

CURRENT HABITAT, DISTRIBUTION AND STATUS OF THE MAMMALS OF KHIRTHAR PROTECTED AREA COMPLEX, SINDH

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ABSTRACT

Studies were undertaken in the Khirthar Protected Area Complex (KPAC) during 2010 and 2011 to record the species of mammals, their main habitats and distribution in this area. A total of 33 species of mammals were recorded and 22 main habitats of mammals were identified. The occurrence of 11 key species of the mammals was recorded in the different components of the KPAC. These species included Sind Ibex or Sind Wild Goat (*Capra aegagrus*), Urial (*Ovis vignei*), Chinkara (*Gazella bennettii*), Striped Hyaena (*Hyaena hyaena*), Caracal (*Felis caracal*), Honey Badger (*Mellivora capensis*), Indian or Asiatic Jackal (*Canis aureus*), Indian Fox (*Vulpes bengalensis*), Red Fox (*Vulpes vulpes*), Desert Cat (*Felis silvestris*) and the Jungle Cat (*Felis chaus*). During the study, 1200 Sind Ibex, 1000 Urial and 150 Chinkara were sighted. Disturbance, human and wildlife conflicts, and degradation of habitats are the main threats to the wild animals particularly to Chinkara. These adverse environmental impacts need to be mitigated.

Keywords: Protected area, Khar Centre, Karchat Centre, distribution, status.

INTRODUCTION

The Protected Areas are recognized as an effective tool in conserving biodiversity and ecosystems. The Red List of Threatened Species (World Conservation Union-IUCN) documents that the loss of natural habitats is a predominant threat to biodiversity, and protected areas are widely regarded as one of the most successful measures implemented for the conservation of biodiversity. Currently, the World Database on Protected Areas has documented 148,000 protected areas worldwide (IUCN, 2013).

Pakistan has three categories of protected areas: National Parks, Wildlife Sanctuaries, and Game Reserves (Khan *et al.*, 2010). The Khirthar Protected Areas Complex (KPAC) stretches over 4,350 km², encompassing the protected areas (PAs) that lie in Kohistan in the southwest of Sindh. The KPAC comprises of Khirthar National Park (KNP), the Mahal Kohistan Wildlife Sanctuary (MKS), Hab Dam Wildlife Sanctuary (HDS), the Surjan, Sumbak, Eri, and Hothiano Game Reserves (SGR). Khirthar National Park is listed as a Protected Category II area by the IUCN, and is the first of Pakistan's national parks to be included in the 1975 United Nation's list of National Parks and Equivalent Reserves.

The KNP, MKS, and HDS were officially declared as Protected Areas on January 31, 1974. The Park stretches over 3,087 km², while the MKS and the HDS cover 705.7 km² and 272 km² respectively. The SGR was established in June 1976 over an area of 285.3 km². The KPAC is significant for its sizable indigenous settlements, rugged terrain, valuable flora and mineral resources, and a number of rare wildlife species such as the Sindh Ibex, Urial, Chinkara, Houbara Bustard, Gray Partridge, See-see Partridge and Birds of Prey. Archeologically significant sites include the tombs in Taung, the Fort of Rannikot and the fossils and petrified forests of the Khirthar Range.

Some work has been previously done on the fauna of the KPAC. Initial benchmark studies were undertaken in 1979 - 80 and information was collected on the ecology, population and the status of the key species of the KNP particularly in respect of the ungulates (Haleem and Khan, 1975). The first Management Plan of KNP was prepared by Holloway and Khan (1973).

