

PRELIMINARY SURVEY ON ASIATIC BLACK BEAR IN KASHMIR HIMALAYA, PAKISTAN: IMPLICATIONS FOR PRESERVATION

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Abstract

Asiatic black bears (Ursus thibetanus thibetanus) are considered vulnerable throughout their range. In 2012 we conducted field surveys and questionnaires in the autonomous state of Azad Jammu and Kashmir in Pakistan to document the presence of bears and to evaluate human – bear conflicts. We recorded bears mainly in the northern and eastern part of the study area and documented wide-scale human – bear conflicts, which often resulted in the killing and a generally negative public perception of bears. We recommend additional studies to more accurately evaluate black bear status, biology and human – bear conflicts and the establishment of a protected area for bears in the region. On a national level, an Asiatic Black Bear Action Plan that will guide and coordinate research, management and conservation efforts is necessary to safeguard the future of the species in the country.

Keywords: *Ursus thibetanus thibetanus; Crop damages; Endangered species; Himalayas; Livestock depredation; Management;*

Introduction

Economic development, human encroachment and unsustainable land – use patterns have led to an increase in fragmentation of natural habitats [1] and human – wildlife conflicts [2], which in turn have driven species worldwide towards extinction [1, 3-4]. Large carnivores are particularly predisposed to conflicts with humans [5] due to induced human mortality, livestock depredation and agricultural damages [6], and often their populations are endangered due to retaliatory human persecution [7]. Conflicts between humans and bears are currently globally on the rise and the negative impact on their conservation is increasing [8]. The success of carnivore conservation in general and of bears specifically, depends largely on the support of rural people [9], however such support may diminish if conflicts with humans increase [10-11].

The Asiatic black bear (*Ursus thibetanus thibetanus*) has been classified as vulnerable [12]; widespread illegal killing of bears and trade in parts, combined with loss of habitat, have

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resulted in the decline of the species in most parts of its range [13]. In Pakistan, Asiatic black bears used to be common 20 – 30 years ago [14], but now occupy only the Himalayan moist and dry temperate forests in the northern part of the country and the autonomous state of Azad Jammu and Kashmir (AJK) (Fig. 1). With fewer than 1,000 individuals remaining [15] Asiatic black bears are considered vulnerable in Pakistan and are threatened by habitat loss, poaching and live capture for bear baiting (i.e., exhibition fights between bears and dogs) [16]. On a national level Asiatic black bears in Pakistan are protected by the “Pakistan Wildlife Ordinance” of 1970 and on a local level by wildlife protection acts issued by each autonomous state [17]. However, no systematic monitoring and management actions for the species are currently in place and a National Action Plan has not been formulated yet. Habitat assessment, public awareness and conservation education have been identified as the main conservation priorities for black bears in Pakistan [16].

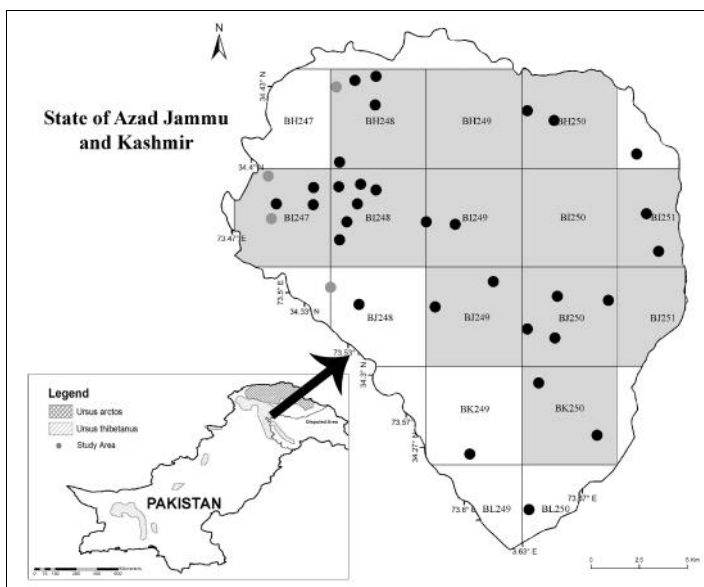


Fig.1. Map of the study area at the State of Azad Jammu and Kashmir.

