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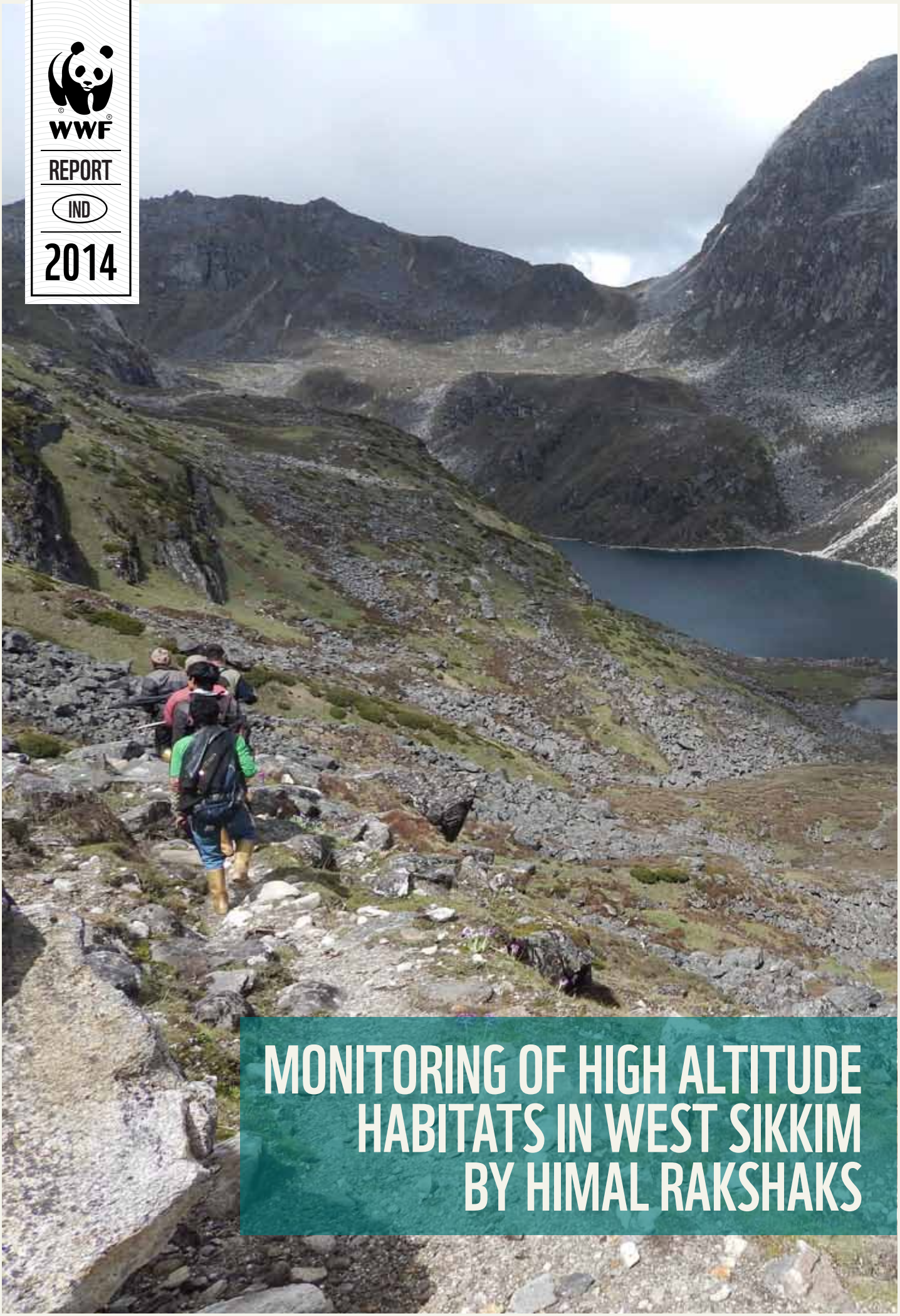

MONITORING OF HIGH ALTITUDE HABITATS IN WEST SIKKIM BY HIMAL RAKSHAKS

SUPPORTED BY

WWF-India
Khangchendzonga Landscape Programme and Khangchedzonga Conservation Committee
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FOREWORD

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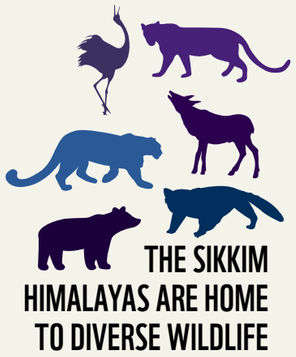
"The himalaya, the king of the mountains, five and three thousand leagues in extent at the circumference, with its ranges of eight and forty thousand peaks, the source of five hundred rivers, the dwelling place of multitude of mighty creatures, the producer of manifold perfumes, enriched with hundreds of magical drugs, like a cloud, the centre of the earth."

The alpine zone in the Himalaya (locally known as *bugyal, chaur, himal*) begins where the trees end, giving way to the rolling alpine meadows. It has exceptional ecological, cultural, economic and biodiversity values. This zone forms the headwaters of the Himalayan rivers, which sustain millions of humans who inhabit the several river basins below. Culturally this landscape is considered sacred by the Hindus and the Buddhists alike and is dotted with *dhams, thirth-sthals, gumpas, chortens* and *shangrilas*. Pastoralism, medicinal plants collection, nature tourism and pilgrimage are the main land use practices pervasive here. If anything could come close to penning the magic of the Himalaya, this ancient hymn of sage Nagsena does.

While the forests in the country were brought under the Joint Forest Management participatory conservation regime decades back, the alpine zone continues to have inadequate on-ground management. Hence, while a number of large sanctuaries and national parks have been notified to protect this unique alpine landscape, on-ground effective conservation initiatives continue to be lacking. In order to address this policy gap, the *Himal Rakshak* or voluntary mountain guardian program was piloted in Sikkim in the year 2006. Community based resource persons who had vast traditional knowledge and a passion to conserve, were recognized by the Forest Department as *Himal Rakshaks* and given the responsibility of environmental stewardship of the alpine areas. Various civil society organizations like WWF-India, The Mountain Institute-India, Sindrabung Khangchendzonga Ecofriendly Society (SKES), Khangchendzonga Conservation Committee (KCC) and others contributed in their capacity building in scientific monitoring and also in equipping them. Following this, the *Himal Rakshaks* took the lead and played a vital role in mobilizing the local community and in reducing the conservation threats to the high altitudes. This mission over the last seven years has led to a drastic reduction in commercial ranching, retaliatory carcass poisoning and hunting across the alpine zone of the Sikkim Himalaya. Consequently, wildlife populations have started bouncing back, herd size of blue sheep has increased, solid waste is better managed and tourist satisfaction has improved.

I am happy to note that the Himal Rakshak initiative has come alive as a vibrant, people-centric initiative due to the love and passion of the *Himal Rakshaks* for wildlife conservation. Though a voluntary effort, there is a need to build in incentives and rewards for these brave hearts to recognize their undying commitment for nature conservation. Also, time is ripe to initiate steps to seed this idea in other alpine areas of the Himalayas, by providing an enabling policy framework that empowers the local community to better manage and conserve their Himal.

