, local people and administrative mechanism has resulted in the knowledge of strengths as well as management aspects that require additional efforts. This has allowed for the option of adaptive management for the future progress of the project. Community engagement and village relocation have come out to be a priority action in the present tiger recovery effort. While grassland development and prey augmentation efforts are being taken up, protection is also increased as the tiger reserve boundary has been reorganized. The continuous training and capacity building workshops has built confidence among the frontline staff in monitoring tigers, installation of camera traps and handling telemetry instruments. The efforts are being made to systematically collect and document scientific information on prey, co-predators, tigers and the habitat variables on regular basis.

Milestones

(i) Successful translocation of two sub-adult tigers (a male and a female) from Madhya Pradesh to Satkosia Tiger Reserve was done. (ii) Positive interaction of resident female tiger and translocated male was noticed. (iii) Setting up of initial home-range by the translocated male (T1) in the eastern part of the Tiger Reserve. (iv) Recapture of translocated tigress (T2) was done successfully. (v) Mortality of T1. (vi) Internal project review meeting for adaptive management and advancing project objectives.

Reintroduction and Recovery of Tiger in Panna Tiger Reserve and Landscape Complex: Phase-II



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Funding Source
Madhya Pradesh Forest Department

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Panna TR (Collaborator)

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Date of Initiation
February 2015

Date of Completion
March 2020

Objectives

The objectives of the project are to (i) monitor and study the population growth of translocated/re-established tiger population in Panna Tiger Reserve, including their genetic variation and physiological profile; (ii) understand the dynamics of co-predator and prey populations in relation to tiger occupancy pattern, food habits, habitat association and other management interventions; (iii) study landscape ecology of tiger and ranging patterns incorporating human interface issues such as human use of core and buffer, poaching pressure and ecological correlates linked to economics and system services, including water sources and stream ecology; and (iv) upgrade the skills of PTR staff to independently execute the Phase IV tiger monitoring in next two years.

Progress

During the fourth year of the project, the reintroduced and recovered population was regularly monitored using radio telemetry (for nine collared tigers) and camera trapping (for rest of the un-collared tigers). Further, genetic analysis was done to understand the genetic diversity of the Panna tiger population. In addition, Phase IV activities i.e. camera trapping for tiger and co-predator population estimation and distance sampling for prey abundance estimation were also carried out. Occupancy survey based on signs of carnivores, herbivores and human, was carried out. Multiple spatial layers were generated for PTR; namely hill shade, watershed, vegetation, land surface

temperature and land use land cover (LULC) maps. The LULC map was then analysed in FRAGSTAT to understand landscape connectivity. Questionnaire survey data were analysed to understand socio-economic status, resource use, and human-wildlife conflict in villages in and around PTR core. Training of forest staff were organised to capacitate them to carry out phase IV monitoring activities, independently.

Outputs and Outcomes

Home range map of all the radio-collared tigers was generated and minimum convex polygon (MCP) was calculated. The home range analyses revealed that mean 95% MCP of male tigers was 282.69±117.41 km^2 and female was 45.37±17.31 km^2. Results of sign survey showed that during winter 2018-19, when the whole PTR was sampled, of the total area of PTR (1,586 km^2) tiger was estimated to be occupying 46% and leopard 75%. For winter 2018-19, a total of 474 tiger captures were obtained using camera traps, from which 30 tigers were uniquely identified. The best fit model in the R interface estimated tiger density to be 4.32/ 100 km^2. Camera trapping also revealed that in general, areas with low tiger presence had higher leopard presence. Prey density was estimated using program Distance 6.2, in summer 2018. Result of separate analysis for core reveals that the density of wild ungulates was 25.8±4.03/km^2. During winter sampling 2018-19, a total of 100 transects were walked, and results show the density of all the prey species was 55.55±5.63/km^2.

The overall accuracy of the LULC classification was 90%. The LULC map for PTR has eight classes dense forest, open forest, grassland, scrubland, water, open land, agriculture land, and settlements, of which, the dominant LULC class was a dense forest. Six major forest types were identified in the core area of PTR: dense mixed forest, open mixed forest, teak mixed forest, teak forest, bamboo mixed forest and *Anogeissus pendula* forest. The overall accuracy of the forest cover type classification was 87%. The dominant class of forest type in PTR was a mixed dense forest.

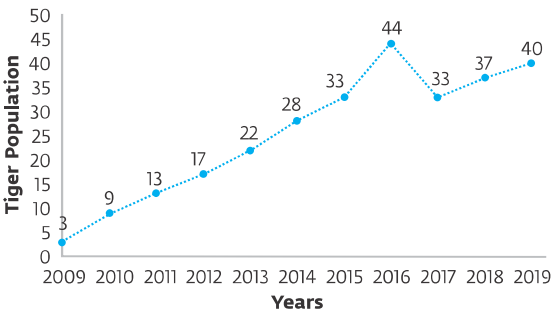

Figure: Tiger population growth in Panna Tiger Reserve since reintroduction

Results of questionnaire survey revealed that of the 330 households (HH) sampled, 84.8% depend upon reserve forest for resources which include fuel wood, fodder and NWFPs. Of all the sampled HH, 66.1% owned livestock, of these, 67% depend upon forest for fodder. 65% of sampled livestock owning HH reported grazing their livestock in the Tiger Reserve. Of 330 respondents, 24.2% had positive perceptions of the tiger; however, 53.3% had negative perceptions. 27.3% of sampled HH reported the loss by reintroduced tigers. Total of 141 livestock were reported to be lost by these HH facing conflict (HFC). All respondents from HFC, except two, knew about the livestock compensation scheme by the forest department. However, only 57.8%, applied for compensation, of this only 57.7% received compensation. On an average compensation amounted to only 24.8% of the market cost of the lost livestock. The HHs that were facing crop loss due to herbivores (70% of sampled HH) most frequently ranked, wild pig, as the number one problem species, followed by nilgai.

Milestone

Panna Reintroduction and Recovery Project has reached a significant milestone with the completion of Phase I and near completion of Phase II. The population growth has been rapid, and the demography reflects healthy population growth. Given the fastest population recovery, dispersal events are taking place, invoking the need for landscape-level approach to tiger population management.

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E-Bird Technology for Tiger Conservation: Development and Integration of Un-manned Aerial Vehicles as Surveillance and Monitoring Tool for Protection of Tigers and Capacity Building of the Frontline Staff

© Shashank Sawan

Objectives

The objectives of the project are to (i) integrate Un-manned Aerial Vehicle (UAV or Drone) for surveillance in Panna Tiger Reserve, Madhya Pradesh based on pilot testing experience in the reserve; (ii) Undertake need and feasibility analysis for integration of UAV in representative tiger reserves of the country with reference to poaching risk and conflict management strategies; (iii) Map locations of poaching and conflict-prone areas in the tiger reserves, which would serve as a basis for technology integration; (iv) Experiment and implement UAV technology in a phased manner in the representative tiger reserves for day-time aerial surveillance in strategic locations, night patrolling, mapping and monitoring of encroachment or degradation, data collection from camera traps and tiger monitoring involving RFID technology; and (vi) Undertake capacity building of field staff for technology transfer and to implement UAV technology as a part of the regular management strategy.

Progress

Project team involving three Engineers (Aeronautical, Mechatronics and Mechanical) has developed locally customized units of UAVs at Wildlife Institute of India. So far, one quad-copter e-bird Q1; one fixed-wing; and one delta-wing model e-bird S1 were customized and used for various field activities. The development of a hybrid VTOL model and a Hexa-copter is under development.

Funding Source
National Tiger Conservation Authority

Investigators
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Date of Initiation
June 2017

Date of Completion
June 2020

UAV customization was supported with a parallel process of procurements. Commercially available drones were utilized which are freely available in the market for technology familiarization and hands-on training of field staff as well as to carry out data collection.

Outputs and Outcomes

UAV based survey and data collections on habitat, wildlife populations, and surveillance in poaching sites, conflict sites and fires prone areas have been completed in Panna, Sathyamangalam, Kaziranga, Dudhwa and Rajaji Tiger Reserves.

A questionnaire was prepared to focus on poaching, conflict, forest-fire, weed presence, anthropogenic pressure and encroachment and was distributed to all the tiger reserves. Series of field training sessions were conducted in Panna, Dudhwa, Sathyamangalam and Kaziranga Tiger Reserves, and this included hands-on training to frontline staff on how to use the UAVs in surveillance and monitoring purpose. UAV units were transferred to the forest department of Panna and Dudhwa Tiger Reserves.

Milestone

(i) Development of fixed-wing e-bird S1 and multi-copter e-bird Q1 unit for the application in the forest with the transfer of technology done to Dudhwa and Panna Tiger Reserves. (ii) Assisted the tranquillizing team by providing aerial support for the capture of an elephant from Motichoor range at Rajaji Tiger Reserve. (iii) Provided with an aerial day/night data of animal movements to the ground team working for Rehabilitation and up-gradation of 2/4 lane with paved shoulders of Abohar-Sito Gunno-Dabwali Road of NH-354 E in the state of Punjab passing through Abohar Wildlife Sanctuary. (iv) Conducted aerial surveys off the coasts of Mallipattinam and Keezhathottam, extending up to Adhirampattinam, in Thondi to help with the Dugong survey under the "Save Dugong" CAMPA project.

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Wildlife Conservation Plan for the Impact Zone of Etalin HEP, Dibang Valley District, Arunachal Pradesh

Funding Source
Etalin Hydro Electric Power Company Limited (EHEPCL), Arunachal Pradesh

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Date of Initiation
January 2018

Date of Completion
July 2019

Objectives

To determine the current status of wildlife habitat and distribution patterns of plants, entomofauna, fish, herpetofauna, birds and mammals within the impact zone of the Etalin Hydroelectric Project (EHEP) area covering multiple seasons. (a) Status and distribution pattern of certain "Rare, Endangered and other Threatened (RET) species in the impact zone of the EHEP. (b) Identification of critical habitats, wildlife corridors and migratory paths of RET species in the impact zone. (c) Assessment of the likely impacts due to the construction and operation of the EHEP and associated activities on flora, fauna and their habitats. (d) Develop a Wildlife Conservation Plan in order to avoid / mitigate likely hydropower impacts and conserve key biodiversity areas and species.

Progress

Terrestrial Biodiversity

Flora: The flora within the Zone of Impact (ZoI) of the EHEP were surveyed to generate baseline information and to identify key plant biodiversity areas and key plant species (RET, endemic species) using reconnaissance survey followed by quadrat sampling. A total of 15 sites were selected randomly depending on accessibility and approach within ZoI; within these 15 plots, 133 plots for trees and shrubs and 266 plots for herbs were quantified.

Mammals: A total of 78 camera traps were deployed over an area of 53 square km and total 1552 nights were sampled in the post-monsoon/ winter and pre-monsoon season. (ii) *Avifauna*: A total of 89 variable radius point count plots were surveyed, and a total distance of 50.5 km was covered via line transects. Overall, using McKinnon's species richness method, 49 lists were enlisted. (iii) *Entomofauna*: A total of 63 transects for spiders and 65 transects for butterflies and dragonflies were walked, covering a total distance of 128 km. In addition, forest trails (a cumulative distance of 16 km) were surveyed for both spiders and butterflies. (iv) *Herpetofauna*: the abundance of amphibians was assessed using Visual Encounter Survey along the roads and streams Frog calls were also used to record the species. Time constrained search methods was also followed wherein a specific micro habitat was searched intensively for 5-10 minutes depending on the size of the microhabitat. Additionally, other opportunistic sightings were also recorded. (v) *Aquatic Biodiversity*: Water quality parameters *viz.* dissolved oxygen (mg/l), water temperature (°C), specific conductance (µS/cm), total dissolved solids (ppm), electrical conductivity (µS/cm) were measured at each sampling segment using YSI water quality kit. As a part of habitat assessment, certain key river meso-habitat characteristics – run, riffles, pools and cascades were measured in all 35 sampling sites. Fish sampling was done using different types of fishing gears such as cast net, gill net with different mesh size (0.5 x 0.5 mm, 1 x 1 cm, 1.5 x 1.5 cm) and through local methods (bamboo traps etc.) and it was done for approximately 60 minutes in each steam segment. Benthic invertebrate sampling was done using drift net with fine mesh size and the samples were preserved in 70 % Ethyl alcohol for identification. (vi) *Socio Economic Surveys:* Demographic profile of the district is extracted was extracted from Primary Census Abstract, 2011 (National Census, Govt. of India, 2011) and list of Project Affected Villages (PAVs) along with list of Project Affected Families (PAFs) were extracted as source of secondary data (SIA and R&R plan of EHEP, January, 2015). The PAVs were further differentiated based on direct (land acquisition) and indirect impacts (other project related activities) of EHEP on the people.

A standard semi-structured questionnaire was developed for the collection of primary data from the field. The questionnaire was pre-tested to assess the appropriateness of the questions. Primary strategy for identifying respondents for conducting household surveys, involved selecting people randomly to interview by walking through each village. As each village was relatively small, this approach led to traversing the entire village. Information regarding gender, age, religion, tribe, clan, household profile, source of income, drinking water facilities, crop cultivation and livestock, knowledge about medicinal plants, cultural values associated with flora and fauna was collected through survey. Knowledge about wildlife present in and around villages was ascertained using field guide books. Total 179 HHs were surveyed in 22 villages.

Outputs and Outcomes

Flora: A total of 563 angiosperm species belonging to 368 genera and 110 families were reported from in and around the study area. 8 gymnosperms belonging to five families were reported from the area and a total of 31 species of pteridophytes belonging to 8 families were also recorded from the study area. One plant species, *Piper pedicellatum*, which is mentioned as vulnerable species by IUCN was recorded. Although due to its locally abundant density, BSI, has not listed it as threatened. Nine species has been listed as endemic.

(*I) Butterflies:* A total of 159 species of butterflies belonging to 77 genera spread over 6 families were recorded in ZoI, three of which are listed under the Indian Wildlife (Protection) Act, 1972. (ii) *Odonates, Spiders & Moths*: A total of 11 odonate species were identified in the study area, belonging to 5 genera and 2 families. A total of 113 species (43 identified) belonging to 88 genera (84 identified) from 25 families was recorded from the study area. A total of 51 species of moths belonging to 45 genera (43 identified) from 12 families was recorded in and around the base camp. (iii) *Amphibians:* Within the study area, 14 species of amphibians belonging to 12 genera and 6 families were recorded. (iv) *Reptiles:* A total of 31 species of reptiles, belonging to 23 genera and seven families, were observed in the study area. (v) *Birds*: A total of 230 species were recorded, of which 205 species were birds of terrestrial ecosystem, while the remaining 25 species were aquatic or dependent on aquatic ecosystem. Of the 16 range restricted species of Eastern Himalayas (Stattersfield et al., 1998), that are resident in Arunachal Pradesh, 6 species were sighted and recorded in the study area. (vi) *Mammals*: Within the ZoI, 21 species of mammals belonging to 19 genera and 15 families were recorded. 5 species are listed as threatened under different

categories of the IUCN Red List. Of these, one species (Chinese Pangolin) is Critically Endangered (CR), Indian Wild dog is Endangered (EN), Himalayan Black Bear & Smooth Coated Otter are Vulnerable (VU), Assam Macaque is Near Threatened (NT). Three species – Himalayan serow, Asian golden cat and Leopard cat were listed as Schedule I of Indian Wildlife (Protection) Act, 1972. (vii) *Aquatic Biodiversity*: Total 17 groups of benthic invertebrates were identified. 12 different species of fishes (belonging to two orders and four families) were recorded within the study area over the sampling period. Overall, *Schizothorax progastus* was the most dominant species followed by *S. richardsonii*, *Aborichthys* sp, *Garra magnidiscus*, and Tor sp. (viii) *Socio-culture*: Traditional knowledge about medicinal plants, cultural values associated with flora and fauna was collected through survey. About 38.2% of PAFs are dependent on forests and their resources, as their primary source of income. Overall, 24 edible and fodder plant species collected from forest was recorded, along with 9 medicinal plants. Importance of animal resources and customary restrictions associated with hunting rituals were also documented. Interactions with locals showed that, as per people's perception 69.3% of PAFs are in favour of the Proposed EHEP. Various reasons for the support of project was discussed by the people, which mainly included, making use of hydropower potential, education, health, infrastructure facilities, job and enhancement of life quality. 5 % of the PAFs were not in favour of the proposed project due to loss of land, threat to their culture as reason of influx of outside people. 20% pf PAFs were neutral for the project i.e. neither in favour nor against the project.

Milestone

Biodiversity management and wildlife conservation plan along with budget was proposed to EHEP for conservation of RET species, aquatic habitat, to maintain stream morphology. Action plan for enhancement of bio resources for people was also suggested which includes life quality enhancement, development of additional livelihood, improved health care and education, People's Biodiversity Register (PBR) etc. long-term research and monitoring was also recommended.

Assessment and Conservation Practices of Pollinators through Community Participation in the Indian Trans-Himalayan Region – Climate Change Perspective – National Mission of Himalayan Studies (NMHS)

Funding Source
G.B. Pant National Institute of Himalayan Environment and Sustainable Development (GBPNIHESD)

Investigator
Dr V.P. Uniyal

Researchers
Agni Chandra, Mona Chauhan, Pooja Thakur, Vandna Meharwar

Date of Initiation
February 2018

Date of Completion
March 2021

Objectives

The project has the following objectives (i) *Assessment*: Impact of land use changes on the pollinators and the risks associated with the loss of pollination services; (ii) *Adaptive Management*: Identifying the best management practices and technologies to overcome declines in pollinators; (iii) *Capacity Building*: Build and strengthen alliances and expertise to increase the benefits from pollination; and (iv) *Mainstreaming*: Supporting national plans for the conservation and sustainable use of pollinators, and increasing the awareness of governments, industry and the public.

Progress

Study was conducted in Lahaul & Spiti district of Himachal Pradesh and Chamoli and Pithoragarh district of Uttarakhand. A total of 43 sites have been widely covered. The study was focused on (i) the identification of leading indigenous crops that depend on insect pollination for their production and their level of dependence on pollinators; (ii) the influence of land-use changes at both local and landscape scales for pollinator communities and their services; and (iii) future options for landscape and agricultural management to enhance wild pollinators and ensure pollination services for crop production.

Outputs and Outcomes

Documentation of insect pollinators of the regions and establishment of scientific data base correlating impact of shifting land use and agro-pastoralism on the pollinator diversity was done. Major identified orders were from the Order Lepidoptera (19 species) and Hymenoptera (19 species). About 18 Training/ Capacity building programmes/Workshops have been conducted so far for local communities, institutions and administrations in different villages of the study area.

Milestone

Participatory Rural Appraisal, Workshop, Surveys, Awareness program have been conducted to identify the best practice. Publications and Knowledge Products such as Brochures and Pamphlets on the conservation of insect pollinators have been prepared and distributed in the study area.

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Tiger Recovery Strategy and Long-term Monitoring in Sahyadri Tiger Reserve, Maharashtra

© Shah Nawaz Jelil

Funding Source
Sahyadri Tiger Conservation and National Tiger Conservation Authority

Investigators
Dr K. Ramesh and Dr V. Clement Ben

Researchers
Shah Nawaz Jelil, Avinash Gaykar and Natasha Girkar

Date of Initiation
2016

Date of Completion
2021

Objective

The objectives of the project are to (i) undertake feasibility study, habitat recovery and prey augmentation towards preparing inviolate core area with adequate prey for tiger reinforcement, if needed; (ii) ensure demographically, genetically and physically (health-wise) optimal population of tiger and its offspring by undertaking population management by strengthening of existing connectivity options and consider translocation of tiger from other suitable sites if natural colonization is not absolutely possible; (iii) devise and execute monitoring strategy of founder individuals (prey species and tiger if translocated) involving radio telemetry and GPS satellite/GSM tracking technology; (iv) study prey-predator relationship and undertake population estimation and monitoring as per NTCA Phase IV monitoring protocol; and (v) undertake conservation education program for local people and capacity building training for field staff towards social acceptability and technical skill development respectively for effective implementation of tiger recovery program.

Progress

The first objective has been accomplished; the feasibility study is now complete and the report has been prepared. It has been submitted to the concerned forest department. In addition to the feasibility study, regular monitoring in the form of sign surveys, standard line transects and camera trapping, in tiger reserve has been carried out in the past year, 2018-19.

Specific tasks to fulfill the second objective (*i.e.* to ensure genetically and physically optimal population of tiger and its

offspring) were also undertaken during the reporting period. The team gathered information through sign surveys and thus obtained fresh scats. At least 50% of these scats were collected in a sterile medium-sized zip-lock plastic bag without harming the upper mucus layer of scat and without touching by hand. All samples were brought to laboratory and were given the sample ID and then stored in 4°C until DNA was isolated from them. Remotely sensed data were used in GIS platform to develop connectivity maps.

Outputs and Outcomes

For the reporting period, the research team put in a total effort of 9,074 camera trap nights and captured a total of 5,728 independent captures of 25 mammal species belonging to 14 families. Wild boar was the most captured mammal species (15.80/100 trap nights), followed by the Indian crested porcupine (9.51). Among felids, leopards had the highest capture rate (4.13), while tiger had the least (0.04). Only one canid was captured, dhole (0.42). Common palm civet was the highest captured civet (1.23), the least captured was the brown palm civet (0.15). This is the complete checklist of all the mammal species found within Sahyadri Tiger Reserve.

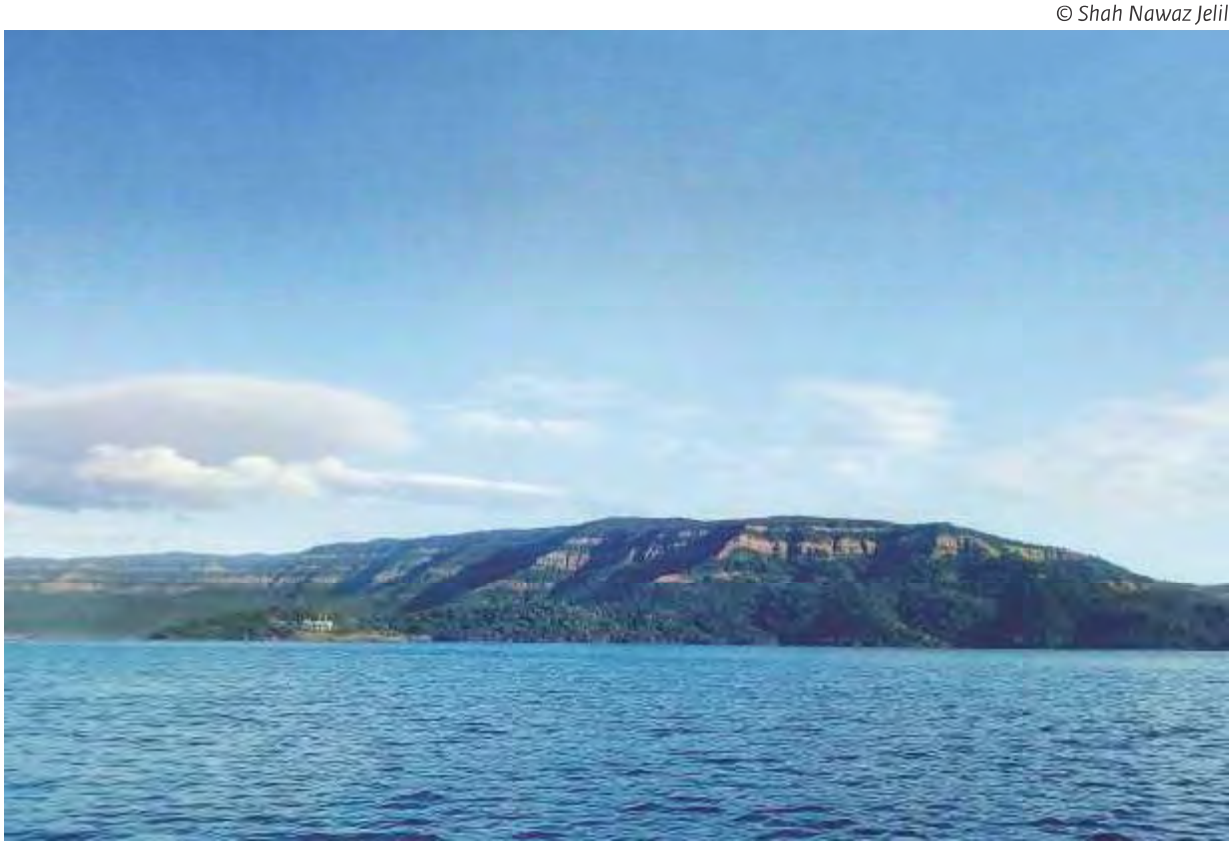
Sign survey and genetic analyses results: Sign surveys revealed two potential scats of tiger in Helwak range of the tiger reserve. Screening was done on both of scats and following results were achieved for one of the scat.

Landscape analyses using remotely sensed data and GIS: The research team analysed the current status of the larger landscape of the Western Maharashtra region first using the railways and road network and fragments of the different protected areas. The team also mapped the different forest classes of the region. The team found that the southern corridor of the Sahyadri Tiger Reserve with the adjacent Radhanagri Wildlife Sanctuary and up to Mhadei Wildlife Sanctuary in the state of Goa is still comparatively intact than the northern direction to Phansad and Bhimashankar Wildlife Sanctuary. The southern corridor can still provide potential movement corridor for larger mammal species such as tigers, leopards and sloth bears.

Milestone

The team was able to detect and confirm tiger presence based on camera trapping in May 2018 and scat in February, 2019 in the tiger reserve. These have been confirmed after eight years from the reserve.

The research team has also recorded and compiled the checklist of all mammals from the reserve because of extensive camera trapping efforts. Now, the team has a full checklist of 25 mammals.



Assessment of Biodiversity for Effective Management and Evaluation of Ecotourism Potential of Four Protected Areas of Himachal Pradesh, India

Funding Source
Himachal Pradesh State Forest Department

Investigators
Dr Bilal Habib and Dr Bitapi C. Sinha

Researcher
Ankita Bhattacharya

Date of Initiation
May 2018

Date of Completion
September 2019

Objectives

The project has the following objectives (i) Assessing the occurrence and estimating occupancy of selected mammal species; (ii) Estimating the populations of major carnivore and ungulate species; (iii) Estimating the populations of key bird species (Pheasants); (iv) Assessing the eco-tourism potential of the protected area; and (v) Capacity building of forest department staff and volunteers at local level for future monitoring.

Progress

The research team deployed a total of 52 camera traps in Lippa-Asrang WLS and Daranghati WLS for 30 days involving the forest staff and local people. Alongside, sign surveys, bird and butterfly counts were conducted in pre-existing trails en route to deploying the cameras. Light trapping was done in Daranghati for moths at night at different elevational gradients.

In Lippa-Asrang, the team got the first photographic records of snow leopard and Himalayan brown bear indicating new habitat records for these species. We listed around 53 bird species through the bird counts.

From Daranghati, the team got photo captures of 10 mammal and 4 Galliformes species. Himalayan goral, Himalayan black bear and Himalayan monal had high photo capture rates. Species richness reached asymptote with 20 camera traps. We generated activity patterns of the photo-captured species. The team estimated occupancy of selected species using the single species single-season model with site covariates.

Some interesting highlights of the study were that the team recorded 94 birds, 23 butterflies and 132 moth species from Daranghati. The group recorded the common blue Apollo butterfly and the Brahmid moth which are pretty rare to sight and interesting indicators of their respective habitats. The research team found new habitat records of the beautiful rose-finch and white-throated tit. The team also had opportunistic sightings of the Himalayan pit viper during sampling. This indicated a healthy ecosystem of the Wildlife Sanctuary. As stated earlier, new habitats of threatened schedule 1 species was revealed from Lippa Asrang. The team has deployed 96 camera traps in Rakchham-Chhitkul WLS and Rupi-Bhaba WLS.

Outputs and Outcomes

Camera trapping exercise along with other sampling techniques gave comprehensive information about species assemblages in lesser-studied protected areas of Himalayas. Introduction of forest staff to modern sampling techniques leads to effective capacity building. The team included more forest staff and local people for the second phase of camera trapping and sampling.

For effective management and long-term monitoring goals of any protected area, baseline information is very vital, giving insights on the presence of rare and threatened fauna. There are three areas in the Daranghati Wildlife Sanctuary which could be considered for ecotourism focusing mainly on bird watching and butterfly walks. However, chances of sighting of mammals in these routes would be rare. In Lippa-Asrang Wildlife Sanctuary, because of its rough terrain, it would be difficult to consider it for ecotourism. However, this area could be established as an eco-trekking route.

Based on the results generated from the second phase, the team would evaluate the ecotourism potential of those areas for the purpose of sensitization. The key message to convey was to use more camera traps and helping hands through participatory approaches for comprehensive information on the mountainous protected areas.

© Camera Trap Image

Ecological Responses of Flora and Fauna to Climate Change in Trans-Himalayan Landscape with Special Reference to Vulnerability and Adaptations

Funding Source
NATCOM, MoEFCC, New Delhi

Investigators
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Researchers
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Date of Initiation
July, 2018

Date of Completion
June, 2020

Objectives

The objective of the project is to understand the nature of vulnerability to climate change adaptation by the local pastoral communities - Livelihood and Natural resource dependence *vis-a-vis* vulnerability.

Progress and Outcomes

The study aims to investigate ecological responses vis-a-vis resource pattern, productivity and biodiversity as well as impacts in terms of livelihood security of traditional herding practices along with ethnomedicinal practice/Amchi System in the Trans-Himalayan region, *i.e.* (Spiti valley, Himachal Pradesh and Ladakh - Jammu & Kashmir). Vegetation sampling was done across various landforms in four different watersheds *viz.*, Tsoham, Khamedngar, Kinlung and Parahio. Among the watersheds, the vegetation density was higher in Khamedngar followed by Parahio, Tsoham and Kinlung watersheds. However, the Livelihood Vulnerability Index (LVI) entire Spiti region was divided into four zones. It found that the upper zone (Morang, Rangrik, Sumling villages) was highly vulnerable followed by middle zone (Kaza, Kibber, Key, Langza, Komic and Hikkim).

The interview was conducted for *Changpa* headers on their migratory pattern and socio-economic status at Thukje village (40 Ladakhi & 18 Tibetan families) near Tso Kar by using a semi-structured questionnaire. The preliminary reconnaissance survey on herders would be conducted in sites like Karzok, Sumdo, Tanglangla and Kharnak. The economic dependency of local herders is on livestock mainly Pashmina Goat, Sheep and Yak; though they face the conflict between livestock and wild animals, specifically with the hybrid dog, *Kypshang*. However, battling with extreme weather events is not the only concern for the residents of high-altitude villages but also to have a sustainable resourceful living situation. Therefore, the study also aims to do experimental studies to know the response, cause and mitigation strategies to sustain the changing climate along with the vulnerability and adaptations. The preliminary results on LVI following UNDP 2007 framework indicates that the upper zone comprising of Morang, Rangrik, Sumling villages were found to be highly vulnerable, whereas middle zone and Pin valley zone are moderately vulnerable; and the least vulnerable is the Lower zone (Tabo, Gue, Lari, Mane, Dhankar).

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03

COMPLETED

ONGOING

PROJECT INITIATED

The Assessment of Impacts of the Proposed Nagpur-Mumbai Super Communication Expressway, Maharashtra, Samruddhi Corridor on Wildlife Values and Measures Recommended to Mitigate Negative Impacts

Funding Source
Maharashtra State Road Development Corporation (MSRDC)

Investigators
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Researchers
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Date of Initiation
July 2018

Date of Completion
July 2021

Objectives

The project has the following objectives (i) literature review on road ecology, habitat, vegetation and faunal diversity along the expressway; (ii) Identification of Wildlife Focus Area (WFAs) and proposed structures that require modification; and (iii) Recommendation of mitigations within and outside WFAs.

Progress

MSRDC has proposed to develop a Samruddhi Expressway corridor connecting two economic hubs of Maharashtra, *i.e.* Mumbai and Nagpur. The literature review included detailed research on road ecology, habitat, vegetation and faunal diversity along the proposed corridor. The corridor was divided into three regions (Vidarbha, Aurangabad Highlands and Northern Western Ghats) based on land use land cover, habitat and species distribution for better understanding of the landscape. Ecologically sensitive areas were identified based on literature review and available GIS data *viz.* land-use land-cover (NRSC 2015-16), vegetation type, tiger corridor, great Indian bustard distribution, Blackbuck and Chinkara sighting locations and Indian wolf distribution. Later, a reconnaissance survey was carried out following *ad-libitum* sampling, which was instrumental in filtering priority areas - Wildlife Focus Area (WFA). Also, structures outside the WFAs which required mitigation were taken into consideration.

The prioritisation of wildlife focus areas for detailed field-based ecological assessment was evaluated using information and data collected during this survey. MSRDC has already planned several structures on the expressway such as box culverts for water drainage, minor bridges, major bridges, flyover/viaducts and tunnels in addition to wildlife overpasses and underpasses at several locations. Each of the structures was visited and looked for direct/indirect evidence of suitable habitat and wildlife presence.

Outputs and Outcomes

The research team published two reports from the project: (i) Preliminary Report on Priority Areas for Ecological Assessment along Samruddhi Corridor, Maharashtra, India; and (ii) Suggested Modifications of Structures Outside Wildlife Focus Areas along the Proposed Alignment of Samruddhi Expressway.

During the reconnaissance survey, the presence of 14 species of mammals with maximum indirect sightings in Aurangabad highlands was observed. The team also recorded 76 tree species and 12 herb species, which shows the stretch is rich in terms of biodiversity. Suggestions regarding the structures for modification outside WFAs were provided.

Milestone

The literature review was completed. Proposed structures that need modification and WFAs were identified. The team prepared a report recommending mitigation measures outside WFAs. The field survey within WFAs was completed.

Understanding the Amur Falcon, Falco amurensis their Stop-over Sites in Nagaland and their Migratory Routes for Better Conservation Planning

Funding Source
Ministry of Environment, Forest and Climate Change

Collaborating Agency
Nagaland State Forest Department

Investigator
Dr R. Suresh Kumar

Researchers
Alex Jacob and Amarjeet Kaur

Date of Initiation
July 2018

Date of Completion
June 2019

Objectives

The objectives of the project are to (i) deploy modern technology in the form of lightweight satellite tags fitted to Amur Falcons in Nagaland to track their amazing migration journeys; (ii) to carry out a state-wide survey to locate and identify Amur falcon roost sites; and (iii) to identify and document prey species from regurgitated pellets of the Amur falcons in Nagaland, India.

Progress

The first objective of the study has been completed (100 %) and one of the five satellite-tagged birds continues to be active since tagging in October 2016. Over the last one year, 3,140 locations were received, and as a result, the third complete cycle of its migration between its wintering and breeding grounds was completed. It is expected that Longleng will continue to be active and is likely to return to Nagaland in October 2019. Ten of the 13 districts have been surveyed during the last two years, and that includes Wokha, Dimapur, Longleng, Peren, Mon, Zunheboto, Kohima, Mokokchung, Tuensang, Kiphri. Nearly 80 % of the work has been completed.

A detailed analysis of the diet of Amur falcons during their stop-over in Nagaland has been completed (80 %) and termites were found to be the predominant prey item. Presently the identification of the termite species in the diet of the Amurs is being carried out. Also, information on distribution, abundance and emergence pattern of the particular termite in question here is being-studied.

The satellite tracking data of the active Amur Falcon Longleng was regularly downloaded from the Argos website and summarised. Survey to locate different roost sites in Nagaland were made, followed by a semi-structured questionnaire survey and discussion with local people. Three months were spent in four districts (Peren, Zunheboto, Kohima and Mon) to locate and document active Amur falcon roost sites that were not surveyed before. Regurgitated pellets of Amur falcons were collected from three major roost sites (Pangti, Yaongyimchen and Hakhizhe). A total of 1,530 whole pellets were collected, and sun-dried and stored in paper bags and labelled. Amur falcon regurgitate was also collected opportunistically from another roost site Umrangso in Assam. In the lab, individual pellets were examined under a microscope. Frequency of occurrence of particular taxa was then calculated.

Outputs and Outcomes

Longleng a female Amur falcon captured and tagged in October 2016 in the Longleng district continues to be active during the reporting period. Over the last one year and up to August 2019, a total of 3,140 data locations were further received. On its return migration from Africa, Longleng flew straight across to Odisha and then to North-East India, unlike previous years where it travelled down to Southern India and then return. It appears that this may be in response to cyclone Fani that was heading up along the Odisha coast around the same time when Longleng arrived. It was evident that Longleng appeared to use tail-winds after cyclone Fani made landfall accelerating its flight over the Bay of Bengal to Northeast India. The migratory routes of Longleng otherwise coincided with the previous years and arrived in the same wintering and breeding site showing site-fidelity.

Milestone

Survey to locate roost sites in Nagaland is under progress, and till now eight active roost sites of Amur falcons have been located in the districts Dimapur, Wokha, Longleng, Peren, Mon, Tuensang and Kiphire. Three other districts are yet to be surveyed. The examination of Amur falcon regurgitates revealed termites to be the predominant prey (89%). The termite species identification is in progress.

Assessment of Climate Change Impacts on Soil Health through Microbial and Plant Communities in Alpine Ecosystems of Indian Himalayan Region (GoI- GEF-UNDP Third NATCOM Project)

Funding Source
Ministry of Environment, Forest and Climate Change

Investigators
Dr G.S. Rawat and Dr G. Talukdar

Researchers
Pankaj Tiwari

Date of Initiation
July 2018

Date of Completion
January, 2021

Objective

The objectives of the project are to (i) assess soil health by investigating changes in soil organic carbon, soil CO_2 efflux and soil microbial enzymatic activity with respect to climate change; (ii) understand variations in soil nutrient composition under experimental warming with emphases on C: N ratio; and (iii) evaluate climate change impacts on microbial and plant diversity, community composition, plant biomass and phenology.

Progress

During the reporting period, the literature survey was done. The soil health parameters to be incorporated in future research work were selected. 14 Open Top Chambers (OTC) along with temperature data loggers were established in Bhagirathi River Basin, Gangotri National Park, Uttarakhand. Automated Soil CO_2 Flux System was purchased and standardized for future field measurement of soil respiration. Phenocams have been installed to monitor plant phenological changes inside OTC. Preliminary investigations performed for variations in temperature enhancement, microbial and plant community composition, soil nutrient content and microbial enzyme activities under experimental warming.

Outputs and Outcomes

The experimental warming plots were established for long-term monitoring of climate warming impacts on alpine plant, soil bacterial and fungal community function, diversity and composition. Baseline data on soil physico-chemical properties in these regions was recorded during the reporting period.

Milestone

(I) Increase in air and soil temperatures by 2°C and 1.6°C respectively inside OTCs. (ii) Increased carbon degrading ability of microbial enzymes, beta-glucosidase and phenol- oxidase under experimental warming. (iii) Increased soil CO_2 efflux and CO_2 concentration inside OTCs. (iv) The increased relative abundance of copiotrophic bacterial phyla and decreased relative abundance of oligotrophs under experimental warming. (v) Increase in biomass of dominant plant species under experimental warming.

06

COMPLETED

ONGOING

PROJECT INITIATED

Population Management of Species Involved in Human-Wildlife Conflict

Funding Source
MoEFCC

Investigators
Shri Qamar Qureshi
and Dr Y.V. Jhala

Researchers
Project coordinator:
Dr Kafil Hussain
Project scientists:
Dr Sanath K. Muliya,
Dr Priya Gusain,
and Dr Divya Ramesh
Project Fellow
Uddalak T. Bindhani

Date of Initiation
August 2018

Date of Completion
August 2021

Objectives

The objectives of the project are to (i) develop appropriate reproductive control techniques to manage the population of problem species below the tolerance level; and (ii) understand the ecological aspects of conflict management.

Progress

The following activities were undertaken during the reporting period: (i) Engagement of project personnel: Project coordinator-1; Project scientist-3; Project fellow-1; (ii) Applications and progress on procurement of porcine zone pellucida (PZP) vaccines and requisite permits for field trials; (iii) Formation of Institutional Animal Ethics Committee (IAEC); (iv) Procurement of requisite permissions to conduct field trials at various field sites in the country (in captivity and free-ranging areas) for each of the four target species of the project; (v) Approval of building plan and required sanctions for construction of laboratory and animal housing facilities; (vi) Procurement of field, veterinary, and laboratory equipment necessary to collect and process samples; (vii) Ecology of Rhesus macaques in and around the Wildlife Institute of India (WII) campus, Dehradun: radio-telemetry study of adult female macaques being conducted and home ranges estimated; (viii) Ecology of ungulates in conflict in and around Pench Tiger Reserve, Madhya Pradesh: camera trapping and line transects conducted to estimate nilgai and wild pig population densities; interviews with farmers and preliminary camera trapping conducted around agricultural fields to study patterns of crop-raiding and intensity of conflict; (ix) Laboratory-based work: diet and nutritional analyses of Rhesus macaques being conducted in the WII campus, using faecal samples collected across seasons, to understand influence of human habitation and human provisioned food sources such as garbage dumps vs. natural food sources, and resource utilization by macaques; and (x) Development of protocols for all data sampling, collection and processing techniques including ecological, veterinary, and laboratory methods.

Outputs and Outcomes

The project has the following outputs during the reporting period: (i) Procurement of requisite permissions to conduct field trials at various field sites in the country (in captivity and free-ranging areas) for each of the four target species of the project; (ii) Development of protocols for all data sampling, collection and processing techniques including ecological, veterinary, and laboratory methods; and (iii) Procurement of field, veterinary, and laboratory equipment necessary to collect and process samples.

Milestone

(I) Further to the procurement of import license from the Directorate General of Health Services, New Delhi, two hundred doses (200) of PZP contraceptive vaccine (100 µg each) have been imported from the Science and Conservation Centre, Zoo Montana, USA. All necessary permits for field trials, including (a) 'No Objection Certificate' (NOC) from Animal Husbandry Ministry, New Delhi; (b) NOC from Directorate General of Health Services, New Delhi; and (c) Vaccine safety certificates from National Institute of High Security Animal Diseases, Bhopal, were procured for Macaques, whereas permits for remaining species were being processed.

(ii) Establishment of formal MoU with Humane Society International (India), to share vaccine production and field implementation expertise from counterparts in South Africa.

(iii) In principle, approval for pre-immunization trials, including demographic and behavioural studies have been secured from Karnataka Forest Department for (a) Capture, handling, and health assessment of captive nilgai in Mysore Zoo; (b) Capture, handling, health assessment and collaring of a total of ten (10) wild elephants from conflict areas as part of Phase I of the project; and (c) Periodical blood and dung sample collection from a total of ten (10) captive female elephants from the Dubare, Bannerghatta, Sakrebyle and Tittimatti elephant camps. Fieldwork towards achieving the above will be initiated from the month of June, following the completion of the requisite project personnel hiring process.

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07

COMPLETED

ONGOING

PROJECT INITIATED

Management of Invasive Species in Wet Grassland of Kaziranga Tiger Reserve, Assam

Funding Source
The National Tiger Conservation Authority (NTCA)

Collaborating Agency
NTCA; Shri P. Sivakumar, Kaziranga Tiger Reserve; and Shri Rabindra Sharma

Investigators
Dr S.A. Hussain, Dr G.S. Rawat, Dr Ruchi Badola and Dr B.S. Adhikari

Researchers
Megha Shruti and Umar Saeed

Date of Initiation
October 2018

Date of Completion
October 2021

Objectives

The objectives of the project are to (i) estimate the extent of invasiveness in the affected areas of the landscape; (ii) study the seed ecology of a selected invasive species- *Bombax ceiba* in the landscape; and (iii) understand the response of hydrological alterations in a selected invasive species- Bombax ceiba.

Progress

A preliminary survey was conducted in the invasive species infested areas of the Park to assess the status of invasive species. To study the seed-ecology of *Bombax ceiba*, four variables were considered. The seed viability and germination under different inundation levels was estimated through a greenhouse experiment. Soil samples were collected in three layers: L1-upper layer (0-15cm), L2-middle layer (15-30cm) and L3- lower layer (30-45cm) in six different areas of invasion in the Park. Two replicates were collected from one quadrat, and the respective layers were uniformly mixed to form a homogenous layer of soil. The soil was transferred to pots, was sown with *Bombax ceiba* seeds (n=30) and left to germinate in the greenhouse in three different conditions- dry, moist and standing water (5cm).

Outputs and Outcomes

A total of 12 species representing trees (n=5 species), shrubs (n=3 species), herbs (n=3 species) and climber (n=1 species) were recorded during the study period. Most species were invasive (n=8 species) in the grassland ecosystem. The recorded species represented nine families with the dominancy of Asteraceae (n=4 species).

Status of plants recorded in grassland ecosystem: Trees from five families were found with most species non-invasive in nature (n=4 species). *Bombax ceiba* was the most abundant (15.37±7.22 SE /ha) invasive species in the grassland of Kaziranga. It was followed by *Syzygium* sp. (6.58±4.49 SE /ha) and *Careya arborea* (2.19±2.15 SE /ha). One shrub species was recorded with an average density of 0.01±0.009 SE /ha. Three herb species *viz. Ageratum conyzoides*, *Mimosa invasa* and *Ethulia conyzoides* were found with an average density of 14.37±5.12 SE /ha, 0.64±0.31 SE /ha and 0.21±0.19 SE /ha respectively. The climber recorded in the grassland ecosystem of Kaziranga was recorded with an average density of 0.40±0.12 SE /ha.

Status of regeneration: Regeneration of tree species; Bombax ceiba was the highest followed by *Glochidion indica* and *Litsea salicifolia*.

Overall average of the total number of seeds comes out to be 232 ± 11.6 SE with the minimum and maximum number of seeds being 96

and 471 respectively. The average seed length for all the sampled pods is 12.57 cm ± 0.21 SE, while the minimum and maximum lengths range between 9.5 to 17.0 cm. 7.22 cm ± 0.09 SE was recorded to be the average seed width, with minimum and maximum width ranging from 6.0- 9.5 cm.

There is a significant relationship between tree GBH and the total number of pods produced indicating that trees with greater GBH (representing older trees) produce more fruits (pods). Similarly, the significant relationship is observed between pod length, and the total number of seeds indicating that greater the pod length, higher is the number of seeds it bears. No significant relationship was observed between GBH and pod length and GBH and no. of seeds. It shows that tree age does not affect its pods length and its seed production within each pod; however it indirectly affects the total seed production as an older tree bears more fruits.

Three seedlings germinated in moist water conditions after 4-5 days of sowing. One seedling withered on the 16th day after attaining 2.3cm height while the other two seedlings reached around 5 cm height in 20 days. Only one seedling germinated in standing water condition (5 cm) after four days of sowing and withered on the 10th day due to damping off like condition near the stem base. Only one individual was able to germinate in the dry condition after seven days of sowing and died-off in its initial stage on its 10th day.

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Funding Source
Manipur State
Forest Department

Investigator
Dr R. Suresh Kumar

Date of Initiation
October 2018

Date of Completion
September 2020

COMPLETED

ONGOING

PROJECT INITIATED

Satellite Tracking Amur Falcons, Falco amurensis from their Stop-over Sites in Manipur to Support Conservation Efforts

Objectives

The objectives of the project are to (i) To deploy modern technology in the form of lightweight satellite tags fitted to four Amur Falcons in Manipur to track their amazing migration journeys and to support conservation efforts; and (ii) To carry out a state-wide survey to locate and identify Amur falcon roost sites.

