Conservation status of black bear (*Ursus thibetanus*) in the Kumrat valley, Pakistan

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Asiatic black bear (*Ursus thibetanus*) is one of the vulnerable species classified by IUCN Red list due hunting for its body parts and habitat fragmentation. The forest zone of Kumrat, is one of the important habitat for black bear. The primary objective of the study conducted was to determine the conservation status of Asian black bear in Kumrat valley. Pre-planned questionnaire and interviews were conducted for data collection. The results showed that black bears used to cause damage to the local property, crops and livestock and as a result, the community was hunting it ruthlessly. Illegal hunting and habitat loss in the form of deforestation, visit to forest areas for recreation and grazing of livestock were among the main anthropogenic activities causing threats to black bear. These activities resulted in gradual decline in their number and had brought it at the verge of extinction in the study area. To conserve this rare species, awareness among the people regarding its conservation, incentives to the local community in case of losses, strict regulation measures, sustainable tourism and control on the deforestation are the main recommendations of this study.

Keywords: Conservation status; Black bear; Kumrat valley; Wildlife; *Ursus thibetanus*

INTRODUCTION

Asian black bear (*Ursus thibetanus*) is one of the largest carnivores on Earth, widely distributed in countries like Iran, Afghanistan, China, India, Japan, Korea, Laos, Pakistan, Taiwan and Vietnam (Garshelis and Steinmetz, 2008; Escobar et al. 2015). It is found in a variety of habitats e.g. both broad leaved and coniferous forests. It is also famous in shifting habitat and food habits seasonally (Sathyakumar and Viswanath, 2003; Izumiyama and Shiraishi, 2004; Hashimoto and Anrui, 2013).

It is a large, stocky omnivore with plantigrade feet, short tail, small round ears, and small eyes. Its color is generally uniform except for a brown muzzle and occasional white marking or "blaze" on the chest, with blazes occurring on up to 25% of individuals in some populations (Rounds, 1987). Average adult black bears stand less than 2.9 feet (0.9 meter) tall at the shoulder and are about 2.9 to5.0 feet (0.9 to 1.5 meters) in body length. Black bears exhibit sexual size dimorphism with males typically 20% longer and 10 to 70% heavier than females. Adult female black bears weigh from 90 to 300 pounds (41 to 136 kg), and adult males weigh from 132 to 485 pounds (60 to 220 kg). All bears tend to gain weight in fall and lose weight during the winter

period of inactivity (Ternent, 2005).

The habitat of black bear overlaps with the local people in its distribution; they are considered as a big threat to the property, cattle and crops. In rural areas, the private property is damaged by black bears is most common (Juárez-Casillas and Cora Varas, 2013). Bears scavenge on carrion of wild animals and livestock when available (Ayres et al. 1986). The home range size of females is linked to habitat quality, whereas male home range size may be a function of the availability of estrous females (Rogers, 1987). Females with newborn cubs have smaller home ranges that gradually increase as the cubs mature (Ternent, 2005). Annual male home ranges are generally larger than those of females (Koehler and Pierce, 2003; Carter et al. 2010) and are thought to increase the potential for breeding opportunities. Movements and activity of black bears varies in response to food supply. Black bears can travel long distances to exploit concentrated food sources such as soft and hard mast, human refuse, and agricultural crops (Garshelis and Pelton, 1981; Rogers, 1987).

Black bears are omnivorous and opportunistic feeders, often referred to as food driven i.e. consume both plant and animal matter but about 75% of their diet consists of vegetation such as skunk cabbage, sedges, and grasses (Ternent, 2005). Most animal matter consumed by bears includes colonial insects and larvae such as ants, bees, beetles, and other insects (Hwang et al. 2002; Huygens et al. 2003; Hashimoto and Anrui, 2013). According to Hwang et al. (2010), food availability is one of the most important factor affecting their distribution and home range. Due to habitat destruction and poaching of bear prey, food availability for these bears has been decreased and has resulted in increased raiding of cultivated fruits and crops and human-bear conflicts (Huygens et al. 2003; Hwang and Garshelis, 2007; Skripova, 2013).

