Ecology and Conservation of Brown Bear in Annapurna Conservation Area Nepal

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Acknowledgment

Short Summary

The project documented the current scenario of brown bear in Nepal. The existence of Brown Bear in Nepal was unknown. However, after this study we are able to trace that the Brown Bear exists; beside we have evidence of conflict between Brown Bear and local people. Existence of Brown bear is locality suggests it was migrated from Tibetan territory. The brown bears are distributed in Manasalu Conservation Area (MCA) and Upper Mustang region of Annapaurna Conservation Area (ACA) of Nepal.

In Nepal, brown bears are thought to be distributed in Annapurna and Manasalu Conservation Areas, Shey-Phoksundo National Park (unconfirmed) and corridors connecting these areas. Locally, the brown bear is known as "*Tingting*" in Gorkha area of Manasalu Conservation Area and "*Mithe*" in Upper Mustang area of Annapurna Conservation Area (ACA); it is sometimes referred to as "Yeti".

The project has succeeded to collect baseline data about Brown bear and its distribution in Mustang district of Nepal. The Brown bears has distributed in 6 VDC's Pasture land of Upper mustang region within ACA, it has distributed in more than 1000 sq.km area of Upper mustang region (it has found in Loamangthnag, chhoser/Dhalung, Chhunup, Surkhang, Charang and Ghami VDC). Diggingg and scats density were 7.3/100km2 and 4.3/100km2 respectively in the study area. Brown bear were found in minimum altitude 4200m and maximum altitude was 5321. On an average it uses 4871 m altitude. Brown bear uses mostly North-East (36.8%) aspect followed by South-East (28.2%), North West (12.50%). They less use the Northern (1.32%) and West (1.32%).

On the basis of preliminary data, it says that main diet of brown bear was covered by Himalayan Marmots. Its 78% feeding species was animals and only 22% was covered by plants, insects. Its main preys species was Himalyana Marmot (39%), Pika (18%), wooly hare (11%) and we were also found Blue sheep (9%) in its scats, so it's also killed large mammals however we don't know whether those blue sheep were killed by brown bear themselves or killed by others predators.

We found 4% of its diet covered by livestock.

The project has published book on Brown bears and Poster on Bears of Nepal; raised conservation education programme in local level and National workshop on participatory Brown bear conservation Action plan which are key success of the project.

Technical Reporting of the Project

Introduction

The brown bear (*Ursus arctos*) is the most widely distributed *ursid* in the world (Servheen et al. 1999). Historically, the species ranged across a large portion of North America, including northern Mexico, throughout Europe, Asia, the Middle East, and even across North Africa. Today they are found in the northern hemisphere, including the Palearctic and Nearctic. Status of the brown bear varies throughout the world from endangered to common; hence their Red List category is vulnerable under criteria C2a(i) version 3.1 (http://www.iucnredist.org.details/41688/0) in the IUCN Red List. They are listed in Appendix II of the Convention on International Trade in Endangered Species (CITES). The species is most endangered in Asia, where small isolated populations exist mostly in remote mountainous areas (Servheen et al. 1999).

Remnant populations of brown bears are scattered across many portions of Asia, however very little is known about numbers or connectivity. In Pakistan, there are an estimated 150–200 bears in seven separate populations in the Himalaya, Karakoram and Hindu Kush Range, but only one has more >20 individuals (Nawaz 2007). In India, brown bears exist in 23 protected areas 35 other localities in the northern states of Jammu and Kashmir, Himachal Pradesh, and Uttarakhandl, but they are regarded as fairly common in only two of these protected areas; country-wide it has been estimated that there are 500 to 750 individuals (Sathyakumar 2006). In China, brown bears exist in sparse, poorly defined populations in the west and also in the northeast, with estimates of 6,000 and 1,000 in each of these regions, respectively (Gong and Harris 2006).

The Himalayan brown bear (*U. a. isabellinus*), a subspecies that represents an ancient lineage of the brown bear (Galbreath et al. 2007; Gong *et al.* 2006), was distributed over the Great Himalaya region but very little is known about their current status which hinders conservation efforts (Servheen et al. 1999). This subspecies is thought to occur at very low densities in the alpine regions of the Greater and Trans Himalayan regions of India (Sathyakumar 2006). Nothing is known about the distribution and abundance of brown bears in Nepal, and the species has not been recorded in Bhutan to the east since 1953.

In Nepal, brown bears are thought to be distributed in Annapurna and Manasalu Conservation Areas, Shey-Phoksundo National Park (unconfirmed) and corridors connecting these areas. Locally, the brown bear is known as "*Tingting*" in Gorkha area of Manasalu Conservation Area and "*Mithe*" in Upper Mustang area of Annapurna Conservation Area (ACA); it is sometimes referred to as "Yeti". The Government of Nepal has laws protecting endangered flora and fauna, including brown and Asiatic black bears (*Ursus thibetanus*). The Government of Nepal has established National Park, Reserve and Conservation Areas for the conservation of endangered flora and fauna, but many species are severely depleted due to over exploitation, pollution, habitat destruction, poaching, and human and livestock pressures in the natural habitats (NBS/Nepal, 2002). Both bear species are believed to be depleted due to poaching, habitat destruction (NBS/Nepal, 2002), but adequate information to make such a determination is lacking.

In Nepal, there has been lacking study on the Bears, food and feeding habits and how anthropogenic pressures affect Bears habitat, bears population and habitat use. The project was carried out to survey on status, distribution of brown bear in Annapurna Conservation area. The project was also raise conservation awareness through different publications, awareness

programme as well as collected information for black bear. This project investigated poaching activities, local people perception and finally develops the participatory bear's conservation action plan through the involvement of local people.

We are working on the project and this is report referring as midterm report, we are continually working for remaining activities of the project.

Project Objectives

1. To find out status and distribution of Brown bear in ACA.

2. To find out habitat preference of Brown bear in ACA.

3. To investigate the diet condition of Brown bear through the scats analysis.

4. To assess past and present the poaching activities, trade pattern and relationship between Bear-human.
5. To map out distribution and potential poaching area

6. To know the perception of schools' student and local people towards the Bear conservation in ACA.

7. Launch the Community base Brown bears conservation activities:

   i. Provide training for existing local community to monitor of Brown bear in future.
   ii. Eco-club formation in schools
   iii. Conservation Area Brown Bear Conservation Network Formation
   iv. Conservation workshop with local herder, youths, political leaders and concern authorities to raise awareness for Brown bear conservation
   v. Community base participatory Brown bear conservation and monitoring plan preparation.
   vi. To strengthen knowledge and capacity of local community, Conservation Area Management Committee (CAMC), schools students, youths through conservation awareness program and form bear conservation eco-club in one school.
   vii. To publish Poster, educational kids on Brown bear of Nepal