Progress

The capture and tagging of Amur Falcons at Tamenglong roost site in Manipur were initiated in October 2018. However, it was not fully successful due to technical issues with the transmitters to be deployed (20%). Only a few areas within the Tamenglong and the adjoining Noney district in Manipur were surveyed to locate Amur falcon roost sites (10%).

A total of four PinPoint 75 GPS Argos tags (Lotek Inc.) were procured for deployment on Amur Falcons at the Tamenglong roost site. A team of three Hungarian raptor biologists were invited to help with capture and tagging of the Amur Falcons. Falcons were trapped using canopy mist nets, and captures were attempted during the evening when the birds arrived in to roost. The capture and tagging operations were carried out from 2-5 November 2018.

Outputs and Outcomes

On 4th November the team surveyed the Barack river roost site, and five falcons were caught in the net, three of these were adult male, while one was an adult female and the other was a juvenile (sex unknown). They were quickly removed from the net and placed in individual boxes for the night. On 5th morning, two out of the five falcons: the adult female weighing 164 g and an adult male weighing 149 g were chosen for tagging based on their weight and/or feather condition. The female falcon was named "Tamenglong" after the district, and the male was named "Manipur" after the State. The two-tagged falcons were released at the site of capture in the presence of local people and forest officials.

Two days after release *Manipur* foraged and roosted in around Irang river not very from the Barak river. On 9th November evening DFO, Tamenglong received information about a falcon with a satellite tag attached having been hunted at Kebuching village. The tag was handed over to the forest department personnel, and it was confirmed to be the falcon Manipur. From the data gathered, this bird was killed on 8th morning at the Irang river roost site, and during the three days of tracking, it transmitted 14 GPS and 5 Argos locations.

The female Amur falcon, Tamenglong upon release, moved into the Barak river roost site and on 7th November arrived in the Irang river roost site. Thereafter like Manipur, Tamenglong also foraged in the area between Punglam - Kabui Khullen - Nagaching and returned every day to roost at the same site until 18th November. On the 18th midnight, Tamenglong started on its southbound migration and headed southwest flying nonstop over Bangladesh, then across Bay of Bengal for 225 km to cross into Odisha state, and then flew across Telengana and then to the Karnataka coast covering 2,500 km in two days and 15 hours. Tamenglong continued on its nonstop flight over the Arabian Sea covering 3,300 km in three days to arrive on 24th November at a stop-over site in Somalia. Thereafter, over seven days Tamenglong made relatively short daily flights covering between 250 to 571 km, and cut across Kenya and arrived along the shores of Lake Rukuwa in southern Tanzania on 2nd December. After spending a week, Tamenglong continued on its journey south and arrived in North Luangwa National Park in northeast Zambia on 10th December. There, it stopped over until 14th December and after that its transmission stopped ending the more than 38 days of tracking since release.

Milestone

The female Amur falcon Tamenglong was tracked for more than 38 days. In October - November 2019 five more falcons are proposed to be tagged.

Conducting a Baseline Study and Establishing a Database on Biodiversity Conservation, Sustainable Natural Resource Management in SECURE Himalaya Project Landscapes in Selected Districts of Jammu and Kashmir, Himachal Pradesh, Uttarakhand and Sikkim

Funding Source
Global Environment Facility (GEF) funded United Nations Development Programme (UNDP) and Ministry of Environment, Forest and Climate Change, Govt. of India

Investigators
Dr V.B. Mathur, Dr G.S. Rawat, Dr Sathyakumar and Dr Gautam Talukdar

Researcher
Anindita Debnath

Date of Initiation
November, 2018

Date of Completion
September, 2019

COMPLETED

ONGOING

PROJECT INITIATED

Objectives

The objective of the project was to conduct baseline study and establish a database on biodiversity conservation, sustainable natural resource management in SECURE Himalaya project landscapes for selected districts of Jammu and Kashmir, Himachal Pradesh, Uttarakhand and Sikkim.

Progress

Design of database schema has been finalized, and information based on the set format has been collected and compiled. The domain name has been registered, and the Laravel framework has been finalized for web portal development. Dynamic Content Management System (CMS) is used for creating, updating and deletion of web-pages/contents in the backend of the portal. Specific web-pages for four distinct databases titled "Studies", "Best Practices", "Experts", and "Ongoing Schemes" have been created and their contents have been integrated into the portal.

A separate web-page has been developed which provides information about the various baseline studies commissioned under Secure Himalaya project. Secure Himalaya portal has links to the websites of its stakeholders and other related organisations. The portal can be accessed from any device, e.g. computers, tablets, or mobile devices and has been developed in accordance with the essential Guidelines for Indian Government Websites (GIGW). Portal is now being tested and optimized. Link of the portal: http://securehimalaya.in/beta/home.

Outputs and Outcomes

(I) Database development of local experts, best conservation practices, NRM based livelihoods, human-wildlife conflicts for Jammu and Kashmir, Himachal Pradesh, Uttarakhand and Sikkim. (ii) Developed an interactive and easily accessible web-based database with baseline information on various components of SECURE Himalaya project. (iii) Hosting and operationalising of the database in the appropriate web server and provision for its regular updation with a scope of integration of the outputs from other baseline studies of the project. (iv) Provided training to the host agency/department on its use with operation and maintenance for three months.

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Establishing Climate - Resilient Landscapes in Sikkim through Connectivity Corridors and Protected Area Integration: Building Adaptive Capacity of Forest Department to Address Climate Change

Funding Source
United Nations Development Programme (UNDP)

Investigators
Dr Gautam Talukdar and Dr R Suresh Kumar

Researchers
Malyasri Bhattacharya and Sneha Pandey

Date of Initiation
November, 2018

Date of Completion
June, 2019

© *Malyasri Bhattacharya*

Objectives

The objectives of the project are to (i) delineate possible corridors linking various PAs in the Sikkim Himalaya landscape; (ii) developing methodology to assess the biophysical conditions of selected corridors; (iii) examine the threats and identify critical areas along the corridors with high probability of negative human-wildlife interface; (iv) framework to assess the impact of climate change on corridors.

Progress

Suitable habitats for Asiatic black bears were mapped using questionnaire and sign surveys. This layer was subsequently used to delineate/map out corridors using graph theory, and subsequently, the bottlenecks were identified using centrality analysis.

Outputs and Outcomes

Connectivity throughout Sikkim and seven bottlenecks were identified between eight protected areas in Sikkim with high numbers of human black bear conflict. The condition of corridors was determined, followed by phenology monitoring. However, both potential corridors and bottlenecks have to be further validated on the ground. Sign surveys and questionnaire surveys have been done to assess the presence of a Himalayan Black bear in Sikkim landscape.

Milestone

Time-lapse cameras were deployed to assess the phenology of fruit-eating trees by a Himalayan black bear. Potential corridors were delineated using Circuitscape and ArcGIS. Using centrality analysis critical points (which have a high probability of negative human-wildlife interface) in the corridors were delineated. The draft project report was submitted to UNDP and Forest Department, Sikkim.

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COMPLETED

ONGOING

PROJECT INITIATED

Kailash Sacred Landscape Conservation and Development Initiative - Phase II

Funding Source
ICIMOD, Nepal through GBPNISHED, Almora

Investigators
Dr G.S. Rawat and Dr B.S. Adhikari

Researchers
Arti Kala and Udita Garbyal

Date of Initiation
December 2018

Date of Completion
November 2023

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Objectives

The project has the following objectives (i) Assessment of trans-boundary issues in KSL with focus on national policies and programs; and (ii) Trans-boundary dialogues and agreement on identified issues.

Progress

Following activities were initiated during the reporting period: (i) A nursery was developed for propagation of high-value fodder and timber trees at Himkhola by *Van Panchayat* and BMC members. The hands-on training was given to villagers of Himkhola on sowing seeds, preparation of seedbeds and polybags. (ii) The information on Transboundary Rangeland Management and Wildlife Management issues in Darma valley has been collected recently. (iii) Wildlife Institute of India (WII), Dehradun organised a workshop on "Biodiversity and wildlife conservation" through cross border cooperation between ASKOT Wildlife Sanctuary, India & Api-Nampa Conservation Area (ANCA), Nepal", as a special session under KSLCDI Project-Phase II, which was a part of three days' workshop "Our culture is our heritage" from 19-21 December 2018 at Block Hall, Dharchula, Pithoragarh. The workshop was mainly focused on strengthening trans-boundary cooperation for curbing illegal wildlife trade, management plans of Askot Wildlife Sanctuary; and Api Nampa Conservation Area (ANCA), Nepal; and Scientific studies on biodiversity and conservation. (iv) During the reporting period, UNESCO C2C-WII has organised several expert consultation meetings with various agencies, viz. Uttarakhand State Forest Department; Uttarakhand Space Application Centre; Wadia Institute of Himalayan Geology, Dehradun; GBPNIHESD, Almora; INTACH, Delhi; Rung Kalyan Sanstha, Dharchula, Pithoragarh and other eminent retired experts from the region for developing dossier for the nomination of Kailash Sacred Landscape (KSL) as a UNESCO World Heritage Site.

Monitoring of Reintroduced Gaur, *Bos gaurus gaurus* in Bandhavgarh Tiger Reserve, Madhya Pradesh, Phase II

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Funding Source
Madhya Pradesh Forest Department

Investigators
Dr Parag Nigam, Dr Bilal Habib and Field Director, Bandhavgarh Tiger Reserve

Researcher
Ritesh Vishwakarma

Date of Initiation
November 2018

Date of Completion
November 2021

Objectives

The objectives of the project are to (i) understand the movement, ranging pattern, fission-fusion dynamics and habitat use of the gaur population; (ii) understand the social interaction within and between gaur herds in Bandhavgarh Tiger Reserve; (iii) provide the genetic makeup of the gaur population and evaluate the individual contribution towards population growth; and (iv) monitor the health condition of reintroduced gaur in Bandhavgarh Tiger Reserve.

Progress

All the radio-collared gaurs were monitored in Bandhavgarh Tiger Reserve (BTR) through ground tracking and direct sightings. The gaur individuals without collar were identified based on their body size, horn structure (shape, colour, spread, length and curves), permanent marking (scar and injury on the body), individual with nonfunctional collar (old collar individual) and the size of the bos spp. The Minimum Convex Polygon (100% MCP) and Fixed Kernel Density Estimator (FKD) method were used for home range estimation, whereas, habitat variables such as terrain, broad vegetation type, distance to the nearest water body, road and human settlement were recorded to evaluate the habitat use of radio-collared gaur.

A total of seven herds were identified, and a herd profile and individual dossiers for each identified individual were prepared. The identified individuals within the herds were separated based on their body characteristics. The social interaction within and between gaur herds was studied using behavioural sampling methods, the Social dynamics of gaur herds were studied using social network analysis.

Outputs and Outcomes

During the study period, a total of 184 locations were recorded for all the gaur individuals of identified herds (n=7). Using obtained locations (n=184) of radio-collared gaurs and identified gaur herds, the overall home range of gaur in Bandhavgarh was estimated. The overall estimated home range for gaur using 100% MCP was 205.4 sq.km whereas it was 163.6 sq.km using 95% FKD and 29.5 sq.km using 50% (core area) FKD. The home ranges for all seven herds with 100% MCP were estimated. The mean estimated home range for different gaur herds using 100% MCP was 25.37 ± 3.94 (SE) sq.km (95% CI=9.64).

The gaur with functional radio-collared (n=3), were monitored, and locations were recorded. The home ranges for collared gaurs were at 100% MCP was 43.66 ± 10.79 (SE) sq. km (95% CI= 46.45 sq.km) for the study period.

The behavioural data were collected based on animal's association, affiliation and agonistic behaviour of individually identifiable animals. A total of 110.20 hours' behavioural samples of all possible interaction were collected. Social Interaction, network statistics, and social network diagram of individual association of one group were prepared. The association network provides information that the group members reciprocally interact with each other in all age classes. The network also showed that the group's dominance hierarchy was statistically nonlinear and based on one individual centrality.

Milestone

Monitoring of the gaur herds was carried out during the study period. The present study showed that the current population of gaur is now expanding to other parts of the reserve and has significant fission-fusion dynamics with fluctuating resources.

The study of fission-fusion dynamics through the Social Network Analysis (SNA) in gaur, predicts the integrated movement decisions made by individuals scales up to group motion as they are now expanding their home ranges to the different part of the reserve. The results of the association network of one herd provided the quantitative information of the herd size and structure in available resources. The study revealed that the individuals could modify the persistence of associations with others herds or individuals and result in the complex higher-order social structure. The association matrix of interaction in the herd describes behaviorally heterogeneous differences of herd and individuals within the herd that may provide information on herd dynamics and hierarchy structure of gaur. The study is first of its kind of gaur in India. Additionally, the genetic makeup of the reintroduced gaur population would be carried out in the present study.

COMPLETED

ONGOING

PROJECT INITIATED

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Preparation of a State Level Strategy for Mitigation of Human-Wildlife Conflict in Kerala

Funding Source
Periyar Tiger Conservation Foundation and Kerala Forest and Wildlife Department

Investigators
Dr Anil Kumar Bhardwaj, Shri Qamar Qureshi and Dr Nehru Prabakaran

Date of Initiation
November 2018

Date of Completion
December 2019

Objectives

The objectives of the project are to (i) Study the current trends, extent and distribution of Human-Wildlife Conflict (HWC) in Kerala, including assessment of efficacy of current mitigation strategies being used by State; (ii) Development of comprehensive state level human-wildlife conflict management strategy for Kerala, comprising of short and long-term measures; and (iii) Development and implementation of active population management strategies, including immune-contraceptive in pilot study areas.

Progress

Inception workshop done, data on conflict cases for all the divisions and prominent Rapid Response Teams (RRTs) for last five years collected and compiled and two studied, i.e. (i) Understanding of efficacy of mitigation strategies; and (ii) Identification and understanding of corridors in different landscapes of Kerala and existing landscape policies of the state.

Outputs and Outcomes

Data regarding human-wildlife conflict cases for the state for the last five years was compiled.

Milestone

GIS maps for understanding hotspots of conflict were generated in the state. Consultative meetings were held for preparing SOPs for the major species. TOT for selected personnel in the state and designing of conflict mitigation strategy was organised during the reporting period.

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COMPLETED

ONGOING

PROJECT INITIATED

Preparation of Management Plan for Siswan Community Reserve

Funding Source
Punjab Forest & Wildlife Preservation Department

Investigators
Dr Anil Kumar Bhardwaj, Dr Bivash Pandav, Dr B.S. Adhikari, Dr V.P. Uniyal, Dr Ruchi Badola, Dr Bitapi C.Sinha, Dr J.A. Johnson, Dr Gautam Talukdar and Dr Abhijit Das

Researchers
Bidyut Bikash Berman and Priya Prajapati

Date of Initiation
January 2019

Date of Completion
December 2019

Objective

The objectives of the project are to (i) compile the baseline information of Siswan Community Reserve; and (ii) prepare the management plan for the reserve by involving local communities and other stakeholders.

Progress

After initial surveys and understanding of the area, the first stakeholder workshop was conducted on 7th February 2019. Thereafter fieldwork has been carried out for collecting data for preparing GIS maps of the area. Also, ecotourism trails have been created in the Community Reserve, and sensitization training was conducted for local youth to be trained as local ecotourism guides. A number of consultations have been conducted with the local communities and staff of the Forest Department for generating their participation and support in this exercise.

Outputs and Outcomes

Concerns of communities and stakeholders were identified during the reporting period. A platform for engagement with the communities and different line agencies was established. Most of the field data for planning has been collected, and the maps for the area are under preparation.

Milestone

Objective setting and strategy formulation workshop is proposed to be organised during this month. Remaining surveys for herpetopfauna and avian biodiversity are to be completed before November 2019. The draft plan will be prepared and put up in the dissemination workshop before 31 December 2019.

Wild Tigers of Similipal: A Study on Spatial Distribution, Abundance and Population Genetics

Funding Source
National Tiger Conservation Authority

Investigators
Dr Bivash Pandav, Dr Samrat Mondol, Dr Manoj Nair, Dr Bilal Habib (WII), and Dr Debabrat Swain, Field Director, Similipal Tiger Reserve

Researchers
Harshvardhan Singh Rathore

Date of Initiation
January 2019

Date of Completion
December 2021

Objectives

The objectives of the project are to (i) estimate population density of tiger and their co-predators; (ii) estimate spatial distribution and ecological density of wild ungulate prey species; (iii) estimate genetic relatedness, social dynamics and population structure of tigers; and (iv) investigate underline genetic mechanism responsible for tiger melanism.

Progress

In the initial three months of the project, the research team focused on achieving the first objective *i.e.* to estimate the population density of tiger and co-predators in Similipal Tiger Reserve (STR). A camera-trapping plan was prepared, and the entire STR was overlaid by a grid of 2 km^2. A pair of camera-trap was to be deployed in each 2 km^2 grid. Each camera-trap location was decided to be kept functional for 25 days at least. All seven ranges of the core division (808.66 km^2) were targeted for camera-trapping. The exercise was to be conducted in four blocks. The first Block being the two southernmost ranges of core division *i.e.* Upper Barakamuda and Jenabil.

An intensive sign survey was conducted in each 2 km^2 grid to decide the best locations to place the camera-traps. The team also collected all the large carnivore scats encountered during the survey to fulfill other project objectives subsequently. The sign survey was completed by 20th January and the camera-trap placement initiated on 22nd January. The final day of camera-trap removal in Block I was 2nd March. In total, 137 camera-trap locations were deployed in Block I. The data from all the locations was retrieved and all the images were geotagged. Subsequently, all the leopard and tiger images were sorted and cross-checked to come up with a uniquely identified tiger and leopard by using their pelage pattern.

Outputs and Outcomes

The research team captured 8 individual tigers in Block I out of which three turned out to be melanistic. The team also captured 21 individual leopards in the block. The data collected by conducting similar sampling in the other five ranges would help in generating density estimates for tiger and leopard in STR. The team also captured the photograph of two tiger cubs with a female indicating that Similipal population is still a breeding population.

Milestone

It is probably the last breeding tiger population in entire East-Central landscape (Chhattisgarh, Jharkhand, Odisha and South Bengal put together).

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COMPLETED

ONGOING

PROJECT INITIATED

Impact Mitigation Plan for Koderma Detour Dedicated Freight Corridor on Gautam Buddha Wildlife Sanctuary, Bihar

Funding Source
Dedicated Freight Corridor Corporation of India (DFCCIL)

Investigators
Dr S.A. Hussain and Dr Gopi G.V.

Researchers
Mujahid Ahamad, Vivek Ranjan and Umar Saeed

Date of Initiation
February 2019

Date of Completion
October 2019

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Objectives

The project has the following objectives: (i) Focused on the alignment of the proposed railway track through the Sanctuary and its surroundings; and (ii) At every 250m on either side of the proposed alignment to determine the status of wildlife species, vegetation structure and forest health.

Progress

The Koderma Detour proposed a 15km long railway alignment passing from the eastern boundary of the Gautam Buddha Wildlife Sanctuary (GBWLS). The survey was conducted to assess flora and fauna along the proposed alignment between March and April 2019. All sighting of mammals (direct or indirect) were recorded 250m on either side of the proposed alignment. Besides, dominant vegetation along with tree species were also observed and recorded. Informal questionnaire survey and interaction with local communities were conducted to better understand the habitat features of the area for wildlife usage. Evidences of human activities and disturbances were also recorded. Special attention was made to record the presence of rare, endangered and threatened (RET) species in the sanctuary area and near to proposed alignment. Areas of moisture and water availability for wild animals were also identified. Rock crevices and unturned boulders were checked randomly for reptiles.

Outputs and Outcomes

Faunal diversity along the proposed Koderma Detour: During the survey, direct sighting of Spotted deer, *Axis axis*; Barking deer, *Muntiacus muntjak*; Blue bull, *Boselaphus tragocamelus*; Golden Jackal, *Canis aureus*; Hanuman langur, *Semnopithecus entellus*; Rhesus macaque, *Macaca mulata*; Rufous-tailed hare, *Lupus nigricollis* and indirect evidence of striped Hyaena, *Hyaena hyaena* and Indian porcupine, *Hystrix indica* were found along the proposed route for railway. Sloth

bear, *Melursus ursinus* attack victim was recorded in Chittagarha village 4 to 5 km from the proposed route of railway track. Two reptiles, *i.e.* Monitor lizard, *Varanus bengalensis* was sighted directly, and an unidentified snake was also recorded. The recorded species are categorized as vulnerable (n=1), Near Threatened (n=1) and Least concern (n=10) in IUCN Red List of Threatened Species. Most species belong to schedule III of Indian Wildlife (Protection) Act-1972.

Table 1: Mammalian species recorded along with the proposed site for Koderma Detour in GBWLS, Bihar

Common Name	Scientific Name	Family	IUCN Red List Status	WPA 1972
Striped Hyaena	*Hyaena hyaena*	Hynidae	Near Threatened	Schedule III
Sloth Bear	*Melursus ursinus*	Ursidae	Vulnerable	Schedule I
Golden Jackal	*Canis aureus*	Canidae	Least concern	Schedule III
Indian crested porcupine	*Hystrix indica*	Hystricidae	Least concern	Schedule IV
Blue Bull	*Boselaphus tragocamelus*	Bovidae	Lest concern	Schedule III
Barking Deer	*Muntiacus muntjak*	Cervidae	Lest concern	Schedule III
Spotted Deer	*Axis axis*	Cervidae	Lest concern	Schedule III
Rufous-tailed hare	*Lupus nigricollis*	Leporidae	Least concern	Schedule IV
Monitor Lizard	*Varanus bengalensis*	Varanidae	Least concern	Schedule I
Wild Boar	*Sus scrofa*	Suidae	Least concern	Schedule III
Rhesus Macaque	*Macaca mulata*	Cercopithecidae	Lest concern	Schedule III
Hanuman Langur	*Semnopithecus entellus*	Cercopithecidae	Lest concern	Schedule II

Mitigation Measures

Elevators to support wildlife movement, eight bridges and culverts (15m wide at every 250 m distance) for uninterrupted streams flow, rail dampers and rail fastenings to minimize noise and vibrations are recommended in the proposed alignment. Blasting should not be allowed for excavating hilly terrain for construction. A time-bound construction period with no activities during night time was recommended to minimize the disturbance caused during the construction phase. DFCCIL was recommended to take responsibility of monitoring and maintenance of all the mitigation structures and mechanical or physical measures. Forest Department has recommended for the monitoring of the construction phase and suggested mitigation measures. Moreover, the department has recommended providing land for afforestation with fruiting trees; and construct water hole along the proposed alignment.

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17

COMPLETED

ONGOING

PROJECT INITIATED

Assessment of Medicinal and Aromatic Plant (MAP) Species including their Collection, Usage, Demand, Markets, Price Trends and Life Cycle, Focusing on Landscapes in Himachal Pradesh

Funding Source
UNDP

Investigators
Dr Amit Kumar, Dr B.S. Adhikari, Dr A.K. Gupta and Dr G.S. Goraya

Researchers
Dr Rupali Sharma, Himanshu Bargali, Monika Sharma, Manisha Mathela and Shiva Ram

Date of Initiation
March 2019

Date of Completion
May 2020

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Objectives

To conduct a detailed assessment of Medicinal and Aromatic Plant (MAP) species in the project landscape of Himachal Pradesh with focus on ensuring sustainable cultivation and harvesting by (i) Identifying usage patterns; and (ii) Studying existing value chains.

Progress

Out of the 12 focal tasks of MAP, the following key tasks were completed during the reporting period: (i) literature review of ethnobotanical documentation of MAP species and overview of projects, government schemes and other initiatives on MAPs; (ii) identify and list MAPs with significant economic end usage in the landscapes; (iii) select 5 MAPs each in two focal categories; and (iv) assessment of distribution, abundance and conservation of the listed 10 species identified as per the criteria above in the landscapes. The following tasks are in progress:

(i) Study of value chains for the 10-listed species; and (ii) Understand the role of 10 MAPs in livelihoods of respective communities and assess how businesses pertaining to these MAPs operate under the existing economic and legal framework.

Outputs and Outcomes

Of the four major outcomes expected from SECURE Himalaya project, the current proposal aims to contribute to two major outcomes as below: (i) improved and diversified livelihood strategies and improved capacities of communities and government institutions for sustainable natural resource management and conservation; and (ii) effective knowledge management and information systems established for promotion of sustainable management practices in the high range Himalayan ecosystems.

The Institute completed nine research projects during the reporting period. There were 37 ongoing projects and 17 projects were initiated during the year 2018-19.

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ACADEMIC AND TRAINING ACTIVITIES

Academic programme

XVI M.Sc. (Wildlife Science)

During the reporting period, the XVI M.Sc. students successfully completed their 2nd, 3rd and 4th semesters. Teaching inputs were given in both classroom, and field. The students underwent the major field tours, *i.e.* Wetland Conservation and Management tour; National Parks tour; and Conservation Practice tour. The students chose their respective dissertation topic, and defended their proposal before the Institute's committee. All the proposals were successfully defended and the students started their dissertation fieldwork from December 2018 onwards.

Table 1: List of M.Sc. (Wildlife Science) Dissertation Topics

Name	Dissertation Topic	Supervisor(s)
Aaranya Gayatri	Factors that shape vegetation in the arid zone of India	Dr Malvika Oniyal and Dr Navendu Page
Abhishek B	See through sound: Understanding the pattern of habitat use by Gangetic river dolphin in the part of Brahmaputra River	Dr J.A. Johnson and Shri Qamar Qureshi
Abir Jain	Impact of habitat fragmentation on plant-frugivore interactions in lowland tropical forests of upper Assam, north-east India	Dr Navendu Page, Dr G.S. Rawat and Dr Rohit Naniwadekar
Bhavya Iyer	Ecological Aspects of Vertebrate Scavenging in Central Indian Forests	Dr Y.V. Jhala and Shri Qamar Qureshi
Doli Borah	Investigating the Social Structure of Female Asiatic Lions	Dr Vishnupriya Kolipakkam and Dr Y.V. Jhala
Himanshu C Lad	Factors influencing small carnivore community structure in Chandoli National Park, Northern Western Ghats	Dr Gopi G.V. and Dr Bilal Habib
Indira S	Habitat Use by Gaur and Assessment of Human-Gaur Conflicts in Human Modified Landscapes of Nilgiris Forest Division, Tamil Nadu	Dr S. Sathyakumar, Dr Gopi G.V. and Dr Ruchi Badola
Kushagra M	Patterns and determinants of Elephant habitat use in mosaic landscape of Northern Chhattisgarh	Dr Bivash Pandav, Dr Parag Nigam and Dr Bilal Habib
Laxmi Langlang	Assessing the Patterns of Human-Wildlife Conflict and Compensation Around Pakke Tiger Reserve, Arunachal Pradesh	Dr Abhijit Das, Dr Gopi G.V. and Dr Nandini Velho
Mohit Mudliar	Pattern of segregation during foraging of East Indian Olive Ridley population and nesting habitat characteristics of Arribada nesting ground of Rushikulya	Dr K. Sivakumar, Dr Gopi G.V. and Dr Karthik Shanker

Name	Dissertation Topic	Supervisor(s)
Nisam Mang L	Assessing the impacts of livestock-induced disturbance on the vegetation composition and forest regeneration in Sikkim's mid-elevation forests	Dr G.S. Rawat, Dr S. Sathyakumar and Dr Sandeep Tambe
Pratik Das	Vigilance architecture and temporal variation in emergence return of Indian Flying fox	Dr Salvador Lyngdoh and Dr S.P. Goyal
Sakshi Nulkar	Endoparasitic prevalence and associated physiological changes in Rhesus Macaques across areas of different intensities of human use	Dr Gautam Talukdar, Shri Qamar Qureshi and Dr Lallianpuii Kawlni
Sayanti Basak	Resource use and distribution of Smooth coated otter (*Lutrogale perspicillata*) in the sub Himalayan foothill rivers of Uttarakhand	Dr S.A. Hussain, Dr Bivash Pandav and Dr J.A. Johnson
Siva R	Impacts of road related disturbances on mammalian and vegetation assemblages-a case study of SH33 passing through Nagarahole Tiger Reserve	Dr Bilal Habib and Mr Sanjay Gubbi
Subhashini K	Dogs finally have their day? Aspects of Free-ranging Dog Ecology at Hanle, Changthang Wildlife Sanctuary - Ladakh	Dr Lallianpuii Kawlni, Dr Y.V. Jhala and Dr Suthirtha Dutta
Sumashini PS	Impact of habitat fragmentation on diurnal squirrels in lowland tropical forests of upper Assam, north-east India	Dr Manoj Nair and Shri Qamar Qureshi
Sutirtha Lahiri	A forked relationship-Understanding the acoustic communication strategies in sympatric drongos	Shri Qamar Qureshi and Dr Vishnupriya Kollipakkam
Varun Kher	Patterns of bird community structure in relation to land-use driven habitat changes in the arid grasslands of Thar Desert	Dr Suthirtha Dutta, Dr Malvika Oniyal and Dr Navendu Page

Other Dissertations

Neha Yadav (2018). **Status of Terrestrial Eco-regions of India**. School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi. Supervisor: Dr Gautam Talukdar.

Bharti Tomar (2018). **Species Distribution Modelling of the Jacobin Cuckoo using E-bird Mobilised Data.** School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi. Supervisor: Dr Gautam Talukdar.

Ravindra Nath Tripathi (2018). **Visualization Techniques to Highlight.** The Spatial Extent of Water in the Gangetic River Network using Google Earth Engine. Uttarakhand Open University, Haldwani (Nainital) Uttarakhand. Supervisor: Dr Gautam Talukdar.

Shatakshi Sharma (2018). **A Map Story of the Nature Trail in Wildlife Institute of India, Dehradun.** Uttarakhand Open University, Haldwani (Nainital) Uttarakhand. Supervisor: Dr Gautam Talukdar.

Status of Doctoral Research at WII

Registered for Ph.D.

Debanjan Sarkar (2018). **The resilience of protected areas of India to climate change: Current status and future scenario.** Forest Research Institute. Supervisor: Dr Gautam Talukdar.

Ruchika Sah (2018). **Ecotoxicological and GIS Spatial Risk Assessment of Estrogenic Endocrine Disrupting Compounds (e-EDCs) from Middle Ganga.** Saurashtra University. Supervisor: Dr Gautam Talukdar.

Naitik Patel (2019). **Systematics and ecology of *Amolops monticola* species complex of Himalaya.** Saurashtra University, Rajkot. Supervisors: Dr Abhijit Das and Prof. S.D. Biju.

Bitupan Boruah (2019). **Systematics and biogeography of Bush frogs (Anura: Rhacophoridae) of northeast India.** Saurashtra University, Rajkot. Supervisors: Dr Abhijit Das and Prof. S.D. Biju.

Jignasu Dolia (2019). **Distribution and nesting ecology of King cobra, Ophiophagus *Hannah*.** Saurashtra University, Rajkot. Supervisor: Dr Abhijit Das.

Kumudani Bala Gautam (2019). **Population genetic structure and differentiation of Monitor lizard, *Varanus bengalensis* for conservation and illegal trade monitoring.** Saurashtra University, Rajkot. Supervisor: Dr Abhijit Das.

Goura Chandra Das (2019). **Spatio-temporal distribution, abundance and habitat use patterns of Gangetic river dolphin, *Platanista geangetica* in the lower Ganga River, India with respect to its conservation.** Saurashtra University, Rajkot. Supervisor: Dr Abhijit Das.

Rana S. (2018). **Plant diversity gradients along the Himalaya: A comparison between the east and the west.** Saurashtra University, Rajkot. Supervisor: Dr G.S. Rawat.

Vishnu, C.S. (2019). **Spatio-temporal and thermal ecology of Indian python, *Python molurus molurus*, Linn. 1758 in Sathyamangalam and Mudumalai Tiger Reserves, Tamil Nadu.** Forest Research Institute University, Dehradun. Supervisors: Dr C. Ramesh and Dr Gautam Talukdar.

Ph.D.Theses Submitted

A. Pragatheesh (2019). **Assessment of the existing National Highway-7 and its proposed widening on habitat use and movement of wild animals in Pench Tiger Reserve, Madhya Pradesh.** Saurashtra University, Rajkot. Supervisors: Dr Asha Rajvanshi and Dr V.B. Mathur.

Indranil Mondal (2018). **Evaluating landscape connectivity and bottle-necks for tigers, *Panthera tigris tigris* in Tadoba Andhari Landscape Complex, Maharashtra, India.** Forest Research Institute (Deemed to be) University, Dehradun. Supervisors: Dr Gautam Talukdar and Dr Bilal Habib.

Training Programmes

XXXIX Post Graduate Diploma Course in Advanced Wildlife Management Concluded, Dehradun, 1 September 2017 to 30 June 2018.

The 10-month P.G. Diploma Course in Advanced Wildlife Management concluded on 30 June 2018 at this Institute in which ten officer trainees including four foreign officer trainees of the rank of Deputy Conservator of Forests/Assistant Conservator of Forests and equivalent levels have participated.

During the reporting period, the Management Tour (Foreign Component: South Africa) was conducted from 12 April to 27 May 2018. The officer trainees visited Kruger National Park, Johannesburg Zoo, South African Wildlife College, Moholoholo Rehabilitation Centre, Endangered Species Breeding Centre, Pretoria Zoo, Johannesburg in South Africa, Pretoria National Botanical Garden, Table Mountain World Heritage site, Cap Town. The purpose of this visit was to get a regional perspective and study a wide range of wildlife and protected area management practices. Management Term Paper Exercise at Manas Tiger Reserve and adjoining places was conducted from 3-14 April 2018. The Management Plan Exercise was organised at Mudumalai Tiger Reserve, Gulf of Munnar and adjoining places from 8 May to 2 June 2018.

All the officer trainees have successfully completed the course. The following officer trainees received the awards and prizes:

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The 'Institute's Gold Medal for the Top Trainee'; and the 'Top Trainee in Wildlife Biology (Book Prize)' were bagged by Dr Ankur Awadhiya. 'Wildlife Preservation Society Silver Medal for the Second in Merit' was given to Ms Anu P. James. 'Silver Medal for the Best All Round Wildlifer'; and 'NR Nair Memorial Silver Medal for Best Management Plan' were received by Mr Devinder Singh Dhadwal. 'A.K. Chatterjee Silver Medal for Best Management Term Paper' was awarded to Mr Nay Zar Soe. The 'Silver Medal for the Best Foreign Trainee' was given to Mr Zaw Min Naing.

XL Post Graduate Diploma Course in Advanced Wildlife Management Commenced, Dehradun, 1 September 2018 to 30 June 2019.

The 40th PG Diploma Course in Advanced Wildlife Management commenced from 1 September 2018. Thirteen officer trainees of the rank of DCF/ACF from 10 States, *i.e.* one each from Manipur, Himachal Pradesh, Odisha, Rajasthan, Bihar, Kerala and Andaman & Nicobar Islands and two each from Assam, Andhra Pradesh and Chhattisgarh participated in the course. Four of them were Hari Singh Fellows.

The course was divided into four sub-components *viz.*, Conservation Biology; Tools and Techniques for Conserving Wildlife; Advanced Wildlife Management Practices; and Integrated Wildlife Management Planning. The tours included Orientation Tour to Koluchaur, Chokhamb and adjoining areas from 23-27 September 2018; High Altitude Techniques Tour to Kedarnath Wildlife Sanctuary and Nanda Devi Biosphere Reserve in Uttarakhand from 21-27 October 2018; Techniques tour to Chilla Range and adjoining places of Rajaji Tiger Reserve from 28 November 2018 to 12 December 2018; Wetland tour from 21-27 January 2019 in National Chambal Sanctuary, Morena, Madhya Pradesh; and Keoladeo National Park, Bharatpur, Rajasthan; *ex-situ* Conservation and Management Module Tour to Chatbir Zoo; Chandigarh and Vulture Conservation Centre, Pinjore; Management Tour (India Component) to several protected areas of Maharashtra and Madhya Pradesh from 23 February to 10 March 2019.

XXXIV Certificate Course in Wildlife Management Concluded, Dehradun, 1 November 2018 to 31 January 2019.

The Certificate Course began on 1 November 2018. A total of 18 officer trainees joined the course, of which nine officer trainees were from six different states of the country and nine were foreign countries (five from Malaysia and four from Myanmar).

Apart from the classroom teaching, the officer trainees were taken to Chilla for Orientation-

cum-Technique Tour on 16-28 November 2018 for thirteen days to learn various techniques pertaining to wildlife management. The Management Tour was conducted at various protected areas of Madhya Pradesh, Rajasthan and Chennai and Colombo, Sri Lanka during 5-27 January 2019. The Valedictory Function was organised on 31 January 2019. All the officer trainees have successfully completed the course. Shri Jitendra Agarwal, Former Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Govt. of Madhya Pradesh graced the occasion as the Chief Guest and Dr Rakesh Sharma, Vice Chancellor, Graphic Era University, Dehradun as Guest of Honour. They presented the certificates and awards to the following officer trainees:

Institute's Gold Meal for the Top Trainee was awarded to Mr Mariaswamy K.M. The Silver Medal for the Best All Round Wildlifer; Institute's Silver Medal for Wildlife Management; and Institute's Silver Medal for the Best Foreign Trainee were bagged by Ms Natalia Nadia Yahya.

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Workshops, Seminars and Conferences organised

Special Course on Protected Area Management Planning and Plan Implementation for Sri Lankan Forest Officers, Dehradun, 2-9 April 2018.

The special course on 'Protected Area Management Planning and Plan Implementation' was conducted for Sri Lankan Forest Officers at Wildlife Institute of India. A total of eight Sri Lankan forest officers had participated in this course. This special course was designed to aid the Sri Lankan Protected Area Managers to prepare Management Plan for Wilpattu National Park in Sri Lanka. Both classroom and field inputs were provided during the intensive module period. The course inputs were provided at the Institute during 3-5 April 2018. The participants were taken for a field tour to Rajaji Tiger Reserve, Chilla during 6-8 April 2018.

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Sensitization Workshop on Managing Aquatic Macro-Fauna along Ganga River, Dehradun, 26-28 April 2018.

This 3-day sensitization workshop for Field Veterinary officers of Uttarakhand State" has been organised under the WII-NMCG Biodiversity Conservation and Ganga Rejuvenation Project, Component IV- Rescue and Rehabilitation. The workshop objective was to sensitize veterinary officers to various aspects of conservation and management of Aquatic Macro Fauna. Topics planned were basics of species biology and ecology to conservation challenges, emerging zoonoses, *ex-situ* management, rescue and rehabilitation as well as legal issues for relevant field investigations. The workshop includes theoretical inputs at Wildlife Institute of India and field exposure at Dehradun Zoo by both internal and external experts. The hands-on

training on the 'Use of various equipment employed for physical capture techniques' was carried out.

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The workshop was attended by 34 veterinary field officers, including 14 lady officers. WII-NMCG Biodiversity Conservation and Ganga Rejuvenation project supported the workshop.

Workshop on Status of Tiger Habitat in High Altitude Ecosystems in Bhutan, India and Nepal, Dehradun, 27 April 2018.

Global Tiger Forum (GTF), an Inter-Governmental Organization, with the support of International Union for Conservation of Nature and Natural Resources (IUCN) is implementing a collaborative project involving the Governments of India, Bhutan and Nepal for understanding and conservation planning of tigers in the Higher Altitude Region (in the Himalaya). The main objectives of the project were (i) Appraisal/ ground-truthing of the presence of tiger, co-predators and prey along with human-induced land-use changes; (ii) mapping corridor connectivity and status of the corridor; and (iii) roadmap for long-term conservation efforts for tigers in high altitude regions.

To move forward with this project effectively, a consultation workshop was held in Bhutan during 3-4 April 2018 and the second workshop was held at the Wildlife Institute of India. This specific workshop was conducted to identify specific protocol and implementing strategies and was attended by 20 officers and professionals from India, Bhutan and Nepal, and partner organisations such as National Tiger Conservation Authority, World Wildlife Fund-India (WWF-India), National Trust for Nature Conservation (NTNC) and Uttarakhand Forest Department. The workshop has been able to develop a standardized protocol for data collection and database management towards effective implementation of the project and also for future decision making related to any conservation and development issues in the Himalayan region.

Workshop on "Integrating Precipitation Forecasts and Climate Predictions with Basin-Scale Hydrological Modelling in the Himalayas", Dehradun, 2-4 May 2018.

The workshop was organised by the India-UK Water Centre of Indian Institute of Tropical Meteorology (IITM), Pune and Wildlife Institute of India (WII), Dehradun at WII. The conveners of the workshop were University of Birmingham; The Energy and Resources Institute (TERI); WII; Centre for Ecology and Hydrology, UK (CEH) and IITM. A total of 10 participants from UK and Europe and 30 participants from India, including hydrologists, glaciologists, meteorologists, climate scientists, wildlife scientists and Ph.D. students participated in this workshop. The aim of this workshop was to promote the development of short, medium, and long-term hydrological predictions for Himalayan basins by specifying how integrated hydrological prediction systems for the region can be improved. The participants discussed solutions for key scientific problem gaps, including how to gain synergies by increasing cross-institutional collaboration. The status of the survey work and future prospective of the DST-NMSHE project of WII was also presented in the workshop.

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WCPA-Asia Steering Committee Meeting, Dehradun, 7-9 May 2018.
Wildlife Institute of India (WII) hosted the Steering Committee Meeting of World Commission on Protected Areas (WCPA) - Asia Region. Prof. Yoshitaka Kumagai (Japan), Mr Hamzah Amran (Malaysia), Ms Kim Minsun (IUCN, Thailand), Dr V.B. Mathur, Regional Vice-Chair for South Asia, Dr S. Sathyakumar, Dr K. Sivakumar and Dr Major Nair (WII) participated in this meeting. The foreign participants undertook field visits to Rajaji National Park and Benog Wildlife Sanctuary to get an exposure to wildlife management. Minutes of the last meeting held on 7 August 2017 at Bangkok, Thailand; brief reports from each WCPA Sub-region for 2017-18; Priorities for 2018-19; and update on SC meeting held at Lebanon were presented and discussed. Later, presentations and discussions on Beyond Aichi targets, WCPA Membership, Asia Protected Area Programme and 2nd Asia Parks Congress were held. The meeting closed after discussions with Ms Kathy Mackinnon, Chair, WCPA and Mr Scott Perkins (IUCN Asia Regional Office, Thailand) via skype.

One-week Special Course on Wildlife Protection, Law and Forensic Science for the Officer Trainees of 69th Batch of Indian Revenue Services (Custom and Central Excise) Group-A Service, Dehradun, 7-12 May and 14-19 May 2018.
The National Academy of Custom, Indirect Taxes and Narcotics (NACIN) had sent 120 Officer Trainees of 69th Batch of Indian Revenue Services (Custom and Central Excise) Group-A Service in two batches for a one-week special course on Wildlife Protection, Law and Forensic Science. In the first group 61 and second group 59 Officer Trainees joined the WII for the one-week course, respectively. Three-day classroom inputs were provided on 'Illegal trade of various fauna and flora; Use of modern tools for identification of species of confiscated biological samples with relevant case studies; and Hands-on exposure of contraband biological samples with simple tips for the identification of highly demanded products'. The course received excellent feedback from the participants.

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3-day Sensitization workshop on "Managing Aquatic Macro-fauna along Ganga River", Dehradun, 15-17 May 2018.
The workshop was organized as part of the WII-NMCG Biodiversity Conservation and Ganga Rejuvenation Project (Component IV) for local communities. The objective of the workshop was to sensitize the target group on protocols and procedures required for managing macro-fauna in distress as first responders. Thirty-three Ganga Praharis from Varanasi attended the workshop.

Workshop on 'Public Participation in Generating Biodiversity Information', Dehradun, 20-21 June 2018.
A workshop on 'Public Participation in Generating Biodiversity Information" was organised at Wildlife Institute of India. This workshop brought together a range of stakeholders, including those involved in such projects, conservation managers and governmental regulators. The workshop was co-funded by Foundation for Ecological Security (FES) and Wildlife Institute of India. It addressed the following questions: (i) What is the value of biodiversity information for meeting India's conservation goals and commitments; and what is the contribution of public participation in this? (ii) How can public participation in generating biodiversity information be strengthened and expanded? (iii) What are the opportunities and constraints in aggregating and sharing biodiversity data help by various institutions? (iv) What concerns exist in generating and sharing such data, and how can they be addressed? (v) How can these efforts strengthen the biodiversity strategy outlined in the National Biodiversity Information Outlook?

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The workshop was attended by 49 participants from multiple agencies/institutions. They learnt about how public participation has been facilitating the discovery of new species of butterflies, the tracking of seasonal changes, monitoring of distribution and abundance of birds and many other important outcomes.

Sensitization Workshop on Managing Aquatic Macro-Fauna along Ganga River, Dehradun, 27-29 June 2018.

A sensitization workshop for Veterinary Officers of Uttar Pradesh State was organised under the aegis of the WII-NMCG Biodiversity Conservation and Ganga Rejuvenation Project, Component IV- Rescue and Rehabilitation. The workshop aimed at sensitizing the veterinary field officers to various aspects of conservation and management of Aquatic Macro Fauna. Significant areas of deliberations included specific sessions on species biology, ecology, veterinary and healthcare, rescue and rehabilitation needs, *ex-situ* management as well as legal provision in managing wildlife cases.

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The workshop was attended by 30 veterinary officers from 9 districts along the Ganges *viz.* Sambhal, Varanasi, Allahabad, Hardoi, Bareilly, Bijnor, Kanpur Nagar, Hapur and Lucknow. It was supported by the WII- NMCG Biodiversity Conservation and Ganga Rejuvenation project.

Consultative Workshop on 'Standardization of the Process of Preparation of State Biodiversity Strategy and Action Plan (SBSAP) and Development of Resource Mobilization Strategy for Implementation of SBSAP' Dehradun, 20 July 2018.

India is a Party to Convention on Biological Diversity (CBD). To achieve the global and National Biodiversity Targets, the CBD mandates each Party to prepare National Biodiversity Strategy and Action Plan (NBSAP) or an equivalent instrument, and to ensure that this strategy is mainstreamed into relevant sectoral and cross-sectoral plans, programmes and policies. NBSAPs are the principal instruments for implementing the Convention at the national level. In this context, all State Governments need to prepare and/or revise their State Biodiversity Action Plan (SBSAPs) in line with the NBSAP and 12 National Biodiversity Targets and develop a Resource Mobilization Strategy for implementation of SBSAP.

Accordingly, on behalf of National Biodiversity Authority and Ministry of Environment, Forest and Climate Change, Wildlife Institute of India conducted a one-day consultative workshop on standardization of the process of preparation of State Biodiversity Strategy and Action Plan (SBSAP) and Development of Resource Mobilization Strategy for implementation of SBSAP at State level with the financial support from UNDP India, under the Chairmanship of Shri Hem Pande, Former Secretary, Govt. of India and Dr Amarjeet Ahuja, Former Secretary, Govt. of India. The representatives of key Biodiversity Boards, *viz.*, Uttar Pradesh, Uttarakhand, Madhya Pradesh, Gujarat, Himachal Pradesh, Haryana and Maharashtra participated in the workshop and provided inputs for development of standard template of SBSAP. The Chairperson and Member Secretary of National Biodiversity Authority participated in the workshop through video conferencing and reiterated the commitment of NBA for steering the SBSAP preparation process.