According to Perveen and Abid (2013), various studies have been conducted regarding the interaction of Asian black tiger and humans but scanty information is available about its distribution in western parts. Earlier, Khan et al. (2012) reported the evidence of conflict between Asian black bear and human in the form of crop raiding and bear-baiting. Recently, killing of Asian black bear by local people and bear raiding on humans and livestock was reported in a number of studies (Hwang and Garshelis, 2007; Skripova, 2013; Awais et al. 2016). Nocturnal activity is uncommon but sometimes occurs if bears are avoiding areas of high human activity lie campgrounds, urban areas, roadways, and garbage dumps (Waddell and Brown, 1984; Ayres et al. 1986; Ternent, 2005). Both human and black bear behavior is responsible for human–black bear conflicts (Conover, 2008).

In Pakistan, the Asian black bear is still one of the least-known mammal species and up to our knowledge, no proper study has been conducted regarding the interaction of Asian black bear and human and particularly regarding conservation status of Asian black bear in the Himalayan region of Dir-Kohistan. Studying its current status, causes of its habitat destruction and its interaction with humans would contribute towards its conservation and ultimately in sustainable environment. Based on these assumptions, we conducted this study to investigate its current status, causes of habitat loss, its interaction with community and recommend proper conservation measures.

MATERIALS AND METHODS

Study sites
The study was conducted in Kumrat valley, District Dir (Upper) during 2012. The whole area is usually known as Dir Kohistan (Fig. 1).These valleys cover 140,351 acres of the coniferous forests situated between latitude 35°9' to 35°47' and longitude 71°52' to 72°22' in the northern position of the watershed of Panjkora River. Dir-Kohistan Valley is situated in the North-Eastern side of Dir town, on its eastern side is Swat valley while on its western side is Chitral valley. Kumrat one is one of the beautiful valley enriched with natural resources and biodiversity (Mohammad et al. 2015). According to FDC source at Sheringal that the total area of Dir Kohistan is 412,570 acres in which estimated agriculture land is 33,915 acres and forest is about 378,655 acres. (Anonymous, 1998).

