

## Human interaction and attitude towards wildlife in Muzaffarabad, Azad Jammu and Kashmir-Pakistan

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### Abstract

Human-wildlife interaction is an important topic for analyzing the threat to wildlife. It may have a severe impact on sustainability for both humans and wildlife if unchecked. Hence, data on the different uses of wild animals i.e. food, ethnomedicine, fun and etc. and hunting and killing of animals in Muzaffarabad, Azad Jammu and Kashmir was collected. The data were collected through direct (i.e., dead body observation) and indirect (i.e., meetings with local people) methods. Results showed a total of 386 wild animals belonging to 37 species from four major vertebrate groups were killed during the study period. High numbers of animal killings were noted for different reasons, i.e., trade, road accidents, food, medicine, etc. This illegal and brutal hunting of wildlife requires immediate conservation measures.

**Keywords:** Hunting, Human-wildlife interaction, Trade, Muzaffarabad, Azad Jammu and Kashmir

### Introduction

Human-wildlife interaction has been a hotly debated topic in recent years, as human activities have encroached on the habitats of many wild species (Frank et al., 2019; Nyhus, 2016). Human

attitudes toward wildlife have shifted dramatically over history, ranging from reverence and devotion to fear and hatred (Castillo-Huitrón et al., 2020; Chomba et al., 2012; Manral et al., 2016). Animals are considered sacred and treasured in certain cultures (Ikechukwu Anthony, 2021; Krishna, 2010), whereas in others they are viewed as a resource to be exploited for food (Altaf et al., 2021), medicines (Alves et al., 2013; Iqbal et al., 2023), sport, or other purposes (Altaf et al., 2017; Hamid et al., 2021). Wildlife attitudes differ depending on the species, with some, such as lions (Zanette & Clinchy, 2019) and tigers (Seeley & Skabelund, 2015), being more feared than others (Røskaft et al., 2007).

Interactions between humans and wildlife can have both beneficial and bad consequences for the creatures involved. Conservation activities, such as habitat protection and animal rehabilitation, can help to preserve and even expand the populations of threatened or endangered species (Conover & Conover, 2022; van der Wal et al., 2022). Habitat destruction, poaching, and the introduction of non-native species are all examples of negative interactions that can have awful consequences on wildlife populations (Acharya, 2019). Furthermore, human attitudes about wildlife can have a considerable impact on these interactions, as fear, ignorance, and a lack of empathy can lead to harmful behaviors toward animals (Aslam et al., 2022; Mumtaz et al., 2021).