Certificate Course on 'Ganga Prahari Livelihood Enhancement' under Green Skill Development Programme, Sarnath, Uttar Pradesh, 23 July-12 August 2018.

A Certificate Course on 'Ganga Prahari Livelihood Enhancement' under Green Skill Development Programme of Ministry of Environment, Forest and Climate Change, Govt. of India was organised at Sarnath, Uttar Pradesh. The program comprised of four components, *i.e.* Health and Wellness Program; Nursery Training Program; Prasad and Incense Making Program; and Tourist Guide Program. The three-week extensive course was supervised by resource persons from the Wildlife Institute of India; Himalayan Environmental Studies and Conservation Organization (HESCO, Dehradun); various Central and State Tourism Departments; and Forest, Agriculture and Horticulture Departments. In all, 77 Ganga Praharis were trained under this skill development course.

Training Workshop on "Management Effectiveness Evaluation (MEE) of Protected Areas" for IFS Officers, Dehradun, 2-3 August 2018.

The Ministry of Environment, Forest and Climate Change, Government of India sponsored a two-day training workshop for Indian Forest Service officers on "Management Effectiveness Evaluation of Protected Areas". In all, 21 officers participated in the workshop. The workshop had presentations on MEE criteria and indicators; MEE of Tiger Reserves; MEE of National Parks and Wildlife Sanctuaries; and Challenges in protection and management of Indian Coastal and Marine Protected Areas (CMPAs). The training workshop received excellent feedback from the participants.

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Training Programme on 'Capacity Building for the Conservation of Herpetofauna and Snake Bite Management,' Panna Tiger Reserve, 6 August 2018.

The objective of the training was to build capacity and create awareness and education amongst the various major stakeholders, including forest department, officials, local villagers and students to promote conservation of herpetofauna. It was organised by the project team of WII. More than 100 forest department staff and officials participated in the training.

Capacity Building-cum-Planning Workshop on Ecotourism and Visitor-Use Management in Protected Areas', Dehradun, 8-10 August 2018.

A three-day capacity building-cum-planning workshop was organised at the Wildlife Institute of India (WII), Dehradun with support from the National Tiger Conservation Authority (NTCA), Government of India. The main objectives were to provide a platform for (a) Increasing awareness regarding planning frameworks for visitor-use management; (b) Review of the impact of the NTCA Guidelines on Tourism in Tiger Reserves; and (c) Developing an outline for a long-term collaborative project for policy, planning, research and capacity building in the area of tourism management.

Twenty forest officers from Tiger Reserves across six states of India and representatives from NTCA, WWF and Tata Trust Tourism Division attended the workshop. The workshop was conducted by the resource persons from the University of Montana, United States; Griffith University, Australia; Dr H.S. Pabla, Chairman, WII-TRAC; and Shri R. Bhartari, Chief Wildlife Warden, Uttarakhand.

Inception Workshop on WII-GIZ Human-Wildlife Conflict Project, Dehradun, 24 August 2018.

The Wildlife Institute of India launched a new project on "Knowledge support to development of guidelines, specialized field studies and training on human-wildlife conflict mitigation in India", funded by the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) GmbH under the Indo-German Technical Cooperation project entitled "Human-wildlife conflict mitigation in India (HWC)".

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The inception workshop was chaired by Dr H.S. Pabla, Chairman, WII-TRAC and Dr Konrad Uebelhoer, Programme Director, Indo-German Biodiversity Programme, GIZ. The workshop was organised to launch the project activities and to initiate planning for developing National Human-Wildlife Conflict Mitigation Strategy and Action Plan (N-HWCM-SAP) and Standard Operating Procedure (SOPs) for conflict mitigation with selected species. The primary agenda of the workshop was to share information of the overall cooperation among MoEFCC-GIZ-WII and to discuss the framework, key elements, approach and work-plan for drafting N-HWCM-SAP and SOPs. The workshop was attended by 39 senior forest officials, scientists and researchers. The workshop included case studies, knowledge café, and group discussions on N-HWCM-SAP and SOPs for carnivore and herbivore species. In the end, frameworks and key elements of N-HWC-SAP and SOPs were finalized.

National Consultation Workshop for 'Recommending the Future Status of Sea Cucumber Conservation in India', Dehradun, 3 September 2018.

A national consultation workshop for recommending the future status of sea cucumber conservation in India' was held at Wildlife Institute of India. The workshop was attended by experts and managers representing various National and International Institutions, NGOs, and State Forest Departments. It was organised to get the inputs and opinions of experts and managers on the current conservation status of sea cucumbers in India so that the MoEFCC can be appraised appropriately to decide on the listing of sea cucumbers in the Wildlife (Protection) Act, 1972. Presentations were made on the ecology, status, distribution and ecological role of sea cucumbers in India and on a recent survey of sea cucumbers in Palk Bay and Gulf of Mannar regions. The participants were of a considered view that the present history of sea cucumbers in Schedule I of the Wildlife (Protection) Act, 1972 should continue.

3rd Himalayan Research Seminar (HRS), Dehradun, 10 September 2018.

The HRS was chaired by Dr M.K. Pandit, Dean, Faculty of Science, University of Delhi. A total of 19 presentations were made in five technical sessions *viz.*, Ecological Patterns; Aquatic Ecology; Human dimension and interface; Ecology and modelling and Plant ecology; and Ethnobotany. Twelve poster presentations were also made in the HRS.

XIV Internal Annual Research Seminar (IARS), Dehradun, 11 September 2018.

The IARS was chaired by Shri V.K. Uniyal, Former PCCF, Kerala. A total of 12 presentations were made in four technical sessions' *viz.*, Status and Distribution, Ecology and Behaviour, Taxonomy and Genetics, and Anthropogenic drivers and Impacts. The presentations were based on recently initiated and ongoing research studies and were made by research fellows of the Institute.

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The following presentations were adjudged as the three best oral presentations by a panel of two external evaluators and the research personnel were awarded book prizes:

Oral Presentation Awards

XIV - Internal Annual Research Seminar (11 September 2018)

Rank	Name	Title of Presentation
I	N. Lakshminarayanan	Undefined boundaries, prickly neighbours: some preliminary insights on human-elephant conflict in Chhattisgarh
II	Shaheer Khan	Living in the Anthropocene: Space use and movement of Indian grey wolf
III	Rohit Jha	Dog is not a bird's best friend! Breeding distribution and proximate factors affecting nest success in four exclusively river-island nesting birds in the National Chambal Sanctuary, Uttar Pradesh

Seminar on Biodiversity Conservation and Ganga Rejuvenation, Dehradun, 17 September 2018.

The seminar was chaired by Dr Savita, Director FRI. A total of 10 presentations were made in two technical sessions, *viz.*, Biodiversity Conservation in Ganga and Community Participation and Awareness Creation.

The following were adjudged as the three best oral presentations by a panel of 3 external evaluators and the research personnel were awarded book prizes:

Oral Presentation Awards

Seminar on Biodiversity Conservation and Ganga Rejuvenation (17 September 2018)

Rank	Name	Title of Presentation
I	Dr Niladri Dasgupta	Prioritization of areas for conservation in mainstream Ganga River
II	Ravi Sharma	Identifying effective education strategies for creating a connect between the resources and community living along the Ganga
III	Dr Sangeeta Angom	Capacity building for biodiversity conservation of various stakeholders of Ganga River

A total of 25 poster presentations were made. The following presentations were adjudged as the three best poster presentations by a panel of 3 external evaluators and the research personnel were awarded book prizes:

Poster Presentation Awards

Rank	Name	Title of the Poster Presentation
I	Amanat K. Gill	Evaluating the ecosystem services of Ganga River: A framework
II	Ekta Sharma and Manisha Mallick	Pathway for community mobilization in Biodiversity Conservation and Ganga Rejuvenation: Case Studies from Bihar, Jharkhand and West Bengal
III	Bitupan Baruah	An overview of anuran and squamate reptile diversity along Ganga and Alaknanda Rivers, India
	Sayantika Banerjee	The past and present distribution of aquatic and semi-aquatic mammals of the Ganga River basin

Seminar on Endangered Species Recovery Programme, Dehradun, 18 September 2018.

The seminar was chaired by Dr P.K. Mathur, Former Dean, WII. A total of 4 presentations were made in two technical sessions, *viz.*, Terrestrial Species and Aquatic Species.

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The following were adjudged as the three best oral presentations by a panel of 2 external evaluators and the research personnel were awarded book prizes:

Oral Presentation Awards

Seminar on Endangered Species Recovery Programme, Dehradun (18 September 2018)

Rank	Name	Title of Presentation
I	Dr Anant Pande	Conserving the sea grass sentinels: an update on the Dugong Recovery Program
II	Dr Rashid H Raza	Understanding Distribution, Abundance & Anthropogenic Stressors of Gangetic River Dolphin in Ganga - Brahmaputra System
III	Dr Chongpi Tuboi	Implementation of action plan for conservation of Manipur's brow antlered deer or *Sangai*: An update

A total of 25 poster presentations were made. The following were adjudged as the three best poster presentations by a panel of 2 external evaluators and the research personnel were awarded book prizes:

Poster Presentation Awards

Rank	Name	Title of the Poster Presentation
I	Priyamvada Bagaria	Challenges in mapping the grassland habitats of highly endangered species of both marine and desert ecosystems
II	Swapnali Gole	Uncharismatic habitats: studying sea grass ecosystems in a coral-centric marine world
III	Sajal Sharma	Use of advanced technology for monitoring Gangetic River Dolphin and its habitat
	Ashwin Warudkar and Sunny Deori	Abundance and distribution of Ganges River Dolphin (*Platanista gangetica gangetica*) in Brahmaputra River System

XXXII Annual Research Seminar (ARS), Dehradun, 19-20 September 2018.
Dr S.S. Negi, Former Director General and Special Secretary, MoEFCC gave the inaugural address. Dr H.S. Pabla, Chairman WII-Training, Research and Academic Council was the seminar chairperson. A total of 24 presentations were made in six technical sessions *viz.*, Species recovery programmes, Mammalian Ecology, Landscape management and climate change, Human-wildlife Interface and Invasive Species Ecology, Tools and Techniques for Wildlife Management, and Wildlife Monitoring. The presentations were based on the ongoing/completed research studies. They were made by research fellows and faculty members of the Institute.

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More than 600 delegates attended the ARS that included senior officials of MoEFCC, Principal Chief Conservators of Forests, Chief Wildlife Wardens and other senior officials representing State Forest Departments, delegation from NTCA and WWF, officials of sister institutions, scientists, wildlife experts, National Mission for Clean Ganga, NGOs, faculty members, researchers, M.Sc. students and officer trainees of the Post-Graduate Diploma Course in Advanced Wildlife Management. The probationers undergoing training at the Indira Gandhi National Forest Academy and CASFOS attended the first two sessions on the inaugural day.

A panel of four eminent scientists and wildlife managers evaluated the oral presentations. Presentations made by the following researchers were adjudged the 'best presentations' during the XXXII Annual Research Seminar of the Institute and researchers were awarded the book prize.

Oral Presentation Awards

XXXII -Annual Research Seminar (19-20 September 2018)

Rank	Name	Title of Presentation
I	Tapajit Bhattacharya	Assessment of climate change effects on wildlife species in the Indian Himalayan Region: An initiative in three biotic provinces
II	Ninad Mungi	What makes *Lantana camara* invasion, a success? Degrading forests and adaptive plasticity!
III	Shri Anant Pande	Movement ecology of swamp deer along upper Gangetic plains of north India

A total of 15 poster presentations were made. The following were adjudged as the three best poster presentations by a panel of 4 external evaluators and the research personnel were awarded book prizes:

Poster Presentation Awards

Rank	Name	Title of the Poster Presentation
I	Tista Ghosh	Insight into RhoDIS: A molecular approach for rhino forensic and population management in India
II	Ankita Bhattacharya	Misty mountain hop: A scoping study in two Protected Areas of Himachal Pradesh, India
III	Urjit Bhatt	Catch me if you can: Does moon illumination influence mammal activity in Manas National Park?
	Suyash Katdare	Demographic status of Gharial (*Gavialis gangeticus*) in the National Chambal Sanctuary

Meeting of Chief Wildlife Wardens of States and Union Territories of Government of India, Dehradun, 21-22 September 2018.
A two-day meeting was organised at Wildlife Institute of India, Dehradun under the Chairmanship of Shri Siddhanta Das, Director General of Forests & Special Secretary to the Govt. of India, Ministry of Environment Forest & Climate Change (MoEFCC) to discuss the issues and challenges related to wildlife conservation in the country. The Chief Wildlife Wardens or their representatives of 23 States & Union Territories participated in the meeting. Shri M.S. Negi, Additional Director General of Forests (Wildlife), MoEFCC and Dr Amit Mallik, IG (NTCA), MoEFCC were present as Guests of Honour. The meeting focused on various important issues such as use of modern technology in Wildlife Management; Population management for mitigation of Human-Wildlife Conflicts; and Use of M-STrIPES in tiger monitoring and possibilities of its replication in other PAs. The senior

officials discussed the priorities of research and capacity building, human-wildlife conflict scenario and best practices in the respective States.

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A meeting of CWLWs with the Chairmen of the 13 Regional Expert Committees of Management Effectiveness Evaluation (MEE) and WII faculty representatives was also organized. In the meeting, the result of MEE of 125 National Parks and Wildlife Sanctuaries conducted during 2017-18 was shared by Dr V.B. Mathur, Director, WII. The management strengths, management weaknesses and immediately actionable points were discussed by 13 Chairmen with the respective CWLW State representatives.

2018 Ecosystem Services Partnership (ESP) Asia Conference, Dehradun, 9-12 October 2018.

Wildlife Institute of India organised the 2018 Ecosystem Services Partnership (ESP) Asia Conference in association with the Ecosystem Services Partnership (ESP) Asia Regional Office, the Republic of Korea at the Wildlife Institute of India. The theme of this year's Asia regional conference was "Communicating and Engaging Ecosystem Services in Policy and Practice in Asia".

The ESP Regional Conference offered a unique opportunity to share experiences with the ecosystem service community in Asia and strengthen the regional network. The aim of this conference was to accelerate collaboration in Asia by expanding information-sharing among experts, policy-makers and practitioners on ecosystem services as a practical tool for nature-based solutions. Nearly 70 participants, including 25 nationals from Asian countries attended the conference comprising students, researchers, practitioners and government representatives.

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Two-day 'Writing Workshop for the Development of the Structure and Framework of the National Human-Wildlife Conflict Mitigation Strategy and Action Plan (N-HWCM-SAP) and Standard Operating Procedure (SOPs),' Dehradun, 15-16 October 2018.

The Wildlife Institute of India organised a writing workshop for the development of the structure and framework of the National Human-Wildlife Conflict Mitigation Strategy and Action Plan (N-HWCM-SAP) and Standard Operating Procedure (SOPs) for conflict mitigation with selected species, as part of its project entitled "Knowledge Support to Development of Guidelines, Specialized Field Studies and Training on Human-Wildlife Conflict Mitigation in India". The project is a collaboration between WII, *Gesellschaft für*

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Internationale Zusammenarbeit (GIZ) GmbH and Ministry of Environment, Forest and Climate Change (MoEFCC).

The primary agenda of the workshop was to review and deliberate on existing information on human-wildlife conflict and mitigation strategies so as to effectively structure the framework of N-HWCM-SAP and SOPs. The workshop was attended by 37 senior officials from MoEFCC and State Forest Departments, scientists and researchers. The workshop included the formation of expert groups dealing with specific sections of the N-HWCM-SAP and species/case studies.

The BIOFIN Technical Partner's Meeting, UNDP, New Delhi, 25 October 2018.

Biodiversity Finance Initiative (BIOFIN) is a global programme launched by UNDP in 2012, currently being implemented in 31 countries of the world to address the biodiversity finance challenge in a comprehensive manner and India became part of the global team from May 2015 onwards. As part of BIOFIN Project, UNDP India organised the technical partners meeting under the chairmanship of Ms Anabelle Trinidad, Senior Technical Advisor, Global BIOFIN Programme. The agenda of the meeting was to discuss the progress made till date in the first phase of BIOFIN project in India and to discuss the way forward in the second phase of BIOFIN and the implementation of National Biodiversity Finance Plan. In the meeting, presentations were made by BIOFIN technical agencies and their contributions in developing India's National Biodiversity Finance Plan. A total of 15 participants attended the meeting.

Planning Meeting Regional Expert Committee (REC) for Management Effectiveness Evaluation (MEE) of National Parks and Wildlife Sanctuaries in 2018-19, New Delhi, 31 October 2018.

Wildlife Institute of India organised a planning meeting with 64 experts of 16 Independent Regional Expert Committee (RECs) for Management Effectiveness Evaluation (MEE) of National Parks and Wildlife Sanctuaries in 2018-19 under the Chairmanship of Shri M.S. Negi, Additional Director General of Forests (Wildlife) and Inspector General of Wildlife, Ministry of Environment Forest & Climate Change (MoEFCC), Government of India. The MoEFCC constituted 16 Independent Regional Expert Committees for undertaking Management Effectiveness Evaluation of 146 National Parks and Wildlife Sanctuaries during 2018-19 in the country. In this meeting, the tentative plans of field visit for evaluation of 146 protected areas in the country during 2018-19 were discussed by 16 RECs. The results of MEE of 125 National Parks and Wildlife Sanctuaries conducted during 2017-18 were also shared by Dr V.B. Mathur, Director, WII.

National Training Workshop on Biodiversity Conservation and Ganga Rejuvenation of Ganga States", Dehradun, 14-18 November 2018.

The National training workshop for College and University Teachers under WII-NMCG project "Biodiversity Conservation and Ganga Rejuvenation" was conducted at Wildlife Institute of India. A total of 24 professors from five Ganga States *viz.* Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal participated in the workshop. The main objective of the workshop was to develop the skills of the participants in the area of aquatic biodiversity conservation. Theoretical emphasis was given on understanding the biology, ecology and monitoring for various taxa like invertebrates, dolphins, turtles and otters. A field visit to the Himalayan Environmental Studies & Conservation Organisation (HESCO), Suklapur was organised where interaction regarding the recharge of streams and rivers using isotopes, was discussed with the participants. A field monitoring demonstration was organised in Rajaji National Park, Uttarakhand.

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Two-day Training Workshop on "Mainstreaming Biodiversity in Impact Assessment", Dehradun, 15-16 November 2018.

The two-day training workshop was conducted for Indian Forest Service Officers at Wildlife Institute of India. The objectives of the workshop were to (i) improve the mechanisms for mainstreaming biodiversity in impact assessment for sound decision making and long term gains for conservation; (ii) enhance understanding of the issues and conflicts related to role of impact assessment

in meeting conservation and development goals vis-à-vis ground realities; and (iii) review options for professionalizing EIA for positive outcomes for biodiversity conservation. A total of eleven officers from seven States attended this workshop.

Training inputs were given on Integration of biodiversity in impact assessment; EIA framework and best practices for mitigating impacts on biodiversity; Best practices for planning and implementing conservation solutions in transportation infrastructure development cumulative assessment of hydropower development. A film on the Impacts of hydropower development was also screened. A panel discussion on the 'Role of Foresters in professionalizing EIA for biodiversity conservation' was held for the participants.

Interaction Meeting for Management Effectiveness Evaluation (MEE) of Fourth Cycle of Tiger Reserves in India, New Delhi, 20 November 2018.

Wildlife Institute of India in collaboration with National Tiger Conservation Authority (NTCA) organised an interaction meeting for Management Effectiveness Evaluation of Fourth Cycle of Tiger Reserves at Scope Complex, New Delhi under the Chairmanship of Shri Anup Nayak, Member-Secretary, NTCA and Dr V.B. Mathur, Director, WII. Over 75 participants attended the meeting, which included Field Directors of 50 Tiger Reserves, Chairman and Members of five Independent Regional Expert Committees, WII Faculty Members and NTCA Officials. The agenda of the meeting was to discuss the outcomes of the fourth cycle of MEE of Tiger Reserves with Field Directors of all Tiger Reserves.

Stakeholders' Workshop on "Forests for Water", Dehradun, 28 November 2018.

A stakeholders' workshop on "Forests for Water" was organised by Wildlife Institute of India, Dehradun in partnership with Foundation for Ecological Security (FES), Anand at Dehradun. A total of 63 participants and resource persons from various organisations *viz.* Forest Research Institute, Forest Survey of India, IIT Roorkee, ATREE Bangalore, Peoples Science Institute, Water Aid India, G.B. Pant Himalayan Institute, Indian Institute of Remote Sensing, Veditum India Foundation etc. participated in the event. The objective was to bring together the experiences of the various stakeholders in the conservation of forest for water and to carve out pathways for future collaborations. The highlight of the workshop was the talk by Dr Michael P. Dombeck on "Forests for water". Dr Dombeck is the former chief of the U.S. Forest Service and U.S. Bureau of Land Management and currently serves as the Executive Director of the David Smith Post-doctoral Fellowship Programme on Conservation Biology.

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One-Week Compulsory Training Programme for IFS Officers on "Illegal Trade in Wildlife and Role of Wildlife Forensics in Dealing with Wildlife Crime", Port Blair, 3-7 December 2018.

The Wildlife Institute of India conducted the One Week Compulsory Training Programme on "Illegal Trade in wildlife and role of wildlife forensics in dealing with wildlife crime" at Port Blair. A total of 36 IFS Officers participated in the course. The course provided extensive inputs on forensic science and its relevance in combating Wildlife crime. The first day concentrated on theoretical inputs. The trainees were taken to field during next three days to Jolly Boy Island, Mahatma Gandhi Marine National Park, Mangrove Forest in Baratang Island and Havelock Islands, where they were given inputs on the investigation, crime scene analysis, evidence collection and mock exercises. Overall feedback on the course was very good.

One-day Workshops on "Managing Aquatic Macro-fauna along Ganga River", Dehradun, 7-8 December 2018.

Two separate one-day workshops on were organized by the Wildlife Institute of India for forest officials of Kashi Division, Uttar Pradesh Forest Department. A total of 63 forest department staff from Mughalsarai, Chahania, Naughad, Chandraprabha, Jaimohini, Mazgai, Chakia ranges and the Flying Squad attended both the workshops.

Inception Meeting on 'UNDP Project SECURE Himalaya', Dehradun, 11 December 2018.

WII organised the Inception meeting on Project SECURE Himalayas (Securing livelihoods, conservation, sustainable use and restoration of high range Himalayan ecosystems) funded by UNDP on International Mountain Day. The main objective of the workshop was to prepare a road map for implementation of the WII project pertaining to the delineation of the landscape boundaries, identifying the key stakeholders and villages in the landscape. The purpose of this meeting was also to decide on the tentative dates of the four workshops to be conducted in the two landscapes in Uttarakhand (Gangotri–Govind and Darma–Byans). In all, 32 people, including specialists and forest officials from various organisations, attended the meeting. Four presentations on WII studies were made in the meeting. Based on the deliberations, the road map for implementation of these studies under SECURE Project was prepared.

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Training Course on Eco-development Planning for Biodiversity Conservation, Dehradun, 19–26 December 2018.

As part of the ongoing Post Graduate Diploma Course, under the module on "Eco-development planning for Biodiversity Conservation", the *Namami Gange* – the WII project "Biodiversity Conservation and Ganga Rejuvenation" has sponsored the lateral entrant officers at ACF/DCF level from five Ganga states at Wildlife Institute of India (WII), Dehradun. The objectives were to discuss the various aspects of biodiversity conservation and importance of community participation highlighting the importance of motivation in the process of natural resource conservation, understanding the causes of conflict and the possible measures for their resolution as well as mitigation. The course also aimed at the methods and practical experiences utilised to ensure cooperation between the various stakeholders involved in ensuring sustainable resource utilisation and eco-development. A total of eight forest officials participated in the training course.

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Three-day Module on 'Wildlife Management' for IFS Officers, Dehradun, 26-28 December 2018.

A 3-day module on 'Wildlife Management' was organised at Wildlife Institute of India for IFS officers undergoing induction training at Indira Gandhi National Forest Academy, Dehradun. The schedule included a variety of themes related to the topic, including Wildlife Census and Monitoring, Wildlife Forensics, Overview of Wildlife Health, Management Effectiveness Evaluation, Human-Wildlife Interface, Wetland Management, Use of technology in Wildlife, ex-situ Conservation, and World Heritage Management. The programme culminated with a panel discussion on 'Emerging issues in wildlife management'. A field trip to Asan Barrage was also organised for the officer trainees. A total of 36 officer trainees attended the programme from the states of Andhra Pradesh, Assam, Chhattisgarh, Himachal Pradesh, Kerala, Odisha, Rajasthan, Tamil Nadu, Telangana, Uttarakhand and West Bengal.

Consultation and Field Survey in Garo Hills Conservation Area, Meghalaya, 9 January 2019.

The UNESCO C2C-WII organised a Community Stakeholder Consultation in Tura, Garo Hills, Meghalaya. The primary objectives of the consultation were to (i) share information about the status and process of Garo Hills Conservation Area as a proposed World Heritage Site; and (ii) enhance understanding of the unique culture and traditions of the communities of Garo Hills for their appropriate reflection in the World Heritage nomination document. A total of 27 participants, including local community

representatives and Forest Department personnel, attended the consultation and provided positive feedback on the proposed nomination of the site as World Heritage.

10-day Orientation Workshop on "Wildlife and Health Management", Dehradun, 16-25 January 2019.

10-day orientation workshop was organized by the Institute for veterinary officers of Uttarakhand. The workshop was organized with the objective of providing an exposure on various aspects of wildlife management. It included topics ranging from basics of species biology, behavior and ecology to conservation challenges in Uttarakhand, dimensions of human-wildlife conflict, wildlife forensics, emerging zoonoses, ex-situ management, rescue and rehabilitation as well as legal issues for relevant field investigations. The workshop included theoretical inputs at Wildlife Institute of India and field exposure at different facilities and institutions. The field component included a visit to Chidiyapur Wildlife Transit Rehabilitation Centre, Haridwar for demonstration of sterilization techniques in macaques. The participants subsequently visited the Wildlife S.O.S's facility (Elephant Conservation & Care Centre and Bear Rescue Facility) at Agra. A field excursion at Keoladeo Ghana National Park was also undertaken followed by a visit to Sariska Tiger Reserve. The field component was aimed at providing a better understanding of capture and restraint options for wild animals, species-specific handling protocols, options and concerns and scientific handling of wild animals.

The workshop was attended by 26 veterinary field officers, including 11 woman officers. The workshop was supported by Uttarakhand Forest Department and CAMPA, Uttarakhand.

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One-week Compulsory Training Course for Indian Forest Service Officers on "Management of Coastal and Marine Biodiversity in India: Challenges and Prospects", Port Blair, Andaman and Nicobar Islands, 4-8 February 2019.

Wildlife Institute of India in association with Department of Environment & Forest, Andaman & Nicobar Islands jointly organised this one-week course. This course addressed the following thematic issues: (i) How effective are administrative/ governance/ legal frameworks for conservation of marine and coastal biodiversity? Are these frameworks promoting the integration of biodiversity conservation and livelihood enhancement? (ii) What are the existing and potential threats for the conservation of coastal and marine biodiversity? (iii) What are the current policy and governance challenges to coastal and marine biodiversity conservation? What is the role of community in the governance and management of marine protected areas and ecologically sensitive coastal areas?

Twenty-seven IFS officers attended the course. Apart from classroom sessions, the participants were taken to Mahatma Gandhi Marine National Park (MGMNP), Wandoor, Jhansi Rani Marine National Park and Baratang mangrove forests for field exposure. The course received excellent feedback from the participants.

Workshop on "Managing Aquatic Macro-fauna along Ganga River", Dehradun, 18 February 2019.

A day-long workshop for frontline staff of Bulandshahr Division of Uttar Pradesh Forest Department was organized by the Wildlife Institute of India as part of the WII-NMCG Biodiversity Conservation and Ganga Rejuvenation Project (Component IV). Thirty-nine forest officials from Anupshahar, Bulandshahr, Arnicha, Dibai, Narora, Khurja, Syana attended the workshop.

6th Course on Wildlife Conservation for Wildlife Enthusiasts, Dehradun, 18–27 February 2019.

Wildlife Institute of India organised the course for wildlife enthusiasts. A total of nine participants attended the course. The participants underwent four days of classroom sessions that dealt with Indian biogeography; Wildlife conservation and challenges across the country; Science and management of tiger reintroduction; Wildlife

trade and dealing with wildlife crime; Managing wild animals in stress. The participants were taken on a five-day field tour to the Kotdi range of the Lansdowne Forest Division adjoining to Corbett TR, and on the return to Dehradun. They were also taken to Jhilmil Conservation Reserve.

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Meeting on 'Action Taken' on the Findings of Management Effectiveness Evaluation (MEE) Exercise Conducted during 2017-18 and Release of the 'MEE of PAs 2017-18' Report, New Delhi, 20-21 February 2019.

In collaboration with Ministry of Environment, Forest & Climate Change (MoEFCC), Government of India, the Wildlife Institute of India (WII) organised a two-day meeting on 'Action Taken' on the findings of Management Effectiveness Evaluation (MEE) exercise conducted during 2017-18 at India International Centre, New Delhi. In the meeting, Shri Siddhanta Das, DGF&SS, MoEFCC, Shri Praveen Garg, AS&FA, MoEFCC, Shri M.S. Negi, ADG (Wildlife), MoEFCC, Shri Soumitra Dasgupta, IGF (Wildlife), Shri S.P. Vashishtha, DIG (Wildlife), MoEFCC and Dr V.B. Mathur, Director, WII provided inputs. Other participants of the meeting were Chief Wildlife Wardens & their representatives from 26 States/UTs, PA managers & their representatives from 119 National Parks and Wildlife Sanctuaries, Chairmen of the 13 Independent Regional Expert Committee (REC) of the MEE, WII Faculty representatives of 13 REC of MEE.

This meeting was called to review the follow-up actions taken or need to be taken on the findings of MEE exercise conducted for 119 National Parks and Wildlife Sanctuaries during 2017-2018. Shri Siddhanta Das, DGF&SS, MoEFCC and Shri Praveen Garg, AS&FA, MoEFCC released the report on MEE of 119 National Parks and Wildlife Sanctuaries. Dr V.B. Mathur, Director, WII presented the results of MEE of 119 National Parks and Wildlife Sanctuaries in the meeting.

Launch of WII Products and Services, New Delhi, 27 February 2019.

In an event on Clean Ganga Movement held at New Delhi, WII's products and services of the project "Biodiversity Conservation and Ganga Rejuvenation" were launched. Present on the occasion were Shri Arun Jaitley, Hon'ble Union Minister for Finance and Corporate Affairs, Government of India, Shri Nitin Gadkari, the Hon'ble Union Minister for Water Resources, River Development and Ganga Rejuvenation, Road Transport Highways and Shipping, Government of India, Shri Dharmendra Pradhan, the Hon'ble Union Minister for Petroleum and Natural Gas and Skill Development and Entrepreneurship, Government of India, Shri Arjun Ram Meghwal, the Hon'ble Minister of State, Water Resources, River Development and Parliamentary Affairs, Dr Satya Pal Singh, the Hon'ble Minister of State, Water Resources, River Development and Ganga Rejuvenation and Human Resource Development, Smt. Hema Malini, the Hon'ble Member of Parliament, Smt. C. Mary Kom Hmangte, the Hon'ble Member of Parliament, Shri U.P. Singh, Secretary, Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India and Shri Rajiv Ranjan Mishra, Director General, National Mission for Clean Ganga.

Ganga Darpan Interpretation Centre at Sarnath and Ganga Tarini, a floating museum in Varanasi were inaugurated. Besides this, Pravasiya Ganga Prahiri Programme was launched. Two publications *viz.* Biodiversity Profile of Ganga River and Conservation Reference Guide for Turtles and Crocodilians were also released during the event. Dr V.B. Mathur, Director, Wildlife Institute of India, Dr S.A. Hussain, Dr Ruchi Badola and Dr Bitapi C. Sinha along with their team members, were also present on this occasion.

Professional Development Programme (PDP) for Enhancing EIA Effectiveness, Dehradun, 25 February–8 March 2019.

The Ministry of Environment, Forest and Climate Change (MoEFCC) sponsored 'Professional Development Programme (PDP) for Enhancing EIA Effectiveness' was conducted at the Wildlife Institute of India, Dehradun. The PDP was designed for MoEFCC officials involved in reviewing EIA reports and engaged in environmental decision-making. The aim of the programme was to significantly contribute to the professional development of these officials so that biodiversity concerns are mainstreamed in the

decision making for enhancing the effectiveness of EIA as a tool against a background of rapidly declining natural heritage.

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In all, 28 officials from MoEFCC, State Forest Departments and Pollution Control Boards participated in this programme. The training programme received excellent feedback.

Workshops, Seminars, Conferences and Meetings attended by WII personnel

IUCN WCPA Steering Committee Meeting, Al Shouf BR, Lebanon, 9-15 April 2018.
The meeting was organised by IUCN's World Commission on Protected Areas (WCPA) at Al Shouf BR. Dr S. Sathyakumar attended the meeting and provided inputs.

CMS- Central Asian Mammal Initiative, Vilm Island, Germany, 16-20 April 2018.
It was organised by CMS-BfN. Dr S. Sathyakumar attended the meeting and provided inputs

Project Evaluation Workshop, Goa, 16-18 May 2018.
It was organised by the National Centre for Polar and Ocean Research (NCPOR), formerly known as the National Centre for Antarctic and Ocean Research (NCAOR). Dr S. Sathyakumar attended the workshop.

38th Annual Conference of the International Association for Impact Assessment (IAIA) "Environmental Justice in Societies in Transition", Durban, South Africa, 16-19 May 2018.
Dr Vinod B. Mathur and Dr Asha Rajvanshi were invited to attend the IAIA'18 and to chair the technical session on "Greening the Transport Sector through Smart Plans and Eco-Friendly Designs" and make presentations in this session. During this session, Dr Mathur made a presentation on Greening the Transport Sector through Smart Plans and Eco-friendly Designs Country Capacity and Financing Option. Dr Asha made a presentation on Good practice guidance for infrastructure assessment and design: Experience from India. Dr Asha Rajvanshi was also invited to make a presentation on 'Enabling approaches for promoting biodiversity offsets in India' in the technical session.

International Expert Workshop on Mainstreaming Biodiversity in the Sectors of Energy and Mining, Infrastructure, and Manufacturing and Processing in Cairo, Egypt, 20-22 June 2018.
Dr Asha was nominated as a member to the Informal Advisory Group on the mainstreaming of biodiversity into economic sectors of the CBD, by MoEFCC, Govt. of India. The Ministry of Environment of the Arab Republic of Egypt and the Secretariat of the Convention on Biological Diversity, with the kind support of the German Federal Ministry for Economic Cooperation and Development and the European Commission, invited Dr Asha Rajvanshi to participate in the International Expert Workshop. During this workshop, Dr Asha presented the country case study on "Linear Infrastructure in India."

CITES Animal Committee Meeting, Geneva, Switzerland, 16-21 July 2018.
It was organised by CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora). Dr S. Sathyakumar attended the meeting and provided inputs.

National Training for Wetland Managers, Myanmar, 6-10 August 2018.
The training programme was organised by Ramsar Regional Centre, East Asia. The objective of the training programme was to provide training on the collection, analyzing the wetland variables for monitoring. Hands-on training on measuring water quality variables, benthic invertebrate sampling was provided, and monitoring framework was demonstrated. Fifteen trainees belonging to Myanmar Forests Service and University faculties attended the training programme.

Dr J.A. Johnson represented the Institute in the training programme.

Meeting of IPBES Expert Group on Policy Support Tools and Methodologies, Cambridge CB2 3QZ, United Kingdom, 7–11 August 2018.

The objectives of the meeting were to (i) finalise drafting of the "Guidance on how to assess policy instruments and facilitate the use of policy support tools through IPBES assessments"; (ii) identify ways in which the catalogue of policy support tools and methodologies and its use can be further developed; and (iii) discuss lessons learnt with respect to IPBES function to support policy formulation and implementation with a view to inform the Platform's next work programme. It was organised by IPBES.

A draft on "Guidance on how to assess policy instruments and facilitate the use of policy support tools through IPBES assessments" and tentative work-plan to guide the further development of the catalogue of policy support tools and methodologies was prepared. A document on structure of catalogue and on lessons learnt with respect to the IPBES function to support policy formulation and implementation with a view to inform the Platform's next rolling work programme was also prepared. Dr Gautam Talukdar attended this meeting.

International Conference on Himalayas and Spirituality, Leh, Ladakh, 17-22 August 2018.

Dr G.S. Rawat participated in the International Conference on Himalayas and Spirituality organised by Save the Himalayas Foundation (SHF) at Mahabodhi International Meditation Centre (MIMC) in Leh, Ladakh. He presented a case study on the conservation and management of natural heritage sites in the Indian Himalayan Region.

IPCC Working Group II First Lead Author Meeting of the Sixth Assessment Report, Venue: Inkosi Albert Luthuli International Convention Center, Durban, South Africa, 24-29 September 2018.

The objective of the workshop was to prepare an internal draft for the Sixth Assessment Report (AR6) of the Working Group II. It was organised by IPCC. The co-chairs described the process and objectives of IPCC made a detailed presentation. A substantial part of LAM1 was allocated to chapter meetings. The chapter teams developed a detailed plan for producing an outline of their Internal Draft. The internal draft was to be submitted to the Technical Support Unit (TSU) by 26th April 2019 and will be circulated to a small group of invited experts for informal peer review. The result of this informal peer review will be considered at the Second Lead Author Meeting (LAM2) in July 2019 at Kathmandu, for the preparation of the First Order Draft of the Report. Dr Gautam Talukdar attended the meeting.

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), Paris, France, 25-27 September 2018.

With her familiarity with the IPBES system and having significantly contributed as a Coordinating Lead Author (CLA) in the IPBES Asia Pacific Regional Assessment and also in defending it in the IPBES Plenary in Medellin, Dr Asha Rajvanshi was nominated to the third IPBES Capacity-building Forum, which was hosted by UNESCO in Paris, France during 25-26 September 2018 and in the discussion group meeting on prioritised cross-cutting areas of the IPBES Capacity-Building Rolling Plan on 27 September 2018 held at UNESCO headquarters in Paris.

First Eastern Ghats Ichthyological Meet, Vishakhapatanam, Andhra Pradesh, 13-14 October 2018.

The objective of the meeting was to sensitizing researchers regarding the need for documenting fish fauna in the Eastern Ghats. The meet was organised by Conservation Leadership Programme & Wildlife Institute of India. It was a first Ichthyological Meet conducted, focusing on fish research and research gaps in the Eastern Ghats landscape. As a resource person, Dr J.A. Johnson delivered a talk on Aquatic resources and conservation challenges. More than 20 students, researchers and nature lovers actively participated in the meet.

Workshop on 'CITES and Livelihoods', Guangzhou, China, 5-9 November 2018.

Dr G.S. Rawat participated in the workshop on 'CITES and Livelihoods' held at Guangzhou. It

was organised by CITES. Dr Rawat presented a case study on the status of cultivation and trade of Saussurea costus (Kuth) on behalf of MoEFCC.

International Mahseer Conference, Thimpu, Bhutan, 2-8 December 2018.

The objective of the conference was to discuss and deliberate research on mahseer and develop strategies for the conservation of mahseers. It was organised by The Conservation International, UK & WWF-Bhutan. More than 50 International delegates, working on mahseer conservation were participated and presented various ongoing research related to mahseer conservation. As part of the Indian delegation, Dr J.A. Johnson delivered a talk on ecological flow requirement for golden mahseer.

Exploratory Meeting Conducted by Environmental Management Centre, University of Liverpool (EAM), 6-8 December 2018.

Director, EAM, an internationally recognized centre of the University of Liverpool, UK in areas of Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA), Sustainability Appraisal (SA) invited Dr Asha Rajvanshi and Dr Vinod B. Mathur to the exploratory meeting to develop exchange programmes and collaborate on development of guidelines that would help steer the mining sector in India to promote sustainability.

1st State Level Technical Committee Meeting - SECURE Himalaya Project, Shimla, 23 January 2019.

This meeting was held at Shimla on "Conducting a Baseline Study and Establishing a Database on Biodiversity Conservation, Sustainable Natural Resource Management". It was attended by Shri Dinesh Pundir

2nd National Seminar cum Monitoring and Evaluation Workshop for NMHS Projects, Kosi-Katarmal, Almora, 5-6 February 2019.

The seminar was organised by G.B. Pant National Institute of Himalayan Environment & Sustainable Development (An autonomous Institute of Ministry of Environment, Forest & Climate Change, Govt. of India). Dr S. Sathyakumar attended the seminar and presented updates of WII projects.

Side event during International Seminar on Medicinal Plants, Dehradun, 14–16 February 2019.

Dr G.S. Rawat coordinated a side event on 'Conservation and management of high-value medicinal plants in the Himalayan region' during International Seminar on Medicinal Plants in Graphic Era Deemed University, Clement Town, Dehradun. He gave a keynote address on 'Herbal Sector in the Himalayan Region: Policy Issues, Challenges and Way Forward'.

8th Training Programme on "Science, Technology and Emerging Trends in Governance", New Delhi, 18-22 February 2019.

The training programme was organised by the Indian Institute of Public Administration, New Delhi. Dr Lallianpuii Kawlni attended the training programme.

Regional Science - Policy Dialogue Based on Recent Assessment of Biodiversity and Ecosystem Services, Kathmandu, Nepal, 27-28 February 2019.

Dr G.S. Rawat participated in Regional Science - Policy Dialogue based on a recent assessment of Biodiversity and Ecosystem Services conducted by IPBES Kathmandu, Nepal under the aegis of Institute of Global Environmental Strategies (IGES).

IIRS Academia Meet – 2019, Dehradun, 14 March 2019.

IIRS Academia Meet was held at Indian Institute of Remote Sensing. This meet provided a platform to share the experiences of user ministries/stakeholders, geospatial community, and the IIRS faculty and to explore the potential areas for capacity building and joint research. It also provided a unique opportunity to one-and-all for interaction on the entire range of capacity building of RS applications. Dr Panna Lal and Dr Manoj Agarwal attended this meet.

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Study Tours and Visits

Study Tour of Wildlife Officials from Sri Lanka, Dehradun, 23 May–13 June 2018.
Wildlife Institute of India (WII) organised a study tour of 29 Wildlife Rangers from Department of Wildlife Conservation, Government of Sri Lanka. The programme was customized by the Institute as per requirements of Sri Lankan authorities. Apart from the classroom inputs at WII, the officials were taken to Rajaji National Park, Uttarakhand and Kanha Tiger Reserve, Madhya Pradesh; Tadoba Tiger Reserve, Maharashtra; Khijadia Bird Sanctuary; and Marine National Park, Gujarat for further field exposure. The objective of these tours was to provide the first-hand experience of various management practices related to habitat management for endangered species, wildlife protection, control of human activities, wildlife interface conflicts and tourism. The excellent feedback was received from the Sri Lankan officers.

Field Course on Interventions in Wild Animal Health, Sariska Tiger Reserve, 27 January – 15 February 2019.
The Zoological Society of London (ZSL), Wildlife Institute of India (WII) and University of Edinburgh (UoE) organized a study abroad program on Interventions in Wild Animal Health (a component of the MVetSci Conservation Medicine, an online course) at Sariska Tiger Reserve. The course was specially designed for practicing veterinarians and aimed at developing skills in human-wildlife conflict management, translocation techniques, disease outbreak investigation and the monitoring of the health of declining species.

The learning outcomes from the course included (i) to gain a critical awareness of the effects of interventions at the human-wildlife interface; (ii) to develop a systematic understanding of the planning of, and field methods in, disease outbreak investigation, wildlife monitoring and biological management; (iii) to gain a comprehensive understanding including new insights into disease risk management in translocation programmes; (iv) to gain a critical awareness of field methods to investigate the role of disease in the decline of species; and (v) a comprehensive understanding of ex-situ medicine and management in the context of field interventions. Thirty veterinarians attended the three weeks' program.

Course for the Visiting Students of Hiroshima University, Dehradun, 10-22 March 2019.

A group of 22 students and faculty from the Hiroshima University, Japan and the University of Texas, Austin, USA visited WII Dehradun during March 2019 as a part of their on-site training in India on a course on 'Nature Conservation and Forest Dwellers' Livelihood'. The field visit was organised at Rajaji Tiger Reserve, Uttarakhand to explore income-producing activities and conservation prerogatives around protected areas. This graduate course is offered through the Taoyaka Program of the Graduate School for International Development and Cooperation (IDEC) of Hiroshima University (HU), Japan and the Wildlife Institute of India of Dehradun, Uttarakhand, India, in cooperation with the LBJ School of Public Affairs (LBJ School) and the Institute for Innovation, Creativity and Capital (IC^2) of The University of Texas at Austin (UT).

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PROFESSIONAL SUPPORT

Services

Action Plan for Mitigation of Human-Crocodile Conflicts in the Andaman and Nicobar Islands

Funding Source
NITI Aayog, Government of India

Investigators
Dr K. Sivakumar, Dr V.B. Mathur, Shri B.C. Choudhury, Dr Alok Saxena and Shri D.M. Shukla

Researchers
Anant Pande, Swapnali Gole, Sohini Dudhat, Rukmini Shekar and Sameha Pathan

Date of Initiation
March 2018

Date of Completion
March 2019

Objective

The objective of the project was to prepare an 'Action Plan' for mitigation of human-crocodile conflicts in the Andaman and Nicobar Islands.

Progress

A series of stakeholder consultations were organised involving officials from the NITI Aayog; Ministry of Environment, Forest and Climate Change; Forest Department of Andaman and Nicobar; various institutions; and NGOs, followed by a rapid survey in the field. The 'Action Plan' has been finalized and submitted for implementation. This action plan deals with Human-Crocodile Conflicts (HCC) in the Andaman Islands only. However, the measures proposed in the report can also be extended to the Nicobar Islands, if the conflict continues to these southern islands in future.

The plan includes following zones for mitigation of HCC. It is recommended to classify the HCC areas into three management zones to mitigate the HCC:

(i) *Crocodile Conservation Zone (CCZ):* Crocodile Conservation Zone will be exclusively for the conservation of salt-water crocodiles. It will include all Protected Areas (PAs), other critical crocodile habitats and the areas falling outside the different two zones. No or minimum human interventions will be allowed in this zone.

(ii) *Human Crocodile Co-existence Zone (HCCZ):* This zone will include creeks and areas where crocodile habitat and human settlements are nearby and are known for occasional or regular conflicts. The management interventions here will aim at mitigating the conflict in a way that both human and crocodile live peacefully without harming each other.

(iii) *Crocodile Free Zone (CFZ):* This zone will include areas that are important for the livelihood of local communities and where activities like fishing, aquaculture, tourism etc. are primary sources of the local economy. The plan does not recommend any change in the schedule of saltwater crocodile.