Data collection
The data regarding presence of bear, its conflicts with people, and damages to the people, bear related activities and other relevant data with respect to the topic was collected. For data collection, many tours were arranged with the help of local people as a guide to the areas where the presence of the bear was expected. Questionnaire, survey, in-depth interview and focused group discussion were used to collect information on Black bear.
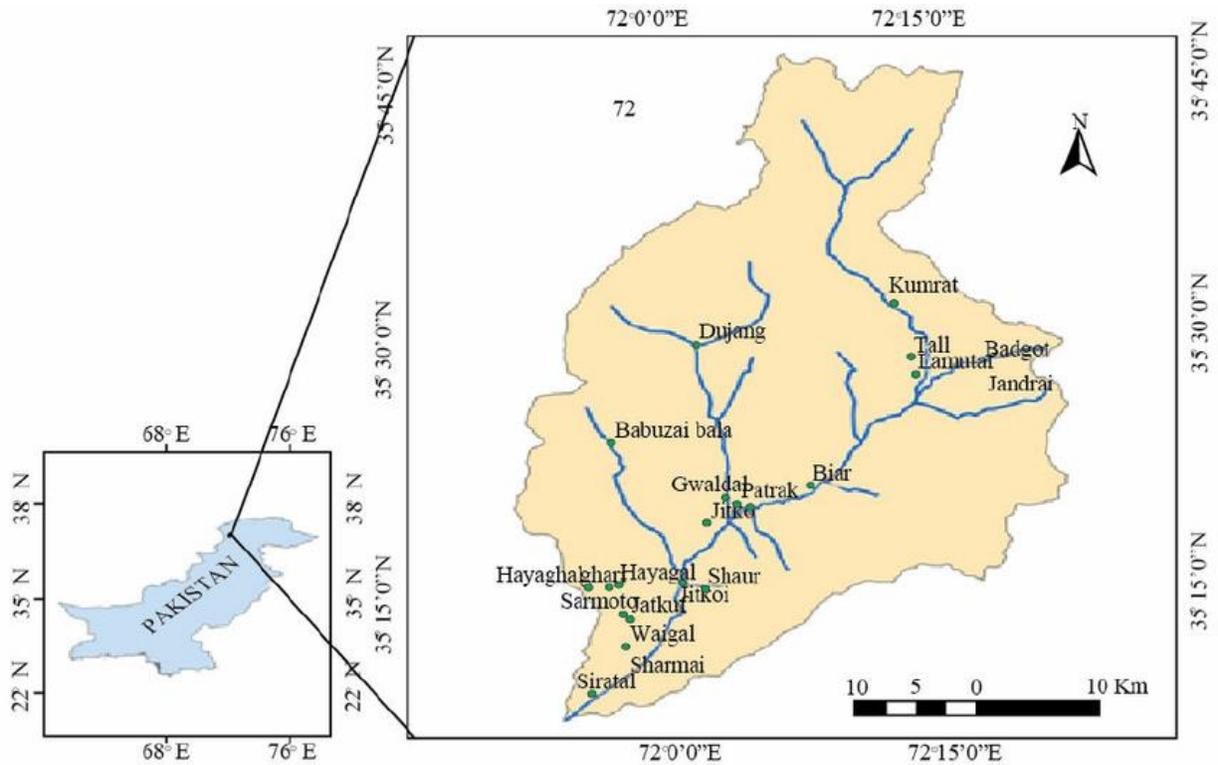
Figure 1: Location map of the study area, a rich biodiversity spot of Dir-Kohistan, Khyber Pakhtunkhwa, Pakistan

Ten villages were purposively selected based on their closeness to forest reserve. Within these villages, random sampling was further used to select house hold heads for interview, 60 respondents across the selected villages were interviewed. During the questionnaire survey, participant group meetings were conducted and research objectives explained.

RESULTS

The literacy rate of study area is very low (33%); the main occupation of the people in the study area is farming and laboring, majority of the people having their own land and cultivate themselves. Local name of the bear is "Malo" in Pashto language while "ayesh" in local Kohistani language which is known by each and every person living in the area. The key results obtained are discussed as follows:

Presence of the black bear

Most of the local people were familiar with the name and presence of the black bear in the study area (Table 1). About 30% respondents have

seen the bear in the area, 22 respondents (37%) have observed the damages caused by the bear

in the area while rest of the respondents (33%) were with the idea that bear was present in the area but they didn't see it as they were living in the remote area of thick forest zone.

Table 1. Showing the presence of the bear

Bear Presence	Frequency	Percentage
Seen	18	30%
Not Seen	20	33%
Damage Observed	22	37%
Total	**60**	**100%**

Total number of the black bear

A remarkable number of the black bear was present in the research area but not properly conserved. No exact information was there about the total number of the bear, however on the basis of their experience and familiarity with the hunting and shooting, the respondents answered the

question which shows that approximately 20 aged bears, 25 young ones and 30 to 35 cubs were present in the valley of Kumrat (Table 2).

Table 2. Total number of the bear in the study area as observed by the interviewees

Bear	Frequency	Percentage
Aged	20	25%
Young	25	31%
Cubs	35	44%
Total	**80**	**100%**

Threats from bear

Majority of the people were facing a great threat from the bear regarding livestock damages, crop damages, house damages etc. As shown in Table 3, about 75% of the whole respondents were facing direct threats while rest of the respondent was facing indirect threats when they were trying to go to forest.