In Figure 1 black circles indicate villages where human – bear conflicts were recorded, grey circles indicate villages where no human – bear conflicts were recorded. Grey shaded cells indicate areas where bear evidence was found during the field surveys; no bear evidence was found in the white cells. The inset map indicates the location of the study area within Pakistan and the approximate distribution of Asiatic black and brown bears in the country.

In 2012 we initiated a preliminary survey to document the presence and to describe and evaluate human – Asiatic black bear conflicts in a Himalayan landscape in Pakistan. Considering the current conservation status of the species, as well as the socio – economic situation in the country, we propose management actions to decrease human - bear conflicts and facilitate the effective conservation of Asiatic black bears in Pakistan.

Study area

The study was carried out in a 406 km² large and mountainous area in the Pir-Chinasi / Pir-Hasimar mountains (34^o 22' 12" N, 73^o 30' 47" E) in the State of AJK in Pakistan (Figure 1), which belongs to the Western Himalayan biodiversity hotspot [18]. Other carnivore species

living in the study area include the leopard (*Panthera pardus*), leopard cat (*Prionailurus bengalensis*), Asiatic jackal (*Canis aureus*), red fox (*Vulpes vulpes*) and yellow throated martin (*Martes flavigula*) [5]. Human population density in the State of AJK is high (i.e., 258 people per sq km) and has been steadily increasing since 2000, which has resulted in increasing habitat destruction and demand for natural resources [19-20].

Methods

We evaluated black bear presence by dividing the study area in 17 cells (5 x 5km) using ArcMap (version 9.1, ESRI INC., Redlands, California, USA) (Figure 1). Within each cell we randomly selected 10 survey plots of 50m radius, which we inspected once (July – September 2012) in search of direct (i.e., observations, dead animals) and indirect signs of bear presence (i.e., claw marks, feeding signs, scats, tracks, etc.).

At the same time we conducted questionnaire surveys on human - bear conflicts among residents of 35 randomly selected villages in the study area. The main aims of the questionnaire surveys were to explore the different aspects of human – Asiatic black bear conflicts and the attitude of locals towards the species. The questionnaire consisted of 13 questions organized in three main sections: (1) demographic and socio-economic characteristics of respondents: information about the respondent and his livestock and/or agricultural property was collected; (2) human – bear conflict experience: information on human - bear conflicts in the area was collected, including information on the type, year, season and estimated distance from forest edge (i.e., <250m, 250 - 500, >500m) of bear damage (i.e., livestock depredation and crop damage) in the last 5 years; and 3) information on the perceptions towards bears in the area was collected. Only reliable damage data were used in the study; reliable data were considered damage cases, where the person questioned either saw the bear causing the damages, or could provide sufficient information on the damage incident to be considered reliable.

Information on bear presence and human – bear conflicts was corroborated by evaluating the official records of the AJK Wildlife Department on killed bears.

We used descriptive statistics to summarize results and non-parametric tests (i.e., Kruskal Wallis test, Chi-square goodness-of-fit) for comparisons [21]. The significance level was set to $P = 0.05$. We plotted all field and questionnaire data using ArcMap software.

Results

Black bear presence was documented in 52 cases (i.e., 6 claw marks, 5 feeding signs, 10 footprints, 31 scats), in 47 out of the 170 plots and in 12 of the 17 cells surveyed (Figure 1). Bear presence was recorded more frequently in the northern and eastern parts of the study area (i.e., cells BH249, BH250, BI251, BI250 and BK250) and less frequently or not at all at the western and southern borders of the study area (i.e., cells BH247, BI247, BJ248, BK249, BL249 and BL250).

We carried out 105 questionnaire surveys on human – Asiatic black bear interactions throughout the autonomous State of AJK (July - September 2012). People interviewed were older males of the cast of the choudry (38%), involved mostly in animal herding (76%). All respondents kept cattle, goats (78%) and sheep (58%). The mean number of livestock kept per respondent was 48 animals (i.e., 27 goats, 12 sheep, 4 cattle and 5 other). Also, all respondents cultivated corn, 69% had wheat and 57% rice. During the five years for which data were collected, 46.6% of the people interviewed reported damages to their livestock and 57% to their crops.

Black bears killed a total of 103 livestock, mainly goats (58%) and sheep (23%); goats were attacked significantly more often (Kruskal – Wallis $H = 21.18$, 3 df, $P < 0.001$). The mean number of livestock loss per respondent was 2.06 individuals, with 42% of respondents suffering the loss of a single livestock.