INTRODUCTION



The high altitude areas of Sikkim, especially regions above 3000 m, encompass three major eco-regions of the State and are classified as Reserve Forests. These areas cover more than 59% of Sikkim's geographical area (4,187 sq. km) (Government of Sikkim 2006). The temperate, sub-alpine and alpine landscapes of the Sikkim Himalayas are home to an immense diversity of flora and fauna (Khuswaha et al. 2005; ICIMOD 2011; Chettri and Sharma 2011; Sathyakumar et al. 2011). Studies have revealed occurrence of about 1,705 species of plant belonging to various groups (ICIMOD 2011). A fair number of the plant species found in the high altitude areas or *'Himal'* are utilised by communities for various purposes, including indigenous medicinal practices (Government of Sikkim 2006; Chettri and Sharma 2011). The existing habitats are also home to some enigmatic and globally significant wildlife such as the leopard (*Panthera pardus*), snow leopard (*Panthera uncia*), clouded leopard (*Neofelis nebulosa*), Himalayan musk deer (*Moschus chrysogaster*), Asiatic black bear (*Ursus thibetanus*), red panda (*Ailurus fulgens*) and black-necked crane (*Grus nigricollis*) among others (Government of Sikkim 2006; Sathyakumar et al. 2011). Most importantly, the *Himal* act as the primary source of water for the downstream populations and are home to many important pilgrimage areas.

The transboundary nature of these high altitude landscapes, having borders with Nepal on the western front and the state of West Bengal towards south east adds even more significance in terms of biodiversity conservation. However difficult terrain of the mountain areas and their remoteness makes management and conservation of these areas a challenge for the Forest, Environment and Wildlife Management Department. Further lack of adequate infrastructure and facilities make patrolling visits more like an expedition, with a large contingent of support staff and resultant high attendant costs. The main threats to these regions are from grazing, tourism, hunting and trapping of wild animals and illegal extraction of medicinal and aromatic plants for trade.

Therefore for conservation of these biodiversity rich high altitude areas, FEWMD has sought for community participation by enrolling Himal Rakshaks, who give their time voluntarily towards the cause of conservation. The Himal Rakshaks are community based individual volunteers from the high altitude villages who contribute in conservation initiatives for important wildlife areas of the state. Living in fragile and difficult mountainous areas they mostly practice traditional subsistence farming as one of their livelihood options. Many Himal Rakshaks were erstwhile herders having roamed the forests and high altitude areas for years, therefore their knowledge regarding the state's rich biodiversity is unparallel. With the ban on cattle grazing in the forest areas, the herder community shifted to tourism which was an emerging option for them, and enrolled as Himal Rakshaks after being provided with the opportunity to work for conservation and to make use of their expertise in a positive manner.

21 Himal Rakshaks were nominated by the State Government on June 5, 2006. The number has since then increased to 38 with more volunteers enlisting their names each year.

Since their formation, the Himal Rakshaks have contributed to the cause of conservation of the high altitude areas of Sikkim through periodic monitoring, curbing wildlife crimes with special reference to trap demolition and supporting

Department of Forests, Environment and Wildlife Management (FEWMD), Government of Sikkim, in their endeavour to maintain the sanctity of the sacred landscape. In November 2011, the Himal Rakshaks conducted an eleven day monitoring in the high altitude regions of Sikkim which uncovered evidences of practices such as trapping, hunting, illegal trade of wildlife (specially plant) products, and grazing among others (WWF-India 2011, unpublished report). Based on the observations of this survey, it was realised that the high altitude areas need to be monitored more frequently. Simultaneously, initiatives needed to be taken to enhance the capacity of the Himal Rakshaks in simple monitoring techniques, so that they could procure valuable information from the Himal when they visit these areas during future monitoring exercises. With this background, the present monitoring exercise was conceptualised for the Himal Rakshaks, by WWF-India in cooperation with FEWMD and Khangchendzonga Conservation Committee. The survey was conducted under the SCAPES Project, funded by USAID.

HIMAL RAKSHAK ACTIVITIES

Since their formation, the group of Himal Rakshaks has been involved in a number of activities at the field level from monitoring of the high altitude areas to reporting of deaths of important wildlife in their areas. Supported by various agencies, they have successfully organized monitoring exercises in different parts of West Sikkim in a regular manner.

Supported by TRAFFIC India, monitoring and trap demolition expedition was the first formal exercise carried out by the Himal Rakshaks in 2007. The area of Yambong Sathbhai in the area of Khangchendzonga National Park was monitored from 3rd 10th December 2007. The main objective of this exercise was to carry out off season monitoring of the threats to wildlife which included searching for traps and demolition of the same. The exercise also aimed at motivating Himal Rakshaks by providing them with incentives for biodiversity monitoring and bringing awareness among the local communities, and identifying the adjoining villages having maximum impact on wildlife.

During the seven day expedition, the team covered Lower Yambong, Upper Yambong, Pangmelong, Satayabhaia and Berim. The team came across many indirect evidences of Wild dog, Red panda, Himalayan Black Bear and Pheasants. At Yambong, the monitoring team came across many small and big traps which were dismantled and the traps and equipment found were handed over to Divisional Forest Officer, Wildlife Division, West Sikkim. About 70 small traps laid for pheasants like Blood Pheasant, Satyr Tragopan and Himalayan Monal were dismantled, about 16 big traps laid for Himalayan Tahr, Serow and deer were found and destroyed during the expedition.

Most of the traps were found along Satayabhaia - Berim ridge which was easily accessible by people from Lamathang, Topong and Samtek. After talking to the Panchayat of the locality, it was identified that the people of Lamathang have the maximum impact on hunting.

A similar monitoring was also carried out by the Himal Rakshak jointly with the Ecotourism Service Providers Association of Yuksam (ESPAY) from 12th to 25th May 2008. The area in focus was the Upper Dzongri trail, which is one of the most popular trekking destinations in Sikkim. During the survey a detailed search was conducted all along the trail.

During this exercise the Himal Rakshaks recorded a count of 15 - 20 blue sheep regularly during their trek at Yambong area. In the Lamune area 51 blue sheep were sighted by the Himal Rakshaks.

CAPACITY BUILDING INITIATIVES

After formation of Himal Rakshaks in the state, various training and capacity building programmes were organized for them by FEWMD as well as other partner NGOs. The main issues that were focused on were

1. Significance of the mountain areas for biodiversity conservation
2. Biodiversity monitoring in the high altitudes
3. Assessment of threats to biodiversity
4. Illegal wildlife crimes and trap demolition
5. Strategy development

The first training for 21 Himal Rakshaks was conducted in December 2006 jointly by FEWMD, Wildlife Trust of India, The Mountain Institute and WWF- India. With the objective of training the Himal Rakshaks on assessment of threats to biodiversity as well as monitoring in the high altitude areas, this training workshop served to bring together the newly formed Himal Rakshaks for the first time in a group. Field trip to Yambong Valley was organized that enabled the participants to gain first hand knowledge on habitat types, their quality, threats, wildlife of the area, etc. Each of the Himal Rakshaks was provided with sleeping bags at the end of the training.

Himal Rakshaks received another round of orientation at Barsay Rhododendron Sanctuary in June 2008 with the efforts of Sindrabong Khangchendzonga Ecofriendly Society in collaboration with FEWMD. Digital cameras were given at a cluster level to the Himal Rakshaks during this training programme. To sustain the interest of the group, different conservation agencies have come forward to support them. In 2009, The Mountain Institute organized a training workshop for the Himal Rakshaks to expose them to the conservation issues of the state.

In December 2010, WWF- India with partner Khangchendzonga Conservation Committee organized another round of capacity building programme with the Himal Rakshaks at Yuksam. During this workshop, an analysis of the work done so far by the group was also conducted and a way forward for future work was drafted.

These events chiefly served to bring together the Himal Rakshaks hailing from different mountain areas of the state together on one platform that facilitated sharing and learning amongst the group.

