

National Mission on Himalayan Studies (NMHS)
HIMALAYAN RESEARCH FELLOWSHIP
(FORMAT FOR THE HALF YEARLY PROGRESS REPORT)
[Reporting Period: from July 2018 to December 2018]

Name of the Institution/ University:	Wildlife Institute of India
No. of Himalayan Research/Project Associate:	3
No. of Himalayan Junior Research/Project Fellows:	10

Himalayan Research/Associate

H-RAs Profile Description:

S. No.	Name of RA	Date of Joining	Name of the PI	Qualification
1.	Dr. Anjali Uniyal	04.07.2016	Dr. G. S. Rawat	Ph.D
2.	Dr. Nehru P	27.06.2016 (Resigned on 10.06.2018)	Dr. G. S. Rawat	Ph.D
3.	Dr. Rishi Kumar	01.07.2016	Dr. G. S. Rawat	Ph.D

Progress Report: To be filled for each HRA in separate row.

RA No.	Research Objectives	Achievements	Addressed Deliverables	Location of Field Site with Details, if any
1.	<p>Assess ecosystem services concept in natural resource management</p> <ul style="list-style-type: none"> • To identify different ecosystem types and services provided by them in the study area • To identify different stakeholders and their roles in the management of different ecosystems • To document use of ESS in the study area and their quantification • To quantify vegetation and soil parameters of the forest ecosystem 	<ul style="list-style-type: none"> •Patterns and processes of land degradation •Traditional innovative land restoration practices •Indicators of soil health •Awareness Generation 	<p>Extensive surveys in the upper catchment of Uhl river to identify different ESS flowing</p> <p>Comparative analyses of degraded and conserved sites</p> <p>Identified factors responsible for forest degradation in the study area that are subsequently affecting the ESS flowing</p> <p>Awareness program with villagers on conservation of native species</p> <p>Plantation of fodder</p>	<p>Bohl Spring Shed (286 ha, altitude: 900m- 2100m) and Upper catchment of river Uhl in Dhauladhar mountain range in district Kangra (Himachal Pradesh)</p>

			species in the degraded slopes with the involvement of villagers	
2.	<ul style="list-style-type: none"> To understand the agricultural patterns and spatio-temporal distribution of crop varieties in District Pithoragarh, Uttarakhand To categorize agro-climatic zones across the study area based on crop diversity, terrain, farming practices and environmental characteristics To assess the vulnerability of agricultural systems to climate change and other influencing factors 	<ul style="list-style-type: none"> Landrace diversity of major crops (wheat, paddy and finger millet) are recorded for 99 villages across the study district. Data collection is completed on the factors influencing agriculture across the study area. 	<p>Conservation frameworks developed/ strengthened/ implemented</p> <p>(Final report of the project is under compilation)</p>	Western Himalaya (Pithoragarh Uttarakhand)
3.	<ul style="list-style-type: none"> To develop a comprehensive environmental monitoring protocol for the state of Sikkim To suggest institutional mechanism for mainstreaming of long-term monitoring of key environmental parameters and build scientific evidence base across key sectors. To generate baseline data on key environmental parameters along altitudinal and anthropogenic pressure gradients 	<ul style="list-style-type: none"> Monitoring protocol for vegetation is finalized. Monitoring protocol for fauna is also identified. An institutional mechanism has been developed and it is being discussed with various institutions for implementation after the project. Baseline data is being collected on vegetation via vegetation plots, fauna via transects and climate via data-loggers 	<p>Monitoring protocol developed for flora and fauna and its being implemented in field.</p> <p>Monitoring protocol for fauna also developed and being implemented in field.</p> <p>Work initiated with the involvement of state Forest Department, a discussion initiated with Sikkim University and GBPNHED, Sikkim Unit</p> <p>Baseline data collected on nearly 35 plots of 20m x 20m for trees, nested plots of 5 m x 5m for shrubs and 1m x 1m for herbs.</p> <p>1-hectare plots established along altitudinal and anthropogenic pressure gradients.</p>	A total 26 identified Field sites are located in 14 PA and RFs ie. Kitam Bird Sanctuary, Majhitar RF, Saombok RF, Maenam WLS, Dalley RF, Yangyang RF, Rangpo RFs, Namthang RF, Tendong RF, Singba Rhododendron Sanctuary, Yumthang, Fambong Lho WLS, Kanchendzonga national park.

