



PROTECTED AREAS OF PAKISTAN: WILDLIFE OF SOME SELECTED NATIONAL PARKS: A REVIEW

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ABSTRACT

Pakistan supports a wide array of ecosystems and has a unique and beautiful biodiversity, that belongs to a blend of ecosystems and habitat. These habitats support a large number of species that contribute to the overall vertebrate and invertebrate biodiversity. Pakistan being zoogeographically rich country contains great diversity of wild fauna and flora. There are 198 species of mammals, avifauna includes 700 species, herpetofauna consist of 177 species of reptiles and 22 species of amphibians, while Freshwater resources contains 198 species of freshwater fishes. A rich diversity of invertebrates is also found as 5000 species of invertebrates are reported in Pakistan. Currently human population pressure, increasing of rate of poverty, habitat destruction, poaching, urbanization, less implementation of rules and regulations and lack of knowledge about the conservation and management, several important species are declining. In this scenario protected areas are an effective and important tool in conserving and protecting the threatened wildlife species and ecosystems. There are three types of protected areas in Pakistan which include National parks, Wildlife Sanctuaries and Game Reserves. Recently, Azad Jammu and Kashmir (AJ&K), Baluchistan and Khyber Pakhtunkhwa (KP) have revised wildlife legislation and included several new additional categories. Today, there are over 414 protected areas including 30 National Parks, 92 Wildlife Sanctuaries, 97 Game Reserves, 145 Community Conservation Areas/ Community Game Reserves, 21 Private Game Reserves, 03 Marine Conservation Areas, 02 Wildlife Refuges and 24 Wildlife Parks. Pakistan like many other countries is severely influenced by unfavorable impacts of climate change. Climate change is now being the globally important phenomenon. The awareness relevant to climate disasters is rising day by day. There is a need to develop solution based policies to cope up the extremities of climatic disastrous scenarios. Various adaptations should be done to overcome the adverse effects of climate change on our ecological assets. In Pakistan, the standard evaluation of protected areas is still required to access the population and status of the wild animals and threats of key species population and effectiveness of the conservation and management. The review observed that management of the Protected Areas need to be updated and trained to wildlife staff according to the new and survey and modern management techniques. In this review, we include our national parks filed studies (Ghalib *et al.*, 2013; Ghalib *et al.*, 2015; Khan and Saima, 2011; Khan *et al.*, 2010; Khan *et al.*, 2011; Khan *et al.*, 2013) and other available published data of vertebrate fauna of Lal Suhanra National Park, Kirthar National Park, Hazarganji Chiltan National Park and Hingol National Park for future studies and as reference paper.

Keywords: IUCN green listing, biodiversity, climate change, wildlife monitoring,

INTRODUCTION AND DISCUSSION

Globally, protected areas serve as environmental benchmarks for monitoring of ecosystem systems health and understanding the adverse effects of pollution, climate change, resource extraction, invasive species and other stressors (Anne, 2017). IUCN defines a protected area as: *A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values* (Dudley, 2008; Stolton *et al.*, 2013).

Protected areas have played an important role within the landscapes and seascapes. They are essential for the conservation of invertebrate and vertebrate biodiversity and ecosystems as well as beneficial benefits for people. Protected areas are also recognized in several international agreements and programs, including the United Nations, Millennium Development Goals, the Convention on Biological Diversity (CBD), the Convention on Migratory Species (CMS), the World Heritage Convention, the Ramsar Convention, the UNESCO Man and Biosphere Program and UN Reducing Emissions from Deforestation and Forest Degradation programs. Protected areas performed a vital responsibility to fulfill the criteria of Millenium development Goals and

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their persistence is also very important for sustainable development in upcoming years (Khan, 2015).

The International Union for Conservation of Nature - IUCN, along with the United Nations Environment Program - UNEP and World Conservation Monitoring Centre - WCMC, maintains a database of world protected areas and today included about more than 285,529 protected areas covering 244 countries and territories (UNEP-WCMC and IUCN, 2023) which occupied about 15% of the total land area of earth and about 7.4% of the oceanic ecosystem (Protected Planet, 2023). The valuable progress in protecting of marine biodiversity and ecosystem has also seen in last decade.

Pakistan has a rich and valuable vertebrate biodiversity, different types of ecological habitats and a variety of environmental components which includes savannahs, aquatic ecosystems, grasslands, barren lands, alpine forests, tropical forests, deserted ecosystems, freshwater and marine ecological habitats, wide coastline and beautiful wildlife (Khan *et al.*, 2010; Begum *et al.*, 2014). The wildlife of Pakistan includes 198 mammal species, 700 bird species, 177 reptile species, 22 amphibians, 198 fresh water fishes and 5,000 species of invertebrates (Pakistan National Report, 2019).

The human population of Pakistan is over 230,000,000 as of Jan 2023 (Countrymeters.info, 2023). Today, human population pressure, increasing of rate of poverty, habitat destruction, unlawful poaching activities, unmanaged constructions, uncontrolled anthropogenic activities and lack of conservation and management knowledge, several important species are declining. In this scenario protected areas are an effective tool in conserving the threatened wildlife species and ecosystems.

Protected areas represent a significant contribution to the conservation and protection of global unique wildlife. In Pakistan establishment of network of Protected Areas was started in early 1970's under the provincial wildlife Acts/Ordinances because wildlife is a provincial subject and Provincial Wildlife departments are responsible for the establishment and management of Protected Areas. Pakistan has three categories of protected areas: National Parks, Wildlife Sanctuaries and Game Reserves (Khan *et al.*, 2010). Recently, Azad Jammu and Kashmir, Baluchistan and Khyber Pakhtunkhwa has revised wildlife legislation and included several new additional categories such as Private Game Reserve, Community Conservation/Managed Area, Biodiversity Reserve, Wildlife Refuge, Wildlife Park, Biosphere Reserve, Site of Special Scientific Interest, National Natural Heritage Site, Sacred Protected Site and Marine Conservation Area.

Presently, there are over 414 protected areas in Pakistan including 30 National Parks, 92 Wildlife Sanctuaries, 97

Game Reserves, 145 Community Conservation Areas/Community Game Reserves, 21 Private Game Reserves, 03 Marine Conservation Areas, 02 Wildlife Refuges and 24 Wildlife Parks (Table 1) (Ghalib *et al.*, 2013; Maqsood, 2019).

According to IUCN Protected Areas Management Categories II, *National Parks are large natural or near-natural areas protecting large-scale ecological processes with characteristic species and ecosystems, which also have environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities* (Dudley, 2008).

The main goal of National Park's is to conserve and protect endangered species of flora and fauna. Today, there are more than 6,000 National Parks in 100 countries that protect and conserve biodiversity and support for ecotourism programs and activities (National Parks of the World, 2023).

Recently, Gilgit-Baltistan and Punjab provincial governments proposed four new National Parks including Nanga Parbat National Park, Himalaya National Park (Gilgit-Baltistan); Tilla Jogian National Park, Salt Range National Park, Punjab for notification. The objective of this paper is to review published literature related to Protected Areas updated categories, numbers of protected areas in Pakistan and provide wild animals check list of some selected National Parks for future research work.

Vertebrate Fauna of Some Selected National Parks

Pakistan has world's rarest vertebrate wild species like Indus river dolphin (*Platanista minor*), Balochistan black bear (*Ursus thibetanus gedrosianus*), Snow leopard (*Panthera uncia* or *Uncia uncia*), Common leopard (*Panthera pardus*), Brown bear (*Ursus arctos*), while three endemics, one species and two sub-species, namely, Balochistan black bear, Indus dolphin, Punjab urial (*Ovis vignei punjabiensis*) and Woolly flying squirrel (*Eupetaurus cinereus*). The Indus river dolphin is one of the rarest mammals and internationally second most endangered freshwater river dolphin (Uzma *et al.*, 2018). Due to anthropogenic activities such as habitat loss, fragmentation of habitats, industrialization and overuse of natural resources all species are declining. While, all provincial governments established protected areas including national parks in their provinces for the conservation and protection of threatened species. Today Pakistan has 30 National Parks (Fig. 1).

Lal Suhanra National Park (LSNP)

The area of this National Park comprises of 77480 acres which was developed in 1972. It was the first National Park of Pakistan. It was developed in Bahawalpur Punjab. The aim behind the development of this national park was to protect the endangered species of wild animals and wild plant in the area of Cholistan. This national park was extended in 1984 as the area of 50000 acres were included in it.

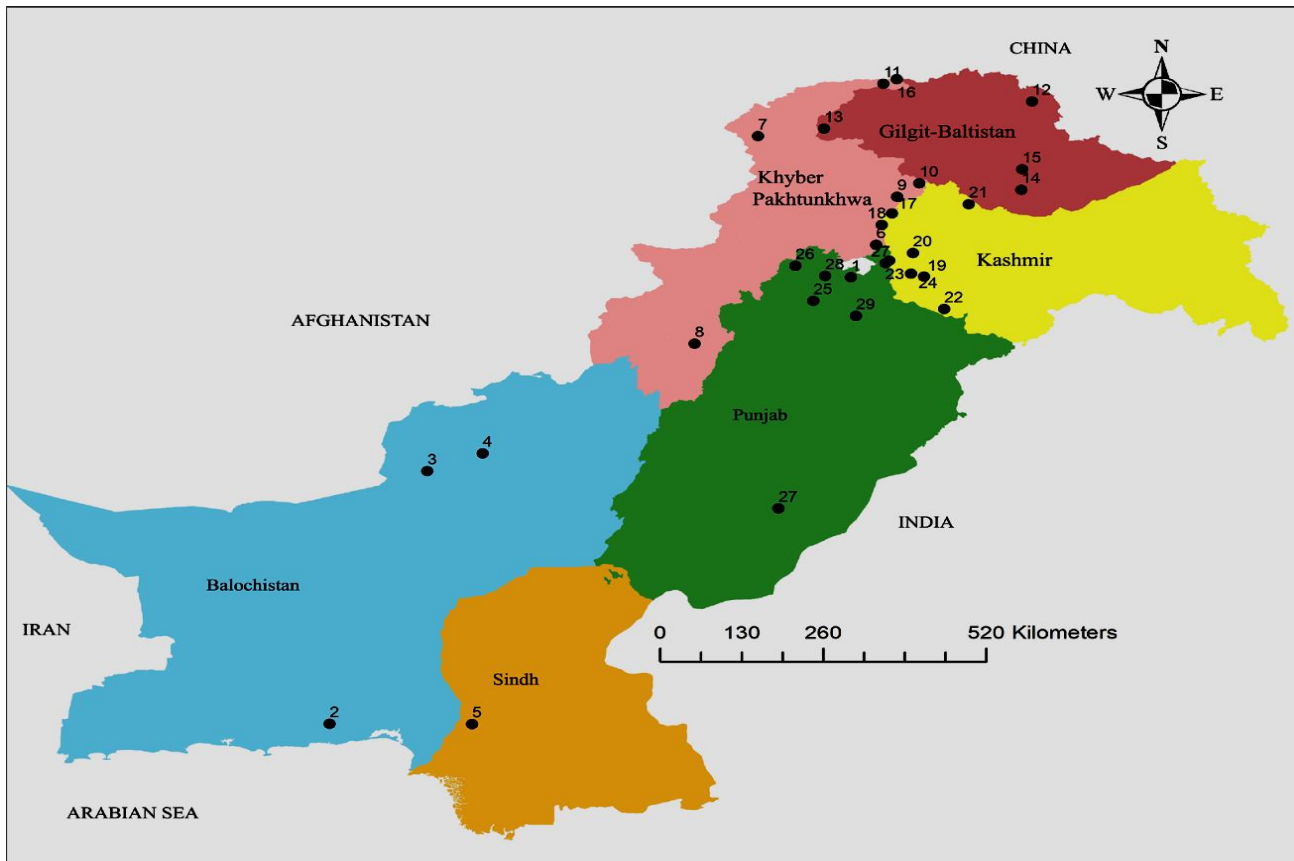


Fig. 1. Map of Pakistan showing locations of National Parks (IUCN Pakistan, 2023).