Afterwards, environmental baseline studies were initiated by the Sindh Wildlife Department and the University of Melbourne, Australia in 2000, and detailed report on the Wildlife of the area was prepared (Morgan and Harrington, 2001). Later on subsequent environmental

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monitoring studies were initiated under the Petroleum exploration activities in the area. Some useful data were collected (Qadir, 2000; Mirza, 2002; Hagler Bailly Pakistan, 2001, 2002, 2002a, 2002b; Halcrow Pakistan, 2002, 2002a; Akhtar, 2006). The second management plan of the KNP was prepared in 2005 (Hagler Bailly Pakistan, 2005). In a recent study, Khan *et al.* (2012), gave detailed information about the fauna and the environmental conditions of the Hub Dam Wildlife Sanctuary area of KPAC, and reported to have encountered 16 species of mammals, 160 species of birds, 23 species of reptiles, 03 species of amphibians, 29 species of fishes, and 25 species of plants.

The objective of the present study was to determine the habitat, current distribution and status of the mammals of Khirthar Protected Area Complex (KPAC).

MATERIALS AND METHODS

The present studies with particular reference to large mammals of the KPAC were undertaken during 2010 - 2011. Field observations were made using spotting cope 60x60 and binoculars 10x50 (Olympus). The animals were watched by walking along ridges and ravines in the early mornings and late afternoons or sitting quietly on cliffs and watching the aspects facing the observer. On spotting an Urial and Ibex herd, the number of individuals was counted. Information recorded included number, sex, age, date, time, latitude, and longitude and habitat type.

Counting procedure

All animals ahead of the observer were counted from 90 degree to the left of the path to straight-ahead to 90 degree to the right. Care was taken not to count an individual more than once; care was also taken in counting groups because, once groups are disturbed and started to move, additional animals might join the group. Binoculars were used only to check identifications and to assist counts of distant groups.

Point Surveys

Observation points were established in the study area and at each observation point, the observer recorded all sightings of the mammals at that site (Brower *et al.*, 1990).

Roadside Counts

This method (Khan *et al.*, 2010) was applied mostly for the nocturnal mammals like Foxes, Jackals and Wild Cats as well as for the diurnal mammals like mongoose. For this purpose a 4x4 vehicle was used which was driven at a slow speed. These roadside counts were carried out during early mornings at dawn and during night by using search lights.

Line transects

The line transect or strip census method (Khan *et al.*, 2010; Schemnitz, 1980) of population estimation involved counting the animals seen by traversing a predetermined transect line and recording the animal and distances on both side of the strip at which they were observed. The length of the strip multiplied by average total distance of both sides of the strip was taken as the sample area.

Pellet counts

Pellet counting in a specific area is a good technique (Khan and Siddiqui, 2011) for locating large mammals and determining their population. The technique involved removing all pellet groups from plots and then estimating from subsequent observations on those plots the number of groups per hectare to compare animal use of areas between sampling periods.

Baited Spotlighting

Most of the larger predatory mammals were difficult to detect using the normal spotlighting techniques; accordingly a technique was used to attract these animals close to the road. So fresh meat bait (e.g. the skin of a recently slaughtered Goat) was dragged behind the vehicles along a 10km long trail by each of the two vehicles. When the route was retraced in the reverse direction, often predatory animals were encountered following the scent trail along the road (Khan and Siddiqui, 2011). Species and numbers of animals were recorded and most of the times, their footprints were found imprinted on the loose ground. In addition to the above data, incidental sightings of all the large mammals, reptiles and any of the rarer bird species were also recorded.

RESULTS AND DISCUSSION

The overall animal habitats were classified into the following prime habitat types:

1. Mountain Ridges and Ravines
2. Mountain Escarpments
3. Stony Ground/ Rocky Areas
4. Sandy Plains
5. Wetlands
6. Riparian Areas
7. Village / Agriculture Area
8. Wasteland

Study Areas

The Sind Ibex is confined to the Khirthar range, Kambhu, Dumbar, Mungthar, Jahatang and Rannikot area and the Game Reserves; while the Urial is distributed in Dumbar, Jobo, Khar, Mehaj, Jahatang, Mol, Benir and Molguy. Chinkara occurs in Khar area, Taung area, Karchat Valley and Bhaal Valley and also in the Game Reserves (Table 1).

