

Snow Leopard Conservation Grants, Snow Leopard Network

FINAL REPORTS FOR 2016 PROJECTS

DUE: 15 FEBRUARY 2017

Please submit your final report by the due date above. We would appreciate it if you could follow the suggested format below. Additionally, please send us copies of any detailed technical report(s), papers, and other output arising from this work. Please refer to your original proposal for items such as objectives, methods, etc. unless those were substantially altered during the course of the work. If so, please explain why.

- 1. Executive Summary:** No more than 750 words. Please describe the original goals and the final results of your project. This may be used in press releases and other publicity material about the Grants Program, so please write it for the general public who may not have scientific background.

Snow leopards (*Panthera uncia*) are the least known big cats and are categorized as endangered. They are widely distributed along the Himalayan range of Central Asia. Unlike other carnivores, Snow Leopards (SL) faces multiple threats in its habitat of Himalayan region of Nepal. Habitat degradation, loss of prey especially by poaching, trade of pelts and the conflict with local herders are the major conservation threats for SL survival. Rotational herding practice as subsistence livelihood has been in existence for 100s of years in Kangchenjunga Conservation Area (KCA) and its neighboring villages. As SLs are opportunistic predators, they often kill livestock because of high encounter rates in the pasturelands, loss of natural prey base because of poaching and inefficient guarding practices of livestock by herders. The project was implemented outside protected area in the adjoining villages, Khebang, Surumkhim and Kalikhola in southeastern part of KCA which links to the Singhalila National Park (SNP) of Sikkim, India and serves as a corridor between KCA and SNP. The landscape is potential for SL movement across two protected areas in Nepal and India. So, the area has significance of habitat connectivity and is important for SL conservation intervention.

The project was designed to assess the distribution of SL thus prioritizing high conflicted areas in the corridor landscape. Eight transect survey was conducted in the study area where maximum number of carnivore and livestock droppings were found. One putative scat of SL was collected which is yet to be confirmed. Plots of 10m radius were plotted in every 50m distance in transect and recorded vegetation to calculate the Important Value Index (IVI). The assumption to calculate the IVI is that the SL will prefer the habitat, which would be suitable for them to predate their prey species. So, there will be the relation between prey species habitat and SL habitat. We also recorded the signs of prey and predators during the survey.

About 30% of the total households (n=261) were randomly selected and interviewed. Six group discussions, two in each village were conducted to understand the human-SL conflict issues, livestock demography, illegal wildlife activities etc. in the study area. Local trustworthy person was employed for interview survey to know the predator killed records in the area.

Altogether 4,000 livestock were recorded of which 24% (Yak, Sheep, and Cow) goes in to the pastureland for rotational grazing practice each year. Most depredations of the livestock were caused by dholes followed by leopards, Himalayan black bears, snow leopard and other small carnivores in the area. Herders have not noted any depredation caused by SLs in 2016 but 21% of the respondents claimed that they are aware about the presence of SLs in their area. Also two yaks were depredated by SL in 2015 in the pastureland (Bikhey Chaur) of Kalikhola. We found the retaliation killing of dholes and clouded leopard during interview survey and are worried on the probability killing of SLs due to retaliation in near future. A conflict map is produced analyzing the livestock and predator kill records. Despite being rich in the faunal

diversity, the area remains unexplored. Lack of conservation awareness and illegal wildlife activities are serious threats to endangered wild animals. The project site is a definite route to India and China, where many trekking trails are used for the illegal activities. It would be better to implement some more conservation awareness activities in the area in coming future to save endangered wild animals.

2. **Objectives:** What was the purpose of the project? How was it expected to contribute to the knowledge or conservation of snow leopards, their prey, or habitat?