“Being a Himal Rakshak has given me an opportunity to work for conservation and learn many new things about Sikkim’s biodiversity. Sikkim’s wealth lies in her natural resources and only if we manage to safeguard it will the future of our children be secure. So far, the State Government’s pro conservation approach has led to an increase in quality of forests and we are happy that we have a role to play in that. However we do hope for more coordination and support from the Government for our future programmes.”

PHUPU TSHERING BHUTIA,
HIMAL RAKSHAK,
YAMBONG CLUSTER

OBJECTIVES

The monitoring exercise for the Himal Rakshaks in 2013 was designed with the following objectives:

1. To enhance the capacity of Himal Rakshaks in monitoring techniques.
2. To enumerate the wildlife species and their distribution in high altitude areas of Sikkim, with special reference to Khangchendzonga Biosphere Reserve and Barsey Rhododendron Sanctuary.
3. To assess key concerns to wildlife and habitat in the survey area.

SURVEY AREA

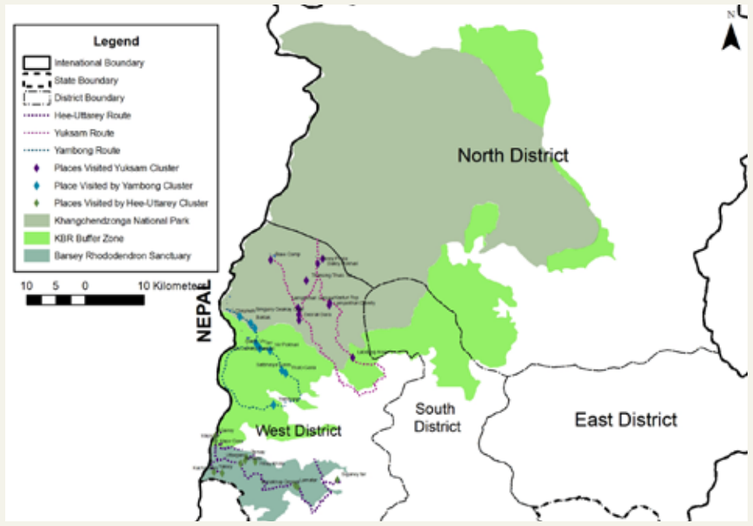


Figure 1
Map of Sikkim showing Khangchendzonga Biosphere Reserve and Barsey Rhododendron Sanctuary along with the trail selected by individual teams for monitoring

The Himal Rakshaks were divided into three clusters – Hee-Uttarey, Yambong and Yuksam, and identified three different areas depending on their area of operation for the proposed monitoring. The Hee-Uttarey cluster chose to survey along the Lamacheri-Kachopatey-Chewabhanjan-Uttarey route; the Yambong cluster selected Sindrabong-Neytham-Neer Pokhri-Gomathang-Sangkhola route for monitoring and the Yuksam team selected the Yuksam-Thansing-Kasturi-Labdang-Yuksam route. Among these, routes selected by the Yambong and Yuksam team were within Khangchendzonga Biosphere Reserve and Khangchendzonga National Park (KBR and KNP) and the one selected by the Hee-Uttarey team was within Barsey Rhododendron Sanctuary (BRS) and partly within KBR.

Figure 2
Yambong team memebers disposing garbage during monitoring

Khangchendzonga Biosphere Reserve and Khangchendzonga National Park

Khangchendzonga Biosphere Reserve covers an area of 2931.12 km² and includes the Khangchendzonga National Park (1,784 km²) and has a buffer of 835.92 km² along with a transition zone of 311.20 km². It is located along the western border of Sikkim, India (27°30–27°55 N, 88°02–88°37 E), and spans across the north and south districts of the state. The area is included in the eastern Himalayan global biodiversity hotspot and listed among the important Global 200 Ecoregions. The Khangchendzonga Biosphere Reserve (KBR) has a sharp elevation gradient of 1,220–8,586 m, varying within an aerial distance of just 42 km. It is divided into seven catchments or river subsystems, viz., Lhonak, Zemu, Lachen, Rangyong, Rangit, Prek and Churong. The area can be characterized into six habitat classes, viz., mixed subtropical, mixed temperate, sub-alpine, alpine pastures, rock and snow cover, and water bodies, and receives an average annual rainfall of around 2,230 mm.

Barsey Rhododendron Sanctuary

Barsey Rhododendron Sanctuary covers an area of 104 km² in the south western corner of Sikkim forming part of the west District (refer to Figure 2). The sanctuary borders Nepal on the west and the neighbouring state West Bengal on the south. Barsey Rhododendron Sanctuary ranges at a height of 1,900 m to 3,685 m and acts as a corridor between Khanchedzonga Biosphere Reserve towards the north and Singalila National Park towards the south. Major forest types encountered here are east Himalayan wet temperate forest, east Himalayan moist temperate forest, east Himalayan dry temperate coniferous forest, east Himalayan subalpine birch/fir forest, birch rhododendron scrub forest, deciduous alpine scrub and alpine pastures.

“I have been a Himal Rakshak since 2006. I used to be a herder in the past; it was a traditional livelihood that our family has been involved in for a long time. It was a hard life. In 2006, we supported the Government’s decision to ban grazing in the forests as we felt it was a good step for conservation and we helped in eradication of cattle sheds from within the forests. From them on I enrolled as a Himal Rakshak and have been working since for wildlife monitoring and other illegal activities. Along with my other Himal Rakshak friends, I have been a part of 4 monitoring exercises so far. Sometimes it is challenging because of the terrain and we once lost one of our members.”

CHYANGBA TSHERING BHUTIA,
HIMAL RAKSHAK

STUDY DESIGN

This monitoring exercise was designed as a four-step activity:-

I. Work plan development
II. Pre-monitoring orientation
III. Monitoring exercise
IV. Debriefing meeting with FEWMD and other stakeholders

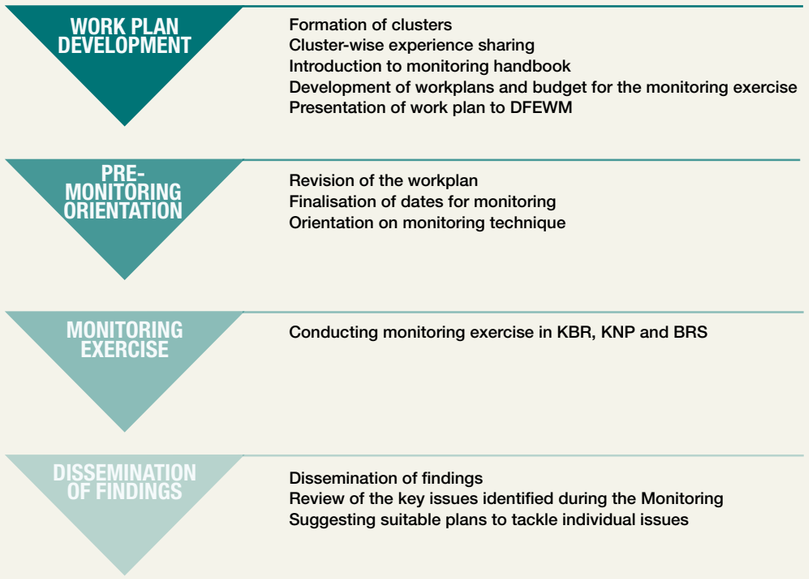


Figure 3
The study layout adopted for the Himal Rakshak Monitoring Exercise 2013

I. Work Plan Development Workshop

The workshop to develop the work plan was organised from 7 to 9 March 2013 at Yuksam in partnership with the Khangchendzonga Conservation Committee (KCC). Twenty-three Himal Rakshaks from Hee Gaon, Uttarey, Sindrabong, Sangkhola, Chauri and Yuksam, attended the workshop. A coordinator was appointed in each of the three clusters, i.e. Mr. N. B. Bhandari, Mr. Gopal Limboo and Mr. L. T. Bhutia for the Hee-Uttarey, Yuksam and Yambong clusters respectively. They would be the main point of contacts for all future programmes with FEWMD and WWF-India.