Note: Data, table and figures may be attached as separate source file (.docx, .xls, .jpg, .jpeg, .png, .shp, etc.).

Himalayan Junior Research/Project Fellows

H-JRFs Profile Description:

S. No.	Name of JRF	Date of Joining	Name of the PI	Qualification
1.	Ms. Shagun Thakur	15.09.2016	Dr.S.Sathyakumar	Msc. Zoology
2	Ms. Alka Chaudhary	15.10.2016	Dr.B.S.Adhikari and Dr. G.S. Rawat	M.Sc Environmental Science
3.	Ms. Meghna Bandyopadhyay	08.06.2016	Dr. K. Ramesh	M.Sc. Environmental Science
4.	Mr. Hussain Saifee Reshmwala	10.06.2016 (Resigned)	Dr. Bilal Habib	M.Sc. Environmental Science
5.	Mr. Chirag Girdhar	23.11.2017	Dr. G.S Rawat	B.sc Botany (Hons.) M.sc Biochemistry
6.	Ms. Priyanka kashyap	08.06.2016	Dr. V.P. Uniyal	M.sc
7.	Mr. Shuvendu Das	10.06.2016	Dr. V.P. Uniyal & Dr. S. Sathyakumar	M.Sc in Environmental Science(Ecotoxicology)
8.	Ms. Ankita Sinha	08.06.2016	Dr. K. Ramesh	Masters in Zoology
9.	Dr. Suresh Kumar	15.09.2016	Dr. G. S. Rawat	Ph.D. in Wildlife Science
10.	Ms. Anjani Rawat	20.06.2016	Dr. V.P Uniyal	M.Sc Environmental Science

Progress Report: To be filled for each JRF in separate row.

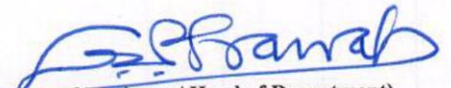
JRF No.	Research Objectives	Achievements	Addressed Deliverable	Location of Demonstration/ Study Site with Details
1.	<ul style="list-style-type: none"> To assess the distribution of large mammals (carnivores) in the Great Himalayan National Park (H.P.) Occupancy(Site utilization) of large carnivores in the context of anthropogenic pressures(Livestock grazing) 	<ul style="list-style-type: none"> Temporal overlap was found to of around 75 percent in case of common leopard and humans, between Black bear and humans is around 53 percent and in case of Brown bear and humans is around 50 percent in summer season Black bear is found to be associated with humans in both winter and summer season thereby both the species resulting in Human-Wildlife conflict. Common leopard is closely associated with the human activities inside the park as well as in the eco-zone. 	<p>To develop Sustainable conservation protocols for diverse natural resources</p> <p>To study Impacts of anthropogenic pressures on mammals and their habitats</p>	Great Himalayan National Park (H.P.)
2.	<ul style="list-style-type: none"> To model spatial distribution of selected plant invasive species using distribution modeling technique To analyze peoples' perception towards spread of AIPs in Kailash Sacred Landscape – Indi To assess the impacts of AIP on native flora and relationship with habitat parameters, Experimental trials on eco-restoration of habitats and prediction of future spread for better management 	<ul style="list-style-type: none"> Potential habitat maps have been prepared of two major alien invasive plants <i>Ageratina adenophora</i>, <i>Lantana camara</i> in the entire KSL-Indian landscape also future prediction of the spread of these species in the KSL-India landscape has been done therefore the maps prepared can be used by risk managers for management of AIPS. Eco- Restoration sites have been developed and AIPS have been replaced by native fodder plant species. Nurseries at small scale have been developed and maintained for native 	<p>Distribution of two major alien invasive species <i>Lantana camara</i> and <i>Ageratina adenophora</i> has been done in KSL-India using habitat suitability model.</p> <p>Questionnaire survey has been done in 2 pilot watersheds of KSL- India. Data entry of more than 600 questionnaires has been done. Data analysis under process.</p> <p>Vegetation plots have been laid in different sites for monitoring the impact of AIPS on native flora. Data entry has been done and data analysis under process.</p> <p>Monitoring plots have been</p>	<p>The present investigation was conducted in the entire KSL-India landscape mainly for two major invasive alien species viz. <i>Ageratina adenophora</i>, <i>Lantana camara</i> in Pithoragarh district of Kumaon region, Uttarakhand which falls under Kailash Sacred Landscape (KSL).</p> <p>Questionnaire survey has been done in 2 pilot watersheds Chandak Anwalaghat watershed and Hatkalika watershed of KSL-India.</p> <p>To monitor the impact of AIPS on native flora Vegetation plots were laid in four blocks (Bin,</p>