Outputs and Outcomes

The zonation of the Andaman Islands in this action plan and the measures suggested and implemented shall ensure that conservation, development and community livelihoods can go hand-in-hand in a successful manner. Government of Union Territory of Andaman and Nicobar Islands has already notified the report in their gazette and actions have already been initiated to mitigate the conflicts.

Activities under Different Cells

(A) Environmental Impact Assessment Cell

Collaboration with Asian Development Bank

An MoU was signed between WII and Asian Development Bank (ADB) under ADB's TA 9461 REG: Protecting and Investing in Natural Capital in Asia and the Pacific on 21 January 2019 for the duration of 2019-2020. The project 'Knowledge and Capacity Building Activities for Natural Capital' has the objective to build the capacity of participants working in the implementation of Green Infrastructure (GI) Projects in transportation sectors in South East Asia/East Asia/South Asia.

The Environmental Impact Assessment Cell of WII continued to undertake R&D related studies, provide professional support in capacity building initiatives at WII and other institutions; professional bodies; and government and corporate organisations. Efforts of networking with global and regional institutions and collaborations with international agencies also continued to expand and diversify.

Endorsement by IAIA for EIA Cell Trainings and Workshops

The IAIA (International Association for Impact Assessment) is the leading global authority for advancing innovations and communication of best practices in all forms of impact assessment. It grants endorsements to training courses conducted by IAIA endorsed trainers after rigorous scrutiny of proposals. The EIA cell of WII has conducted two training courses in the area of Impact Assessment for which IAIA endorsement was received. This endorsement upscales the recognition of such training programmes for the professional advantage of the participants.

Capacity Building for Mainstreaming Biodiversity in Impact Assessment

Training Workshop on Mainstreaming Biodiversity in Impact Assessment for Indian Forest Service Officers, 15-16 November 2018. The workshop was organised by WII. It has the following objectives (i) Improving the mechanisms for mainstreaming biodiversity in the impact assessment for sound decision making and long-term gains for conservation; (ii) Enhanced understanding of the issues and conflicts related to the role of impact assessment in meeting conservation and development goals vis-à-vis ground realities; and (iii) Review options for professionalising EIA for positive outcomes for biodiversity conservation. It was sponsored by Ministry of Environment, Forest and Climate Change (MoEFCC). Eleven participants attended the training programme.

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Professional Development Programme (PDP) for Enhancing EIA Effectiveness, 25 February - 8 March 2019. The training has the following objectives (i) Enhance appreciation of the importance of environmental assessment as a decision support tool to regulate development. (ii) Make adequate and appropriate contributions to the contents of the full EIA starting at the scoping stage to improve the environmental design of the proposed project. (iii) Arrive at a common understanding of the biodiversity-inclusive EIA framework within which to review the EIA reports. (iv) Enable reviewers to assess the completeness of the information required as well as its quality. (v) Review scope, efficacy and feasibility of mitigation options including the cost that are proposed in the Environmental Management Plan (EMP) of development projects. (vi) Enable the reviewers to make an overall assessment of the acceptability of the proposed development, taking into account the environment, ecological (forest and wildlife) and social imperatives. It was sponsored by Ministry of Environment, Forest and Climate Change (MoEFCC).

The Professional Development Programme (PDP) was designed for MoEFCC officials involved in reviewing EIA reports and engaged in environmental decision-making. Dr V.B. Mathur, Director, WII, emphasised that capacity constraints in EIA remain one of the biggest challenges for straightforward and clear recommendations as an outcome of EIA appraisals. Twenty-eight officials from MoEFCC, State Forest Departments and Pollution Control Boards participated in this programme.

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Collaboration with ADB for Mainstreaming Biodiversity in Transportation Sector, Durban, South Africa, 18 May 2018. The Asian Development Bank (ADB), through the regional technical assistance on Protecting and Investing in Natural Capital in Asia and the Pacific; in collaboration with the World Wildlife Fund and Wildlife Institute of India, organised a workshop on Greening the Transport Sector through Smart Plans and Eco-Friendly Designs. Dr V.B Mathur and Dr Asha Rajvanshi were invited to give their technical inputs in this workshop.

Conducting EIA studies at Kandi Road: Dr Malvika Onial and Dr Asha Rajvanshi provided their inputs in the assessment of the proposed up-gradation of Kotdwar-Ramnagar Kandi Road, Uttarakhand and review of the feasible options to promote green infrastructure to address the impacts on wildlife values. The report was submitted to the National Buildings Construction Company (NBCC), New Delhi and Ecotourism Development Corporation Limited (EDCUL), Uttarakhand.

Training Workshop on Enhancing Capacity for Land Use Planning and Management (LUPM) using Strategic Environmental Assessment (SEA), 28 November-30 December 2018. Dr Asha was invited by GIZ to conduct a training workshop on Enhancing Capacity for Land Use Planning and Management (LUPM) using Strategic Environmental Assessment (SEA). This training aimed to provide to the officials from different ministries and departments of the states of Odisha and Tamil Nadu and other experts, an adequate understanding of the role and scope of SEA in conflict resolution between different sectors within distinct administrative units to arrive at a balanced and environmental friendly spatial development. Dr Asha Rajvanshi conducted the training as the core trainer with specialised resource inputs also provided by Dr Vinod B. Mathur, Director, Wildlife Institute of India.

(B) Information Technology, Remote Sensing and Geographic Information System

Information Technology, Remote Sensing and Geographic Information System facility is part of almost all wildlife research projects, education and training. The facility is available for 24x7 to the faculty members, trainees, researchers, students and collaborators working with the Institute. A large number of desktop computers configured with MS Windows, Linux and specialized analytical software for data processing are made available in the dedicated laboratories.

The computer facility is provided by a wide array of hardware setup connected to Local Area Network (LAN). There are Intel Xeon servers with Storage Area Network (SAN) and Network Attached Storage (NAS) system for the Internet, Intranet, Database Management, and Library Automation Services. There are more than 400 nodes and 600 users on WII LAN. Wi-Fi connectivity is provided in hostels, guest houses, classrooms, auditorium, board room and porta-cabin. The Institute has dedicated and unshared 200 Mbps (fibre) and 30 Mbps (Radio Frequency, Microwave) internet leased line connectivity via ISPs, BSNL and Reliance Communications.

Geoinformatics laboratory caters to research and training program of the Institute. The laboratory is equipped with several high-end workstations, A0 scanner-cum-plotter and software packages *viz.* ArcGIS, ERDAS Imagine, IDRISI, GRASS and several open-source softwares for landscape-level analysis. A dedicated team provides support and training in IT and Geoinformatics. The module on Remote Sensing, GIS and Landscape Ecology are conducted for students of M.Sc. in Wildlife Science and Officer Trainees of Advanced PG Diploma and Certificate Courses in Wildlife Management conducted by the Institute. Hands-on training is also provided to other graduate, post-graduate students and interns.

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WII has video conferencing facility consisting of Polycom HDX 8000 VC systems with high definition cameras and displays based on IP Internet Leased Line connection. These systems are regularly used for conducting lectures, meetings, classes, interviews and presentations within the country and abroad.

New activities accomplished by the IT and RS/GIS Cell during the reporting year:

Extension of LAN to WII Residential Complex: The WII LAN has been extended to residential complex (Block I and IV) of the Institute to provide reliable and a good speed internet connection to 30 faculty houses located in this complex.

The connectivity is provided using fiber optics cable as the backbone, which terminates at network switches placed at four locations in this complex. Network connection to individual houses is provided using ethernet Shielded Twisted Pair (STP) copper cables originating from these network switches.

Upgradation of Wireless Network: The wireless network of the Institute was upgraded at the following locations: (i) WII Auditorium; (ii) Guest House and its Annexe; (iii) New and Old Hostels; (iv) Porta Cabin; and (v) Board Room.

The existing 36 Wi-Fi access points at the above mentioned locations are replaced with new Sophos AP100 wireless access points. These new wireless access points have better performance with high-speed data transfer and supporting a large number of user/device connections.

Upgradation of Security Surveillance System: High definition IP CCTV dome cameras (23 no. - Axis M3044-V) with PoE have been procured and installed at the following locations: (i) UNESCO C2C office building; (ii) WII Main Gate; (iii) WII Auditorium; (iv) Guest House and its Annexe; (v) New and Old Hostels; (vi) Genetics Laboratory; and (vii) Library.

The Institute now has a total of 45 CCTV cameras were fixed at various locations of the office premises. The Institute also received a new Axis S1032, Network Video Recorder (NVR) in addition to the existing Hikvision NVR for recording, monitoring and managing all the 45 no CCTV cameras installed in the Institute.

Application of Geoinformatics in Research Projects: Geoinformatics technology is being used in most of the research projects of the Institute for wildlife research and conservation. The work is in progress on the development of a spatial database on the boundaries of all the national parks, wildlife sanctuaries, conservation reserves and community reserves in the country. Similarly, digitization of the division, range and beat boundaries of the 17 tiger range states in the country is in progress. The country-level data on climate, vegetation, topography and animal distribution is also in progress.

(C) Library & Documentation Centre

The Library and Documentation Centre (L&DC) of WII plays a vital role in the dissemination of information to a wide range of users including scientists, researchers and wildlife managers. It was established in line with WII's mission as multidisciplinary information and learning resource centre on biodiversity conservation and management. It has the following objectives: (i) to serve as a repository of all wildlife-related literature published in India; (ii) to acquire, organize and disseminate all relevant literature on biodiversity conservation and related fields; (iii) to serve the user readership through normal and special library & information services; (iv) to establish and maintain links with other national information systems in India and other countries to ensure free flow of information at national and international levels; (v) to serve as a training center for information personnel and users; and (vi) to bring out periodic updates/bulletins on current content of periodicals, research in progress, unpublished research literature i.e. dissertations, thesis, compilation of bibliographies on various themes for ENVIS bulletins and database for WII publications.

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The L&DC now holds 28,504 books, 8,802 maps/toposheets, more than 7,165 bound volumes of old and rare journals. The library also maintains a good collection of the scientific paper number to 11,200. It subscribes to more than 500 Journals (print and online). The L&DC is fully automated using automation software, *i.e.* Web-centric LIBSYS 10 (Library Management Software) and RFID technology. All library users, *i.e.* researchers, officer trainees and faculties, can access the online journals and online

databases subscribed by the L&DC through Intranet. Being connected to the library facility, the users have privileged to access all in-house databases like books, reprints, Indian wildlife abstract, map/toposheet collection and press clippings. Users can access the online database, i.e. Indiastat.com through Intranet. The L&DC provides a variety of Library & Information Services to its user.

During the reporting period, RFID technology introduced and in this process, library documents tagged with RFID chips. To avoid unauthorized access RFID gate is installed in L&DC. During this period, approximately 32,000 documents were issued and consulted. Value Added Service/ Ready Reference Service was provided to approximately 800 users. Around 300 queries were attended from outside users and more than 4,000 bibliographic references were provided to the users. E-Document delivery service was also provided to outside users during this period. In-house databases were regularly updated during the reporting period. The WII publication database was updated by adding the research papers, thesis, reports, popular articles, paper presented and other categories in this period. Specialized bibliographies were also compiled for different courses and on user request.

(D) National Wildlife Database

The objectives of the computer-based National Wildlife Database are to (i) provide readily accessible and comprehensive information on the conservation status of biogeographic regions, habitat types, individual animal species and the network of protected areas in the country; (ii) establish linkages with researchers, protected area managers and planners and also with other data centres; and (iii) facilitate research and training activities in wildlife by providing bibliographic references on protected areas, habitat types and animal species.

During 2018-19, the main thrust of the activities has been on the updation of the databases on Protected Areas, Species and Wildlife Bibliography, based on the collection of current information from various published/unpublished sources during the above mentioned period. The Protected Area Database of the country has been updated, and presently there are 870 Protected Areas including 104 National Parks, 551 Wildlife Sanctuaries, 127 Community Reserves and 88 Conservation Reserves in the country, covering 1,65,158 km2 which is 5.01% of the total geographical area of the country. The Species Database was corrected and updated by adding information on the distribution of mammalian species in various protected areas. Bibliographic Database was updated by adding current literature published on Indian wildlife in various issues of journals/periodicals during the reporting period. Review of the Wildlife Protected Area Network report has been updated by incorporating the latest information. Trainees Database has been updated further, and now there is information of 707 Diploma and 608 Certificate officers trainees trained in various courses including 264 foreign nationals. Website of the national wildlife database has been updated further by incorporating the latest information. Nearly one hundred sixty queries were received, and outputs were provided in various desired formats.

(E) Wildlife Forensic and Conservation Genetics Cell

The Wildlife Forensic and Conservation Genetics (WFCG) Cell was established to strengthen the enforcement of Wildlife (Protection) Act, 1972 of India. The main functions of the Cell include identification of species from a variety of wildlife parts and products for forensic investigation, along with expanding an already available repository of wildlife reference samples and R&D on newer forensic tools. It is now a recognised laboratory for conducting the wildlife forensic research and casework for supporting the judiciary process. Besides these, the WFCG Cell plays a role in sensitising enforcement agencies in crime scene examination and proper collection of evidence through regular training and workshops. Being a focal agency in the Southeast Asian region, it also provides advanced training for wildlife crime analysis to the scientific organisations of the neighbouring countries. The WFCG cell provides services related to molecular ecology to various ongoing research projects that involve phylogeny, population genetics and endocrinology.

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During 2018-19, the Cell has received a total of 285 wildlife offence cases from enforcement agencies across the country, of which 3 from CBI, 39 were from the honourable Courts, 12 from Customs, 189 from Forest Department, 35 from police, two from MoEFCC and five were from Hospitals. An assortment of biological products was received for species identification, and of these, 206 cases contained tissue samples requiring DNA based techniques, 68 cases requiring morphometric technique and 11 cases requiring both DNA and morphometric techniques for species identification. The Cell provided reports on species identification for 346 cases, and a further 69 summons were received from various honourable Courts for appearances as an expert scientific witness during this period.

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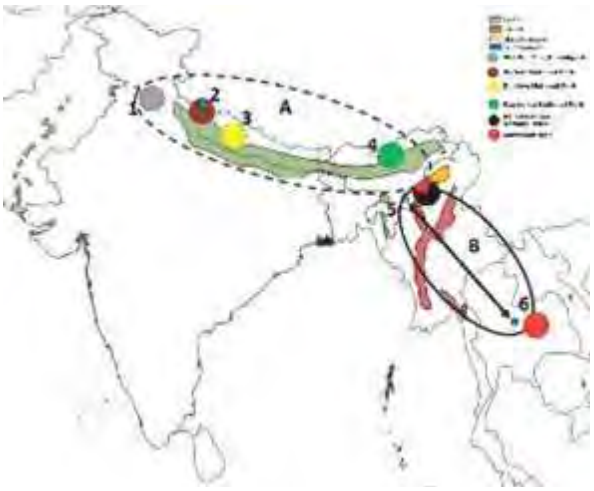
Field exercises and lectures were conducted on 'Crime scene management' and evidence collection for officer trainees of the Diploma and Certificate courses and officer trainees at Indira Gandhi National Forest Academy, Dehradun. The Cell was involved in conducting research in the field of 'Conservation Genetics' and 'Wildlife Endocrinology', where cutting-edge molecular tools are being used to understand species biology. The conservation genetics laboratory also contributes to the objectives of several projects at the institute. Besides, WFCG Cell published genetic studies on several wild animals.

WFCG Cell has discovered one of the rare subspecies of hog deer, *Axis porcinus annamiticus* from India, which was known to occur eastward of middle Thailand. WFCG Cell conducted a study to understand the distribution of this little-studied species. This study confirmed the existence of a small population of hog deer in Manipur that genetically resembles *A.p. annamiticus*. The findings of this study have significant



Mitochondrial DNA control region based haplotype sharing and the distribution map of hog deer, Axis porcinus adapted from IUCN and created using the ArcGIS 10.2 software package. Dotted circle A and solid circle B represents two distinct lineages of A.p. porcinus and A.p. annamiticus, respectively.

conservation implication and invite a conservation focus for this subspecies in India.

(F) Wildlife Extension & Audio Visual Cell

The Cell caters to the needs of various requirements of academic activities. It maintains CDs/DVDs, conference system, a projection system, various audio-visual equipment, still cameras and video cameras with accessories and a photo library. During the reporting period, the Cell provided support for all the workshops, seminars, meetings and courses; visiting classes; guest lectures and celebrations of important days or events.

As part of its information dissemination activities, the Institute prepares four quarterly issues of the e-Newsletter of WII. These issues were uploaded on the website of the Institute during the reporting period. The Institute organized the following activities during the reporting period:

Painting, Poster and Exhibition Competition at WII, Dehradun, 25 April 2018.

Starting with the events lined up for celebrating World Environment Day, 2018, the the Wildlife Institute of India organised an 'On the Spot Painting and Poster Making Competition' along with an 'Exhibition' at the Institute. Thirty-six students and teachers from various school of Dehradun participated in this event. Short movies were screened to spread awareness about the ill effects of

plastic pollution and what initiatives can be taken on an individual and community level. An exhibition was also organised in which display items and working models were presented by the school students.

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Celebration of International Day of Biodiversity, Varanasi, 22 May 2018.
The Institute celebrated the International Day of Biodiversity with the youth and children of village Rampur in Varanasi. The children were briefed about the importance of cleanliness; effects of plastic pollution in our daily life; and the importance of river biodiversity.

Participation in World Environment Day Celebrations at New Delhi, 31 May - 6 June 2018.

India was the global host for the 2018 World Environment Day (WED). An exhibition was set up at the back lawns of Vigyan Bhavan in New Delhi. Wildlife Institute of India joined this exhibition and performed the 'Puppet Show'

titled 'Dekho Dekho Sab Badal Raha Hai'. A large number of visitors and dignitaries witnessed the shows and expressed their appreciation.

Participation in Kumbh Mela Exhibition - 2019 at Prayagraj, 14 January - 4 March 2019.

The Wildlife Institute of India participated along with other sister institutions from the Ministry of Environment, Forest and Climate Change, Govt. of India in the Kumbh Mela Exhibition - 2019 at Prayagraj, Uttar Pradesh. The theme of the exhibition was Green Good Deeds. The objective of the exhibition was to educate people about the challenges of Climate Change, India's rich tradition of protecting environment, the safeguard/ concerns addressed while examining cases for environment/ forest clearance, problems of pollution, saving of biodiversity and ecology, how a citizen can contribute towards the environment by adopting Green Good Deeds.

Wildlife Institute of India displayed the journey of the river Ganga from 'Source to Sea', the biodiversity, its value and threats, and how one can contribute by adopting Good Deeds for safeguarding the lifeline of India. Films produced by the National Mission for Clean Ganga on various aspects, like biodiversity of Ganga, Ganga Prahari initiatives, steps taken towards cleaning the river and the ghats and involvement of community living on the banks of the river were screened throughout the Mela period.

XVI WII-FODS "Wildlife and Environment Quiz" 2018, Dehradun, 6 October 2018.
The XVI WII-FoDS "Wildlife and Environment Quiz" 2018 - a collaborative activity of Wildlife Institute of India and Friends of the Doon Society (FoDS) was organised at the Institute to mark the celebrations of the Wildlife Week 2018. Twenty-six schools from Dehradun participated in the preliminary round. Top five scorers in the preliminary round were adjudged as finalists of the competition. The Asian School, Dehradun topped the list and won the WII-FoDS Sameer Ghosh Memorial Nature and Wildlife Rolling Trophy, Shield and Book Prize. Dr Mahesh Rangarajan, Professor of History and Dean of Academic Affairs, Ashoka University, Sonipat graced the occasion as the chief guest and distributed the prizes to the winning teams.

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(G) ENVIS Resource Partner on Wildlife and Protected Areas

The Ministry of Environment, Forest and Climate Change, Government of India established the 23rd Centre on Environment Information System in September 1997 at Wildlife Institute of India. The thematic area of ENVIS Resource Partner, Wildlife Institute of India, Dehradun is 'Wildlife and Protected Areas'. The mission of ENVIS is to support and facilitate the diverse group of clientele from policy-makers to researchers and industries and promote national and international level co-operation and exchange of environmental data and information through a nation-wide network. The goals of WII-ENVIS Centre are to (i) build up a repository and act as a dissemination centre for information on wildlife sciences; (ii) provide information for decision-making at the apex level relating to conservation and development; (iii) establish a database on Protected Area Network in India; and (iv) promote national and international co-operation through networking and exchange of wildlife-related information.

The following activities were undertaken by the ENVIS Resource Partner, WII during the reporting period:

Celebration of International Day of Biodiversity, Gulf of Mannar Marine National Park, 22 May 2018.
ENVIS centre along with Gulf of Mannar Biosphere Reserve Authority celebrated the International Day of Biodiversity with the youth and school children. Awareness about plastic wastes and importance of dugong conservation were the main themes of the programme.

Certificate Course on Nature Interpretation for Rural Youth, Manas Tiger Reserve, Assam, 8-28 July 2018.
ENVIS centre organised a certificate course on Nature Interpretation for Rural Youth under

Green Skill Development Programme. This course for the youth from villages in the proximity of Protected Area was of 3-week duration to empower them so that they could enhance their socio-economic status and conserve biodiversity. The trained persons can serve as nature guides with knowledge of biodiversity, conservation and good communication skills.

Certificate Course on Ganga Prahari Livelihood Enhancement Course, Sarnath, 23 July - 12 August 2018.
ENVIS centre organised a three-week certificate course on 'Ganga Prahari Livelihood Enhancement' under Green Skill Development Programme. The course was organised for Ganga Praharis to enhance their socio-economic status and conserve biodiversity.

Celebration of World Ozone Day, Dehradun, 14 September 2018.
The ENVIS centre celebrated World Ozone Day at WII. As part of the celebrations, a documentary titled "The Antarctic Ozone Hole - From Discovery to Recovery: A Scientific Journey" was screened along with two other short video clips from United Nations Environment Programme (UNEP), which included the message from Erik Solheim, Executive Director, UNEP. Awareness posters on the Ozone Day were also displayed at the Institute's auditorium. The event was attended by WII's faculty members, trainee officers, researchers, M.Sc. students and was highly appreciated.

Asan Nature Conservation Awareness Camp, Asan Wetland Conservation Reserve, 12-13 February 2019.
ENVIS Centre jointly organised a "Nature Conservation Awareness Camp" with Chakrata Forest Division, Uttarakhand at Asan Wetland Conservation Reserve. It was a two-day event in which students and accompanying teachers from six schools participated. The events included the screening of short films, documentaries, popular, talks, bird watching, wildlife quiz and nature walks.

Great Backyard Bird Count and Campus Bird Count, Dehradun, 15-18 February 2019.
ENVIS Centre organised the Great Backyard Bird Count and Campus Bird Count. Volunteers from the Institute worked day and night for making checklists and reporting species of birds found in WII. The Institute campus emerged as the winner of Campus Bird Count, 2019 reporting the maximum number of species found in a campus in India.

(H) Tiger Cell

The Tiger Cell was initiated at WII in collaboration with the National Tiger Conservation Authority (NTCA) in April 2016 to achieve the goal of tiger conservation through a holistic approach based on science. The main mandates of the Cell include (i) periodic, country-wide assessment of tigers, co-predators, prey and their habitat; (ii) ecological monitoring of the Tiger Reserves; (iii) implementation of MSTrIPES in Tiger Reserves; (iv) site appraisals and evaluation of development projects vis-à-vis tiger distribution, dispersal and corridor network; and (v) maintain National Tiger Photo Database for controlling illegal wildlife trade-related to tigers; and (vi) to provide training as and when required for ecological monitoring, research and management.

Major activities of the Cell during the reporting period are given below:

Country-wide Assessment of Tigers, Co-Predators, Prey and their Habitat: (i) The Cell coordinated with the States and provided scientific and technical inputs to conduct Phase I survey in all potential tiger habitats of 20 tiger range states of the country. (ii) Customized GIS shapefiles for 615 Forest Divisions of the country so that the data can be collected using MSTrIPES mobile android application. They can directly be imported and/or entered in MSTrIPES desktop software. (iii) Analyzed Phase I data from about 450 Forest Divisions of India to generate country-wide occupancy and distribution maps for tigers, co-predators and prey. (iv) Processed and analyzed about 3.42 crores camera trap photographs received from 136 sites with 28,064 camera trap locations. (v) Analyzed 42,000 tiger images (from 108 camera trapping sites) and 27,400 leopard images in program Extract Compare for their identification. (vi) A total of 1,546 genetic samples were analyzed for individual identification of tigers to arrive

at minimum tiger numbers. (vii) Twelve sites were sampled for estimating prey abundance from camera trap-based distance sampling using Random Encounter Model (REM) framework. (viii) Inputs in reconciliation and physical verification of Phase I data from eight states (Madhya Pradesh, Odisha, Jharkhand, Chhattisgarh, Maharashtra, Karnataka, Kerala and Tamil Nadu).

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Monitoring System for Tigers: Intensive Protection and Ecological Status (MSTrIPES): (i) An image processing software known as CaTRAT (Camera Trap data Repository and Analysis Tool) was developed and used for geo-tagging of camera trap images obtained from the field. (ii) A web-server which is a systematic database of the data generated using the MSTrIPES program from across the implementation sites has been hosted at Tiger Cell. This makes the server the largest repository of information on the wildlife crimes, illegal activities, human disturbances, ecological status of important species, habitat parameters and human-wildlife conflict. (iii) Regular inputs in conceptualization, design and customization of multilingual android mobile applications for MSTrIPES patrol and ecological modules.

Management Effectiveness Evaluation (MEE) of Protected Areas and Tiger Reserves: The Cell provided inputs by reviewing MEE draft reports from over 30 sites.

National Repository for Camera Trap Photographs of Tigers (NRCTPT): Over 40,000 tiger photographs maintained under National tiger photo database library at the Cell. Matching was done with the photographs of the tiger skins seized and snared tigers to ascertain the identity of the tigers and their photo-capture histories and information shared with the NTCA and State Forest Departments.

Training and Capacity Building: During past one year, 12 regional workshops and about 30 site-specific workshops were conducted with the assistance of WII's MSTrIPES team to train about 7,500 officials, frontline staff, computer operators, GIS technicians and field biologists on MSTrIPES patrol module and ecological protocols.

Research and Technical Assistance to NTCA, Government of India and State Forest Departments: (i) Evaluation of about 25 proposals on developmental projects in the tiger landscapes of the entire country and reports communicated to NTCA and Wildlife Division of MoEFCC for Standing Committee of National Board for Wildlife. (ii) Country-wide mapping for elephants finished. (iii) Assisting the state forest departments to develop and implement tiger and prey recovery programs (iv) Supervision of a research project on tiger and prey augmentation in Palamau Tiger Reserve, Jharkhand. Supervision of long-term ecological monitoring project in Kanha Tiger Reserve, Madhya Pradesh. (v) Provided inputs to Rajasthan Forest Department for translocating tigers from Ranthambhore Tiger Reserve to Sariska and Mukundra Hills Tiger Reserves. (vi) A proposal on long term monitoring of Sariska was prepared and submitted to Rajasthan Forest Department and NTCA for funding support. (vii) Preparation of posters for NTCA (MoEFCC) pavilion in Kumbh Mela. (viii) Inputs in quantifying tourism carrying capacity and other managerial issues of Corbett and Rajaji Tiger Reserves (Uttarakhand) as a part of the Oversight Committee constituted by NTCA.

(I) Research Laboratory

The WII's research/teaching laboratory is dedicated to the analysis of physic-chemical properties and eco-toxicological aspects of soil, plants, scat, water, fish samples as well as analyzing the morphology/structure of wildlife specimens. For which, the laboratory is well equipped with advanced instruments such as High Performance Liquid Chromatography, Gas Chromatography, Automatic Nitrogen Analyzer, Fiber Analyzer, Magnetic Stirrer, Solid Phase Extraction Unit, Sonicator, Centrifuge, Water Bath, Flame Photometer, Soxhlet Apparatus, Rotatory-Evaporator, UV-Visible Spectrophotometer, Digital Analytical Balances, Inverted Microscope, Stereomicroscope, Hot-Air Oven, Muffle Furnace and Conductivity Meter. Sample processing and storage facility is also there.

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The laboratory facilities are used for teaching and conducting practical's for the ongoing courses of the institute as well as organizations and universities in and around Dehradun. The aspects which are studied includes collection and preservation of biological samples, processing of samples, analysis of herbivore pellet and carnivore scat, determination of age and sex of wild animals based on the body parts, osteology of mammals, photomicrography and analysis of ecological (plant, water and soil) samples for various purposes.

During the reporting period, around 20 researchers from various projects have completed their assignments and analyzed more than 2000 soil, 400 sediment, 500 sea grass and 50 water samples. The parameters which were determined in the biological samples includes ADF, NDF, Lignin, Cellulose, Crude Protein, Nitrogen, Phosphorus, Sodium, Potassium, Organic Carbon, Ash Content. Around 2000 samples (sediment, fish, water and sea grass) have been analyzed for the presence of pesticide concentration using GCMS. In addition to that around 600 slides were prepared by the researchers for scat/hair samples.

Species confirmation and cataloguing of reptiles, amphibians, fishes, insects and other invertebrate specimens was done. Technical inputs in field activities were provided by the laboratory staff for snake rescue, demonstration of camera trap, mist netting for birds and demonstrating radio telemetry techniques.

(J) Herbarium

During the reporting period, herbarium staff provided their inputs in various field activities and surveyed different protected areas. Approximately 750 plant specimens were identified, which were collected by research scholars, diploma and certificate trainees and faculty members from various parts of the country, such as Panna National Park, Rajaji National Park, Corbett National Park, Pin Valley National Park, Kedarnath WS, Valmiki Tiger Reserve and Gautam Buddha WS. The plant specimens collected under NMSHE and NMCG projects were also identified.

(K) Campus Development

During the reporting period, the construction work of 20 rooms of New Guest House; Construction of Guest House for visiting faculty; Renovation of Old Hostel's washroom; Renovation of washroom in Type IV, V quarters; Construction of Porta Cabin for Forensic laboratory; Installation and supplying of 400 KVA DG Set; and purchase process of two vehicles (Tata Hexa and Bolero) for WII have been completed. The extension work of Research Laboratory; Construction of Porta Cabin for researchers; and Installation and supplying of gas fire suppression system with an addressable fire alarm system in Library block were in progress during the year.

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(L) Information on Details of Vigilance Cases for the Year 2018-19 of Wildlife Institute of India, Dehradun

Vigilance Cases as on 01.04.2018	No. of vigilance cases added during the year	No. of vigilance cases pending as on 31.03.2019
Nil	Nil	Nil

(Dr Pratap Singh)
Chief Vigilance Officer

(M) Right To Information

RTI Cases	Opening Balance as on 1st April 2018	No. of new applications directly received from Indian Citizens during 2018-19	No. of new applications received as transferred from other Public Authorities during 2018-19	No. of applications transferred to other Public Authorities during 2018-19	No. of applications as on 31.03.2019	No. of applications disposed off/rejected during 2018-19	No. of applications not disposed off/rejected and hence carried forward to next year 2019-20
(a)	(b)	(c)	(d)	(e)	(f) (b+c+d)-(e)	(g) (h) (f-g)	
RTI Application	01	57	25	07	76	75	01
First Appeal	00	09	00	00	09	09	00
CIC Cases	01	00	00	00	01	01	00

(N) Sports Activities

WII has a long tradition of sporting. The Institute has an eight-station outdoor gym and a cricket ground for multipurpose use. The Institute has participated in the 24th All Indian Forest Sports Meet 2019, Raipur, Chhattisgarh during 9-13 January 2019. The Institute had taken part in events of badminton, tennis, table tennis, rifle shoot, athletics and archery. A contingent of 13 participants was selected through a competitive process to represent the Institute. The Institute secured third and fourth place in the rifle shooting categories.

Activities of the UNESCO Category 2 Centre for World Natural Heritage Management and Training for Asia and the Pacific Region at WII

Nominations/Dossiers

A key objective of the Centre is to contribute towards enhancing the representation of properties on the World Heritage List. Towards this end, the Centre offers technical support to State Parties in the process of nomination of World Heritage Sites.

The Operational Guidelines of the World Heritage Convention has elaborate provisions for the nomination of properties on the World Heritage List. The first step is for a State Party to make an 'inventory' of its important natural and cultural heritage sites termed as Tentative List. After that, the State Party may prepare an exhaustive nomination file for a site which is submitted to the World Heritage Centre for review and to check it is complete. Once a nomination file is complete, the World Heritage Centre sends it to the appropriate Advisory Bodies for evaluation. A nominated property is independently evaluated by two Advisory Bodies mandated by the World Heritage Convention: the International Council on Monuments and Sites (ICOMOS) for cultural sites and the International Union for Conservation of Nature (IUCN) for natural sites.

Once a site has been nominated and evaluated, the intergovernmental World Heritage Committee makes the final decision on its inscription. Once a year, the Committee meets to decide which sites will be inscribed on the World Heritage List. It can also defer its decision and request further information on sites from the States Parties. To be included on the World Heritage List, sites must be of outstanding universal value and meet at least one out of ten selection criteria (six cultural and four natural criteria). A full nomination cycle from Tentative List to final inscription may take a minimum of two-and-a-half years or more.

Proposal for the Nomination of Tentative Listing of Kailash Sacred Landscape World Heritage Site

The UNESCO C2C, India has been associated with the process for nomination of the Kailash Sacred Landscape (KSL) as a World Heritage Site since 2016. The Centre participated in the Brainstorming cum Policy Forum on "Transboundary Landscapes - Making a Difference" organised by GBPNIHESD at Almora on 11 September 2018. It included discussions and analysis on the Kailash landscape, especially from a transboundary perspective, and was attended by key stakeholders of the area. On 17 October 2018, UNESCO C2C India organised an "Expert Consultation on Kailash Sacred Landscape (KSL) as a UNESCO World Heritage Site" in Dehradun to take the nomination process forward by discussing on the area, criteria and heritage routes of the proposed World Heritage Site.

A letter from the Shri Sadhguru Isha Foundation to the Prime Minister's Office, Government of India on the 'Kailash Sacred Landscape and Pilgrimage Routes' was referred to the Archaeological Survey of India (ASI) and subsequently forwarded to UNESCO C2C India in January 2019. The letter stated the urgent need for inclusion of Kailash in India's Tentative List and final inclusion on the List of UNESCO World Heritage Sites. The Centre subsequently prepared a draft document for this site named 'Sacred Mountain Landscape and Heritage Routes' as a Mixed (Cultural and Natural) Site based on Annex 2A - Tentative List Submission Format as per Operational Guidelines for the Implementation of the World Heritage Convention. This document was submitted for the "Meeting of Advisory Committee on World Heritage Matters (ACWHM)" convened by the Archaeological Survey of India (ASI) at New Delhi on 18 January 2019. As a follow-up to the ASI meeting, UNESCO C2C-India organised a "Consultation Meeting on nomination document of Kailash landscape as a proposed World Heritage Site" at Dehradun on 4 February 2019. The primary objective was to solicit comments/suggestions/additional information on the draft Tentative List document from stakeholders and experts from Uttarakhand. A presentation was further made at the next "Meeting of Advisory Committee on World Heritage Matters (ACWHM)" convened by the Archaeological Survey of India (ASI) at New Delhi on 14 March 2019 for the inclusion of the Kailash landscape on the Tentative List of World Heritage Sites in India.

World Heritage Nomination Dossier Preparation for Garo Hills Conservation Area, Meghalaya

The documentation of Garo Hills Conservation Area (GHCA), Meghalaya

submitted by the Government of India to UNESCO World Heritage Centre, with technical support from UNESCO C2C India in association with Government of Meghalaya, was formally placed on the Tentative List of India's World Heritage Sites in September 2018. Subsequently, an MoU has been signed between the Chief Wildlife Warden, Government of Meghalaya and the Wildlife Institute of India, Dehradun in December 2018 for preparation of detailed proposals for the inscription of Garo Hills Conservation Area as a World Heritage Site and Notification of Narpuh-Saipung landscape as Biosphere Reserve. In this context, the UNESCO C2C India organised a Community Stakeholder Consultation in Tura, Garo Hills, Meghalaya on 9 January 2019.

The primary objectives of the consultation were to (i) share information about the status and process of Garo Hills Conservation Area as a proposed World Heritage Site; and (ii) enhance understanding of the unique culture and traditions of the communities of Garo Hills for their appropriate reflection in the World Heritage nomination document. A total of 27 participants, including local community representatives and Forest Department personnel, attended the consultation and provided positive feedback on the proposed nomination of the site as World Heritage. The UNESCO C2C India staff members further undertook an extensive field tour of the site to assess and document attributes of the site.

Identification and Prioritization of Potential WHS for Tentative Listing and Preparation of Nomination Dossier for Satpura-Kanha-Pench-Bandhargarh-Sanjay protected areas as "Central Indian Tiger Landscape" and Bedaghat (Jabalpur), Madhya Pradesh

The Madhya Pradesh Tourism Board has approached WII, Dehradun for submission of proposal to nominate Satpura-Kanha-Pench-Bandhavgarh-Sanjay protected areas in the tentative list of UNESCO Natural World Heritage as "Central Indian Tiger Landscape" and Bhedaghat, Jabalpur. This activity will be taken up in 2019-20, for which M.P. Tourism Board will provide necessary funds.

Capacity Building Training and Workshops

Training Programme on 'Monitoring of Outstanding Universal Values of Natural World Heritage Sites' Great Himalayan National Park Conservation Area, 28-30 June 2018.

A training programme on Monitoring of Outstanding Universal Values of Natural World Heritage Sites in India was organised with the overall objective to build capacity and sensitise frontline staff and other stakeholders of World Heritage Sites with the best OUV monitoring techniques such as wildlife monitoring, use of GIS application and socio-economic tools to assess and manage the OUV of the natural World Heritage Sites. A total of 31 frontline staff of the Himachal Pradesh Forest Department participated in the programme.

Capacity Building-cum-Planning Workshop on 'Ecotourism and Visitor-Use Management in Protected Areas', Dehradun, 8-10 August 2018.

A three-day capacity building-cum-planning workshop was organised by the Wildlife Institute of India. The objective of the workshop was to provide a platform for increasing awareness regarding planning frameworks for visitor use management; Review of the impact of the National Tiger Conservation Authority (NTCA) guidelines on Tourism in Tiger Reserves; and developing an outline for a long-term collaborative project for policy, planning, research and capacity building in the area of tourism management. The NTCA guidelines on tourism in Tiger Reserves were issued in 2012 and have been under implementation for over five years. Meanwhile, the demands from visitors continue to increase unabated. Visitor management in Tiger Reserves is highly context specific and governed by local histories and practices. A review of the NTCA guidelines provided insights into the changes achieved on the ground as a result of this intervention by NTCA and the current challenges being faced by Tiger Reserves in visitor management in different parts of India.

ESP-Asia Conference at WII, Dehradun, 9-12 October 2018.

UNESCO C2C India jointly organised the 2018 Ecosystem Services Partnership (ESP) Asia Conference in association with the ESP Asia Regional Office, the Republic of Korea at the Wildlife Institute of India. The theme of this year's conference was 'Communicating and engaging ecosystem services in policy and practice in Asia'. The conference was structured into 20 technical sessions and three keynote address by Shri Vinay Sheel Oberoi, Former Permanent Representative of India to UNESCO; Mr Pavan Sukhdev, President of WWF International's Board; and Dr Madhav Karki, Co-chair, IUCN-Commission on Ecosystem Management and IPBES. Nearly 70 participants, including 25 nationals from Asian

countries, attended the conference comprising students, researchers, practitioners and government representatives. The aim of this conference was to accelerate collaboration in Asia by expanding information-sharing among experts, policy-makers and practitioners on ecosystem services as a practical tool for nature-based solutions.

Training Programme on 'Dossier Preparation for Natural World Heritage, Mixed and Cultural Landscapes Nomination of World Heritage Sites', Dehradun, 23 October 2018.

UNESCO C2C India conducted the training programme at WII, Dehradun. It was an intensive one-day training designed to address the challenges of dossier preparation for World Heritage Sites. Fifteen heritage professionals and researchers participated in the training programme. Resource persons from Ahmedabad University, ICOMOS/ DRONAH and UNESCO C2C India presented on Outstanding Universal Value, World Heritage Criteria, the nomination process for natural, mixed and cultural landscape sites. A group exercise and experience sharing session was held with the participants, who filled up a sample nomination format with specific case-studies. The training programme was planned to enhance the capacity of young professionals in understanding and contributing to the nomination process of World Heritage Sites.

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Symposium on 'Culture - Nature Journey: Beyond Borders in Asia and the Pacific, Dehradun, 24-26 October 2018.

UNESCO C2C India in association with the Ministry of Culture, Government of India, Archaeological Survey of India (ASI), ICOMOS India and associate partners organised the symposium. The symposium dwelled on culture-nature linkages in the Asia-Pacific with focus on case-studies on existing and potential World Heritage Sites. A part of the Symposium consultation was also hosted by ASI, New Delhi with discussions on Kailash Sacred Landscape, Garo Hills Conservation Area and Indian Ocean Cultural Landscapes, Monsoon and Trade Routes. Key resource persons represented ICOMOS, IUCN, Ahmedabad University and UNESCO C2C India. Forty-five participants, including students, researchers, practitioners and heritage professionals, attended the symposium. The symposium was another step in the process to continue to explore the theme initiated as part of the Culture - Nature Journey at the World Conservation Congress, Hawaii in 2016 and the Culture-Nature Plenary Session hosted by UNESCO C2C India during the ICOMOS General Assembly, New Delhi in 2017.

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Training Programme on 'Monitoring of Outstanding Universal Values of Natural World Heritage Site at Nanda Devi and Valley of Flowers National Parks, Joshimath, 27-29 November 2018.

UNESCO C2C organised the training programme in Joshimath, Uttarakhand. The purpose of this workshop was to build capacity and sensitize world heritage site frontline staff and other stakeholders with the best OUV monitoring techniques. The training provided valuable information on the OUVs for natural World Heritage Sites, Monitoring &

Reporting, and SWOT analysis for the site. Eighteen participants, including DFO, ACF, RFO, and Forest Guards, attended the training.

Training Programme on Monitoring of Outstanding Universal Values of Natural World Heritage Sites (Serial Sites of Western Ghats WHS), Karnataka, 14-15 December 2018.

UNESCO C2C India organised the training programme at Kudremukh National Park, Western Ghats World Heritage Site, Karnataka. The purpose of this workshop was to build capacity and sensitize world heritage site frontline staff and other stakeholders with the best OUV monitoring techniques. The training provided valuable information on the OUVs for natural World Heritage Sites, Monitoring & Reporting, and SWOT analysis for the site. Twenty-four participants, including DFO, ACF, RFO, and Forest Guards, attended the training.

Seminar on 'Indigenous Urbanism', Dehradun, 8-9 January 2019.

The UNESCO C2C-WII in association with the University of East Anglia, United Kingdom organised a seminar on 'Indigenous Urbanism - Exploring Climate Justice in Resilient Cities' at the Wildlife Institute of India, Dehradun, India. Key themes of the seminar were (i) Relevance of indigenous tribal people, their knowledge and culture for climate-resilient cities; (ii) Significance of materiality and memory of indigenous communities to climate justice and sustainable cities; (iii) Role of traditional knowledge and tribal interactions, including with non-humans in positive urban transformations; and (iv) Lessons from law, governance and climate action/inaction in (emerging) urban areas.

The seminar brought together 30 members belonging to a multidisciplinary group of academics and practitioners in exploring ideas on co-producing sustainable urbanisms, focusing on tribal knowledge/ culture, cities and climate.

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Consultation Meeting on Nomination Document of Kailash Landscape as a Proposed World Heritage Site, Dehradun, 4 February 2019.

UNESCO Category 2 Centre (C2C) at WII prepared a draft document for 'Sacred Mountain Landscape and Heritage Routes' as a mixed (cultural and natural) site as per the operational guidelines for implementation of the World Heritage Convention. It was submitted for the 'Meeting of Advisory Committee on World Heritage Matters (ACWHM)' convened by the Archaeological Survey of India (ASI) at New Delhi on 18 January 2019. As a follow-up to the ASI meeting, UNESCO C2C-WII organised a 'Consultation meeting on nomination document of Kailash landscape as a proposed World Heritage Site' at Dehradun.

The primary objective of the meeting was to solicit comments/ suggestions/ additional information on the draft tentative list document from stakeholders and experts from Uttarakhand. The major outcomes of the consultation were to revisit the proposed title of the site; Re-define the area to include only the Pithoragarh district of Uttarakhand; Re-assess the viability of each of the proposed criteria; and consider commissioning short

studies for additional information on various cultural and natural attributes of the site.

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Foundation Training Course on Wildlife Management for Frontline Staff of Great Himalayan National Park Conservation Area (GHNPCA), Dehradun and GHNP, Himachal Pradesh, 7-27 February 2019.
UNESCO C2C India organised two-week foundation training course on 'Wildlife Management for Frontline Staff of Great Himalayan National Park Conservation Area (GHNPCA)' at WII, Dehradun and GHNP, Himachal Pradesh. A total of 42 participants, including DFO, ACF, RFO (Forest Rangers) and Forest Guards attended the training.

UNESCO Sub-regional Conference on World Heritage Global Strategy in the context of South Asia, Kolkata, West Bengal, 21-22 February 2019.
UNESCO Category 2 Centre for World Natural Heritage Management and Training for the Asia and Pacific Region has been playing a pivotal role in the implementation of the World Heritage Convention in the region. UNESCO New Delhi, therefore, considers crucial that the UNESCO Category 2 Centre not only takes part in the aforementioned conference to represent India but also plays an important role by bringing expertise and experience in the implementation of the World Heritage Convention in particular for natural heritage.

UNESCO C2C India was represented by Mr Niraj Kakati, Technical Officer and key involvement of Dr Sonali Ghosh and Dr Shikha Jain. The Centre actively contributed resource persons to support the UNESCO Delhi Office in conducting the conference. The Centre's involvement included facilitation and presentations in several sessions including on (i) Gaps in India's TL/WHL; (ii) Culture-Nature Journey; (iii) Heritage Routes and (iv) Know Your World Heritage. Nearly 50 participants included representatives of Indian State Governments and South Asian countries. The Kolkata Declaration includes mention of UNESCO C2C India as a key partner in contributing to World Heritage capacity-building in the region.

Training Programme on Monitoring of Outstanding Universal Values of Natural World Heritage Sites at Kaziranga National Park, 25-26 February 2019.
UNESCO C2C India organised the training programme at Kaziranga National Park, Assam. The purpose of this workshop was to build capacity and sensitize world heritage site frontline staff and other stakeholders with the best OUV monitoring techniques. The training provided valuable information on the OUVs for natural World Heritage Sites, Monitoring & Reporting, and SWOT analysis for the site. Forty-two participants, including DFO, ACF, RFO, and Forest Guards, attended the training.

UNESCO Visiting Fellow
UNESCO C2C India has been running a 'Visiting Fellows Programme' over the last couple of years. The programme is intended to host scholars and practitioners working on subjects relevant to World Heritage. The

objectives of the programme are to (i) Exchange professional experience and collaborate on diverse issues of World Natural Heritage Sites. (ii) Build and enhance capacity for management of natural heritage sites. (iii) Contribute to research and policy on natural heritage sites. (iv) Build linkages, networks and partnerships with other organisations and experts. (v) Provide an opportunity to work in a multi-cultural, multidisciplinary organisation. Three visiting fellows have been engaged with the Centre since 2017-18, who have worked on varied themes.

