



Review on Conservation and Status of Bear in Pakistan

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ABSTRACT

In Pakistan the Family Ursidae consists of 3 subspecies, viz., Baluchistan Black Bear (*Ursus thibetanus gedrosianus*), Himalayan black bear (*U. t. laniger*) and Himalayan Brown Bear (*U. arctos isalbellinus*). Brown Bears are the more abundant group in northern latitudes including Chitral, Ghizer, Gilgit and Skardu areas. However, Black Bears distribution is frequent in southern latitudes Battagram. Moreover, both Brown and Black Bears are found in central latitudes like Astor, Diamir, Kohistan and Mansehra. There were 34 populations of Brown Bears; the largest one in the Deosai Plateau and small populations in other localities. Furthermore, there were 9 isolated meta-populations having common gene pools; 7 of them were very small facing serious inbreeding and extinction problems. However, Deosai and Diamir-Astor populations have a high inbreeding rate. There were about 45 localities of Black Bears; the largest of them found in Battagram. These were further subdivide into 6 meta-populations found in Kohistan-Batagram-Mansehra, Diamir-Astor and south Chitral, Thack, Hisper-Minipin and Chasma the first three are larger populations while the remaining three are with smaller having high inbreeding. Bears damage our standing maize crops as well as fruits. Average annual bears depredation of farm animals have also been noticed. Respondents reported 4 incidences of bear attack and 2 cases of cub poaching during 2013. The main objective of this review is analyze the habitat and distribution of bears as well as the possible threats and how to avoid them.

Keyword: Black Bear, Brown Bear, Status, Distribution, populations, crop damage, livestock damage.

INTRODUCTION

In Pakistan the Family Ursidae consists of 3 subspecies, viz., Baluchistan black bear (*Ursus thibetanus gedrosianus*), Himalayan black bear (*U. t. laniger*) and Himalayan brown bear (*U. arctos isalbellinus*) [1].

The distribution of Asiatic Black Bear (*Ursus thibetanus*), one of the largest carnivore specie in earth, is from Japan westward to Iran in southwestern Asia. Asiatic Black Bears lives in multiple sort of habitats, involving broadleaved and coniferous forest habitats its range is about 4300 m above sea level [2, 3]. In Pakistan they are found in Khuzdar, Suleiman range, Toba Kakar range and Kalat (Balochistan) in Pakistan until 1950's. But unfortunately it has now reach up to extinction level; the only surviving population of Baluchistan black bear in Pakistan the Red List of Threatened Species as Vulnerable [4]. Great demands of serious studies and conservation measures for the survival of this species are needed.

The two Himalayan subspecies the Brown and Black Himalayan Bears were found to be distributed in the valleys of the Himalayas, Karakoram and Hindu Kush ranges in Pakistan. But due to ignorance and many other human activities its distribution is limited in selected areas [5, 6, 1]. The Himalayan Brown Bear, distributed throughout Europe and even in the British Isles until the tenth century. But now, its distribution become limited from Turkey through Iraq, Iran, Afghanistan, Turkmenistan, Tajikistan, Uzbekistan, Kyrgyzstan, Kazakhstan, China, Mongolia, Pakistan, India and Nepal [7, 8, 9]. In Pakistan, Nawaz (2007) concluded 15 different zones of the brown bear in Pakistan, viz., Deosai, Minimergh, Nanga Parbat, Central Karakoram National Park, Khunjab National Park, Ghizer, Karanbar, Tirch Mir, Kalam, Palas, Kaghan, Gumot, Shontar and Taobat. The decrease in population of Deosai plateau during 1993 to 19 [10] attracted many researchers/conservationists to work on it, resulting in increase of about 40-50 in 2006 [11]. Another management and Protection plan increases the population of 7 in 1997 [9] in Khunjab National Park to 10-15 in 2006 [11]. Remaining all populations of Himalayan Brown

Bear are still unattended [11]. The distribution of Himalayan Black Bear is from Bhutan through Kashmir and Sikkim to Pakistan [1]. The all hills/valleys having temperate forests in northern Pakistan are the inhabiting place in of this subspecies. Due to its viable population in Neelam Valley, Sari and Soghran, lower Kaghan, north Dir, south Chitral (Khyber-Pukhtunkhwa), Gilgit and Randu Valley (Gilgit-Baltistan), it remains unattracted or little attracted to researchers/conservationists until the 1950's [1]. But the drastic decline of this specie has been witnessed during the last 40-50 years [12].