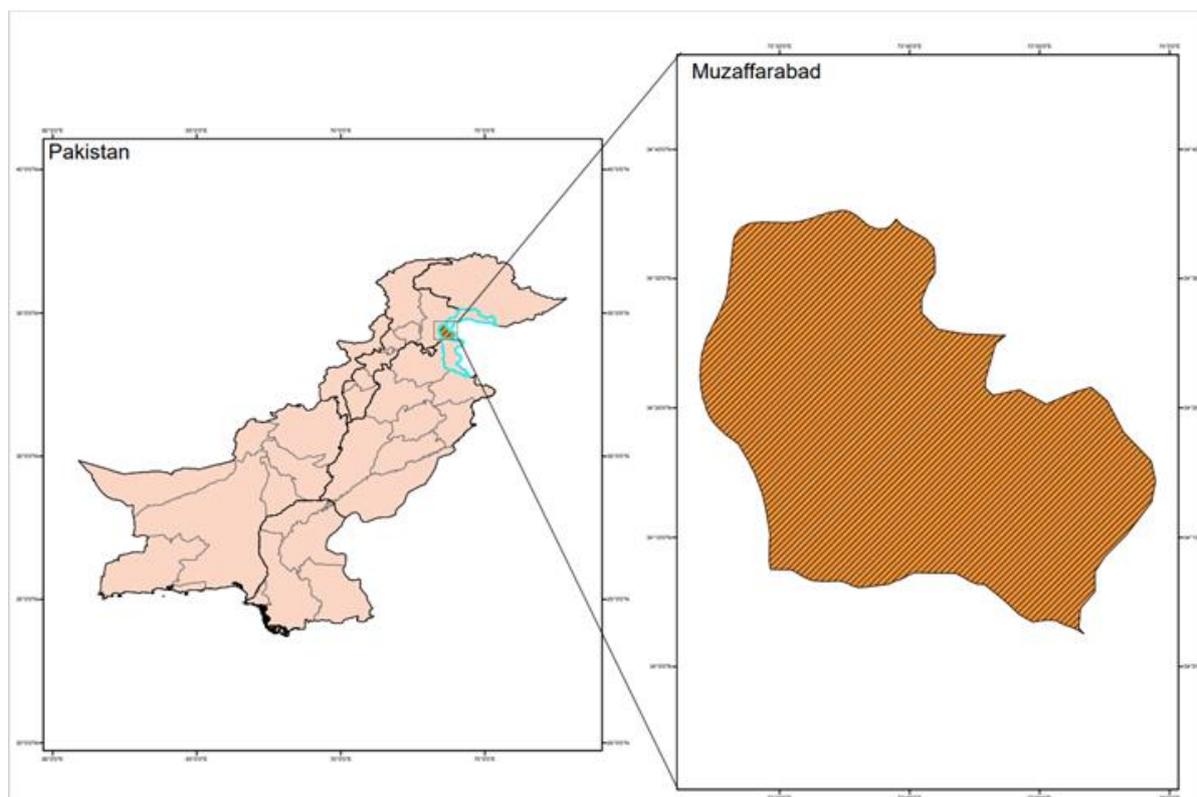
In Pakistan, many wildlife species conflict with humans including the snow leopard (Rashid et al., 2021), the common leopard (Khattak et al., 2021), the grey wolf (Khattak et al., 2022), the Asiatic black bear (Waseem et al., 2020), and Asiatic jackal (Altaf et al., 2022), etc., resulting in retaliatory killing of these species in many areas of the country. We did this study because we were intrigued about the various reasons why individuals utilize wild animals and hunting and killing of wildlife in Muzaffarabad, Azad Jammu and Kashmir, Pakistan. Our primary goal was to learn about the many ways in which wild animals are used in this region, as well as to get insight into their roles in local culture and daily life.

## **Material and methods**

### ***Area of Study***

The study area, having geographical coordinates of (N 34° 28.855 E 073° 26.897) with an elevation range of 3000 to 4000m, is situated in the district Muzaffarabad (Fig. 1), AJ&K (Pakistan). The study area is a moist region influenced by the monsoon rains; therefore, the area is known for heavy rainfalls and temperature variations. Various trends of weather are observed in the region, as the temperature varies from 0°C to 46°C. Its landscape stretches from large, dense forests to cultivable lands. The area also encompasses many important plant and

animal species. A region of 10 km<sup>2</sup> was distributed into the following sampling sites (Mohrian, Jabian-Jabri, Toba-peerchala, Patti, Gran, and Chugian-Danna), based upon evidence of the existence or killing of animals in these areas (Khan et al., 2019).