Internship

As a part of the Centre's mandate, it is essential to undertake research on identified priority areas related to Natural World Heritage protection and management, with particular focus on models of community participation. With this goal, the following post-graduate students were engaged to take up their internship with the C2C.

Aseem Madhur (2018). **Human-wildlife interface: A case study of Chandrabani, Dehradun.** Tata Institute of Social Sciences, Guwahati Campus, Assam. Supervisor: Dr Manoj V. Nair.

Anuranjan Roy (2018). Involved in the editing of **"Jewels in the Crown"** an anthology of nature writing to be published by the WII UNESCO C2C India. The co-editors of this book were Prerna Bindra, Sonali Ghosh and Anuranjan Roy.

Nikhil Parashar (2018). Worked on the identification, classification, and compilation of attributes for the Indian part of **'Kailash Sacred Landscape'** (KSL), to contribute the compilation of information towards the nomination of KSL as a potential World Heritage Site.

Training and Workshops Attended by C2C Staff

DST Sponsored Summer Training Workshop, Mumbai, 4-17 June 2018.

Ms Persis Farooqy, World Heritage Assistant of UNESCO Category 2 Centre attended DST sponsored summer training workshop on 'Developments in Climate Change and Sustainable Development' held at the Tata Institute of Social Sciences, Mumbai. This workshop was aimed at building capacities in the social, political and economic dimensions of understanding climate change, its impacts, and required and proposed interventions.

Abor Hills Expedition in Arunachal Pradesh, September-October 2018.

The original Abor Expedition was undertaken by British India officials in Assam on the North-Eastern Frontier of India (now Arunachal Pradesh) during 1911-1912. Zoological exploration was also part of the scientific component of the expedition. The present expedition during September-October 2018 attempted to revisit the route of the original expedition. It undertook a comprehensive and intensive survey of mammals, birds, reptiles, amphibians, butterflies, odonates and cicadas of the Abor landscape, paying special emphasis on threatened taxa. The entire expedition was exhaustively photo-documented. This expedition was conducted in collaboration with Arunachal Pradesh Forest Department and Saevus magazine where Hem Chandra Mahindra Foundation financially supported it. Dr Manoj Nair and Mr Vivek Sarkar, World Heritage Assistant, were part of the expedition team.

Training Course on Adaptive Management Course, Australia, 5-10 November 2018.

UNESCO C2C India is part of a consortium in collaboration with two organisations from Australia viz. the Blue Mountains World Heritage Institute (BMWHI) and the Protected Areas Learning and Research Collaboration (PALRC) to implement a series of training programmes for adaptive management of protected areas and natural heritage in 2018-19. The first such training course was held in Katoomba, Blue Mountains, Australia. The course was designed to provide the participants with an understanding of adaptive management tools, including the internationally recognised UNESCO C2C India was represented by Dr Manoj Nair and Shri Niraj Kakati.

Heritage Management Conference in Ahmedabad University, Ahmedabad, 14-16 December 2018.

The 2nd Edition of the "International Conference on Heritage Management and Practice" was organised by the Centre for Heritage Management, Ahmedabad University at Ahmedabad. The theme of this edition was 'Developing Integrated Approaches in Heritage Management'. Mr Niraj Kakati represented UNESCO C2C India at the conference as a Scientific Programme Committee member, Session Chair on 'Integrating Nature and Culture' and also presented a case-study paper on 'Community Participation and Partnerships'. A key contribution was in advancing the Culture-Nature Journey by involving in events and programmes that take this process forward.

Advisory Services

The Centre offers advisory services and technical inputs on World Natural Heritage issues, including for conservation and management of World Heritage Sites, State of Conservation reports, State Party interventions at World Heritage Centre sessions among others to Central and State Governments of India, other countries on request, UNESCO Advisory Bodies and other relevant institutions.

Stakeholders Consultation Meeting and Exploratory Survey in Garo Hills

A visit was conducted in the month of January to conduct a stake holder's consultancy meeting in Garo hills to nominate Garo Hills Conservation Area (hereafter mentioned as GHCA) followed by an exploratory survey in the nominated areas as well as in Norpu WLS and Saipong Reserve forest of Jaintia Hills. The lecturers from NEHU, the chairperson of the Nokma council and officials from the Dept. of Arts and Culture participated in the meeting. Dr Erik de Maaker, Professor of Institute of Cultural Anthropology and Development Sociology of Leiden University, gave a presentation entitled 'Living Heritage? Culture, Traditions and Livelihoods'. The primary objectives of the exploratory survey were to see the proposed area to get the overview of the nomination property and get a glimpse of the practical scenario in the field so that the gaps can be identified and necessary actions can be initiated. Along with them, the areas of potentials for proposed criteria were identified and documented.

State of Conservation Report 2018 for World Heritage Sites

As part of the advisory and technical support mandate of UNESCO C2C India, the Centre provided necessary inputs for preparation of the World Heritage State of Conservation (SoC) Reports 2018 for Manas Wildlife Sanctuary, Assam and Great Himalayan National Park Conservation Area, Himachal Pradesh for onward submission to UNESCO World Heritage Centre, Paris. The Centre also provided technical advice and response to the Government of India on Parliamentary Questions related to natural World Heritage Sites in India.

Reflection Meeting on Reforming the World Heritage Nomination Process, Tunis, Tunisia, 23-25 January 2019.

Dr V. B. Mathur, Director, UNESCO C2C India at Wildlife Institute of India, attended a "Reflection Meeting" organised by the UNESCO World Heritage Centre to examine different possibilities for reforming the World Heritage nomination and evaluation process in Tunis, Tunisia. It had emerged from the discussions of the Ad hoc group that it would be worth exploring a modified nomination process, designed in such a way as to help States Parties to avoid investing expertise, money and time in developing nominations of sites with no potential for Outstanding Universal Value. The Committee at its 42nd session held at Manama in June-July 2018 was also of the view that the nomination process needs to undergo some serious re-shaping. In this regard, in its Decision 42 COM 12A, the Committee requested World Heritage Centre to organize a reflection meeting by March 2019 to examine different possibilities for reforming the nomination and evaluation process and to propose recommendations for consideration by the World Heritage Committee in view of increasing the balance and credibility of the World Heritage List. Further to this decision, the World Heritage Centre launched an online consultation survey in November-December 2018. Thus, the expected result of the ongoing reflection in 2018-19 will be a sound set of recommendations for the reform of the nomination process by the 43rd session of the Committee to be held in Baku, Azerbaijan during July 2019 that will guide the Committee in its deliberations and decisions concerning the scope and main lines of the reform.

Outreach

A basic objective of the Centre is to raise awareness among the general public and youth in particular, of the importance of natural World Heritage and the need to protect it. This includes the development of outreach and communication tools to explain the key concepts and processes of the World Heritage Convention and ensuring all stakeholders can make the most effective use of the Convention to support world heritage conservation. The World Heritage Committee also encourages raising awareness of the need to preserve World Heritage and supports the development of educational materials, activities and programmes towards this end.

Celebration of World Heritage Day, 18 April 2018.

The UNESCO C2C India at Wildlife Institute of India, Dehradun, celebrated World Heritage Day (WHD) by organizing a series of events. Participants included school students from three UNESCO World Heritage Sites (WHS) of India namely, Nanda Devi and Valley of Flowers National Parks (Uttarakhand), The Great Himalayan National Park Conservation Area (Himachal Pradesh) and Keoladeo National Park, Bharatpur (Rajasthan) as well

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as from Model School, National Institute for the Empowerment of Persons with Visual Disabilities (Divyangjan), Dehradun. The primary objective of the celebration was raising awareness and exposure of school students through a nature walk, field visit, quiz contest and cultural performances. The students visited museums at Forest Research Institute and ONGC at Dehradun as well as Nature Trail in the WII campus for exposure trips. The students also took part in exciting quiz competition on attributes of World Heritage Sites in India. The students participated in a cultural programme with music and dance performances. Nearly 50 members were part of the WHD celebration including students, teachers and staff.

Session at Green Hub Festival on Aliens in World Heritage Sites: A Key Concern in Maintaining Outstanding Universal Values, Tezpur University, May 2018.

The UNESCO C2C India conducted a session in the Greenhub Festival, 2018 in Tezpur University on 'Aliens in World Heritage Sites: A key concern in maintaining Outstanding Universal Values'. The target audience for this session was students and researchers from academic institutes (Gauhati University, Cotton University, Assam University, Dibrugarh University) and nongovernmental organisations (associated with World Heritage Sites). The key speakers of this session were Dr Bibhuti P Lahkar (Aaranyak), Dr Hilloljyoti Singha (Assam University) and Mr Dhritiman Das (Pygmy Hog Conservation Centre). The session was moderated by Dr Anukul Nath and Mr Vivek Sarkar of UNESCO C2C India.

IUCN reported that the spread of invasive species, particularly *Mimosa*, remains a concern and that the efficacy of the efforts undertaken, including manual uprooting and controlled burning, have yet to be assessed. In addition to that, the World Heritage Centre raised concerns on the lack of information on invasive species, and the role of the use of fire in grassland management in controlling or potentially facilitating the proliferation of invasive in Manas World Heritage Site. The World Heritage Centre, therefore recommended that the State Party *i.e.* India to undertake or commission a detailed study on the use of fire for grassland management and its role in the proliferation or control of invasive species.

Students Visit from Griffith University, Australia

A group of students and faculty from the Department of Tourism, Griffith University, Australia visited WII, Dehradun during November - December 2018. The visit was part of a three-year (2017-2019) scheme funded through Australia's Federal Government's Department of Foreign Affairs & Trade to increase Australian students' knowledge of the Indo-Pacific region. The students undertook classroom lectures and field visit to study issues of ecotourism. UNESCO C2C India also facilitated talks on India's natural heritage and culture for the visiting group.

Students Visit from Hiroshima University for Onsite Training in India

A group of students and faculty from the Hiroshima University, Japan visited WII, Dehradun during March 2019 as a part of their

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onsite training in India on Nature Conservation and Forest Dweller's Livelihoods. This graduate course is offered through the Taoyaka Program of the Graduate School for International Development and Cooperation (IDEC) of Hiroshima University (HU), Japan and the Wildlife Institute of India of Dehradun, Uttarakhand, India, in cooperation with the LBJ School of Public Affairs (LBJ School) and the Institute for Innovation, Creativity and Capital (IC^2) of The University of Texas at Austin (UT).

Natural Heritage Bulletin

The Centre publishes a quarterly e-bulletin that is a compilation of news and relevant articles about Natural World Heritage sites in the Asia-Pacific region. Four issues have been successfully published during 2018-19 *viz.* Spring, Summer, Monsoon and Winter.

Research & Monitoring

A function of the Centre is to undertake research on identified priority areas related to natural World Heritage protection and management, including a focus on models of community participation. The World Heritage Committee also encourages State Parties to support research, since knowledge and understanding are fundamental to the identification, management and monitoring of World Heritage properties.

Rapid Assessment of Hispid Hare in Manas World Heritage Site, India

The UNESCO C2C India along with forest department carried out a rapid survey of the Endangered Hispid Hare in February 2019 as a part of ongoing OUV (Outstanding Universal Value) monitoring programme of endangered grassland mammals of Manas World Heritage Site (WHS) initiated by Ghosh et al. (2014). The survey was conducted in the grasslands of Bansbari and Bhuyanpara Range of Manas WHS. A total of 194 pellet groups were recorded from the present survey. Among the surveyed sites Kanchanbai, Bangalehathdhowa, Dhonbeel, Kuribeel and Mofu camp-sites comprise number of pellet groups compared to other sites. During the field survey pellets of Swamp deer and Hog deer were also recorded. It was evident that the occurrence of Hispid Hare pellets was mostly confined to the areas with lower disturbance (in terms of the presence of cattle grazing and invasive species) and higher in areas with cover and grass density. Invasive species (*Chromolena odoratum* and *Mikania micarantha*), unregulated grazing and removal of minor forest produce are the vital factors that impact the grassland habitat of Manas. Henceforth, further systematic studies required to know the factors influencing the distribution and habitat association of hispid hare in the terai grassland of Manas World Heritage Site.

Master's Degree Course in Heritage Conservation and Management (2019-21)

The UNESCO C2C India is introducing a 2-year residential Master's Degree Course in Heritage Conservation and Management beginning from 1 July 2019. The course is presently affiliated with Saurashtra University, Rajkot, Gujarat which has been Accredited 'Grade A' by NAAC. The course is interdisciplinary and advances sustainability studies through the prism of heritage. It includes theoretical and methodological integration of ecological sciences, social sciences and humanities, and heritage studies. It entails taught courses, internship, dissertation and direct engagement with UNESCO World Heritage sites. With a maximum intake of ten candidates for the course, the Centre has invited applications for this prestigious course for the year 2019-2021 from eligible Indian and foreign candidates with a passion for heritage conservation and management.

Collaborations

UNESCO C2C India is collaborating with a range of sub-national, national and international institutions and organisations: (i) Uttarakhand State Council for Science and Technology (UCOST), Dehradun; (ii) International Centre for Integrated Mountain Development (ICIMOD), Nepal; (iii) Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP), IIRS, Dehradun; (iv) Assam Forest Department; (v) Himachal Pradesh Forest Department; (vi) Karnataka Forest Department; (vii) Manipur Forest Department; (viii) Maharashtra Forest Department; (ix) Meghalaya Forest Department; (x) Odisha Forest Department; (xi) Uttarakhand Forest Department; (xii) Green Hub, Tezpur, Assam; (xiii) National Disaster Management Authority; (xiv) Tata Institute of Social Sciences, Mumbai; (xv) INTACH Heritage Academy, New Delhi; (xvi) Archaeological Survey of India (ASI); (xvii) DRONAH; (xviii) ICOMOS India; (xix) IUCN; (xx) Blue Mountains World Heritage Institute (BMWHI)/ Protected Areas Learning and Research Collaboration (PALRC), Australia; (xxi) Ecosystem Services Partnership (ESP) Asia Regional Office, Republic of Korea; (xxii) Centre for Heritage Management, Ahmedabad University; and (xxiii) Saurashtra University.

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VISITORS

- Acropolis Institute of Technology & Research, Indore, 3 April 2018.
- Tribhuvan Institute of Forestry, Hetauda, Nepal, 9 April 2018.
- Tribhuvan Institute of Forestry, Hetauda, Nepal, 12 April 2018.
- Eliezer Joldan Memorial Govt. College, Leh Ladakh, Jammu & Kashmir, 16 April 2018.
- University of Agricultural and Horticultural Sciences College of Forestry, Karnataka, 19 April 2018.
- College of Veterinary & Animal Science, Bikaner, Rajasthan, 20 April 2018.
- Karnataka Forest Department Forest Academy, Karnataka, 26 April 2018.
- Rajiv Gandhi Institute of Veterinary Education & Research, Puducherry, 28 April 2018.
- Forest Guard Training, Rampur, Mandi, Dehradun, Uttarakhand, 1 May 2018.
- College of Veterinary & Animal Science, Navani, Vallabhnagar, Rajasthan, 5 May 2018.
- SFS College, New Forest, CASFOS, Dehradun, 15 May 2018.
- Rani Lakshmi Bai Central Agricultural University, Jhansi, Uttar Pradesh, 18 May 2018.
- Karnataka Forest Academy, Gungargatti, Dharward, Karnataka, 24 May 2018.
- T.S. Forest Department, Telangana State Forest Academy, Hyderabad, 29 May 2018.
- FRO, Forestry Training Academy, Haldwani, Uttarakhand, 12 June 2018.
- FRO, Forest Training Institute & Rangers College Sunder Nagar, Mandi, Himachal Pradesh, 19 June 2018.
- RFO, Kundal Academy of Development, Administration and Management, Kundal, Maharashtra, 3 July 2018.
- B.Tech. students from Graphic Era (Deemed to be University) Clement Town, Dehradun, 3 August 2018.
- FRI Deemed University, M.Sc. Forestry Students, Dehradun, 10 August 2018.
- SFS Officers of Central Academy for State Forest Service (CASFOS) New Forest Dehradun, 31 August 2018.
- Forest Guard, Hoshiarpur, Punjab, 5 September 2018.
- SFS officer from Tamil Nadu, 12 September 2018.
- B.Sc. Forestry students from Sir Syed College, Kerala, 17 September 2018.
- Forest Guards from Mandi, Himachal Pradesh, 25 September 2018.
- Forest Range Officer from Assam, 25 September 2018.

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- Students and faculty of Vigyan Manthan Yatra from Madhya Pradesh, 8 October 2018.
- Students from TERI School of Advanced Studies, New Delhi, 10 October 2018.
- Forest Service Officer of Assam, 11 October 2018.
- Students of B.Sc. (Botany) from Zakir Hussain College, Delhi, 12 October 2018.
- Forest Guards from Forest Training Academy, Haldwani, 22 October 2018.
- Students of B.V.Sc. & A.H. from Dr GC Negi College of Veterinary & Animal Science, HP, 23 October 2018.
- Students of B.Sc. Forestry from Hemwati Nandan Bahuguna Garhwal University, 24 October 2018
- B.Sc. Forestry from Doon (PG) College of Agriculture Science & Tech, Dehradun, 26 October 2018.
- Frontline staff of Wildlife Division of Kullu, Himachal Pradesh, 29 October 2018.
- IFS from Indira Gandhi National Forest Academy, Dehradun, 1 November 2018.

- Students of B.Sc. Forestry from Kerala, 1 November 2018.
- Frontline staff of Wildlife Division of Kullu, HP, 12 November 2018.
- B.V.Sc.& AH students from Veterinary College Bidar, Karnataka, 15 November 2018.
- B.Sc. students from Kerala Agricultural University, Thrissur, 22 November 2018.
- Students from Indian Institute of Remote Sensing, Dehradun, 28 November 2018.
- Students from Tamil Nadu Agricultural University, 28 November 2018.
- Range Forest Officers from Kundal Academy, Sangli, Maharashtra, 28 November 2018.
- B.Sc. (Agri) students from Tamil Nadu Agricultural University Coimbatore, 4 December 2018.
- Student of M.Sc. Environmental Science from Savitribai Phule, Pune, University, 5 December 2018.
- IFS Probationers from Indira Gandhi National Forest Academy, Dehradun, 13 December 2018.
- Foresters from Training Academy, Haldwani, 18 December 2018.
- Students from Nagaland University, 8 January 2019.
- Forest Guards from Forest Training Institute, Chail, Himachal Pradesh, 16 January 2019.
- Students from Saurashtra University, 23 January 2019.
- B.Sc. Forestry students from SHUATS, Naini, Prayagraj, 24 January 2019.
- B.Sc. Forestry students from Sher-e-Kashmir University, 4 February 2019.
- B.Sc. Botany students from Maya Devi Sita Ram Degree College, Chandausi, UP, 6 February 2019.
- Range Forest Officers from Central Academy of Forest Education, Kurseong, West Bengal, 6 February 2019.
- Student of B.Sc. (Hons.) Forestry from Birsa Agricultural University, Ranchi, 12 February 2019.
- SFS Officers of Central Academy for State Forest Service from Coimbatore, Tamil Nadu, 15 February 2019.
- Forest Guards of Hoshiarpur, Punjab, 20 February 2019.
- B.V.Sc. students from Veterinary and Animal Sciences, Pookode, Kerala, 22 February 2019.
- Range Forest Officers from Gujarat Forest Rangers College, Narmada, 22 February 2019.
- M.Sc. (Environmental Science) students from Shivaji University, Kolhapur, 25 February 2019.
- Trainees of State Forest Training Institute of Aizwal, Mizoram, 26 February 2019.
- B.Sc. (Forestry) students from SHUATS Prayagraj, 27 February 2019.
- Range Forest Officers from J&K Forest Department, 28 February 2019.
- B.Sc. Forestry students from Kathmandu Forestry College, Nepal, 1 March 2019.
- Students form Woodstock School, Mussoorie, Uttarakhand, 1 March 2019.
- B.Sc. (Forestry) students from Tribhuvan University, Nepal, 5 March 2019.
- B.Sc. (Forestry) students from Kamareddy Degree College, Telangana University, Nizamabad, 6 March 2019.
- M.Sc. Geo-informatics students form TERI, 6 March 2019.
- Forest Guards from Forestry Training Academy, Haldwani, 11 March 2019.
- B.Sc. (Forestry) students from Tribhuvan University, Nepal, 12 March 2019.
- B.Sc. (Forestry) students from Navsari Agricultural University, Gujarat, 13 March 2019.
- P.G. & Doctoral students from Punjab University, Chandigarh, 25 March 2019.
- Forest Guards trainees from Mandi, Himachal Pradesh, 25 March 2019.
- B.Sc. (Hons.) Zoology students from Miranda House College, Delhi University, 29 March 2019.

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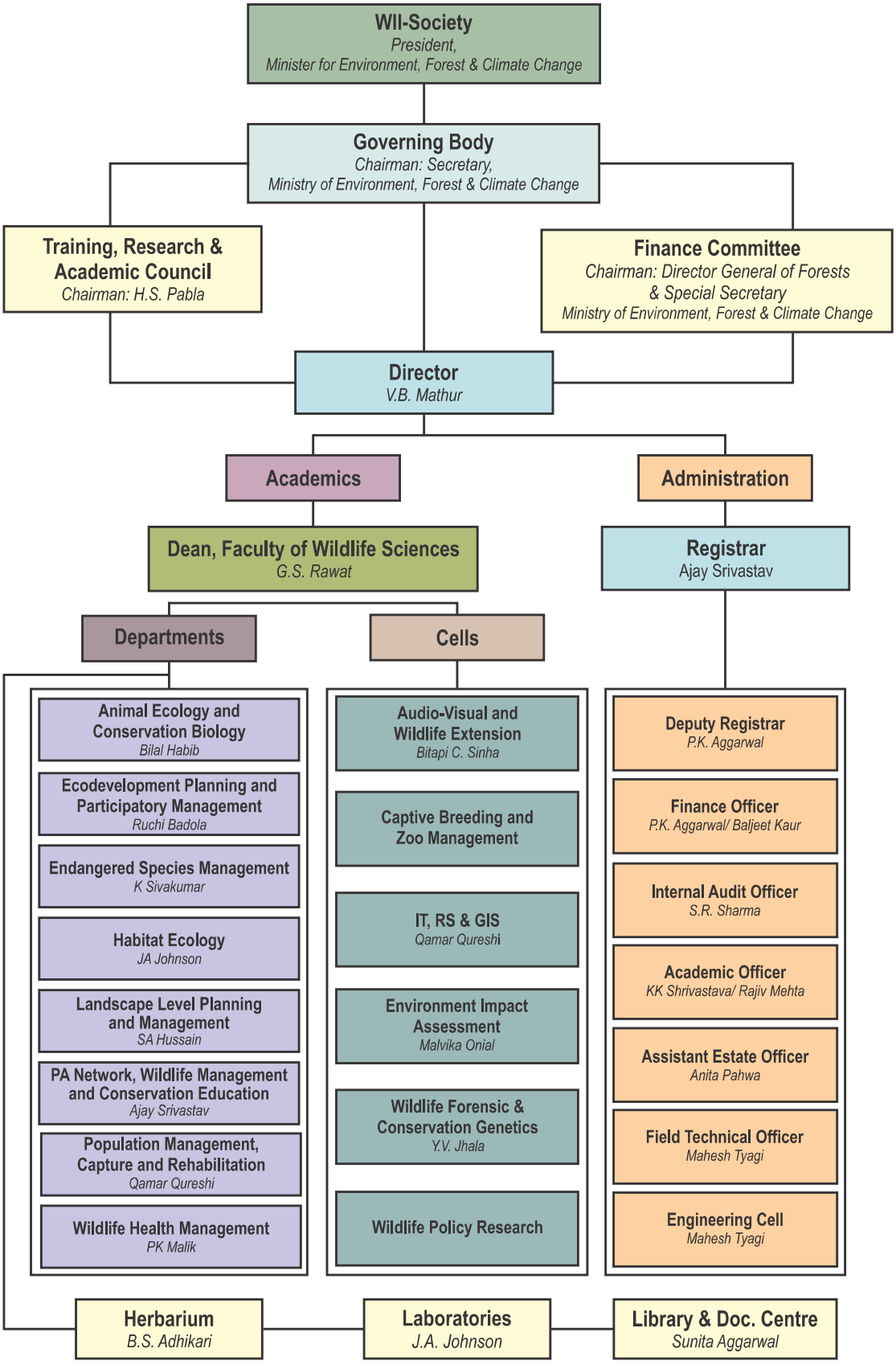
GOVERNANCE

Organizational Structure of WII



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16. Shri Imran Hussain,
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Srinagar, Garhwal

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New Delhi - 110 018

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Dehradun - 248 009

22. Shri Himanshu Malhotra,
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23. Shri Damodar Sharma, IAS (Retd.),
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24. Shri R.P. Agarwalla, IFS (Rtd.),
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Dr Bhupen Hazarika Path,
Guwahati - 781 004

25. Dr H.S. Singh,
Plot 44, Sector-8,
Gandhinagar - 382 010

26. Dr A.K. Puri,
Director General,
Institute of Technology and Science (ITS),
Mohan Nagar,
Ghaziabad - 201 007

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27. Professor Dileep K. Singh,
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28. Shri S.S. Bist
Former Principal Chief Conservator of Forests & Head of Forest Force,
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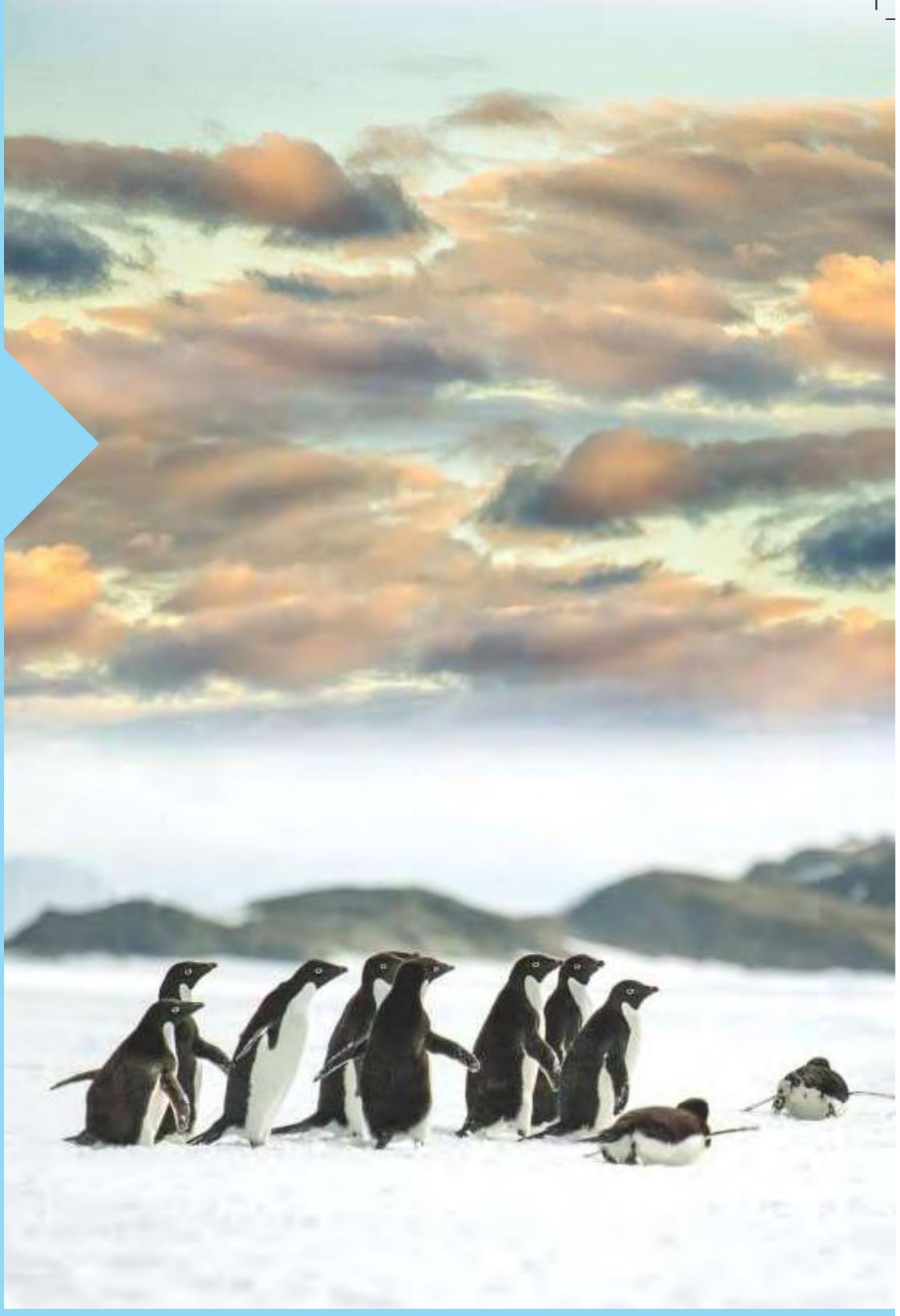

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Awards

Dr Asha Rajvanshi, Senior Fellow at WII is a recipient of the IAIA's Lifetime Achievement Award for 2019. The International Association for Impact Assessment (IAIA) annually gives awards in different categories for institutions and individuals that contribute to impact assessment practice and theory. Previously known as the Rose-Hulman Award, the Lifetime Achievement Award is given to a past or present member of IAIA for major contribution to the field of impact assessment over a sustained period. Dr Asha received this award, in Brisbane, Australia, for her sustained and significant contributions to biodiversity-inclusive impact assessment as a dedicated trainer, governmental advisor, author, and practitioner for over three decades.

This is the first ever award from IAIA received by a professional from India.

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ACCOUNTS

Separate Audit Report of the Comptroller Auditor General of India on the Accounts of Wildlife Institute of India, Dehradun for the year ended 31 March 2019

1. We have audited the attached Balance Sheet of the Wildlife Institute of India, Dehradun (WII) as at 31 March 2019 and the Income and Expenditure Account and Receipt and Payment Account for the year ended on that date under Section 20 (1) of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act 1971. These financial statements are the responsibility of the WII Management. Our responsibility is to express an opinion on these financial statements based on our audit.

2. This separate audit report contains the comments of the Comptroller and Auditor General of India (CAG) on the accounting treatment only with regard to classification, conformity with the best accounting practices, accounting standards and disclosure norms, etc. Audit observations on financial transactions with regard to compliance with the Laws, Rules and regulations (Propriety and Regularity) and efficiency-cum-performance aspects, etc. if any, are reported through Inspection Reports/CAG's Audit Reports separately.

3. We have conducted our audit in accordance with auditing standards generally accepted in India. These standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatements. An audit includes examining, on a test basis, evidences supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of financial statements. We believe that our audit provides a reasonable basis for our opinion.

4. Based on " audit, we report that:

I). We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purposes of our audit;

ii). The Balance Sheet, Income and Expenditure Account and Receipt and Payment Account dealt with by this report are drawn up in the format as prescribed by the Ministry of Finance, Government of India.

iii). In our opinion, proper books of accounts and other relevant records have been maintained by WII in so far as it appears from our examination of such books.

iv). We further report that:

A. Balance Sheet

A.1 Liabilities

A.1.1 Earmarked Funds (Schedule 3): Rs. 2.57 crore

This schedule did not include the balances and transactions related to the sponsored projects (Opening Balance Rs. 25 crore, Receipts Rs. 89.43 crore, Payments Rs. 75.13 crore and Closing Balance Rs. 39.30 crore. This resulted in understatement of Earmarked Funds and Current assets by Rs. 39.30 crore.

A.2 Assets

A.2.1. Investment from Earmarked Funds (Schedule 9): Rs. Nil

No Amount has been shows in this schedule. However, an amount of Rs. 6 crore was invested in FDs from Earmarked Funds as detailed below:

Sl. No.	Project Name	Amount Invested in FD (in Rs.)
1	WII Management Effectiveness....	200,00,000
2	Conservation of Manipur Brow....	400,00,000

Thus, investment from Earmarked Funds were understated by Rs. 6 crore.

A.2.2. Investment-Others (Schedule 10): Rs. 62.14 crore

The amount depicted under Grant in Aid, GPF and Corpus Fund were not correct as detailed below:

Sl. No.	Head	FD no.	Amount taken in Schedule 10	Actual amount invested	Difference
1.	GPF	207344	7699739	8042160	
2.		207345	7699739	8042160	
3.	Corpus Fund	207386	5492874	5744400	
4.		207091	9213986	9249910	
5.		207089	9213986	9249910	
6.		207094	9213986	9249910	
7.		207339	7583737	7929251	
8.		207340	7583737	7929251	
9.		207341	7137634	7462824	
10.		207346	7919731	8271936	
11.		207387	5492874	5744400	
12.		207307	5680712	5781194	
13.		207308	5680712	5781194	
14.	Pension Fund	287057	9000000	10990399	
15.		207069	9000000	10406148	
16.		207070	9000000	10406148	
17.		207072	6980625	8071269	
18.		207073	9000000	10406148	
	Total		**138594072**	**148758612**	**10164540**

The accrued interest of Rs. 1.02 crore was shown in Schedule 11. Hence, due to incorrect depiction of investments in FDs, the investments were understated by Rs. 1.02 crore and current assets were overstated by the same amount.

B. Income and Expenditure Account

B.1 Income from Investments (Schedule 15): Rs. Nil

The interest income of Rs. 1.76 crore earned by WII from FDs made from Earmarked Funds has not been depicted in the above schedule as detailed below.

Sl . No.	Project Name	Amount of interest received from FDs in Rs.
1	WII Management Effectiveness ….	6,71,664
2	Conservation of Manipur Brow ….	1,68,418
3	Recovery of Dugongs ….	27,06,729
4	Habitat Improvement ….	1,18,75,283
5	Development of Conservation ….	18,61,013
6	Assessment of impact ….	3,01,813
	Total	**1,75,84,920**

C. Receipt and Payment Account:

The closing Bank Balance shown in Receipt and Payment Account in respect of GPF and Corpus Fund included amount invested in FDs (Rs. 1.10 crore from GPF and Rs. 3.55 crore from Corpus Fund). Hence, closing bank balances were overstated by Rs. 4.65 crore and payments were understated by the same amount in Receipt and Payment Account.

D. Grant-in-aid:

WII received Grants in Aid of Rs. 33 crore (Rs. 31 crore revenue and Rs. 2 crore capital) besides opening balance of Rs. 7.85 crore and other receipts of Rs. 10.64 crore. Out of total available amount of Rs. 51.49 crore, WII made payments of Rs. 50.64 crore and an amount of Rs. 85.23 lakh was closing balance.

E. Management Letter.

Deficiencies which have not been included in the Audit Report have been brought to the notice of the Director, WII through a management letter issued separately for remedial/corrective action.

I). Subject to our observations in the preceding paragraphs, we report that the Balance Sheet, Income and Expenditure Account and Receipt and Payment Account dealt with by this report are in agreement with the books of accounts.

ii). In our opinion and to the best of our information and according to the explanations given to us, the said financial statements read together with the Accounting Policies and Notes on Accounts, and subject to the significant matters stated above and other matters mentioned in ***Annexure*** to this Audit Report five a true and fair view in conformity with accounting principles generally accepted in India.

a. In so far as it relates to the Balance Sheet of the state of affairs of the WII, as at 31 March 2019 and

b. In so far as it relates to Income and Expenditure Account of the deficit for the year ended on that date.

For and on behalf of the C&AG of India
Director General of Audit (SD)

Place: New Delhi
Date: 13.1.2020

Annexure to SAR

1. Adequacy of internal audit system

Last internal audit of Wildlife Institute of India, Dehradun was conducted in August 2018 by MoEF&CC for the period 2013-14 to 2017-18

2. Adequacy of internal control system

a. Signatures of the cashier or DDO had not been made on any of the entry in the Cash book. Further, no surprise checks of the cash balance had been conducted and certificate recorded by WII.

b. 30 audit paras of 6 Inspection Reports for the period from 2010-11 to 2017-18 were outstanding.

3. System of physical verification of fixed assets

The physical verification of fixed assets had not been conducted for the year 2018-19.

4. System of physical verification of inventory

a. Physical verification of consumable store has not been conducted for the year 2018-19.

b. The physical verification of Books had been conducted for the year 2017-18. 79 number of books worth Rs. 41,500 were missing.

5. Regularity in payment of statutory dues

No Payment over six months in respect of statutory dues like Income Tax, Sales Tax, Service tax, Custom Duty, Cess, contributory provident fund (CPF) and employee's state insurance were outstanding as on 31.03.2019.

Dy. Director (EA)

Annexure

1. Understatement of Capital Fund

The opening balance of Capital Fund was taken as Rs. 28,54,72,702 instead of Rs. 29,72,36,330 which was closing balance of previous year. Hence, Capital Fund was understated by Rs. 1.18 crore.

2. Misclassification of Current Assets

An amount of Rs. 2,03,44,645 (Land Acquisition Charges - Rs. 180,00,000, Advance to IIT-Rs. 12,39,000, Advance to Account No. 54272-Rs. 10,00,000 and Advance for vehicle insurance-Rs. 105,645) was misclassified as Loan to Staff instead of Advances recoverable in cash or kind/pre-payments.

3. Misclassification of Interest Earned

An amount of Rs. 34,86,572 was misclassified under the head 'Interest on Savings Account' instead of the head 'Interest on Term Deposits' and an amount of Rs. 1,85,819 was misclassified under the head 'Interest on Term Deposits' instead of the head 'Interest on Loan and Advance'.

4. Current Liabilities and Provisions (Schedule 7): Rs. 27.12 crore

Audit of WII is being conducted by the CAG of India for certification of Annual Accounts and WII is liable to pay audit fee to the CAG of India. However, no provision was made for audit fees in the Annual Accounts. Therefore, liabilities as well as expenditure were understated to that extant.

Dy. Director (EA)

RECEIPT & PAYMENT ACCOUNTS FOR THE YEAR 2018-19

	RECEIPTS			Previous Year		PAYMENT			Previous Year
Particulars	Plan	Non Plan	Total		Particulars	Plan	Non Plan	Total	
(A) GRANT-IN-AID					Expenses				
To Opening Balance					By Salaries & Allowances	21,53,97,769.00	-	21,53,97,769.00	19,30,88,666.00
Cash in Bank	7,84,63,541.04	-	7,84,63,541.04	5,44,49,195.04	By Medical	1,15,24,293.00	-	1,15,24,293.00	1,02,08,418.00
Cash In Hand	230.00	-	230.00	10,801.00	By LTC	26,09,461.00	-	26,09,461.00	18,14,759.00
					By OTA	-	-	-	31,325.00
To Grant in Aid (Revenue)	31,00,00,000.00	-	31,00,00,000.00	32,27,00,000.00	By Honorarium	2,83,050.00	-	2,83,050.00	1,47,000.00
To Grant in Aid (Capital)	2,00,00,000.00	-	2,00,00,000.00	1,70,00,000.00	By Fellowship & Wages (R/Proj)	38,82,523.00	-	38,82,523.00	78,15,256.00
To Grant (other Projects)	6,59,522.00	-	6,59,522.00	2,60,000.00	By Stipend of MSc Students	7,04,974.00	-	7,04,974.00	8,00,459.00
To MSc Course Fee	31,96,800.00	-	31,96,800.00	34,60,093.00	By Leave encashment & Gratuity	2,13,43,390.00	-	2,13,43,390.00	74,45,764.00
To Bus Charges	1,02,130.00	-	1,02,130.00	-	By Bonus	-	-	-	6,08,307.00
To Rent	4,10,534.00	-	4,10,534.00	46,320.00	By Fellowship Forenis Cell	-	-	-	5,85,664.00
To WII Products	-	-	-	-	By Base Camp Exp.(Res Project)	1,90,040.00	-	1,90,040.00	2,38,374.00
To Misc Receipts	9,62,629.00	-	9,62,629.00	5,82,402.00	By Vehicle insurance	3,51,435.25	-	3,51,435.25	-
To Elect & Water	4,65,129.00	-	4,65,129.00	2,400.00	By Annual Res Seminar-ARS	10,24,709.00	-	10,24,709.00	6,64,284.00
To Interest on Saving A/c	16,06,868.00	-	16,06,868.00	18,92,239.00	By Estate Security	69,74,313.00	-	69,74,313.00	1,23,43,182.00
To Loan & Advance	-	-	-	68,400.00	By POL, Hiring of Veh (R/Proj)	4,29,497.00	-	4,29,497.00	6,04,659.00
To EMD Security Deposit	9,11,500.00	-	9,11,500.00	2,58,350.00	By Contingencies (Res Proj)	24,75,565.00	-	24,75,565.00	13,82,647.00
To Hostel Caution Money	3,92,500.00	-	3,92,500.00	2,59,900.00	By Travel Expenses (Res. Proj)	6,63,740.00	-	6,63,740.00	6,65,226.00
To Intt on HBA	1,85,819.00	-	1,85,819.00	-	By Lab Expenses-Forc Lab	6,73,045.00	-	6,73,045.00	7,59,325.00
To Travel/FA Adv.-GIA	-	-	-	4,00,743.00	By M.Sc Expenditure	44,26,162.00	-	44,26,162.00	45,32,445.00
To Travel Adv.(R/Proj)	41,000.00	-	41,000.00	21,000.00	By Elect and Water Charges	90,07,317.00	-	90,07,317.00	98,79,024.00
To FA (Research Project)	2,762.00	-	2,762.00	1,69,362.00	By Hospitality/Entertainment	2,36,870.00	-	2,36,870.00	3,15,898.00
To LTC Adv	-	-	-	42,642.00	By POL of WII Vehicle	5,18,541.00	-	5,18,541.00	6,75,924.00
To Medical Adv	11,58,000.00	-	11,58,000.00	22,984.00	By Postage & Telegram	2,22,600.00	-	2,22,600.00	1,99,041.00

		RECEIPTS		Previous Year			PAYMENT		Previous Year
Particulars	Plan	Non Plan	Total		Particulars	Plan	Non Plan	Total	
To M.Sc-FA & TA Advance	-	-	-	4,22,441.00	By Repair & Maint of Vehicle	7,45,331.00	-	7,45,331.00	9,27,376.00
To Loan from othe project	-	-	-	12,812.00	By Sport	5,45,760.00	-	5,45,760.00	52,787.00
To Expenses for Capitales	2,19,50,373.00	-	2,19,50,373.00	14,36,823.00	By Stationery & Consumables	6,07,651.00	-	6,07,651.00	8,76,968.00
To Opening Stock-Library	6,749.00	-	6,749.00	5,301.00	By Telephone & Trunk Calls	6,38,507.00	-	6,38,507.00	6,15,238.00
To GPF Recd	-	-	-	5,400.00	By Legal Expenses	24,04,964.00	-	24,04,964.00	3,07,992.00
Adv payment CPWD	58,98,549.00	-	58,98,549.00	77,22,933.00	By Operational expenses	13,76,236.00	-	13,76,236.00	4,24,941.00
Adv Payment CCU	6,33,95,629.00	-	6,33,95,629.00	2,55,55,073.00	By Printing & Binding	31,600.00	-	31,600.00	15,25,681.00
Advance for Veh. Ins.	-	-	-	65,359.00	By Maint of WII Campus	5,87,006.00	-	5,87,006.00	5,67,350.00
Campus Development-CPWD	50,92,979.00	-	50,92,979.00	-	By Repair of equip/furniture	5,250.00	-	5,250.00	1,09,558.00
					By Computer AMC & Cons.	21,50,637.00	-	21,50,637.00	24,24,283.00
					By Lab. Exp-Research Lab	47,904.00	-	47,904.00	2,92,665.00
					By Lab. Expenses-Gen.	1,68,675.00	-	1,68,675.00	30,291.00
					By Maint. Of Civil Work	12,06,080.00	-	12,06,080.00	64,28,938.00
					By Transferred to Trg A/c	50,00,000.00	-	50,00,000.00	1,60,00,000.00
					By Travel Expenses	30,42,049.00	-	30,42,049.00	24,22,878.00
					By Lib expenses	2,16,353.00	-	2,16,353.00	-
					By Computer & Accessories	1,07,05,309.00	-	1,07,05,309.00	9,79,359.00
					By Furniture & Fixture	37,40,139.00	-	37,40,139.00	2,78,134.00
					By Journals & Periodicals	60,31,487.79	-	60,31,487.79	27,51,744.00
					By TDS	-	-	-	22,101.00
					By Fellowship Arrear	-	-	-	65,754.00
					By Medical Adv	-	-	-	11,58,000.00
					By Forest advance R/Proj	5,63,345.00	-	5,63,345.00	2,762.00
					By Tour Advance -R/Proj	22,196.00	-	22,196.00	41,000.00
					By M.Sc. TA Advance	29,530.00	-	29,530.00	-
					By M.Sc. FA Advance	3,28,318.00	-	3,28,318.00	-
					By Building Complex	6,36,49,306.00	-	6,36,49,306.00	2,55,55,073.00

		RECEIPTS		Previous Year			PAYMENT		Previous Year
Particulars	Plan	Non Plan	Total		Particulars	Plan	Non Plan	Total	
					By Campus Development	-	-	-	50,92,979.00
					By Vehicle	28,12,898.00	-	28,12,898.00	19,71,130.00
					By Forensic Lab.	1,22,94,712.00	-	1,22,94,712.00	15,56,899.00
					By Lb Eqpt (Harberian)	-	-	-	34,691.00
					By DG Set	45,45,044.00	-	45,45,044.00	-
					By Lab Equipment (Res. Lab.)	77,031.00	-	77,031.00	21,500.00
					By Office equipment	7,30,964.00	-	7,30,964.00	2,42,290.00
					By Office Eqpt (Res. Proj)	10,37,434.00	-	10,37,434.00	28,160.00
					By Camp Eqpt (Res. Proj.)	12,03,129.00	-	12,03,129.00	6,38,277.00
					By Loan and adv-IIT Kanpur	2,47,800.00	-	2,47,800.00	9,91,200.00
					By Intt. Tfr to Corpus Fund	-	-	-	61,95,962.00
					By Prev. Year bal. Transf. to Corpus	3,32,61,512.00	-	3,32,61,512.00	1,76,26,894.00
					By Elect. Equipment	33,70,213.00	-	33,70,213.00	-
					By Advance for CPWD	2,32,50,383.00	-	2,32,50,383.00	-
					By Advance for CCU	48,75,661.00	-	48,75,661.00	31,47,150.00
					By Sundry Creditores	3,17,31,912.00	-	3,17,31,912.00	19,92,648.00
					By Complementry-Library	6,749.00	-	6,749.00	5,301.00
					Internal loan		-	-	16,110.00
					By Security Deposit	46,276.00	-	46,276.00	-
					Adv for Vehical Ins. Premium	1,05,644.75	-	1,05,644.75	1,81,491.00
					In Bank	83,75,247.25	-	83,75,247.25	7,84,63,541.04
					In Hand	1,47,705.00	-	1,47,705.00	230.00
A' Total	51,49,03,243.04	-	51,49,03,243.04	43,68,72,973.04	A' Total	51,49,03,243.04	-	51,49,03,243.04	43,68,72,973.04