8. Preparation of community base Brown bear conservation action plan.

Study Area
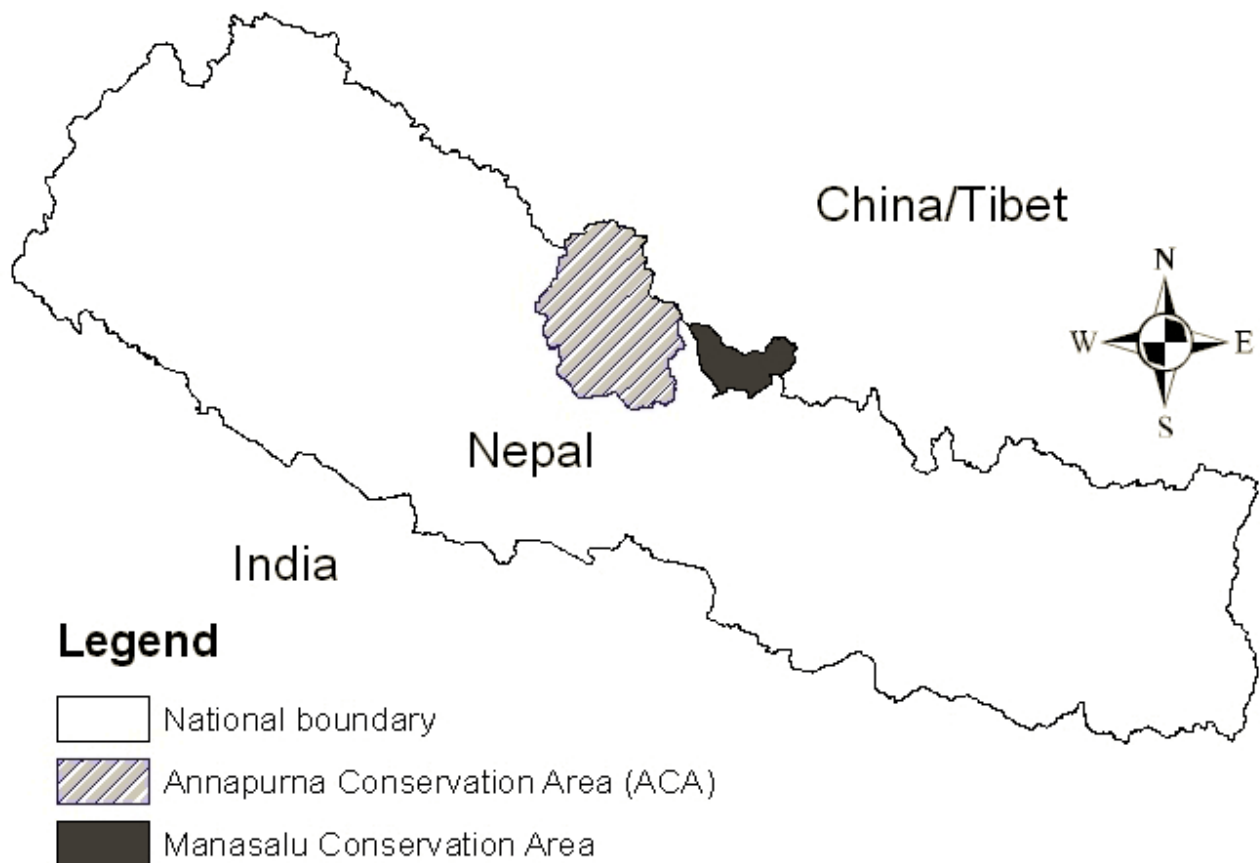
Figure 1: Study area ACA

Study was conducted at Upper mustang region of Annapurna Conservation area of Nepal

Upper Mustang

One of the study site is upper mustang surrounding the Lo-manthang, also known as Monthang previously, is one of the seven Village Development Committees (VDCs) of Upper Mustang. It lies in the northern part of Mustang District approximately at 83° 45' to 84° E and 29° 04' 12" to 29° 18' N. It is known to the world as The Walled City since the settlement is surrounded by wall. To its North is Chhonup VDC, in South Surkhang VDC, in East Surkhang VDC and in West Ghami VDC (Map1). The altitude range of Lo Manthang VDC is 3200m to 6500m. There are altogether two permanent settlements in Lo ManthangVDC.

The climate of the area can be characterized as cold desert, desiccated by strong winds and high solar radiation. The climate is sub-alpine, and has a maximum and minimum temperature of 26.8°C and 9.9°C in July and 10.7°C and -5.8 °C in November of 2005. The whole area remains under snow for 4 – 5 months from November to March. Total annual rainfall is less than 200 mm and more than half of the total precipitation occurs as snow during the winter months. The region falls under the Dhaulagiri–Annapurna mountain rain-shadow zone.

Agricultural production in the area is very limited due to scarcity of water, lack of proper irrigation, low temperature for longer periods and low rainfall. Only 1.7-% land is cultivable and average

landholding is 0.35 ha per person. Majority of the land is uncultivated and barren. Local production of food meets only 55% of subsistence needs and that only 8% of the 5700 inhabitants of Upper Mustang are self sufficient in terms of grain (Thakali, 1994). Animal husbandry is the main source of income for the local people. The average number of animals reared in 2002 in Upper Mustang is 36,503 (MIS, 2002). Cattle, yaks, dzos, sheep, goats, horses, mules and donkey are reared. Goat and sheep trading from China is also a common practice among the local population.

The rangelands not only provide grazing lands for livestock but also support large number of rare and endangered plants, animals and birds. The vegetation of the area represents high altitude grasslands that are Tibetan in characters (Stainton, 1972). Plant species such as Caragana spp., Lonicera spp., Stipa spp., Carex spp., Kobresia pygmea, Kobresia felicina, Lagotis spp., Thymus linearis, Corydalis spp., Delphinium spp., and Meconopsis spp. characterize the rangelands (Chetri and Gurung 2004). The rangelands also support unique assemblage of rare and endangered species – Tibetan Argali (Ovis ammon hodgsonii), Tibetan Gazelle (Procapra picticaudata), Kiang (Equus kiang), Blue sheep (Pseudois nayaur) and their predators - Snow Leopard (Uncia uncia), Lynx (Lynx lynx isabellinus), Red Fox (Vulpes vulpes), Himalayan Brown bear (Ursus arctos) and Grey Wolf (Canis lupus).

As animal husbandry is the main source of income, rangelands of Upper Mustang have socio-economic relationship with the lives of local people (Pokharel, 2006).
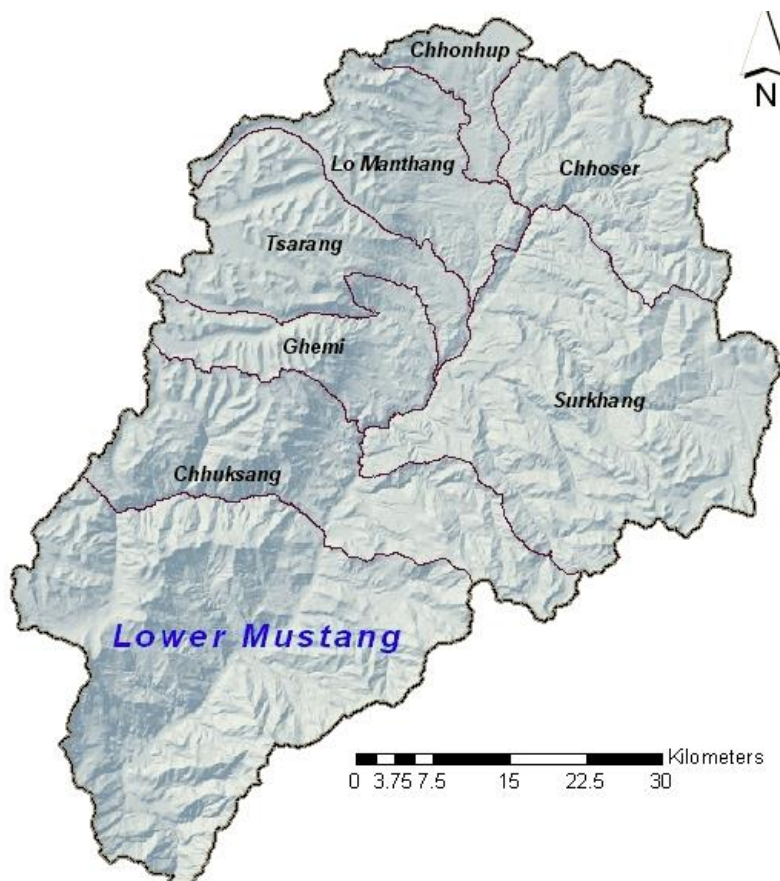
Figure 2: Upper Mustang- intensive study area

Methods

Presence and Absence Survey:

The presence and absence survey was carried out by collecting information from field and interviews with local key person. In Field, potential distribution areas were identified with interview of local people. Field survey was carried out in transect line and randomly walking in potential habitat. Field survey have done searching at direct evidence such as field sightings of bears and/or clearly identifiable sign, bear parts that can be related to time and place of collection; evidence of bear interaction with people or crops and livestock that can be clearly assigned to the right bear species; etc. Tracks and scats were photographed and measured. Hairs, bones and skulls were photographed to show as many characteristics as possible, including good illustration of the side and surface views of tooth rows. The project has given emphasis on brown bear but we have also collected information on black bear as well which is base line information for further research and management.