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|--|-------------------------------------|-------------------------------------|
| 1. Margallah Hills National Park | 2. Hingol National Park | 3. Hazarganji Chiltan National Park |
| 4. Ziarat National Park | 5. Kirthar National Park | 6. Ayubia National Park |
| 7. ChitralGol National Park | 8. Sheikh Badin National Park | 9. Saiful Maluk National Park |
| 10. Lulosar Dodipat National Park | 11. Broghil Valley National Park | 14. Deosai National Park |
| 12. Khunjerab National Park | 13. Hunderab Shandoor National Park | 19. Pir Lasoorha National Park |
| 15. Central Karakoram National Park | 16. Qurumber National Park | 22. Deva Vatala National Park |
| 17. Machiara National Park | 18. Ghamot National Park | 25. Chinji National Park |
| 20. Toli Pir National Park | 21. Musk Deer Gorez National Park | 30. Ara Basharat National Park |
| 23. Azad Pattan National Park, | 24. Mahasheer National Park (AJ&K) | |
| 26. Kala Chitta National Park | 27. Lal Suhanra National Park | |
| 28. Murree-KotliSattian-Kahuta National Park | 29. Kheri Murat National Park | |

Table 1. Protected Areas in Pakistan showing current number, total and percent area identified as PAs of different categories of PAs in the provinces/ territories of Pakistan (IUCN Pakistan, 2023).

Province/Territory	National Park	Wildlife Sanctuary	Game Reserve	Community Conservation Area / Community Game Reserve	Private Game Reserve	Marine Conservation Area	Wildlife Refuge	Wildlife Park	Total	Area of province/ territory under PAs (ha)
Islamabad Capital Territory	1	1	1	--	--	--	--	--	3	93,186
Azad Jammu & Kashmir	8	1	11	--	--	--	--	--	20	123,762
Balochistan	3	14	6	3	--	3	--	--	29	2,472,960
Gilgit-Baltistan	5	2	5	48	--	--	--	--	60	4,527,200
Khyber Pakhtunkhwa	6	3	38	90	16	--	2	8	163	1,065,453
Punjab	6	37	23	4	5	--	--	16	89	1909922
Sindh	1	34	13	--	--	--	--	--	48	1855981
Total	30+4*	92	97	145	21	3	2	24	414	12048464

*Four proposed: Nanga Parbat National Park, Himalaya National Park (Gilgit-Baltistan); Tilla Jogian National Park, Salt Range National Park (Punjab).

While in year 2000, further area of 35088 acres was included as an extension. Currently it comprises of 162568 acres / 65788.93549 hectares of total area (Forest, Wildlife and Fisheries Department, Government of Punjab, 2023). The LSNP was established for the conservation of endangered wildlife species of Blackbuck, Chinkara, Blue bull and native fauna and flora of Cholistan. The park is also working for restoration of gene pool specially in Black buck, Chinkara, Blue bull species.

Saeed and Brohi (2018) conducted a study on Baseline data of Vertebrate Fauna of Lal Suhsnra National Park and reported 28 species of mammals (Table 2), 153 species of birds (Table 3), 37 species of reptiles (Table 4), while Khan *et al.* (2018) recorded five species of amphibians (Table 5) in the LSNP.

After local extinction of Black buck from Pakistan, during the late 1970's and early 1980's, a few pairs of Black buck were brought from Texas, USA and re-introduced in Lal Suhanra National Park. There is no regular census and monitoring program in the park nor is there any update available on animal population status. This park is also facing several threats to ecosystem and wild animals.

Table 2. Mammals of Lal Suhanra National Park (Saeed and Brohi, 2018).

S. No.	Common name	Scientific name
1.	Long-eared Hedgehog	<i>Hemiechinus auritus</i>
2.	Greater Mouse-Tailed Bat	<i>Rhinopoma microphyllum</i>
3.	Least Pipistrelle	<i>Pipistrellus tenuis</i>
4.	Kuhl's Pipistrelle	<i>Pipistrellus kuhlii</i>
5.	Greater Asiatic Yellow Bat	<i>Scotophilus heathii</i>
6.	Indian Wolf	<i>Canis lupus</i>
7.	Asiatic Jackal	<i>Canis aureus</i>
8.	Desert Fox	<i>Vulpes bengalensis</i>
9.	Small Indian Civet	<i>Viverricula indica</i>
10.	Indian Grey Mongoose	<i>Herpestes edwardsii</i>
11.	Striped Hyaena	<i>Hyaena hyaena</i>
12.	Indian Desert Cat	<i>Felis silvestris</i>
13.	Jungle Cat	<i>Felis chaus</i>
14.	Caracal Cat	<i>Caracal caracal</i>
15.	Indian Wild Boar	<i>Sus scrofa</i>
16.	Nilgai	<i>Boselaphus tragocamelus</i>
17.	Blackbuck	<i>Antelope cervicapra</i>
18.	Chinkara Gazelle	<i>Gazella bennettii</i>
19.	Indian Hare	<i>Lepus nigricollis</i>
20.	Northern Palm Squirrel	<i>Funambulus pennantii</i>
21.	Indian Desert Jird	<i>Meriones hurrianae</i>
22.	Indian Gerbil	<i>Tatera indica</i>
23.	Indian Hairy-Footed Gerbil	<i>Gerbillus leadowi</i>
24.	Short-Tailed Bandicoot Rat	<i>Nesokia indica</i>
25.	Little Indian Field Mouse	<i>Mus booduga</i>
26.	House Mouse	<i>Mus musculus</i>
27.	Black Rat	<i>Rattus rattus</i>
28.	Indian Crested Porcupine	<i>Hystrix indica</i>

Table 3. Birds of Lal Suhanra National Park (Saeed and Brohi, 2018).

S.No.	Common name	Scientific name
1.	Common Quail	<i>Coturnix coturnix</i>
2.	Grey Francolin	<i>Francolinus pondicerianus</i>
3.	Black Francolin	<i>Francolinus francolinus</i>
4.	Red-Vented Bulbul	<i>Pycnonotus cafer</i>
5.	White-eared Bulbul	<i>Pycnonotus leucogenys</i>
6.	Coppersmith Barbet	<i>Psilopogon haemacephalus</i>
7.	Rufous-tailed Shrike	<i>Lanius isabellinus</i>
8.	Bay-backed Shrike	<i>Lanius vittatus</i>
9.	Long-tailed Shrike	<i>Lanius schach</i>
10.	Southern Grey Shrike	<i>Lanius meridionalis</i>
11.	Pied Cuckoo	<i>Clamator jacobinus</i>
12.	Rufus Treepie	<i>Dendrocitta vagabunda</i>
13.	House Crow	<i>Corvus splendens</i>
14.	Common Raven	<i>Corvus corax</i>
15.	Greater Coucal	<i>Centropus sinensis</i>
16.	Common Hoopoe	<i>Upapa epops</i>
17.	Indian Roller	<i>Coracias benghalensis</i>
18.	European Roller	<i>Coracias garrulous</i>
19.	Plain Martin	<i>Riparia paludicola</i>
20.	Pale Martin	<i>Riparia diluta</i>
21.	House Swift	<i>Apus nipalensis</i>
22.	Blue-Cheeked Bee-eater	<i>Merops persicus</i>
23.	Green Bee-eater	<i>Merops orientalis</i>
24.	Alexandrine Parakeet	<i>Psittacula eupatria</i>
25.	Rose-ringed Parakeet	<i>Psittacula krameri</i>
26.	White-throated Kingfisher	<i>Halcyon smyrnensis</i>
27.	Yellow-Crowned Woodpecker	<i>Leiopicus mahrattensis</i>
28.	Sind Woodpecker	<i>Dendrocopos assimilis</i>
29.	Black-Rumped Woodpecker	<i>Dinopium benghalense</i>
30.	Macqueen's Bustard	<i>Chlamydotis macqueenii</i>
31.	Indian Bustard	<i>Ardeotis nigriceps</i>
32.	Pin-Tailed Sandgrouse	<i>Pterocles alchata</i>
33.	Chestnut-Bellied Sandgrouse	<i>Pterocles exustus</i>
34.	Spotted Sandgrouse	<i>Pterocles senegallus</i>
35.	Black-Bellied Sandgrouse	<i>Pterocles orientalis</i>
36.	Barn Swallow	<i>Hirundo rustica</i>
37.	Collard Scops Owl	<i>Otus lettia</i>
38.	Spotted Owlet	<i>Athena brama</i>
39.	Eurasian Nightjar	<i>Caprimulgus europaeus</i>
40.	Sykes's Nightjar	<i>Caprimulgus mahrattensis</i>
41.	Rock Pigeon	<i>Columba livia</i>
42.	Eurasian Collard Dove	<i>Streptopelia decaocto</i>
43.	Laughing Dove	<i>Spilopelia senegalensis</i>
44.	Red Collard Dove	<i>Streptopelia tranquebarica</i>
45.	Indian Courser	<i>Cursorius coromandelicus</i>
46.	Black-Shouldered Kite	<i>Elanus axillaris</i>
47.	Black Kite	<i>Milvus migrans</i>
48.	Egyptian Vulture	<i>Neophron percnopterus</i>
49.	Eurasian Griffon Vulture	<i>Gyps fulvus</i>
50.	Cinereous Vulture	<i>Aegyptius monachus</i>
51.	Short-toed Snake Eagle	<i>Circaetus gallicus</i>
52.	Eurasian Marsh Harrier	<i>Circus aeruginosus</i>
53.	Pallied Harrier	<i>Circus macrourus</i>
54.	Shikra	<i>Accipiter badius</i>

55.	Eurasian Sparrowhawk	<i>Accipiter nisus</i>
56.	Eurasian Eagle Owl	<i>Bubo bubo</i>
57.	Short eared Owl	<i>Asio flammeus</i>
58.	Nothern Goshawk	<i>Accipiter gentilis</i>
59.	Oriental Honey Buzzard	<i>Pernis ptilorhynchus</i>
60.	White-eyed Buzzard	<i>Butastur teesa</i>
61.	Common Buzzard	<i>Buteo buteo</i>
62.	Long-Legged Buzzard	<i>Buteo rufinus</i>
63.	Tawny Eagle	<i>Aquila rapax</i>
64.	Greater Spotted Eagle	<i>Clanga clanga</i>
65.	Steppe Eagle	<i>Aquila nipalensis</i>
66.	Bonelli's Eagle	<i>Aquila fasciata</i>
67.	Imperial Eagle	<i>Aquila heliaca</i>
68.	Common Kestrel	<i>Falco tinnunculus</i>
69.	Laggar Falcon	<i>Falco jugger</i>
70.	Peregrine Falcon	<i>Falco peregrinus</i>
71.	Golden Oriole	<i>Oriolus oriolus</i>
72.	Black Drongo	<i>Dicrurus macrocercus</i>
73.	Bluethroat	<i>Cyanecula svecica</i>
74.	Indian Robin	<i>Saxicoloides fulicatus</i>
75.	Common Stonechat	<i>Saxicola torquatus</i>
76.	Pied Bushchat	<i>Saxicola caprata</i>
77.	Red-Throated Flycatcher	<i>Ficedula albicilla</i>
78.	Black Redstart	<i>Phoenicurus ochruros</i>
79.	Variable Wheateater	<i>Oenanthe picata</i>
80.	Desert Wheateater	<i>Oenanthe deserti</i>
81.	Isabelline Wheateater	<i>Oenanthe isabellina</i>
82.	Rufous-Tailed Wheateater	<i>Oenanthe xanthopygma</i>
83.	Rosy Starling	<i>Pastor roseus</i>
84.	Common Myna	<i>Acridotheres tristis</i>
85.	Bank Myna	<i>Acridotheres ginginianus</i>
86.	Striated Prinia	<i>Prinia crinigera</i>
87.	Rufous-fronted Prinia	<i>Prinia buchanani</i>
88.	Ashy Prinia	<i>Prinia socialis</i>
89.	Plain Prinia	<i>Prinia inornata</i>
90.	Graceful Prinia	<i>Prinia gracilis</i>
91.	Common Tailorbird	<i>Orthotomus sutorius</i>
92.	Lesser Whitethroat	<i>Sylvia curruca</i>
93.	Desert Warbler	<i>Sylvia nana</i>
94.	Common Chiffchaff	<i>Phylloscopus collybita</i>
95.	Common Babbler	<i>Argya caudate</i>
96.	Jungle Babbler	<i>Turdoides striata</i>
97.	Black-Crowned Sparrow Lark	<i>Eremoptrix nigriceps</i>
98.	Ashy-Crowned Sparrow Lark	<i>Eremopterix griseus</i>
99.	Greater Hoopoe Lark	<i>Alaemon alaudipes</i>
100.	Crested Lark	<i>Galerida cristata</i>
101.	Greater Short-toed Lark	<i>Calandrella brachydactyle</i>
102.	Oriental Skylark	<i>Alauda gulgula</i>
103.	Purple Sunbird	<i>Cinnyris asiaticus</i>
104.	House Sparrow	<i>Passer domesticus</i>
105.	Spanish Sparrow	<i>Passer hispaniolensis</i>
106.	Chestnut-Shouldered Petronia	<i>Gymnoris xanthocollis</i>
107.	White Wagtail	<i>Motacilla alba</i>
108.	Yellow Wagtail	<i>Motacilla tschutschensis</i>
109.	Grey Wagtail	<i>Motacilla cinerea</i>
110.	Paddyfield Pipit	<i>Anthus rufulus</i>
111.	Baya Weaver	<i>Ploceus philippinus</i>
112.	Indian Silverbill	<i>Euodice malabarica</i>
113.	Common Rosefinch	<i>Carpodacus erythrinus</i>