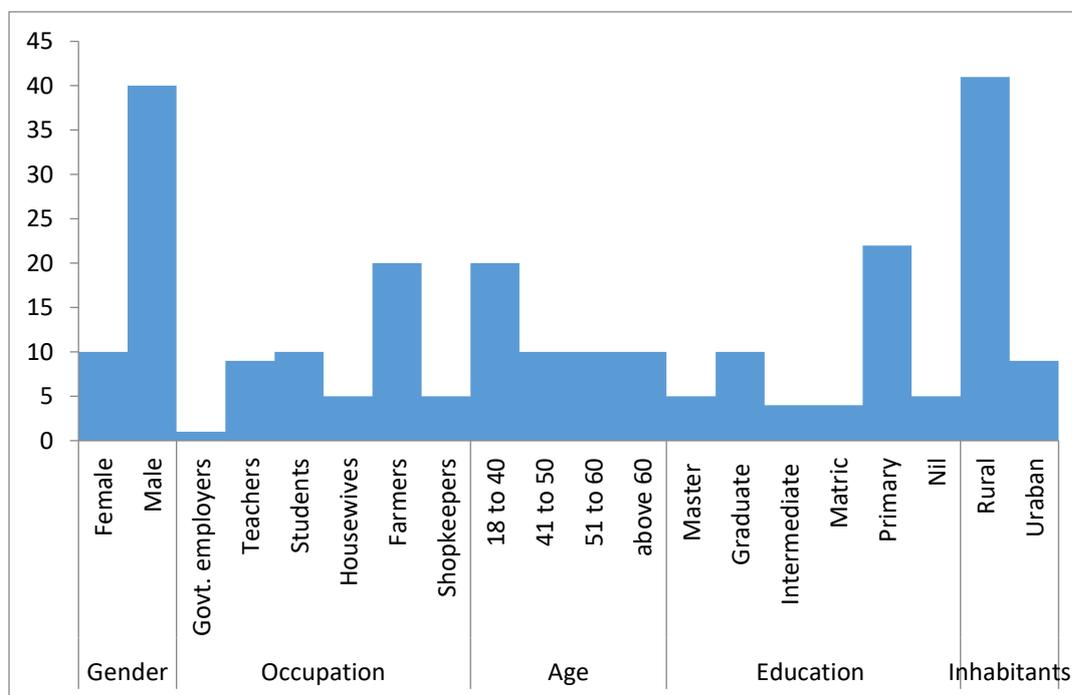


**Figure 1.** Map of study area

We carefully gathered data between 2015 and 2022 using two separate ways. The first way, known as the "direct method," entailed attentively watching how wild animals were used in society and killing and hunting of wildlife. This allowed us to see directly how animals were integrated into people's life, whether as a source of food, for ethnomedicine, or even as sources of entertainment and delight. In comparison, our "indirect method" was more regimented. We created a questionnaire to serve as our research tool. This questionnaire was separated into two sections in order to obtain a comprehensive knowledge of our respondents' viewpoints. The first section enquired about the persons we surveyed socioeconomic origins, offering light on their financial problems and living conditions. The second section focused on their knowledge and understanding of the various functions that animals played in their community. Statistical analysis was performed using R software for the heat map and MS Excel for the graphs.

## Results

The data were collected from the male (80%) and female (20%) respondents; they were shopkeepers, farmers, housewives, students, teachers, and others. Most of the respondents were educated (90%). The ages of informants were from 18 to 72 years old, and most of the informants (40%) ranged from 18 to 40 years old (Fig. 2).



**Figure 2.** Respondent profile

In this study, the examination of 386 different animals belonging to 37 species was carried out. These animals were either killed or hunted down in the study area. It included mammals (08 species), birds (18 species), reptiles (08 species), and amphibians (03 species) (Table 1). Primarily, these species were killed by the natives for recreational purposes (37.14%), followed by killing for trade (10.43%) and for edible purposes (10.65%). Other factors included the HWC (23.51%) and unintended killings (18.27%) (Fig. 3 and 4).

### Mammals

The total number of mammals killed during the study period was 160. Among these 105 belonged to the order Carnivora, including families Viverridae (35), Canidae (55), and Felidae (15), while the remaining 55 were from the order Rodentia (Sciuridae (25), and Hystricidae (3) (Table 1). The motives behind the killing of mammals included HWC, which accounted for 44% of the total killings, followed by amusement purposes (25.75%), trade (19.25%), and accidental killings (11%). The feeding habits of wild animals were the major source of the HWC, as few animals have frugivore modes of nutrition (*Viverri culaindica*, *Paguma larvata*, and *Hylopetes fimbriatus*) that devastate the fruit trees planted by humans. Others, such as the