Photography was used with local people interview to identify bears species in local level. Any information such as skulls was documented thoroughly and supported by photographs when possible.

Habitat Parameters:

After encountering with the any sign of bear in area, there was laid out plot for collecting different parameters of the habitats such as latitude, altitude, slopes, ground covers, crown covers, vegetation types, Cover types, influence of local people, livestock grazing, Forest types, land features.

Herbs and shrubs were measure in each plots of Brown bear habitat and we calculated important value index (IVI) of vegetation for brown bear habitat.

Following formulas were use for calculating IVI

$$\text{Frequency} = \frac{\text{No. of plots with the individual species} \times 100}{\text{Total no. of plots studies}}$$

$$\text{Relative frequency (RF)} = \frac{\text{Frequency of any one species} \times 100}{\text{Total frequency of all species}}$$

$$\text{Density} = \frac{\text{Total no. of individual species in all plots} \times 100}{\text{Total no of plots} \times \text{area of plots}}$$

$$\text{Relative Density (RD \%)} = \frac{\text{Density of a species} \times 100}{\text{Total density of all species}}$$

$$\text{Relative Coverage (RC)} = \frac{\text{Coverage of a species} \times 100}{\text{Total coverage}}$$

$$\text{Importance value index (IVI)} = RF + RD + RC$$

Scats Collection:

Scats of brown bear has collected from field through the transacted walking along the trail in pasture land and scanning all possible area, digging site for searching scats.

Bear Distribution Mapping:

On the base of local information as well as direct field investigation, GPS point was taken from the field, plotted in Digitized Topo- Map of MCA by of GIS Arc 9.1 Version software.

Conservation Education Parts

Publication:

Poster on Brown bear of Nepal was published which gave information on all three types of bear of Nepal with differentiate characters. It has distributed in study area people and students and university students which help to once think about bears of Nepal through such publication university students were able create interest on research on these species for their dissertation.

Book on Conservation Biology of Brown bear has ready; it is prepared on the basis of previous my research on Brown bear and literature survey. It has specially targeted to local people to arise conservation awareness level in local level so that it has prepared in Nepali language. Book has almost ready and now it is for editing to bear export, after getting comments from there we will finalized and send it to press in December.

*Schools Base Bear Conservation Eco-Club Formation***:**

Bear conservation Eco-Clubs was formed in three of study area and these clubs include the school's students, teachers and youth of the village. After formation of Clubs, further work strategy and important of bears were discussed

Bear Conservation Essay/Art and Quiz Competition among Schools Students:

Bear Conservation art competition was carried out among all schools of study area.

Community Base Brown Bear Conservation Action Plan:

Community Base Brown bear conservation workshop was conducted on 20-24 December 2009, Local participants has given their idea and conservation measurement, the plan is in written up process after taking comments and suggestions from expert, It will process forwards for endorsing in national level at Ministry of Forest and soil conservation then international level.

Result and Discussion

Presence and Absence Survey of Brown Bear in ACA:

This was first study on Brown bear of this region, so the project able to find out basic information on brown bear distribution in the region. Presence and absence survey of Brown bear was done in Annapurna Conservation Area (ACA) of Nepal. Questioners survey and directly field survey was done for confirmation of brown bear in the area. The Brown bears has distributed in 6 VDC's Pasture land of Upper mustang region within ACA, it has distributed in more than 100 sq.km area of Upper mustang region (it has found in Loamangthnag, chhoser/Dhalung, Chhunup, Surkhang, Charang and Ghami VDC). On the basis of local people, and field survey we predict there are 15-25 Brown bear in the region. Generally, it can seen as common in February-June and October December, at that time all livestock come down and low human activities in the area. Main potential areas for Brown bear in Annapurna Conservation area are Damodhar Kunda region of Surkhang VDC, Dhalung pasture land of Chooser VDC and high pasture land of Ghami VDC. We were found more sign in Damudar kunda area, Dhalung area and Ghami Lekhs. In MCA Brown bear has distributed in Samma VDC of Gorkha district. Samdo area is only one potential site for brown bear. We were recorded skulls and claws of brown bear in Gyala pasture land of Samma area of Gorkha (Fig a, & 2).

Fig: a, b Claws of Brown Bears found in Samma area

Figure 3 Skull of Brown bear found in Samma Area

Brown bear distribution area in ACA
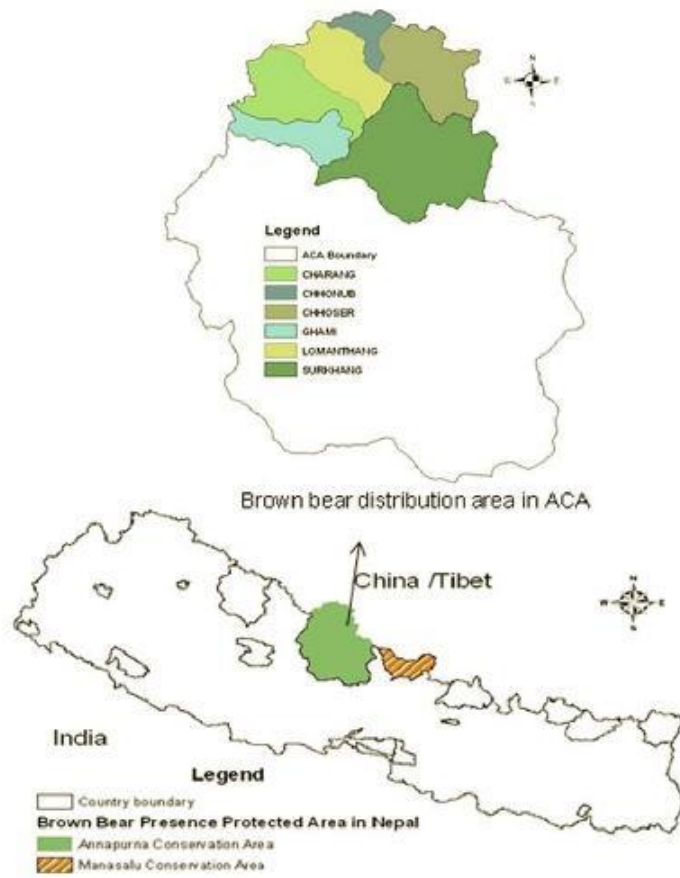
Figure 4: Brown bear Distribution in ACA
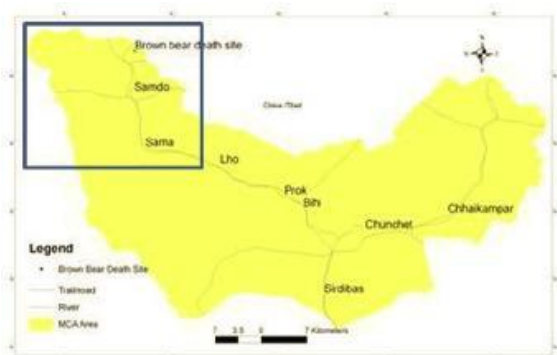
Fig.1a

Fig.1b

Figure 5: Brown bear distribution in MCA

Field Landscapes:

Figure 6: Photos: Field activities, Camping tents at Dhalung

Brown Bear Sign Density:

Total potential Brown bear distribution area was 1000 km$_2$; therefore, total number of sign which we were collected from field was divided by 1000 km$_2$ for calculation of density. We divided our study area in different strata according to local name of the site and in each we walked randomly for searching digging site and scats of Brown bears. Digging site and scats density were 7.3/100km$_2$ and 4.3/100km$_2$ respectively.