Table 3. Response of interviewees about threat from bear

Response Of Interviewees	Frequency	Percentage
Direct Threats	45	75%
IndirectThreats	15	25%
Total	**60**	**100%**

Damage caused by black bear

Black bear cause damages to the local people, crops and livestock and these damages occur mostly in those areas which are adjacent to the forest area. Majority of damages were observed in livestock, crops, houses and human life. As clear from the data in Table 4, 30 respondents were facing damages to their livestock, 15 respondents had crop damages, 10 respondents feeling fear of their house damages while rest of the respondents were facing life threats from bear when going toward the bear residential area in searching out their livestock.

Table 4. Damages caused by Asian black bear

Damages	Frequency	Percentage
Live Stock	30	50%
Crops	15	25%
Houses	10	17%
Life Threats	5	8%
Total	**60**	**100%**

Livestock affected by black bear

The data showed that goats and sheep were mostly affected by black bear raids (Table 5). Data indicated that 15 sheep, 15 goats and 10 cows became victims of the bear per year per bear.

Table 5. Livestock affected by Asian black bear

Livestock	Frequency	Percentage
Sheep	15	37.5%
Goat	15	37.5%
Cows	10	25%
Total	**40**	**100%**

Threats to black bear

In the study area, black bear had a lot of threats from the community. There was a huge conflict between human and bear since a long period of time. The basic and the main threat was the habitat loss due to different anthropogenic activities followed by illegal hunting of bear by the local hunter while poaching was also an emerging threat. Data in Table 6 showed that 58% of the respondents found habitat loss as the main threat, 25% of the respondents were with the opinion that hunting of the bear was the main threat to bear life while the rest of the respondents were with the idea that poaching was the main threat.

Table 6. Threats to Asian black bear

Threats	Frequency	Percentage
Habitat Loss	35	58%
Hunting	15	25%
Poaching	10	17%
Total	**60**	**100%**

