

CURRENT DISTRIBUTION AND STATUS OF RAPTORS OF SINDH

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ABSTRACT

Pakistan has 47 species of raptors, out of which, 38 species have so far been recorded from Sindh province. Raptors have gained wide attention due to the fact that over half of the world's raptors have declining populations. The present paper deals with the status and distribution of raptors in principal habitats of these species in Sindh based on field data collected during 2010 to 2018. It emphasizes the need for the conservation of Falcons and Vultures in particular. As regards the Conservation Status of raptor species in Sindh, eight species are threatened viz. Indian White-backed Vulture (*Gyps bengalensis*), Long-billed or Indian Vulture (*Gyps indicus*), Redheaded or King Vulture (*Sarcogyps calvus*) are Critically Endangered, Egyptian Vulture (*Neophron percnopterus*), Pallas's Fishing Eagle (*Haliaeetus leucoryphus*), Steppe Eagle (*Aquila nipalensis*) are Endangered, while Imperial Eagle (*Aquila heliaca*) and Greater Spotted Eagle (*Aquila clanga*) are Vulnerable.

Keywords: Birds of prey of Sindh, hotspots, main habitats, distribution, status.

INTRODUCTION

The province of Sindh lies in the south of Pakistan (Fig. 1). It is ecologically very important area due to the presence of a variety of ecosystems such as Indus Basin,

plain areas, desert, hilly areas, wetlands, marshes, riverine and mangrove forests, Indus River and the marine Zone (Khan *et al.*, 2018). Birds of prey are an important part of our wildlife and play a very significant role due to their ecosystem services and economic values.

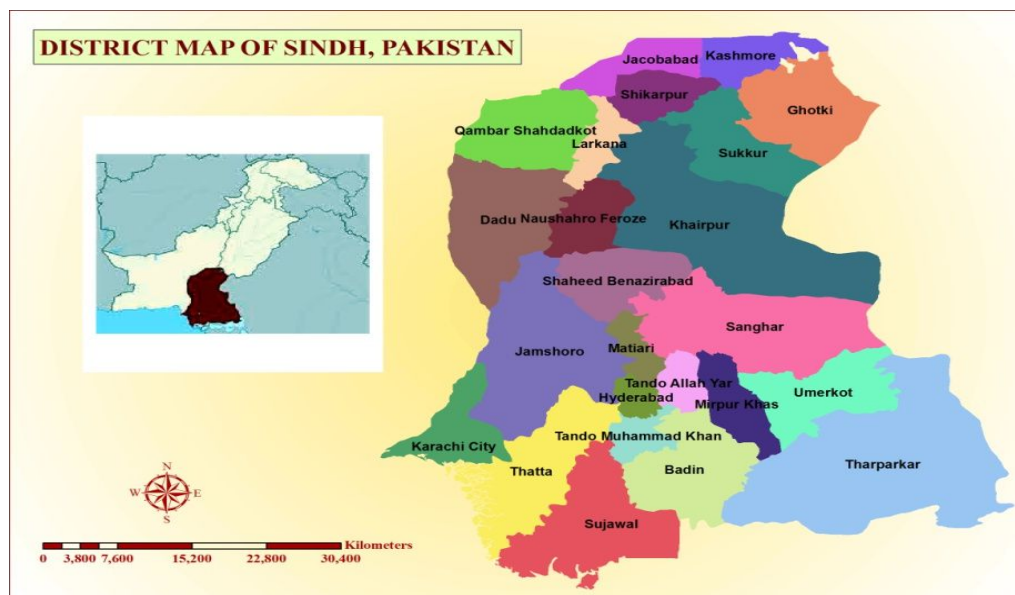


Fig. 1. Map of Sindh Province showing administrative Districts.

Birds of prey are considered as the major hunters, which predate on other living organisms for the purpose of food. Vultures are the only raptors which are scavenging in nature and feed on animal carcasses. The word raptor is taken from the Latin word "Raptare" means to grasp. They used their sharp claws to grasp and hunt on their prey. Their fossil records mention that they were found in the late Eocene period which shows a huge primitive background of these creatures.

Ecological Significance

Several types of Raptors can be found in different types of habitats and there are over 500 species of Raptors recorded all over the world (The Spruce, 2018). Birds of prey are considered as environmental indicators as their presence or absence in any habitat refers to the stability or decline of any ecological habitat. Their fluctuating populations show the environmental degradation in any particular habitat. Birds of prey have very sharp senses as they can detect the chemical contaminants and give alerting signals to the other members of their community. They exist on the highest level of food chains in any ecosystem. They play a major role in pest control in agricultural fields as they feed on the rodents, small mammals and other birds.

Falcons and Falconry

Falconry is largely practiced in Pakistan. It is the capture, keeping, training of and hunting with falcons, eagles and hawks for sport and pastime. Many wild populations of some falcon species have fallen drastically in numbers in recent years for a variety of reasons, including loss of habitats, deliberate persecution, accidental poisoning by pesticides, unsustainable harvest, for illegal and unregulated falcon and falconry trade.