Habitat destruction and poaching of bear prey are among the causes of decline in bear population. Moreover, Cub poaching and adult killing also goes against the future survival of the bears. Due to combined efforts of Bioresource Research Centre-Pakistan (BRC) and the World Society of Protection of Animals (WSPA) in Pakistan the events of cub poaching are being eliminating from business venture. Though, Bear killing is still a great threat to the bear population [4]

Due to decreasing size and ranges of distribution the Himalayan brown and Himalayan black bears have a reach vulnerable status in Pakistan [12] leading towards increasing fragmentation, inbreeding rate, genetic fixation and changes in populations [13,14] and limited dispersal, access to food and protection; all having serious consequences for their future survival.

Protection and conservation can be done by adequate knowledge of threats to population and reasons of its decline. Individually, bears are widely known to shift their habitat and food habits seasonally as well as when needed. [15, 4, 10]. In this regard, the isolated population, have greater chances of extinction. Therefore, future management of bear populations in Pakistan needs an early assessment of existing distribution, status, and isolation for providing proper population management guidelines, along with lowering the extent of retaliatory human killing of bears as part of the human bear conflict. In order to design an effective conservation plan, it is necessary to understand the structure of threatened populations, particularly those which, like this one, exist in degraded or fragmented

habitats [13, 5, 15, 16, 17].

Due to these facts, the present study collects basic information on distribution, decline, isolation and human conflict of the Himalayan Brown and Black Bears of Pakistan. Human have high dependence on wild resources; as hunters, grazers, or subsistence farmers [18, 19]. Bears, especially the Himalayan black, are data deficient in Pakistan, requiring some information on distribution and human conflict, useful in management action plan of conservation. Information collected under the present attempt can also be used in future planning of field studies and the generation of more reliable data.

The main objective of his review is to identify the distribution and status of Bears in Pakistan and their possible threats and cause of their decline.

STATUS AND DISTRIBUTION

Bears are the one of largest carnivores' species found on this planet. IUCN/SSC Bear Specialist Group documents the status and distribution of Bears in Pakistan [7]. The population of Black Bear was most frequent in southern latitudes as well as the central latitude including Batagram, central Chitral, Astore, Diamir, Kohistan and Mansehra. According to this report there are about 150–200 Black Bears surviving in the seven populations in northern Pakistan. All of them except Doesai national park are declining. However, during 1993 in DNP there are 19 individuals, which have increases upto 43 [4, 18]. Among which there were 41% adults, 8% subadults and 18% young in the population. We identified 45 populations of Black Bear. Large populations survived in 45 mega populations which are further subdivided into 6 metapopulations. Moreover, a very large meta-population was present over a wide area of Kohistan, Batagram, and Mansehra. Baluhistan Black Bear is distributed in the Khuzdar and Suleman valley within the range of tuba kakar and kalat. However, its number of organism is still undiscovered [13].

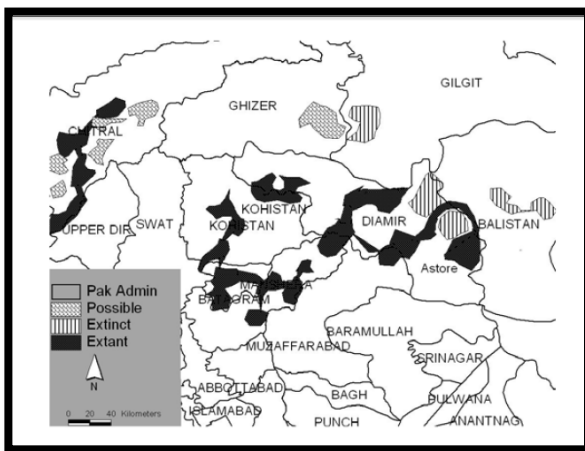


Figure 1 Distribution of Himalayan Black Bear in Northern Pakistan

Source: [19]

The survey about the Brown Bear in Pakistan ends up with results describing about its population status in Pakistan. The northern areas are considered as the most frequent habitat of Brown Bear. The mostly prefer the northern Chitral, Ghizer, Gilgit and Skardu, there are total 34 populations of Brown Bear in Pakistan among them the Deosai Plateau had a large population [19]. Five other localities like Khunjerab, Thack, Minimerg, Kawai, and Paris also contained medium size population. Instead of them there are 14 and 15 more localities having, small and very small populations. These 34 populations are further subdivided into 9 Meta populations [16].