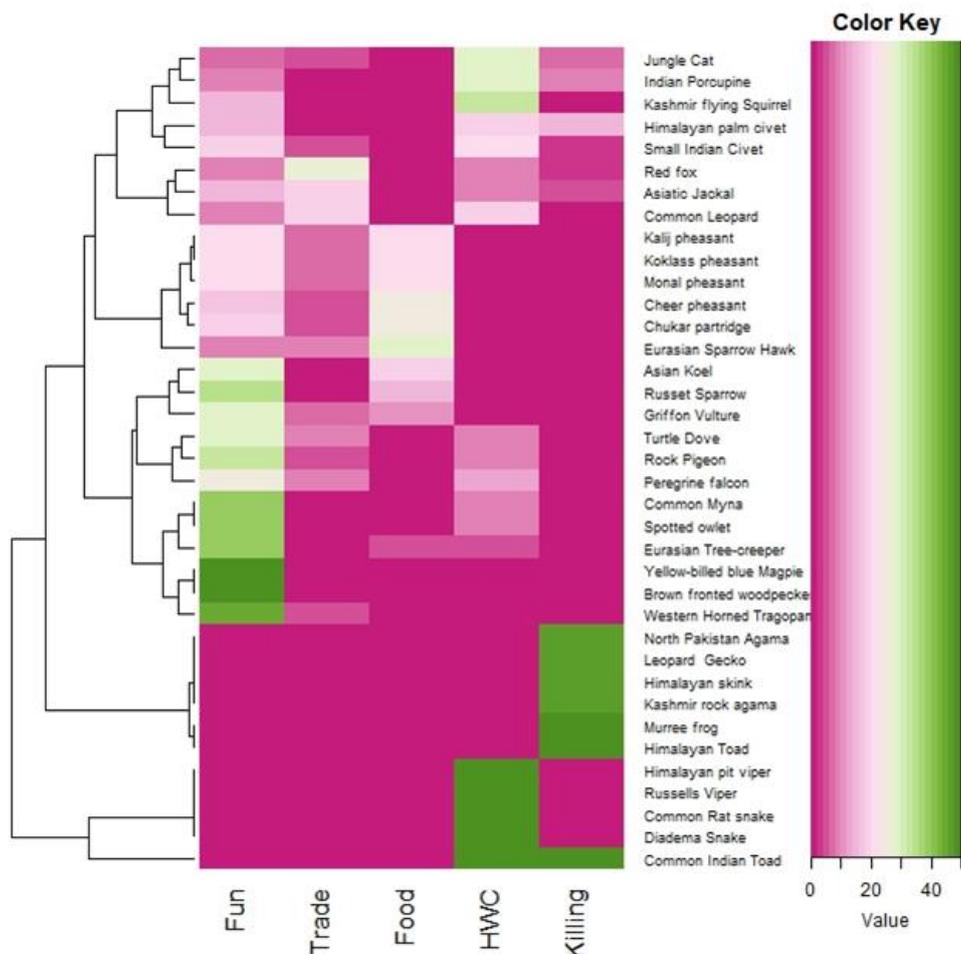
Indian crested porcupine (*Hystrix indica*), exhibited themselves as pests for the harvest and were therefore killed whenever they came across them. Some mammals, such as *Panthera pardus*, *Canis aureus*, and *Vulpes vulpes*, were noted to hunt down domestic animals and poultry for their food (Fig. 3 and 5).