Figure: Density/100km² chart showing Digging site (7.3) and Scats (4.3)
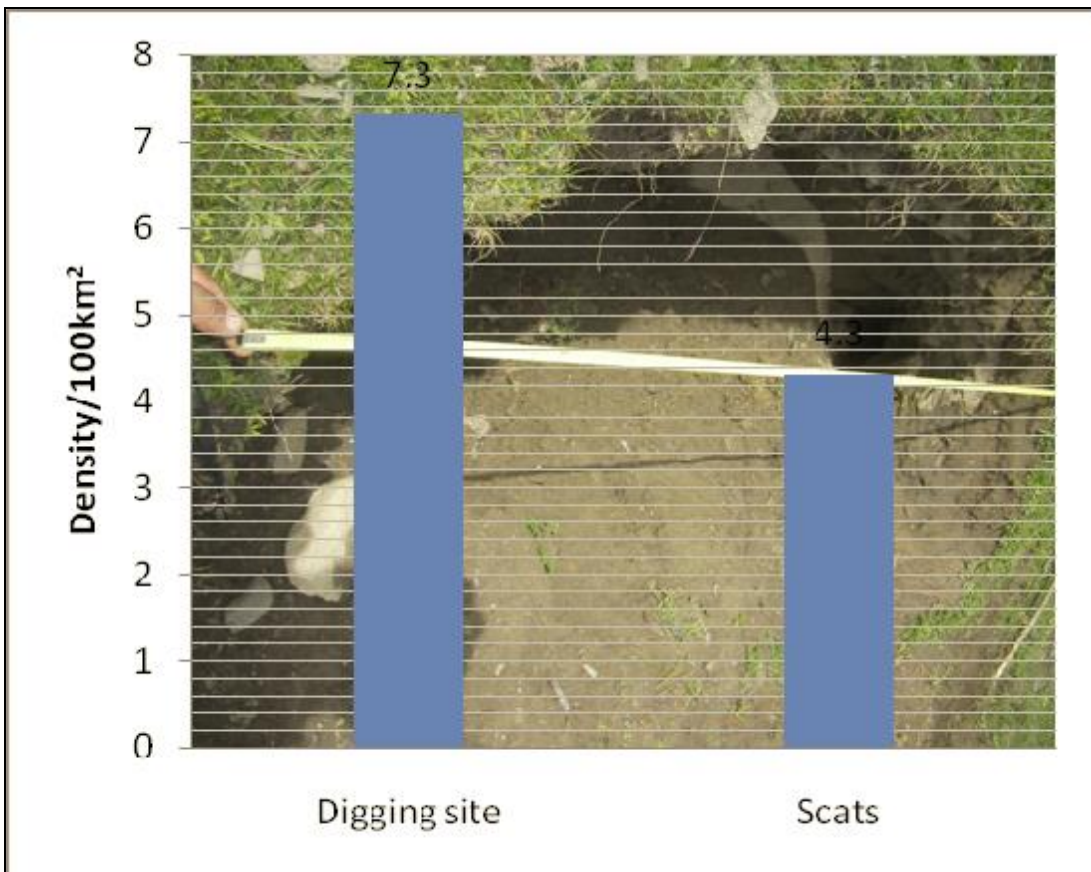
Fig . Brown bear digging site

Fig. Brown bear scats

Figure 7: Brown bear hair collection

Brown Bear Scats Collection and Diet Analysis:

Altogether 43 scats were collected. We collected scats from Chhooser, Chuunup, Lomanthang (panga), Ghami and Damudar kunda of upper mustang March 2009 to December 2009.

Figure 8: Himalayan Marmot (Main Prey species of Brown bear)

On the basis of preliminary data, it says that main diet of brown bear was covered by Himalayan Marmots. Its main preys species was Himalyana Marmot (39%), Pika (18%), wooly hare (11%) and we were also found Blue sheep (9%) in its scats, so it's also killed large mammals however we don't know whether those blue sheep were killed by brown bear themselves or killed by others predators. We found 4% of its diet covered by livestock.
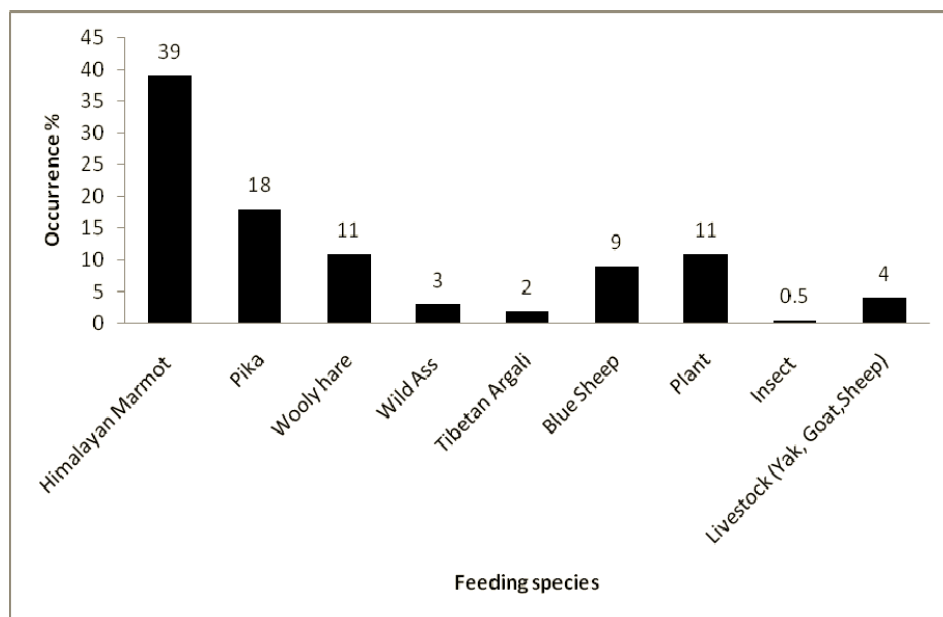
Figure 9: Diet of Brown bear

Figure 10: Lab work

Figure 11: Scats collection at field

Habitat Use of Brown Bear:

We have collected following information from survey area, we will collected more data from remaining survey area then we prepare detail technical report on habitat use of brown bear. Below information gives just figure out the habitat use of brown bears.

Altitude:

Brown bear were distributed in almost all VDC of Upper Mustang, they were found in minimum altitude 4200m and maximum altitude was 5321. On an average it uses 4871 m altitude.