114.	Rock Bunting	<i>Emberiza cia</i>
115.	Red-Headed Bunting	<i>Emberiza bruniceps</i>
116.	Common Shelduck	<i>Tadorna tadorna</i>
117.	Ruddy Shelduck	<i>Tadorna ferruginea</i>
118.	Gadwall	<i>Mareca strepera</i>
119.	Eurasian Wigeon	<i>Mareca penelope</i>
120.	Mallard	<i>Anas platyrhynchos</i>
121.	Common Teal	<i>Anas crecca</i>
122.	Garganey	<i>Spatula querquedula</i>
123.	Northern Pintail	<i>Anas acuta</i>
124.	Northern Shoveler	<i>Spatula clypeata</i>
125.	Common Pochard	<i>Aythya ferina</i>
126.	Little Grebe	<i>Tachybuptus ruficollis</i>
127.	Great Cormorant	<i>Phalacrocorax carbo</i>
128.	Little Egret	<i>Egretta garzetta</i>
129.	Cattle Egret	<i>Bulbulcus ibis</i>
130.	Tawny Pipit	<i>Anthus campestris</i>
131.	Intermediate Egret	<i>Ardea intermedia</i>
132.	Great Egret	<i>Ardea alba</i>
133.	Grey Heron	<i>Ardea cinerea</i>
134.	Purple Heron	<i>Ardea purpurea</i>
135.	Indian Pond Heron	<i>Ardeola grayii</i>
136.	Black-Crowned Heron	<i>Nycticorax nycticorax</i>
137.	Great Bittern	<i>Botaurus stellaris</i>
138.	Demoiselle Crane	<i>Anthropoides virgo</i>
139.	Purple Swampphen	<i>Porphyrio porphyria</i>
140.	Common Moorhen	<i>Gallinula chloropus</i>
141.	Common Coot	<i>Fulica atra</i>
142.	Common Snipe	<i>Gallinago gallinago</i>
143.	Jack Snipe	<i>Lymnecryptes minimus</i>
144.	Common Greenshank	<i>Tringa nebularia</i>
145.	Greater Painted Snipe	<i>Rostratula benghalensis</i>
146.	Green Sandpiper	<i>Tringa ochropus</i>
147.	Ruff	<i>Calidris pugnax</i>
148.	Little Stint	<i>Calidris minuta</i>
149.	Temminck's Stint	<i>Calidris temminckii</i>
150.	Black-Winged Stilt	<i>Himantopus himantopus</i>
151.	Red-Wattled Lapwing	<i>Vanellus indicus</i>
152.	Common Sandpiper	<i>Actitis hypoleucos</i>
153.	Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>

Table 4. Reptilian Species in Lal Suhanra National Park (Saeed and Brohi, 2018).

S.No.	Common name	Scientific name
1.	Oriental Garden Lizard	<i>Calotes versicolor</i>
2.	Brilliant Agama	<i>Trapelus agilis pakistanensis</i>
3.	Afghan Ground Agama	<i>Trapelus megalonyx</i>
4.	Sind Sand Gecko	<i>Crossobamon orientalis</i>
5.	Tuberculate Ground Gecko	<i>Cyrtopodion scabrum</i>
6.	Brooke's House Gecko	<i>Hemidactylus brookii</i>
7.	Yellow-belly House Gecko	<i>Hemidactylus flaviviridis</i>
8.	Spotted Lacerta	<i>Mesalina watsonana</i>
9.	Common Mole Skink	<i>Eurylepis taeniolata</i>
10.	Three-Toad Snake Skink	<i>Ophiomorus tridactylus</i>
11.	Bengal Monitor	<i>Varanus bengalensis</i>
12.	Desert Monitor	<i>Varanus griseus koniecznyi</i>
13.	Slender Worm Snake	<i>Indotyphlops porrectus</i>
14.	Common Sand Boa	<i>Eryx johnii</i>

15.	Striped Keelback	<i>Amphisma stolatum</i>
16.	Common Cat Snake	<i>Boiga trigonata</i>
17.	Northern Wolf Snake	<i>Lycodon striatus</i>
18.	Sindhi Awl-headed Sand Snake	<i>Lytorhynchus paradoxus</i>
19.	Banded Kukri Snake	<i>Oligodon arnensis</i>
20.	Streaked Kukri Snake	<i>Oligodon taeniolatus</i>
21.	Indian Sand Snake	<i>Psammophis condanarus</i>
22.	Pakistan Sand Racer	<i>Psammophis leithii</i>
23.	Schokari Sand Racer	<i>Psammophis schokari</i>
24.	Indian Rat Snake	<i>Ptyas mucosa</i>
25.	Diadem Snake	<i>Spalerosophis diadema</i>
26.	Red-Spotted Diadem Snake	<i>Spalerosophis arenarius</i>
27.	Checkered Keelback	<i>Xenochrophis piscator</i>
28.	Common Krait	<i>Bungarus caeruleus</i>
29.	Indian Cobra	<i>Naja naja</i>
30.	Russell's Viper	<i>Daboia russelii</i>
31.	Eastern Saw-Scaled Viper	<i>Echis carinatus sochureki</i>
32.	Indian Spiny-tailed Lizard	<i>Uromastix hardwickii</i>
33.	Cholistan Skink Lizard	<i>Eumeces cholistanensis</i>
34.	Cholistan Lizard	<i>Eremius cholistanica</i>
35.	Brown Roofed Turtle	<i>Pangshura smithii</i>
36.	Spotted Pond Turtle	<i>Geoclemys hamiltonii</i>
37.	Ganges Soft-shelled Turtle	<i>Nilssonina gangetica</i>

Table 5. Amphibian of Lal Suhanra National Park (Khan *et al.*, 2018).

S.No.	Common name	Scientific name
1	Indian Bull Frog	<i>Hoplobatrachus tigerinus</i>
2	Asian grass Frog	<i>Fejervarya limnocharis</i>
3	Southern Cricket Frog/Long-legged Cricket Frog	<i>Fejervarya syhadrensis</i>
4	Ornate Narrow-Mouthed Frog	<i>Microhyla ornate</i>
5	Baloch Green Toad	<i>Bufo viridis zugmayeri</i>

Khirthar National Park (KNP)

Khirthar National Park is one of Pakistan's largest National Park on area of 308,733 hectares. It was established in 1974 for conservation of threatened mammal species such as Sindh Ibex (*Capra aegagrus*), Urial (*Ovis vignei*), Chinkara (*Gazella bennettii*) and indigenous flora and fauna. Several other species like Desert wolf, Leopard, Striped hyaena, Desert wolf, Jungle cats, Porcupine and Pangolin are also resident of this park (Roberts, 1997).

It was the first park incorporated in the listing system of United Nation's National Parks in 1975 (Khan *et al.*, 2013). Hot spots of vertebrate wildlife are found in croplands and wetlands while lowest in mountain areas. Total 277 vertebrate species were found including 36 species of mammals (Table 6a, 6b), 207 species of birds (Table 7), 42 species of reptiles (Table 8) and three species of amphibians (Table 9).

In the Khirthar National Park highest vertebrate wildlife is found in wetlands and croplands and the lowest in mountain sites. The farmland areas observed relatively

less importance to several of the rarer species. Khirthar National Park (3087km²) is part of the Khirthar Protected Areas Complex (KPAC) that stretches over 4350km² and comprises of Mahal Kohistan Wildlife Sanctuary (705.7 km²), Surjan Game Reserve, Sambak Game Reserve, Eri Game Reserve, Huthiano Game Reserve (285.3km²) and Hub Dam Wildlife Sanctuary (272km²) (Khan *et al.*, 2013). Due to the presence of several threatened species, such as: Imperial Eagle, Pallas's Fishing Eagle, Dalmatian Pelican, Sociable Lapwing, Indian Skimmer and Great White Pelican Khirthar National Park and Hub Dam are included as Important Bird Area (IBAs) (Khan *et al.*, 2012).

Table 6a. Mammals of Khirthar National Park (Khan *et al.*, 2013; University of Melbourne, 2001).

S. No.	Scientific name	Common name
1	<i>Capra aegagrus blythi</i>	Sindh ibex
2	<i>Capra hircus</i>	domestic goat
3	<i>Bos taurus</i>	domestic cattle
4	<i>Bubalus bubalus</i>	Indian water buffalo
5	<i>Ovis vignei</i>	Sindh urial
6	<i>Ovis aries</i>	domestic sheep
7	<i>Gazella bennettii</i>	chinkara
8	<i>Camelus dromedarius</i>	domestic camel
9	<i>Equus caballus</i>	domestic horse
10	<i>Equus asinus</i>	domestic donkey
11	<i>Lepus nigricollis</i>	black-naped hare
12	<i>Funambulus pennantii</i>	five-striped palm squirrel
13	<i>Hystrix indica</i>	Indian crested porcupine
14	<i>Mus musculus</i>	house mouse
15	<i>Rattus rattus</i>	black rat
16	<i>Tatera indica</i>	Indian gerbil
17	<i>Gerbillus nanus</i>	Baluchistan gerbil
18	<i>Meriones hurrianae</i>	Indian desert jird
19	<i>Calomyscus hotsoni</i>	mouse-like hamster
20	<i>Acomys cahirinus</i>	Cairo spiny mouse
21	<i>Mus booduga</i>	little Indian field mouse
22	<i>Mus saxicola</i>	grey spiny mouse
23	<i>Golunda ellioti</i>	golunda (Indian bush rat)
24	<i>Herpestes javanicus</i>	small Indian mongoose
25	<i>Herpestes edwardsi</i>	Indian grey mongoose
26	<i>Hyaena hyaena</i>	striped hyaena
27	<i>Felis chaus</i>	jungle cat
28	<i>Felis silvestris ornata</i>	Indian desert wild cat
29	<i>Vulpes vulpes pusilla</i>	common red fox
30	<i>Vulpes bengalensis</i>	Bengali fox
31	<i>Mellivora capensis</i>	ratel
32	<i>Canis familiaris</i>	domestic dog
33	<i>Canis aureus</i>	Asiatic jackal
34	<i>Manis crassicaudata</i>	Indian pangolin
35	<i>Paraechinus micropus</i>	Indian hedgehog
36	<i>Hemiechinus collaris</i>	long-eared desert hedgehog

Table 6b. List of Large mammals recorded at Khirthar National Park (Khan et al., 2013).