Following are the main study areas for the present investigation which form most of the main components of the entire Protected Area Complex supporting the major populations of the key mammalian species:

Table 1. Important Sites for Mammals in KPAC.

S. No.	Study Areas	Co-ordinates
1.	Baran Naddi	N 25 42 25. 3 E 67 42 16. 3
2.	Behind Thonkri Hills	N 25 24 52. 2 E 67 16 46. 0
3.	Benir Ridge	N 25 29 19. 6 E 67 37 35. 9
4.	Dumbar Jabbal	N 25 40 17. 0 E 67 30 33. 1
5.	Dumbar Hills West	N 25 45 36. 6 E 67 31 10. 3
6.	Deedar Lak	N 25 31 18. 9 E 67 35 12. 0
7.	Gombok Area	N 25 26 51. 8 E 67 34 07. 4
8.	Halalo Pachran	N 25 15 29. 1 E 67 26 19. 4
9.	Karchat Flat Plain	N 25 47 40. 8 E 67 40 42. 1
10.	Kambho Hills	N 25 32 14. 9 E 67 45 58. 4
11.	Khirthar near Chamrhaywari	N 25 44 53. 9 E 67 41 38. 3

S. No.	Study Areas	Co-ordinates
12.	Khar Centre	N 25 18 02. 4 E 67 11 24. 8
13.	Marri Hills	N 25 15 07. 7 E 67 13 15. 9
14.	Moidan Flat Plain Area	N 25 29 25. 5 E 67 16 21. 8
15.	Mol Area	N 25 27 15. 5 E 67 28 46. 9
16.	Rannikot Fort Area	N 25 53 56. 7 E 67 52 56. 3
17.	Sattani Bhor	N 25 51 42. 1 E 67 39 29. 9
18.	Sumbak Hills	N 25 24 42. 0 E 67 52 56. 4
19.	Sajjati Jabbal	N 25 39 09. 6 E 67 30 23. 6
20.	Thonkri Hills	N 25 50 41. 4 E 67 32 08. 5
21.	Tikko Baran	N 26 02 06. 2 E 67 28 34. 5
22.	Uth Palan	N 25 11 58. 5 E 67 30 01. 1

Khirthar National Park (Karchat Area)

It forms the core area of the prime habitat of Sind Ibex and Urial. The key sites include the Kambhu Range, Dumbar area, Khirthar Range and the Rannikot Area (Fig. 1).