This project was proposed for the first time to be implemented outside the PA network. The project was designed based on local reports of livestock depredation in south eastern part of KCA which focused to understand the distribution of SL, livestock depredation rates and associated threats of SL in the area. The specific objectives of the project were to:

- i. Assess SL distribution and wild prey density in the corridor landscape
- ii. Assess nature and extent of human-SL conflict
- iii. Assess livestock population of the area and prioritize high human-SL conflict areas

Jackson and Ahlborn (1990) have concluded that 65% of Nepal's SL habitat (13,000 sq. km.) was located outside protected area. With reference to this study and the possibility of SLs using corridor landscape of eastern Nepal to move across the countries - we intended to study the distribution/movement of SLs beyond the PA through transect survey and assessing human-SL conflict. This study was conducted for first time within the study area where we found practice of illegal hunting of the game birds and the ungulates (for food) and low level of conservation awareness among the herders/community people. This study has given some insight of the current situation and it is important to continue the conservation work in the area to secure endangered wildlife population. So, we look forward to continue the work on SL through conservation awareness, engagement of local communities on conservation through different community based activities and more exploration about the species (research).

3. **Methods:** Describe the methods you used in detail, so that someone else could repeat the work, or, avoid the problems that you encountered.

- i. Assess SL distribution and wild prey density in the corridor landscape

Key informant interview followed by informal group discussions with the herders and local communities was carried out to assess the distribution of SL and wild prey density in Surumkhim, Khebang, and Kalikhola villages covering an area of 166 sq. km. On the basis of the compressed information obtained from interviews and group discussions - transects were laid for sign survey and estimation of prey density. Transects of one to two kilometer were laid and surveyed following contour lines or trails corresponding to elevation from 2500m to 4500m.

During the transect work, in every 50m distance a plot of 10m radius was laid out for the vegetation survey and at the same time signs of SL and prey base if encountered were collected along with other habitat parameters. Important value index (IVI) of vegetation was calculated through the collected information. The assumption to calculate IVI was to know the preferable habitat used by SLs to predate their prey species so as to know the relation between prey species habitat and SL habitat.

- i. Assess nature and extent of human-SL conflict
- ii. Assess livestock population of the area and prioritize high human-SL conflict areas

A semi-structured set of questionnaire was prepared to assess the nature and extent of human-SL conflict in the study area. The information obtained was helpful to prioritize high conflicted areas. About 30% (n=261) herders and livestock owners were interviewed for this purpose. Local herders, community leaders and knowledgeable persons were identified through random sampling technique for key informant survey.

Historical trend of SL population was also collected through interview survey. We collected the details of livestock to graze in pasture land and identified high conflicted areas based on SL kill and livestock depredation records. In the interview, basic information related to the species, their food behavior, places where SL visit frequently, different problems associated with their distribution, cases of poisoning, livestock population, livestock loss due to predation and diseases along with nature of conflict were collected. We conducted a total of six group discussions in different hamlets of the villages. Interview survey was conducted employing trustworthy local person so that we can collect predator killing records as well. GPS location of the livestock grazing pasturelands, SL killing location, livestock depredation sites were collected and the location were overlaid on base map of study area to generate the human-SL conflict map.

- 4. Results:** Please describe in detail the results of your project. Please illustrate clearly how your stated goals and objectives could be met. You may wish to include tables or graphs in this section if appropriate. This section will be very important to explain the value of these grants to funders of the Snow Leopard Conservation Grant Program. Please be clear, concise, and thorough.

Assess SL distribution and wild prey density in the corridor landscape

The transect survey was conducted in November-December, 2016 for the assessment of SL distribution in corridor landscape. All together eight line transects were laid, two in each village including the neighboring village, Falaicha of Panchthar district. The possibility of SL movement was also reported in Falaicha village at the inception meeting conducted with local stakeholders in Taplejung district before project implementation.

Transects were laid in such a way that different habitat type from grassland to alpine and plain to ridgeline were covered. Transects of 1100m to the maximum of 1850m were laid in different habitats to the maximum elevation of 4419 m starting from 3700m.

During survey, maximum of the livestock droppings and carnivore scats were recorded. Only one putative scat of SL was collected in the laid transect of Kalikhola. The collected sample is yet to be confirmed through the genetic test whether it is from SL or from other species.