Receipt & Payment Accounts for the year 2018-19

GENERAL PROVIDENT FUND

		RECEIPTS		Previous Year			PAYMENT		Previous Year
Particulars	Plan	Non Plan	Total		Particulars	Plan	Non Plan	Total	
To Opening Bal (Bank)	89,09,428.00	-	89,09,428.00	40,15,421.00	By Final Payment	1,40,67,717.00	-	1,40,67,717.00	32,53,599.00
To GP Fund Contribution	2,84,68,830.00	-	2,84,68,830.00	2,37,69,709.00	By Advance/withdrawl	1,18,92,368.00	-	1,18,92,368.00	70,76,958.00
To Encashment of FDR	80,00,000.00	-	80,00,000.00	-	By Loan to Deputationists	13,00,000.00	-	13,00,000.00	-
To Int. on saving a/c	5,49,913.00	-	5,49,913.00	4,54,855.00	By Investment of FDR	99,00,000.00	-	99,00,000.00	90,00,000.00
To Int. on FDR	22,78,433.00	-	22,78,433.00	-					
To Refunds of Loan	13,00,000.00	-	13,00,000.00	-					
					By Closing Balance (Bank)	1,23,46,519.00		1,23,46,519.00	89,09,428.00
B' Total	4,95,06,604.00		4,95,06,604.00	2,82,39,985.00	F' Total	4,95,06,604.00		4,95,06,604.00	2,82,39,985.00

Receipt & Payment Accounts for the year 2018-19

PENSION FUND

		RECEIPTS		Previous Year			PAYMENT		Previous Year
Particulars	Plan	Non Plan	Total		Particulars	Plan	Non Plan	Total	
To Opening Balance									
Cash in Bank	56,36,534.00	-	56,36,534.00	57,32,894.00	By Investment in FDR	7,17,80,625.00	-	7,17,80,625.00	-
To encashment of FDR	2,97,00,000.00	-	2,97,00,000.00	2,08,54,255.00	By Commuted Value of Pension	89,49,787.00	-	89,49,787.00	75,52,311.00
To Interest (Pension A/c)	3,26,542.00	-	3,26,542.00	1,31,487.00	By Pension/ Family Pension	2,23,81,199.00	-	2,23,81,199.00	2,30,44,652.00
To WII Contribution	81,28,981.00	-	81,28,981.00	87,54,943.00	By Loan	1,00,00,000.00	-	1,00,00,000.00	-
To Interest on FDRs	84,58,684.00	-	84,58,684.00	7,59,918.00					
To Refund of Loan	6,19,80,625.00	-	6,19,80,625.00	-					
					Cash in Bank	11,19,755.00	-	11,19,755.00	56,36,534.00
C' Total	11,42,31,366.00	-	11,42,31,366.00	3,62,33,497.00	D' Total	11,42,31,366.00	-	11,42,31,366.00	3,62,33,497.00

Receipt & Payment Accounts for the year 2018-19

CORPUS FUND

	RECEIPTS			Previous Year		PAYMENT			Previous Year
Particulars	Plan	Non Plan	Total		Particulars	Plan	Non Plan	Total	
To Opening Balance	3,20,02,120.00	-	3,20,02,120.00	1,17,68,477.00	By Investment in FDRs	11,40,00,000.00	-	11,40,00,000.00	3,14,00,000.00
To Misc Receipts	11,84,43,569.00	-	11,84,43,569.00	7,60,23,606.00	By 30% 7CPC Arrear	-	-	-	65,23,219.00
To Interests on Saving A/c	7,38,732.00	-	7,38,732.00	7,86,503.00	By investment in RBI Bonds	-	-	-	4,20,00,000.00
To Encashment of FDR	-	-	-	2,22,20,859.00	Wrongly crdited by bank	-	-	-	2,000.00
To Interest on FDR	-	-	-	11,27,894.00					
					Closing Balance	3,71,84,421.00		3,71,84,421.00	3,20,02,120.00
D' Total	15,11,84,421.00	-	15,11,84,421.00	11,19,27,339.00	F' Total	15,11,84,421.00		15,11,84,421.00	11,19,27,339.00

Receipt & Payment Accounts for the year 2018-19

TRAINING ACCOUNT

	RECEIPTS			Previous Year		PAYMENT			Previous Year
Particulars	Plan	Non Plan	Total		Particulars	Plan	Non Plan	Total	
To Opening in Bank	1,51,27,946.82	-	1,51,27,946.82	1,47,91,877.99	By Office Equipment	8,74,092.00	-	8,74,092.00	1,20,680.00
To Grant Received	50,00,000.00	-	50,00,000.00	1,60,00,000.00	By Cont/Misc	17,52,567.74	-	17,52,567.74	11,96,831.17
To Interest Received	4,72,519.00	-	4,72,519.00	4,53,860.00	By Camping Gear	2,31,218.00	-	2,31,218.00	11,69,220.00
To Other Receipts	1,52,38,942.00	-	1,52,38,942.00	1,48,98,884.00	By Travelling Expenses	36,10,553.00	-	36,10,553.00	39,18,978.00
To Adv. for Expenses	1,55,000.00	-	1,55,000.00	1,45,000.00	By TA/DA & Honorarium	3,90,439.00	-	3,90,439.00	8,28,888.00
Other for expenses	2,58,558.00	-	2,58,558.00	3,90,181.00	By POL & Maint of Vehicle	5,70,285.00	-	5,70,285.00	5,58,610.41
TDS Payable	1,899.00	-	1,899.00	-	By Boarding & Lodging	72,09,546.76	-	72,09,546.76	1,12,03,824.00
					By Books	53,970.00	-	53,970.00	1,33,460.00
					By Salary & Wages	7,77,832.00	-	7,77,832.00	12,92,931.00
					By Other Advance	-	-	-	2,58,558.00

		RECEIPTS		Previous Year			PAYMENT		Previous Year
Particulars	Plan	Non Plan	Total		Particulars	Plan	Non Plan	Total	
					By Corpus Funds	1,33,80,000.00	-	1,33,80,000.00	1,03,29,860.00
					By Maint of Vehicle	-	-	-	2,20,262.59
					By Sports Item	41,860.00	-	41,860.00	67,294.00
					By Advances for expenses	12,00,000.00	-	12,00,000.00	1,55,000.00
					By Maint. Of Civil Work	-	-	-	97,459.00
					By Loan D/WII A/c No 54272	10,00,000.00	-	10,00,000.00	-
					By Closing in Bank	51,62,501.32	-	51,62,501.32	1,51,27,946.82
E' Total	3,62,54,864.82	-	3,62,54,864.82	4,66,79,802.99	C' Total	3,62,54,864.82	-	3,62,54,864.82	4,66,79,802.99

Receipt & Payment Accounts for the year 2018-19

CONSULTANCY PROJECT

		RECEIPTS		Previous Year			PAYMENT		Previous Year
Particulars	Plan	Non Plan	Total		Particulars	Plan	Non Plan	Total	
To Opening Balance:									
at Bank	6,45,92,130.00	-	6,45,92,130.00	2,49,92,327.52	By Office Equipment	10,58,100.00	-	10,58,100.00	21,51,699.00
To Grant Received	3,29,20,303.00	-	3,29,20,303.00	3,61,52,356.89	By Camp Equipment ontingenciges/Misc	-	-	-	-
To Interest Saving A/c	9,37,130.00	-	9,37,130.00	6,48,557.00	By Contingenciges/Misc	18,62,881.26	-	18,62,881.26	56,56,171.57
To Misc Receipt	3,22,02,462.18	-	3,22,02,462.18	4,67,44,210.00	By Fellowship & Wages	10,77,174.00	-	10,77,174.00	15,48,322.00
To Advance for expenses	80,000.00	-	80,000.00	1,24,000.00	By Travel Expenses	43,14,688.00	-	43,14,688.00	36,87,453.00
					By POL & Maint. of veh.	78,563.00	-	78,563.00	2,55,568.00
					By Stationery items	1,80,243.00	-	1,80,243.00	4,78,701.00
					By Advance for expenses(FA)	11,28,400.00	-	11,28,400.00	80,000.00

CONSULTANCY PROJECT

		RECEIPTS		Previous Year		PAYMENT			Previous Year
Particulars	Plan	Non Plan	Total		Particulars	Plan	Non Plan	Total	
					By Boarding & Lodging	55,77,915.00	-	55,77,915.00	90,82,704.84
					By TA /DA & Honorarium	3,28,570.00	-	3,28,570.00	1,86,496.00
					By Transf. To Corpus Fund	50,61,403.00	-	50,61,403.00	2,06,37,866.00
					By Training course fees	9,84,658.00	-	9,84,658.00	-
					By Report writing	-	-	-	27,750.00
					By Field Equipment	-	-	-	2,76,590.00
					By Sport expenses	6,384.00	-	6,384.00	-
					By Loan to other project	15,88,064.00	-	15,88,064.00	-
					By Misc Receipt-Payment	8,18,07,939.00	-	8,18,07,939.00	-
					Total Expenditure	10,50,54,982.26		10,50,54,982.26	4,40,69,321.41
					By Bank Balance	2,56,77,042.32	-	2,56,77,042.32	6,45,92,130.00
F' Total	13,07,32,025.18	-	13,07,32,025.18	10,86,61,451.41	E' Total	13,07,32,024.58	-	13,07,32,024.58	10,86,61,451.41

(Baljeet Kaur)
Finance Officer

(Dr. V.B. Mathur)
Director

FORM OF FINANCIAL STATEMENTS (NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
BALANCE SHEET AS ON 31 MARCH 2019

(Amt. Rs.)

CORPUS /CAPITAL FUND AND LIABILITIES	Schedule	Current Year	Previous Year
CORPUS /CAPITAL FUND	1	66,36,53,625.39	58,04,89,783.64
RESERVE AND SURPLUS	2	-	-
ENDOWMENT/EARMARKED FUND	3	2,56,77,042.92	6,45,92,130.00
SECURED LOAN AND BORROWINGS	4	-	-
UNSECURED LOAN AND BORROWINGS	5	5,56,968.00	5,25,37,593.00
DEFERRED CREDIT LIABILITIES	6	35,82,546.00	19,75,678.00
CURRENT LIABILITIES AND PROVISION	7	27,12,35,411.00	25,96,11,109.00
TOTAL (A)		96,47,05,593.31	95,92,06,293.64
ASSETS			
FIXED ASSETS	8	19,47,07,792.40	16,50,08,064.11
INVESTMENTS- FROM EARMARKED / ENDOWMENT FUNDS	9	-	-
INVESTMENTS- OTHERS	10	62,13,68,542.00	48,61,51,388.00
CURENT ASSETS, LOANS, ADVANCES ETC.	11	14,86,29,258.91	30,80,46,841.53
MISCELLANEOUS EXPENDITURE (to the extent not written off or adjusted)			
TOTAL (B)		96,47,05,593.31	95,92,06,293.64

(Baljeet Kaur)
Finance Officer

(Dr. V.B. Mathur)
Director

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
SHEDULES FORMING PART OF BALANCE SHEET FOR THE YEAR ENDED 31 MARCH 2019

(Amt. Rs.)

SCHEDULE 1: CORPUS/ CAPITAL FUND		Current Year	Previous Year
Balance as at the begninig of the year		28,54,72,701.97	28,72,48,856.14
Add: Contribution towards Corpus/ Capital fund		8,04,23,706.79	3,88,44,683.00
Add/(Deduct) : Balance of net income (expenditure) transferred from		-11,23,73,957.04	-2,88,57,209.17
TOTAL	A	25,35,22,451.72	29,72,36,329.97
Corpus Fund			
Opening Balance		28,32,53,453.67	18,89,17,872.67
Received during the year		11,84,43,569.00	7,60,23,606.00
Add Accrued Interest		1,86,17,473.00	2,29,22,797.00
Add Interest Earned		7,38,732.00	19,14,397.00
Add/Less : Paid to 7th CPC		-	-65,23,219.00
Add/Less : wrongly crdited Accrued Intt. 2016-17 and 2017-18		-1,09,22,054.00	-2,000.00
Total	B	41,01,31,173.67	28,32,53,453.67
Total A+B		66,36,53,625.39	580489783.64

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
SHEDULES FORMING PART OF BALANCE SHEET FOR THE YEAR ENDED 31 MARCH 2019

(Amt. Rs.)

SCHEDULE 2: RESERVE AND SURPLUS:	Current Year	Previous Year
1. Capital Reserve :		
As per last Account	-	-
Addition during the year	-	-
Less : Deductions during the year	-	-
2. Revaluation Reserve :		
As per last Account	-	-
Addition during the year	-	-
Less : Deductions during the year	-	-
3. Special Reserves :		
As per last Account	-	-
Addition during the year	-	-
Less : Deductions during the year	-	-
4. General Reserve :		
As per last Account	-	-
Addition during the year	-	-
Less : Deductions during the year	-	-
TOTAL		

FORM OF FINANCIAL STATEMENTS (NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
SHEDULES FORMING PART OF BALANCE SHEET FOR THE YEAR ENDED 31 MARCH 2019

SCHEDULE3 : EARMARKED FUNDS		Current Year	Previous Year
a)	Opeining Balance of the Funds	6,45,92,130.00	2,49,92,327.52
b)	Addition to the Funds		
	i Grants Received	6,52,02,765.18	8,30,20,566.89
	ii Interest Received	9,37,130.00	6,48,557.00
Total		6,61,39,895.18	8,36,69,123.89
TOTAL (A+B)		13,07,32,025.18	10,86,61,451.41
Utilisation/Expendition towards objectives of funds			
c)	i Capital Expenditures (Fixed Assets)		
	Camp/Field Equipment	-	2,76,590.00
	Office Equipment	10,58,100.00	21,51,699.00
	ii Revenue Expenditure		
	Contigencies/Misc.	18,80,881.26	28,42,637.57
	Fellowship & Wages	10,57,174.00	15,48,322.00
	Travel Expenses	43,14,688.00	36,87,453.00
	POL & Maint. Of Vehicle	78,563.00	2,55,568.00
	Advance for Expenses (FA)	-	80,000.00
	Boarding & Lodging	55,77,915.00	90,82,704.84
	Misc receipt - Payment (Previous Year)	8,18,07,939.00	-
	Report Writing	-	27,750.00
	Corpus fund	50,61,403.00	2,06,37,866.00
	TA/DA & Honorarium	3,28,570.00	1,86,496.00
	Stationery items	1,80,243.00	4,78,701.00
	Training Course Materials	2,000.00	28,13,534.00
	Training course fee	9,84,658.00	-

SCHEDULE3 : EARMARKED FUNDS	Current Year	Previous Year
Sport Expenses	6,384.00	-
Loan to Director WII A/c No 54272	15,00,000.00	-
Loan to Director WII A/c No 10	88,064.00	-
Advance for other Firm	11,28,400.00	-
TOTAL-C	10,50,54,982.26	4,40,69,321.41
NET BALANCE AS AT THE YEAR-END (A+B-C)	2,56,77,042.92	6,45,92,130.00

FORM OF FINANCIAL STATEMENTS (NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
SHEDULES FORMING PART OF BALANCE SHEET FOR THE YEAR ENDED 31 MARCH 2019

(Amt. Rs.)

SCHEDULE 4 : SECURED LOANS AND BORROWINGS	Current Year	Previous Year
(1) Central Govt.	-	-
(2) State Govt.(Specify)	-	-
(3) Financial Instittions		
(a) Term Loans	-	-
(ib) Interest accured and due	-	-
(4) Banks		
(i) Term Loans		
-Interest accured and due	-	-
(ii) Others Loans (specify)		
- Interest accured and due	-	-
(5) Other Institutions and Agencies	-	-
(6) Debentures and Bonds	-	-
(7) Others (specify)	-	-
TOTAL	-	-

FORM OF FINANCIAL STATEMENTS (NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
SHEDULES FORMING PART OF BALANCE SHEET FOR THE YEAR ENDED 31 MARCH 2019

(Amt. Rs.)

SCHEDULE 5 : UNSECURED LOANS AND BORROWINGS	Current Year	Previous Year
(1) Central Govt.	-	-
(2) State Govt.(Specify)	-	-
(3) Financial Instittions	-	-
(4) Banks		
(i) Term Loans	-	-
(ii) Others (specify)	-	-
(5) Other Institutions and Agencies	-	-
(6) Debentures and Bonds	-	-
(7) Fixed Deposits		
(8) Others (Specify)		
Security Deposit	5,56,968.00	5,56,968.00
Internal Loan	-	-
Pension Fund	-	5,19,80,625.00
TOTAL	5,56,968.00	5,25,37,593.00

FORM OF FINANCIAL STATEMENTS (NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
SHEDULES FORMING PART OF BALANCE SHEET FOR THE YEAR ENDED 31 MARCH 2019

(Amt. Rs.)

SCHEDULE 6 : DEFERRED CREDIT LIABILITIES:	Current Year	Previous Year
(A) Acceptances secured by hypothecation of capital equipment and other assets	-	-
(B) Others	35,82,546.00	19,75,678.00
TOTAL	35,82,546.00	19,75,678.00

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
SHEDULES FORMING PART OF BALANCE SHEET FOR THE YEAR ENDED 31 MARCH 2019

(Amt. Rs.)

SCHEDULE 7 : CURRENT LIABILITIES AND PROVISION	Current Year	Previous Year
(A) CURRENT LIABILITIES		
(1) Acceptances		
(2) Sundry Creditors		
(1) For Goods		
(2) For Others		
Other Payments outstanding (Grant in Aid) (15-16)	-	82,200.00
Other Payments outstanding (Grant in Aid) (16-17)	-	1,79,183.00
Other Payments outstanding (Grant in Aid) (17-18)	2,73,945.00	4,31,63,941.00
Other Payments outstanding (Grant in Aid) (18-19)	7,76,871.00	-
(3) Advances Received		
Hostel Caution Money	13,59,903.00	9,67,403.00
(4) Interest accrued but not due on		
(1) Secured Loans/Borrowings	-	-
(2) Unsecured Loans/Borrowings	-	-
(5) Statuary Liabilities		
(1) Overdue		
(2) Others (Specify)		
Pension Fund	12,17,26,806.00	8,28,42,748.00
GP Fund	14,52,82,829.00	13,14,73,976.00
(6) Others (Specify)		
EMD Received	18,13,158.00	9,01,658.00
Welfare Fund	-	-
TOTAL (A)	27,12,33,512.00	25,96,11,109.00
(B) Provisions		
(1) For Taxation		
TDS- Training Account	1,899.00	-
(2) Gratuity		
(3) Superannuation/ Pension	-	-
(4) Accumulated Leave Encashment	-	-
(5) Trade Warranties/ Claims	-	-
(6) Others (Specify)		
TDS refund paid to GPF, Pension & Corpus	-	-
CGEGIS	-	-
GPF	-	-
Payment to Income Tax	-	-
Payment made to Sh Rajkishore Mohanto (Res. Projecdt)	-	-
Fellowship (Arrear)	-	-
TOTAL (B)	1,899.00	-
TOTAL (A+ B)	27,12,35,411.00	25,96,11,109.00

FORM OF FINANCIAL STATEMENTS (NON-PROFIT ORGANISATIONS)
Wildlife Institute of India, Dehradun
SCHEDULES FORMING PART OF BALANCE SHEET FOR THE YEAR ENDED 2018-19
SCHEDULE 8 : FIXED ASSETS

Pariculars	Gross Block						DEPRECIATION				NET BLOCK	
		Addition during the year										
	Cost as at the beginning of the year	Upto 30-Sep	After 30-Sep	Deduction during the year	Adjustment change of dep rates	Cost as at the end of the year	As at the beginning of the year	For the year	Deduction during the year	At the end of the year	As at the current year-end	As at the Previous year-end
LAND												
BLOCK: 0%												
TOTAL	66,07,214.58	-	-	-	-	66,07,214.58	-	-	-	-	66,07,214.58	66,07,214.58
BUILDINGS												
BLOCK: 10%												
TOTAL	8,83,52,800.91	-	3,80,94,233.00	-	-	12,64,47,033.91	1,03,96,478.00	1,07,39,992.00	-	1,07,39,992.00	11,57,07,041.91	11,90,00,852.91
BLOCK: 5%												
TOTAL	53,63,276.71	-	-	-	-	53,63,276.71	2,97,134.00	2,68,164.00	-	2,68,164.00	50,95,112.71	53,63,276.71
PLANT MACHINERY & EQPT												
BLOCK: 15%												
TOTAL	3,30,84,545.60	85,21,340.00	1,33,31,198.00	-	-3,81,974.50	5,45,55,109.12	56,06,257.00	71,83,425.00	-	71,83,425.00	4,73,71,684.12	3,27,78,979.96
AC Plant : BLOCK : 10%												
TOTAL	4,99,895.46	-	-	-	-	4,99,895.46	92,573.00	49,990.00	-	49,990.00	4,49,905.46	4,99,895.46
FURNITURE, FIXTURES : BLOCK : 10%												
TOTAL	33,85,206.32	27,02,965.00	10,37,174.00	-	-	71,25,345.32	3,83,662.00	6,60,676.00	-	6,60,676.00	64,64,669.32	33,85,206.32
COMPUTER/PERIPHERALS : BLOCK : 40%												
TOTAL	6,82,242.86	81,14,079.00	25,91,230.00	-	-	1,13,87,551.86	7,15,680.00	40,36,775.00	-	40,36,775.00	73,50,776.86	6,82,242.86
BOOKS : BLOCK : 40%												
LIBRARY BOOK:-BLOCK : 40%												
TOTAL	14,77,808.66	2,01,751.00	58,29,736.79	-	-	75,09,296.45	33,35,337.00	18,47,909.00	-	18,47,909.00	56,61,387.45	14,77,808.66
GRAND TOTAL	13,94,52,991.10	1,95,40,135.00	6,08,83,571.79	-	-3,81,974.50	21,94,94,723.41	2,08,27,121.00	2,47,86,931.00	-	2,47,86,931.00	19,47,07,792.40	16,97,95,477.46

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
SHEDULES FORMING PART OF BALANCE SHEET FOR THE YEAR ENDED 31 MARCH 2019

(Amt. Rs.)

SCHEDULE :9 INVESTMENTs FROM EARMARKED/ENDOWMENT FUNDES	Current Year	Previous Year
(1) In the Govt. Securities	-	-
(2) Other approved Securities	-	-
(3) Shares	-	-
(4) Debentures and Bonds	-	-
(5) Subsidaries and Joint Ventures	-	-
(6) Others (Specify)	-	-

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
SHEDULES FORMING PART OF BALANCE SHEET FOR THE YEAR ENDED 31 MARCH 2019

(Amt. Rs.)

SCHEDULE :10 INVESTMENT – OTHERS	Current Year	Previous Year
(1) In the Govt. Securities		
(2) Other approved Securities		
(3) Shares		
(4) Debentures and Bonds		
Investment in RBI Bond (GPF)	-	-
Investment in RBI Bond (Pension)	-	-
Investment in RBI Bond (Corpus Fund)	4,20,00,000.00	4,20,00,000.00
(5) Subsidaries and Joint Ventures		
(6) Others (Specify)		
Investment in GIA	-	5,19,80,625.00
Investment in FDR (GPF)	12,22,28,753.00	10,52,23,896.00
Autosweep FDR-GPF	1,10,00,000.00	75,00,000.00
Investment in FDR (Pension Fund)	10,12,17,737.00	6,10,25,558.00
FDR Corpus Fund	30,94,22,052.00	18,34,21,309.00
Autosweep FDR Corpus fund	3,55,00,000.00	3,05,00,000.00
Autosweep FDR-Pension Fund	-	45,00,000.00
TOTAL	62,13,68,542.00	48,61,51,388.00

(Baljeet Kaur)
Finance Officer

(Dr. V.B. Mathur)
Director

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
SHEDULES FORMING PART OF BALANCE SHEET FOR THE YEAR ENDED 31 MARCH 2019

(Amt. Rs.)

SCHEDULE :11 CURRENT ASSETS, LOANS, ADVANCES ETC.	Current Year	Previous Year
(A) CURRENT ASSETS		
(1) Inventories		
Closing Stock of Steel & Cement	-	-
Advance paid for Journals (Grant in Aid)	-	-
Closing Balance of WII Publication	3,06,871.00	3,13,620.00
(2) Sundry Debtors		
(1) Debts Outstanding for a period exceeding six months	-	-
(2) Others (Specify)		
(3) Cash balances in hand (including cheques/drafts and imprest)		
Grant-in-Aid A/c	1,47,705.00	230.00
Training A/c	-	-
Pension Fund A/c	-	-
GPF A/c	-	-
Corpus Fund	-	-
(4) Bank Balances		
(1) With Scheduled Banks		
Grant-in-Aid A/c	83,75,247.25	7,84,63,541.04
Training A/c	51,62,501.32	1,51,27,946.82
Pension Fund A/c	11,19,755.00	11,36,534.00
GPF A/c	13,46,519.00	14,09,428.00
Corpus fund No 4032	16,84,421.67	15,02,120.67
Endowment Funds	2,56,77,042.92	6,45,92,130.00
TOTAL (A)	4,38,20,063.16	16,25,45,550.53
(B) LOANS, ADVANCES AND OTHER ASSETS	Current Year	Previous Year
(1) Loans		
(1) Staff FA(MSc) TA(MSc) FA TA LTC Med Adv)		
Advance for expenses (Staff) (328318+ 29530)	3,57,848.00	11,58,000.00
Advance for expenses (Research Projects)	5,85,541.00	43,762.00
Land Acquisition Charges (Deposited in Hon'ble High Court)	1,80,00,000.00	1,80,00,000.00
Advance for expenses (Training Account)	12,00,000.00	1,55,000.00
Advance for IIT kanpur	12,39,000.00	9,91,200.00
Advance for D/WII A/c 54272	10,00,000.00	-
Advance for Vehicle Insurance	1,05,644.75	65,359.00
(2) Other entities engaged in activities /objectives similar to		
(3) Others (Specify)		
Adv for civil work to CPWD	1,38,78,479.00	13,53,505.00
Loan for World Environment Day (MoEF)	2,80,984.00	2,80,984.00
Loan for WCF workshop	30,253.00	30,253.00

Advance payment to CCU	1,44,82,255.00	2,18,92,077.00
Advance Payment-Training Account	-	2,58,558.00
(2) Advances and other amounts recoverable in cash or in kind or		
(1) On Capital Accounts		
(2) Prepayments		
(3) Others (Specify)		
Security Deposit for Electricity Connection	4,58,559.00	4,12,283.00
TDS to be refunded by the ITO (Pension Fund)	43,89,787.00	43,89,787.00
TDS to be refunded by the ITO (GPF)	22,77,757.00	22,77,757.00
TDS to be refunded by the ITO (Corpus fund)	29,07,227.00	29,07,227.00
(3) Income Accrued		
(1) On Investments from Earmarked / Endowment Funds		
(2) On Invesments -Others		
Interest Accrued on FDR (GIA)	-	82,77,056.00
Interest Accrued on FDR (GPF)	84,29,800.00	1,50,62,895.00
Interest Accrued on FDR (Pension Fund)	1,49,99,527.00	1,17,90,869.00
Interest Accrued on FDR (Corpus Fund)	1,86,17,473.00	2,29,22,797.00
(3) On Loans and Advances		
(4) Others (Specify)		
Training Cost Accrued But not Received	8,38,375.00	8,38,375.00
(4) Expenses payable towards capital/fixed Assets		
(1) Grant in Aid (2015-16)	-	82,200.00
(2) Grant in Aid (2016-17)	-	88,620.00
(3) Research Project (2017-18)	-	18,76,671.00
(4) Grant in Aid (2017-18)	2,73,945.00	3,03,46,056.00
(5) Grant in Aid (2018-19)	4,56,741.00	-
TOTAL (B)	10,48,09,195.75	14,55,01,291.00
TOTAL (A+B)	14,86,29,258.91	30,80,46,841.53

(Baljeet Kaur)
Finance Officer

(Dr. V.B. Mathur)
Director

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

	Schedule	Current Year	Previous Year
INCOME			
Income from Sales/Services	12	-	-
Grants/Subsidies	13	24,95,76,293.21	24,95,76,293.21
Fees/Subscriptions	14	2,40,95,264.00	3,46,18,977.00
Income from Investments (from earmarked/endowment Funds Transferred to funds)	15	-	-
Income from Royalty, Publication etc	16	19,40,422.00	6,31,122.00
Interest Earned	17	41,44,910.00	44,59,489.00
Other Income	18	-	-
Increase/decrease) in stock of Finished goods and works-in-progress	19	-	-
TOTAL (A)		27,97,56,889.21	28,92,85,881.21
EXPENDITRUE			
Establishment Expenses (Plan & Non Plan)	20	25,67,13,332.00	22,40,76,923.00
Other Administrative Expenses (Plan & Non Plan)	21	13,50,35,539.75	14,49,18,958.17
Expenditure on Grants, Subsidies etc.	22	-	-
Expenditure on Grants, Subsidies etc.	23	-	-
Significant account Polices (notes on Accounts)	24	-	-
CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS (Illustrative)	25	-	-
Total (B)		39,17,48,871.75	36,89,95,881.17
Balance being excess of Income over Expenditure (A-B)		-11,19,91,982.54	-7,97,09,999.96
Prior period items		-3,81,974.50	-4,26,233.00
BALANCE BEING SURPLUS (DEFICIT) CARRIED TO CORPUS/CAPITAL FUND		-11,23,73,957.04	-8,01,36,232.96

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :12 INCOME FROM SALES/SERVICES	Current Year	Previous Year
(1) Income from Sales		
(a) Sale of Finished Goods	-	-
(b) Sale of Raw Material	-	-
(c) Sale of Scraps	-	-
(2) Income from Services		
(a) Labour and Processing Charges	-	-
(b) Professional/Consultancy Services	-	-
(c) Agency Commission and Brokerage	-	-
(d) Maintenance Services (Equipment/Property)	-	-
(e) Other (Specify)	-	-
TOTAL	-	-

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :13 GRANTS/SUBSIDIES	Current Year	Previous Year
(1) Central Government		
Grant -in- Aid from MoEF	33,00,00,000.00	32,97,53,000.00
Balance Grant 2017-18	-	99,47,000.00
Amt capitalized (-)	8,04,23,706.79	3,88,44,683.00
Total	24,95,76,293.21	30,08,55,317.00
(2) State Governments (s)		
(3) Government Agencies	-	-
(4) Institutions/Welfare Bodies	-	-
(5) International Organisations	-	-
(6) Others (Specify)		
WII Contribution (Pension A/c)	-	-
TOTAL	24,95,76,293.21	30,08,55,317.00

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :14 FEES/ SUBSCRIPTIONS	Current Year	Previous Year
(1) Entrance Fees		
M.Sc.Course Fee	31,96,800.00	34,60,093.00
(2) Annual Fees/ Subscriptions	-	-
(3) Seminar/ Program Fees		
Seminar/ Workshop Fees	-	-
(4) Consultancy Fees		
Consultancy refund	-	-
(5) Others (Specify)		
Other Receipt (Training)	1,52,38,942.00	1,48,98,884.00
Receipt for Training courses	50,00,000.00	1,60,00,000.00
Other Project Grant	6,59,522.00	2,60,000.00
Pre-receipted bill issued but not received	-	-
Receipt for Training Cost	-	-
TOTAL	2,40,95,264.00	3,46,18,977.00

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :15 INCOME FROM INVESTMENTS	Investment from Earmarked fund		Investment-Other	
(income on Investment from Earmarked/Endowment funds transferred to Funds)	Current Year	Previous Year	Current Year	Previous Year
1. Interest				
(a) On Govt Securities	-	-	-	-
(b) Other Bonds/Debentures	-	-	-	-
2. Dividends:				
(a) On Shares	-	-	-	-
(b) On Mutual Fund Securities	-	-	-	-
3. Rents	-	-	-	-
4. Others (Specify)	-	-	-	-
TOTAL	-	-	-	-

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :16 INCOME FROM ROYALTY, PUBLICATION ETC.	Current Year	Previous Year
(1) Income from Royalty	-	-
(2) Income from Publications	-	-
(3) Others (Specify)		
Genetic lab	-	-
Misc. Receipts	9,62,629.00	5,82,402.00
UBI Building Rent	50,100.00	-
Misc Income from Lib	-	-
WII Products	-	-
House Licence Fee	3,60,434.00	46,320.00
Bus Charges	1,02,130.00	-
Electricity & Water Charges	4,65,129.00	2,400.00
Telephone	-	-
TOTAL	19,40,422.00	6,31,122.00

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :17 INTEREST EARNED	Current Year	Previous Year
(1) On Term Deposits		
(1) With Scheduled Banks		
Int. on Bank Deposit	-	-
Interest on FDR	-	-
Interest on Investment	-	-
(2) With Non-Scheduled Banks	-	-
(3) With Institutions	-	-
(4) Others (Specify)	-	-
Int. on Investment(Training)	-	-
Interest (Training)	-	-
Interest on HBA	1,85,819.00	-
(2) On Savings Account		
(1) With Scheduled Banks		
Int. on Savings Account	-	-
Accrued Interest on FDR A/c (GIA)	34,86,572.00	40,05,629.00
Interest on Saving A/c (Training A/c)	4,72,519.00	4,53,860.00
(2) With Non-Scheduled Banks	-	-
(3) Post Office Savings Account	-	-
(4) Others (Specify)	-	-
(3) On Loans		
(1) Interest on Loan & Advance	-	-
(2) Others	-	-
(4) Interest on Debtors and Other Receivables		
TOTAL	41,44,910.00	44,59,489.00

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :18 OTHER INCOME	Current Year	Previous Year
(1) Profit on Sale/Disposal of Assets		
(1) Owned Assets	-	-
(2) Assets acquired out of grants, or received free of cost	-	-
(2) Export Incentives realized	-	-
(3) Fees for Misc. Services	-	-
(4) Others (Specify)		
Misc. Receipts	-	-
EMD Forfeited	-	-
Receipt for Project	-	-
TOTAL	-	-

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :19 INCREASE/DECREASE IN STOCK OF FINISHED GOODS	Current Year	Previous Year
(1) Closing Stock		
(1) Finished Goods		
Closing Stock of WII Publication	-	-
(2) Work-in-progress	-	-
(2) Less : Opening Stock		
(1) Finished Goods	-	-
(2) Work-in-progress	-	-
TOTAL	-	-

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :20 ESTABLISHMENT EXPENSES	Less of Last yr committed	Current Year		Previous Year	
		Plan	Non Plan	Plan	Non Plan
(1) Salaries and Wages					
Salary & Wages (Training A/c)		7,77,832.00	-	12,92,931.00	-
Honorarium		2,83,050.00	-	1,47,000.00	-
Medical		1,15,24,293.00	-	1,02,08,418.00	-
Fellowship - Forensic Cell		-	-	5,85,664.00	-
Salaries & Allowances		20,92,54,754.00	-	18,53,60,029.00	-
Stipend		7,04,974.00	-	8,00,459.00	-
Fellowship & Wages (Research Project)		38,82,523.00	-	78,15,256.00	-
HRA		37,61,412.00	-	50,70,088.00	-
(2) Allowances and Bonus					
Bonus		-	-	6,08,307.00	-
OTA		-	-	31,325.00	-
LTC		26,09,461.00	-	18,14,759.00	-
Corps Fund (Training)		-	-	-	-
Transferred to Corpus Fund		-	-	-	-
Honorarium (Training A/c)		-	-	-	-
(3) Others (Specify)					
(4) Contribution to Other Fund (Specify)					
Leave Salary and Pension Contr.		23,81,603.00	-	26,58,549.00	-
(5) Staff Welfare Expenses					
Uniforms		-	-	-	-
(6) Expenses on Employees Retirement and Terminal Benefits					
Final Payment					
Leave Encashment & Gratuity		2,13,43,390.00	-	74,45,764.00	-
(7) Others (Specify)					
Camp Expenses (Research Project)		1,90,040.00	-	2,38,374.00	-
TOTAL		25,67,13,332.00	-	22,40,76,923.00	-

(Baljeet Kaur)
Finance Officer

(Dr. V.B. Mathur)
Director

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :21 OTHER ADMINISTRATIVE EXPENSES	R&P	Committed	Current Year		Previous Year	
		Plan		Non Plan	Plan	Non Plan
AMC of Computers	21,50,637.00	-	21,50,637.00	-	24,24,283.00	-
Annual Research Seminar	10,24,709.00	-	10,24,709.00	-	6,82,284.00	-
Contingencies/Misc. (Research Project)	24,75,565.00	-	24,75,565.00	-	7,42,258.00	-
Cont./Misc. (Training Account)	20,37,755.74	-	20,37,755.74	-	24,99,511.17	-
Expenses for Library	2,16,353.00	-	2,16,353.00	-	82,888.00	-
Electricity and Water Charges	90,07,317.00	-	90,07,317.00	-	98,79,024.00	-
Maint. Of WII Campus	5,87,006.00	-	5,87,006.00	-	5,67,350.00	-
Estate Security	69,74,313.00	-	69,74,313.00	-	1,23,43,182.00	-
Lab Expenses (Research lab)	47,904.00	-	47,904.00	-	4,00,473.00	-
Lab Expenses (Forensic Lab)	6,73,045.00	-	6,73,045.00	-	1,07,13,460.00	-
Lab Expenses (Genetic Lab)	1,68,675.00	-	1,68,675.00	-	30,291.00	-
Legal Expenses	24,04,964.00	1,45,140.00	25,50,104.00	-	3,07,992.00	-
M.Sc. Course Expenditure	44,26,162.00	-	44,26,162.00	-	45,32,445.00	-
Operational Expenses	13,76,236.00	-	13,76,236.00	-	8,63,150.00	-
Corpur Fund Transfer (Training Account)	1,33,80,000.00		1,33,80,000.00	-	1,03,29,860.00	-
POL & Maintenance of Vehicle (Research Project)	4,29,497.00	-	4,29,497.00	-	6,04,659.00	-
POL & Maintenance of Vehicle (Training A/c)	5,70,285.00	-	5,70,285.00	-	5,58,610.41	-
POL for Vehicles	5,18,541.00	-	5,18,541.00	-	6,75,924.00	-
Postage & Telegrams	2,22,600.00	-	2,22,600.00	-	1,99,041.00	-
Printing & Binding	31,600.00	-	31,600.00	-	15,25,681.00	-
Borading & Lodging (Training Account)	72,09,546.76	-	72,09,546.76	-	1,12,03,824.00	-
Repair & Maintenance of Vehicles	7,45,331.00	-	7,45,331.00	-	7,05,972.00	-
Vehicle insurance	4,16,794.25	-	4,16,794.25	-	3,37,536.00	-
Repair of Vehicle (Training Account)	-	-	-	-	2,20,262.59	-
Repair & Maintenance furniture & Fixture	5,250.00	-	5,250.00	-	1,09,558.00	-
Sports	5,45,760.00	-	5,45,760.00	-	52,787.00	-
Hospitality/entertainment	2,36,870.00	-	2,36,870.00	-	3,15,898.00	-
Sport Goods (Training Account)	41,860.00	-	41,860.00	-	67,294.00	-
Stationery	6,07,651.00	1,30,445.00	7,38,096.00	-	12,17,142.00	-
Training Allowance	-	-	-	-	-	-
Telephone & TC	6,38,507.00	44,545.00	6,83,052.00	-	6,15,238.00	-
Training & Skill Upgradation of Staff	-	-	-	-	-	-
Training Cost Expenditure	50,00,000.00	-	50,00,000.00	-	1,60,00,000.00	-
Travel Exp. (Grant in Aid)	30,42,049.00	-	30,42,049.00	-	24,22,878.00	-
Travel Exp. (Research Project)	6,63,740.00	-	6,63,740.00	-	6,65,226.00	-
Travelling Expenses (Training A/c)	40,00,992.00	-	40,00,992.00	-	47,47,866.00	-

(Amt. Rs.)

SCHEDULE :21 OTHER ADMINISTRATIVE EXPENSES	R&P	Committed	Current Year		Previous Year	
		Plan		Non Plan	Plan	Non Plan
Maintinancae of civil work	47,82,702.00	-	47,82,702.00	-	64,28,938.00	-
Add : Expenditure Plant & Treee (As pointed out by Audit)	-	-	-	-	-	-
Wild Life Health Lab	-	-	-	-	-	-
Harberium	-	-	-	-	-	-
Complementary-Lib.	6,749.00	-	6,749.00	-	5,301.00	-
Repair of Building (Training Account)	-	-	-	-	97,459.00	-
DST Funded Asatic Lion & GPS telemetry	-	-	-	-	-	-
Antartica Programme	-	-	-	-	6,40,389.00	-
Opening Bal. Grant transfer for Next Financial Year 2017-18	-	-	-	99,47,000.00	-	
Funds Transfer of Misc. Recipt to Corpus A/c	3,32,61,512.00	-	3,32,61,512.00	-	76,79,894.00	-
Depriciation during the year 20859968+616161	2,47,86,931.00	-	2,47,86,931.00	-	2,14,76,129.00	-
TOTAL	13,47,15,409.75	3,20,130.00	13,50,35,539.75	-	14,49,18,958.17	-

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :22 EXPENDITURE ON GRANTS, SUBSIDIES ETC...	Current Year		Previous Year	
	Plan	Non Plan	Plan	Non Plan
(a) Grants given to Institutions/Organisation	-	-	-	-
(b) Subsidies given to Institution?Organisations	-	-	-	-
TOTAL	-	-	-	-

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :23 - INTREST :	Current Year		Previous Year	
	Plan	Non Plan	Plan	Non Plan
(a) On Fixed Loans	-	-	-	-
(b) On other Loans (including Bank Chargs)	-	-	-	-
(c) Other (Specify)	-	-	-	-
TOTAL	-	-	-	-

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

SCHEDULE – 24 SIGNIFICANT ACCOUNTING POLICES (Notes on Accounts)	
1	ACCOUNTING CONVENTION
	The financial statement are prepared on the basis of historical cost convention, unless otherwise stated and on the accrual method of accounting.
2	INVENTORY VALUATION
2.1	Stores and spares (including machinery spares) are valued at cost.
2.2	Nil
3	INVESTMENTS
3.1	Investments classified as Long term investments are carried at cost. Provision for decline, other than temporary, is made on carrying cost of such investments.
3.2	Investments classified as current are carried at lower of coast and fair value. Provision for shortfall In the value of such investments is made for each investment considered individually and not on a global basis.
3.3	Cost includes acquisition expenses like brokerage, transfer stamps.
4	EXCISE DUTY
	Nil
5	FIXED ASSETS
	5.1Fixed assets are stated at cost of acquisition inclusive of inward freight, duties and taxes and incidental and direct expenses related to acquisition. In respect of projects involving construction, related pre-operational expenses (including interest on loan for specific project prior to its completion), form part of the value of the assets.capitalized
	5.2Fixed assets received by way of non-monetary grants, (other than towards the Corpus Fund), are capitalized at values stated by corresponding credit to capital Reserve.
6	DEPRECIATION
6.1	Depreciation is provided on "Written Down Value method" as per specified in the Income-tax, 1961 except depreciation on cost adjustments arising on account of conversion of foreign currency, liabilities for acquisition of fixed assets, which is amortized over the residual life of the respective assets.
6.2	In respect of additions to/deductions from fixed assets during the year, depreciation is considered on pro-rata basis.
6.3	Nil
7	MISCELLANEOUS EXPENDITURE
	Nil
8	ACCOUNTING FOR SALES
	Nil
9	GOVERNMENT GRANT/SUBSIDIES
9.1	Government grants of the natures of contribution towards capital cost of setting up projects are treated as Capital Reserve
9.2	Government grants in respect of specific assets acquired are shown as a deduction from the cost of the releated assets.
9.3	Government grants /subsidy are accounted on realization basis.
10	FOREIGN CURRENCY TRANSACTION
10.1	Transaction denominated in foreign currency are accounted at the exchange rate prevailing at the date of the transaction.
10.2	Current assets, foreign currency loans and current liabilities are converted at the exchange rate prevailing as at the year end and the resultant gain/loss is adjustment to cost of fixed assets, if the foreign currency liability related to fixed assets, and in other cases is considered to revenue
11	LEASE
	Lease rentals are expensed with reference to lease terms.
12	RETIREMENT BENEFITS
	The pension scheme followed in the institute is based on CCS Pention Rules, for the employees appointed prior to 01 Jan 2004. The New Pension Scheme(NPS) is in operation for the employees recruited on or after 01 Jan 2004
13	PRIOR PERIOD ITEMS
13.1	Prior period items, Extra ordinary items and changes in Accounting Polices are accounted in accordance with Accounting Standard-5.

FORM OF FINANCIAL STATEMENTS(NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

(Amt. Rs.)

SCHEDULE :25 - CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS :	Current Year		Previous Year	
	Plan	Non Plan	Plan	Non Plan
1 CONTINGENT LIABILITIES				
1.1 Claims against the Entity not acknowledged as debts	-	-	-	-
1.2 In respect of :				
Bank guarantees given by/on behalf of the entity	-	-	-	-
Letters of Credit opened by Bank on behalf of the Entity	-	-	-	-
Bills discounted with banks	-	-	-	-
1.3 Disputed demands in respect of :				
Income Tax	-	-	-	-
Sales-Tax	-	-	-	-
Municipal Taxes	-	-	-	-
1.4 In respect of claims from parties for non-execution of orders, but contested by the Entity	-	-	-	-
2 CAPITAL COMMITMENTS				
Estimated value of contracts remaining to be executed on capital account and not provided for (net of advance)	-	-	-	-
3 LEASE OBLIGATIONS				
Future obligations for rentals under finance lease arrangements for Plant and Machinery amount to	-	-	-	-
4 CURRRENT ASSESTS, LOANS AND ADVANCES				
In the opinion of the Management, the current assets, loans and advances have a value on realization in the ordinary course of business, equal at least to the aggrerate amount shown in the Balance Sheet.	-	-	-	-
5 TAXATION				
In view of there being no taxable income under Income-tax Act 1961, no provison for income tax has been considered necessary	-	-	-	-
6 FOREIGN CURRENCY TRANSACTIONS				
6.1 Value of Imports calculated on C.I.F. Basis :				
Purchase of finished Goods	-	-	-	-
Raw Materials & Components (including in transit)	-	-	-	-
Capital Goods	-	-	-	-
Stores, Spares and Consumables	-	-	-	-
6.2 Expendidtudre in foreign currency:				
a) Travel	-	-	-	-
b) Remittances and Interest payment to Financial Institutions/Banks in Foreign Currency	-	-	-	-
c) Other expenditure:				
Commission on Sales	-	-	-	-
Legal and Professional Expenses	-	-	-	-
Miscellaneous Expenses	-	-	-	-
6.3 Earnings:				
Value of Exports on FOB basis	-	-	-	-

(Amt. Rs.)

