DECLARATION

I hereby declare that this study titled “Distribution and abundance of the different diets and habitats and their threats of the Himalayan Black Bears in Pelgiri and Zongkha, Jigme Dorji National Park” is an original research work done by me and I have not committed, to my knowledge, any academic dishonesty or resorted to plagiarism in writing this thesis. All the sources of information and assistance received during the course of the study were duly acknowledged.

ACKNOWELDGEMENT

I am deeply indebted to Rufford foundation for its prestigious second grant for my study on the distribution and abundance of the different diets and habitats and their threats of the Himalayan Black Bears in Pelgiri and Zongkha, Jigme Dorji National Park. Without the grant, I cannot even think of giving a start to this important study. Therefore, I shall always remain grateful to RSG for the financial support.

My sincere thanks are also to my Referees, Dr. Phuntsho Thinley, Mr. Sherub and Mrs Thinley Choden for their valuable support and recommendations. My proposal would not have succeeded without their recommendations and support. I am also thankful to them for guiding me throughout the course of my study.

I should not forget to express my gratitude to my former Referees, Dr. Ngawang Norbu, Dr. Nancy and Mr. Lhendup Tharchen for giving me another support and encouragement to carry out my second proposal on the same species of animal. Thank you all for your continued support and guidance.

The unprecedented support and cooperation from the hermits and the local villagers has added a lot of zeal and moral support during my survey periods. It was otherwise a very tough job for me and my team to climb the hills up and down in the harsh climatic condition. For this act of humanity, I sincerely express my thanks to all the hermits of Zongkha and Pelgiri and the local villagers.

I am thankful to my friends, Kinley Rabgay, Chencho ,Gem Tshewang and Tshering Choden for their kind support and assistance in helping me to carry out sign survey and refinement of my project proposals. They have been my right shoulder in all times of need during the course of the project.

My crucial partner for this study were my wife, Khandu Wangmo, sons, Rigsel and Yoezer and my only parent, mother, Sonam Wangmo. They were the source of my inspiration for this work. My mom and wife had prepared me good meals on time and advice me on the time management. My two sons gave me enough hope and courage for this work to be completed on time. For all these, I am deeply thankful to them.

ACRONYMS

HBB	Himalayan Black Bear
HBBs	Himalayan Black Bears
ABBs	Asiatic Black Bears
PAs	Protected Areas

ABSTRACT

Due to the increasing developmental activities, many of the forested areas are degraded annually in Bhutan. The forests are cut down and excavated for the construction of modern amenities and infrastructures. These activities result in the loss, degradation and fragmentation of the habitats of the Black Bears. Also the excavation activities pose the risk for the complete wipe of some of the staple diet of the Black Bears. The presence of the human settlement also add up problem in addition to the developmental activities as the park residents compete directly with the bears for the wild fruits and vegetables. This study found out the different diets and habitats of the Himalayan Black and their potential threats in areas called Zongkha and Pelgiri in Jigme Dorji National Park.

Most of the wild vegetables and fruits on which the HBBs feed are highly preferred and heavily collected by the park residents and other people. Only 32% of the residents know that the HBBs also feed on these wild fruits and vegetables. HBBs are found to feed on shoots, forbs and leaves in the spring, fruits and vegetables in the summer and nuts and acorns in the autumn. Among the different habitats, the most preferred habitat and dens for the HBBs was found to be oak trees (*Quercus semicarpifolia*) and the least preferred was hollow trees/stumps/ logs. The maximum destruction of the habitat was on the fallen logs followed by oak trees. All the fallen logs were converted either into timber or collected as firewood by the park residents.

The relative abundance of ungulates was high for Sambar Deer followed by Barking deer. Other species of ungulates like Musk deer and Himalayan Goral are also found in the study areas.

Key words: Degraded, excavated, loss, fragmentation, highly, heavily

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CHAPTER ONE

Introduction

1.1 Background.

Due to the increasing developmental activities, many of the forest areas are degraded annually in Bhutan. The forests are cut down and excavated for the construction of modern amenities and infrastructures. These activities result in the loss, degradation and fragmentation of the habitats of the Black Bears. Also the excavation activities pose the risk for the complete wipe of some of the staple diet of the Black Bears. The presence of the human settlement also add up problem in addition to the developmental activities as the park residents compete directly with the bears for the wild fruits and vegetables.