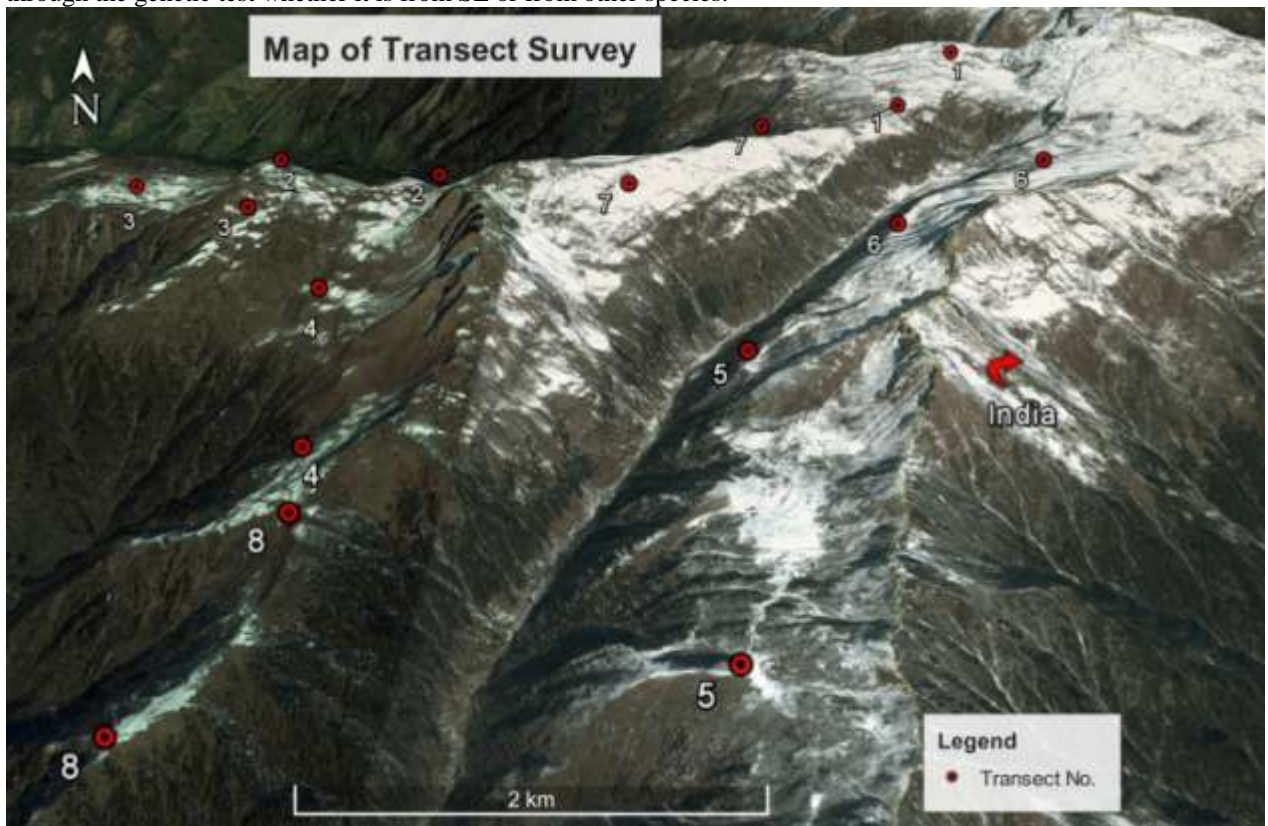


Figure 4: Map of Transect Survey

High grazing of livestock was recorded in the pastureland of Surumkhim (Ghumne; elevation-3882m) where maximum of the livestock droppings were recorded. The grazing lands of Khebang, Surumkhim and Kalikhola meet at the top of pastureland (Timbung Pokhari area, 4419m elevation) of Kalikhola village where maximum numbers of livestock are seen grazing thus outraging the natural prey species of SLs. Altogether, 301 plots each of 10m radius were laid to calculate IVI.