The teams were introduced to the monitoring handbook that would help them in registering significant observations related to wildlife and conservation issues. Each cluster identified the areas they would visit for monitoring. They developed tentative plan of activities, duration of monitoring and a budget for this exercise,and each cluster presented their plans in front of the other participants (Appendix I). Mr Tshering Pintso, Divisional Forest Officer (Wildlife Division), west District, attended the programme on the final day as the Guest of Honour.

II. Pre-Monitoring Orientation

The orientation on monitoring techniques was organised at Uttarey on 1 June 2013 and 18 Himal Rakshaks attended the programme. During the pre-monitoring orientation, the work plan developed at Yuksam was revisited and fine-tuned. Budgets were updated for all three clusters and the work plan was revised for Yuksam and Yambong clusters. The Yuksam group decided to initiate their 12 day monitoring on 5 June 2013, while the Yambong and the Hee-Uttarey group decided to begin on 8th and 10th June 2013 respectively.
A brief overview was given to the participants on the monitoring technique. They were trained on how to document their findings during the monitoring into datasheets as well as the use of GPS. WWF-India provided one camera for each cluster. As part of the programme, Mr. Aishwarya Maheswari of WWF- India conducted a session on the snow leopard and its status in the wild.

Figure 4
Yuksam Himal Rakshak Team at Tshoka Photograph by the Yuksam team members

III. Monitoring exercise in three clusters:

A. Yuksam cluster
Monitoring period - June 5 to 17, 2013

The Yuksam cluster started their survey from Yuksam and during the course of their 12 day monitoring visited Tshoka, Dzongri, Base Camp, Thangshing, Lampokhri, Kasturey Orar, Bikhay Bhitta and Labdang (Figure 6). They covered a distance of 78 km and an area of 117 km² during the survey. During this period, the eight member Yuksam team collected valuable information on wildlife along the survey route. They came across evidences of species such as blue sheep (*Pseudois nayaur*), musk deer (*Moschus chrysogaster*), Himalayan monal (*Lophophorus impejanus*), and blood pheasant (*Ithaginis cruentus*) among others. A detailed account of the species recorded is provided in Appendix III. They also collected important information on the existing threats to the wildlife habitat and the species found in this area. Important among them are issues related to trapping of both mammals and birds and occurrence of feral dogs within the Reserve. Detailed account of activities of the Yuksam cluster is provided in Appendix II.

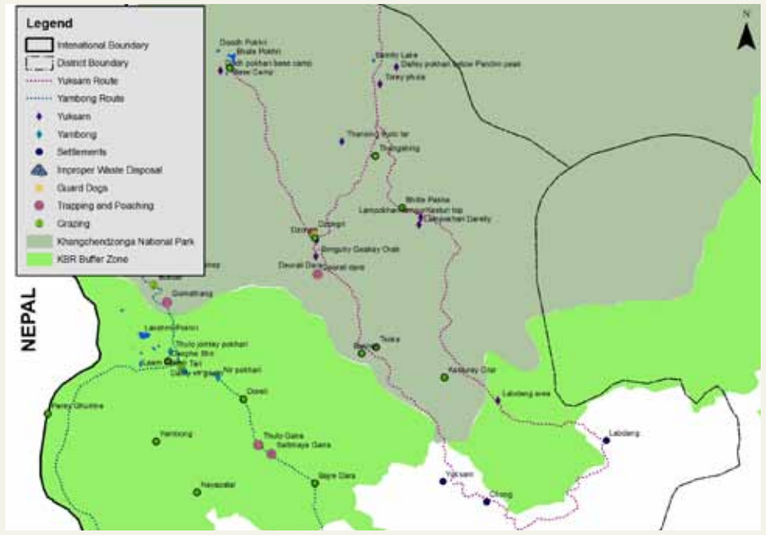


Figure 5
Areas surveyed by the Yuksam team during their monitoring exercise

Figure 6
Yambong team memebers filling up datasheet during the survey.

B. Yambong cluster
Monitoring period – June 8 to 21, 2013

The Yambong cluster started their 12 day monitoring on 8 June, 2013 from Sindrabong, continuing on toNetham, Phedi, Parey Ghumney, Gomathang, Neer Pokhri, Boktok,Danphe Bhr, Birim and finally ending at Sangkhola (Figure 8). During this survey, the 8 member team covered an area of 81 km². They sighted the Asiatic black bear (*Ursus thibetanus*), Himalayan goral (*Naemorhedus goral*), blue sheep (*Pseudois nayaur*) and satyr tragopan (*Tragopan satyra*) (Appendix III). Members of the Yambong cluster also made some interesting observations on various conservation issues such as evidence of possible poaching, illegal collection of medicinal plants and grazing. Detailed account of activities of the Yambong cluster in provided in Appendix II.

Figure 7
Areas surveyed by the Yambong cluster during their monitoring exercise 2013

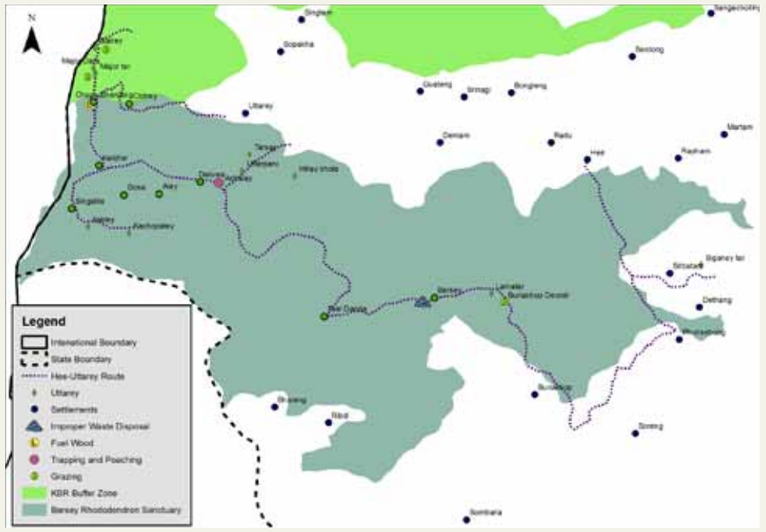


Figure 8
Locations surveyed by the Hee-Uttarey cluster during their monitoring exercise 2013

C. Uttarey cluster
Monitoring period - June 10 to 21, 2013

Starting from Hee Patal, the Uttarey team covered Lamachari, Line Dara, Tal Dara, Deoningale Dhaap, Kachopatey, Toriphooley, Chewabhanjang, Gairy, Sikkim Dhur and finally completed their 12 day survey on 21 June 2013 at Uttarey (Figure 9). An area of 76 km² was covered by the team. The monitoring group encountered animals such as Himalayan goral (*Naemorhedus goral*), Asiatic black bear (*Ursus thibetanus*), wild boar (*Sus scrofa*), barking deer (*Muntiacus muntjak*), Himalayan monal (*Lophophorus impagenus*), kalij (*Lophura leucomelanos*), satyr tragopan (*Tragopan styra*), and blood pheasant (*Ithaginis cruentus*) among others. In comparison to the Yambong and Yuksam teams, the Hee-Uttarey group reported very few threats from their survey area in Barsey and KBR (Appendix II).