1.2 Rationale

Bhutan's developmental activities are guided by the philosophy called the Gross National Happiness and therefore, this philosophy demands the development and environment conservation in a balanced way or in other words in a win-win situation. The conservation of the natural flora and fauna should not obstruct the developmental activities and at the same time, the conservation of the natural flora and fauna should not be over ridden by the developmental activities. The philosophy also cares the sentiment and happiness of the people of the country. Therefore, all the parks in Bhutan have human settlements in the buffer zones. The settlements in these buffer areas support some form of livelihood and therefore, these residents have the right to modern amenities like any other residents of the country. An eco friendly road construction is under way in the buffer zones of the Jigme Dorji National Park which falls in and near the areas called Zongkha and Pelgiri. The construction of the road might have fragmented and degraded many of the Black Bear habitats and in some parts it might have resulted in the habitat loss of this bear species. The recent problem of the Human- Bear Conflict in these areas could have aroused due to the fragmentation and loss of habitat and displacement due to the ongoing developmental activities and by the competition for resources like wild fruits and vegetables, shoots and canes by the park residents. Therefore, understanding the root cause of the Human-Bear Conflict in these areas is more important than installing the electric fences as a mitigation measures. The installation of the electric fences can be only an interim measure as the bears

might get accustomed to the electric fences or else the repair and maintenance of the electric fences might cost more and unaffordable to the park management and therefore understanding the potential threats to the diets and habitats of the black bear is very crucial.

The conservation agencies in Bhutan have little information on the habitats and diets of the bears and their potential threats and therefore this proposed study would answer the following questions.

1. What are the different types of the bear habitats and their threats?
2. What are the different types of the wild fruits and vegetables and shoots and canes that the bears feed on?
3. Who are the competitors for these diets and how severe is the competition?
4. Understanding the different types of Black Bear Habitats.

1.3 Objectives

- Study the different kinds of wild fruits, acorns, nuts, shoots and vegetables that are the diet of the Himalayan Black Bears.
  - Find out the different types of habitats of the Himalayan Black Bear and their threats.
  - Find out the different types of ungulates and their abundance in the study area
- Educate the general public on the importance of the diets of the bears to avoid the Human- Bear Conflict.

1.4 Expected outcomes

The finding from this project would be an eye opener for the conservationist and law makers. The results would help and back up the conservationists to advice our law makers in framing the rule of the laws in a rightful manner. The advocacy program of the proposed study will not leave even a single stone unturned. The advocacy programs will help disseminate information like the wild fire and therefore, it would certainly draw the attention of the general public for the conservation of bear for the lasting good of man.

The key outcome from this project would be

1. Knowing the different types of black bear habitats and their threats posed by the developmental activities and park residents.

2. Documenting the distribution and abundance of the different diets of the Black bears and the competition for these resources from the park residents and edge effect of the developmental activities on these diets.
3. Educating the local communities and advising the law makers on the importance of bear habitats and diets in mitigating the Human-Bear Conflict.

CHAPTER TWO

Literature Review

2.1 Background

According to the Bio Expedition, the Himalayan Black Bear is able to adapt very well to a variety of changes in the natural environment and therefore, it is through these adaptations that they have been able to continue to survive.

The Himalayan Black Bears are said to be arboreal mammals as they spend half of their lives on trees rather than on the ground (Bio Expedition, n.d).

These Himalayan Black Bears can hibernate but not all of them hibernate due to varying reasons. Both males and female sleep in the northern latitude and in the tropics, only the female giving birth hibernate (Hwang & Garshelis, 2007). The hibernation month starts from November until March taking previously the time to prepare their den during October (Bio Expedition, nd). According to Sathyakumar et al,(2006) the altitudinal range of the Himalayan Black Bears may extend up to 4300 meter above sea level and changes the habitat and altitude seasonally.

The Himalayan Black Bears are considered Generalists as they feed on varying diets ranging from succulent vegetation in spring to insects to variety of tree and shrub borne fruits in summer to nuts and acorns in autumn to meat at times (Bromlei, 1965 & Hwang et al, 2002 & 2010.

2.2 Himalayan Black Bear Diet and Feeding.

The Himalayan Black Bears are considered to be omnivores as their feeding habits are very diverse. They prefer to consume fruits, berries and nuts in the fruiting seasons. They also look for honey and carrion in the trees. They have short claws to open termite mounds. At times of food scarcity, they also consume bark from the trees. Sometimes they can be seen on the ground looking for other animals to eat. They were reported to predate on wild boars, water buffalos and barking deer in rare occasions. Sometimes they often look for dead fish (Bio Expedition, nd).

As reported by Bourne, (nd), Himalayan Black Bears also feed on fungi and invertebrates like bees, wasps and ants, small crustaceans, small vertebrates and larger vertebrates which are either killed or eaten as carrion. The Himalayan Black Bears also feed on cultivated fruit crops such as maize, sorghum, dates and pineapples (Dierenfeld, nd).

Bourne (n.d) reported that a study in the Tangjiahe Reserve, China found that these bears ate at least 28 wild plant foods. These included mainly forbes and leaves from shrubs during April to mid- July, with fruits added mid- July to mid- September and were sometimes supplemented by bamboo shoots in August. The bamboo shoot preferred by these bears is the *Fargesia scabrida*.

In Japan, the Black Bears feed on grasses, sedges, buds and herbs in spring and in summer and autumn, they mainly feed on berries and nuts (Dierenfeld & Bourne).