	N	Minimum m	Maximum	Mean	Std. Deviation
Altitude	74	4200	5321	4871.8649	249.74345
Valid N (listwise)	74				
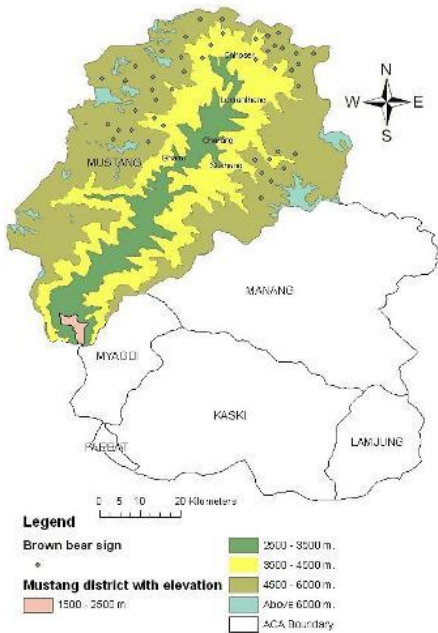
Figure 12: Brown bear sign in ACA

Aspect:

Brown bear uses mostly North-East (36.8%) aspect followed by South-East (28.2%), North West (12.50%). They less use the Northern (1.32%) and West (1.32%). Brown bear most used North-East, South East and southern side because of high number of Marmot lives in those aspects and that aspect is hotter than other aspect. It is also the survival strategy of Brown bear to choose such area securing their food and as good shelter.
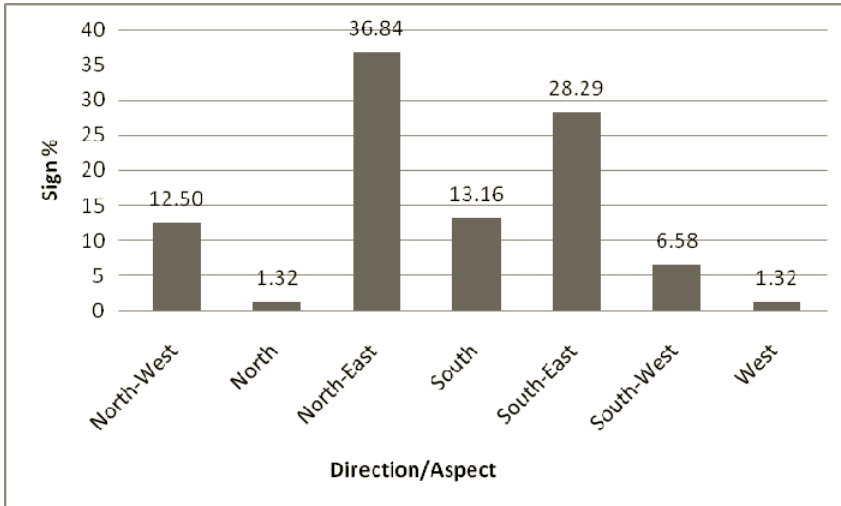
Figure 13: Different aspect use by Brown bear

Vegetation Use by Brown Bears:

Upper Mustang's rangeland provides prime habitat for engendered wildlife. Rangeland resource is equally important to survey of Brown bear in the area. Directly or indirectly supporting it and its prey species in the area. The study show that hat most important herb species in brown bear habitat are *Kobressia spp* (IVI-72) followed by *Carex spp*. (IVI-37), *Saxifraga spp* (IVI-35) etc .Brown bear mostly use *Kobressia spp, Carex spp, Saxifraga spp, Potentilla spp etc* in its habitat. Due to

changing climate those resource condition has also destroying and availability of those resources reduce years by years.

Species	Relative frequency	Relative density	Relative cover	IVI
Anaphalis spp.	6.6	7.34	4.76	18.7
Anaphalis triplinervis	5.43	1.32	0.432	7.182
Androsace spp.	6.98	1.67	1.87	10.52
Bistorta spp.	2.19	0.1	0.2	2.49
Carex spp.	9.29	12.51	15.64	37.44
Cortia depressa	1.65	2.91	0.43	4.99
Euphorbia estachyei	3.76	0.8	2.4	6.96
Kobressia spp.	18.49	32.12	21.71	72.32
Lancea tibetica	14.69	6.08	3.61	24.38
Pedicularis spp.	3.39	1.02	0.19	4.6
Penisetum spp.	12.57	8.08	11.86	32.51
Potentilla plurijuga	5.74	0.34	2.67	8.75
Potentilla spp.	9.27	2.76	2.13	14.16
Saussurea nepalensis	5.88	2.98	1.01	9.87
Saxifraga spp.	5.12	12.21	18.48	35.81

Perception of Schools Student and Local People

Interview were taken to know the perception of local people towards the bears conservation in ACA, altogether 219 people from Upper Mustang and Lower Mustang and some part of Kaski district of ACA region. Local people strongly believed that population of Brown bear are decreasing in study area as compare to past. About 87% of local people from upper mustang said that the population of Brown bear has been decreasing.

Interviews were taken from herders and other local people of the study area. According to them main cause of population increasing is religion believes, high rate of preys species available for Brown bear i.e. Himalayan Marmot. There are other predators (Snow leopards, wolf, Lynx, Red fox etc) so they are not blaming to Brown bear to kill their livestock, however the preliminary diet analysis said its diet composition covered 4% of its diet. But local people did not believe their livestock killed by Brown bear.

All the respondents were not known its legal status. Our conservation activities and series of local people discussion and workshop were able to raise conservation awareness and provided knowledge its situation and status. Therefore, there was urgent need to conduct conservation awareness activities both for schools students as well as villagers.

Conflict Between Brown Bear-Human

Livestock depredation can be observed mostly during winter months particularly during December to March because of the severe cold and the lack of forage.

Predation generally occurs more when the less availability of grasses tends livestock to the rocky and cliff areas, as the predators seen to be hiding and waiting for their prey.

Throughout the interview with local people they didn't mention livestock depredation by brown bear however our diet analysis data say 4% of brown bear diet covered by livestock that might be causes of presence of other predators like snow leopards, lynx wolf, red fox etc. Frequency of encountering with local people and herder with this those predators was high so they dint mention the killing by brown bear. Another cause may be brown bear may have kill livestock in Tibetan side. So there was not any conflict with brown bear and local people.

According to local people last year's Snow leopards, Lynx, wolf killed 101, 14, 23 livestock respectively in Chhoser area.

Because of livestock depredation by other predator local people are more aggressive to kill those predator and they area also practising to kill those predator by poisoning however that practice are controlling by local conservation body i.e. CAMC but poor livelihood drive them to kill those predators for their subsistence by selling those predators parts and reduce the predation on their livestock. Poaching or killing pattern will be only control if we have good compensation facility and support to local people livelihoods.

Figure 14: Blue sheep killed by Snow leopards Photo by Manij Upadhyaya 2009

Most of them are of the opinion that depredation of livestock is in decreasing trend. They generally face problems from diseases like foot and mouth disease, respiratory infection, diarrhoea, dysentery and scabies. Due to the lack of veterinary services they often complaint about this issue. In case of predation, the wolf problem is lessening as the wolf can move freely across the open Nepal- China border and are also being killed by the Tibetans. But the snow leopard problem is unchanged.

Issues and challenges

It is a challenging task to conserve overall biodiversity of Upper Mustang. There are several components that are responsible to affect the biodiversity. As dhokpas are also an important entity of this area and their activities are directly related to the biodiversity, it is quite necessary to give focus on their interaction with the nature.

Large flocks of goats/sheep often come from Tibet to Dhalung/Chhujung area. Usually 4-5 goths come from Tibet every year and each goth comprises 400-500 goats/sheep. Such type of activities is creating grazing pressure on the limited pastureland. Dhokpas say that this is the main reason behind the deterioration of pastures.

In the summer months, one can see the dhokpas coming from Tibet and the grazing areas seem a miniature settlement in Dhalung/Chhujung area.

The daily activities of those outsider dhokpas have creating impacts on the biodiversity of that area. They cut the Caragana spp. and juniperus tree as firewood and also interfering the free movement of wildlife on that area. During the summer, the movement of Tibetan gazelle and Tibetan wild ass is badly affected. Till April, the activities of those herbivores can be seen satisfactorily but after May to till October it is difficult to watch their movement.