“My name is Laku Tshering and I am the coordinator for Himal Rakshaks of Yambong cluster with our area of operation in the Khangchendzonga Biosphere Reserve. I joined in 2006 as Himal Rakshak. During those days tourism was being initiated in our areas, and we felt this would lead to serious impacts in the wildlife areas. So I enrolled as a Himal Rakshak to contribute in reduction of those impacts such as improper garbage disposal, poaching, etc. NGOs like Khangchendzonga Conservation Committee, WWF- India and The Mountain Institute have supported our initiatives and the trainings we received helped build our capacities for wildlife monitoring and other field techniques.”

LAKU TSHERING BHUTIA,
HIMAL RAKSHAK,
YAMBONG CLUSTER

OBSERVATIONS

1. HABITAT STATUS

Based on their observation during the monitoring exercise, all the teams unanimously mentioned that the habitat conditions in the survey areas have improved considerably in the past few years. The overall increase in the forest cover has been reported from Barsey Rhododendron Sanctuary, Khangchendzonga National Park and Khangchendzonga Biosphere Reserve. According to the the survey teams, restriction in human movement within forest areas has played a positive role in improving the habitat condition. The Hee-Uttarey team stated that evidences of regeneration were observed at places like Lamatar, Taal, Achaley, among others. The Yuksam team added that there has been a marked reduction in the overall level of disturbance in some of the sensitive wildlife areas of Khangchendzonga National Park. This has made these areas congenial for various important wildlife species.

2. WILDLIFE RECORDED DURING THE MONITORING EXERCISE

During the survey, the three teams made significant observation on key wildlife species, with special reference to threatened mammals and pheasants during the monitoring. The Himal Rakshaks came across evidences of eight mammals, among which five are regarded as highly threatened, and six pheasant species during the monitoring, among which one is categorised Near Threatened, (Appendix III).

Figure 9 & 10
Top: Blue sheep photographed near Samilty Lake
Bottom: A femal Himalayan Monal photographed near Lham Pokhri

Among the species sighted during the monitoring, blue sheep was encountered on four occasions (twice each by Yuksam and Yambong clusters). Total number of blue sheep encountered by the two teams was 21. Goral was encountered on two occasions; once by the Yambong team, during which they encountered five individuals, and the Hee-Uttarey team sighted goral once at Yakalay. Asiatic black bear was sighted only once by the Yambong team at Gomathang. However, evidences of this species were encountered by all three teams in their respective survey areas. The Yuksam cluster sighted one red fox near Lampokhari. Additionally, the Hee-Uttarey team recorded barking deer and wild boar on four occasions each. The Yambong team sighted barking deer at Nayapatal on 19 June 2013. Though evidences of serow and musk deer were recorded during the survey, none of the teams sighted these two species during the monitoring.

Among the pheasant species recorded during the surveys, blood pheasant, Himalayan monal and satyr tragopan were reported by all the teams from their respective areas. The Yuksam and Yambong teams sighted blood pheasant on two occasions each. They recorded 12 and 17 individuals of this species respectively. The Hee-Uttarey cluster sighted blood pheasant only once. The Yuksam team recorded 11 Himalayan monals and the Yambong team sighted 4 individuals of this species during their survey. The Hee-Uttarey group reported it from the Sikkim Dhur. The Yambong and Yuksam teams reported snow partridge from Dalley Pokhri, Lampokhri and Seto Pani. The Yambong team sighted satry tragopan on one occasion at Yambong and the Hee-Uttarey cluster recorded this species at Yakley and Balautey. In addition to these, Kalij was sighted by the Hee-Uttarey group on one occasion at Kachopatey .The Yuksam team reported two Tibetan snow cocks from the Base Camp area. The teams also recorded some other avian species from their respective areas. A detailed account of the species recorded during the monitoring is provided in Appendix III.

3. THREATS TO WILDLIFE AND THEIR HABITAT

This monitoring exercise provided critical insight on the key threats to essential wildlife and their habitats at Barsey Rhododendron Sanctuary and more importantly at Khangchendzonga National Park and Khangchendzonga Biosphere Reserve. Majority of these are human related. Significant among the threats, noticed by the teams, were poaching, trapping, grazing, fuel wood collection, improper waste management and occurrence of feral dogs in critical wildlife areas are worth mentioning.

3.1 Poaching and trapping

The monitoring undertaken in November 2011 indicated that incidents of poaching, trapping and snaring were still common in the high altitude forests, though such incidents were encountered less in number than previous surveys. This year's survey showed a marked reduction in the number of incidents of trapping. Thirty traps were reported from 8 areas that had been set up to capture both birds and large animals (Maps 2, 3 and 4). Among these, 29 traps were reported from Khangchendzonga National Park and Khangchendzonga Biosphere Reserve and one was reported from Achaley in Barsey Rhododendron Sanctuary. Traps discovered at Thulo Gaira (reported by Yambong team), Deorali Dara and Dzongri (reported by Yuksam team) were set up to capture musk deer. The Yambong team discovered a fresh trap to capture Asiatic black bear at Gomathang. All traps discovered by the teams were dismantled. The Yuksam team dismantled 20 traps, Yambong team dismantled 9 traps and the Hee-Uttarey team dismantled 1 trap.

Table 1 Areas where trapping and snaring activities were recorded by individual clusters

Cluster	Areas identified
Yuksam	Dzongri
Yambong	Netham, Phalekey, Gomathang, Satbhaiya
Hee-Uttarey	Achale

Figure 11
A Himal Rakshak in front of the bear trap reported from Gomathang

3.2 Illegal collection of medicinal plants

The Yambong cluster reported a case of organised medicinal plant extraction from the Phalekey area of Khangchendzonga Biosphere Reserve. Here, they came across a group of three men from Jhakri Dhunga (Uttarey) who had set up camp at Phalekey and were collecting rizomes of the herb *Paris polyphylla* illegally. *Paris polyphylla* is locally called *Satuwa*. These villagers had constructed a temporary drying station, adjacent to their camp, inside the Biosphere Reserve, to pre-process the rhizomes after collection, before they are transported out of the forest for further distribution.
Paris polyphylla is used in traditional medicinal practice to cure illnesses such as fever, burns, wounds, and stomach problems as an anti-helminthic drug and to treat livestock that has been poisoned. This species is widely distributed in the Asian countries. In the Himalayas, it is known to grow in forests up to an altitude of 3300 m. According to Madhu et al. (2010), Satuwa has been recognised as Vulnerable by IUCN and its commercial extraction has been banned in Nepal.

3.3 Grazing

Grazing in critical wildlife areas is banned since 1994. This has resulted in increase in the overall forest cover in the state by about 10 % in the last 15 to 18 years. However, few herders are still found operating in the alpine pastures, mainly in KBR. From the account of the Himal Rakshaks it was clear that most of the *Goths* belonged to residents of Sikkim and a few, especially along Indo-Nepal border, were owned by herders from Nepal. It was decided that a FEWMD inspection team would visit the prime grazing areas to evaluate the status and subsequently take steps to control livestock grazing activities in the high altitude pastures.
Grazing was reported from eight locations in Khangchendzonga Biosphere Reverve and one locality in the Barsey Rhododendron Sanctuary. These areas are – Dzongri, Sato Pani, Satabhaiya Gaira, Danfe Bhir, Boktak, Chirphuk and Sikkim Gaira in KBR. The only *Goth* at BRS was reported from Buriakhop Deorali by the Hee-Uttarey cluster. The monitoring teams also stated that they came across a few *Goths* that were unoccupied. They suspected that most of these people were alarmed by the news of monitoring taking place and had temporarily shifted their bases.