The annual number of livestock damaged increased from 9 and 5 in 2008 and 2009 respectively to 30 and 39 in 2010 and 2011 respectively. In 2012 it dropped to 19 livestock

killed. Most livestock was killed by Asiatic black bears during the summer months of June, July and August (50%), there was however no significant relationship between type of livestock damaged and season of damage (Chi-square test of association $\chi^2 = 1,317$, 4 df, $P = 0,141$). Livestock attacks occurred significantly more often at locations more than 500 m from the forest edge (Kruskal – Wallis $H = 30.06$, 2 df, $P < 0.001$).

A total of 108 cases of damages to corn fields by Asiatic black bears were reported; the mean number of crop damages per respondent was 1.02, with 29% of respondents suffering a single damage to their crops during the study period. Most crop damages by Asiatic black bears were reported during the summer (38%) and autumn months (60%). The annual number of crops damaged increased from 4 and 9 in 2008 and 2009 respectively to 25 and 48 in 2011 and 2012 respectively. Crop damage occurred significantly more often at locations very close to the forest edge (i.e., < 250m) (Kruskal – Wallis $H = 8.311$, 2 df, $P < 0.05$).

Local people generally had neutral (46%) or negative (32%) attitudes towards bears because of the damages caused by bears to their property. People who were negatively predisposed towards bears believed that they were dangerous and a major threat to their livestock and therefore should be eliminated.

The official records of the AJK Wildlife Department indicated an increasing trend in the cases of bears illegally killed in the study area between 2008 – 2012 (adult females $N = 7$; adult males $N = 4$; cubs $N = 2$).

Discussion

We present the results of the first field survey on Asiatic black bear presence and human – bear conflicts in the autonomous State of Azad Jammu and Kashmir in Pakistan. The combined results of our field and questionnaire surveys indicate that Asiatic black bears are widely distributed in the study area: bear presence was confirmed from almost throughout the entire study area, except from the western- and southernmost parts of it. This is most likely due to the fact that habitat quality in the western- and southernmost parts of the study area has been reduced through commercial logging and human encroachment. Knowledge on species presence is essential in effective conservation planning [22]. Considering the limited amount of data on bear presence collected in this study it is important that additional field work is carried out in order to more accurately understand the distribution of Asiatic black bears in the State of AJK.

During the study we recorded human – bear conflict patterns commonly observed in most bears species [8, 23-25]. Our interviews with local villagers indicated that human – bear conflicts, including agricultural and livestock damages were widespread and that damage patterns likely reflected the biological needs of the bears, the availability of the resources and the need to hide from humans.

The damages caused by bears resulted in a generally negative attitude towards bears and occasionally in their deliberate killing. Such a negative attitude towards bears and large carnivores in general is quite common in the region [5, 26-27]. Although bear are legally protected, the increase in human population in the area is most likely going to lead to an increase in human – bear conflicts in the future and in an increase in illegal bear killings, thus making the application of effective mitigation measures an immediate conservation priority.

Recommendations

Though based on limited field data, our results suggest that Asiatic black bears in AJK face numerous conservation challenges, and therefore actions are needed to safeguard the future of the species. We recommend the following priority research and management actions:

- 1) Systematic monitoring efforts are required in order to understand species population trends and conflicts with humans and ultimately develop an effective and outreaching conservation strategy for the species [28].

- 2) Public awareness, including community education and skill development in order to provide alternative livelihood prospects and reduce pressure on Asiatic black bear habitat in the region.
- 3) Establishment of a protected area that will provide adequate protection for critical black bear habitat in the area.

These research and management actions should be part of a more comprehensive Species Action Plan that will guide conservation efforts aiming to secure the future of the Asiatic black bear in Pakistan.

Conclusions

Asiatic black bears although IUCN red listed species and also categorized a protected species by the state wildlife act but bears are killed either in conflicts with human or for some bear parts. These killings are especially high outside protected areas like in the present study area. Wildlife protection staffs do not have the capacity in handling conflicts and protecting bears, additionally department also short of resources to protect bears outside protected areas. The current study provides baseline information on the level of human black bear conflicts along with some suggestion to help minimize these conflicts. Based on the information provided, wildlife department could develop conservation strategies to help protect the species and its habitat from further degradation which is very important and need of the time.

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