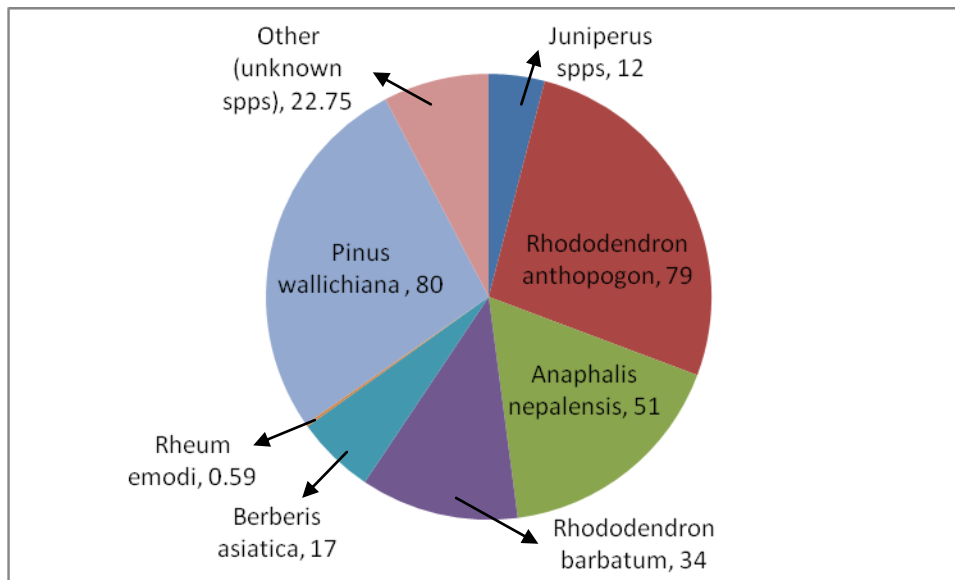


Fig:1 Pie chart demonstrating the IVI of different plant species

Blue pine (*Pinus wallichiana*) was the dominant tree species with maximum 80 IVI within the elevation range of 3838m, followed by a shrub species, Golden leaf, common Nepali name as “Sunapati”(*Rhododendron anthopogon*) with 79 IVI at the elevation of 4365m and Nepal pearly everlasting commonly known as “Bookie” in Nepal (*Anaphalis nepalensis*) the herb species with 51 IVI.

- i. Assess nature and extent of human-SL conflict
- ii. Assess livestock population of the area and prioritize high human-SL conflict areas

To assess the nature and extent of the conflict with assessment of livestock population to graze in the pastureland interview survey with herders and group discussions were conducted.

Interview survey and Group discussions:

Out of total households in three villages, 30% (i.e 261 households) were interviewed. Random sampling technique was adopted to interview the households. Six group discussions, two in each project site were conducted. Through interview survey, the information related to SL population trend, conflict issues, livestock demography, most depredated livestock etc were generated. And the group discussions helped to reveal the illegal wildlife activities of villages. Illegal hunting is basically practiced for consumption of meat not for trade (as per villagers) but the undercover agents working with our local partner stakeholders reported name of some hunters who are involved in different wildlife poaching for illegal trafficking. We also found the traps set for ungulates during the survey. Local trustworthy persons were employed to conduct interview survey to collect information of predator kill records. Majority of the respondents were farmers/herders who own livestock and were dependent on agriculture/livestock rearing for livelihood.

Details of livestock grazing in the pastureland:

A total of 4,000 livestock were recorded in three villages. Out of total livestock recorded, 980 (24%) were taken to the pasturelands from 3200m to 4200m elevation for rotational grazing. These livestock basically includes Cows/Oxen, Sheep and Yak.