SCHEDULE :25 - CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS :		Current Year		Previous Year	
		Plan	Non Plan	Plan	Non Plan
6.4	Remuneration to auditors				
	As auditors				
	Taxation Matters	-	-	-	-
	For Management Services	-	-	-	-
	For certification	-	-	-	-
	other	-	-	-	-
7	Corresponding figures for the previous year have been regrouped/rearranged, wherever necessary	-	-	-	-
8	Schedules 1 to 25 are annexed to and form an integral part of the Balance Sheets as at 31 Mar 2019 and the Income and Expenditure Account for the year ended on that date.	-	-	-	-
TOTAL		-	-	-	-

GENERAL PROVIDENT FUND ACCOUNT NO. 518502010001297
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

Income		Expenditure	
Particulars	Amount	Particulars	Amount
Opening Balance	8909428.00	Final payment of GPF	14067717.00
Interest Received on Saving Account	549913.00	Investment	9900000.00
Interest Earned on RBI Bond	0.00	Advance/Withdrawal paid	11892368.00
GPF Contribution	28468830.00	Interest Accrued and invested	0.00
Encashment of FDR	8000000.00	TDS on Interest if FDR	0.00
Interest on FDR	2278433.00	Loan to Deputationists	1300000.00
Refunded of Loan	1300000.00	Bank Balance	12346519.00
Total 49506604.00		Total	49506604.00

PENSION FUND ACCOUNT NO. 518502010000018
WILDLIFE INSTITUTE OF INDIA, CHANDRABANI, DEHRADUN
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 2018-19

Income		Expenditure	
Particulars	Amount	Particulars	Amount
Opening Balance	5636534.00	Investment in FDR	71780625.00
Interest Received on Saving Account	326542.00	Commuted Value of Pension	8949787.00
Interest Earned on FDR	0.00	Family Pension/ Pension	22381199.00
WII Contribution	8128981.00	Loan	10000000.00
Encashment of FDR	29700000.00		
Interest FDR	8458684.00		
Refund of Loan	61980625.00	Bank Balance	1119755.00
Total	114231366.00	Total	114231366.00

FORM OF FINANCIAL STATEMENTS (NON-PROFIT ORGANISATIONS)
WILDLIFE INSTITUTE OF INDIA, DEHRADUN
FIXED ASSETS PURCHASED FROM FUNDS REFLECTED IN SCHEDULE-3
ACCOUNT FOR THE YEAR ENDED 2018-19

Pariculars	Gross Block						Depreciation			Net Block	
		Addition during the year									
	Cost as at the beginning of the year			Deduction during the year	Cost as at the end of the year	As at the beginning of the year	For the year	Deduction during the year	At the end of the year	As at the current year-end	As at the Previous year-end
		Upto 30-Sep	After 30-Sep								
PLANT MACHINERY & EQPT											
BLOCK: 15%											
Office Equipment	6319991.03	226893.00	831207.00	-	7378091.03	-	1044373.13	-	1044373.13	6333717.90	6319991.03
Camp Equipment	3180700.18	0.00	0.00	-	3180700.18	-	477105.03	-	477105.03	2703595.15	3180700.18
TOTAL	9500691.21	226893.00	831207.00	-	10558791.21	-	1521478.16	-	1521478.16	9037313.05	9500691.21
FURNITURE, FIXTURES											
BLOCK : 10%											
Furinitures & Fixtures	198457.25	-	-	-	198457.25	-	19845.73	-	19845.73	178611.53	198457.25
TOTAL	198457.25	-	-	-	198457.25	-	19845.73	-	19845.73	178611.53	198457.25
BOOKS : BLOCK : 60%											
Books	11125.93	-	-	-	11125.93	-	6675.56	-	6675.56	4450.37	11125.93
TOTAL	11125.93	-	-	-	11125.93	-	6675.56	-	6675.56	4450.37	11125.93
GRAND TOTAL	9710274.39	226893.00	831207.00	-	10768374.39	-	1547999.44	-	1547999.44	9220374.95	9710274.39

(Baljeet Kaur)
Finance Officer

(Dr. V.B. Mathur)
Director

ASSESSING THE IMPACTS OF POWER – LINES ON AVIAN SPECIES IN THE ARID PLAINS OF WESTERN GUJARAT
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	4,34,892.00	Manpower	10,46,070.00
Grant Received	41,46,194.30	Equipment	26,54,902.00
Interest Received	14,409.00	Travel	3,51,440.00
		Accommodation	73,343.00
		Contingency	74,479.00
		Total Expenditure	42,00,234.00
		Outstanding :	
		Tour Advance	25,000.00
		Balance as on 31.03.2019 A/C No. 56170	3,70,261.30
Grand Total	45,95,495.30	Grand Total	45,95,495.30

DST FUNDED – WOMEN SCIENTIST (WoS) PROJECT
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	3,82,103.00	Manpower	4,95,000.00
Grant Received	1,19,828.00	Consumables	1,53,269.00
Interest Received	7,791.00	Contingency	12,334.00
Loan Received from A/c No.- 62	3,00,000.00	Total Expenditure	6,60,603.00
		Balance as on 31.03.2019 A/C No. 55926	1,49,119.00
Grand Total	8,09,722.00	Grand Total	8,09,722.00

POPULATION GENETIC STRUCTURE IN TRACKING POACHING CASES OF INDIAN PANGOLIN (MANIS CRASSICUDATA)
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	3,06,345.00	Manpower	6,93,917.00
Grant Received	9,10,000.00	Consumables & Lab Expenditures	78,839.00
Interest Received	15,910.00	Contingencies	58,538.00
Advances	30,000.00	Field Allowance	51,100.00
		Travel and Lodging & Fooding	1,54,215.00
		Overhead Expenses	1,00,000.00
		Total Expenditure	11,36,609.00
		Outstanding :	
		Forest Advances	35,000.00
		Tour Advance	5,000.00
		Balance as on 31.03.2019 A/C No. 56111	85,646.00
Grand Total	12,62,255.00	Grand Total	12,62,255.00

FORENSIC CELL REVOLVING FUND
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	76,52,012.41	Contingency	2,22,086.00
Forensic Income	18,34,694.00	Consumables	1,79,765.00
Interest Received	2,99,242.00	Travel	2,20,527.00
Advances	49,000.00	Total Expenditure	6,22,378.00
		Outstanding :	
		Forest Advances	28,000.00
		Tour Advances	56,000.00
		Balance as on 31.03.2019 A/C No. 53911	91,28,570.41
Grand Total	98,34,948.41	Grand Total	98,34,948.41

CAUSES OF AVIAN DIVERSITY GRADIENTS ALONG THE HIMALAYAS
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	3,358.91	Manpower	1,58,877.00
Grant Received	2,01,808.00	Total Expenditure	1,58,877.00
Interest Received	249.00	Outstanding :	
		Loan to A/c No.- 55510	20,000.00
		Balance as on 31.03.2019 A/C No. 53582	26,538.91
Grand Total	2,05,415.91	Grand Total	2,05,415.91

UNDERSTANDING THE AMUR FALCON FALCO AMURENSIS, THEIR STOP OVER SITES IN NAGALAND AND THEIR MIGRATORY ROUTES FOR BETTER CONSERVATION PLANNING
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	12,22,641.63	Satellite tagging and tracking	62,549.41
Grant Received	11,59,000.00	Manpower	3,93,377.00
Interest Received	39,378.00	Travels	1,72,421.00
Advances	31,029.00	Accommodation expenses for the Research Team	36,680.00
		Miscellaneous	44,116.00
		Hire of Vehicle, POL	45,814.00
		Total Expenditure	7,54,957.41
		Balance as on 31.03.2019 A/C No. 55510	16,97,091.22
Grand Total	24,52,048.63	Grand Total	24,52,048.63

ECOLOGICAL RECONNAISSANCE AND CONSEERVATION ASSESSMENT OF AVIFAUNA IN SAHYADRI TIGER RESERVE
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	1,13,463.00	Manpower	30,833.00
Grant Received	3,00,000.00	Contingency	19,830.00
Interest Received	2,739.00	Travel	1,21,696.00
Advances	94,000.00	Field Wages	10,800.00
		Total Expenditure	1,83,159.00
		Outstanding :	
		Loan to Amur Falcon	11,029.00
		Loan to A/c No.- 55742	3,00,000.00
		Balance as on 31.03.2019 A/C No. 55467	16,014.00
Grand Total	5,10,202.00	Grand Total	5,10,202.00

MONITORING OF RE-INTRODUCED GAUR IN BANDHAVGARH TIGER RESERVE
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	7,87,002.50	Manpower	2,41,080.00
Interest Received	20,069.00	Radio Collars	39,754.00
		Travel	1,24,091.00
		Insurance	6,874.00
		Vehicle & POL Maintenance	72,558.00
		Purchase of drugs & accessories for immobilization equipment	1,70,815.00
		Contingency	79,490.00
		Total Expenditure	7,34,662.00
		Outstanding:	
		Tour Advance	5,000.00
		Balance as on 31.03.2019 A/C No. 50629	67,409.50
Grand Total	8,07,071.50	Grand Total	8,07,071.50

MONITORING OF RE-INTRODUCED TIGERS IN SARISKA TIGER RESERVE
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	9,89,232.55	Manpower	1,25,000.00
Interest Received	23,390.00	Field Assistant	1,27,996.00
		Travel	41,518.00
		Vehicle & POL Maintenance	65,849.00
		VHF Radio Collars	1,19,254.00
		Contingency	42,505.00
		Insurance	13,747.00
		Total Expenditure	5,35,869.00
		Balance as on 31.03.2019 A/C No. 50545	4,76,753.55
Grand Total	10,12,622.55	Grand Total	10,12,622.55

ECOLOGICAL MONITORING OF TIGER POPULATION IN PANNA LANDSCAPE (MP)
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	29,02,341.48	Manpower	15,74,248.00
Opening Balance of Advance	45,000.00	Vehicle Hiring & Fuel	11,65,402.00
Grant Received	16,00,000.00	Contingency/Mis	1,44,032.00
Interest Received	75,711.00	Travel	1,04,665.00
		Base Camp	87,681.00
		Office Equipment	10,700.00
		Transfer of Grant	4,00,000.00
		Total expenditure	34,86,728.00
		Outstanding:	
		Forest Advance	1,60,000.00
		Balance as on 31.03.2019 A/c No 50908	9,76,324.48
Grand Total	46,23,052.48	Grand Total	46,23,052.48

ECOLOGY OF CLOUDED LEOPARD (NEOFELIS NEBULOSA) IN AN EAST HIMALAYAN BIODIVERSITY HOTSPOT
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	4,11,534.00	Manpower	4,44,927.00
Grant Received	10,00,000.00	Consumables	62,042.00
Interest Received	8,627.00	Travel	3,71,601.00
		Contingencies	79,542.00
		Overhead Charges	2,48,000.00
		Total expenditure	12,06,112.00
		Outstanding:	
		Tour Advance	35,000.00
		Balance as on 31.03.2019 A/C No. 55559	1,79,049.00
Grand Total	14,20,161.00	Grand Total	14,20,161.00

RECONCILING DEVELOPMENT WITH CONSERVATION : DELINEATING HABITAT PATCHES AND CORRIDORS FOR GIR LIONS
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	48,372.19	Manpower	35,600.00
Interest Received	1,098.00	Total Expenditure	35,600.00
		Balance as on 31.03.2019 A/C No. 55692	13,870.19
Grand Total	49,470.19	Grand Total	49,470.19

AN INVESTIGATION OF SPECIES OCCUPANCY PATTERNS AND NICHE DIFFERENTIATION AMONG SYMPATRIC CARNIVORES ACROSS VARYING AND USE AND DISTURBANCE REGIMES IN AND AROUND MEHAO WILDLIFE SANCTUARY, ARUNACHAL PRADESH

RECEIPT & PAYMENT

FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	2,43,417.00	Manpower, Consumbles, National, Travel,	89,981.00
Opening Balance of Advance	15,000.00		
Interest Received	7,601.00	Total Expenditure	89,981.00
		Balance as on 31.03.2019 A/C No. 55358	1,76,037.00
Grand Total	2,66,018.00	Grand Total	2,66,018.00

RESEARCH ON FLAGSHIP SPECIES IN DACHIGAM NATIONAL PARK

RECEIPT & PAYMENT

FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	4,32,089.00	Manpower	1,41,135.00
Interest Received	9,579.00	Travel	1,77,845.00
		Consumables	33,846.00
		Total Expenditure	3,52,826.00
		Balance as on 31.03.2019 A/C No. 55384	88,842.00
Grand Total	4,41,668.00	Grand Total	4,41,668.00

STUDY ON DIVERSITY AND ECOLOGY OF HERPETOFAUNA OF PANNA TIGER RESERVE

RECEIPT & PAYMENT

FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	1,76,891.00	Manpower	3,66,874.00
Grant Received	7,36,000.00	Field Assistant	80,927.00
Interest Received	4,419.00	Travel	61,891.00
		Hiring of Vehicle	89,847.00
		Equipment & Consumables	1,65,000.00
		Consumables	39,366.00
		Institutional charges	1,10,000.00
		Total Expenditure	9,13,905.00
		Balance as on 31.03.2019 A/C No. 55735	3,405.00
Grand Total	9,17,310.00	Grand Total	9,17,310.00

AUGMENTATION AND LONG TERM MONITORING OF TIGER IN BUXA TIGER RESERVE (W.B.)
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	72,90,479.00	Manpower	13,30,717.00
Interest Received	1,58,939.00	Equipment	21,90,053.20
		Travel	1,51,557.00
		Vehicle Hiring & Fuel	3,71,377.00
		Contingency	3,86,467.00
		Miscellaneous	26,138.00
		Institutional charges	9,00,000.00
		Total Expenditure	53,56,309.20
		Outstanding:	
		Forest Advance	1,40,000.00
		Balance as on 31.03.2019 A/C No. 56209	19,53,108.80
Grand Total	74,49,418.00	Grand Total	74,49,418.00

DEVELOPING SPATIAL DATABASE ON THE STATUS, DISTRIBUTION AND ABUNDANCE OF UNGULATES IN AND AROUND THE FOREST DIVISION OF KULLU WL DIVISION
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	2,70,000.00	Miscellaneous	80,683.00
Interest Received	5,970.00	Total Expenditure	80,683.00
		Balance as on 31.03.2019 A/C No. 56366	1,95,287.00
Grand Total	2,75,970.00	Grand Total	2,75,970.00

DST- INSPIRED FACULTY FELLOW & DST FUNDED: METAPOPULATION DYNAMIC OF TIGER IN TERAI ARC LANDSCAPE PROJECT & POPULATION GENETICS OF SWAMP DEER
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	11,69,119.00	Manpower	16,94,170.00
Opening Balance of Advances	52,000.00	Equipment	1,01,831.00
Grant Received - Metapopulation	6,50,000.00	Contingency	2,47,846.22
Grant Received - Inspired	7,35,515.00	Consumables	4,28,080.00
Interest Received	34,025.00	Travel	22,355.00
Loan from A/c No.-62	10,00,000.00	Total Expenditure	24,94,282.22
		Outstanding:	
		Forest Advance	36,000.00
		Balance as on 31.03.2019 A/C No. 54269	11,10,376.78
Grand Total	36,40,659.00	Grand Total	36,40,659.00

WCT PANTHERA FUNDED: METAPOPULATION DYNAMIC OF TIGER IN TERAI ARC LANDSCAPE PROJECT
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	17,55,211.55	Manpower	3,36,000.00
Opening Balance of Advances	3,48,083.00	Fuel, Vehicle hiring, maintenance and logistics	79,559.00
Grant Received	23,65,020.00	Contingency	2,22,830.00
Interest Received	99,190.00	Equipment	45,990.00
		Lab Reagents	4,13,613.00
		Total Expenditure	10,97,992.00
		Advance for expenses	
		Forest Advance	924.00
		Loan to DST Metapopulation	2,00,000.00
		Balance as on 31.03.2019 A/C No. 54992	32,68,588.55
Grand Total	45,67,504.55	Grand Total	45,67,504.55

IMPLEMENTING RHINO DNA INDEXING SYSTEM TO COUNTER RHINO POACHING THREAT AND AID POPULATION MANAGEMENT IN INDIA
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	13,72,317.00	Non Recurring Component	3,21,706.00
Opening Balance of Advances	51,175.00	Manpower	3,66,874.00
Interest Received	28,620.00	Contingency	46,548.00
		Laboratory Reagents	2,06,271.00
		Total Expenditure	9,41,399.00
		Outstanding:	
		Forest Advance	39,175.00
		Tour Advance	15,744.00
		Balance as on 31.03.2019 A/C No. 55585	4,55,794.00
Grand Total	14,52,112.00	Grand Total	14,52,112.00

NATIONAL MISSION ON HIMALAYAN STUDIES (NMHS) - HUMAN WILDLIFE CONFLICT PROJECT (PROJECT- 1)
NATIONAL MISSION ON HIMALAYAN STUDIES (NMHS) - FELLOWSHIP PROJECT (PROJECT- 2)
NATIONAL MISSION ON HIMALAYAN STUDIES (NMHS) - TREELINE PROJECT (PROJECT- 3)
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	1,66,73,561.12	Expenses: Human Wildlife conflict	
Advances (Human Wildlife conflict) :		Manpower	33,64,480.00
Forest Advance	4,18,355.00	Consumables	2,73,074.19
Tour Advance	1,62,431.00	Contingency	2,16,317.00
Advances (Fellowship) :		Travel	12,15,739.72
Forest Advance	2,59,069.00	Equipment	4,28,860.00
Tour Advance	61,960.00	Activities & Other project cost	5,10,836.30
Advances (Treeline) :		Forest Advance	9,58,829.28
Forest Advance	23,781.00	Tour Advance	2,54,580.00
Grant Received HWC Project	63,69,278.00	Expenses: Fellowship	
Grant Received Treeline Project	15,97,556.00	Manpower	40,71,962.00
Interest Received	3,77,348.00	Contingency including travelling	22,25,444.00
Loan from A/c No.-56389	13,12,302.00	Forest Advance	10,24,055.00
Loan from Other Project	10,00,000.00	Tour Advance	1,73,679.00
		Expenses : Treeline	
		Manpower	5,53,291.00
		Consumables	7,501.00
		Contingency	36,848.00
		Travel	1,40,672.00
		Equipment	49,680.00
		Other Cost	8,477.00
		Forest Advance	23,781.00
		Tour Advance	37,000.00
		Total Expenditure	1,55,75,106.49
		Advance to Science & Conservation	2,06,336.58
		Loan to D/WII A/c No.-55018	82,800.00
		Loan to Other Project	5,00,000.00
		Balance as on 31.03.2019 A/C No. 55352	1,18,91,398.05
Grand Total	2,82,55,641.12	Grand Total	2,82,55,641.12

DST-NMSHE PROGRAMME PROJECT - MICRO FLORA AND FAUNA & WILDLIFE ANIMAL POPULATION
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	42,71,610.37	Manpower	94,51,968.00
Opening Balance of Advances	2,02,80,048.00	Equipment	20,74,333.00
Grant Received from DST	1,72,08,664.00	Travel & field work	14,29,170.00
Grant Received from Inspire	19,00,000.00	Consumables	8,64,698.00
Interest Received	94,496.00	Overhead	4,01,101.00
Loan from A/c No.-02	10,00,000.00	Workshop report & Miscellaneous	25,182.00
Loan from A/c No.-08	15,00,000.00	Development of Lab (CPWD)	38,73,685.00
Loan from A/c No.-56403	10,00,000.00	Total Expenditure	1,81,20,137.00
		Outstanding:	
		Tour Advance, Forest Advance & others	2,07,25,089.00
		Balance as on 31.03.2019 A/C No. 54272	84,09,592.37
Grand Total	4,72,54,818.37	Grand Total	4,72,54,818.37

DST-NMSHE TEK PROJECT
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	2,75,952.00	Manpower	6,26,326.00
Opening Balance of Advances	25,000.00	Travel & field work	54,608.00
Grant Received	12,06,797.00	Consumables	1,409.00
Interest Received	26,037.00	Printing of reports/Contingencies	16,439.00
		Total Expenditure	6,98,782.00
		Outstanding:	
		Forest Advance	1,00,000.00
		Tour Advance	10,070.00
		Closing Balance of Loan to A/c No.-55352	5,00,000.00
		Balance as on 31.03.2019 A/C No. 55746	2,24,934.00
Grand Total	15,33,786.00	Grand Total	15,33,786.00

AITEP 2017-19/MSTrIPS/Genetic Connectivity Project
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	2,78,25,530.17	Fellowship	2,84,49,975.00
Grant AITEP	1,18,64,980.00	POL & eh Hiring	45,30,901.00
Grant AITEP	1,75,00,000.00	Travel Exp	50,57,561.00
Grant MSTrIP	48,66,520.00	Contingencies	36,36,729.00
Grant MSTrIP	45,00,000.00	field equipment	67,30,894.44
Grant 50685	10,00,000.00	Institutional Charges	57,84,000.00
Interest	2,93,528.00	Field expenditure	13,85,895.00
Advances for Expenses	7,59,804.00	Genetic analysis	7,88,909.00
Grant Tiger cell	37,62,820.00	Software	12,59,838.00
		Printing/Publication	7,67,947.00
		Loan: Director WII A/c No. 55367	13,20,844.00
		Total Expenditure	5,97,13,493.44
		Forest/Tour Advance	26,62,018.00
		Bank UBI-50968	99,97,670.73
Grand Total	7,23,73,182.17	Grand Total	7,23,73,182.17

WII - TIGER CELL & PALAMAU TIGER PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	55,50,231.25	Manpower	37,88,763.00
Grant Received	13,20,844.00	POL & eh Hiring	2,06,193.00
Interest	1,21,249.00	Travel Exp	1,39,779.00
Loan from Dolphin(55293)	3,00,000.00	Contingencies	5,69,395.00
Advances for Expenses	1,82,756.00	Institutional Charges	5,79,735.00
Misc income	35,000.00	Refund of Loan to 50968	8,00,000.00
		Equipment	8,12,061.00
		Total expenses	68,95,926.00
		Tour Advance	1,55,401.00
		Grand Total	70,51,327.00
		Bank UBI-55367	4,58,753.25
Grand Total	75,10,080.25	Grand Total	75,10,080.25

WII - LONG TERM MONITORING OF TIGER IN TADOBA ANDHARI TIGER RESERVE
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	18,28,445.25	Fellowship	17,85,334.00
Grant Received	40,89,600.00	Travel Exp	3,02,233.00
Interest	68,759.00	Contingencies	3,84,091.00
Advances for Expenses	7,000.00	Institutional Charges	3,79,500.00
		Field equipment	11,62,975.00
		Total expenses	40,14,133.00
		Tour Advance	10,746.00
		Grand Total	40,24,879.00
		Bank UBI-53431	19,68,925.25
Grand Total	59,93,804.25	Grand Total	59,93,804.25

WII - GLOBAL TIGER FORUM SNOW LEOPARD PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	4,06,509.25	Travel	2,666.00
Interest	13,478.00	Printing/Binding	1,37,060.00
		Grand Total	1,39,726.00
		Bank UBI-55366	2,80,261.25
Grand Total	4,19,987.25	Grand Total	4,19,987.25

WII - ECOLOGICAL IMPACT ASSESSMENT AND ROAD INFRASTRUCTURE
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	1,21,763.00	Fellowship	7,66,938.00
Refund of loan	26,54,400.00	Printing/Binding	1,61,688.00
Interest	35,374.00	Travel Exp	3,77,703.00
Advances for Expenses	1,163.00	workshop	50,000.00
		Contingencies	1,37,840.00
		Repair of vehicle	9,005.00
		Total expenses	15,03,174.00
		Tour Advance	55,791.00
		Grand Total	15,58,965.00
		Bank UBI-55338	12,53,735.00
Grand Total	28,12,700.00	Grand Total	28,12,700.00

WII - RE-INTRODUCTION OF CHEETAH PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opeining Balance	19,627.19		
Intrest Received	696.00	Bank UBI-52366	20,323.19
Grand Total	20,323.19	Grand Total	20,323.19

WII MANAGEMENT EFFECTIVENESS EVALUATION (MEE) OF PROTECTED AREAS
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	31,70,260.57	Travel Expenses	81,78,279.00
Interest received 2018-19	2,16,395.00	Sitting Fee	11,75,300.00
Interest received from FDRs	6,71,664.00	Per diem to evaluation team	17,74,580.00
Grant received for MEE of NPs and WLS 125 PAs	1,17,06,360.00	Report Writing Cost	3,75,000.00
Grant received for MEE of NPs and WLS 146 PAs	2,89,45,200.00	Project Initiation Cost	20,43,222.00
Refund of Loan	15,00,000.00	Project Management Cost	18,15,131.00
Encashment of FDRs	50,00,000.00	Miscellaneous & unforeseen Expenses/Overheads	18,23,414.00
Refund of Tour advance MEE TR	35,000.00	Expenditure World Environment Day	1,97,577.00
		Loan to other project	23,62,000.00
		FDRs	2,00,00,000.00
		Total of MEE Expenditure	3,97,44,503.00
		Expenditure MEE Tiger Reserve	2,15,236.00
		Bank Balance A/C No - 62	1,12,85,140.57
Grand Total	5,12,44,879.57	Grand Total	5,12,44,879.57

PROJECT TIGER CO-PREDATOR, PREY & HABITAT PHASE IV
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	1,07,053.00		
Interest received 2018-19	4,710.00		
		Bank Balance A/C No - 50673	1,11,763.00
Grand Total	1,11,763.00	Grand Total	1,11,763.00

PREPARING AND UPDATING STUD BOOKS OF 34 ENDANGERED SPECIES (14 OLD AND 20 NEW)
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	10,53,334.08	Salaries	6,02,000.00
Interest received 2018-19	17,237.00	Travel (Data colletion from Zoos)	2,18,174.00
Excess refund of transaction charges	94.40	Stationery	93,020.00
		Miscellaneous & contingencies	264.00
		Unspent balance refunded to CZA	1,57,113.00
		Bank Balance A/C No - 53274	94.48
Grand Total	10,70,665.48	Grand Total	10,70,665.48

PATTERN OF BIOMASS PRODUCTION BY WETLANDS AND ITS USE BY WILD UNGULATES IN KAZIRANGA LANDSCAPE
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	2,07,234.00		
Interest received 2018-19	7,348.00		
		Bank Balance A/C No - 53439	2,14,582.00
Grand Total	2,14,582.00	Grand Total	2,14,582.00

BLACK KITE PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	5,20,198.00	Manpower Wages to Field Asst	9,31,485.00
Interest received 2018-19	23,499.00	Travel	1,11,943.00
Grant received for Project from RRCF, Mumbai	9,05,446.00	Contingencies	2,49,656.00
		Loan	50,000.00
		Bank Balance A/C No - 55500	1,06,059.00
Grand Total	14,49,143.00	Grand Total	14,49,143.00

WII-BUILDING PARTNERSHIP TO SUPPORT UNESCO WORLD HERITAGE PROGRAMME
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Bal.	63,970.33	Misc. & Contigencies	60,487.00
Interest Received	1,003.00	Corpus Funds	4,486.33
		Expenditure Total	64,973.33
		Bank Balance A/c No. 50246	0.00
Grand Total	64,973.33	Grand Total	64,973.33

WII-ENVIS PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	47,71,088.75	Fellowship and Wages	14,99,631.00
Interest Received	98,923.00	Travelling Expenditure	15,886.00
Grant Received	14,69,088.00	Contigency	70,753.00
Misc. Income	9,25,000.00	Quiz Programme Expenditure	35,550.00
Salary Payable	1,08,974.00	Advance for Expenses	10,000.00
Advance for Expenses	86.00	Payable Salary	70,686.00
		Green Skill Development Prog. (Manas Project)	15,65,874.00
		Green Skill Development Prog. (Ganga Project)	21,96,947.00
		Expenditure Total	54,65,327.00
		Bank Balance A/c No. 32	19,07,832.75
Grand Total	73,73,159.75	Grand Total	73,73,159.75

WII-UNESCO PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	24,46,703.41		
Interest Received	86,779.00	Expenditure Total	0.00
		Bank Balance A/c No. 44	25,33,482.41
Grand Total	25,33,482.41	Grand Total	25,33,482.41

WII-DGH SEATURTLE TELEMETRY PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	8,78,837.28	Contigencies	36,338.76
Interest Received	31,165.00		
		Expenditure Total	36,338.76
		Bank Balance A/c No. 59	8,73,663.52
Grand Total	9,10,002.28	Grand Total	9,10,002.28

WII-GRATUITY OF CONTRIBUTION
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	1,18,621.83	Contigencies	61.56
Gratuity Contribution	1,23,56,793.00	Investment	1,21,00,000.00
Interest Received	47,017.00		
		Expenditure Total	1,21,00,061.56
		Bank Balance A/c No. 55326	4,22,370.27
Grand Total	1,25,22,431.83	Grand Total	1,25,22,431.83

TIGER RESPONSE TO PRAY HUMAN DISTURBANCE
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	16,11,458.30		
Interest Received	57,146.00		
		Expenditure Total	0.00
		Bank Balance A/c No. 60	16,68,604.30
Grand Total	16,68,604.30	Grand Total	16,68,604.30

ISRO-GBP PROJECT ON LULC DYNAMICS & BIOFIN PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	3,20,526.87	Salary & Wages	12,19,868.00
Grant Received-BIOFIN Project	23,31,703.50	Boarding & Lodging	57,664.00
Interest Received	16,397.00	Travel Expenses	2,25,322.00
Advance for Expenses	174.00	Office Equipment	3,39,663.00
		Misc. & Contigencies	67,776.00
		Expenditure Total	19,10,293.00
		Bank Balance A/c No. 51241	7,58,508.37
Grand Total	26,68,801.37	Grand Total	26,68,801.37

INTERRATED DEVELOPMENT OF WILDLIFE HABITATS
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	57,032.00		
Interest Received	2,022.00		
		Expenditure Total	0.00
		Bank Balance A/c No. 51240	59,054.00
Grand Total	59,054.00	Grand Total	59,054.00

I U C N Cell
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	5,67,324.39	Misc. and Meeting and Confrenace	560.00
Interest Received	24,044.00		
Member Ship Fees	1,82,000.00		
		Expenditure Total	560.00
		Bank Balance A/c No. 41	7,72,808.39
Grand Total	7,73,368.39	Grand Total	7,73,368.39

WESTERN TRAGOPAN PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	15,20,650.00	Advance for Expenses	20,000.00
Interest Received	53,952.00		
Advance for Expenses	20,000.00		
		Expenditure Total	20,000.00
		Bank Balance A/c No. 52465	15,74,602.00
Grand Total	15,94,602.00	Grand Total	15,94,602.00

STRUCTURAL AND FUNCTIONAL ATTRUBUTES OF PLANT COMMUNITIES IN COLD ARID REGION OF NANDA DEVI BIOSPHERES RESERVE, UTTARAKHAND
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	10,983.00		
Interest Received	390.00		
		Expenditure Total	0.00
		Bank Balance A/c No. 52529	11,373.00
Grand Total	11,373.00	Grand Total	11,373.00

ASSESSMENT OF ECOLOGICAL SETTING AND BIODIVERSITY VALUES OF PAPIKONDA NATIONAL PARK AND INDIRA SAGAR (POLAVARAM) MULT. PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	6,32,994.00		
Interest Received	22,448.00		
		Expenditure Total	0.00
		Bank Balance A/c No. 53223	6,55,442.00
Grand Total	6,55,442.00	Grand Total	6,55,442.00

ECOLOGY AND CONSERVATION OF SEA TURTLE OFF COAST OF THE SINDHUDURY USING SATELLITE TRACKING TECHNIQUES
&
DEVELOPMENT OF INTERGRATED MANAGEMENT PLAN OF THE THANE CREEK FLAMINGO SANCTURY
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	8,32,914.00		
Interest Received	32,695.00		
		Expenditure Total	0.00
		Bank Balance A/c No. 54273	8,65,609.00
Grand Total	8,65,609.00	Grand Total	8,65,609.00

WII-UNESCO C 2 C Project
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	2,65,79,222.00	Salaries	84,05,975.00
Interest Received	10,44,136.00	Travel Expenditure	6,70,410.00
Misc. Receipt	51,32,550.00	Contigencies/Misc. Expenses	13,08,165.00
Advance for Expenses	1,13,192.00	Office Equipment	11,97,792.00
		Database Development & Maintenance	4,01,945.00
		Report Writing	4,71,166.00
		Training & Workshop Expenses	36,77,223.00
		Boarding & Lodging	12,750.00
		Advance for Expenses	1,86,174.00
		Expenditure Total	1,63,31,600.00
		Bank Balance A/c No. 54034	1,65,37,500.00
Grand Total	3,28,69,100.00	Grand Total	3,28,69,100.00

WII-THE UNIVERSITY OF BRITISH COLUMBIA
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	3,61,013.08	Boardig & Loding	3,77,483.00
Grant 4,94,572.50		Travel Expenses	54,015.00
Interest Received	14,888.00	Wages of Field Assistant	68,000.00
		Contigencies	24,097.20
		POL & Maint. Of Vehicle	40,999.00
		Advance for Expenses	1,72,089.00
		Expenditure Total	7,36,683.20
		Bank Balance A/c No. 55061	1,33,790.38
Grand Total	8,70,473.58	Grand Total	8,70,473.58

WILD LIFE INSTITUTE OF INDIA
FOREIGN CONTRIBUTION ACCOUNT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Balance as on April,1 2018		Fellowship & Wages	42,33,483.00
UBI A/c No 518502010000010	2,38,05,674.52	Travel Expenditure	3,29,189.00
Interest Received	7,87,952.00	POL & Maint. Of Vehicle	6,827.00
Fund Received		Contigencies	18,59,944.58
ZSL-UKFD on Tiger Conservation Project	90,45,522.00	Office Equipemt	2,72,855.00
ESP Asia Conference Regt. Fees (UNESCO C2C)	2,18,013.20	Boarding & Lodging	2,23,045.00
Japan Travel Bureau Foundation	1,47,227.00	Workshop/ Awareness Camp	39,78,953.00
Asian Development Bank	29,45,716.00	Corpus Funds	31,39,270.00
Doshisha University	95,479.00	Advance for Payment	4,49,302.00
Indigenous Uranism-Exploring Climate Justice	2,91,220.00	Other Advance	1,56,000.00
Misc. Receipt	8,805.00		
Loan:- Director WII A/c No. 8	88,064.00	Total Expenditure	1,46,48,868.58
Advance for Expenses	1,92,601.00	Balance as on 31.03.2019	
		UBI A/c No 518502010000010	2,29,77,405.14
Grand Total	3,76,26,273.72	Grand Total	3,76,26,273.72

ECOLOGY TAXONOMY AND CONSERVATION OF FISH DIVERSITY IN SUBANSIRI RIVER BASIN OF ARUNANCHAL PRADESH
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	1,57,254.00		
Interest Received	5,665.00		
		Total Expenditure	0.00
		Balance as on 31.03.2019, A/c No - 53803	1,62,919.00
Grand Total	1,62,919.00	Grand Total	1,62,919.00

KAILASH SACRED LANDSCAPE CONSERVATION AND DEVELOPMENT INITIATIVE (KSLCDI)
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	21,33,062.40	Manpower	4,32,000.00
Grant received during 2018-19	2,21,272.73	Workshop	67,766.00
Interest Received	71,404.00	Travel	24,458.00
Advance for Expenses	15,000.00	Miscellaneous Expenses	2,34,060.00
Misc Receipt	1,92,000.00	IT Communication/ Stationary	10,502.00
		Field work and field base rental	10,500.00
		Total Expenditure	7,79,286.00
		Outstanding :	
		Forest Advance	15,000.00
		Balance as on 31.03.2019 A/c No. 53475	18,38,453.13
Grand Total	26,32,739.13	Grand Total	26,32,739.13

POPULATION GENETIC STRUCTURE AND GENE FLOW IN BROWN BEAR POPULATION IN INDIA AND ASSESS EXTENT OF GENE FLOW BETWEEN POPULATION OF INDIA & PAKISTAN
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	59,149.00	Non Recurring :	
Opening Balance of Advances	6,930.00	Equipment	2,338.00
Interest Received	2,524.00	Recurring :	
Loan from NMHS HWC	5,00,000.00	Manpower	82,800.00
Loan from A/c No.-55157	72,561.00	Consumables	1,17,732.00
Loan from A/c No.-55352	82,800.00	Total Expenditure	2,02,870.00
		Outstanding :	
		Forest Advances	6,930.00
		Loan to NMHS HWC	5,00,000.00
		Balance as on 31.03.2019 A/C No. 55018	14,164.00
Grand Total	7,23,964.00	Grand Total	8,41,696.00

GENETIC ASSESSMENT OF SAMBER RUSA UNICOLOR POPULATION IN NORTH-EAST INDIA
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	48,427.00		
Interest Received	2,764.00		
Advance for Expenses	362.00		
		Total Expenditure	0.00
		Outstanding :	
		Tour Advance	362.00
		Balance as on 31.03.2019 A/c No. 54947	51,191.00
Grand Total	51,553.00	Grand Total	51,553.00

ASSESSMENT OF THE CONSERVATION VALUE OF MANGROVES OF GUJARAT (PROJECT 1) &
MAPPING OF MARINE PROTECTED AREAS OF INDIA COAST INCLUDING ISLANDS (PROJECT 2) &
MARINE TURTLE PROJECT ALONG THE COAST OF PUDUCHERRY & KARAIKAL REGION (PROJECT 3) &
DETERMINATION OF CONSERVATION VALUE OF MANGROVES OF GOA (PROJECT 4)
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	2,56,624.00		
Interest Received	9,875.00	Total Expenditure	0.00
Opening Balance of Advance	1,00,000.00		
		Outstanding :	
		Loan to D/WII A/c No. 55701	1,00,000.00
		Balance as on 31.03.2019 A/c No. 54919	2,66,499.00
Grand Total	3,66,499.00	Grand Total	3,66,499.00

EVALUATING ECOLOGICAL STATUS OF LEOPARDS IN KALESAR NATIONAL PARK, H.R. &
RECONNAISSANCE SURVEY FOR BLACKBUCK AND ITS HABITAT IN AND ADJOINING LANDSCAPE OR NPCIL COLONY SITE (H.R.) &
MAPPING LANDUSE/ LANDCOVER PATTERNS IN ARAVALLIS, HARYANA WITH SPECIAL REFERENCE TO STATUS OF KEY WILDLIFE SPECIES &
LONG TERM MONITORING OF LEOPARDS AND ITS PREY IN KALESAR NATIONAL PARK HARYANA
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	4,83,297.83	Travel & Vehicle Hiring for field visit	7,500.00
Interest Received	17,803.00		
		Total Expenditure	7,500.00
		Balance as on 31.03.2019 A/c No. 54196	4,93,600.83
Grand Total	5,01,100.83	Grand Total	5,01,100.83

POPULATION GENETIC STRUCTURE OF NILGIRI THAR IN WESTERN GHATS, INDIA CONSERVATION & FORENSIC IMPLICATIONS &
DBT- STIPEND FOR DBT-RA
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	2,76,738.77	Manpower	2,26,271.00
Opening Balance FA & TA DBT RA	50,000.00	Contingency	99,506.00
Grant Received for Nilgiri Tahr	4,75,240.00	Equipment	1,67,016.00
Interest Received	11,025.00	Stipend for DBT Research Associate with HRA	1,44,000.00
		Total Expenditure	6,36,793.00
		Refund of Loan to D/WII A/ c 55760	20,000.00
		Outstanding :	
		Loan to Brown Bear Project D/WII A/c No.	72,561.00
		Forest Advance	18,494.00
		Balance as on 31.03.2019 A/c No. - 55157	65,155.77
Grand Total	8,13,003.77	Grand Total	8,13,003.77

CONSERVATION OF MANIPUR BROW ANTLERED DEER OF SANGAI AN INTEGRATED APPROACH
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	28,08,131.47	Manpower	43,42,762.00
Grant Received	4,90,00,000.00	Infrastructure and Equipment	27,17,788.00
Opening Balance of Advances	22,81,488.00	Research & Monitoring	20,46,502.00
Interest Received	1,71,829.00	Base Camp Expenses	46,644.00
FDR Interest	1,68,418.00	Capacity Development	1,18,244.00
Encashment of FDR	50,00,000.00	Community Engagement	39,689.00
		Conservation Education & Awareness	2,14,286.00
		Establishment of Second Home	57,090.00
		Habitat Recovery Plan at KLNP	2,52,920.00
		Vetrinary Action Plan	1,88,974.00
		Total Expenditure	1,00,24,899.00
		Refund of Loan to CMAPA GIB A/c No. 55292	25,00,000.00
		Outstanding :	
		Forest advance	1,90,488.00
		Tour Advance	2,69,701.00
		Advance to Project Management Unit	31,91,992.00
		Investment in FDR	4,00,00,000.00
		Balance as on 31.03.2019 A/C No. 55295	32,52,786.47
Grand Total	5,94,29,866.47	Grand Total	5,94,29,866.47

RECOVERY OF DUGONGS AND THEIR HABITATS IN INDIA AN INTEGRATED PARTICIPATORY APPROACH DEVELOPMENT OF MANAGEMENT ACTION PLAN TO MITIGATE HUMAN CROCODILE CONFLICTS IN ANDAMAN & NICOBAR ISLANDS - NITI AYOG PROJECT
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	21,95,050.00	Manpower Engagement	50,77,496.00
Opening Balance of Advances	67,55,936.00	Capacity Building & Awarness	47,95,743.00
Interest Received	6,91,115.00	Research Monitoring Species and Habitat	46,22,055.00
Interest on FDR	27,06,729.00	Participatory Management	17,48,374.00
Encashment of FDR	1,50,00,000.00	Marine Mammal Rescue and Rehab	43,144.00
		Niti Aayog	16,68,511.68
		Total Expenditure	1,79,55,323.68
		Outstanding :	
		Forest Advance	1,15,615.00
		Tour Advance	2,76,709.00
		Advance to Dive India	1,59,300.00
		Advance to Fern Sattva Resort Dwarka	1,23,035.00
		Advance to M/s TSG Hotel	4,38,120.00
		Loan to D/WII A/c No.- 55701	2,50,000.00
		Advance to Project Management Unit	65,35,936.00
		Balance as on 31.03.2019 A/C No. 55294	14,94,791.32
Grand Total	2,73,48,830.00	Grand Total	2,73,48,830.00

NTCA- E-BIRD TECHNOLOGY FOR TIGER CONSERVATION DEVALOPMENT AND INTEGRATION OF UN-MANNED AERIAL VEHCILES AS A SURVEILLANCE AND MONITORING TOOL FOR PROTECTION OF TIGERS AND CAPACITY BUILDING OF FRONTLINE STAFF
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	17,53,595.00	Manpower	19,65,836.00
Interest Received	77,932.00	Equipment	10,07,922.00
IVth Grant Received	25,00,000.00	Travel & Lodging	6,01,643.00
Misc Grant F.Y. 2018-19	4,00,000.00	Contingency	1,26,611.00
Outstanding Advance	36,730.00	Miscellaneous	94,748.00
		Institutional Charges	8,25,000.00
		Total Expenditure	46,21,760.00
		Outstanding :	
		Forest Advance	84,251.00
		Tour Advance	62,147.00
		Balance as on 31.03.2019 A/c No. 55580	99.00
Grand Total	47,68,257.00	Grand Total	47,68,257.00

PRIORITIZATION AND PREPERATION OF BRIEF DOCUMENT FOR NOTIFICATION UNDER WETLANDS RULES, 2010 IN CHHATTISGARH
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	3,29,518.00	Equipment	5,447.00
Interest Received	11,702.00	Total Expenditure	5,447.00
		Balance as on 31.03.2019 A/c No. 55688	3,35,773.00
Grand Total	3,41,220.00	Grand Total	3,41,220.00

10 DAY ORIENTATION TRAINING ON WILDLIFE MANAGEMENT WITH SPECIAL REFERENCE TO HEALTH MANAGEMENT FOR FIELD VETERINARIAN OF UTTARAKHAND
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	16,30,587.00	Learning Materials Misc Hono IT	3,82,849.00
Interest Received	1,10,193.00	Loadging and Boarding	10,27,321.00
IInd Grant Received F.Y. 2018-19	57,92,000.00	Travel	4,03,394.00
Opening of Advance to Hotel (Sariska Palace, Rajasthan)	94,200.00	Vetrinary Supplies	2,22,484.00
		Tuition fees	4,64,000.00
		Institutional charges	6,96,000.00
		Total Expenditure	31,96,048.00
		Balance as on 31.03.2019 A/c No. 55709	44,30,932.00
Grand Total	76,26,980.00	Grand Total	76,26,980.00

BIODIVERSITY ASSESSMENT (FAUNAL ASSESSMENT) OF GAUTAM BUDHA WILDLIFE SANCTUARY IN HAZARIBAGH AND GAYA DISTRICT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	19,77,694.00	Manpower	8,81,645.00
IInd Grant Received R.Officer NHA of India R.O Patna	7,00,000.00	Equipment	21,357.00
Interest Received	45,238.00	Travel & Field Visit	1,26,901.00
		Consmables & Stationery Items	11,303.00
		Field Camp establishment Expenses	46,419.00
		POL	62,955.00
		Vehicle Hiring for Field Work	79,670.00
		Misc	9,410.00
		Total Expenditure	12,39,660.00
		Outstanding :	
		Advance	
		Forest Advance	1,00,000.00
		Tour Advance	29,110.00
		Balance as on 31.03.2019 A/c No. 55784	13,54,162.00
Grand Total	27,22,932.00	Grand Total	27,22,932.00

SPATIO TEMPORAL AND THERMAL ECOLOGY ON INDIAN PYTHON IN MOYAR RIVER, TAMIL NADU PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	19,41,910.75	Manpower	8,55,000.00
IIIrd Grant Received	7,00,000.00	Consumables	99,078.00
Interest Received	55,422.00	Contingency	56,088.00
Advances Caution Money to S. Karthy	25,000.00	Other Cost	77,658.00
Advance FA/TA	12,613.00	Travel	2,77,033.00
		Equipment	10,08,230.00
		Overhead	2,50,000.00
		Total Expenditure	26,23,087.00
		Outstanding :	
		Advances Caution Money to S. Karthy	25,000.00
		Tour Advance	4,630.00
		Forest Advance	25,868.00
		Balance as on 31.03.2019 A/c No. 55725	56,360.75
Grand Total	27,34,945.75	Grand Total	27,34,945.75

STUDY OF ECOLOGY AND SOCIO-ECONOMIC IMPACT OF INVASSIVE SPECIES, PROSOPIS JULIFLORA AND LATANA CAMERA, AND THEIR REMOVAL FROM FOREST COMMON AND FALLOW LAND IN TAMIL NADU
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Ist Grant Received	745.25	Manpower	2,66,425.00
Opening Balance of Advances	1,25,000.00	Other Items	9,457.00
Loan From D/WII A/c No. 55294	2,50,000.00	Travel	70,841.00
Loan From D/WII A/c No. 62	1,00,000.00	Field Camp Establishment	5,900.00
Bank Interest F.Y. 2018-19	1,446.00	Total Expenditure	3,52,623.00
		Outstanding :	
		Loan from D/WII A/c No. 54919	1,00,000.00
		Balance as on 31.03.2019 A/c No. 55701	24,568.25
Grand Total	4,77,191.25	Grand Total	4,77,191.25