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

Table 7. Birds of Khirthar National Park and adjoining areas (Ghalib et al., 2013; University of Melbourne, 2001).

S.No.	Scientific name	Common name
01	<i>Podiceps cristatus</i>	Great Crested Grebe
02	<i>Podiceps nigricollis</i>	Black Necked Grebe
03	<i>Tachybaptus ruficollis</i>	Little Grebe or Dabchick
04	<i>Pelecanus onocrotalus</i>	White or Rosy Pink
05	<i>Pelecanus crispus</i>	Dalmatian Pelican
06	<i>Phalacrocorax carbo</i>	Large Cormorant
07	<i>Phalacrocorax niger</i>	Little Cormorant
08	<i>Ardea cinerea</i>	Grey Heron
09	<i>Ardeola grayii</i>	Indian Pond Heron
10	<i>Bubulcus ibis</i>	Cattle Egret
11	<i>Casmerodius alba</i>	Great Egret
12	<i>Egretta intermedia</i>	Smaller or Median Egret
13	<i>Egretta garzetta</i>	Little Egret
14	<i>Nycticorax nycticorax</i>	Night Heron
15	<i>Ixobrychus minutus</i>	Little Bittern
16	<i>Ixobrychus sinensis</i>	Yellow Bittern
17	<i>Platalea leucorodia</i>	Eurasian Spoonbill
18	<i>Phoenicopterus roseus</i>	Greater Flamingo
19	<i>Anas acuta</i>	Pintail
20	<i>Anas crecca</i>	Common Teal
21	<i>Anas platyrhynchos</i>	Mallard
22	<i>Anas strepera</i>	Gadwall
23	<i>Anas penelope</i>	Wigeon
24	<i>Anas clypeata</i>	Shoveller
25	<i>Aythya ferina</i>	Common Pochard
26	<i>Aythya fuligula</i>	Tufted Duck
27	<i>Elanus caeruleus</i>	Black winged Kite
28	<i>Pernis ptilorhynchus</i>	Oriental Honey Buzzard
29	<i>Milvus migrans</i>	Black Kite
30	<i>Accipiter badius</i>	Shikra
31	<i>Accipiter nisus</i>	Asiatic Sparrow-Hawk
32	<i>Buteo rufinus</i>	Longlegged Buzzard
33	<i>Buteo buteo</i>	Common Buzzard
34	<i>Buteo teesa</i>	White-eyed Buzzard Eagle
35	<i>Hieraetus fasciatus</i>	Bonelli's or Slender Hawk Eagle
36	<i>Hieraetus pennatus</i>	Booted Hawk Eagle
37	<i>Aquila chrysaetos</i>	Golden Eagle
38	<i>Aquila heliaca</i>	Imperial Eagle

39	<i>Aquila rapax</i>	Tawny Eagle
40	<i>Aquila nipalensis</i>	Steppe Eagle
41	<i>Aquila clanga</i>	Greater Spotted Eagle
42	<i>Haliaeetus leucoryphus</i>	Pallas's Fishing Eagle
43	<i>Aegypius monachus</i>	Cinereous Vulture
44	<i>Gyps fulvus</i>	Indian Griffon Vulture
45	<i>Gyps begalensis</i>	Indian Whitebacked Vulture
46	<i>Neophron percnopterus</i>	Egyptian Vulture
47	<i>Circus aeruginosus</i>	Marsh Harrier
48	<i>Circus gallicus</i>	Short-toed Eagle
49	<i>Pandion haliaetus</i>	Osprey
50	<i>Falco jugger</i>	Lagger Falcon
51	<i>Falco peregrinus</i>	Peregrine Falcon
52	<i>Falco subbuteo</i>	Hobby
53	<i>Falco columbarius</i>	Pallid Merlin
54	<i>Falco chicquera</i>	Red Headed Merlin
55	<i>Falco tinnunculus</i>	Common Kestrel
56	<i>Ammoperdix griseularis</i>	See-see Partridge
57	<i>Francolinus francolinus</i>	Black Partridge
58	<i>Francolinus pondicerianus</i>	Grey Partridge
59	<i>Conturnix conturnix</i>	Grey Quail
60	<i>Pavo cristatus</i>	Indian Peafowl
61	<i>Amaurornis phoenicurus</i>	White-breasted Water Hen
62	<i>Gallinula chloropus</i>	Indian Moorhen
63	<i>Fulica atra</i>	Coot
64	<i>Chlamydotis undulate</i>	Houbara Bustard
65	<i>Vanellus leucurus</i>	White-tailed Lapwing
66	<i>Vanellus gregarius</i>	Sociable Lapwing
67	<i>Vanellus indicus</i>	Red Wattled Lapwing
68	<i>Vanellus malabaricus</i>	Yellow-wattled Lapwing
69	<i>Charadrius dubius</i>	European Little Ringed Plover
70	<i>Charadrius alexandrinus</i>	Kentish Plover
71	<i>Limosa limosa</i>	Black tailed Godwit
72	<i>Tringa totanus</i>	Common Redshank
73	<i>Tringa nebularia</i>	Greenshank
74	<i>Tringa ochropus</i>	Green Sandpiper
75	<i>Tringa hypoleucos</i>	Common Sandpiper
76	<i>Capella gallinago</i>	Common or Fantail Snipe
77	<i>Calidris minutus</i>	Little Stint
78	<i>Calidris temminckii</i>	Temminck's Stint
79	<i>Calidris testaceus</i>	Curlew-Sandpiper
80	<i>Philomachus pugnax</i>	Ruff
81	<i>Phalaropus lobatus</i>	Rednecked Phalarope
82	<i>Himantopus himantopus</i>	Blackwinged Stilt
83	<i>Cursorius cursor</i>	Cream coloured or Desert Courser
84	<i>Cursorius coromandelicus</i>	Indian Courser
85	<i>Glareola lactea</i>	Small Pranticole
86	<i>Larus argentatus</i>	Herring Gull
87	<i>Larus ridibundus</i>	Black headed Gull
88	<i>Chlidonias hybrida</i>	Whiskered Tern

89	<i>Gelochelidon nilotica</i>	Gullbilled Tern
90	<i>Sterna albifrons</i>	Little Tern
91	<i>Pterocles exustus</i>	Chestnut-bellied or Common or Indian Sandgrouse
92	<i>Pterocles lichtensteinii</i>	Close-barred Sandgrouse
93	<i>Columba livia</i>	Blue Rock Pigeon
94	<i>Streptopelia decaocto</i>	Ring Dove
95	<i>Streptopelia tranquebarica</i>	Red Turtle Dove
96	<i>Streptopelia senegalensis</i>	Little Brown or Senegal Dove
97	<i>Psittacula krameri</i>	Rose ringed Parakeet
98	<i>Cuculus canorus</i>	Eurasian Cuckoo
100	<i>Eudynamis scolopacea</i>	Indian Koel
101	<i>Centropus sinensis</i>	Common Crow-Pheasant or Coucal
102	<i>Otus brucei</i>	Striated or Pallid Scops Owl
103	<i>Bubo bubo</i>	Indian Great Horned or Eagle Owl
104	<i>Athene brama</i>	Spotted Owlet
105	<i>Asio otus</i>	Longeared Owl
106	<i>Caprimulgus europaeus</i>	Eurasian Nightjar
107	<i>Caprimulgus mahrattensis</i>	Syke's or Sind Nightjar
108	<i>Caprimulgus asiaticus</i>	Indian Little Nightjar
109	<i>Tachymarptis melba</i>	Alpine Swift
110	<i>Apus affinis</i>	House Swift
111	<i>Ceryle rudis</i>	Indian Pied Kingfisher
112	<i>Alcedo atthis</i>	Indian Small Blue Kingfisher
113	<i>Halcyon smyrensis</i>	White breasted Kingfisher
114	<i>Merops superciliosus</i>	Blue cheeked Bee-eater
115	<i>Merops orientalis</i>	Sind Small Green Bee- eater
116	<i>Coracias benghalensis</i>	Roller or Blue Jay
117	<i>Upupa epops</i>	Hoopoe
118	<i>Jynx torquilla</i>	Eurasian Wryneck
119	<i>Picoides assimilis</i>	Sind Woodpecker
120	<i>Eremopterix grisea</i>	Ashycrowned Finch-Lark
121	<i>Eremopterix nigriceps</i>	Blackcrowked Finch-Lark
122	<i>Ammomanes deserti</i>	Indian Desert Finch-Lark
123	<i>Alaemon alaudipes</i>	Greater Hoopoe Lark
124	<i>Calandrella rufescens</i>	Lesser Short-toed Lark
125	<i>Calandrella brachydactyla</i>	Great Short-toed Lark
126	<i>Melanocorypha bimaculata</i>	Calandra Lark
127	<i>Galerida cristata</i>	Crested Lark
128	<i>Alauda arvensis</i>	Common Skylark
129	<i>Riparia riparia</i>	Pale Martin
130	<i>Mirafra erythroptera</i>	Indian Bush Lark
131	<i>Riparia paludicola</i>	Grey throated Indian Sand Martin
132	<i>Ptyonoprogne fuligula</i>	Pale Crag Martin
133	<i>Hirundo rustica</i>	Common Swallow
134	<i>Hirundo daurica</i>	Redrumped Swallow
135	<i>Lanius isabellinus</i>	Rufous-tailed or Isabelline Shrike
136	<i>Lanius excubitor</i>	Grey Shrike

137	<i>Lanius vittatus</i>	Baybacked Shrike
138	<i>Lanius collurio</i>	Redbacked Shrike
139	<i>Lanius schach</i>	Rufous-backed Shrike
140	<i>Dicrurus adsimilis</i>	Black Drongo or King Crow
141	<i>Sturnus roseus</i>	Rosy Starling or Rosy Pastor
142	<i>Acridotheres ginginianus</i>	Bank Myna
143	<i>Sturnus vulgaris</i>	Common Starling
144	<i>Acridotheres tristis</i>	Indian Myna
145	<i>Dendrocitta vagabunda</i>	Tree Pie
146	<i>Corvus splendens</i>	Sind House Crow
147	<i>Corvus corax</i>	Common Raven
148	<i>Hypocolius ampelinus</i>	Grey Hypocolius
149	<i>Tephrodornis pondicerianus</i>	Sind Wood Shrike
150	<i>Pericrocotus cinnamomeus</i>	Sind Small Minivet
151	<i>Pycnonotus leucogenys</i>	White-cheeked Bulbul
152	<i>Pycnonotus cafer</i>	Red-vented Bulbul
153	<i>Chrysomma sinense</i>	Yellow-eyed Babbler
154	<i>Turdoides caudatus</i>	Common Babbler
155	<i>Turdoides earlei</i>	Striated Babbler
156	<i>Turdoides striatus</i>	Sind Jungle Babbler
157	<i>Muscicapa striata</i>	Spotted Flycatcher
158	<i>Ficedula parva</i>	Red breasted Flycatcher
159	<i>Terpsiphone paradisi</i>	Asian Paradise Flycatcher
160	<i>Cettia cetti</i>	Cetti's Warbler
161	<i>Acrocephalus stentoreus</i>	Clamorous Reed Warbler
162	<i>Acrocephalus dumetorum</i>	Blyth's Reed Warbler
163	<i>Prinia buchanani</i>	Rufousfronted Wren- Warbler
164	<i>Prinia gracilis</i>	Indian Streaked Wren- Warbler / Long tailed Warbler
165	<i>Prinia inornata</i>	North Western Plain Wren-Warbler
166	<i>Prinia burnesii</i>	Long tailed Grass Warbler
167	<i>Prinia criniger</i>	Brown Hill Warbler
168	<i>Scotocerca inquieta</i>	Streaked Scrub Warbler
169	<i>Orthotomus sutorius</i>	Tailor Bird
170	<i>Hippolais caligata</i>	Booted Tree Warbler
171	<i>Sylvia hortensis</i>	Orphaen Warbler
172	<i>Sylvia curruca</i>	Greater White throat
173	<i>Sylvia communis</i>	Common White throat
174	<i>Sylvia nana</i>	Desert Warbler
175	<i>Phylloscopus collybita</i>	Chiffchaff
176	<i>Phylloscopus neglectus</i>	Plain Leaf Warbler
177	<i>Phylloscopus trochiloides</i>	Greenish Warbler
178	<i>Cercotrichas galacototes</i>	Rufous Chat or Rufoustailed Scrub Robin
179	<i>Luscinia svecicus</i>	Bluethroat
180	<i>Phoenicurus ochruros</i>	Black Redstart
181	<i>Saxicola torquata</i>	Common Stone Chat
182	<i>Saxicola caprata</i>	Pied Bush Chat
183	<i>Oenanthe isabellina</i>	Isabelline Wheatear
184	<i>Oenanthe xanthopyrma</i>	Redtailed Wheatear