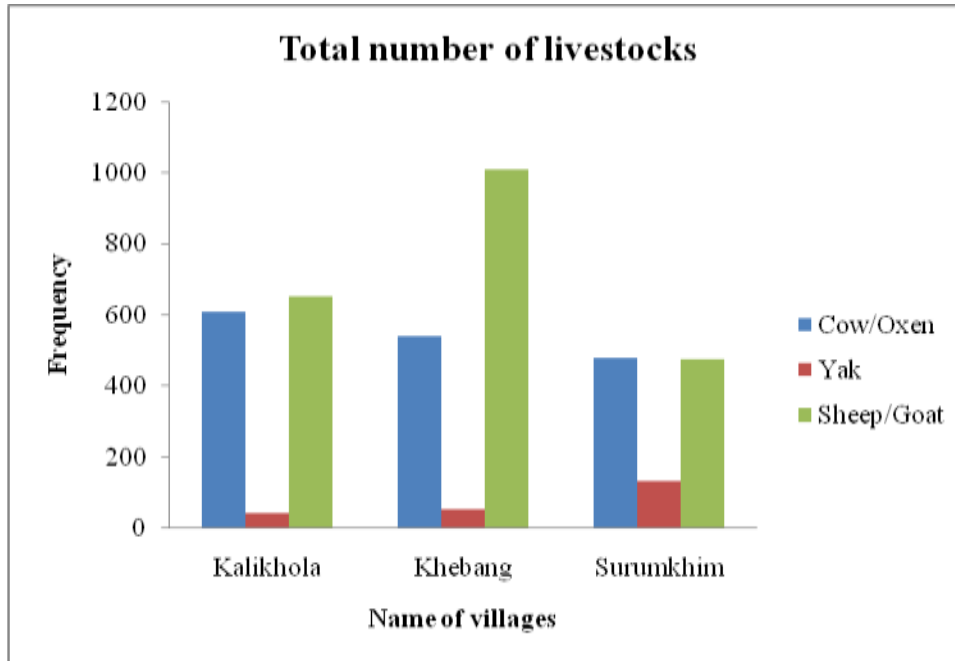


Figure 2: Livestock demography

Figure 2 indicates total number of livestock in the study area of which Khebang owns the highest number of livestock (1607), followed by Kalikhola (1305) and Surumkhim (1089). In a year, herders spent an average of 6-8 months of their time in the pastureland. In peak grazing season, March to August the pasturelands gets fully utilized by livestock. The key informants and the result of group discussions indicated that the ungulates gets outraging during peak grazing season. The three villages meet at the top in the pastureland of Kalikhola where hundreds of livestock were seen grazing in September 2016.

Interview survey revealed that the study area is rich in faunal diversity with both the prey and predator species. Most depredations of the livestock were caused by dholes, leopards, Himalayan black bear etc. Herders have not noted any recent depredation caused by SLs in 2016, but 21% of the respondents claimed that they are aware about the presence of SLs in the area (some have seen as well). In 1997, five sheep were killed by SL in the pastureland (Mundumdada) of Kalikhola. Similarly, two yaks were depredated by SL in 2015 in the pastureland (Bikhey chaur) of Kalikhola.