### **Birds**

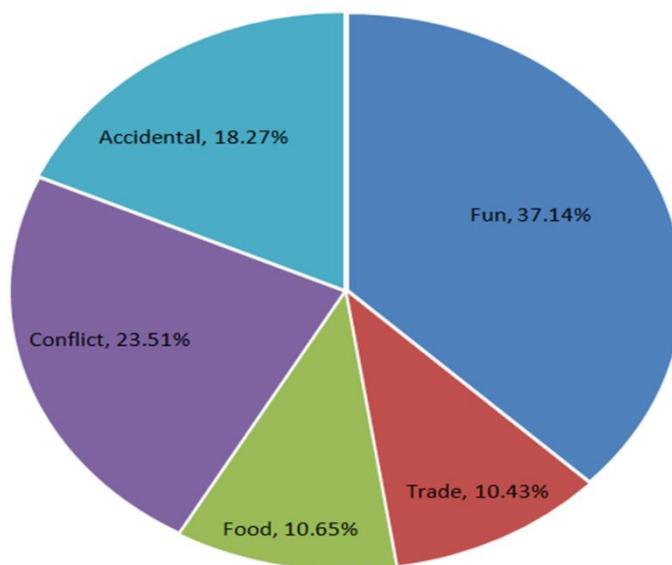
A total of about 192 birds forming various groups were traced during the current study. It comprised of Galliformes (Phasianidae, 70), Gruiformes (Rallidae, 14), Columbiformes (Columbidae, 32), Accipitriformes (Accipitridae, 10), Falconiformes (Falconidae, 3), Piciformes (Picidae, 12), Passeriformes (Corvidae, 8), (Emberizidae, 10) and (Sternidae, 10), Strigiformes (Strigidae, 3) and Cuculiformes (Cuculidae, 20) (Table 1). These birds were killed for various reasons. The edible species mainly belong to pheasants. The predatory birds of families Accipitridae and Falconidae were primarily exterminated by humans as they fed on poultry (Table 1 and Fig. 6). *Hystrix indica* is killed the highest Relative Abundance (RA) as 0.104, followed by as *Vulpes vulpes* (RA=0.090), *Hylopetes fimbriatus* and *Canis aureus* (RA=0.087), *Streptopelia orientalis* (RA=0.076) and *Paguma larvata* (RA=0.069) (Table 1).

### **Reptiles and Amphibians**

The reptiles comprised five snake species (n = 7) and four lizard species (n = 14). The formers were killed in self-defense, as people are afraid of this venomous creature, whereas they are road-kill, and for its medicinal importance. There are different reasons for killing reptiles. Most of the reptiles were found dead from beatings and capture, where all the amphibians (n = 14) were accidentally killed (Table 1 and Fig. 3).



**Figure 3.** Human wildlife interaction and conflict in study area.



**Figure 4.** The reasons of killing of different wildlife species in the study area.



**Figure 5.** Photographs of some mammal species hunted in the study area; (A) *Viverricula indica* (small Indian civet) hunted at Jabri (B) Road kill of *Vulpes vulpes* (red fox) in study area (C) *Vulpes vulpes* (red fox) hunted at Jabri (D) *Hylopetes fimbriatus* (squirrel) hunted at Gran (E) *Canis aureus* (Golden Jackal) at Patti site.



**Figure 6.** Photographs of some bird species being hunted in the study area; (A) *Catreus wallichii* (Cheer pheasant) hunted at peerchala (B) *Lophura leucomelanos* (Kalij pheasant) hunted at Toba site (C) *Columba livia* (Rock pigeon) hunted at Mohrian site (D) *Accipiter nisus* (Eurasian Sparrow Hawk) hunted at Danna site (E) *Alectoris chukar* (Chukor) hunted at Danna (F) *Pucrasia macrolopha* (Koklas) hunted at Toba.

## Discussion

The diversification of aspects of sociocultural, commercial, and recreational nature in the environment is related to wildlife (Afsheen et al., 2020). Animals are pivotal for the ecosystem, as the family of mammals (Ramírez-Fráncel et al., 2022) and birds contribute significantly to seed dispersal while turning out to be eminent pollinating agents (García-Rodríguez et al., 2022). Besides, the major portion of food for human beings is also acquired from them. Moreover, many species of birds slay insects and other pests in quest of their food; hence, they

fundamentally help to control the spread of crop pests, which have a derogatory effect on many crops (García-Rodríguez et al., 2022; García et al., 2021). Despite all these beneficial outputs for the environment, wild animals have been facing a fierce threat of near extinction across vast swatches of the world. The contributing factors to their endangerment include excessive hunting, destruction to the home of these wild animals, and rapid human urbanization resulting in the devastation of natural habitat for wild animals (Hinsley et al., 2023; Khan et al., 2020; Ndlovu et al., 2023; Singh et al., 2021).