Figure 12 & 13
Left: Illegal medicinal plant extraction camp at Phalekey
Right: Sheep herd recorded grazing near Dzongri

Table 2: Areas where grazing was recorded by individual clusters

Cluster	Areas identified
Yuksam	Dzongri, Base camp, Thangshing, Samity Lake, Lampokhri
Yambong	Yangshep, Chirphuk, Gomathan, Tari, Danphe Bhir
Hee-Uttarey	Sikkim Dhur, Sikkim Gairi

3.4 Improper waste management

The Himal Rakshaks reported cases of improper waste management from all the trek routes they followed during the exercise. A special mention needs to be made of the significant amount of waste encountered around the sacred cave at Netham by the Yambong cluster. Netham is an important pilgrimage site for the residents of Sikkim. Though Department of Forests, Environment and Wildlife Management has put up a signboard requesting the pilgrims to maintain sanctity of this holy place, most of them seemed to overlook the instructions and had littered the place. The Yambong team camped here for two days, cleaned the areas adjacent to the cave and disposed the waste materials by incinerating them. Improper waste management was reported from the trek routes that were monitored during the November 2011 survey too (WWF-India, unpublished report).
One important issue that was discussed during the experience sharing meeting was the unmanaged disposal of toilet waste by the SSB BOPs at Toriphuley, Chewabhanjang, Gosa and Chitre. It was observed that the toilet waste is dumped directly into nearby streams or *kholas*. It was explained to the SSB that most of the *kholas* act as the primary water source for most villages downstream. Dumping of untreated wastewater may cause contamination of streams leading to serious health issues in these villages. It was suggested to Mr. Singh that SSB should take immediate steps to contain this situation. Mr. Arvind Kumar advised that the toilet waste should be channelised into pits, dug within camp premises, rather than dumping them into the streams directly. These pits can be closed once they are full and a new pit may be dug in its place.

Figure 14
Garbage cleaning drive conducted by the Yuksam team at Tshoka

Table 3. Areas where improper waste management was recorded by individual clusters

Cluster	Areas identified
Yuksam	Sachen and Phedang
Yambong	Netham
Hee-Uttarey	Barsey to and adjoining areas

3.5 Occurrence of stray dog

Feral dogs are considered as one of the direct causes of threat to the survival of wildlife in this habitat. Cases of feral dogs harassing wildlife species have been reported from a number of key wildlife areas in Sikkim. During the present monitoring exercise, the Yuksam team reported occurrence of stray dog at Dzongri. They presumed that this may be a guard dog and it belonged to the grazier who owned the flock of 300 sheep. Such guard dogs are well known for attacking and killing wildlife in order to protect the flock from wild intruders.

3.6 Fuel wood collection

During the monitoring, teams from Yambong and Hee-Uttarey reported cases of fuel wood collection from their respective area. The Yambong team reported a case of collection of juniper wood by one of the pastoralist at Tari. They recorded three bundles of juniper wood stacked in their *Goth*, which they had collected from the areas adjoining their camp. Additionally, they also suggested that a group of labourers stationed at Netham, for maintenance of the Public Health Engineering pipeline, have also been collecting fuel wood from the forest.
Use of rhododendrons as fuel wood was also reported from Chewabhanjang by the Hee-Uttarey from the Border Outposet of SSB.

Figure 15 & 16
Top: Waste materials dumped along Tshoka Dzongri trail
Bottom: Fuel wood stacked inside a Yak Goth at Yangshep

Figure 18
Himal Rakshaks' group at Yuksam during a training programme

IV. Debriefing meeting with FEWMD and other stakeholders

The observations made by the Himal Rakshaks during their 12-day monitoring exercise in three clusters were shared with the Department of Forest, Environment and Wildlife Management Department, Shasastra Seema Bal, and NGO partners like The Mountain Institute and the Khangchendzonga Conservation Committee during an experience-sharing meeting at Gangtok on 30 July, 2013. Mr. Arvind Kumar (Secretary and Principal Chief Conservator of Forest, Department of Forests, Environment and Wildlife Management Department) chaired the programme. WWF- India presented a brief background of the SCAPES programme under which this monitoring exercise was conducted along with the main objectives of the SCAPES programme and the various initiatives conducted under it, in partnership with the communities and the local NGOs and CBOs around Khangchendzonga Biosphere Reserve and Barsey Rhododendron Sanctuary.

The cluster coordinators then presented on monitoring outcomes of their own clusters providing a detailed account of their daily activities, the flora and fauna they had observed and the threats and issues percieved during the survey. Based on the outcomes of the exercises undertaken at Barsey Rhododendron Sanctuary, Khangchendzonga National Park and Khangchendzonga Biosphere Reserve, the Himal Rakshaks summarised that the conditions of the wildlife habitats have improved considerably since they had conducted their first monitoring during 2006.

They also stated that the threats to the wildlife and their habitat have been brought under control significantly too. However, as the present survey indicates, initiatives need to be intensified to contain the threats that persist in the survey areas. The main threats as mentioned in the earlier section during the monitoring were discussed at length and the group forwarded issue-specific recommendations, to tackle the situation in the field.

WAY FORWARD

The experience-sharing meeting, organised on 30 July 2013, provided the ideal platform to review the existing management issues in BRS, KNP and KBR and subsequently come up with recommendations to manage the issues encountered during the Himal Rakshak monitoring 2013:

1. FEWMD would keep aside funds for regular monitoring of the high altitude areas employing the expertise of Himal Rakshaks and EDC members. At least two monitoring exercises would be conducted annually to ensure that practices of poaching and snaring are curbed as much as possible.
2. A team of Forest Department staff would visit Phalekey and its adjoining areas to gather more information on illegal extraction of medicinal plants from KBR, as well as on grazing practices. The Department of Forests, Environment and Wildlife Management also assured strict action against any perpetrators practicing illegal collection of medicinal plants.
3. To manage the garbage along the trekking trails, it was decided that the State Forest Department would support garbage management drives along with the annual monitoring exercise. At Nup Dechenphuk, a semi-permanent garbage dumping station would be developed replacing the open dumping ground under use presently.
4. Sterilisation drives for feral and stray dogs would be conducted in the sensitive areas in partnership with the Sikkim Anti-Rabies and Animal Health Programme. A programme to sterilise the feral dogs has already been adopted in the Khangchendzonga Biospehere Reserve Management Plan for 2013-2014.
5. In addition, Department of Forests, Environment and Wildlife Management, would also felicitate best performing Himal Rakshaks with a conservation award for their commendable contribution in the field of nature conservation at important state functions.
6. Decision was taken to involve the Himal Rakshaks to monitor and curb illegal trade related to medicinal plants.
7. It was also decided that Himal Rakshaks would be engaged in future conservation initiatives related to critical wildlife species like red panda, snow leopard, musk deer among others.

“My main job is to look after the tourist hut at Dzongri which is along the Yuksam-Dzongri trekking trail, but I enrolled myself as a Himal Rakshak because of my keen interest in conservation of wildlife. This provides me the opportunity to interact with many others like me and also to learn new things. As a Himal Rakshak I regularly monitor the wildlife along the trekking trail and also collect the garbage at regular intervals.”

MANGALMAN SUBBA,
HIMAL RAKSHAK

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“I come from a family of herders and we used to have cattle station within the Barsey Rhododendron Sanctuary. Having seen the negative impacts brought about by the huge presence of cattle inside forest areas, I was convinced that the ban on grazing issued by the State Government would lead to better protection of our forests. I convinced not only my own family to stop grazing inside the Sanctuary but motivated other herders also to stop this practice. I then enrolled myself as a Himal Rakshak and got involved in regular monitoring of the forest areas for illegal activities. As a tourist guide, during the treks I conduct I always keep a look out and undertake wildlife and garbage monitoring. Now I am the Coordinator for the Himal Rakshaks of Uttarey Cluster.”