185	<i>Oenanthe deserti</i>	Desert Chat or Desert Wheatear
186	<i>Oenanthe picata</i>	Pied Chat/Pied Wheatear
187	<i>Oenanthe alboniger</i>	Hume's Chat or Wheatear
188	<i>Saxicoloides fulicata</i>	Indian Robin
189	<i>Monticola solitarius</i>	Blue Rock Thrush
190	<i>Anthus campestris</i>	Tawny Pipit
191	<i>Anthus similis</i>	Long billed Rock Pipit
192	<i>Motacilla flava</i>	Yellow or Citrine Wagtail
193	<i>Motacilla citreola</i>	Yellowheaded Wagtail
194	<i>Motacilla alba</i>	White or Pied Wagtail
195	<i>Nectarinia asiatica</i>	Purple Sunbird
196	<i>Passer domesticus</i>	House Sparrow
197	<i>Passer hispaniolensis</i>	Spanish Sparrow
198	<i>Passer pyrrhonotus</i>	Sind Jungle Sparrow
199	<i>Petronia xanthocolis</i>	Sind Yellow headed Sparrow
200	<i>Ploceus philippinus</i>	Indian Baya
201	<i>Estrilda amandava</i>	Red Munia
202	<i>Lonchura malabarica</i>	White throated Munia
203	<i>Bucanetes githagineus</i>	Trumpeter Bull Finch
204	<i>Carpodacus erythrinus</i>	Common Rosefinch
205	<i>Emberiza melanocephala</i>	Blackheaded Bunting
206	<i>Emberiza buchanani</i>	Greynecked Bunting
207	<i>Emberiza striolata</i>	Striped or House Bunting

Table 8. Reptiles of Kirthar National Park and adjoining areas (Ghalib et al., 2015; University of Melbourne, 2001).

S.No.	Scientific name	Common name
1	<i>Geoclemys hamiltonii</i>	Yellow Spotted Mud Turtle
2	<i>Hardella thurjii</i>	Common River Turtle
3	<i>Crocodylus palustris</i>	Marsh Crocodile
4	<i>Calotes versicolor</i>	Indian Garden Lizard/ common Tree Lizard
5	<i>Laudakia lirata</i>	Yellow-headed Spotted Rock Agama
6	<i>Laudakia melanura</i>	Black Rock Agama
7	<i>Laudakia nupta</i>	Rock Agama
8	<i>Trapelus agilis</i>	Brilliant Agama / Common Field Agama
9	<i>Trapelus megalonyx</i>	Afghan Agama/ Ocellate Ground Agama
10	<i>Trapelus rubrigularis</i>	Red- throated Agama
11	<i>Eublepharis macularius</i>	Indian Fat-tailed Gecko
12	<i>Agamura persica</i>	Persian Spider Gecko
13	<i>Cyrtopodion kachhensis</i>	Warty Rock Gecko / Kutch Spotted Ground Gecko
14	<i>Cyrtopodion scabrum</i>	Keeled Rock Gecko/ Common Tuberculate Ground Gecko
15	<i>Crossobamon orientalis</i>	Sind or Yellow-tailed Sand Gecko
16	<i>Hemidactylus brookii</i>	Spotted Indian House Gecko / Spotted Barn Gecko
17	<i>Hemidactylus flaviviridis</i>	Yellow bellied House Gecko
18	<i>Hemidactylus leschenaultia</i>	Tree Bark Gecko

19	<i>Hemidactylus persicus</i>	Persian House Gecko
20	<i>Hemidactylus triedrus</i>	Blotched House Gecko
21	<i>Teratolepis faciata</i>	Flat-tail Gecko
22	<i>Tropiocolotes persicus</i>	Persian Banded or Sind Dwarf Gecko
23	<i>Acanthodactylus cantor</i>	Indian Fringe-toed Lizard
24	<i>Mesalina watsonana</i>	Long tailed Desert Lacerta/ Spotted Lacerta
25	<i>Ophisops jordonii</i>	Punjab Snake-eyed Lizard/ Rogose Spectacled Lacerta
26	<i>Eurylepis taeniolatus</i>	Common Mole Skink
27	<i>Novoeumeces blythianus</i>	Orange tail Skink
28	<i>Ophiomorus tridactylus</i>	Indian Sand Swimmer
29	<i>Saara hardwickii</i>	Indian Spiny tailed Lizard
30	<i>Varanus bengalensis</i>	Indian Monitor
31	<i>Varanus griseus</i>	Desert Monitor
32	<i>Ramphotyphlops braminus</i>	Brahminy Blind Snake
33	<i>Typhlops ductuliformes</i>	Slender Blind Snake
34	<i>Eryx johnii</i>	Common Sand Boa
35	<i>Platyceps rhodorachis</i>	Cliff Racer
36	<i>Platyceps ventromaculatus</i>	Glossy bellied Racer/ Plains Racer
37	<i>Psammophis candanura</i>	Indian Sand Snake
38	<i>Psammophis leithii</i>	Sindh Ribbon Snake
39	<i>Spalerosophis diadema</i>	Blotched Diadem Snake/ Royal Snake
40	<i>Bungarus caeruleus</i>	Common Krait
41	<i>Naja naja</i>	Black Cobra
42	<i>Echis carinatus</i>	Saw scaled Viper

Table 9. Amphibian of Kirthar National Park (Ghalib et al., 2015).

S. No.	Scientific name	Common name
1	<i>Rana cyanophlyctis</i>	Skittering frog
2	<i>Rana breviceps</i>	Indian burrowing frog
3	<i>Bufo stomaticus</i>	Marbled toad

Hazarganji Chiltan National Park (HCNP)

Hazarganji Chiltan National Park (HCNP) is one of the 30 declared national parks of Pakistan established in 1980 with the area of 15,555 ha in the districts of Quetta Balochistan province for the protection and conservation of Chiltan Markhor (*Capra aegagrus chiltanensis*). There are 30 species of mammals (Table 10) with nine species of large mammals and 21 species of small mammals including Chiltan Markhor (*Capra aegagrus chiltanensis*), Asiatic Jackal (*Canis aureus*), Stone/Beech Martin (*Martes foina*), Indian Wolf (*Canis lupus*), Caracal/ Red Lynx (*Felis caracal*), Common Red Fox (*Vulpus vulpus*), Jungle Cat (*Felis chaus*), Marbled Pole Cat (*Vormela peregusna*) and Striped Hyaena

(*Hyaena hyaena*), 120 species of birds (Table 11) comprised of 36 Resident and 84 Migratory species, 25 species of reptiles (Table 12) and four species of amphibians (Table 13) recorded in this national park (Khan and Saima, 2011). Wild Goat, Stone Marten, Caracal, Marbled Pole Cat are the key species of mammals. Chukor, Houbara Bustard and See-See Partridge are key species of birds, while the area is also important for the birds of prey. The birds consist of resident 36 species and 84 migratory species. The Hazarganji Chiltan National Park is also important for birds of prey and game birds.

Table 10. Mammals of Hazarganji Chiltan National Park (Khan and Saima, 2011; Shafique *et al.*, 2002).

S.No.	Common name	Scientific name
1	Chiltan Markhor	<i>Capra aegagrus chiltanensis</i>
2	Asiatic Jackal	<i>Canis aureus</i>
3	Stone/Beech Martin	<i>Martes foina</i>
4	Indian Wolf	<i>Canis lupus</i>
5	Caracal/ Red Lynx	<i>Felis caracal</i>
6	Common Red Fox	<i>Vulpus vulpus</i>
7	Jungle Cat	<i>Felis chaus</i>
8	Marbled Pole Cat	<i>Vormela peregusna</i>
9	Striped Hyaena	<i>Hyaena hyaena</i>
10	Afghan Hedgehog	<i>Hemiechinus auritus</i>
11	Brandt's Hedgehog	<i>Paraechinus hypomelas</i>
12	Balochistan Short Tailed Shrew	<i>Crocidura gmelini</i>
13	Zarudny's Shrew	<i>Crocidura zarudnyi</i>
14	Greater Horse Shoe Bat	<i>Rhinolophus ferrummequinum</i>
15	Cape Hare	<i>Lepus capensis</i>
16	Afghan Pika	<i>Ochotona rufescence</i>
17	Migratory Hamster	<i>Cricetulus migratorius</i>
18	Mouse like Hamster	<i>Calomyscus bailwardi</i>
19	Small Five Toad Jerboa	<i>Allactaga elater</i>
20	Forest Dormouse	<i>Dryomys nitedula</i>
21	Indian Crested Porcupine	<i>Hystrix indica</i>
22	Short Tailed Mole Rat	<i>Nesokia indica</i>
23	House Mouse	<i>Mus musculus</i>
24	Sand Colored Rat	<i>Millardia gleadowi</i>
25	Roof or House Rat	<i>Rattus rattus</i>
26	Grey Spiny Mouse	<i>Mus saxicola</i>
27	Afghan Mole Vole	<i>Ellobius fuscocapillus</i>
28	Libian Jird	<i>Meriones libycus</i>
29	Persian Jird	<i>Meriones persicus</i>
30	Sundevall's Jird	<i>Meriones crassus</i>

Table 11. Birds of Hazarganji Chiltan National Park (Khan and Saima, 2011).