This particular study takes into account four different kinds of species, namely, carnivores and predators, frugivores, crop-damaging species, and eatable species. The HWC conflict and the subsequent killing of animals were found to be linked to the following factors: fierce carnivores, such as common leopards (Naha et al., 2020), Asiatic jackals (Younus et al., 2018), and foxes (Soulsbury, 2020) killed livestock and humans either in quest of food or as preemptively to assure their safety (Abrahms et al., 2023). Hence, in retaliation, these birds were exterminated by human beings as revenge measures (Almuna et al., 2020).

The second category incorporated many frugivores that were responsible for imparting substantial monetary losses by damaging fruit trees. This group is mainly comprised of the small Kashmir flying squirrel, two civet species, and the yellow-billed blue magpie. The next group acknowledges crop pests (Indian porcupine, Eurasian tree creeper, and common myna). These species rely on crops for their food. The Indian porcupine has disastrous effects on watermelon, maize, cucumber, potato, and onion. Another deadly invasive species, the common myna, has adverse effects on cultivated lands.

The last group of the wildlife species under observation is comprised of edible wildlife. The Muslim community has a staunch religious prohibition on eating mammals, amphibians, and reptiles. Consequently, some species were killed for dietary purposes. Researchers reported the chukor (*Alectoris chukar*) is an important game bird (Albayrak et al., 2022). Moreover, their efficacy in terms of fulfilling meat requirements and pharmaceutical significance made them more susceptible to hunting (Wendimu & Tekalign, 2022). Besides, the bird population also faces grave threats due to excessive hunting practices across the globe (Gross, 2019).

The data on snakes and lizards were included in the group of dead reptilian fauna. Apart from the leopard gecko, which has therapeutic value, these animal entities were primarily killed for self-protective purposes by humans (Adil et al., 2022; Saleem et al., 2021). Due to the poisonous nature of snakes and their fearsome nature, the snakes are shot down by local people. Universally, according to the true incidences, it is estimated that more than 5 million humans are confronted with snake envenomation per year, resulting in thousands of deaths and millions

of others facing life-threatening concerns. The Russell's viper, for example, among all venomous snakes, accounts for the greatest numbers of snake bite incidents and deaths across the world because of its extensive distribution and its innate ability to accustom itself to existing in human settlements (Abhilash & Rao, 2021; Altaf, 2022; Di Nicola et al., 2021).

High rates of hunting can have serious environmental and societal effects (Di Minin et al., 2021). Overhunting can deplete wildlife populations, alter food chains, and degrade ecosystems, ultimately risk to biodiversity and environmental stability (de Araujo Lima Constantino, 2016). It can also push some species to extinction, disturbing nature's delicate equilibrium. Excessive hunting can have a negative influence on local people that rely on animals for life, cultural activities, and livelihoods (Francesconi et al., 2018), resulting in food shortages and economic adversity (Milner-Gulland & Bennett, 2003). It can also strain interactions between human groups and conservation initiatives, leading to conflicts over diminishing resources (Bolton, 1997). To prevent these far-reaching ecological and social consequences, a sustainable balance between hunting and conservation is required.