Some Important Related Works

Newton (1979, 2013) studied about the ecological role of raptors. It was stated that different prey populations can be controlled by introducing birds of prey in any ecological habitat. Raptors also serve as the ecological indicators as they indicate the fluctuating conditions of environment and climatic changes (Sergio *et al.*, 2005, 2006, 2008). Many different scientists worked on the ecological significance, breeding and feeding habits of raptors including Cade *et al.*, 1988; Newton and Wyllie, 1992; Bretagnolle *et al.*, 2008; Sulawa *et al.*, 2010., Ratcliffe, 1970, 1993 and Newton, 1986.

The publications made so far related to the Birds of Prey of Sindh include Koning (1976), Karim (1985), Roberts *et al.* (1986), Nawaz (1987, 1988), Karim and Ifthikhar (1988), Roberts (1991), Mirza (2007), Nauroji (2007), Grimmett *et al.* (2008), Ahmed (2003, 2013), Kanwal *et al.* (2015), MOCC and IUCN (2016) and Ghalib *et al.* (2016, 2018a,b). The present studies were undertaken to

record the occurrence, current distribution and status of various species of raptors in Sindh and also to record and identify the threats to the species particularly Falcons and Vultures to identify the hotspots for priority species.

MATERIALS AND METHODS

Desk Study/Literature Search

National and international published literature was reviewed to get the background information on the similar studies conducted in other parts of the world, relevant to the distribution and status of avifauna.

Field Surveys

Selected areas of Sindh with particular reference to the key habitats of the raptor species were surveyed. Surveys were undertaken in the major ecological zones of the province to collect latest information about their occurrence and status during 2010 – 2018. Most of the data have been collected through the IEE/ EIA and Baseline studies undertaken by the present works under various developmental projects in the areas. Following methods were applied in the field.

Line Transect Method

Line transect method was used and transect walks were made to record the data about population of birds while ecology, threats and environmental conditions were also monitored. Line transects techniques are used for widespread and homogenous areas (Gregory *et al.*, 2004). Observations were made with high power binoculars for identification of birds. The area of 150 m was selected for raptors observation.

Point Surveys

In this method, observation points were established at suitable locations for viewing the birds and habitats. The Point counts involve an observer standing in one spot and recording all the birds seen at either a fixed distance or unlimited distance all around.

Interviews with Local Communities

Interviews were made with local residents of those areas as the information collected served as the first hand knowledge about the currently occurring species in that particular habitat, their abundance and their behavioral aspects.

RESULTS AND DISCUSSION

Raptors are found in all habitats like desert, semi-desert, open areas, plains, forest, mountains, hills, coastal areas, marshes, rivers and lakes (Table 1). They are found around human settlements and they are also found feeding at refuse dumps and near slaughter houses.

Table 1. Important sites for Raptors in Sindh.

S. No.	Area	GPS Coordinates/ Locations	Importance of the Site
1	Moti Jo Vandiyoon	242343.8 N 705453.9 E	Staging/Wintering Site
2	Lakhay Jo Vanidyoon	242346.2 N 704139.4 E	Nesting Site
3	Kharrho Dam near Karoonjhar Hills	242413.8 N 703829.7 E	Nesting Site
4	Mithi Bypass	244402.8 N 694907.2 E	Observation point for White-backed and Long-billed Vultures
5	Ranpur Dam	242123.8 N 705218.6 E	Wintering area for Waterbirds and Raptors
6	Khirthar Protected Area Complex (Bhal, Bachhani, Mol Pat, Pokhan and Taung), Moidan	272925.5 N 671621.8 E	Seasonal Occurrence
7	Upper Mole Dam	252728.6 N 672714.6 E	Seasonal Occurrence
8	Lungh Lake	272924.1 N 680133.9 E	Seasonal Occurrence
9	Haleji Lake	244712.2 N 674724.0 E	Seasonal Occurrence
10	Hadero Lake	244907.6 N 675033.8 E	Seasonal Occurrence
11	Keenjhar Lake (Chul Side area)	250238.6 N 680920.6 E	Seasonal Occurrence
12	Gorano Dam	243152.0 N 702214.0 E	Seasonal Occurrence
13	Nearby areas along Karachi–Thatta National Highway	Dhabiji, Gharo, Thatta (Thatta District)	Seasonal Occurrence mainly near the Poultry Farms
12	Karachi Coastal Areas	Area near Port Qasim, Chashma Goth, Rehri Creek, Korangi Creek, Phitti Creek, Mangrove Forest, Hawkesbay and Sandspit	Seasonal Occurrence. A few species are found all Year round

Composition of Major Groups of Raptors in Sindh

As many as 38 species with assemblage in 8 major groups occur in Sindh (Table 2).

Table 2. Composition of various Groups of Raptors of Sindh.

S. No.	Raptors Groups	No. of Species recorded
1	Buzzards	04
2	Eagles	10
3	Falcons	06
4	Hawks	03
5	Harriers	04
6	Kites	03
7	Osprey	01
8	Vultures	07
Total		38

Threats

In Pakistan, populations of Eagles, Falcons, Shikras and Goshawks are drastically declining due to over hunting, shooting, trapping, trading and taking of eggs and young ones from the nests. The destruction of natural habitat poses major threat to the birds of prey.