S.No.	Common name	Scientific name
1	Shikra	<i>Accipiter badius</i>
2	Eurasian Sparrow Hawk	<i>Accipiter nisus</i>
3	Black Kite	<i>Milvus migrans</i>
4	Golden Eagle	<i>Aquila chrysaetos</i>
5	Tawny Eagle	<i>Aquila rapax</i>

6	Bonelli's Eagle	<i>Hieraetus fasciatus</i>
7	Short Toed Eagle	<i>Circaetus gallicus</i>
8	Bearded Vulture/ Lammergeier	<i>Gypaetus barbatus</i>
9	Eurasian Griffon Vulture	<i>Gyps fulvus</i>
10	Egyptian Vulture	<i>Neophron percnopterus</i>
11	Cinereous Vulture	<i>Aegypius monachus</i>
12	Long Legged Buzzard	<i>Buteo rufinus</i>
13	Hen Harrier	<i>Circus cyaneus</i>
14	Eurasian Kestrel	<i>Falco tinnunculus</i>
15	Northern/ Eurasian Hobby	<i>Falco subbuteo</i>
16	Saker Falcon	<i>Falco cherrug</i>
17	Peregrine Falcon	<i>Falco peregrinus</i>
18	Merlin	<i>Falco columbarius</i>
19	See-See Partridge	<i>Ammoperdix griseogularis</i>
20	Chakor	<i>Alectoris chukar</i>
21	Houbara Bustard	<i>Chlamydotis undulata</i>
22	White Tailed Lapwing	<i>Chettusia leucura</i>
23	Spotted Sand Grouse	<i>Pterocles senegallus</i>
24	Blue Rock Pigeon	<i>Columba livia</i>
25	Common Wood Pigeon	<i>Columba palumbus</i>
26	Western Turtle Dove	<i>Streptopelia turtur</i>
27	Eurasian Ring Dove	<i>Streptopelia decaocto</i>
28	Little Brown Dove	<i>Streptopelia senegalensis</i>
29	Rose Ringed Parakeet	<i>Psittacula krameri</i>
30	Asiatic/Eurasian Cuckoo	<i>Cuculus canorus</i>
31	Spotted Owllet	<i>Athene brama</i>
32	Eagle Owl	<i>Bubo bubo</i>
33	Eurasian Scops Owl	<i>Otus scops</i>
34	Pallid Scops Owl	<i>Otus brucei</i>
35	European Nightjar	<i>Caprimulgus europaeus</i>
36	Common Swift	<i>Apus apus</i>
37	Little Swift	<i>Apus affinis</i>
38	Alpine Swift	<i>Apus melba</i>
39	European Bee-Eater	<i>Merops apiaster</i>
40	Small Green Bee Eater	<i>Merops orientalis</i>
41	Hoopoe	<i>Upupa epops</i>
42	Scally Bellied Wood Pecker	<i>Picus squamatus</i>
43	Hume's Short Toed Lark	<i>Calandrella acutirostris</i>
44	Great Short Toad	<i>Calandrella brachydactyla</i>
45	Small Skylark	<i>Alauda gulgula</i>
46	Eurasian SkyLark	<i>Alauda arvensis</i>
47	Eastern Caloundara Lark	<i>Melanocorypha bimaclata</i>
48	Crested Lark	<i>Galerida cristata</i>
49	Barn or Common Swallow	<i>Hirundo rustica</i>
50	Red Rumped Swallow	<i>Hirundo daurica</i>
51	Crag Martin	<i>Ptyonoprogne rupestris</i>
52	Collard Sand Martin	<i>Riparia riparia</i>
53	Great Grey Shrike	<i>Lanius excubitor</i>
54	Brown Shrike	<i>Lanius cristatus</i>
55	Bay-Backed Shrike	<i>Lanius vittatus</i>
56	Red Backed Shrike	<i>Lanius collurio</i>
57	Rufous- Backed Shrike	<i>Lanius schach</i>
58	Isabelline Shrike	<i>Lanius isabellinus</i>
59	Lesser Gray Shrike	<i>Lanius minor</i>
60	Golden Oriole	<i>Oriolus oriolus</i>
61	Red Throated Pipit	<i>Anthus cervinus</i>
62	Long Billed Pipit/ Brown Rock Pipit	<i>Anthus similis</i>
63	Water Pipit	<i>Anthus spinoletta</i>
64	Yellow Wagtail	<i>Motacilla flava</i>
65	Yellow Headed /Citrine	<i>Motacilla citreola</i>

	Wagtail	
66	Grey Wagtail	<i>Motacilla cinerea</i>
67	White /Cheeked Bulbul	<i>Pycnonotus leucogenys</i>
68	Red Vented Bulbul	<i>Pycnonotus cafer</i>
69	Blue Rock Thrush	<i>Monticola solitarius</i>
70	Mistle Thrush	<i>Turdus viscivorus</i>
71	Pied Bush Chat	<i>Saxicola caprata</i>
72	Stone Chat/Indian Bush Chat	<i>Saxicola torquata</i>
73	Hume's Wheatear	<i>Oenanthe alboniger</i>
74	Pied Wheatear	<i>Oenanthe picata</i>
75	Desert Wheatear	<i>Oenanthe deserti</i>
76	Cetti's Warbler	<i>Cettia cetti</i>
77	Plain leaf Warbler	<i>Phylloscopus neglectus</i>
78	Great Reed Warbler	<i>Acrocephalus scirpaceus</i>
79	Booted Warbler	<i>Hippolais caligata</i>
80	Green Warbler	<i>Phylloscopus nitidus</i>
81	Sulphur –Bellied Warbler	<i>Phylloscopus griseolus</i>
82	Upcher's Warbler	<i>Hippolais languid</i>
83	Orphean Warbler	<i>Sylvia hortensis</i>
84	Lesser White Throat	<i>Sylvia curruca</i>
85	Rufous- Backed Redstart	<i>Phonicurus erythronotus</i>
86	Black Redstart	<i>Phoenicurus ochruros</i>
87	Red Throated Flycatcher	<i>Ficedula parva</i>
88	Spotted Flycatcher	<i>Muscicapa striata</i>
89	Common Babbler	<i>Turdoides caudatus</i>
90	Himalayan Laughing Thrush	<i>Garrulax lineatus</i>
91	White Cheeked Long Tailed Tit	<i>Aegithalos leucogenys</i>
92	Black Crested Tit	<i>Parus rufonuchalis</i>
93	Great Tit	<i>Parus major</i>
94	Eastern Great Nuthatch	<i>Sitta tephronota</i>
95	Common European Nuthatch	<i>Sitta europaea</i>
96	Wall creeper	<i>Tichodroma muraria</i>
97	Jackdaw	<i>Corvus monedula</i>
98	Raven	<i>Corvus corax</i>
99	Mag Pie	<i>Pica pica</i>
100	Alpine Chough	<i>Pyrrhocorax graculus</i>
101	Chough	<i>Pyrrhocorax Pyrrhocorax</i>
102	Rosy Pastor	<i>Sturnus roseus</i>
103	House Sparrow	<i>Passer domesticus</i>
104	Tree Sparrow	<i>Passer montanus</i>
105	Spanish Sparrow	<i>Passer hispaniolensis</i>
106	Red Munia	<i>Estrilda amandava</i>
107	Brambling	<i>Fringilla montifringilla</i>
108	Red Fronted Serin	<i>Serinus pusillus</i>
109	Eurasian Goldfinch	<i>Carduelis carduelis</i>
110	Eastern Linnnet	<i>Carduelis cannabina</i>
111	Common Rosefinch	<i>Carpodacus erythrinus</i>
112	Red Mantled Rosefinch	<i>Carpodacus grandis</i>
113	Black Billed Desert Finch	<i>Rhodopechys obsoleta</i>
114	White Winged Gross Beak	<i>Mycerobas carnipes</i>
115	Hawfinch	<i>Coccothraustes coccothraustes</i>
116	Pine Bunting	<i>Emberiza leucocephalos</i>
117	Black Headed Bunting	<i>Emberiza melanocephala</i>
118	White Capped Bunting	<i>Emberiza stewarti</i>
119	Rock Bunting	<i>Emberiza cia</i>
120	Red Headed Bunting	<i>Emberiza bruniceps</i>

Table 12. Reptiles of Hazarganji Chiltan National Park (Khan and Saima, 2011).

S.No	Common name	Scientific name
1	Common Field Agama	<i>Trapelus agilis pakistenensis</i>
2	Caucasian Rock Agama	<i>Laudakia caucasia</i>
3	Ocellate Ground Agama	<i>Trapelus megalonyx</i>
4	Garden Lizard/ Common Tree Lizard	<i>Calotes versicolor</i>
5	Persian Spider Gecko	<i>Agamura persica</i>
6	Kachh Spotted Ground Gecko	<i>Cryptopodian kachhense</i>
7	Persian Sand Lacerta	<i>Eremias persica</i>
8	Persian House Gecko	<i>Hemidactylus persicus</i>
9	Long Tailed Desert Lacerta	<i>Mesalina watsonana</i>
10	Snake Eyed Lacerta	<i>Ophisops jerdonii</i>
11	Mountain Dwarf Gecko	<i>Tropicolotes depressus</i>
12	Fat Tailed Gecko/ Leopard Gecko	<i>Eublepharis macularius</i>
13	Blue Tail Sand Lizard	<i>Acnthodactylus cantoris</i>
14	Eastern Dwarf Skink	<i>Ablepharus pannonicus</i>
15	Caspian Varanus	<i>Varanus griseus caspius</i>
16	Golden Wolf Snake	<i>Lycodon striatus bicolar</i>
17	Cliff Racer	<i>Platycephalus rhodorachis rhodorachis</i>
18	Saharo-Sindhian Ribbon Snake	<i>Psammodromus schokari</i>
19	Dark Headed Dwarf Racer	<i>Pseudocyclophis persicus</i>
20	Dhaman / Rope Snake	<i>Ptyas mucosus</i>
21	Indian Cobra	<i>Naja naja naja</i>
22	Saw Scaled Viper	<i>Echis carinatus sochureki</i>
23	Levantine Viper	<i>Macrovipera lebetina obtuse</i>
24	Persian Horned Viper	<i>Pseudocerastes persicus</i>
25	Central Asian/ Afghan Tortoise	<i>Agrionemys horsfieldii</i>

Table 13. Amphibians of Hazarganji Chiltan National Park (Khan and Saima, 2011).

S.No	Common name	Scientific name
1	Common Skittering Frog	<i>Euphlyctis cyanophlyctis cyanophlyctis</i>
2	Baluch Mountain Frog	<i>Paa sternosignata</i>
3	Indus Valley Toad	<i>Bufo stomaticus</i>
4	Zugmayer's Toad/ baloch Green Toad	<i>Bufo viridus zugmayeri</i>

Shafique and Barkati (2002) reported 13 species of birds of prey (Table 14), while in another study two more species viz Eurasian Griffon and Cinereous vulture were recorded. Houbara bustard (*Chlamydotis undulata*), See-See Partridge (*Ammoperdix griseogularis*), Spotted Sand Grouse (*Pterocles senegallus*) and Chukor (*Alectoris chukar*) are reported as game birds. Presently, there are no serious threats to the wild species except there could be an impact of Bugti and Murri Tribes, occupying some of the Core area of the Park.

Table 14. Birds of Prey at Hazarganji Chiltan National Park (Shafique and Barkati, 2002; Khan *et al.*, 2011).

S.No.	Common name	Scientific name
1	Golden Eagle	<i>Aquila chrysaetos</i>
2	Black Kite	<i>Milvus migrans</i>
3	Sparrow Hawk	<i>Accipiter nisus</i>
4	Short-Toed Eagle	<i>Circaetus gallicus</i>
5	Bearded or Lammergeier Vulture	<i>Gypaetus barbatus</i>
6	Cinereous Vulture	<i>Aegypius monachus</i>
7	Long Legged Buzzard	<i>Buteo rufinus</i>
8	Hen Harrier	<i>Circus cyaneus</i>
9	Eurasian Kestrel	<i>Falco tinnunculus</i>
10	Peregrine Falcon	<i>Falco peregrines</i>
11	Spotted Owllet	<i>Athene brama</i>
12	Eurasian Griffon	<i>Gyps fulvus</i>
13	Cinereous vulture	<i>Aegypius monachus</i>

Hingol National Park (HNP)

Hingol National Park is located in Balochistan which was developed in 1997 and comprises of 619,043 hectares. This national park is exclusive as it contains variety of ecosystems that includes mountaneous habitat, Arabian Sea, rivers, estuaries, deserted ecosystems and flatlands. Multiple ecosystems lead to the great diversity of wild fauna and flora that are the inhabitant of marine, freshwater and terrestrial environments.

There is a rich wild fauna, that includes many species of avifauna, herpatofauna and mammalian fauna. A variety of fish fauna also inhabits the marine and riverine ecosystems. Some of the prominent species include Ibex (*Capra aegagrus*), Urial (*Ovis vignei*), Chinkara (*Gazella bennettii*), Dalmatian Pelican (*Pelecanus crispus*), Spotted-billed Pelican (*Pelecanus philippinus*), Houbara Bustard (*Chlamydotis undulata*), Imperial Eagle (*Aquila heliaca*), Sooty Falcon (*Falco concolor*), Flamingo (*Phoenicopterus roseus*), fish Mahsheer (*Tor putitora*), Marsh Crocodile (*Crocodylus palustris*), Green turtle (*Chelonia mydas*), Skittering frog (*Rana cyanophlyctis*) etc.