The current study spanned over one year, and the study findings reveal the massive killings of 386 animals belonging to 37 wildlife species in an area smaller than merely 10 km<sup>2</sup>. It poses a worrisome question about the safeguarding of biodiversity. The inhabitants of the selected area had little knowledge about the beneficial impacts of wild animals. The residents of the area killed various animals for recreational purposes. Hence, it was found necessary to devise and implement immediate and workable wildlife protection measures. The wildlife authorities should play a vital role in addressing and fulfilling the essential requirements of food for the local people, other than hunting wildlife disproportionately for dietary purposes. Moreover, the wildlife department has to keep a close eye on prohibited hunting practices while implementing the conservation campaign immediately. Nevertheless, the unwarranted killing must be stopped straightaway to help protect these animals from mere extinction.

### **Conclusion**

In conclusion, the findings of this study conducted in Muzaffarabad, Azad Jammu and Kashmir, Pakistan, suggest concerning patterns in human-wildlife interactions. According to the survey, the primary motivations for hunting are recreational objectives, trade, and edible consumption. Conflicts between humans and wildlife, particularly between predators and frugivores, have also resulted in retaliatory killings. These findings highlight the critical need of conservation activities, such as raising awareness in local communities about the ecological importance of animals and the potential repercussions of overhunting.

The report identifies many critical steps that should be implemented to solve the issues caused by hunting and encounters with animals in Muzaffarabad, Pakistan. To begin, it is critical to educate people about the importance of wildlife in the ecosystem and how it benefits us, such as crop pest control. This can help people realize why animal protection is so important. Second, we should protect these species' natural habitats so that they have secure places to dwell. One of the most serious hazards to animals is habitat destruction. We must also enforce stringent restrictions against illicit hunting and, when required, encourage responsible hunting methods. By doing so, we can assist to ensure the well-being of both the animals and the people who reside in the area.

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Table 1. Records of wild animals killed in Talgran area of Muzaffarabad.

	Species	Order	Family	Scientific Names	Status of the species in Pakistan	IUCN status of species	Numbers killed	Relative Abundance
Mammals	Small Indian Civet	Carnivora	Viverridae	<i>Viverricula indica</i>	Near Threatened (CAMP, 2003)	Least concern	15	0.052
	Himalayan palm civet	Carnivora	Viverridae	<i>Paguma larvata</i>	Least Concern (CAMP, 2003)	Least Concern	20	0.069
	Asiatic Jackal	Carnivora	Canidae	<i>Canis aureus</i>	Near Threatened (CAMP, 2003)	Least Concern	25	0.087
	Indian Porcupine	Rodentia	Hystriidae	<i>Hystrix indica</i>	Near Threatened (CAMP, 2003)	Least Concern	30	0.104
	Kashmir flying Squirrel	Rodentia	Sciuridae	<i>Hylopetes fimbriatus</i>	Vulnerable (CAMP, 2003)	Least Concern	25	0.087
	Red fox	Carnivora	Canidae	<i>Vulpes vulpes</i>	Near Threatened (CAMP, 2003)	Least Concern	26	0.090
	Jungle Cat	Carnivora	Felidae	<i>Felis chaus</i>	Least concern	Least Concern	15	0.052
	Common Leopard	Carnivora	Canidae	<i>Panthera pardus</i>	Critically Endangered (CAMP, 2003)	Vulnerable	04	0.014
<b>Total</b>							<b>160</b>	
Birds	Chukar partridge	Galliformes	Phasionidae	<i>Alectoris chukar</i>	Least concern	Least concern	14	0.048
	Cheer pheasant	Galliformes	Phasionidae	<i>Catreus wallichii</i>	Vulnerable (CBD, 1999)	Vulnerable	18	0.062
	Koklass pheasant	Galliformes	Phasionidae	<i>Pucrasia macrolopha</i>	Vulnerable <a href="http://www.wildlifeofpakistan.com">http://www.wildlifeofpakistan.com</a>	Least concern	12	0.042
	Kalij pheasant	Galliformes	Phasionidae	<i>Lophura leucomelanos</i>	Endangered <a href="http://www.wildlifeofpakistan.com">http://www.wildlifeofpakistan.com</a>	Least concern	10	0.035
	Monal pheasant	Galliformes	Phasionidae	<i>Lophophorus impejanus</i>	Near Threatened <a href="http://www.wildlifeofpakistan.com">http://www.wildlifeofpakistan.com</a>	Least concern	07	0.024
	Western Horned Tragopan	Galliformes	Phasionidae	<i>Tragopan melanocephalus</i>	Vulnerable (CBD, 1999)	Vulnerable	09	0.031
	Russet Sparrow	Passeriformes	Passeridae	<i>Passer rutilans</i>	Least concern	Least concern	14	0.048
	Rock Pigeon	Columbiformes	Columbidae	<i>Columba livia</i>	Least concern	Least concern	10	0.035
	Eurasian Sparrow Hawk	Accipitriformes	Accipitridae	<i>Accipiter nisus</i>	Least concern	Threatened	05	0.017