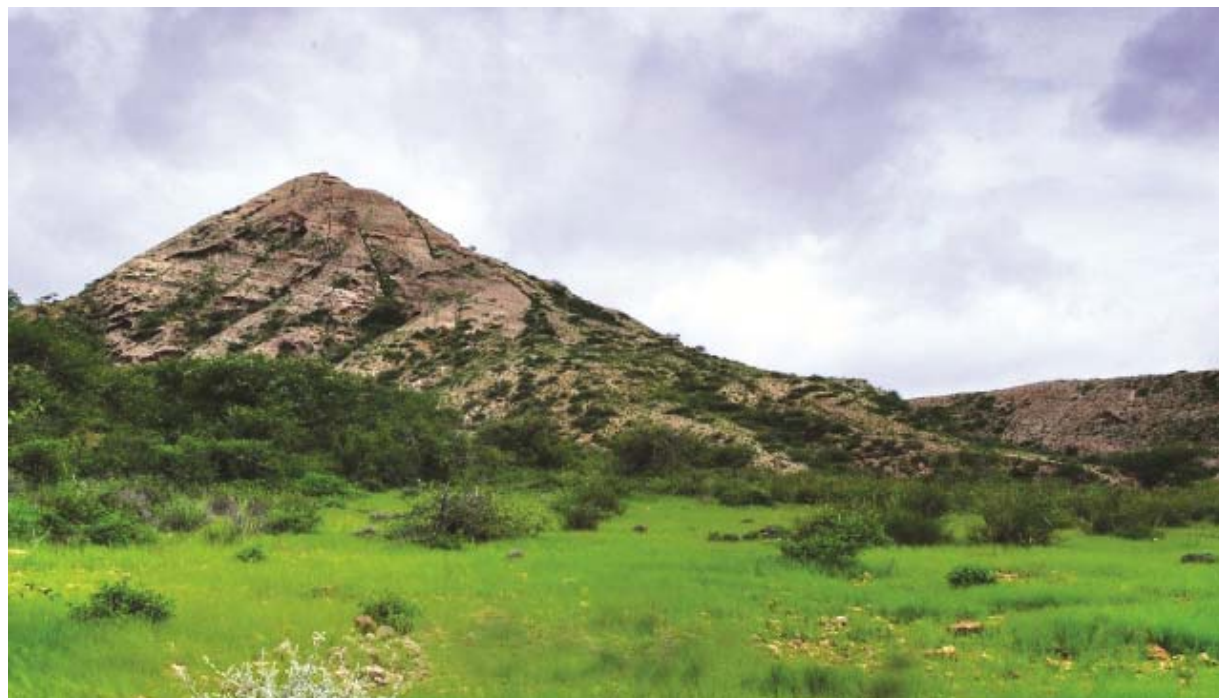


Fig. 1. Karchat, a core area of the Sind Ibex and Urial (source: pakwheels.com).

Khirthar National Park (Khar Centre Area)

It is also an important area for Urial and Sind Ibex. The important sites include the Marri Hills (Fig. 2), Munghthar Hills (Fig. 3), Lusar Hills, and the Thonkari

Area. Munghthar and Lusar Hills are under the control of the Army. Moidan is an important area including sandy area (Fig. 5) for Chinkara.



Fig. 2. Marri Hills at Khar Centre.



Fig. 3. Munghthar Hills Area at Khar Centre.

Surjan Game Reserve

Surjan Game reserve has high population of Ibex particularly in Nimwari due to the presence of two water

points and a good grazing ground (Fig. 4). It also has favorable plain area for Chinkara.



Fig. 4. Water point at Khirthar Protected Area Complex.



Fig. 5. Sandy Area at Khar Center.

Sumbak Game Reserve

It has sufficient grazing ground for Ibex, and also flat plain area for Chinkara. There is no disturbance to the animals.

Eri Game Reserve

It has ample grazing ground for Ibex and Chinkara but it is difficult to locate the animals due to lot of disturbance by the activities of the locals for digging the plant, *Commiphora mukul*. Hyaena sighting is reported mainly from Gujhri area. There is a wildlife observation post Turi Buthi on the top of mountain for making observations on Ibex. Foot prints of Hyaena were recorded here, while Honey Badger is also reported in the area.

Huthiano Game Reserve

It is a favorable area for Ibex and Hyaena. Caracal and Honey Badger have been reported from the area.

In the Khirthar Protected area Complex (KPAC), a total

of 33 species of mammals have so far been recorded (Table 2). Out of which 11 species of large mammals were recorded during the present study (Table 3), which include the key species such as Sindh Ibex or Sind Wild Goat (*Capra aegagrus*) (Fig. 6), Urial (*Ovis vignei*) (Fig. 7), Chinkara (*Gazella bennettii*) (Fig. 8), alongwith Red Fox (*Vulpes vulpes*), Indian Fox (*Vulpes bengalensis*), Desert Cat (*Felis silvestris*), Jungle Cat (*Felis chaus*) and Indian Jackal (*Canis aureus*) which were sighted and counted during the present study. Hyaena, Caracal and Honey Badger were not sighted but have been recorded on the basis of presence of their footprints in the area, while Caracal was last seen in 1997. Three main species, though previously recorded from the area, were not recorded or reported during the present study period. Of these, Indian Pangolin and Wolf are very rare and Wolf was last reported in 1989, while the Leopard seems to be extirpated from the area. It was last reported in 1978. Indian Pangolin was last recorded during the Baseline Study in 2000.