Habitat loss of bear

As earlier mentioned, habitat loss was the main threat to the black bear in the study area. Several causes of habitat loss such as cutting of the forest, increase in the population of the human, continuous visit of the people to the forest area and hunting of the bear were found responsible. According to the data presented in Fig. 2, 22(37%) respondents were in favor that illegal hunting as the main reason behind habitat loss of bear while 18(30%), 12(20%) and 8(13%) respondents, respectively found continuous visit of the local people, forest cutting and increase in human population as the main reasons for habitat loss of bear.
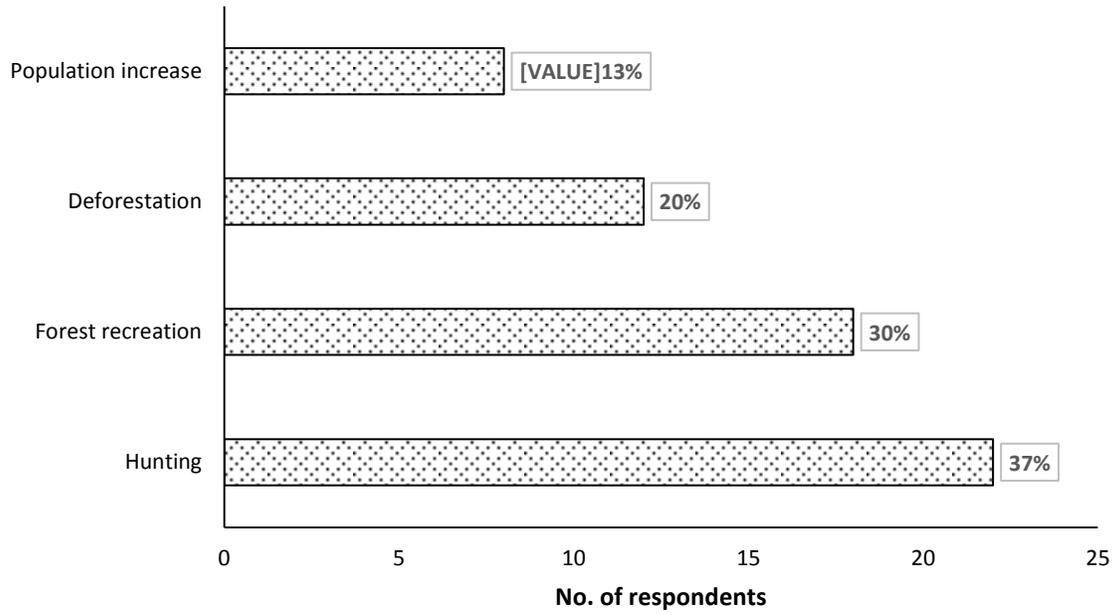
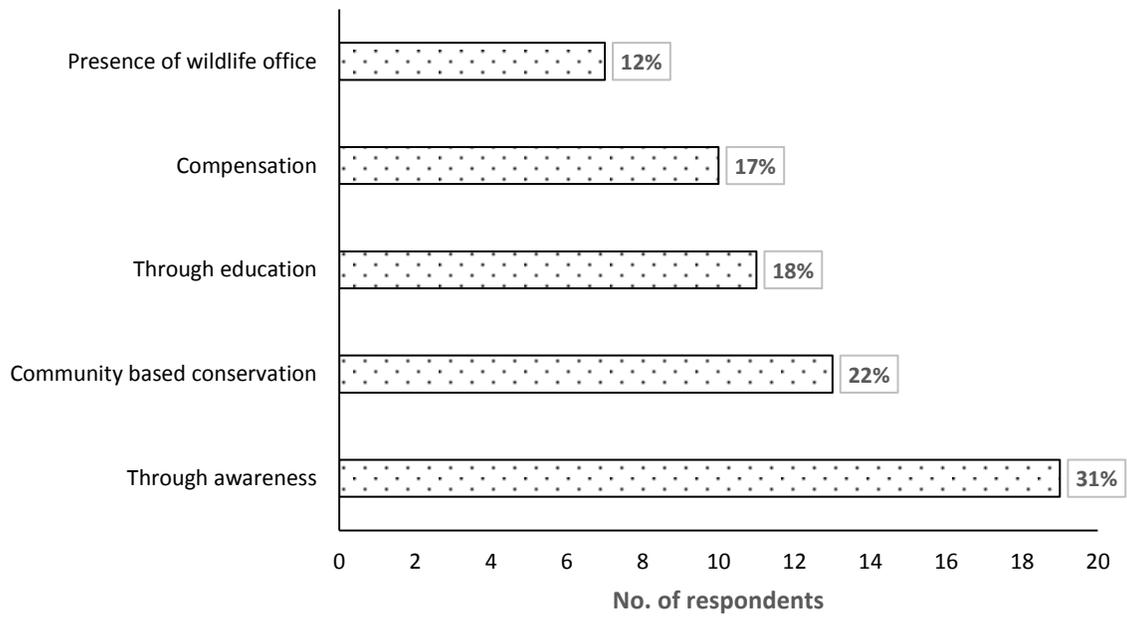**Figure 2. Factors responsible for habitat loss of Asian black bear**

Figure 3. Ways to control illegal hunting of Asian black bear

How can we stop illegal hunting?

The conservation status of bear in the study area was very poor. Illegal hunting of the bear was the main threat towards habitat loss of the bear in the study area. From the data (Fig. 3), it was found that About told that illegal hunting can be stopped through creation of the awareness in the local community19(31%), by engaging the local people in the conservation process 13(22%), through education 11(18%), paying compensation to the people for damages caused by bear 10(17%) and presence of wildlife office 7(12%).

DISCUSSION

Most of the people residing in the study area were familiar with the existence of the bear due to its destructive activities observed. It was seen by those people who were living in adjacent areas of the forest and visiting to forest for the collection of fuel wood, to take herds for grazing, for hunting, for collection of medicinal plants etc. Rapid population growth has resulted in increased demands for natural resources and their subsequent depletion has resulted in decreased population of bears and other wildlife. There is an increasing trend in the use forest resources as fuel wood which has resulted in deforestation and ultimately in the habitat loss for bears (Escobar et al. 2015). In Pakistan, bear's population is declining due to many anthropogenic factors such as habitat loss and fragmentation, hunting and commercial poaching for bear body parts and their cubs to gypsies (Sheikh and Molur, 2004).