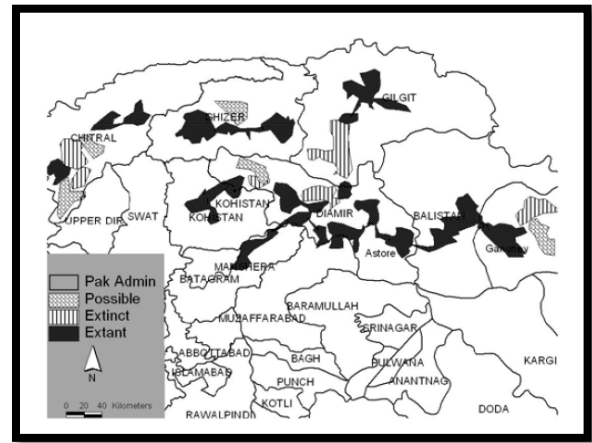


Figure 2 Distribution of Brown Bear populations in northern areas

Source: [19]

SIZE

The limited information about Black Bear, suggested the total length of adults is 130 to 190 centimeters. Adult males range from 100 to 200 kilograms and adult females from 50 to 125 kilograms. Brown Bears size is variable in different populations, depending on the food available [15]. However, the weight of some Bears is twice as much in the fall as compared to spring. Adult males have weigh 135 to 390 kilograms weigh and females having 95 to 205 kilograms. In case of cubs at birth, weigh is 340 to 680 grams [16].

DIET

They are considered as carnivores which feed both on plants and animal meat. Black Bear feed on a wide range of foods. In vegetable or plant food they include fruits. Moreover, it also feed on nuts, Jujube, fruits of the dwarf palm. Among the animals the feed on bees' nests, insects, invertebrates, small vertebrates, and carrion kill domestic livestock, Insects, lizards. They are also considered as the significant predators of livestock [16]. The Baluchistan Bear usually like *Olea ferruginea*, *Zizyphus nummularia*, rhizomes and fruits of the dwarf palm, insects and lizards [21, 22, 17]

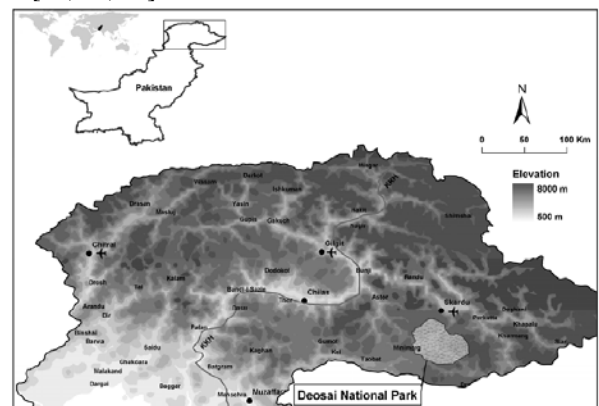


Figure 3 Location of Deosai National Park

Source: (Nawaz, 2008)

As far as the diet of brown Bear is concerned, it consists of about the 70% of plant residues in which Graminoideae i.e. grasses and sedges (93%), forbs 52% (stems and inflorescences). The volume of animal residues is 4%, including the rodents (88%) in it. The regular plant diet of brown bears was consisting of only 8 families; Poaceae, Polygonaceae, Cyperaceae, Apiaceae, Asteraceae, Caryophyllaceae, Lamiaceae, and Rubiaceae (Garshelis and McLellan, 2004) Males in both Cases are more carnivorous than females, and preferably ate these plant species;

Bistorta affinis, *Carex diluta*, and *Carex* sp easily available in DNP were homogenous with respect to the diet of brown bears [16].

HABITAT SELECTION

Bear habitat are significantly different from all other vertebrate species. Bears usually not like the higher elevations and steeper slopes, and live in more productive parts of the park. Brown Bears can live on the roads and camps, but usually avoids the grazing areas with high livestock density [16]. Deosai National Park had both poor and excellent habitats for Brown Bears. About 49% of the area is poor habitat, 39% was in between, and remaining 12% of the area is high quality habitat. The habitat preference is due to the biomass productivity patterns [27].