The park has 21 species of mammals including 13 species of small mammals and three species of large mammals, Table 15 (Khan and Zehra, 2011). In an earlier study by Khan *et al.* (2010) conducted in HNP and reported 158 species of birds including 62 resident, 65 winter visitors, 07 passage migrants, 06 year- round visitors, 18 summer breeding visitors, 01 summer visitors and 02 vagrants (Table 16). A study by Azam (2004) also completed a survey of birds of HNP. While, 09 species of reptiles (Table 17) and two species of amphibian were also recorded in this park (Table 18). Green turtle (*Chelonia mydas*) nesting was also recorded from the Hingol National Park coastal areas.

Table 15. Mammals of Hingol National Park (Khan and Zehra, 2011).

S. No.	Scientific name	Common name
1	<i>Mus musculus</i>	House Mouse
2	<i>Gerbillus nanus</i>	Balochistan Gerbil
3	<i>Funambulus pennantii</i>	Palm Squirrel
4	<i>Hemiechinus auritus</i>	Afghan Hedgehog
5	<i>Rattus rattus</i>	House Rat
6	<i>Hystrix cristatus</i>	Porcupine
7	<i>Tatera indica</i>	Indian Gerbil
8	<i>Mus saxicola</i>	Grey Spiny Mouse
9	<i>Acomys cahirinus</i>	Cairo Spiny Mouse
10	<i>Lepus capensis</i>	Cape Hare
11	<i>Callomyscus bailwardi</i>	Mouse like Hamster
12	<i>Meriones hurrianae</i>	Indian Desert Jird
13	<i>Meriones persicus</i>	Persian Jird
14	<i>Ovis vignei</i>	Urial
15	<i>Capra aegagrus</i>	Ibex
16	<i>Gazella bennettii</i>	Chinkara
17	<i>Felis chaus</i>	Jungle Cat
18	<i>Felis libyca</i>	Desert Cat
19	<i>Vulpes vulpes</i>	Desert Fox
20	<i>Canis lupus</i>	Wolf
21	<i>Canis aureus</i>	Asiatic Jackal

Table 16. Birds of Hingol National Park (Khan *et al.*, 2010; Azam, 2004).

S.No	Scientific name	Common name
1	<i>Phalacrocorax carbo</i>	Large Cormorant
2	<i>Phalacrocorax niger</i>	Little Cormorant
3	<i>Pelecanus crispus</i>	Dalmatian Pelican
4	<i>Pelacanus onocrotalus</i>	White or Rosy Pelican
5	<i>Pelecanus philippinus</i>	Spotted-billed Pelican
6	<i>Dupetor flavicollis</i>	Yellow-throated Black Bittern
7	<i>Egretta alba</i>	Large Egret or Great Egret
8	<i>Egretta garzetta</i>	Little Egret
9	<i>Egretta gularis</i>	Indian Reef Heron
10	<i>Egretta intermedia</i>	Smaller or Median Egret
11	<i>Ardea cinerea</i>	Grey Heron
12	<i>Ardea goliath</i>	Giant Heron
13	<i>Ardea purpurea</i>	Purple Heron
14	<i>Ciconia nigra</i>	Black Stork
15	<i>Psuedibis papillosa</i>	Black Ibis
16	<i>Platalea leucorodia</i>	Spoonbill
17	<i>Phoenicopterus roseus</i>	Flamingo
18	<i>Anas acuta</i>	Pintail
19	<i>Anas crecca</i>	Common Teal
20	<i>Anas clypeata</i>	Shoveller
21	<i>Anas penelope</i>	Wigeon
22	<i>Anas strepera</i>	Gadwall
23	<i>Milvus migrans</i>	Black Kite
24	<i>Haliastur indus</i>	Brahminy Kite
25	<i>Haliaeetus leucorhyphus</i>	Pallas's Fishing Eagle
26	<i>Neophron percnopterus</i>	Egyptian Vulture
27	<i>Gyps fulvus</i>	Indian Griffon Vulture
28	<i>Circus aeroginosus</i>	Marsh Harrier
29	<i>Accipiter badius</i>	Central Asian Shikra
30	<i>Accipiter nisus</i>	Eurasian Sparrow Hawk
31	<i>Aquila heliaca</i>	Imperial Eagle

32	<i>Aquila rapax</i>	Tawny Eagle
33	<i>Pandion haliaeetus</i>	Osprey
34	<i>Falco columbarius</i>	Pallid Merlin
35	<i>Falco concolor</i>	Sooty Falcon
36	<i>Falco jugger</i>	Lagger Falcon
37	<i>Falco naumanni</i>	Lesser Kestrel
38	<i>Falco peregrinus</i>	Peregrine Falcon
39	<i>Falco tinnunculus</i>	Kestrel
40	<i>Ammoperdix griseogularis</i>	See-see Partridge
41	<i>Francolinus pondicerianus</i>	Grey Partridge
42	<i>Coturnix coturnix</i>	Common Quail
43	<i>Fulica atra</i>	Coot
44	<i>Chlamydotis undulata</i>	Houbara Bustard
45	<i>Haematopus ostralegus</i>	Oyster catcher
46	<i>Himantopus himantopus</i>	Black Winged Stilt
47	<i>Dromas ardeola</i>	Crab Plover
48	<i>Burhinus oedicnemus</i>	Stone Curlew/Eurasian Thick-Knee
49	<i>Esacus recurvirostris</i>	Great Stone Plover/Thick-Knee
50	<i>Charadrius alexandrinus</i>	Kentish Plover
51	<i>Charadrius dubius</i>	Little Ringed Plover
52	<i>Charadrius hiaticula</i>	Ringed Plover
53	<i>Charadrius leschenaultii</i>	Large Sand Plover
54	<i>Charadrius mongolus</i>	Lesser Sand Plover
55	<i>Vanellus indicus</i>	Red Wattled Lapwing
56	<i>Vanellus leucurus</i>	White-tailed Lapwing
57	<i>Calidris alpinus</i>	Dunlin
58	<i>Calidris minutus</i>	Little Stint
59	<i>Calidris temminckii</i>	Temminck's Stint
60	<i>Calidris testaceus/ferruginea</i>	Curlew-Sandpiper
61	<i>Limicola falcinellus</i>	Broadbilled Sandpiper
62	<i>Philomachus pugnax</i>	Ruff
63	<i>Capella gallinago</i>	Common or Fantail Snipe
64	<i>Limosa lapponica</i>	Bartailed Godwit
65	<i>Limosa limosa</i>	Blacktailed Godwit
66	<i>Numenius arquata</i>	Curlew
67	<i>Numenius phaeopus</i>	Whimbrel
68	<i>Tringa hypoleucos</i>	Common Sandpiper
69	<i>Tringa nebularia</i>	Greenshank
70	<i>Tringa ochropus</i>	Green Sandpiper
71	<i>Tringa stagnatilis</i>	Marsh Sandpiper
72	<i>Tringa terek</i>	Terek Sandpiper
73	<i>Tringa totanus</i>	Redshank
74	<i>Larus argentatus</i>	Herring Gull
75	<i>Larus brunnicephalus</i>	Brown headed Gull
76	<i>Larus cachinans</i>	Yellow legged Gull
77	<i>Larus geni</i>	Slenderbilled Gull
78	<i>Larus ridibundus</i>	Black headed Gull
79	<i>Gelochelidon nilotica</i>	Gullbilled Tern
80	<i>Hydroprogne caspia</i>	Caspian Tern
81	<i>Sterna albifrons</i>	Little Tern
82	<i>Sterna bengalensis</i>	Lesser Crested Tern
83	<i>Sterna sandvicensis</i>	Sandwich Tern
84	<i>Chlidonias hybrida</i>	Whiskered Tern
85	<i>Pterocles coronatus</i>	Coronated Sandgrouse
86	<i>Pterocles indicus</i>	Painted Sandgrouse

87	<i>Pterocles orientalis</i>	Imperial or Black-bellied Sandgrouse
88	<i>Columba livia</i>	Blue Rock Pigeon
89	<i>Streptopelia decaocto</i>	Ring Dove
90	<i>Streptopelia senegalensis</i>	Little Brown or Senegal Dove
91	<i>Psittacula krameri</i>	Rose Ringed Parakeet
92	<i>Caprimulgus mahrattensis</i>	Syke's or Sind Nightjar
93	<i>Athene brama</i>	Spotted Owlet
94	<i>Apus affinis</i>	House Swift
95	<i>Apus apus</i>	Common Swift
96	<i>Apus pallidus</i>	Pale Brown or Pallid Swift
97	<i>Alcedo atthis</i>	Common Small Blue Kingfisher
98	<i>Halcyon smyrnensis</i>	Whitebreasted Kingfisher
99	<i>Merops orientalis</i>	Small Green Bee-eater
100	<i>Merops superciliosus</i>	Blue cheeked Bee-eater
101	<i>Coracias bengalensis</i>	Roller or Blue Jay
102	<i>Upupa epops</i>	Hoopoe
103	<i>Picoides assimilis</i>	Sind Pied Woodpecker
104	<i>Eremopterix grisea</i>	Ashcrowned Finch-lark
105	<i>Eremopterix nigriceps</i>	Blackcrowned Finch-lark
106	<i>Ammomanes deserti</i>	Indian Desert Finch-lark
107	<i>Alaemon alaudipes</i>	Hoopoe Lark
108	<i>Calandrella acutirostris</i>	Hume's Short-toed Lark
109	<i>Calandrella brachydactyla</i>	Greater Short- toed Lark
110	<i>Galerida cristata</i>	Crested Lark
111	<i>Riparia paludicola</i>	Brown-throated Sand Martin
112	<i>Riparia riparia</i>	Collared Sand Martin
113	<i>Hirundo daurica</i>	Redrumped Swallow
114	<i>Hirundo rustica</i>	Barn Swallow
115	<i>Hirundo smithi</i>	Wire-tailed Swallow
116	<i>Motacilla alba</i>	White or Pied Wagtail
117	<i>Motacilla cinerea</i>	Grey Wagtail
118	<i>Motacilla flava</i>	Yellow Wagtail
119	<i>Anthus trivialis</i>	Tree Pipit
120	<i>Pycnonotus cafer</i>	Red-vented Bulbul
121	<i>Pycnonotus leucogenys</i>	White cheeked Bulbul
122	<i>Luscinia svecica</i>	Bluethroat
123	<i>Oenanthe alboniger</i>	Hume's Wheatear
124	<i>Oenanthe deserti</i>	Desert Wheatear
125	<i>Oenanthe isabellina</i>	Isabelline Wheatear
126	<i>Oenanthe monacha</i>	Hooded Wheatear
127	<i>Phoenicurus ochruros</i>	Black Redstart
128	<i>Saxicoloides torquata</i>	Collared Indian Bush Chat or Stone Chat
129	<i>Saxicoloides fulicata</i>	Indian Robin
130	<i>Acrocephalus dumetorum</i>	Blyth's Reed Warbler
131	<i>Acrocephalus stentoreus</i>	Clamorous Warbler
132	<i>Phylloscopus collibita</i>	Chiffchaff
133	<i>Phylloscopus neglectus</i>	Plain Leaf Warbler
134	<i>Prinia buchanani</i>	Rufousfronted Wren Warbler
135	<i>Sylvia curruca</i>	Lesser Whitethroat
136	<i>Sylvia nana</i>	Desert Warbler
137	<i>Ficedula parva</i>	Redthroated Flycatcher
138	<i>Rhipidura aureola</i>	White browed Flycatcher
139	<i>Turdoides caudatus</i>	Common Babbler
140	<i>Nectarinia asiatica</i>	Purple Sunbird
141	<i>Lanius meridionalis</i>	Southern Grey Shrike
142	<i>Lanius isabellinus</i>	Rufous-tailed or Isabelline

		Shrike
143	<i>Lanius schach</i>	Rufous-backed Shrike
144	<i>Lanius vittatus</i>	Baybacked Shrike
145	<i>Dicrurus adsimilis</i>	Black Drongo
146	<i>Corvus corax</i>	Common Raven
147	<i>Corvus ruficollis</i>	Desert Raven
148	<i>Corvus splendens</i>	Indian House Crow
149	<i>Acridotheres tristis</i>	Indian Myna
150	<i>Passer domesticus</i>	House Sparrow
151	<i>Passer hispaniolensis</i>	Spanish Sparrow
152	<i>Passer pyrrhonotus</i>	Sind Jungle Sparrow
153	<i>Passer xanthocollis</i>	Sind Yellowthroated Sparrow
154	<i>Lonchura malabarica</i>	Common Silverbill or Whitethroated Munia
155	<i>Carpodacus erythrinus</i>	Common Rosefinch
156	<i>Emberiza cia</i>	Rock Bunting
157	<i>Emberiza meanocephala</i>	Blackheaded Bunting
158	<i>Emberiza striolata</i>	Striped or House Bunting

Table 17. Reptiles of Hingol National Park (Khan and Zehra, 2011).