Hunting of bears especially female bears was done to catch their cubs for sale to gypsies as clear in the discussion made during data collection. These are also hunted as sport activity by military officers, persecuted by the villagers who feel their livestock threatened. Nomad grazers have been found to be involved in bear hunting for commercial purposes. Moreover, Asiatic black bear is well renowned in causing crop damage (Khan et al. 2012). Crop damage is confused with caused by wild bears and jackals but the local respondents were well experienced and they can easily differentiate the damages caused by them. Human bear conflict is well renowned global problem and several reasons have been responsible for this conflict (Conover, 2008). In the present study, increased human population with increased human encroachment, subsistence agriculture and livestock farming were the main reasons for bear habitat destruction (Fig. 2). According to the people living in the study

areas, bear raiding into the residential areas for food and to damage the maize crop, was mostly during night. Increased human encroachment of local forest communities has resulted in both human reaction to the bears and in response crop and livestock damage (Hwang and Garshelis, 2007; Baruch-Mordo et al. 2008; Skripova, 2013; Awais et al. 2016). Raiding of agricultural produces and livestock caused by bears was a continuous mental threat for the local communities as revealed through the discussion with local respondents. Bears attacks on human is a widely circulated news and 04 attacks in a specific area, is counted towards little fear. Moreover, due to advancements in motor travel, limited late night travel and a lowered bear population has resulted lower number bear attacks on human (Hwang and Garshelis, 2007; Skripova, 2013). Serious efforts in this regard are needed in order to investigate the ways in developing peaceful co-existence between bears and local communities (Ali et al. 2017).

The number of black bear was increasing as clear from highest number of cubs present in the study area (Table 2). The impacts of the local community on bear are to affect the habitat of the bear. The data showed that black bear was hunted illegally in study area and there was no rule and regulation regarding this issue. It was mostly hunted due to damages. The data indicates that illegal hunting of bear can be stopped only in case if government is giving compensation to the people of their damages which are caused by the black bear. About 80% of the local people were unfamiliar with the term "conservation". The local people can be engaged in the process of conservation by letting them know about the importance of the wildlife and biodiversity. They can also be engaged through spreading of education.

All of the people of the area were facing threats from bear in form of livestock damages and life threats for those who are visiting forest. The local people of the area cannot inform Wildlife Department about threats caused by bear as there was no wildlife office and wildlife watcher in the area. Moreover, there was no area which was protected or reserved or marked by the government or concern department and the entry of people coming for recreation, into the study area was free. The visitors were allowed to visit the particular areas where the presence of the bear was possible.

Recommendations

Based on the results obtained, the following are the main recommendation of the study:

- Educational awareness of the local people through environmental education about importance and conservation of wild life for sustainable environment
- Social awareness among the local communities regarding the population reduction of black bears
- Ensure incentives and share for the local communities residing in the surrounding areas of forest so that they could find their wages from other sources than sole dependence on forest resources
- Strict rules and regulation of wildlife law should be implemented in the form of fine and punishment for illegal hunting
- Increase number of wildlife staff for sound implementation of rules and regulation of wildlife law
- Discouraging deforestation in the wild area of Kumrat valley
- Promotion of eco-tourism and sustainable tourism instead of tourism

CONCLUSION

Based on the results, it was concluded that black bears cause damage to the local property, crops and livestock and as a result, the community was hunting it ruthlessly. Illegal hunting and habitat loss in the form of deforestation, visit to forest areas for recreation and grazing of livestock were among the main anthropogenic activities causing threats to black bear in the form of gradual decline in their number and bringing it at the verge of extinction in the study area.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest".

AUTHOR CONTRIBUTIONS

AW, AM and JM designed and performleed the experiments and also wrote the manuscript. AD, JM, SS and AK conducted data analysis and reviewed the manuscript. All authors read and approved the final version.

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