		<p>fodder plant species.</p> <ul style="list-style-type: none"> • Awareness raising programs have been done among school children and community level for management and monitoring the spread of AIPS in the landscape • Field data for all the four research objectives has been collected, compiled and entered. 	<p>set for monitoring the growth and spread of AIPS in the study area.</p>	<p>Thal, Gangolihat and Didihat) and four different ecosystems of the ksl-india landscape.</p> <p>Monitoring plots have been set to monitor the growth of AIPS in the pilot watershed Chandak Awlaghat watershed and in four different ecosystems.</p>
3.	<ul style="list-style-type: none"> • Good practices tested on scientific evidence base of small carnivore habitat interactions with anthropogenic pressures and climate change in riverine habitats 	<ul style="list-style-type: none"> • Response of small carnivore to changing habitat with respect to elevation. • First authentic record of snow leopard at global lowest elevation in GHNP • First record of stone marten in GHNP. • Repeated photo capture of snow leopard at 3763m. 	<p>Distribution pattern of small carnivores with respect to elevation.</p>	<p>Great Himalayan National Park (GHNP), Himachal Pradesh, Western Himalaya</p>
4.	<ul style="list-style-type: none"> • Climate Change indicators in the region using Red Fox as indicator species 	<ul style="list-style-type: none"> • Survey carried out at 6 sites across the trans-Himalayan region of J&K, Himachal Pradesh and Uttarakhand. • 54 dens of Red Fox identified, 700 scat samples are collected for analysis. • A total of 34 different food items were found in the diet of the red fox 	<p>Species responses to changing LULC and Climate in the region documented.</p> <p>(Final report of the project is under compilation)</p>	<p>Trans-Himalaya</p>
5.	<ul style="list-style-type: none"> • To assess the lichen community assemblages and their spatial-temporal dynamics along environmental gradients, and the following deglaciation • To assess changes in lichen bio-chemical composition along the gradient of environmental conditions and in experimental 	<ul style="list-style-type: none"> • Over 2000 samples of lichens from Bhagirathi basin, Uttarakhand and 200 samples from Teesta basin, Sikkim were collected. • Identified 210 species from Bhagirathi basin and 40 species from Teesta basin. • <i>Baeomyces rufus</i> recorded as a new 	<p>Our objectives will bridge the knowledge gap that exists about soil-dwelling lichens along environmental gradient and in glacier forelands which never gained proper attention from the ecologists in the Himalayan region.</p> <p>The study will provide understanding about the response of the lichen communities, their functional roles in high</p>	<p>Two sites were selected Bhagirathi basin, Uttarakhand and Teesta basin, Sikkim.</p>