As reported by Dierenfeld & Bourne (n.d) a study of the diet of Asiatic Black Bears in Japan using carbon and nitrogen stable isotope analysis found that bears from the alpine areas ate mainly vegetable material like c_3 plants. The analysis also found little animal material in spring. The acorn was found as the main diet for the bears prior to hibernation.

2.3 Himalayan Black Bear Habitats.

The home range of HBB vary widely across the southern part of Asia, all the way from Pakistan, across the northern part of India and the southern part of China. It is also found in Taiwan, Korea, Japan, southern Siberia and northeastern China (Bears of the World).

The HBBs like heavily forested mountainous areas and moist tropical forests. They are at times found at elevations of up to 13,000 feet and descend down to lower elevations during the colder seasons. Their territories are usually less than half square miles, depending on the availability and abundance of the food (Bears of the World).

The HBBs are said to be nocturnal near human habitation and diurnal in forested areas. They sleep in caves or hollow trees, coming out at night to feed (Bears of the World).

HBBs have been reported to use alpine habitats (Novikov 1956, Hazumi 1994). In India, the HBB inhabits forested hills ranging from 1,200 m to 3,300 m (Prater 1980). The HBB distribution in the Indian subcontinent is contiguous with Nepal and Bhutan.

According to WWF, the HBBs use Broad leaved and coniferous forests to an elevation of 4300 meters. The bears use rock crevices, hollow trees and stumps, upturned trees and dug out earthen dens as their habitats for hibernation (Hazumi *et al.* 2001).

They use rock caves as shelters during daytime, and feed at night, possibly to avoid the sun or encounters with people in this very exposed habitat (Fahimi *et al.* 2011).

In Russia, ABBs selected flat river bottoms for denning (Seryodkin *et al.* 2003), whereas in central China they moved to high elevation rocky outcrops on steep slopes (Reid *et al.* 1991).

Likewise in Japan, dens tended to be in remote, difficult to access mountainous areas (Huygens *et al.* 2001, Koike and Hazumi 2008).

2.4 Threat to habitats and diets of the Himalayan Black Bears.

According to the IUCN, the major threat to the habitats and diets of the HBBs are habitat loss due to logging, expansion of agriculture and plantations, roadway networks and dams. The IUCN reported that habitat loss due to logging and conversion to agriculture is a major threat to bears in 9 of 18 range countries, including Afghanistan, Bangladesh, Cambodia, India, Lao PDR, Myanmar, Nepal, Pakistan, and Russia. Of these countries, Myanmar stands out as it encompasses a relatively large portion (about 12%) of the global range, so habitat loss here will have a large impact on the global status of the species.

Habitat loss and degradation is most severe in the southern portion of the range. In India, <10% of the species' range is within protected areas (PAs), and areas outside PAs are subject to development projects and extraction of wood for fuel and livestock fodder (Sathyakumar 2006, Sathyakumar *et al.* 2012). In Bangladesh, where forest cover is very low comparing to other neighboring countries (<7% of the land area), Himalayan Black Bears survive only in small remnant patches in the east, generally near the Myanmar and Indian borders. Cambodia and Myanmar, although still well forested (57% and 48%, respectively), are third and fourth in the world in the annual rate of loss of forested area (among countries occupied by black bears; North Korea and Pakistan have higher rates (FAO 2010). Thailand has lower forest cover (<30%), but most of its remaining forests are within PAs, and three-fourths of these are occupied by black bears (Kanchanasakha et al. 2010). Natural Forest area in Vietnam is highly degraded from both legal and illegal lumbering (Nguyen Xuan Dang 2006, FAO 2010).

CHAPTER THREE

Methodology

The methodology is an important part of the research aspect. The systematic sampling was adopted in finding the different types of wild fruits and vegetables, canes and shoots and nuts and acorns. The snow ball sampling were carried out in determining the habitat destruction and the intensity of damages. Habitat types were also determined through the systematic sampling by lying out the plots.

3.1 Sample plots.

The transects were laid in such a way that they touch valleys, ridges, gentle and sloppy areas within the study area following the systematic sampling. A maximum of 1500 were kept between each transect and 260 m between each plot to cover maximum Black Bear habitats. The plot radius was 20 m to collect the animal evidences and within this plot, a sub plot of 10 m x 10 m and 3 m x 3 m was created alternatively to collect data on tree species and other wild edible fruits and vegetables.

For the social survey, sampling was drawn from the population of the study area. Sampling size was determined by using Yamane's formula: $n = N/1+Ne^2$ (Where, n=sample size, N=population size, e^2 =the error of sampling) at 95% confidence level and 5% error level (0.05).

3.2 Data Collection.

Both the primary and secondary data were collected.

3.3 Primary Data

Working colleagues of the Jigme Dorji National Park and Wildlife Conservation Division were deployed to carry out the field survey activities. Before the actual field survey begins, the survey sheets for data collection were prepared and consulted with the senior colleagues for proper verification.