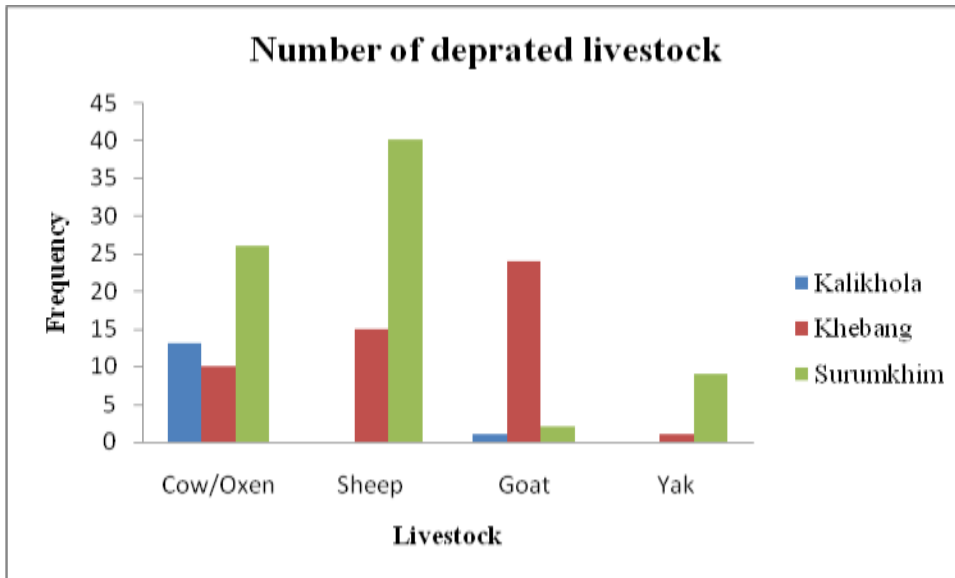


Figure 3: Livestock depredation by predators in three villages (Kalikhola, Khebang and Surumkhim)

Figure 3 indicates depredation rate of different livestock in last 14 years. Goats are killed by foxes and bears in the houses while cow/oxen, sheep and yak are killed by dholes, leopard and Himalayan black bear in the pastureland. Five cows of Min Bhandari were killed by clouded leopard from pastureland (Bikhe Chaur) of Kalikhola in 2015. As revenge a clouded leopard was killed by poisoning in carcass in pastureland (Kharpani) of Kalikhola. Similarly a dhole was killed in Khebang in 2010. A feel of revenge/anger seems minimal among herders as they said depredation of a Yak causes a loss of USD 800 to 1000 (NPR80000-100000) which ultimately leads to retaliation.