ASSESSMENT OF HABITAT USE BY BLACK NECKED CRANE AND EFLOW OF NYAMJANG CHU HYDRO ELECTRIC PROJECT IN TAIWANG DISTRICT ARUNANCHAL PRADESH
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	3,92,156.00	Fellowship and Wages	2,12,990.00
Interest Received	12,181.00	Travel	2,33,981.00
Opening Balance of Advances	4,06,390.00	Misc	52,882.00
		Contingencies	52,417.00
		Equipment	73,105.00
		Total Expenditure	6,25,375.00
		Outstanding :	
		Forest advance	9,440.00
		Loan to Sahydari Anjama Project A/c No. 55467	1,00,000.00
		Total Expenditure	1,09,440.00
		Balance as on 31.03.2019 A/c No. 55742	75,912.00
Grand Total	8,10,727.00	Grand Total	8,10,727.00

HABITAT IMPROVEMENT & CONSERVATION BREEDING OF THE INDIAN BUSTARD
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	42,09,071.19	Staff engagement	52,90,697.00
Opening Balance of Advance	94,60,017.00	Conservation Breeding	70,14,114.00
Interest Received	1,49,488.00	Applied Research	55,27,249.00
FDR Interest	1,18,75,283.00	Capacity Building and Awareness	93,68,563.00
Encashment of FDR	2,50,00,000.00	Pilot Habita Management	6,21,345.00
		Total Expenditure	2,78,21,968.00
		Outstanding :	
		Forest Advance	6,76,561.00
		Tour Advance	2,96,609.00
		D/WII Management Unit of Campa	75,35,936.00
		Advance to CPWD Jaisalmer	92,32,090.00
		Advance to Nucleome Informatics	25,00,000.00
		Balance as on 31.03.2019 A/C No. 55292	26,30,695.19
Grand Total	5,06,93,859.19	Grand Total	5,06,93,859.19

DEVELOPMENT OF CONSERVATION PLAN FOR RIVER DOLPHIN
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	4,01,094.26	Manpower engagement	86,95,514.00
Grant Received	4,62,00,000.00	Capacity Building & Awareness	18,33,045.62
Opening Balance of Advances	78,53,711.00	Research	1,31,46,583.00
Interest Received	52,230.00	Misc/Contingency	13,52,432.00
FDR Interest	18,61,013.00		
Encashment of FDR	1,00,00,000.00	Total Expenditure	2,50,27,574.62
		Outstanding:	
		Forest Advance	8,25,163.00
		Tour Advance	4,77,847.00
		Advance to Management Unit	77,69,253.00
		Balance as on 31.03.2019 A/C No. 55293	3,22,68,210.64
Total	6,63,68,048.26	Total	6,63,68,048.26

PROJECT MANAGEMENT UNIT
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	8,81,722.00	Manpower	32,90,299.00
Grant Received	20,00,000.00	Contingency	8,67,872.00
Advances Received	23,00,000.00	Travel	1,41,292.00
Interest Received	31,875.00	Workshop Expense	
		Total Expenditure	42,99,463.00
		Outstanding:	
		Forest Advance	20,000.00
		Tour Advance	24,693.00
		Balance as on 31.03.2019 A/C No. 55357	8,69,441.00
Total	52,13,597.00	Total	52,13,597.00

POPULATION ESTIMATION AND HOME SITE SELECTION BY WOLVES IN HUMAN DOMINATED LANDSCAPE
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	1,65,592.00	Travel Exp.	30,949.00
Interest Received	11,784.00	Equipment	29,000.00
Advance for Expenses	2,25,000.00	Total Expenditure	59,949.00
		Balance as on 31.03.2019 A/C No. 55281	3,42,427.00
Grand Total	4,02,376.00	Grand Total	4,02,376.00

GENETIC ASSESSMENT OF WILD CAUGHT LEOPARD IN THE STATE OF MAHARASHTRA
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	4,92,763.00	Sample collection	26,480.00
Interest Received	18,373.00	Disease Investigation/Genetic and Forensic	18,700.00
Advance for Expenses	60,000.00	Total Expenditure	45,180.00
		Balance as on 31.03.2019 A/C No. 55280	5,25,956.00
Grand Total	5,71,136.00	Grand Total	5,71,136.00

STUDY IN SHIVALIK AND ARAVALI AREAS
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	1,82,248.00	Manpower	1,28,052.00
Interest Received	4,174.00	Contingencies	8,529.00
Advance for Expenses	75,000.00	Travel	56,758.00
		Total Expenditure	1,93,339.00
		Balance as on 31.03.2019 A/C No. 55257	68,083.00
Grand Total	2,61,422.00	Grand Total	2,61,422.00

CONSERVING GREAT INDIAN BUSTARD LANDSCAPES
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	8,68,132.00	Field Logistic	44,431.00
Interest Received	30,786.00		
Advance for Expenses	1,10,000.00	Total Expenditure	44,431.00
		Outstanding :	
		Forest Advances	92,147.00
		Balance as on 31.03.2019 A/C No. 55339	8,72,340.00
Grand Total	10,08,918.00	Grand Total	10,08,918.00

ECOLOGY OF WOLVES WITH EXPHASES ON DISPERSAL IN A HUMAN DOMINATED LANDSCAPES
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	1,10,366.00	Manpower	4,58,308.00
Grant Received	16,50,000.00	Consumable	17,829.00
Interest Received	25,236.00	Travel	2,31,800.00
Advance for Expenses	69,999.00	Equipment	3,88,624.00
		Contingencies	19,297.00
		Total Expenditure	11,15,858.00
		Outstanding :	
		Forest Advances	1,28,639.00
		Tour Advances	15,000.00
		Balance as on 31.03.2019 A/c No. 55480	5,96,104.00
Grand Total	18,55,601.00	Grand Total	18,55,601.00

GEF-UNDP-GOI MUNNAR LANDSCAPE PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	3,83,521.00		
Interest Received	13,601.00	Total Expenditure	0.00
Advance for Expenses	4,11,381.00	Outstanding :	
		Advance for Expenses	4,11,381.00
		Balance as on 31.03.2019 A/c No. 55075	3,97,122.00
Grand Total	8,08,503.00	Grand Total	8,08,503.00

SWAMP DEER - FUNDED BY UTTARAKHAND FOREST DEPARTMENT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	5,36,931.00	Swamp Deer Project	
Grant for Bakhira Bird	26,98,000.00	Field Assistant	3,66,300.00
Grant for Swamp Deer	13,70,000.00	Travel	98,686.00
Grant for Workshop Technology	12,85,700.00	Equipment	1,57,682.00
Interest Received	19,918.00	Contingencies	32,432.00
Advance for Expenses	50,000.00	Laboratory Reagents and Chemicals	25,763.00
		Institutional Charges	1,71,300.00
		Workshop Project	
		Manpower	4,571.00
		Institutional Charges	83,850.00
		Bakhira Project	
		Travel	64,703.00
		Institutional Charges	39,000.00
		Total Expenditure	10,44,287.00
		Outstanding :	
		Forest Advances	50,000.00
		Tour Advances	57,635.00
		Balance as on 31.03.2019 A/c No. 55350	48,08,627.00
Grand Total	59,60,549.00	Grand Total	59,60,549.00

EVALUATION OF WALLS AND OTHER BARRIERS USED FOR STOPPING CROP DEPREDATION BY ELEPHANTS & WILD PIGS
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	5,81,971.00		
Interest Received	20,638.00		
Advances for Expenses	85,000.00	Total Expenditure	0.00
		Outstanding :	
		Advances for Expenses	85,000.00
		Balance as on 31.03.2019 A/c No. 55351	6,02,609.00
Grand Total	6,87,609.00	Grand Total	6,87,609.00

ASSESSMENT OF IMPACTS ON WILDLIFE OF KEDARNATH VALLEY DUE TO HELICOPTER SERVICES
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	5,76,507.00	Chemicals	1,72,889.00
Interest Received	16,975.00		
Advance for Expenses	1,10,000.00	Total Expenditure	1,72,889.00
		Outstanding :	
		Advance for Expenses	1,10,000.00
		Balance as on 31.03.2019 A/c No. 55282	4,20,593.00
Grand Total	7,03,482.00	Grand Total	7,03,482.00

CONCEPT ON TECHNOLOGY INTERVENTION FOR MOUNTAIN ECOSYSTEM (TIME) FOR COORDINATION (HESCO)
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	3,59,678.00	Manpower	3,62,771.00
Interest Received	7,510.00	Travel	47,582.00
Advance for Expenses	50,561.00	Contingencies	86,794.00
Loan from NMCG Project	2,00,000.00	Project Planning Workshop	10,620.00
		Total Expenditure	5,07,767.00
		Outstanding :	
		Advance for Expenses	16,030.00
		Balance as on 31.03.2019 A/c No. 55700	93,952.00
Grand Total	6,17,749.00	Grand Total	6,17,749.00

ETALIAN HYDRO PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	9,12,135.00	Manpower	37,81,411.00
Grant Received	84,33,000.00	Equipment	14,70,754.00
Interest Received	31,398.00	Field Studies	20,36,778.00
Advance for Expenses	11,17,000.00	Institutional Charges	10,00,000.00
		Total Expenditure	82,88,943.00
		Outstanding :	
		Advance for Expenses	15,07,500.00
		Balance as on 31.03.2019 A/c No. 56211	6,97,090.00
Grand Total	1,04,93,533.00	Grand Total	1,04,93,533.00

DEVELOPING GENETIC DATABASE TO UNDERSTAND METAPOPULATION DYNAMICS & CONNECTIVITY OF TIGERS
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	33,69,736.00	Manpower	3,32,748.00
Interest Received	68,939.00	Field Assistant	90,650.00
Advance for Expenses	35,000.00	Laboratory reagents & Consumables	16,76,181.00
		Field Vehicle hiring	2,40,555.00
		Base Camp	19,000.00
		Miscellaneous	11,167.00
		Total Expenditure	23,70,301.00
		Outstanding :	
		Forest Advances	5,000.00
		Tour Advance	20,000.00
		Balance as on 31.03.2019 A/c No. 55479	10,78,374.00
Grand Total	34,73,675.00	Grand Total	34,73,675.00

STUDYING THE DISPERSAL OF TIGERS ACROSS THE EASTERN
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	36,70,218.63	Manpower	7,48,933.00
Interest Received	95,943.00	Field Wages	1,04,650.00
Advance for Expenses	20,000.00	Vehicle Cost Pol	3,89,362.00
		Miscellaneous	3,93,189.74
		Total Expenditure	16,36,134.74
		Outstanding:	
		Forest Advance	32,925.00
		Tour Advance	1,05,800.00
		Loan to A/c No.-55281	2,00,000.00
		Balance as on 31.03.2019 A/C No. 55244	18,11,301.89
Grand Total	37,86,161.63	Grand Total	37,86,161.63

POPULATION MANAGEMENT OF SPECIES INVOLVED IN HUMAN – WILDLIFE CONFLICT
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	6,35,00,000.00	Engagement of Proj. Scientist & Res. Scholars	28,20,438.00
Interest Received	6,40,169.00	Lab Facility and Animal Housing & Lab Running Cost	9,53,712.00
		Field Equipment	36,88,501.00
		Field Implementation	13,34,842.00
		Total Expenditure	87,97,493.00
		Outstanding :	
		Forest Advance	3,00,974.00
		Tour Advance	1,15,991.00
		Advance to Executive Engineer	3,28,00,000.00
		Balance as on 31.03.2019 A/C No. 56389	2,21,25,711.00
Grand Total	6,41,40,169.00	Grand Total	6,41,40,169.00

ASSESSMENT OF IMPACTS OF THE PROPOSED NAGPUR – MUMBAI SUPER COMMUNICATION EXPRESSWAY, MAHARASHTRA, SAMRIDDHI CORRIDOR ON WILDLIFE VALUES & MEASURES RECOMMENDED TO MITIGATE NEGATIVE IMPACTS
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	4,09,64,400.00	Technical Manpower Charges	32,84,390.00
Interest Received	73,789.00	Field Logistics	12,45,502.00
Interest on FDR	3,01,813.00	Equipments & Data/Imagery/ Infrastructure etc.	1,05,08,975.00
		Miscellaneous	22,467.00
		Institutional Charges	1,00,00,000.00
		Total Expenditure	2,50,61,334.00
		Outstanding :	
		Forest Advance	1,10,000.00
		Tour Advance	20,376.00
		Balance as on 31.03.2019 A/C No. 56459	1,61,48,292.00
Grand Total	4,13,40,002.00	Grand Total	4,13,40,002.00

DEVELOPMENT OF LANDSCAPE MANAGEMENT PLAN AND MONITORING WITH REFERENCE TO KEN – BETWA RIVER LINK PROJECT IN PANNA TIGER RESERVE, MADHYA PRADESH
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	7,83,63,600.00	Manpower	33,59,743.00
Interest Received	13,20,519.00	Equipment	2,99,95,586.00
		Travel & Lodging	11,37,122.00
		Contingency	12,22,360.00
		Institutional Charges	1,17,54,540.00
		Total Expenditure	4,74,69,351.00
		Outstanding :	
		Forest Advance	2,66,000.00
		Tour Advance	50,000.00
		Loan to NMSHE A/c No.-54272	10,00,000.00
		Balance as on 31.03.2019 A/C No. 56403	3,08,98,768.00
Grand Total	7,96,84,119.00	Grand Total	7,96,84,119.00

RESEARCH AND MONITORING OF AMUR FALCONS AT TAMENGLONG DISTRICT OF MANIPUR UNDER THE APO ON CSS
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	27,60,000.00	Purchase of four Satellite Transmitters	9,56,927.00
Interest Received	54,363.00	Travel Expenses	2,57,943.00
		Contingency	23,969.00
		Institutional Charges	3,60,000.00
		Total Expenditure	15,98,839.00
		Balance as on 31.03.2019 A/C No. 56401	12,15,524.00
Grand Total	28,14,363.00	Grand Total	28,14,363.00

MANAGEMENT OF INVASIVE SPEICES IN KAZIRANGA TIGER RESERVE, ASSAM
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	12,20,000.00	Manpower	2,26,774.00
Interest Received	25,589.00	Equipment	73,590.00
		Consumables	29,559.00
		Institutional Charges	1,83,000.00
		Total Expenditure	5,12,923.00
		Outstanding :	
		Forest Advance	75,000.00
		Tour Advance	30,000.00
		Balance as on 31.03.2019 A/C No. 56411	6,27,666.00
Grand Total	12,45,589.00	Grand Total	12,45,589.00

ASSESSMENT OF BIODIVERSITY FOR EFFECTIVE MANAGEMENT & EVALUATION OF ECOTOURISM POTENTIAL OF FOUR PROTECTED AREAS IN HIMANCHAL PRADESH, INDIA
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	12,05,000.00	Researcher Engagement	4,38,678.00
Interest Received	19,900.00	Travel	1,06,745.00
		Institutional Charges	1,20,500.00
		Total Expenditure	6,65,923.00
		Balance as on 31.03.2019 A/C No. 56435	5,58,977.00
Grand Total	12,24,900.00	Grand Total	12,24,900.00

ELEPHANT PROJECT, UTTARAKHAND
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	92,00,000.00	Hardware	1,51,109.00
Interest Received	1,33,499.00	Miscellaneous	19,29,006.00
		Total Expenditure	20,80,115.00
		Balance as on 31.03.2019 A/C No. 56402	72,53,384.00
Grand Total	93,33,499.00	Grand Total	93,33,499.00

"WILD TIGERS OF SIMILIPAL : A STUDY ON SPATIAL DISTRIBUTION, ABUNDANCE & POPULATION GENETICS" IN SIMILIPAL TIGER RESERRVE - REG
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	50,34,000.00	Non- Recurring Component	
Interest Received	67,994.00	Camera Trap	17,49,930.00
		Recurring Component	
		Research Personnel Salary	72,032.00
		Miscellaneous	10,850.00
		Travel	87,295.00
		Institutional Charges	6,20,700.00
		Total Expenditure	25,40,807.00
		Outstanding :	
		Forest Advance	1,50,000.00
		Balance as on 31.03.2019 A/C No. 56412	24,11,187.00
Grand Total	51,01,994.00	Grand Total	51,01,994.00

CURRENT DISTRIBUTION POPULATION STATUS & THREATS TO INDIAN PANGOLIN (MANIS CRASSICAUDATA) IN TERAI ARC LANDSCAPE, UTTARAKHAND
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	5,63,550.00	Project Biologist	1,34,710.00
Interest Received	5,523.00	Travel, Lodging and Boarding	46,032.00
		Total Expenditure	1,80,742.00
		Outstanding :	
		Forest Advance	35,000.00
		Balance as on 31.03.2019 A/C No. 56713	3,53,331.00
Grand Total	5,69,073.00	Grand Total	5,69,073.00

PREPARATION OF UTTAR PRADESH STATE BIODIVERSITY STRATEGY AND ACTION PLAN
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	14,28,990.00	Travel	12,561.00
		Institutional Charges	2,14,349.00
		Total Expenditure	2,26,910.00
		Balance as on 31.03.2019 A/C No. 57014	12,02,080.00
Grand Total	14,28,990.00	Grand Total	14,28,990.00

TIGER TRANSLOCATION AND MONITORING IN RAJAJI TIGER RESERVE – REG
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	12,55,000.00	Manpower	95,000.00
		Travel	30,206.00
		Hiring of Vehicle	1,82,452.00
		Contingency	11,401.00
		Total Expenditure	3,19,059.00
		Balance as on 31.03.2019 A/C No. 56977	9,35,941.00
Grand Total	12,55,000.00	Grand Total	12,55,000.00

ASSESSMENT OF CLIMATE CHANGE IMPACTS ON SOIL HEALTH THROUGH MICROBIAL AND PLANT COMMUNITIES IN ALPINE ECOSYSTEM OF THE INDIAN HIMALAYAN REGION [GOI - GEF - UNDP]
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	41,47,000.00	Manpower	1,81,434.00
Interest Received	34,122.00	Equipment	9,26,637.00
		Travel	14,700.00
		Recurring Expenses	1,58,115.00
		Total Expenditure	12,80,886.00
		Outstanding:	
		Forest Advance	54,000.00
		Tour Advance	4,000.00
		Advance to M/s LICOR Inco.	18,09,447.77
		Loan to NATCOM	42,000.00
		Balance as on 31.03.2019 A/C No. 56589	9,90,788.23
Grand Total	41,81,122.00	Grand Total	41,81,122.00

ASSESSMENT OF CLIMATE CHANGE IMPACTS ON SOIL HEALTH THROUGH MICROBIAL AND PLANT COMMUNITIES IN ALPINE ECOSYSTEM OF THE INDIAN HIMALAYAN REGION [GOI - NATCOM PROJECT]
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	27,41,000.00	Manpower	5,30,418.00
Loan from Soil Health	7,88,183.00	Travel	55,382.00
		Recurring Expenses	89,885.00
		Total Expenditure	6,75,685.00
		Outstanding:	
		Forest Advance	1,00,000.00
		Tour Advance	25,000.00
		Grant transfer to A/c No.-56589	7,46,183.00
		Advance to M/s C-Camp	10,16,112.00
		Balance as on 31.03.2019 A/C No. 57062	9,66,203.00
Grand Total	35,29,183.00	Grand Total	35,29,183.00

STUDY ON BLACKBUCK MOVEMENT IN AND AROUND KAIMUR WILDLIFE SANCTUARY INCLUDING RESERVED FORESTS OF MIRZAPUR AND SONBHADRA DISTRICTS OF U.P.
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	48,65,040.00	Technical Manpower Charges	12,11,742.00
Interest Received	39,122.00	Field Logistics	8,25,499.00
		Miscellaneous	30,950.00
		Institutional Charges	20,81,000.00
		Total Expenditure	41,49,191.00
		Outstanding:	
		Forest Advance	6,60,000.00
		Tour Advance	83,647.00
		Balance as on 31.03.2019 A/C No. 56466	11,324.00
Grand Total	49,04,162.00	Grand Total	49,04,162.00

INVENTORIZATION OF FLORA & FAUNA OF CONSERVATION SIGNIFICANCE SHAILA PATTAN RANJIT SAGAR WETLANDS AND LALWAN COMMUNITY RESERVE, PUNJAB
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	15,24,440.00	Manpower	3,04,558.00
Interest Received	15,280.00	Field Assistant	16,884.00
		Consumables	20,952.00
		Hiring of Boat / Vehicle	40,829.00
		Total Expenditure	3,83,223.00
		Outstanding:	
		Forest Advance	59,164.00
		Tour Advance	15,476.00
		Balance as on 31.03.2019 A/C No. 56712	10,81,857.00
Grand Total	15,39,720.00	Grand Total	15,39,720.00

RADIO COLLARING OF TIGERS IN SUNDERBANS TIGER RESERVE
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	6,32,951.20	Manpower	4,11,322.00
Interest Received	18,117.00	Total expenditure	4,11,322.00
		Balance as on 31.03.2019 A/C No. 50546	2,39,746.20
Grand Total	6,51,068.20	Grand Total	6,51,068.20

RADIO TELEMETRY MONITORING SOURCE POPULATION OF TIGERS IN KANHA TIGER RESERVE
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	54,39,522.18	Manpower	12,00,295.00
Opening Balance of Advance	18,000.00	Travel	24,937.00
Interest Received	1,46,708.00	Vehicle & POL	77,349.00
		Equipment	15,90,555.38
		Base Camp	0.00
		Contingency & Publication	33,309.00
		Total Expenditure	29,26,445.38
		Outstanding:	
		Loan to D/WII A/c No.-50968	10,00,000.00
		Balance as on 31.03.2019 A/C No. 50685	16,77,784.80
Grand Total	56,04,230.18	Grand Total	56,04,230.18

WL WORKSHOP ON CENSUS TECHNIC
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT AMOUNT (In Rs.)		PAYMENT	AMOUNT (In Rs.)
Opening Balance	3,10,034.00	Field Tour	1,07,472.00
Interest Received	9,722.00	Stipend	40,000.00
		Contingencies	2,100.00
		Total Expenditure	1,49,572.00
		Balance as on 31.03.2019 A/C No. 55756	1,70,184.00
Grand Total	3,19,756.00	Grand Total	3,19,756.00

PREPARATION OF STATE LEVEL STRATEGY FOR MITIGATION OF HUMAN – WILDLIFE CONFLICT IN KERALA
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	0.00		
Grant Received	5,37,625.00	Travel	78,608.00
		Institutional Charges	80,644.00
		Total Expenditure	1,59,252.00
		Balance as on 31.03.2019 A/C No. 56801	3,78,373.00
Grand Total	5,37,625.00	Grand Total	5,37,625.00

UNDERSTANDING POPULATION DYNAMICS SPACE USE, MOVEMENT AND DIET OF LEOPARDS IN JUNNAR TALUKA, MAHARASHTRA FOR HUMAN LEOPARD CONFLICT MITIGATION
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	0.00	Institutional Charges	4,07,745.00
Grant Received	91,00,000.00	Total Expenditure	4,07,745.00
		Balance as on 31.03.2019 A/c No. 56960	86,92,255.00
Grand Total	91,00,000.00	Grand Total	91,00,000.00

(Baljeet Kaur)
Finance Officer

(Dr. V.B. Mathur)
Director

DEVELOPING A COLLABORATIVE MANAGEMENT STRATEGY FOR CONSERVATION OF TIGERS IN NORTH EAST INDIA, COMPONENT 1 : STATUS AND CONSERVATION OF TIGERS AND THEIR HABITATS IN HILL RANGERS OF NORTH EAST INDIA WITH SPECIAL REFERENCE TO MISHMI HILLS, MANIPUR AND NAGALAND RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	0.00	Manpower	9,000.00
Grant Received	20,00,000.00	Consumables	4,147.00
		Travel	43,831.00
		Institutional Charges	2,00,000.00
		Total Expenditure	2,56,978.00
		Balance as on 31.03.2019 A/c No. 56991	17,43,022.00
Grand Total	20,00,000.00	Grand Total	20,00,000.00

DEVELOPING A COLLABORATIVE MANAGEMENT STRATEGY FOR CONSERVATION OF TIGERS IN NORTH EAST INDIA, COMPONENT 2 : CONNECTING THE DOTS: FINDING DISPERSAL CORRIDORS FOR TIGERS IN NORTH EAST INDIA
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	0.00	Institutional Charges	2,00,000.00
Grant Received	20,00,000.00	Total Expenditure	2,00,000.00
		Balance as on 31.03.2019 A/c No. 56992	18,00,000.00
Grand Total	20,00,000.00	Grand Total	20,00,000.00

PROMOTING COMMUNITY PARTICIPATION IN CONSERVATION AND CONFLICT RESOLUTION IN THE FRINGE VILLAGES OF KAZIRANGA TIGER RESERVE, ASSAM THROUGH ECODEVELOPMENT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	0.00	Institutional Charges	3,00,000.00
Grant Received	20,00,000.00	Total Expenditure	3,00,000.00
		Balance as on 31.03.2019 A/c No. 56990	17,00,000.00
Grand Total	20,00,000.00	Grand Total	20,00,000.00

REVOLVING FUND FOR GUEST HOUSE MAINTENANCE
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	51,22,343.00	Operational Expenses	55,13,651.00
Rent Charges received	74,03,637.00	Fixed Assets:	
Hostel Accomodation Charges	5,66,265.00	Stablizer	37,426.00
Food Bill Charges	9,25,665.00	Steel Almirahs	32,800.00
Interest Received	2,38,491.00	HP Laserjet Printer	24,811.00
		2 Split AC	89,700.00
		12 LED TVs	4,96,000.00
		6 Seater Dining Set 3 Nos.	1,24,431.00
		Refridgerator	44,000.00
		Microwave Oven	13,900.00
		41 Ceiling Fans	48,093.00
		Total Expenditure	9,11,161.00
		Forest Advance	100.00
		Total Expenditure	64,24,912.00
		Bank Balance A/c No 54189	78,31,489.00
Grand Total	1,42,56,401.00	Grand Total	1,42,56,401.00

ECOLOGY OF SLOTH BEAR IN AND AROUND RATANMAHAL JAMBUGHODA SANCTUARIES & UNPROTECTED AND FRAGMENED DST YOUNG SCIENTIST
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	4,18,017.00		
Interest Received	14,824.00	Total Expenditure	0.00
		Balance as on 31.03.2019 A/C No. 53632	4,32,841.00
Grand Total	4,32,841.00	Grand Total	4,32,841.00

EVALUATION OF PREY AVAILABILITY AND HABITAT SUITABILITY FOR TIGER AND ITS RANGING PATTERNS IN SANJAY TIGER RESERVE, MADHYA PRADESH
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	7,52,119.00	Manpower	10,57,275.00
Grant Received	18,40,000.00	Travels	7,84,496.00
Interest Received	40,149.00	Contingency	67,466.00
Opening Balance of Advances	16,000.00	Total Expenditure	19,09,237.00
		Balance as on 31.03.2019 A/C No. 54159	7,39,031.00
Grand Total	26,48,268.00	Grand Total	26,48,268.00

DIVERSITY OF SPIDER (ARACHINDA: ARANEAE) ASSEMBLAGES IN ASKOT WILDLIFE HIMALAYAS SANCTUARY, UTTARAKHAND
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	98,481.00	Manpower	49,677.00
Interest Received	3,731.00	Institutional Charges	52,535.00
		Total Expenditure	1,02,212.00
		Balance as on 31.03.2019 A/C No. 53752	0.00
Grand Total	1,02,212.00	Grand Total	1,02,212.00

ECOLOGY OF ENDANGERED ASIATIC LIONS USING SATELLITE & GPS TELEMETRY
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	3,78,228.00	Total Expenditure	3,91,641.00
Interest Received	13,413.00	Balance as on 31.03.2019 A/C No. 53583	0.00
Grand Total	3,91,641.00	Grand Total	3,91,641.00

NMCG- BIODIVERSITY CONSERVATION AND GANGA REJUVENATION PART 1 (COMPONENT- 1, 3 & 4)
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	62,66,282.84	Component -1	
Grant Received	4,58,00,000.00	Contingency/Misc	1,66,273.00
Opening balance of Advances (C1)	82,500.00	Manpower	47,41,475.00
Opening balance of Advances (C4)	2,500.00	Travel & Field Work	3,58,678.00
Interest Received	3,93,123.00	Equipment	75,980.00
		Operational	23,23,264.00
		Institutional charges	9,26,784.00
		Advance	4,74,000.00
		Total Expenditure (A)	90,66,454.00
		Component -3	
		Manpower	15,32,752.00
		Travel & Field Work	1,70,665.00
		Operational	18,88,165.00
		Institutional charges	5,51,904.00
		Advance	2,29,170.00
		Total Expenditure (B)	43,72,656.00
		Component -4	
		Contingency/Misc	1,67,848.00
		Manpower	29,77,992.00
		Travel & Field Work	4,61,908.00
		Equipment	2,24,546.00
		Operational	48,22,109.00
		Institutional charges	6,50,508.00
		Advance	2,53,000.00
		Total Expenditure ©	95,57,911.00
		Total Expenditure (A+B+C)	2,29,97,021.00
		Balance as on 31.03.2019 A/C No. 55408	2,95,47,384.84
Grand Total	5,25,44,405.84	Grand Total	5,25,44,405.84

CSIR- AN ASSESSMENT OF BREEDING ,FORAGING AND HABITAT USE PATTERNS OF A THREATENED PISCIVOROUS COLONIAL NESTING WATERBIRD,ORIENTAL DARTER AT BHITARKANIKA MANGROVES RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	29,952.00	Total Expenditure	0.00
Interest Received	1,366.00	Balance as on 31.03.2019 A/C No. 55104	31,318.00
Grand Total	31,318.00	Grand Total	31,318.00

NMCG- BIODIVERSITY CONSERVATION AND GANGA REJUVENATION PART - 2 (COMPONENT 2, 5 & 6) RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	2,83,75,066.76	Component 2	
Grant Received	8,03,00,000.00	Manpower	99,00,403.00
Opening Balance of Advances (C2)	57,500.00	Equipment	79,91,074.00
Opening Balance of Advances (C5)	2,58,500.00	Operational Expenses	41,14,279.00
Opening Balance of Advances (C6)	66,600.00	Travels	17,14,103.00
Interest Received	11,01,738.00	Other Expenses	47,41,278.00
		Institutional charges	22,30,960.00
		Advance	8,74,365.07
		Total Expenditure (A)	3,15,66,462.07
		Component 5	
		Manpower	65,84,801.00
		Equipment	35,000.00
		Operational Expenses	64,41,025.00
		Travels	12,59,199.00
		Other Expenses	1,45,606.00
		Institutional charges	12,03,688.00
		Advance	13,50,766.00
		Total Expenditure (B)	1,70,20,085.00
		Component 6	
		Manpower	24,57,057.00
		Equipment	12,42,650.00
		Operational Expenses	1,34,89,627.00
		Travels	9,23,969.00
		Other Expenses	89,571.00
		Institutional charges	12,76,728.00
		Advance	1,18,000.00
		Total Expenditure ©	1,95,97,602.00
		Total Expenditure (A+B+C)	6,81,84,149.07
		Outstanding:	
		Loan & Advance to Kumbh Mela Programme Project A/c No: 56944	41,55,000.00
		Loan to CAMPA Dolphin Project A/c No. 55357	3,00,000.00
		Loan to DST- HESCO Project A/c No. 55700	2,00,000.00
		Balance as on 31.03.2019 A/C No. 55526	3,73,20,255.69
Grand Total	11,01,59,404.76	Grand Total	11,01,59,404.76

TIGER RECOVERY STRATEGY AND LONG TERM MONITORING IN SAHYADRI TIGER RESERVE, MAHARASHTRA
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	17,22,625.00	Manpower	10,54,488.00
Opening Balance of Advances	50,000.00	Contingency	1,52,589.00
Grant Received	12,73,000.00	Travel	3,49,103.00
Interest Received	38,302.00	Equipment	3,23,811.00
		Total Expenditure	18,79,991.00
		Outstanding:	
		Forest Advance	1,05,000.00
		Tour Advance	35,000.00
		Balance as on 31.03.2019 A/C No. 55541	10,63,936.00
Grand Total	30,83,927.00	Grand Total	30,83,927.00

STATUS OF FISH DIVERSITY IN SAHYADRI TIGER RESERVE, MAHARASHTRA & KOSI RIVER MAHSEER PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	2,46,999.00	Fish Diversity in Sahyadri Tiger Reserve:	
Grant Received	4,31,000.00	Manpower	3,97,629.00
Interest Received	8,773.00	Travel	11,000.00
		Contingencies & Consumables	53,299.00
		Institutional charges	56,000.00
		Kosi River :	
		Manpower	32,000.00
		Field Assistant	3,600.00
		Contingency	64,315.00
		Total Expenditure	6,17,843.00
		Outstanding:	
		Forest Advance - Kosi River	30,000.00
		Tour Advance - Kosi River	8,000.00
		Balance as on 31.03.2019 A/C No. 55691	30,929.00
Grand Total	6,86,772.00	Grand Total	6,86,772.00

A RAPID STATUS SURVEY FOR THE GLOBALLY THREATENED YELLOW WEAVER PLOCEUS MEGARHYNCHUS IN UTTARAKHAND
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	78,737.00	Accomodation	1,500.00
Interest Received	1,724.00	Travel	49,359.00
		Contingencies	1,582.00
		Total Expenditure	52,441.00
		Balance as on 31.03.2019 A/C No. 55693	28,020.00
Grand Total	80,461.00	Grand Total	80,461.00

PARTICIPATION OF WII IN THE INDIAN SCIENTIFIC EXPENDITION TO ANTARCTICA (INSEA)
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	6,54,061.00	Travel	21,273.00
Interest Received	26,734.00	Balance Transferred to GIA A/c No.-01	6,59,522.00
		Total Expenditure	6,80,795.00
		Balance as on 31.03.2019 A/C No. 55788	0.00
Grand Total	6,80,795.00	Grand Total	6,80,795.00

CONSERVATION MANAGEMENT OF ELEPHANTS IN CHHATTISGARH: CAPACITY BUILDING INITIATIVE ON THE DISPERSAL & RANGING PATTERNS OF ELEPHANTS FOR EFFECTIVE MANAGEMENT OF HUMAN - ELEPHANT INTERACTIONS
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	63,79,090.83	Manpower	14,64,800.00
Loan taken for Purchase of Chemicals	8,73,335.17	Accommodation & Food	2,06,085.00
Grant Received	99,44,000.00	Equipment & Field Gears	4,78,308.00
Interest Received	1,21,345.00	Supplies & Materials	4,70,388.00
Loan Taken from Nilgiri Thar A/c No:55157	20,000.00	Telemetry Study	30,10,346.08
Opening Balance of Advances	1,10,000.00	Travel	9,87,545.00
		Institutional Charges	13,03,000.00
		Total Expenditure	79,20,472.08
		Loan taken for Purchase of Chemicals	8,73,335.17
		Balance as on 31.03.2019 A/C No. 55760	86,53,963.75
Grand Total	1,74,47,771.00	Grand Total	1,74,47,771.00

LINKING PROTECTED AREAS NETWORKS AND NEAR REAL TIME "RAIN BIRD" LOCATIONS WITH IBIN
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	21,48,000.00	Manpower	3,03,548.00
Interest Received	54,220.00	Equipment	63,991.00
		Consumables	27,288.00
		Contingency	59,469.00
		Travel	2,240.00
		Institutional Charges	1,00,000.00
		Total Expenditure	5,56,536.00
		Outstanding :	
		Tour Advance	30,000.00
		Balance as on 31.03.2019 A/C No. 56141	16,15,684.00
Grand Total	22,02,220.00	Grand Total	22,02,220.00

AUGMENTATION AND RECOVERY OF TIGER POPULATION IN SATKOSIA TIGER RESERVE, ANGUL
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	20,00,000.00	Manpower	11,97,516.00
Grant Received	1,09,80,000.00	Equipment	54,99,492.00
Interest Received	3,12,023.00	Vehicle Hiring and Fuel	5,82,867.00
		Travel	5,82,274.00
		Hormone and DNA Analyses	7,69,257.00
		Contingency	3,50,792.00
		Total Expenditure	89,82,198.00
		Outstanding :	
		Forest Advance	60,000.00
		Balance as on 31.03.2019 A/C No. 56377	42,49,825.00
Grand Total	1,32,92,023.00	Grand Total	1,32,92,023.00

WII - GIZ - HWC PROJECT
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Balance of previous Project	2,530.00		
Grant received from GIZ, New Delhi	68,22,977.84	Salary of Staff	14,24,901.00
Interest received 2018-19	21,687.00	External Expert	0.00
		Transport/Travel Cost	3,31,243.00
		Training Cost	26,40,392.00
		Procurement of goods, Equipment, Consumeables	2,43,152.18
		Supporting/Adm Cost	2,57,113.41
		Transfer to Corpus Fund	2,530.00
		Bank Balance A/C No - 54145	19,47,863.25
Grand Total	68,47,194.84	Grand Total	68,47,194.84

ASSESSMENT AND CONSERVATION PRACTICES OF POLLINATORS
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant received from GB Pant National Institute	34,54,560.00	Manpower Wages to Fd Asst	8,86,752.00
Interest received	60,838.00	Travel	4,92,949.00
		Consumeables	78,120.00
		Contingencies	1,56,893.00
		Activities and other project cost	6,11,316.00
		Equipment	5,45,550.00
		Advances Paid	71,000.00
		Bank Balance A/C No - 56376	6,72,818.00
Grand Total	35,15,398.00	Grand Total	35,15,398.00

ASSESSMENT OF HABITAT USE BY BLACK NECKED CRANE AND EFLOW OF NYAMJANG CHU HYDRO ELECTRIC PROJECT IN TAIWANG DISTRICT ARUNANCHAL PRADESH
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Ist Grant Received	3,92,156.00	Fellowship and Wages	2,12,990.00
Interest Received	12,181.00	Travel	2,33,981.00
Opening Balance of Advances	4,06,390.00	Misc	52,882.00
		Contingencies	52,417.00
		Equipment	73,105.00
		Total Expenditure	6,25,375.00
		Outstanding :	
		Forest advance	9,440.00
		Loan to Sahydari Anjama Project A/c No. 55467	1,00,000.00
		Total Expenditure	1,09,440.00
		Balance as on 31.03.2019 A/c No. 55742	75,912.00
Grand Total	8,10,727.00	Grand Total	8,10,727.00

MOVEMENT ECOLOGY OF TIGER FOR CONFLICT PREDICTION & LANDSCAPE MANAGEMENT IN SATHYAMANGALAM NILGIRI BIOSPHERE COMPLEX, SOUTHERN INDIA
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant received	35,71,200.00	Manpower	5,70,869.00
Interest Received	72,513.00	Equipments	4,80,852.20
		Travel & Lodging	2,84,061.00
		Institutional Charges	4,66,000.00
		Contingency	1,89,682.00
		Miscellaneous	9,838.00
		Total Expenditure	20,01,302.20
		Outstanding :	
		Forest Advance	95.00
		Tour Advances	12,000.00
		Caution Money	25,000.00
		Balance as on 31.03.2019 A/C No. 56410	16,05,315.80
Grand Total	36,43,713.00	Grand Total	36,43,713.00

ASSESSMENT OF THE PROPOSED KOTDWAR-RAMANAGAR ROAD AND REVIEW OF THE FEASIBLE OPTIONS TO PROMOTE GREEN INFRASTRUCTURE TO ADDRESS THE IMPACT AS ON WILDLIFE VALUES
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	0.00	Manpower	18,74,313.00
Grant Received	95,32,000.00	Study Equipments & Data/Imagery	61,01,435.00
Opening Balance of Advance	5,00,000.00	Field Logistics	5,92,294.00
Loan from D/WII A/c No. 62 (MEE Project)	9,62,000.00	Misc	85,426.00
Bank Interest	13,248.00	Administrative Cost	4,71,300.00
		Total Expenditure	91,24,768.00
		Refund of Loan to A/c No.- 55292 GIB Project	5,00,000.00
		Outstanding :	
		Forest advance	11,16,275.00
		Tour Advance	23,000.00
		Balance as on 31.03.2019 A/c No. 56409	2,43,205.00
Grand Total	1,10,07,248.00	Grand Total	1,10,07,248.00

MINSTREAMING LANDSCAPE APPROACH FOR BIODIVERSITY CONSERVATION, IMPROVED LIVELIHOOD & ECOSYSTEM HEALTH IN KAILASH SACRED LANDSCAPE PART IN INDIA - NMHS
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant received	11,29,000.00	Activities	1,78,713.00
Interest Received	11,409.00	Manpower	3,02,671.00
		Travel	1,17,547.00
		Equipment	63,500.00
		Others	10,707.00
		Workshop	2,947.00
		Total Expenditure	6,76,085.00
		Outstanding :	
		Forest Advance	240.00
		Balance as on 31.03.2019 A/C No. 56472	4,64,084.00
Grand Total	11,40,409.00	Grand Total	11,40,409.00

DEVELOPMENT OF MANAGEMENT ACTION PLAN TO MITIGATE HUMAN CROCODILE CONFLICTS IN ANDAMAN & NICOBAR ISLANDS - NITI AYOG
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	5,18,400.00		
Interest Received	4,423.00	Total Expenditure	0.00
		Balance as on 31.03.2019 A/c No. 56756	5,22,823.00
Grand Total	5,22,823.00	Grand Total	5,22,823.00

KAILASH SACRED LANDSCAPE CONSERVATION AND DEVELOPMENT INITIATIVE PHASE II ICIMOD
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	8,00,000.00	Manpower	1,92,000.00
		Nomination Fees UNESCO C2C	1,80,000.00
		Workshop	1,840.00
		Travel	38,321.00
		Total Expenditure	4,12,161.00
		Balance as on 31.03.2019 A/c No. 56932	3,87,839.00
Grand Total	8,00,000.00	Grand Total	8,00,000.00

STAFF WELFARE FUND
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	1,96,446.00	Staff Welfare Expenses	1,31,416.00
Staff Welfare Contribution	65,803.00		
Interest	5,828.00	Expenditure	1,31,416.00
		Bank Balance A/c No. 6009	1,36,661.00
Grand Total	2,68,077.00	Total	2,68,077.00

GENETIC ASSESSMENT OF THE NON - DESCRIPT PIG BREEDS ACROSS SELECTED REGIONS OF UTTARAKHAND
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	0.00	Recurring (General)	
Grant Received	5,94,000.00	Manpower	19,286.00
		Advances	10,000.00
		Total Expenditure	29,286.00
		Balance as on 31.03.2019 A/C No. 56925	5,64,714.00
Grand Total	5,94,000.00	Grand Total	5,94,000.00

SERB- NATIONAL POST DOCTORAL FELLOWSHIP (NPDF)- RESOLVING TAXONOMIC UNCERTAINTY AMONG INDIAN GOURAMI (PERCIFORMES: OSPHRONEMIDAE) USING MOLECULAR AND MORPHOLOGICAL APPROACH
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	9,60,000.00	Total Expenditure	0.00
		Balance as on 31.03.2019 A/C No. 57001	9,60,000.00
Grand Total	9,60,000.00	Grand Total	9,60,000.00

NMCG FUNDED- PROMOTE GANGA RESTORATION BY INVOLVING GANGA PRAHARIS DURING KUMBH MELA
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	0.00	Accommodation	40,000.00
Loan from NMCG Part-2 A/c No: 55526 NMCG	40,00,000.00	Food of Ganga Prahari & Project Personnel	3,39,464.00
		Hiring of Chairs & Mattresses	65,750.00
		Honorarium Boarding & Lodging of Resource Pers	1,55,001.00
		Honorarium of Doctors	16,800.00
		Honorarium of Ganga Prahari	11,16,800.00
		Other Expenses	75,886.00
		Travel	15,504.00
		Vehicle Hiring	38,400.00
		Wages	34,836.00
		Total Expenditure	18,98,441.00
		Outstanding:	
		Forest Advance	6,40,000.00
		Tour Advance	10,000.00
		Balance as on 31.03.2019 A/C No. 56944	14,51,559.00
Grand Total	40,00,000.00	Grand Total	40,00,000.00

RAPTOR RESEARCH & CONSERVATION FOUNDATION
RECEIPT AND PAYMENT
FOR THE PERIOD OF 01 APRIL 2018 TO 31 MARCH 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	1,79,280.00		
	0.00	Bank UBI-57095	1,79,280.00
Grand Total	1,79,280.00	Grand Total	1,79,280.00

WII-UNDP SECURE HIMALAYA PROJECT
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Opening Balance	-	RFP - 056	
Grant Received - 056	19,95,250.00	Personnel Services	1,27,430.00
Grant Received - 058	22,79,875.00	Travel & Accommodation	47,754.00
Grant Received - HCVs	22,24,125.00	Workshop	1,50,000.00
Grant Received - HWC	24,66,923.00	Miscellaneous	10,113.00
Grant Received - LOA-CB	11,53,450.00	Institutional Charges	2,99,288.00
Grant Received - MAP	11,84,960.00	Total Expenditure (A)	6,34,585.00
Interest Received	2,114.00	RFP - 058	
		Personnel Services	6,44,073.00
		Travel & Accommodation	4,47,092.00
		Communications	3,615.00
		Stakeholder Workshops	2,41,465.00
		Local Meetings	4,66,206.00
		Institutional Charges	3,41,982.00
		Outstanding Advances	30,000.00
		Total Expenditure (B)	21,74,433.00
		H C V	
		Personnel Services	89,032.00
		Travel & Accommodation	28,696.00
		Stakeholder Workshops	8,750.00
		Institutional Charges	3,33,619.00
		Total Expenditure (C)	4,60,097.00
		H W C	
		Personnel Services	2,85,291.00
		Travel & Accommodation	81,844.00
		Communications	9,495.00
		Stakeholder Workshops	1,25,619.00
		Institutional Charges	3,70,038.00
		Outstanding Advances	40,000.00
		Total Expenditure (D)	9,12,287.00
		L O A - C B	
		Sharing Workshops	15,990.00
		Others / Contingency	2,200.00
		Institutional Charges	1,73,018.00
		Total Expenditure (E)	1,91,208.00
		M A P	
		Travel & Accommodation	1,960.00
		Stakeholder Workshops	29,940.00
		Institutional Charges	1,77,744.00
		Total Expenditure (F)	2,09,644.00
		Total Expenditure (A+B+C+D+E+F)	45,82,254.00
		Balance as on 31.03.2019 A/C No. 56876	67,24,443.00
Grand Total	1,13,06,697.00	Grand Total	1,13,06,697.00

UNDP-DEVELOPMENT AND CONSERVATION OF FOREST CORRIDORS IN SIKKIM PROJECT
RECEIPT & PAYMENT
FOR THE PERIOD OF 01 APRIL, 2018 TO 31 MARCH, 2019

RECEIPT	AMOUNT (In Rs.)	PAYMENT	AMOUNT (In Rs.)
Grant Received	17,94,000.00	Fellowship & Wages	238753.00
Interest Received	6,290.00	Base Camp Expeses	63805.00
		Camp Equipment	17935.00
		Office Equipment	235216.00
		Contigencies	42638.40
		Travel Expenditure	41782.00
		POL & Maint of Vehicle	77711.00
		Advance for Expenses	260000.00
		Expenditure Total	9,77,840.40
		Bank Balance A/c No. 56772	8,22,449.60
Grand Total	18,00,290.00	Grand Total	18,00,290.00

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