3.4 Secondary data

These data were collected through the available books, literatures, journals, and internet and official reports.

3.5 Data analysis

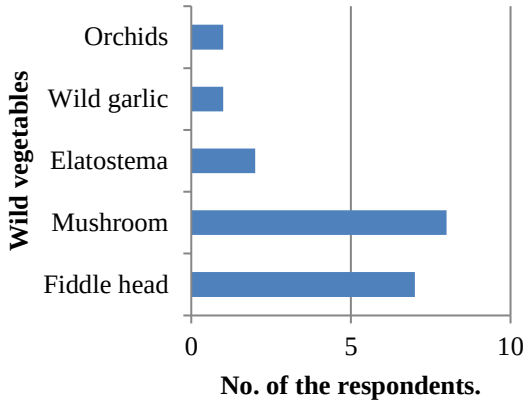
The combination of descriptive as well as statistical tools were used to analyze the data. The data were processed using Statistical Package for the Social Sciences (SPSS) software , Stata Software and MS-Excel. The analysis of data were done through cross-tabulations, frequency tables, pie diagrams and graphical presentations. The descriptive statistical analysis was used to transform raw data. The techniques like simple tabulation are used for frequency tables, determination of mean, median and mode.

CHAPTER FOUR

Results and Discussion

This chapter shows the different diets of the HBBs for the different seasons in a year. Along with this the chapter also shows the discussion on the competition on these diets by the park residents. The different types of HBB habitats in the two study areas and their state of disturbances are also discussed under this chapter. The chapter also covers the abundance of the ungulates that the HBB may feed on during the scarcity period of the wild vegetables and fruit, nuts and acorns and shoots. The different types and number of awareness campaigns carried out during the entire period of the study are also reported under this chapter.

4.1 Different types of wild fruits, wild vegetables, acorns and nuts that the HBBs feed on and the distribution and abundance of the HBB diets.



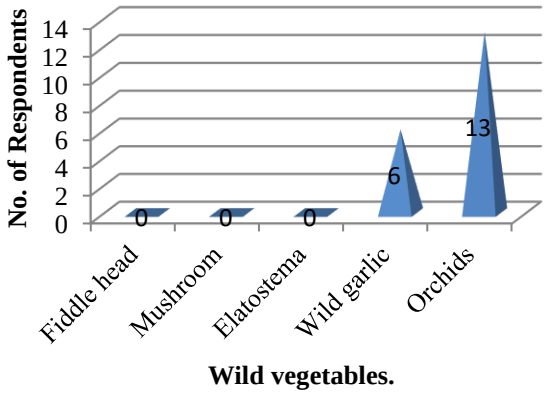


Figure 4.1 Showing the most commonly collected vegetable.

Figure 4.2 The lest vegetable found in the wild

The wild vegetables that are found in the study areas that the HBBs feed on are fiddle head, mushrooms, elatostema, wild garlic and orchids. The most abundant wild vegetable in the two study areas is fiddle heads followed by mushroom and elatostema. The least found wild vegetable is the wild orchids. All 100% of the respondents are found collecting the wild vegetables with mushroom as their most favorable to orchids as the least favorable. The figures 4. 1 and 4.2 given above shows the most commonly collected and least growing wild vegetables.

The majority of the respondents (10 respondents) collect the vegetables for all the four months of the summer season during which the vegetables grow. Six respondents collect the vegetables for three months and three respondents collect the vegetables for two months and there is not even a single respondent that collect the vegetables for one month. Therefore, it is very clear that the collection of the wild vegetables by the respondents is very heavy although 32% of the respondents know that the HBBs also feed on these vegetables. No respondents leave behind few vegetables back in the wild for the HBBs to feed. Fig 4.3, 4.4 and 4.5 below shows the number of months and the respondents collecting wild vegetables, the number of the respondents' awareness of HBBs feeding on the wild vegetables and the number of respondents who leave behind few vegetables in the wild for the bear respectively.

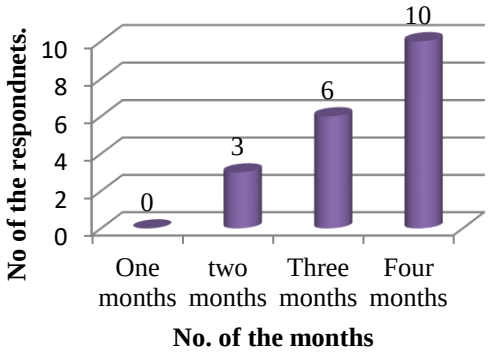


Figure 4.3 No of months spend for collecting veget

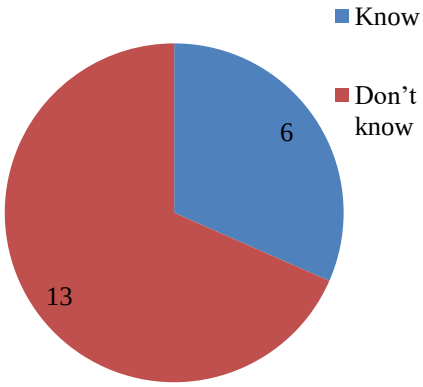


Figure 4.4 No of respondents who know that the HBBs also eat the wild vegetables.