As Nepalese dhokpas are very keen to follow their own traditional rules and regulation, it is quite interesting to note that the biodiversity of dhokpas' residing areas are not adversely affected.

The main impacts on biodiversity are uprooting of Caragana spp., cutting of few juniper shrubs and trees and collection of huge amount of dung. More than half of the animal dung is burnt as fuel and few are sold to the villagers that minimize the soil nutrition of the pasturelands. The health condition of rangeland is also affected due to over grazing. All the activities of dhokpas of Tibet are the key issue to be addressed. If there encroachment continues, more negative impacts will definitely be seen in the future and if the ecosystem of this area cannot be considered on time, problems will occur in the future as well.

Meeting with 4 Conservation Area Management Committee:

Each Conservation area committee with one day meeting and discussion were conducted for taking information about brown bear and its distribution pattern, and local people opinion on brown bears.

Camera Trap Fitted:

Camera traps were fitted for trail but we are unable to capture photos of brown bear and Snow leopards however we were find many sign of the bears and snow leopards in the study area.

Figure 15: Camera Traps in field

Perception of Schools Student and Local People of Study Area:

Local people strongly believed that population of Brown bear are increasing drastically in the study area. About 93% of local people said that the population of Brown bear is increasing high rate.

Interviews were taken from herders and other local people of the study area. According to them main cause of population increasing is religion believes, high rate of preys species available for Brown bear i.e. Himalayan Marmot. With the increasing in Brown bear population they are started to conflict on bear-human as well, during a 3 years they have already killed 29 livestock in study area. Therefore, people are aggressive with this species. This would be future cause to decline Brown bear population. Poisoning which is well know practices among the villagers to kill the problematic carnivores.

All the respondents were not known its legal status. Our conservation activities and series of local people discussion and workshop with CAMC have able to raise conservation awareness and provided knowledge its situation and status. Therefore, there was urgent need to conduct conservation awareness activities both for schools students as well as villagers.

Past and Present Poaching Activities:

There are different techniques to kill Bears (Brown bear and Black bear) ACA. Hunters use a variety of techniques to kill bears, which include snaring and shooting, the latter sometimes aided by poisoning specially for Black bear when they come to crop ridding. In the past hunters usually used guns but now it is replacing by snaring and poisoning.

Present Hunting Technique

There are a few well established methods of hunting and killing bear by poachers. The most commonly practice method is snaring and trapping which is specially used for black bears. Occasionally, the snare line runs from the top of the mountain to the river valley with more than 50 individual traps. For setting the snare, a small hole measuring about 20 to 25cm and 10cm deep is dug and two small pencil-like pegs with inner side made flat are fixed about 15cm apart inside the hole. After this, a stick of about one inch is bent and strongly fixed with both ends making an arch over it for fixing a trigger. The trigger is pulled further by the pressure of a bent over pole. A small horizontal stick with one side is fixed in the pegs. Just above it a wooden platform is built and a wire snare is set with one end attached to the bent over pole. When bear (Black bear) treads on the hidden platform, the horizontal stick falls down by the weight of the bear, the trigger is released with force and as a result the pole straightens, the noose is pulled tight around the animal's leg and the creature is jerked in the air. This is a most wasteful method of killing the bear for gill bladder.

Past Techniques

In past, poachers were used to baying by guns. In the past this was the main method of killing bears and other wildlife but now due to the security situation in the country, most of private guns have been impounded in the District Administration Office, Mustang.

Another method is killing the animal using poison. Another technique uses a pointed bamboo arrow or splinter dipped in poison fixed downhill across a regularly used path in a mountain ridge at the level of belly height. When the bear is disturbed on one side of the ridge, it flees towards the other side by leaps and bounds. At the same time, the poison splinters may inflict a wound in the abdominal region and kill the animal.

Conservation Education Parts

Introduction:

'Without the management of people, we cannot conserve natural resource' this was main theme of conservation education programme. Conservation education programme was focusing to raising conservation education or awareness level of local people towards the conservation of Bear. In this regard BRTF with the support of KNCF, Japan, Rufford Small Grant Foundation, UK conducted Bear education activities in ACA region of Nepal.

The main thrust of the project was to promote conservation education and conservation of Bear. It aimed at recognizing the perception of local people towards the conservation of Bear and raising conservation awareness among local people. Conservation awareness was raised by providing awareness class, poster publication & distribution and workshops with the local people especially, youth, women and students.

Conservation Education Activities

Posters Publication and Distribution:

Posters with the title of 'Bear Conservation of Nepal' had published under the project. Total 1000 pieces of posters were published. Posters were able to extend knowledge about Bear and its threats in local people. In fact, there was not any information on this species and this project was able to initiate to follow information about this species, so in future researchers, students will start work in further research work on this species. Further more than 400 pieces of Poster were distributed in Government of Nepal, Department of National Park and Wildlife Conservation, Annapurna Conservation Area (ACA), Manasalu Conservation Area (MCA), Tribhuvan University, Institute of Forestry-Department of park recreation and Wildlife management, IUCN Nepal, WWF Nepal.

Participatory Bear Conservation Action Plan Discussion with Samma VDC's Leaders:

Samma Conservation Area Management Committee (CAMC) is main responsible local institute for conservation of wildlife and natural resource of the area. We were discussed about local level their needs and prepared their idea how to conserve brown bear in local level. We made some conclusion what they need and how they wanted to conserve Brown bear and its associate ecosystem. This plan has presented at National level workshop at 21-24 Jan, 2010.

Figure 16: Discussion with local people at Samdo area in June 2008

Discussion with CAMC (Conservation Area Management Committee) for Action Plan

Short Term:

   a. Locating Bear habitat:
      With participation of local people probable habitats of Bear will be located and map will be prepared.

   b. Awareness about Bear conservation:
      Many people have misconception about Bear. They don't importance of Bear. At first they will be informed and told about the importance and usefulness of Bear.
   c. Awareness development among local people.

   d. Discussion will be done about importance of Bear in general meeting.

   e. Bear habitat will not be destroyed

   f. More information will be collected about Bear:

      More research will be conducted on Bear. So that more useful things about Bear could be found out.

   g. Information about Bear will be extended through different media:

      Usefulness and importance of Bear will be extended via different media like telephone, radio, television and printing media so that more and more people understand value of Bear in ecosystem.
   h. More people will be informed about importance of Bear.

   i. Grass land Fire will be controlled.

Long Term:

   a. Sustainable management of Bear habitat

   b. Food management:

      Food for Brown Bear can be managed by conservation of Himalayan marmot and other mammals of the area.

   c. Research and education about Bear, like its diet and management.

   d. Seeking help from donor organization:

      Most of the long term actions plan requires budget for conservation education activities, empowering institution. So help should seek from donor agencies.

   e. Upliftment and development of tourism industry:

Focus should be given on Bear conservation for the development of tourism industry. Many tourists may visit Samma to watch Bear and its scenic beauty, which help in upliftment of economic status of local people.

f. Formation of network for Bear conservation.

g. Conservation committee formation:

Conservation committee should be formed so that they can contribute more in Bear conservation by awarding people and informing people about usefulness and importance of Bear in ecosystem.

h. Awareness development through coordination with different organization:

Different organizations should be united together with local people for the Bear conservation by conducting different workshops, awareness programs.

On the basis of local people interview and interaction they have created above long term and short term action plan, Those activities will be implemented by Local legal institute i.e. Conservation Area Management Committee (CAMC) of Samma VDC. CAMC, Samma will be main responsible institute to implement activities through coordination with Government and Non-Government organization.