S.No.	Scientific name	Common name
1	<i>Hemidactylus brooki</i>	House Gecko
2	<i>Trapelus agilis</i>	Brilliant Agama
3	<i>Acanthodactylus cantrois</i>	Indian Fringed-toed Lizard
4	<i>Varanus griseus</i>	Desert Monitor
5	<i>Crossobamon orientalis</i>	Sand Sind Gecko
6	<i>Crocodylus palustris</i>	Marsh Crocodile
7	<i>Echis carinatus</i>	Saw Scaled Viper
8	<i>Eretmochelys imbricata</i>	Hawksbill Turtle
9	<i>Chelonia mydas</i>	Green turtle

Table 18. Amphibian of Hingol National Park (Khan and Zehra, 2011).

S.No.	Scientific name	Common name
1	<i>Rana cyanophlyctis</i>	Skittering Frog
2	<i>Bufo stomaticus</i>	Indus Valley Toad

The HNP has a rich wildlife. The park also has aesthetic venues like Sea beaches, mud volcano, mountains, river, wetlands, estuary, sand dunes and cultural attractions. Thus, it has a potential to be developed as an Eco-tourism site for local and international visitors.

Green Listing of Protected and Conserved Areas

As a new concept for strong wildlife conservation and protection, International Union for Conservation of Nature (IUCN) introduced Green listing of Protected and Conserved Areas.

The standard list follows the terms and criteria for management of protected areas is the Green list which was launched in 2016 by IUCN. This list is comprised of version 1.0 called IUCN Green list that acts as a standard list with a user friendly manual guide. It is accompanied with all international standards that are introduced by

IUCN at IUCN'S World Conservation Congress at Hawaii, USA.

The basic objective of launching the Green List is to provide a standard to all contributing countries to initiate the good management practices with reference to protected areas and initiate the process of sustainable developments, positive conservation strategies and interconnecting them socially and economically to provide them the platform to improve and coordinate their cultural and spiritual ethics (www.iucn.org/theme/protected-areas/our-work/iucn-green-list).

The IUCN Green List Standard is organized into following four components for successful nature conservation in protected and conserved areas:

1. Good Governance
2. Sound Design and Planning
3. Effective Management

There over 60 countries with protected and conserved areas that are engaged in the IUCN Green List community. Globally, as of June 2022, this includes 61 Green Listed sites (IUCN, 2023).

Currently, Ministry of Climate Change, Government of Pakistan is running "Protected Areas Initiative" program with the following three main objectives:

1. Expanding the protected areas in Pakistan upto minimum 15% of land use in 2023.
2. To effectively "protect what is notified" with proper management plans, legislative interventions as well as standardised eco-infrastructure designs.
3. To coordinate and connect minimum seven main national parks of Pakistan for the registration of IUCN Green List of Protected Areas which will lead them towards gold standard conservation categories.

Ministry of Climate Change is also starting a good work under the Protected Areas Initiative project in collaboration with IUCN Pakistan and registered seven leading national parks of Pakistan under the IUCN Green List of Protected Areas.

All national parks needs to review management plan and start regular basis surveys and monitoring with modern scientific techniques and trained wildlife staff.

REFERENCES

- Anne, B. 2017. Top 10 Reasons for Protected Areas. Ontario Nature Blog. <https://ontarionature.org/top-10-reasons-for-protected-areas/> 2023. [accessed on Jan 2, 2023].
- Azam, MM. 2004. Avifaunal diversity of Hingol National Park. Rec. Zool. Surv. Pak. 15:7-15.

- Begum, A., Khan, MZ., Ghalib, SA., Khan, AR., A., Hussain, B., Siddiqui, S. and Tabbassum, F. 2013. Current Status of Mammals and Reptiles at Hub Dam Area, Sindh /Balochistan, Pakistan. *Current World Environment*. 8(3):395-402.
- Countrymeters.info. 2023. Pakistan Population. <https://countrymeters.info/en/Pakistan#:~:text=During%202023%20Pakistan%20population%20is,number%20of%20deaths%20by%205%2C178%2C211>. [accessed on Jan 2, 2023].
- Dudley, N. (Editor). 2008. *Guidelines for Applying Protected Area Management Categories*. Gland, Switzerland: IUCN. x + 86pp. WITH Stolton, S., P. Shadie and Dudley, N. 2013. *IUCN WCPA Best Practice Guidance on Recognizing Protected Areas and Assigning Management Categories and Governance Types, Best Practice Protected Area Guidelines Series No. 21*, Gland, Switzerland: IUCN. xpp. 978-2-8317-1636-7.
- Forest, Wildlife and Fisheries Department, Government of Punjab. 2023. Lal Suhanra National Park. https://fwf.punjab.gov.pk/Lal_suhanera_forest_park [accessed on Jan 2, 2023].
- Ghalib, SA., Khan, MZ., Zehra, A., Begum, A., Hussain, B., Khan, AR., Hussain, SE., Hashmi, MUA., Tabbassum, F., Samreen, N. and Lateef, TA. 2015. Distribution and Current Status of the Reptiles of Kirthar Protected Area Complex (KPAC) and Adjoining Areas in Districts Karachi, Jamshoro and Thatta, Sindh, Pakistan. *Current World Environment*. 10(1):109-114.
- Ghalib, SA., Hussain, SE., Khan, MZ., Damhoureyeh, SA., Yasmeen, R., Zehra, A., Fatima, F., Hussain, B., Siddiqui, S., Abbas, D., Tabbassum, F., Samreen, N., Khan, AR., Jabeen, T., Hashmi, MUA. and Ali, SA. 2013. An Overview of Occurrence, Distribution and Status of the Birds of Khirthar Protected Area Complex (KPAC), Sindh. *CJPAS*. 7(3):2515-2532.
- IUCN Pakistan. 2023. *Protected Areas of Pakistan*. Factsheet, IUCN Pakistan Karachi. pp. 4.
- IUCN. 2023. *IUCN Green Listing of Protected Areas*. www.iucn.org/theme/protected-areas/our-work/iucn-green-list. [accessed on Jan 2, 2023].
- Khan, MZ. 2015. Report: International Training Workshop on Conservation and Management of Protected Areas-2014, Muscat, Sultanate of Oman. IUCN Commission on Ecosystem Management (CEM), West Asia Region. Karachi, Pakistan. pp. 60.
- Khan, MZ. and Saima, S. 2011. *Studies on Bioecology and Fauna of Hazarganji Chiltan National Park and Development of Ecotourism in Protected Areas*. *CJPAS*. 5(1):1371-1384.
- Khan, MZ. and Zehra, A. 2011. *Mammals of Hingol National Park, Balochistan*. Lap Lambert academic publishing GmbH & Co. KG. Dudweiler Landstr. 99, 66123 Saarbrücken, Germany. pp. 101. ISBN 978-3-8465-0590-8
- Khan, BN., R. Ahmad, R., Ali, Z., Yasmeen, R., Azhar., M., Abid, F., Mehmood, S. and Raza, H. 2018. Study Of Vertebrate Diversity At Lal Suhanra National Park, Pakistan. *The Journal of Animal & Plant Sciences*. 28(6):1725-1734.
- Khan, MZ., Ghalib, SA., Khan, AR., Zehra, A., Yasmeen, R., Hussain, B., Siddiqui, S., Abbas, D., Fatima, F., Begum, A., Jabeen, T., Tabassum, F. and Usman, MAH. 2013. Current habitat, Distribution and Status of the Mammals of Khirthar Protected Area Complex. *Canadian Journal of Pure and Applied Sciences*. 7(2):2347-2356.
- Khan, MZ., Begum, A., Ghalib, SA., Khan, AR., Yasmeen, R., Siddiqui, TF., Zehra, A., Abbas, D., Tabassum, F., Siddiqui, S., Jabeen, T. and Hussain, B. 2012. Effects of Environmental Pollutants on Aquatic Vertebrate Biodiversity and Inventory of Hub Dam: Ramsar Site. *CJPAS*. 6(2):1913-1935.
- Khan, MZ., Ghalib, SA., Zehra, A. and Hussain. B. 2010. Bioecology and Conservation of the Birds of Hingol National Park, Balochistan. *Journal of Basic and Applied Sciences*. 6 (2):175-184.
- Maqsood, A. 2019. Review of Protected Areas System of Pakistan to include new categories as provided by IUCN. A report prepared for Green Pakistan Programme, Ministry of Climate Change, Government of Pakistan. Islamabad.
- National Parks of the World. 2023. *World National Parks For Information On The National Parks Of The World And Their Wildlife*. <https://worldnationalparks.com> [accessed on Jan 2, 2023].
- Pakistan National Report. 2019. Pakistan's 6th National Report to the United Nations Convention on Biological Diversity. Ministry of Climate Change, Government of Pakistan. pp. 81.
- Protected areas and Land Use. 2023. <https://www.iucn.org/resources/conservation-tool/iucn-green-list-protected-and-conserved-areas> [accessed on Jan 2, 2023].
- Roberts, TJ. 1997. *The Mammals of Pakistan*. (Revised edi.). Oxford University Press, Karachi, Pakistan.

Shafique, CM. and Barkati, S. 2002. Status and Ecology of Chiltan Wild Goat (*Capra aegagrus chiltanensis*) (Caprinae). Rec. Zool. Surv. Pakistasn. 14:81- 93.

Shafiq, CM., Hassan, A. and Nazar, Q. 2002. Wildlife of Hazarganji Chiltan National Park, Balochistan. Rec.Zool. Sur. Pak.14:55-79

Saeed, K. and Brohi, A. 2018. Baseline data of Vertebrate Fauna of Lal Sohsnra National Park (LSNP) Bahawalpure, Punjab, Pakistan. Rec. Zool. Surv. Pakistan. 24:11-26.

UNEP-WCMC and IUCN. 2023. Protected Planet: The World Database on Protected Areas (WDPA) and World Database on Other Effective Area-based Conservation Measures (WD-OECM) [Online], January 2023, Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net. [accessed Jan 2, 2023].

University of Melbourne. 2001. Khirthar National Park Baseline Environmental Study. Project managed by Melbourne Enterprises International Ltd. Vol. 1, Chapters. 1-5. pp. 791. (unpublished report).

Uzma Ali, Kanwal, R., Zehra, A. Siddiqui, S., Yasmeen, G., Hussain, B., Iqbal, MA., Ullah, U., Uzma, M. and Ghalib, SA. 2018. Mammals of Khyber-Pakhtunkhwa: A review. Canadian Journal of Pure and Applied Sciences. 12(1):4415-4421.

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