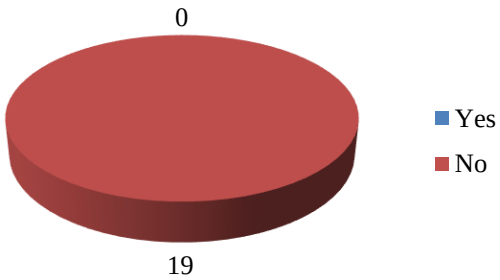


Figure 4.5 No of respondents who leave behind few vegetables in the wild for the bears to feed.

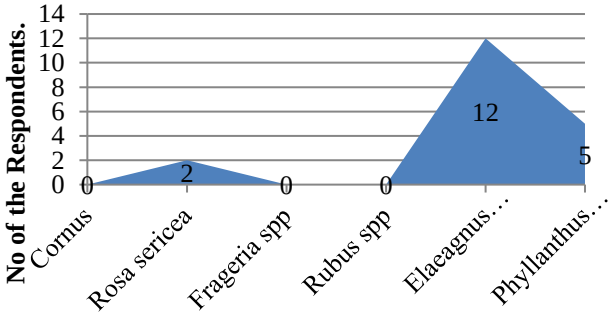


Figure 4.6 The most abundant wild fruit

The wild fruits like *Cornus, Rosa sericea, Frageris spp, Rubus spp, Elaeagnus parvifolia* and *Phyllanthus emblica* grow in Pelgiri and Zongkha. According to the respondents, the most abundant wild fruit that grow in these two areas is the *Elaegnus parvifolia* followed *pyphyllanthus emblica* and *Rosa sericea*. The others are not found in plenty. The figure:4.6 given above shows the wild fruits and their growth abundance according to the respondents.

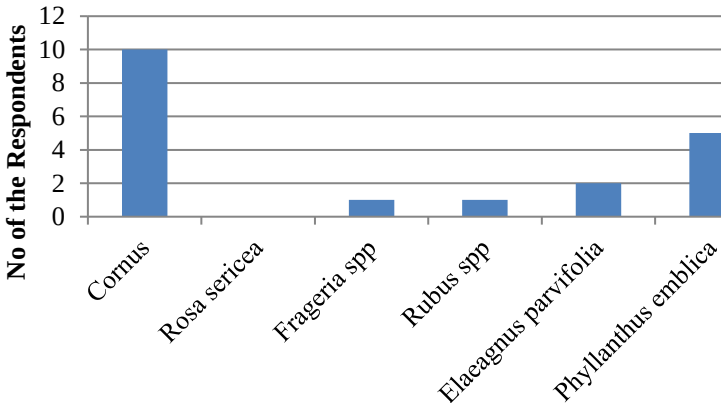


Figure 4.7 The most commonly collected wild fruit

Like the wild vegetables, all the respondents collect these fruits and the most collected wild fruit is the Cornus. The figure 4.7 above shows the most collected wild fruit by the respondents/park residents. Therefore, it looks very obvious for the HBBs to raid and look for some other easy foods as the least grown fruit is collected the most by the park residents.

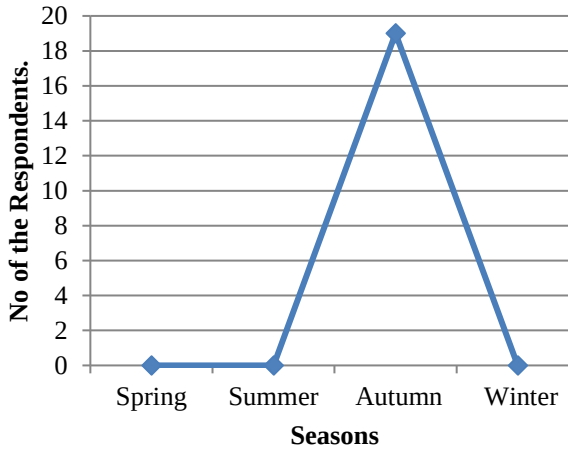


Figure 4.8 Collection season of the wild fruits

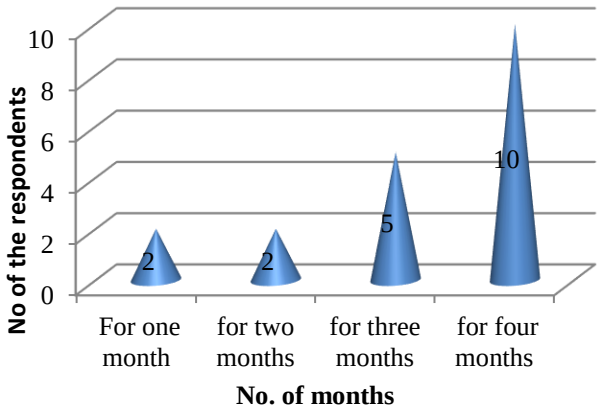


Figure 4.9 Number of months spent on collecting wild fruits

As shown in the figure 4.8 above, the wild fruits are collected during the autumn months. Ten respondents collect the fruits for the entire autumn season, five respondents collect for half the season and two respondents each collect for a duration of one and two months.