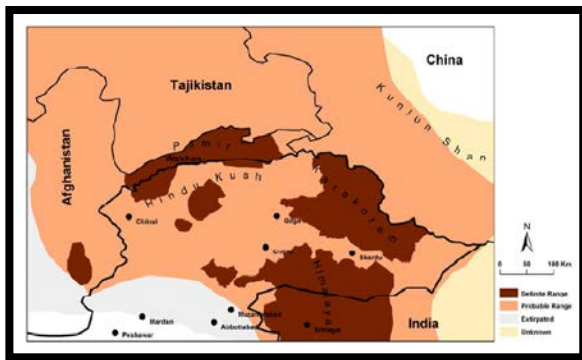


Figure 4 present distribution of Brown Bear in Pakistan and neighboring countries

Source: [18]

SOCIAL SYSTEM

In Russia, the home range of Black bear is reported to be 10 to 20 square kilometers (4 to 8 square miles). Little information is available on social organization. The bears are reported to be mainly nocturnal, sleeping in trees or caves during the day. The Baluchistan black bear is usually sighted in the rainy season from August to November [18]

Under most circumstances, brown bears live as lone individuals, except for females accompanied by their cubs. During the breeding season, a male may attend a female for up to two weeks for mating. Brown bears are distributed in overlapping home ranges and male home ranges are larger than those occupied by females.

LIFE HISTORY AND REPRODUCTION

The fitness of an organism is affected by life history, which are flexible and variable with environmental conditions [27, 28]. Variation in the geographical range due to change in energy and environmental condition [29; 30; 31]. This geographic pattern of life history variation is not limited to interspecific relationships, as populations may also differ within a species' range (Ferguson and McLoughlin, 2000). Habitat is the environmental factor that has a major influence on life history (Southwood et al. 1974; Clark and Yoshimura, 1993). Brown bears are found mostly in northern hemisphere and lives in a variety of habitats from tundra to temperate forests (Schwartz et al., 2003; Servheen et al. 1999). However, their life history traits are diverse (Dahle and Swenson, 2003; Stringham, 1990; Zedrosser, 2006).

The information about reproduction in Asiatic Black Bears is sparse. Sexual maturity of females is between ages of three or four (Stringham, 1990). In Pakistan, mating occurs in October, with young being born in February [21]. Cubs weaned at less than six months old, but lives with their mothers for up to two to three years. Females sometimes live with cubs of different ages. Baluchistan Black Bears usually mate in October and cubs are born in February [1].

The breeding rate of Brown Bear is slight low. They reach sexual

maturity at four-and-a-half to seven years of age. Same is the maturity age in case of males but they are unable of breed until they reach age eight to ten years. Mating season is from early May to middle July [22]. They produce usually one to four cubs which preferably live with their mother up to age of three years.

HUMAN CONFLICT

CROP DAMAGE

Maize is the most susceptible crop to bear damage. Bear troops regularly damages the maize crops causing severe damages in 2 localities of Chitral and 6 localities of Diamir. Instead of this, Moderate damage is caused to 17 localities of Chital, Ghizar, Astor, Mansehra, Battagram), but low damage and is tolerable in 5 localities. However, fruits like apricots, grapes, mulberries, and walnuts also had been damaged b Bear [23].

LIVESTOCK DEPREDATION

Estimates livestock dergradation suggested an annual loss of 54 cattle, 188 goats/sheep, 4 yak, and 9 horses. No loss of poultry was reported. Livestock depredation was higher in Diamir, Astor, Kohistan, and Battagram [14]. Based on the number of livestock heads killed/injured, annual economic loss of Pak Rs. 2,840,000 is estimated faced by the livestock farming community during 2012-14. The losses were higher in Kohistan, Diamir, Chital, Gilgit, and Astore, medium in Batagram, and low in Mansehra and Skardu [25].

HUMAN ATTACK AND CUB POACHING

Respondents reported 4 recent bear attacks on man, of which one did not survive the fatal injuries, while the other 3 sustained major injuries. Only 2 cases of cub poaching have been reported [17]. One black cub was poached from Bolan, which died during transportation to the market place. Another black cub was poached from Palas after killing the mother [23].

THREATS

Hunting has been a traditional practice in most of the bear range in Pakistan. Increasing accessibility and number of vehicles has increased the hunting of wildlife. As a consequence, bears and other large mammals have been largely eliminated in the areas near settlements [27]. Despite the ongoing protection efforts in areas like Deosai National Park, human induced mortality continues and a minimum of 9 bears were killed in the 10-year period 1996–2005, Bears have been hunted for sport, persecuted by villagers who feel their livestock is threatened, and more recently killed for commercial purposes. At least 5 sites were identified in Gilgit, Sakardu, and other towns along the Karakoram Highway [28] where bear fat was sold on a regular basis for about 60 Pakistan Rupees (PKR) per tola [29]. It is estimated that bear parts from an adult bear could fetch as much as PKR 75,000 in a local market, which is much higher than the annual income of a typical wage earner in the NAs. This provides a strong incentive for bear poaching. Female bears are also killed to capture their cubs for sale to gypsies. Cubs of the year are preferred, as they are easy to train for bear displays and baiting events [13].