Conservation education

Training for Local People for Brown Bear Monitoring in Chhosser VDC:

Local knowledge on distribution pattern of brown bear and conservation strategy, problem were discussed in the one day group training, different picture and monitoring methods were discussed and train local people at chhoser rangeland committee. Those committee were more responsible for monitoring pasture land for grazing management and they have encountered with brown bear in several time in their pasture land so they are well familiar with the brown bear in the area. Through this training were share each other villager experiences. Further those participant used for field survey of brown bear in their area.

Book on Brown Bear:

Book on Brown bear Conservation Nepal has published on January 2010. The book has written in Nepali language which has focus especially on local people, school and university student of Nepal. The book has covered General introduction,distribution, ecological behaviours, presents status in Nepal, conservation problem, etc. 1000 pieces have been published in this 1st edition. The National level workshop on Brown bearconservation was organized on 21-24 Jan 2010, at the same date (21 Jan, 2010) the Book has released through Dean of Institute of Forestry, IUCN/SSC/Bear Specialist Group/Member Prof. Dr. S. Sathyakumar. Please find attached detail about book and cover page of the Book has given below.
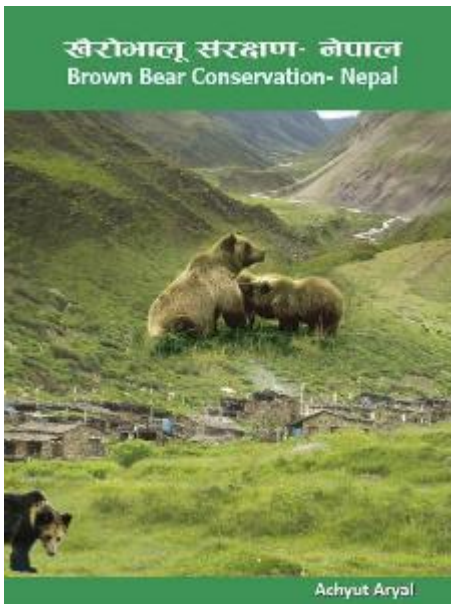
Figure 17: Cover Page of Book

Quiz Competition:

On the occasion of ACA UCO Lomanathnag 22th anniversary and conservation day, we organize Upper Mustang region Brown bear conservation quiz competition. The participant schools name list has given below in detail below:

i) Divya Deep Secondary School, Chhoser,
ii) Rastriya Lower Secondary School, Lo Manthang,
iii) Maha Karuna Shakyapa School , Lo Manthang,
iv) Tsarang Lower Secondary, Tsarang,
v) Lo-Kunfen Aayurbedi School, Lo Manthang

Participant of Quiz Contest in 22th Anniversary and Conservation Day:

S.N.	Name of Teacher and Students	Name of School	V.D.C.
1	Mr. Saligram Subedi (Teacher)	Divya Deep Secondary School	Chhoser
a.	Tsering Wangdi Gurung (Student)		
b.	Pemba Gurung (Student)		
c.	Dhawa Gurung (Student)		
2	Mr.Bhim Prasad Subedi (Teacher)	Maha Karuna Shakyapa School	Lo-Manthang
a.	Nguwang Khedup (Student)		
b.	Dhawa Shangbo (Student)		
c.	Tenzing Lama (Student)		
3	Mr. Manoj Gurung (Teacher)	Lo-Kunfen Aayurbedi School	Lo-Manthang
a.	Tsering Yutin Gurung (Student)		
b.	Tsering Fongok Gurung (Student)		
c.	Sandhya Magar (Student)		
4	Mr. Bishwa Raj Rijal (Teacher)	Rastriya Lower Secondary School	Lo-Manthang
a.	Aabu Yanding Gurung (Student)		
b.	Nhutuk Gurung (Student)		
c.	Sonam Chutin Gurung (Student)		

Mr. Achyut Aryal explaining about the project with mass audience, Upper mustang region quize competition.

Prize distribution for selected participants

Fig. Prize distribution and conservation talk

Participant of Quiz Contest in 22th Anniversary and Conservation Day:

World Environment Day celebrated on June 5th, 2009, with the slogan "Your planet needs you! Unite to combat climate change" following various environmental activities at five CE Schools of Upper Mustang.

Objective:

☐ To rise environmental awareness and wildlife conservation as part of environment and our
   ecosystem.
☐ To provide massage to conservation of wildlife and brown bears

☐ To make familiars local people about important of environment.

Conservation rally and art completion were carrying out in different 5 schools of study area, participant schools are followings in different area.

1. Divya Deep secondary School, Chooser
2. Rastriya Lower Secondary School, Loathing
3. Tsarang Lower Secondary School, Tsarang
4. Lo- Kempten Aurbedic (Medical) School, Lomanthang
5. Mahakaruna Sakyapa vidhyalaya, Lomanthang,

Duration: June 5th 2009 (2066/2/22) (1 day)

Activities:

☐ Clean-up campaign
☐ Environment Slogan with students rally
☐ Essay competition on Brown bears conservation and its important in nature

Additional Information:

World Environment Day was celebrated with slogan **"Your planet needs you! Unite to combat climate change"** at 5 CE school of Lomanthang, Tsarang and Chhoser. In Lomanthang students and teachers of Rastriya Lower Secondary School, Lo- Kunphen Auurbedic (Medical) School and Maha

Karuna Sakyapa Vidhyalaya done cleanup campaign at Lomanthang The campaign had covered all the street of village and entry point of Lomanthang. Bio - diversity Research and Training Group supported in this program. ACAP and Lomanthang Library or information centre, Lomanthang had jointly organised Essay competitions (Inter Lower Level) and Art competition (Inter Primary Level) in Lomanthang.

Name list of winner participants in Essay Competition

1. Divya Deep Secondary School, Chhoser

Topic of Essay- Environment
- Dhoka Gurung Ist
- Pema Gurung 2nd
- Lakpa Dindu Gurung 3rd
- Tenjing Nurbu Gurung Consolation
- Dhawa Gurung Consolation

2. Rastriya Lower Secondary School, lomanthang

Topic of Essay- Environment
- Tsering Lhamo Gurung Class- 8 Ist
- Abu Aanging Gurung Class- 8 2nd
- Son Chutin Gurung Class- 6 3rd

3. Mahakaruna Sakyapa Vidhyalaya Lomanthang

Topic of Essay- Environment
I- Nwang Khedup Gurung Class- 7 Ist
II- Dhawa Shangbo Gurung Class- 7 2nd
III -Tenjing Lama Class-7 3rd

4. Tsarang Lower Secondary School, Tsarang

Topic of Essay- Role of student in Environment Conservation
- Dhiki Gurung, Class-6 Ist
- Dhoma Tsering Gurung, Class- 6 2nd
- Dhindu Gurung, Class-4 Class- 7 3rd

5. Lo- Kunphen Ayurvedic (Medical) School, Lomanthang

Topic of Essay- Environment Conservation and Population Growth
- Sandhya Yonjan Ist
- Tsering Yutin Gurung 2nd
- Pasang Doma Sherpa 3rd

Essay written

Art drawing

Eco Club/Green force Club Reformation

Introduction:

The one of major groups of CE program is school students. Students are messengers of society and future managers, users and decision makers. So ACAP has formed Green Force Club in five schools. Main objectives are to motivate and bring main stream of conservation activities them from school age. Green Force Club reformation program have been carried out at five CE schools of Upper Mustang.

Additional Information:

One day Green Force Club reformation and Orientation program has been conducted in two CE schools Lomanthang. The students of class 6,7 and 8 given process of Green Force Club committee formation, GFC's objectives and work. Rastriya Lower Secondary School in Lomanthang were choose GFC member in election method. Students of class two from class Eight have been participant in election. Lastly Headmaster, CE teachers and ACAP Officer in Charge have given speech about Green Force Club. Other schools have been Green Force Club Reformation. There are Divya Deep Secondary School, Chhoser and Maha Karuna Shakyapa School, Lomanthang.

