

Project Update: January 2018

After the Reconnaissance survey with the forest officials and local communities in the month of Feb, the awareness campaign was conducted. The lack of conservation capacity and awareness for the need and importance to conserve predators such as snow leopard hinders the conservation efforts. Therefore one of the core component of this project was to create abundant education awareness sensitizing various locals and relevant stakeholders (forest officials, governmental/non-governmental, local leaders).

A full-fledged awareness campaign with special focus on local communities on importance of the Conservation of Snow Leopard was conducted from second to last week of the month of March, 2017. The awareness campaign was done in 2 parts 1. Stakeholder Workshop 2. Mass awareness Campaign by placing signboards and posters at important sites and distribution of information leaflets, pamphlets, voucher, cards, bookmarks among the local people for further outreach of the information to large audiences. Social gatherings was conducted with the help of village head and forest officials were invited to talk and convince people about the importance of the species with focus on scientific, traditional knowledge, cultural, religious and ecotourism point of view.

Local people were enthusiastic and keenly participating as there were increasing no. of participants. The awareness campaign focused mainly on how to bring about behavioural changes of the locals as they are the one who literally live with the species every day. The locals were sensitized on grazing their livestock in their private pastures or in any area which is not usually occupied by ungulates to mainly reduce resource competition with wild prey and to avoid denuding the habitat of snow leopard. They were educated on keeping low volume high quality livestock and to diversify their income sources rather than depending solely on livestock for their livelihood. The Ophiocordyceps collectors were sensitized on proper waste management and 9th day of every month is observed as the waste campaign day where all the forest officials along with the local communities collect wastes and sensitize people about the importance of waste management. Coordination of education and awareness campaign as a part of promotional activity was managed by my team mates, forest officials, local leaders and officials of other institutions. Looking at the no. of participants and with the enthusiasm they were participating, the awareness campaign was a successful one.

All over the world, Human-wildlife conflict (HWCs) or negative interactions between people and wildlife is a growing concern and complex challenges are currently being faced by conservationists (Shrestha, 2007; Gore & Kahler, 2012). Negative interaction cases include, wild animals threatening humans, depredating crops and livestock. "The occurrence of Human-wildlife conflict is due to crossing of perceived borderline between nature and culture and entering in the realm of others by human or animal" (Johansson, n.d). Bhutan has steadily gained international recognition for its conservation efforts which is testified by having more than 50% of country's total area under protected area system (Katel & Schmidt-Vogt, 2011). Balancing nature conservation and environment protection with promotion of long term social and economic development to reduce poverty is adversely affected by wildlife that exists in close proximity to the rural

communities (RGOB, 2008; MacGowan et al., n.d). Hence, Human wildlife interaction is one of the biggest challenge for conservation in Bhutan with over 75% of the country's population depending directly on agriculture and livestock production for their livelihoods and it has emerged as one of the national issues.

During 10th Five Year Plan, Human wildlife interaction was perceived as the major cause of poverty in rural Bhutan and the mitigation of which is given the top priority by the government of Bhutan (GOB). Bhutan National Human Wildlife Conflict Strategy (BNHWCS) specified the predators for domesticated animals and they are tigers, leopard, snow leopards, wild dogs and bears. Conservation success often leads to increased Human -wildlife conflict as wildlife populations grow. The often-significant financial and labour losses farmers and livestock owners endure due to guarding and building other protective measures, leads to revenge killing, and antipathy towards wildlife, protected areas and their managers. Conflict between people and wildlife is a serious problem that must be addressed and the support of these same rural people is essential if conservation is to succeed. Realizing the importance of fundamental information for making policy decisions to maintain the sensitive harmony between people and wildlife, Bhutanese researchers have proposed possible solutions for Bhutan, where Human wildlife conflict is a significant obstacle to enlisting and maintaining rural support for conservation. Hence, understanding human attitudes and the potential for wildlife conflicts in the context of protected area management is critically important for the design for long term conservation strategies (Mordi, 1991; Heinen, 1993).

There are efforts to understand the complex factors associated with livestock predation, including herd size and kind, guarding and herding patterns, type of predator species, habitat preferences and effects of human settlements (Linnell et al., 1996; Wang & Macdonald, 2006). Human- wildlife conflicts are intensified as human population growth forces developmental activities that infringe on wildlife habitats. This leads to fragmentation and declining habitat quality eventually causing competition between humans and various wildlife species for space and resources, with stressed wildlife often turning to crops or livestock for food. This is the situation currently facing Bhutan (Wang, 2004). Farmers in central Bhutan rank livestock predation as one of the most serious threats to their livelihood, and many farmers express a desire to eradicate problem wildlife (Wang et al., 2006). Livestock predation by large carnivores and their retaliatory persecution by pastoralists are worldwide conservation concerns. The endangered snow leopard *Uncia uncia* (now listed under vulnerable) is involved in conflict with people across its mountainous range in South and Central Asia, where pastoralism is the predominant land use, and is widely persecuted in retaliation (Maikhuri et al., 2000; Wang & Macdonald, 2006).