NARBAHADUR BHANDARI,
HIMAL RAKSHAK,
UTTAREY CLUSTER

APPENDIX 1

Monitoring Work Plan and Budget proposed by the Himal Rakshaks
Monitoring by Himal Rakshaks in Barsey Rhododendron Sanctuary/KNP/KBR

1. Barsey Cluster

Cluster Coordinator: N B Bhandari (9733110926)

TENTATIVE ITINERARY **Date: June 10 – 22, 2013**

Day 1 - Hee patal to Lamachari
Day 2 - Lamachari to Linedara
Day 3 - Linedara to Taldara
Day 4 - Taldara to Dewnegali Dhap
Day 5 - Dewnegali Dhap to Kachopatey
Day 6 - Kachopatey to Toriphuley
Day 7 - Toriphuley to (Balautey, Rai chowk, Tin Simana, Bulbuley, Cheu Barkhey)
Day 8 - Toriphuley to Chewabhanzang
Day 9 - Chewabhanzang to Gairey
Day 10- Gairey to Sikkim Meghu
Day 11- Sikkim Meghu to Gairey
Day 12- Gairey to Utterey (via Tal Daralei)

2. KBR Cluster

Cluster Coordinator: L T Bhutia (8016294550)

TENTATIVE ITINERARY AND BUDGET **Date: June 8 – 21, 2013**

Day 1- Sindrabung to Neytham
Day 2- Neytham (Survey surrounding)
Day 3- Neytham to Phedi
Day 4- Phedi to Door
Day 5- Door to Parey Megu
Day 6- Parey Megu to Garakhet
Day 7- Garakhet to Pangmelung
Day 8- Pangmelung to Boktok (back to Pangmelung)
Day 9 - Pangmelung to Dorely
Day 10- Dorely to Kasturey
Day 11- Kasturey to Birim
Day 12- Birim to (Survey surrounding)
Day 13- Birim to Sengkhola

3. KNP Cluster

Cluster coordinator: Gopal Limboo (8348194710)

TENTATIVE ITINERARY AND BUDGET **Date: June 5 – 17, 2013**

Day 1- Yuksam to Tshoka
Day 2- Tshoka to Dzongri
Day 3- Dzongi to Teagyapla
Day 4- Teagyapla to Base camp
Day 5- Base camp to Thangsing
Day 6- Thangsing to Lampokhari (Survey surrounding)
Day 7- Lampokhari to Kasturi
Day 8 – Kasturi (survey surrounding)
Day 9- Kasturi to Bikhay Bhitta
Day 10- Bikhay Bhitta (survey surrounding)
Day 11- Bikhay to Labdang
Day 12- Labdang to Yuksam

APPENDIX 2

Day-wise activities performed by the three clusters during their monitoring

	Yuksam Cluster	Yambong Cluster	Hee-Uttarey Cluster
Day 01	05/06/2013	08/06/2013	10/06/2013
	Yuksam to Tshoka – ○ Monitoring could not be done properly because of poor weather	**Sindrabong to Neytham** ○ The team came across PHE pipeline. Probable disturbance caused by labours maintaining the pipeline. ○ They also found improperly managed garbage. ○ The staffs appointed by PHE are collecting firewood from forest area.	**Hee Red Panda Gate to Samma Taar** ○ Labours working at Samma Taar were made aware about proper garbage management and were requested to carry back the wastes once they are finished with their work ○ An Asiatic black bear pug mark was recorded near Samma Taar
Day 02	06/06/2013	09/06/2013	11/06/2013
	Tshoka to Dzongri – ○ Traps for musk deer and blood pheasant located near Deorali Dara	**Camping at Neytham** ○ The Himal Rakshaks Conducted waste collection at Nup Dechenphuk (Neytham). ○ They collected around 300 kg of waste ○ 3 Traps for small birds were dismantled ○ The team came across large aggregation of Satuwa (Paris polyphyla)	**Sammatar to Lamachari –** ○ It was observed that the forest along this stretch was very healthy ○ During the post lunch period the team surveyed Jhandi Dara and its surroundings and recorded foot prints of Asiatic black bear
Day 03	07/06/2013	10/06/2013	12/06/2013
	Surveyed areas surrounding Dzongri – ○ Traps for blood pheasant, Himalayan monal, and musk deer located near the Dzongri tourism bungalow	**Neytham to Phedi** ○ The survey team met two villagers from Uttarey (Jhakri Dhunga) at Phalekey collecting medicinal plants (Satuwa, Paris polyphyla) with temporary sheds to process the medicinal plants. About 6 to 7 kgs of Satwa root was found stocked by the collectors. The processing station was dismantled. ○ The team encountered footprints of Goral, Himalayan Serow and probably musk deer. A blood pheasant was sighted during the day. ○ Last year's bird traps were encountered at Phedi. Traps were dismantled.	**Lamachari to Barsey –** ○ The team sighted a Kalij near Kapti ○ At Line Dara the team interacted with the labours constructing the patrolling hut. They were made aware about the improper waste management and illegal hunting
Day 04	08/06/2013	11/07/2013	13/06/2013
	Dzongri to Rathong Glacier and back to HMI base camp ○ Sighted mainly Himalayan birds. Interesting among them is was Tibetan snow cock.	**Phedi to Parey Ghumne** ○ No observation was made the fourth day of the monitoring as majority of the areas travelled were adjacent to Nepal border. However, 3 Goths were recorded on the Nepal side of the border.	**Barsey to Taal Dara –** ○ On their way to the Taal Dara team observed a barking deer and a satyr tragopan ○ The team surveyed the areas adjoining to Taal Dara and Taal Jhandi. The forest looked very healthy in this area

Day 05	09/06/2013	12/06/2013	14/06/2013
	Base camp to Thangshing – ○ Sheep goth encountered at Baluwa Taar and Doring. Team collected information on the number of sheep they had ○ They also discussed about various conservation issue, especially on the impact grazing may have on flora and fauna in KNP	**Parey Ghumne to Gomathang** ○ Himal Rakshaks sighted snow partridge and cuckoo at Seto Pani. ○ The monitoring team also came across a Yak Goth at Danphey Bhir. There are around 80 yaks. ○ Three blue sheep were sighted at Jamley Pokhri. All of them were males. ○ Old pheasant traps were also procured from a deserted sheep pen. ○ Sighted 3 males, 1 female and 6 young blood pheasants at Gomathang. ○ Encountered a fresh bear trap at Gomathang.	**Taal Dara to Daruwa Khola –** ○ On day 5 the team reached Daruawa Khola via Sallery Taar and Deoningaley Dhaap. During the daylong survey the team came across barking deer, leopard and Asiatic black bear foot prints. ○ The team came across a trap to capture Kalij near Achale
Day 06	10/06/2013	13/06/2013	15/06/2013
	The team halted at Thangshing ○ Monitored areas like Yangzee, Phoktey and Thulotaar ○ Team encountered blood pheasant during the day's survey	**Surveyed areas around Gomathang** ○ The monitoring team sighted an Asiatic black bear at Boktok, Kholatar. ○ Later in the day they came across the empty Goth owned by Kunga Sangbu at Chirphuk. There were about 55 yaks. ○ A Snow Partridge was sighted at Neer Pokhri. ○ Sighted 4 Himalayan monal at Pokhri Taal, Chirphuk. ○ Sighted 10 blue sheep near Yangshep Gufa. ○ The team visited goth owned by Pema Dhandu at Yangshep. This Goth is owned jointly by Chumey Dorjee, Kyaluk Bhutia and Pema Dhandu. ○ On way to Gomathang the team encountered remnants of blood pheasant and also sighted 7 birds of this species near Gomathang.	**Daruwa Khola to Gosa via Dara Barkhey and Aley–** ○ The forest condition near Daruwa was very healthy ○ The team came across signs of illegal activities, especially related to cattle traders from Nepal near Aley. They also came across a temporary sheds, probably constructed by these people, and dismantled it. ○ The Himal Rakshaks visited the SSB camp once they reached Gosa. They interacted with the SSB personnel on issue of garbage management.
Day 07	11/06/2013	14/06/2013	16/06/2013
	Lhamuney, Samity Lake, Jemathang, Dalley Pokhri and Lampokhri – ○ Blue sheep sighted at Dalley Pokhri ○ Yak and snow partridge were also sighted	**Gomathang to Neer Pokhri (Dhaap)** ○ No interesting observation was made on the way to Neer Pokhri from Gomathang	**Camping at Gosa and monitoring Raichok, Balautey and Yakalay –** ○ Goral was sighted and photographed by the Hee-Uttarey team at Yakalay. The team also chanced to see a Asiatic black bear sign at Yakalay. ○ They also saw satyr tragopan and recorded pugmarks of barking deer near Raichok.