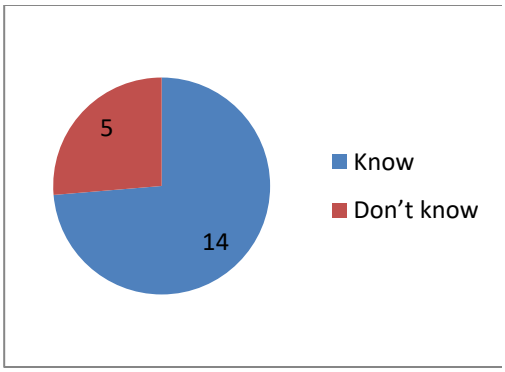


Figure 4.10 No of people who know the HBBs also eat wild fruits.

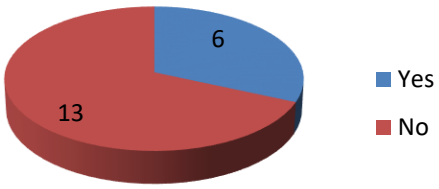
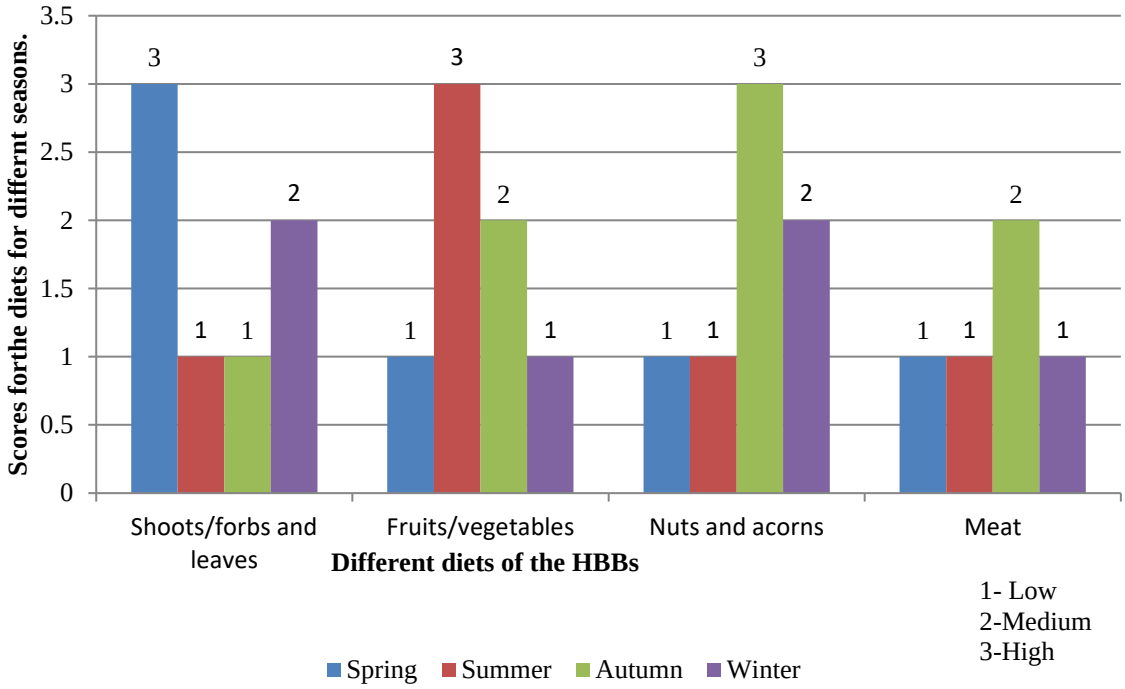


Figure 4.11 No of people who leave behind few fruits in the wild for the bears to feed.

In the above Fig:4.10, although 14 respondents (74%) of the respondents know that the HBBs also feed on these wild fruits but only six respondents (32%) leave behind few fruits in the wild for the HBBs to feed.

Both the vegetables and fruits are found to be growing sparsely over the two study areas.

4.2 Dietary pattern of the HBBs in Pelgiri and Zongkha.



Dietary pattern is seemed to be influenced by the availability of the foods in the wild in different seasons. The fecal analysis show that the HBBs feed on shoots/forbs and leaves in spring, fruits and vegetables in summer, Nuts and acorns in autumn and in winter season, the bears were found feeding on meats and tree barks. Only few fecal samples were available for collection in the winter season. The feeding pattern for the HBBs for different seasons is indicated by the scores, 1 to 3. Score 1 means Low, 2 means Medium and 3 means High.