Eco Club /Green Force Club Reformation Schedule:

Eco club has formed in three schools in study area. There executive board name list has given below in Tables.

Table: Executive board member of Rastriya higher secondary school, Lomanthang

Name	Position
Dutup Gurung	President
Sonam Chuting Gurung	Vice President
Chhimi Gurung	Secretary
Chhiring Jhigmi Gurung	Vice Secretary
Dik Gurng	Treasure
Lhakpa Gurung	Member
Chiring lhamo Gurung	Member
Chhuting Gurung	Member
Aabu Chhiring Gurung	Member
Aabu Yangdin Gurung	Member
Krchung Gurung	Member
Dolma Chhiring Gurung	Member
Kungga Sangbo Gurung	Member
Tasi Dhawa Gurung	Member
Sonam yuting Gurung	Member

Table: Executive board member of Mahakarund Rakya school, Lomanthang

Name Position	Position
Tenging Lama	President
Wangdi Chhiring Lama	Vice President
Dhang Khedhap Lama	Secretary
Dhawa Sangpo Lama	Vice Secretary
Phunjok Sangmo Lama	Treasure
Tenjing Lama	Member
Pema chhiring Lama	Member
Dayandung Tenging Lama	Member
Tasi Sangpo Lama	Member
Nima Sangpo Lama	Member
Serapa Tenjing Lama	Member
Jhampa Rinjing Lama	Member
Jhampa Phungoka Lama	Member
Dawang Jhigmi Lama	Member

Table: Executive board member of Lokunmukha Medical school, Lomanthang

Name Position	Position
Chhiring Phunjok Gurung	President
Pasang Doma Sherpa	Vice President
Chhiring Utine Gurung	Secretary
Sonam Songmo Gurung	Vice Secretary
Lhakpa Lama	Treasure
Pasang Sherpa	Member
Sandhya Yonjan	Member
Sonam Utin Gurung	Member

Brown bear conservation programme at Rastiya Ni. Ma Vi, Lomanthang

Two days conservation awareness programme were conducted at Rastiya Ma vi schools at Lomanthang. Because of the high cold climate most of schools of upper mustang has shift down in Pokhara for 4 months for study. We conducted conservation education classes Art, quiz competition and form eco club at the school.
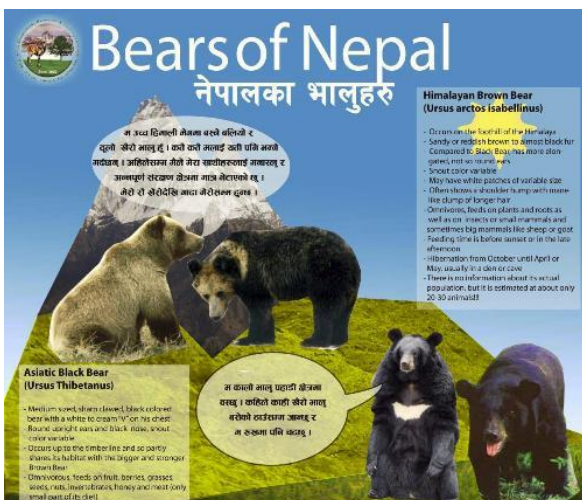

Figure 18: Poster on Bears of Nepal

Workshop Report on Community Base Brown Bear

Conservation Action Plan

21-24 Jan, 2010, Nepal

The Nation level Community base conservation action plan workshop was conduction on 21-24 Jan, 2010. The Chief Guest of the workshop was Prof. Dr. S. Sathyakumar (IUCN/SSC/Bear Specialist Group & Co-chair of south Asian Brown Bear Expert Team). All together 81 participants were participated in workshop on first day and next day 49.

The workshop was coverage has given by National media (findings) were highlighted through different TV and FM Channel of Country, and 30 minute interview and documentary show has showed through ABC Channel of National TV. And also coverage by National news paper (see below cutting page of newspaper).

Now we are working for finalized the points given by local people. The workshop has able to gather all local people in a same platform to conserve Brown bears in Nepal. We have endorsed community demand and voice on the action plan, after finalizing with technical and administrative input; we will present it to Government of Nepal for implement the plan.

Details workshops activities are given below.

Programme
Day one: 21 January 2009
10:00 am to 11:45

Inauguration, Welcome Tibetan Song, Keynote Speech by distinguee personal and closing of opening session.
Chair: BRTF Chairperson: Mr. Achyut Aryal
Chief Guest: Prof. Dr. S.Sathyakumar, IUCN/SSC/Bear Specialist Group & WII, India
Front table: Dean IOF: Dr. Keshav Dutta Awasti.
                Kamal Jung Kuwar, Ministry of Forest and Soil Conservation/ Liaison Officer ACAP.
                UCO, Manage Incharge : Narendra Lama
                Assistant Campus Chief IOF Raj Kumar Koirala
                Prof. Dr. A.K. Das IOF and Advisor of BRTF
                Dr. Govinda Basnet
                Nar Bahadur Amgai : For Project Director ACAP.

Welcome Tibetan Song 5 minute

Book released by Bear Specialist Group Prof. Dr. S. Sthyakumar

Welcome Speech and Objectives by: Narendra Lama

Key notes speech: For Project Director: Nar Bahadur Amgai

Key Notes speech: Dr. Govinda Basnet

Key Notes speech: S. Sathyakumar

Key Notes speech: from Local participants, expectation ( )

Awards distribution: Chief Guest

Closing and thanks Speech: Achyut Aryal

Tea breaks 11:45 to 12:00

Workshop Discussion

Time	Title	Presenter
12:00 to 12:30	Introduction of Bears, distribution, status, Historical distribution and status	Achyut Aryal
	Problem in local level from predators including Brown bears Problem and need assessment for conservation predators (1 hours)	Narendra Lama/AA
		Narendra Lama/AA
	Discussion for Predator (Brown Bear and Snow leopards) Conservation Network and formed (1 hours)	AA /NL
	Participatory Conservation of Community Base conservation action plan (1 hours)	Prof. Dr. Sathyakumar WII India
	Legal Issues : Conservation action plan Work for tomorrow for participants for taking different issue for action plan	Kamal Jung Kuwar AA
	Participatory bears distribution map preparation in Nepal. Experience sharing from among the participants on Bears/Brown bears. (1 hour)	
22-Jan-09		
	Content of Participatory Community Based conservation action plan	KJK
	Set up content/ framework for Conservation Action plan (30 minute)	KJK/AA

	Group work for Conservation Action plan preparation (1 hours)	Achyut Aryal KJK
	Team divides to work on it economic, biologist, student, local people, policy maker, politician, habitat management,	Achyut Aryal/Narendra Lama
	Presentation of group works, comments and suggestion on its, (30 minute) Conclusion,	Participatory
23-Jan	Written up and discussion the Action plan	Dr. Sanat Kumar Dhungel, Narendra Lama, Achyut Aryal, Raj Kumar Koirala,
	Discussed on Technical component of Action plan	Dr. Sanat Kumar Dhungel/ Achyut Aryal,
	Discuss with Government of Nepal and ACAP Authorities	Dr. Sanat Kumar Dhungel and Achyut Aryal, Narendra Lama
24-Jan	Discussion and finalized the plan, Draft conservation action plan will be sent again for Government and concern authorities for final comments and suggestion. (Within one month)	"
	Closing	

Figure 19: Speech given by Prof. Dr. S. Sathyakumar at opening session of workshop

Figure 20: Speech given by Dean of IOF: Dr. K.Dutta Awasti

Figure 21: Book on Brown bear released

Figure 22: Prize distribution to Conservation Quiz competition participants