	Turtle Dove	Columbiformes	Columbidae	<i>Streptopelia orientalis</i>	Vulnerable	Vulnerable	22	0.076	
	Griffon Vulture	Accipitriformes	Accipitridae	<i>Gyps fulvus</i>	Endangered	Least concern	05	0.017	
	Peregrine falcon	Falconiformes	Falconidae	<i>Falco peregrines</i>	Critically endangered (Ministry of Environment, 2009)	Least concern	03	0.010	
	Brown fronted woodpecker	Piciformes	Picidae	<i>Dendrocopos auriceps</i>	Least concern	Least concern	12	0.042	
	Spotted owlet	Srtrigiformes	Strigidae	<i>Athene brama</i>	Least concern	Least concern	03	0.010	
	Yellow-billed blue Magpie	Passeriformes	Corvidae	<i>Urocissa flavirostris</i>	Least concern	Least concern	08	0.028	
	Eurasian Tree-creeper	Passeriformes	Certhiidae	<i>Certhia familiaris</i>	Least concern	Least concern	10	0.035	
	Asian Koel	Cuculiformes	Cuculidae	<i>Eudynamys scolopaceus</i>	Least concern	Least concern	20	0.069	
	Common Myna	Passeriformes	Sternidae	<i>Acridotheres tristis</i>	Least concern	Least concern	10	0.035	
	<b>Total</b>							<b>192</b>	
Reptiles and Amphibians	Russell's Viper	Squamata	Viperidae	<i>Daboia russelii</i>	Least concern	Not Evaluated	01	0.003	
	Himalayan pit viper	Squamata	Viperidae	<i>Gloydius himalayanus</i>	Data deficient	Least concern	02	0.007	
	Common Rat snake	Squamata	Colobridae	<i>Ptyas mucosa</i>	Data deficient	Least concern	02	0.007	
	Diadema Snake	Squamata	Colobridae	<i>Spalerosophis diadema</i>	Least concern	Least concern	01	0.003	
	Leopard Gecko	Squamata	Gekkonidea	<i>Eublepharis macularius</i>	Least concern	Least concern	04	0.014	
	North Pakistan Agama	Squamata	Agamidae	<i>Laudakia pakistanica</i>	Least concern	Not evaluated	5	0.017	
	Himalayan skink	Squamata	Scincidae	<i>Ablepharus himalayanus</i>	Data deficient	Least concern	3	0.010	
	Kashmir rock agama	Squamata	Agamidae	<i>Laudakia tuberculata</i>	Least concern	Not evaluated	2	0.007	
	<b>Total</b>							<b>20</b>	<b>0.000</b>
	Common Indian Toad	Anura	Bufonidae	<i>Duttaphrynus melanostictus</i>	Least concern	Least concern	4	0.014	
	Himalayan Toad	Anura	Bufonidae	<i>Duttaphrynus himalayanus</i>	Least concern	Least concern	5	0.017	
Murree frog	Anura	Dicroglossidae	<i>Nanorana vicina</i>	Least concern	Not evaluated	5	0.017		
	<b>Total</b>						<b>14</b>	<b>0.000</b>	
<b>Grand Total</b>							<b>386</b>		