4.3 Habitats of the HBBs in Pelgiri and Zongkha and their status.

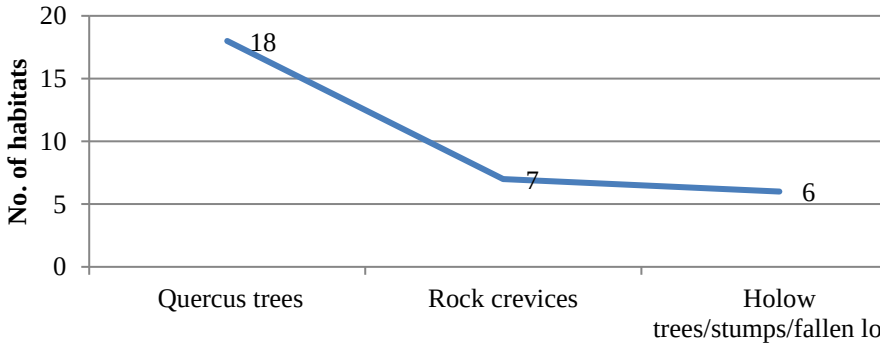


Figure 4.3.1 Habitat preferences of the HBBs in the study areas.

In the study areas, a total of 31different habitats are found. As shown in the figure 4.3.1 above, there are 18 habitats made on the oak trees (eleven at Pelgiri and seven at Zongkha), seven rock crevices habitats (four at Pelgiri and three at Zongkha) and six habitats made in hollow trees/fallen logs and stumps (two at Pelgiri and four at Zongkha). The t-test shows the p value 0.4 and therefore, the difference in the number of habitats in the two study areas is not significant.

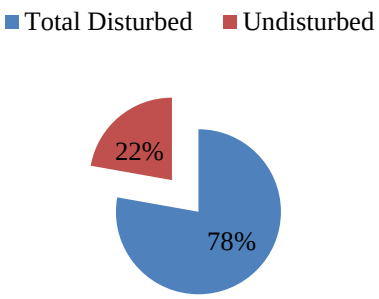


Figure 4.3.2 Disturbed Vs undisturbed habitats in the study areas

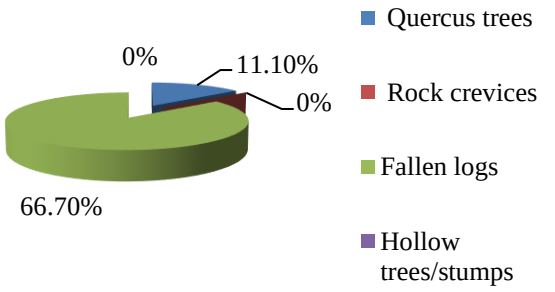


Figure 4.3.3 Destruction of the habitats in the study areas

The disturbance and destruction to the HBB habitats in the two study areas is very high. 78% of the habitats are found disturbed and destructed due to the human activities. Only 22% of the habitats are found undisturbed (see fig:4.3.2). The destruction rate for the habitats made on fallen logs is very high (66.70%) followed by the habitats made on oak trees (11.10%). The fallen logs were found converted to timber and some used as fire wood (Refer fig:4.3.3).

The construction of the motor road in between the two study areas is not found disturbing the habitats of the HBBs but it is more likely having affects on the trails and diets of the bears. In many areas, the slopes created by the cuttings of the road are not less than 60º. Many oak trees that bear fruits and nuts for the bears are cut down during the construction of the road.

4.4 Different types of ungulates and their abundance in the study area.

There are four species of ungulates found in the study areas. The ungulates found in the two study areas are Samber Deer, Barking Deer, Himalayan Goral and Musk Deer.

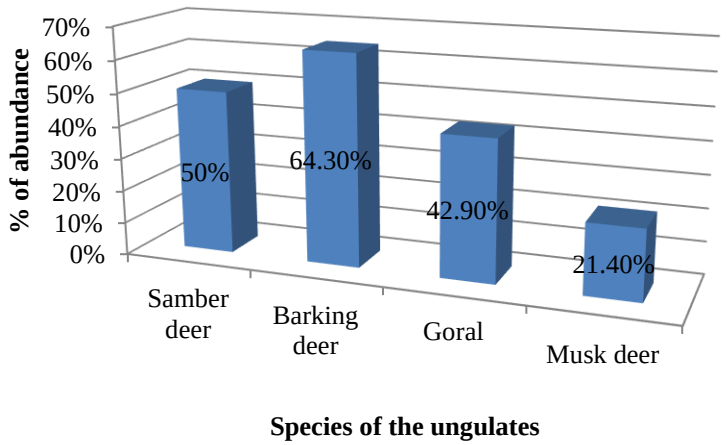


Figure 4.4.1 Relative abundance of ungulates in the study areas

The above figure shows the relative abundance of the ungulates in the two study areas. Barking Deer has the highest relative abundance of 64.30% followed by Samber Deer with 50%. The Musk Deer has the relative of just 21.40%. Therefore, it is deduced that the relative abundance of Barking Deer is very high in the study areas.