Fig. 6. Group of Sind Ibex (*Capra aegagrus*) at Khirthar Protected Area Complex (source: CHAP).



Fig. 7. Urial (*Ovis vignei*) at KPAC (source: Sindh Wildlife Department).



Fig. 8. Chinkara (*Gazella bennettii*) at KPAC.

19 species of small mammals including the Bats, Hedgehogs, Mongooses, Hare, Palm Squirrel, Indian Porcupine and Rodents were recorded from the area

(Table 2), sightings of 8 species of large mammals were made and the numbers of animals sighted were recorded (Table 3).

Table 2. A Checklist of the Mammals of Khirthar Protected Area Complex.

S. No.	Order	Family	Scientific Name	Common Name
01	Insectivore	Erinaceidae	<i>Hemiechinus collaris</i>	Longeared or Desert Hedgehog
02	Insectivora	Erinaceidae	<i>Paraechinus micropus</i>	Indian Hedgehog
03	Chiroptera	Vespertilionidae	<i>Scotophilus pallidus</i>	Yellow Desert Bat
04	Chiroptera	Vespertilionidae	<i>Scotophilus kuhlii</i>	Lesser House Bat
05	Carnivora	Hyaenidae	<i>Hyaena hyaena</i>	Striped Hyaena
06	Carnivora	Canidae	<i>Canis aureus</i>	Asiatic Jackal
07	Carnivora	Canidae	<i>Canis lupus</i>	Wolf
08	Carnivora	Canidae	<i>Vulpes bengalensis</i>	Indian Fox
09	Carnivora	Canidae	<i>Vulpes vulpes</i>	Red fox
10	Carnivora	Mustellidae	<i>Mellivora capensis</i>	Ratel or Honey Badger
11	Carnivora	Herpestidae	<i>Herpestes edwardsi</i>	Grey Mongoose
12	Carnivora	Herpestidae	<i>Herpestes javanicus</i>	Small Indian Mongoose
13	Carnivora	Felidae	<i>Felis silvestris</i>	Desert Cat
14	Carnivora	Felidae	<i>Felis chaus</i>	Jungle Cat
15	Carnivora	Felidae	<i>Felis caracal</i>	Caracal
16	Carnivora	Felidae	<i>Panthera pardus</i>	Leopard
17	Pholidota	Manidae	<i>Manis crassicaudata</i>	Indian Pangolin
18	Artiodactyla	Bovidae	<i>Capra aegagrus</i>	Sind Wild Goat or Sindh Ibex
19	Artiodactyla	Bovidae	<i>Ovis vignei</i>	Urial
20	Artiodactyla	Bovidae	<i>Gazella bennettii</i>	Chinkara
21	Lagomorpha	Leporidae	<i>Lepus migricollis</i>	Indian Hare
22	Rodentia	Sciuridae	<i>Funambulus pennantii</i>	Striped Palm Squirrel
23	Rodentia	Hystriidae	<i>Hystrix indica</i>	Indian Porcupine
24	Rodentia	Muridae	<i>Rattus rattus</i>	Roof Rat / House Rat
25	Rodentia	Muridae	<i>Mus musculus</i>	House Mouse
26	Rodentia	Muridae	<i>Mus booduga</i>	Little Indian Field Mouse
27	Rodentia	Muridae	<i>Mus saxicola</i>	Grey Spiny Mouse
28	Rodentia	Muridae	<i>Golunda ellioti</i>	Indian Bush Rat
29	Rodentia	Muridae	<i>Acomys cahirinus</i>	Cairo Spiny Mouse
30	Rodentia	Muridae	<i>Calomyscus bailwardi</i>	Mouse like Hamster
31	Rodentia	Muridae	<i>Gerbillus nanus</i>	Balochistan Gerbil
32	Rodentia	Muridae	<i>Tatera indica</i>	Indian Gerbil
33	Rodentia	Muridae	<i>Meriones hurrianae</i>	Indian Desert Jird