Assessing attitudes of people living with wildlife and identifying the determinants of these attitudes are important for conservation planning. Where people and livestock live with predators, there is often conflict that can lead to lethal control of the predators. Human-carnivore conflicts have two important dimensions- the reality of damage caused by wildlife to humans, and the perceptions and behavior of humans who suffer carnivore-caused damage. People's tolerance level for large carnivores varies, depending on several factors including their religious beliefs, income, education level, characteristics of carnivores and cultural factors. Often, livestock losses attributed to wild carnivores tend

to get exaggerated, either mistakenly or deliberately. These perceptions can have strong emotional and political consequences resulting in persecution of carnivores (Mishra, 1997; Rigg et al., 2011; Liu et al., 2011; Kellert et al., 1996). Of the many methods used by social researchers such as review of protocols, use of secondary data from the offices records, field survey (camera traps, laying transect), focus group meeting and combination of two or three methods, self-administered structured and semi-structured questionnaire surveys were accepted and widely used in India and Asia (Sekhar, 1998; Chauhan et al., 2009; Kumer, 2012; Linkia et al. 2006; Sahoo & Mohnot, 2004).

Wang et al. (2005 & 2006) used a questionnaire survey to conduct a study on human-wildlife conflict in Jigme Singye Wangchuk National Park, Bhutan. Wangchuk (n.d) also used questionnaire survey to study wild animals' crop depredation in Kanglung, Bhutan. Penjor (2010) studied human-wild pig conflict using questionnaire survey at three selected gewogs in western Bhutan. According to Oppenheim, (1992) household survey is a common method and is generally believed to be formal, systematic, explicit, and representative and gives reliable information. A Semi- structured questionnaire was developed to assess the anthropogenic pressures and severity and frequency of Human – snow leopard conflict. The information on various degrees and classes of anthropogenic pressures on snow leopard were recorded using household questionnaire survey, direct observations, focus group discussions and key informant interview. No. of Livestock owned was recorded by questionnaire survey and past records.

Out of 350 respondents, 63.4% (n=222) were men and rest 36.6% (n=128) were women from all the study area combined. Such a male dominated respondents could be due to most men remained at home attending farming activity along with women. The mean age of the respondents was 49.51 (SD = ± 13.99) years. The majority (23.4%) were in the age category of 48-57 years in case of males and in 38-47 years in case of females (26.6%). The analysis of variance (ANOVA) result showed that the difference between some of the means are statistically significant ($F = 1.824, P=0.049$ and $F_{crit} = 1.818$). (Not all population means are equal). About 34.3% (120 responses) were literate respondents from all the study areas. The mean total family size (average member in household) was 8.76 (SD = ±4.81) people. About 151.51 acres of land has left fallow which constitute 20% (70 responses) of the total respondents. Kamzhing with the acreage of 104.39 acres is the maximum land category left fallow followed by chhuzhing of 46.62 acres and orchard of 0.50 acres. About 6% of surveyed households (n=21) reported livestock loss. Maximum livestock loss was due to leopard followed by wild dog and tiger. Livestock predation was reported for the past two years. The maximum incidence of livestock predation occurred during the month of June. In the month of February, March and September the predation did not occurred. About 87% of respondents (N=350) feel that wildlife should be conserved. Surprisingly 63% of the total respondents who felt that wildlife should be conserved were illiterate.

The ungulates form the natural prey base of the Snow Leopard. For this, ungulates diversity, population and ecological densities were studied. The field data collection was conducted from April to Dec 2017. All the geographical grid cells initially demarcated to estimate the occupancy of snow leopards in the Jigme Dorji National Park by Forest Department of Bhutan was used as the basis for sampling. Using a multicriteria approach, a subsample of these grids was selected to conduct field surveys. 33% of the cells will be

chosen to represent the entire gradient of wild prey. The selected cells was then further divided into 10 km² sub cells of which half of the total cells was chosen in a checker-board fashion and one line transect of 2 km each was be laid within each of the selected sub cells. All field surveys was conducted by four surveyors. Two teams of two observers each carried out surveys simultaneously in the mornings (between 06:15 and 09:30 hours) in a 'single-observer' mode. Each line transect was walked twice. Species, group size, number of individual species was counted on both sides of line covered at set speed in the Jigme Dorji National Park. A total of 150 transects were surveyed. Three species of ungulates which forms the prey base of Snow Leopard were recorded with Blue Sheep (66.7%) being most abundant followed by Himalayan Goral (31.81%) and then Musk Deer (1.49%) (Table 1).

The ecological densities for Blue sheep is estimated and found to be 3.51 individuals per km² similar to result found by Leki (2015) at 3.43 individuals per km². The density for Himalayan Goral is found at 1.67 individuals per km² and 0.07 individuals per km² for musk deer based on total habitat available for each species.

Table 1.

Species	Number of Individuals	Percent of Species Observed
Blue Sheep	3675	66.7
Musk Deer	82	1.49
Himalayan Goral	1753	31.81
Total	N= 5510	100

The field data collection was a complete success as planned and mentioned in the proposal. Detailed report on understanding anthropogenic pressures, prey abundance and prey availability of elusive and endangered Snow Leopard in Jigme Dorji National Park, Bhutan will be published soon for information sharing and public access.

Illustrations

(Awareness campaign, questionnaire survey, stakeholder consultation, field data collection)