	warming.	<p>record to India. At least 3 species are recorded as new to the state of Uttarakhand.</p> <ul style="list-style-type: none"> • Diploid 10 Open Top Chambers, 12 climatic data loggers and 8 phenocams time laps cameras. • Started lab work for heavy metal accumulation, PAH and Carbon Isotope this month. 	altitudes and understanding colonization dynamics	
6.	<ul style="list-style-type: none"> • To prepare an inventory of nematodes (up to genus level) present in the selected sites in the IHR. • To assess the distribution and relative abundance of selected nematodes along the elevation gradient, edaphic factors and environmental variables in the selected sites in the IHR. • To assess the trophic relationships among soil-inhabiting nematodes in the selected sites in the IHR 	<ul style="list-style-type: none"> • We have identified 30 genera ,14 families and 6 orders of nematodes from the samples • The correlation analysis among the different soil parameters showed that SOC showed significant positive correlation with soil moisture($r=0.7575$, $p=0.011$); phosphorus and nitrogen showed positive correlation($r=0.793$, $p=0.06$); • Bacteriovores - most dominant feeding group in the community till date 	Impacts of anthropogenic pressures and climate change on soil micro flora/soil fungi	Gangotri National Park, Uttarakhand.
7.	<ul style="list-style-type: none"> • Status and abundance of Odonata assemblages in Bhagirathi river basin of Uttarakhand and Teesta River Basin of Sikkim. 	<ul style="list-style-type: none"> • Stratified random sampling was carried out in at least 10 plots at each 250m elevation interval within a range of 500m - 4000m (n=220). • Listing of 32 species of Odonates belonging to 17 genera and 11 families in river Teesta basin. • Species diversity along altitudinal gradient, species encounter rate along altitudinal gradient, change in species composition along different habitats, number of 	Diversity and distribution is calculated for Bhagirathi river basin.	Bhagirathi river basin of Uttarakhand and Teesta River Basin of Sikkim

		<p>species encountered at different atmospheric stability zone were calculated.</p> <ul style="list-style-type: none"> Species distribution modelling was done using ARC 10.2 and MaxEnt software. 		
8.	<ul style="list-style-type: none"> To develop the utility of riverine birds as potential indicators of monitoring riverine landscape health. 	<ul style="list-style-type: none"> Species traits that are crucial in process of foraging site selection in river birds were identified. 	<p>An framework incorporating functional traits to understand the importance of environmental filtering in the assembly of river bird communities was identified.</p>	<p>The study was conducted in the headstream of the Upper Ganges including the Bhagirathi and Amrit Ganga basins in the state of Uttarakhand in the western Indian Himalaya</p>
9.	<ul style="list-style-type: none"> Population status of high value medicinal and aromatic plants for their conservation and management 	<ul style="list-style-type: none"> Literature review concluded a usage of c. 300 medicinal plants in the study area. Survey made at four sites in J&K. 40 plant species used by local communities were identified. A total of 88 medicinal plant species were found to be used by the people to cure 23 common ailments/diseases using 73 formulations 	<ul style="list-style-type: none"> Documentation of availability and use pattern of wild MAPs in various parts of J&K Himalaya <p>(Final report of the project is under compilation)</p>	<p>Chenab Valley of Jammu and Kashmir</p>
10.	<ul style="list-style-type: none"> To assess the health of environment by evaluating its physical, chemical and biological components and to create baseline data of the given environment. To assess the impact of changes in environment variables on the indicator species Awareness among locals regarding the environment 	<ul style="list-style-type: none"> Air, water and soil quality has been monitored for 2017 and 2018 and analysis is under process. Aquatic macro-invertebrates has been identified and identification of soil nematodes is under process. 	<p>Change in water quality and macroinvertebrates assemblage is observed with respect to anthropogenic pressure like land use and distance of human habitation.</p> <p>Soil quality analysis for the month of June is under process</p> <p>Air quality is analysis is under process.</p>	<p>1. Mandakini River flowing in different populated towns of Chamoli has been selected for water quality characterization.</p> <p>2. Sonprayag, Ukhimath and Mandal agriculture fields has been selected for soil quality characterization.</p> <p>3)Air quality monitoring stations are at Rudraprayag, Mandal and Ukhimath.</p>

Note: Data, table and figures may be attached as separate source file(.docx, .xls, jpg, .jpeg, .png, .shp, etc.).


(Signature of Registrar/ Head of Department)

Report (hard copy) should be submitted to:

The Nodal Officer, NMHS-PMU
G.B. Pant National Institute of Himalayan Environment and Sustainable Development (GBPNIHESD)
Kosi-Katarmal 263 643, Almora, Uttarakhand

Report (soft copy) should be submitted to:

E-mail: nmhspmu2016@gmail.com