CHAPTER FIVE

Conclusion

Understanding the basic ecology of the HBBs such as their seasonal diets, different types of habitats and the various threats and competition to their diets and habitat fragmentation, habitat configuration and habitat loss are very crucial components in the management of Human-Bear Conflict.

According to Bio-expedition, HBB is able to adapt very well to a variety of changes in the natural environment that makes them able to continue to survive amidst the various biotic and abiotic factors affecting their ecology. However, when the changes in the natural environment cross the threshold, the HBBs may cause conflict resulting in crop raid and some other properties of human/ inhabitants.

The feeding habitat of the HBB is very diverse and is considered omnivores. According to the findings from the fecal analysis, the HBBs feed on shoots/forbs and leaves in the spring, fruits and vegetables in the summer, nuts and acorns in the autumn. In the winter season, the bears were found feeding on meats and tree barks. The competition for the wild vegetables and fruits between the HBBs and the park residents are found very tough and high. Only 46% of the park residents are found to leave behind few wild fruits in the wild for the HBBs to feed and 0% of the park residents leave behind wild vegetables for the HBBs.

By 1990s the habitats of the HBBs have reduced to one-fifth of the area they used to have by the beginning of the century. These reductions in the habitat are due to increased human population and deforestation (Bio Expedition, n.d). The study found a very high disturbance and destruction of the HBB habitats in both the study areas. The average destruction and disturbance is 78%. Only 22% of the habitats were found undisturbed. The following points were worthy to be included in the recommendation.

1. Park residents need to be more educated on the wise collection of wild vegetables.
2. The slopes of the newly constructed road are very high in many stretches of the road. Appropriate measures need to be taken to the overcome the difficulties posed by the high gradient cross cutting to the wild fauna in between the two study areas.

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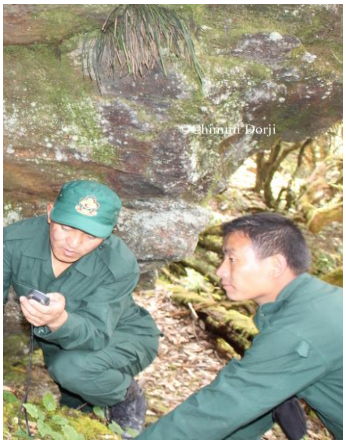
Annexures

Annexure 1.1 Photographs



Pic 1: Author and a fellow researcher noting HBB habitat

Pic 2 : Rosa fruit flowering

Pic 3: Wild straw berries, a delicacy for HBBs

Pic 4: *Elaeagnus* fruit, another delicacy for the HBBs

Pic 5: Cornus spp fruit

Pic 6: Yellow Himalayan fruit

Pic 6: Canthrellus mushroom, a delicacy for humans and HBBs

Pic 7: Fiddle heads and orchid (Cymbidium erythraeum)

Pic 8: Wild mushroom (Ramaria asiatica)

Pic 9: Women selling wild mushroom on high way

Pic 10: Author with the participants at an awareness campaign

Pic 11: Participants and resource person eating lunch at an awareness campaign

Annexure 1.2 Questionnaires.

1. Respondent no…… Area…….
2. Do you collect wild vegetables? Yes NO

   2.1 If yes, name the vegetables.

   ……

   ……

   ……

   ……

   ……

   2.2 How much do you collect in a year?

   ……

   ……..

   2.3 When do you collect? Mention months and season

   ……

   …….

   2.4 Which wild vegetable is most commonly collected?

   …….

   2.5 Which wild vegetable is found abundant in the wild?

   ……..

   2.6 Which wild vegetable is found least in the forest?

   …….

   2.7 Have you ever come to know that the Himalayan Black Bears also eat these vegetables?

   ……..

   2.8 What will the bears eat if all these wild vegetables are collected by human?

   ……..

   2.9 Do you think it is necessary to leave behind half the amount of vegetables that grow in the wild should be left back in the wild for the bears to feed?

3. Do you collect wild fruits ? Yes NO

3.1 If yes, name the fruits

……

……

……

……

……

3.2 How much do you collect in a year?

……

……..

3.3 When do you collect? Mention months and season

……

……

3.4 Which wild fruit is most commonly collected?

……

3.5 Which wild fruit is found abundant in the wild?

……

3.6 Which wild fruit is found least in the forest?

……..

3.7 Have you ever come to know that the Himalayan Black Bears also eat these wild fruits?

……

3.8 What will the bears eat if all these wild fruits are collected by human?

……

3.9 Do you think it is necessary to leave behind half the amount of fruits that grow in the wild should be left back in the wild for the bears to feed?

……