Nomad graziers, who travel all the way from the plains to the mountains with their livestock, are known to be involved in this business in addition to other illegal activities, like collection of medicinal plants [23]. Graziers are suspected to transport poached wildlife down to the plains. Brown bears are potentially threatened by impacts of climate change. Potential threats include loss of habitat, decline in food supply, habitat shift to nonprotected areas, and increased competition with humans. The major habitat of brown bears in Pakistan is the alpine cold desert zone that lies in the alpine tundra biome. The computer simulation model BIOME3 predicted changes in the size and location of forest ecosystems and biomes of Pakistan under the

influences of climate changes in the year 2020 and 2040–50. In general, the model predicted a positive effect on the forests of Pakistan, but alpine tundra, which covers about 6.8% of the total area, would be reduced to 4.6% by the year 2020. A northward and upward shift of all biomes is predicted [33]. The coniferous biome is expected to expand at the expense of alpine tundra. Brown bears already suffering habitat degradation and fragmentation by anthropogenic activities will face further shrinkage of habitat, and this could have serious consequences on their survival [17].

CONSERVATION

Pakistan has ratified the Convention on Biological Diversity (CBD), and as a follow up, developed the National Conservation Strategy (NCS) and Biodiversity Action Plan (BAP) for environmental protection and biodiversity conservation. Wildlife conservation is the responsibility of the provinces in Pakistan, and each province has its own legislation, which is implemented by its respective wildlife or forest department [17]. The brown bear range in northern Pakistan is managed by 3 provincial departments: the NAs Forestry, Parks and Wildlife Department; the NWFP Wildlife Department; and the AJK Department of Fisheries and Wildlife [14]. The National Council for Conservation of Wildlife (NCCW) in the Federal Ministry of Environment, Local Government and Rural Development is responsible at the national level for the coordination of the provincial conservation programs in order for Pakistan to fulfill its international obligations and agreements regarding biodiversity conservation [25].

Three wildlife laws are effective in northern Pakistan: The Azad Jammu and Kashmir Wildlife Act (1975), the Northern Area Wildlife Preservation Act (1975), and the NWFP Wildlife (Protection, Preservation, Conservation and Management) Act (1974). These acts provide the basis for the creation of protected areas in 3 fundamental categories: national parks, wildlife sanctuaries, and game reserves. All provinces have made considerable process in the establishment of protected areas (PAs) that provide legal cover for the protection and conservation of a variety of wildlife; 7 national parks, 8 wildlife sanctuaries, and 10 game reserves have been established in brown bear range in Pakistan [16]. These PAs cover the majority of the existing brown bear populations and provide them with legal protection against hunting and other threats. However, except for a few of those areas including the DNP and the KNP, which are effectively managed, these PAs unfortunately just exist on paper. They were created haphazardly and face problems like weak law enforcement, poor institutions and infrastructure, and lack of adequate resources. Among a total of 25 PAs in northern Pakistan, 16 lack basic baseline information, 22 do not have any management plan, and 19 are without any management infrastructure [38].

CONCLUSION RECOMMENDATIONS

The bear population in Pakistan has shrunk radically and continues to decline in its entire range, with only the exception of Deosai National Park. Immediate efforts are needed to ensure its long-term survival, which will be more effective if taken jointly by the state departments, non-governmental organizations (NGOs), research institutes, and communities. Because most existing bear populations are covered either by the PAs or conservancies, there is no need to create additional protected areas, at least in the short term. However, with limited financial resources and ineffective protection and management systems, these PAs carry little meaning. The World Conservation Union [37] reviewed PAs of Pakistan, and through a process of wide

consultation [3–4] developed a comprehensive action plan framework for strengthening the PAs system and improving its efficiency. The framework identifies priorities for actions and investment, sets definable and measurable goals, and can be smoothly integrated into long-term national policy. The only thing lacking is its implementation and adoption by the concerned departments and authorities.

Carnivores as a whole are considered odious and it is usually difficult to generate support by local communities for their conservation. People always question such efforts because, unlike ungulates, carnivores don't have any meat value and pose a threat to humans and livestock. Environmental education is an important instrument to change perceptions and attitudes. Launching education and awareness initiatives that cater to local communities, staff of the PAs, visitors, and the general public can bridge the knowledge gap and be vital to achieving synergy in conservation efforts. Trophy hunting in Pakistan is an increasingly popular tool for conservation through community participation. Presently based on 5 ungulate species, this program has generated substantial revenue which has been shared with local communities. The trophy hunting program has been effective in rehabilitating populations of wild.

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