Day 08	12/06/2013	15/06/2013	17/06/2013
	Lampokhri and its adjacent areas surveyed thoroughly ○ Red fox sighted at Darely ○ Himalayan monal, Blood pheasant and snow partridge are the other interesting species sighted here	**Neer Pokhri to Doreli** ○ Recorded one foot of dead musk deer near Neer Pokhri ○ Came across a sheep Goth at Tari, Pangmelung. This Goth is owned by Ritbahadur Gurung from Sardung. There were around 85 sheep and two guard dogs at this Goth. They had collected around 3 bundles of Juniper wood for fuel.	**Gosa to Sikkim Major via Chewa Bhanjang –** ○ At Chewa Bhanjang the Himal Rakshaks came across piles of freshly procured Rhododendron, to be used as fuel, in front of SSB camp. The team photographed this incident and reported it with the Range Officer, Ms. B. Subba over phone.
Day 09	13/06/2013	16/06/2013	18/06/2013
	Lampokhri to Kasturey Orar – ○ Droppings of musk deer recorded	**Doreli to Bajre Dara** ○ The team encountered two traps for large animals at Satabhaiya Thulo Gaira. Old bird traps were also discovered in the surrounding areas. ○ Remnants of two dead Himalayan monal was encountered at Satabhaiya Gaira. ○ Himal Rakshaks came across healthy aggregation of Satuwa (Paris polyphyla) and ginseng near Birim.	**Sikkim Major to Gairey** ○ The team came across Yaks grazing on the KBR side of the Indo-Nepal border. These yaks belonged to the graziers mainly from Nepal.
Day 10	14/06/2013	17/06/2013	19/06/2013
	Kasturey Orar to Thotney Tar ○ Large aggregation ginseng plants recorded (50 to 70)	**Bajre Dara to Sangkhola** ○ No interesting observation was made on that day.	**Gairey to Sikkim Dhur** ○ Yaks from the Nepal side were found grazing within KBR area. ○ The Hee-Uttarey team interacted with the graziers from the Nepal side on issues of improper garbage disposal and poaching issues.
Day 11	15/06/2013	19/06/2013	20/06/2013
	Thotney taar to Labdang ○ Pugmarks of Himalayan serow, Asiatic black bear and goral were recorded	**Sangkhola to Nayapatal** ○ Sighted one barking deer at Nayapatal	**Sikkim Dhurd to Taal Daralie –** ○ No significant observation was made during the daylong survey.
Day 12	16/06/2013		21/06/2013
	Team returned to Yuksam concluding the Monitoring		**Taal Daralie to Uttarey –** ○ The team visited the SSB camp along the way and found stacks of Rhododendron and Chestnut branches to be used as fuelwood. ○ The Himal Rakshak team interacted with the SSB unit on issues of proper garbage management and also made them aware about the fact that they should not collect fresh branches for fuel wood purpose

APPENDIX 3

Bird and mammal species recorded by the Himal Rakshaks during the monitoring exercise

Common Name	Scientific Name	Type of Evidence	IUCN Status	IWPA Status	Species Encoutered by each cluster and their numbers		
					Yuksam	Yambong	Hee-Uttarey
BIRDS							
Monal	*Lophophorus impejanus*	Sighted	Least Concern	Schedule I	***11***		
Kalij	*Lophura leucomelanos*	Sighted	Least Concern	Schedule I			***1***
Blood Pheasant	*Ithaginis creuntus*	Sighted	Least Concern	Schedule I	***12***	***17***	***1***
Satyr Tragopan	*Tragopan satyra*	Sighted	Near Threatened	Schedule I		***1***	
Snow Partridge	*Lerwa lerwa*	Sighted			***4***	***13***	
Yellow-billed blue Magpie	*Urocissa flavirostris*	Sighted					***6***
Hill Partridge	*Arborophila torqueola*	Sighted					***1***
Tibetan Snow Cock	*Tetraogallus tibetanus*	Sighted	Least Concern	Schedule I	***2***		
Rufous-bellied Woodpecker	*Dendrocopos hyperythrus*	Sighted			***2***		
Grandala	*Grandala coelicolor*	Sighted				***1***	
White-winged Grosbeak	*Mycerobas carnipes*	Sighted				***1***	
Spotted Nutcracker	*Nucifraga caryocatactes*	Sighted					***1***
Rufous-breasted Bush Robin	*Tarsiger hyperythrus*	Sighted					***1***
MAMMALS							
Blue Sheep	*Pseudois nayaur*	Sighted	Least Concern	Schedule I	***8***	***13***	
Asiatic Black Bear	*Ursus thibetanus*	Sighted	Vulnerable	Schedule II		***1***	
Goral	*Naemorhedus goral*	Sighted	Near Threatened	Schedule III		***1***	***1***
Musk Deer	*Moschus crysogaster*	Carcass	Endangered	Schedule I			
Himalayan Serow	*Caprocornis thar*	Pellets	Near Threatened	Schedule I			
Red Fox	*Vulpes vulpes*	Sighted	Least Concern	ScheduleII	***1***		
Wild Boar	*Sus scrofa*	Sighted	Least Concern	Schedule III			***4***
Barking Deer	*Muntiacus muntjak*	Sighted	Least Concern	ScheduleIII		***1***	***1***

APPENDIX 4

Team members of individual cluster

Yuksam Cluster	Yambong Cluster	Hee-Uttarey Cluster
Mr. GopalLimboo	Mr. LakuTsheringBhutia	Mr. N. B. Chettri
Mr. DeokumarGurung	Mr. Chandra BahadurRai	Mr. AmritBahadurChettri
Mr. Nima Sherpa	Mr. Pemba TsheringBhutia	Mr. BhimBahadurRai
Mr. SanmanLimboo	Mr. BudhilalLimboo	Mr. PassangChodder Sherpa
Mr. BirbahadurLimboo	Mr. Pemba TsheringBhutia	Mr. BhaktabahadurChettri
Mr. Buddha Singh Limboo	Mr. IndrabahadurRai	Mr. TularamRai
Mr. ManbahadurLimboo	Mr. PhupuTsheringBhutia	Mr. Jhagar Singh Chettri
Mr. DalbirChettri	Mr. MingmaTsheringBhutia	Mr. JasbahadurChettri

WWF MONITORING OF HIGH ALTITUDE HABITATS IN WEST SIKKIM BY HIMAL RAKSHAKS

24
Himal Rakshaks participated in the monitoring

274 km²
area covered during the monitoring

21
species of birds and mammals recorded during the exercises

30
animal traps were encountered and dismantled

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