Table 3. List of Large mammals recorded at Khirthar Protected Area Complex

No.	Species	KNP (Khar)	KNP (Karchat)	Game Reserves
1	Urial	+	+	-
2	Chinkara	+	+	+
3	Ibex	+	+	+
4	Indian Fox	+	+	+
5	Red Fox	+	+	+
6	Jackal	+	+	+
7	Desert Cat	+	+	+
8	Jungle Cat	+	+	-
9	Hyaena	Foot Prints	Foot Prints	Foot Prints
10	Caracal	Foot Prints	Foot Prints	Foot Prints
11	Honey Badger	Foot Prints	Foot Prints	Foot Prints

*+ present, - absent

Large Mammals recorded at KPAC

The following eleven species of large mammals were documented in KPAC. These species were represented in the KNP (Karchat and Khar) and the game reserves except that Jungle Cat and Urial were not recorded from the Game Reserves.

Eight species of large mammals were sighted. Their numbers are given in table 4. (Estimation of the total population of these species was not attempted).

Species of Special Conservation Concern

The following species of mammals of the KPAC have been identified as species of special conservation interest being the indicator species viz. Sind Ibex, Urial, Chinkara, Striped Hyaena, Grey Wolf, Honey Badger and Caracal. Information about the current status of Indian Pangolin which is quite rare in the area needs also to be collected.

Major Threats

Khirthar National Park (Khar Center Area)

There is lot of disturbance to the wild animals because of local communities using the same area for collection of drinking water. There is also competition for grazing between the domestic livestock and the wild animals. There is lot of disturbance to the wild animals due to the presence of villages and movement of local people in the area.

A very important habitat for Urial and Ibex viz. Munghthar and Luhsar Hills have been under the control of Army. Previously, herds of Urial and Ibex were usually sighted over the Munghthar Hills but now these are not seen as they have migrated from their main habitat to other areas. The two water springs in Marri Hills have gone dry, so there is shortage of water on water points for the wild animals which have to move to the distant water points in area.

Khirthar National Park (Karchat Area)

Like Khar Center, here in the Karchat area local communities have been using the same point for the

collection of drinking water and due to the movement of people in the area, wild animals have been disturbed. There is competition for grazing between the domestic livestock and the wild animals. There is a lot of disturbance to the wild animals due to movement of local people in the area.

Game Reserves

There is lot of disturbance to the wild animals due to movement of local people in the area. There is also disturbance due to the road leading to Thana Bulla Khan passing through the Surjan Game Reserve. There is also shortage of water for animals in Eri and Huthiano and hence the animals tend to disperse to other areas. There are already two water points made in Huthiano but water is not available there.

CONCLUSION

Two of the main key species of the KPAC are surviving well, but Chinkara seems under threat due to the impact of increasing human population in the area and also expansion of agriculture practices in its core habitat. There is an urgent need for the proper management of the species and its habitat. There is big population of Ibex in Surjan and Sumbak Game Reserves areas, but the habitat in Eri and Huthiano needs to be improved by provision of water points in these areas.

Khar and Kharchat areas have been suggested for the development of ecotourism in Pakistan. Action in this regard may be taken. The boundaries of the different components of KPAC may be demarcated and maps and necessary information material may be prepared to highlight the importance of the area.

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Table 4. Total number of Large Mammals sighted in the Khirthar Protected Area Complex during 2010-2011.

No.	Species	KNP (Khar)	KNP (Karchat)	Game Reserves	Total
1	Urial	300	700	-	1000
2	Chinkara	30	100	20	150
3	Ibex	500	600	100	1200
4	Indian Fox	02	04	02	08
5	Red Fox	08	12	05	25
6	Jackal	15	20	05	40
7	Desert Cat	04	10	06	20
8	Jungle Cat	02	10	-	12

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