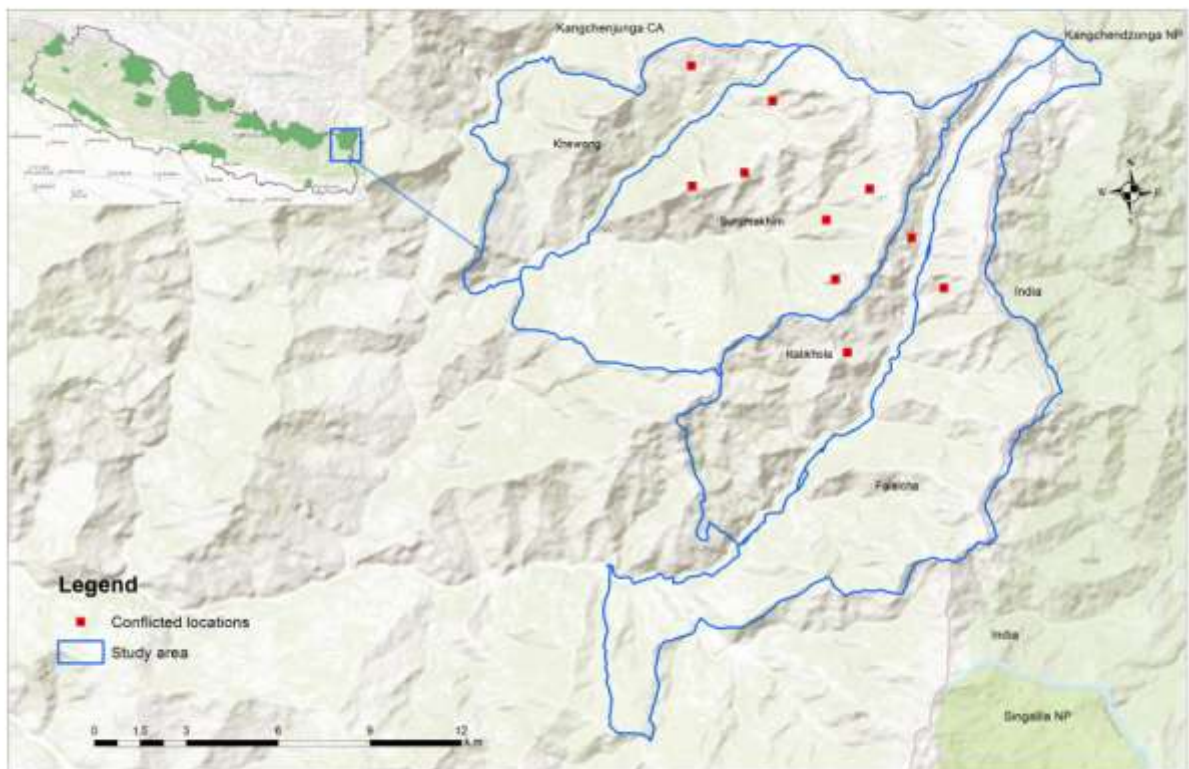


Figure 4: Map of conflict locations in the study area

Figure 4 indicates the most conflicted pastureland among the study area where Surumkhim holds more conflict locations.

- 5. Discussion:** Please evaluate your own work. What did you learn that could help others wishing to do similar projects? How do you see the results being applied to conservation? What additional work is now needed based on your findings?

Transect survey was conducted in November-December, 2016 for the assessment of SL distribution in corridor landscape but appropriate season to conduct transect survey for SLs and prey base is during late spring and in the fall before the onset of snowfall (Snow Leopard Conservancy). The continuous rainfall (May-October) in 2016 in eastern Nepal, did not favored the transect survey (before winter) in study area. Due to which, no any prominent signs of SLs nor its prey were recorded. Transects were laid permanently in opportunistic pasturelands of SL's sighting and its conflict according to the result of interview survey and group discussion. So we have planned to continue, to record the signs of SLs in the laid permanent transect for further study. We trained three local herders to conduct transect survey who will continue to keep record of SLs movement in the study area.

Depredation of livestock by dhole, Himalayan black bear and clouded leopard is seen high in the area in last decade. Herders have started to notice SL's presence in their area as the depredation due to SL is noticed in 2015. We found the retaliation killing of dholes and clouded leopard and are worried on the probability killing of SLs due to retaliation in near future. 'Global Snow Leopard Meeting' held in 20th January 2016 in Kathmandu, Nepal had committed to work for the endangered SL and its habitat holistically which can be achieved through conservation awareness among local villagers on the importance of SL conservation, who shares same habitat with SL. One SL killed due to retaliation is a huge loss of global property which can be avoided through the awareness programs, further detail research and incentives to the herders/local communities as relief fund/compensation towards the loss of their livestock by predators.

A conflict map is produced which will be useful for the villagers to figure out the most conflicted pasturelands to avoid predator attacks to their livestock. This study revealed high pressure on the pasturelands thus outraging natural prey of SL. Hence, this conflict map may help to reduce the pressure on highland pastureland which may help the prey species to graze freely without any competition with the livestock thus minimizing depredation by SL.

The project site is a definite route to India and China, where many trekking trails are used for the illegal activities. The area is rich in its faunal diversity but is never explored with the prospective of conservation. We conducted research activity for the first time in the area where very poor conservation knowledge among the villagers is observed. We activated Community Based Anti Poaching Units (CBAPU) and the undercover agents in partnership with our local conservation stakeholders. We intend to work continuously for the conservation of SLs and other facets of biodiversity of the project area through various research programs and conservation awareness.

We would like to acknowledge the support of SLN, Panthera – Sabin Snow Leopard Grant Program, local communities, local conservation stakeholders and government line agencies for their support to accomplish the project.

- 6. Photographs:** If you have good photographic (preferably digital) images of your project that we could use to advertise the Grants Program, please submit them at this time. Please be sure to include a brief description of the photo and provide the credits for the photographer.



Photo 1: Principal investigator with the representatives of local herder and local conservation stakeholders.



Photo 2: Research assistant and local resource person during the vegetation sampling for calculation of IVI



Photo 3: Livestock in the pastureland of Kalikhola



Photo 4: Group discussion with local herder community at Kalikhola



Photo 5: Trap set for wildlife poaching
Photo by: KCG

All other photos © Monsoon Khatiwada

If you have any questions on the format or other aspects of your final report, please contact us at grants@snowleopardnetwork.org.

Final reports and digital images should be emailed to grants@snowleopardnetwork.org.