Threatened and Near Threatened Species of Raptors of Sindh

There are 8 species of raptor as Threatened viz. Indian White-backed Vulture (*Gyps bengalensis*) Fig. 2, Long-billed or Indian Vulture (*Gyps indicus*), Redheaded or King Vulture (*Sarcogyps calvus*) Fig. 3, Egyptian Vulture (*Neophron percnopterus*) Fig. 4, Pallas's Fishing Eagle (*Haliaeetus leucoryphus*), Steppe Eagle (*Aquila nipalensis*) Fig. 5, Imperial Eagle (*Aquila heliaca*) Fig. 6 and Greater Spotted Eagle (*Aquila clanga*), while 5 species viz. Pale or Pallid Harrier Fig. 7, Cinereous Vulture Fig. 8, Bearded Vulture, Laggar Falcon, and Red-necked Falcon are Near Threatened (Table 3).

Table 3. Threatened and Near Threatened Species of Raptors of Sindh.

S. No.	Order	Family	Scientific Name	Common Name	IUCN Status
1	Accipitriformes	Accipitridae	<i>Gyps bengalensis</i>	Indian White-backed Vulture	CR
2	Accipitriformes	Accipitridae	<i>Gyps indicus</i>	Long-billed or Indian Vulture	CR
3	Accipitriformes	Accipitridae	<i>Sarcogyps calvus</i>	Redheaded or King Vulture	CR
4	Accipitriformes	Accipitridae	<i>Neophron percnopterus</i>	Egyptian Vulture	EN
5	Accipitriformes	Accipitridae	<i>Haliaeetus leucoryphus</i>	Pallas's Fishing Eagle	EN
6	Accipitriformes	Accipitridae	<i>Aquila nipalensis</i>	Steppe Eagle	EN
7	Accipitriformes	Accipitridae	<i>Aquila heliaca</i>	Imperial Eagle	VU
8	Accipitriformes	Accipitridae	<i>Aquila clanga</i>	Greater Spotted Eagle	VU
9	Accipitriformes	Accipitridae	<i>Circus macrourus</i>	Pale or Pallid Harrier	NT
10	Accipitriformes	Accipitridae	<i>Aegypius monachus</i>	Cinereous Vulture	NT
11	Accipitriformes	Accipitridae	<i>Gypaetus barbatus</i>	Bearded Vulture	NT
12	Falconiformes	Falconidae	<i>Falco jugger</i>	Laggar Falcon	NT
13	Falconiformes	Falconidae	<i>Falco chicquera</i>	Red-necked Falcon	NT

Legend: CR= Critically Endangered, EN= Endangered, VU= Vulnerable, NT= Near Threatened.



Fig. 2. Indian White-backed Vulture (Photo credit: Mirza Naim Beg).



Fig. 3. Redheaded or King Vulture (Photo credit: Mirza Naim Beg).



Fig. 4. Egyptian Vulture (Photo credit: Mirza Naim Beg).



Fig. 5. Steppe Eagle (Photo credit: Mirza Naim Beg).



Fig. 6. Imperial Eagle (Photo credit: Mirza Naim Beg).



Fig. 7. Pallid Harrier (Photo credit: Mirza Naim Beg).



Fig. 8. Cinereous Vulture (Photo credit: Mirza Naim Beg).

Decreasing/ Badly affected Species

The following species have been declining severely due to various reasons including trapping, falconry trade and deleterious effect of Diclofenac acid (Table 4).

Table 4. Declining species of Raptors of Sindh.

S. No.	Scientific Name	Common Name	Reasons for decline
1	<i>Accipiter gentilis</i>	Northern Goshawk	Excessive trapping
2	<i>Falco chicquera</i>	Red-necked Falcon	Large scale trapping for falconry
3	<i>Falco jugger</i>	Lagger Falcon	Heavy persecution from falconry trade
4	<i>Falco peregrinus</i>	Peregrine Falcon	Massive decline due to falconry trade
5	<i>Gyps fulvus</i>	Eurasian Griffon Vulture	Deleterious effects of Diclofenac acid
6	<i>Gyps bengalensis</i>	White rumped Vulture	Deleterious effects of Diclofenac acid
7	<i>Aegyptius monachus</i>	Cinereous Vulture	Trapping for Zoo trade

Status of Priority Species of Raptors in Sindh

Vultures are the important group of Raptors on account of their ecological importance and Falcons are also important for their economic value in falconry. The status of these two groups is discussed below:

Status of Vultures

Vultures which seem unfriendly to humans actually have so many ecological benefits for mankind as their scavenging habits facilitate our ecosystems on regular cleanups of dead bodies of animals and birds. They protect our environment from several diseases which may spread from the microbes growing on those dead bodies.

Table 5. Species and Status of Falcons of Sindh.

S. No.	Common Name	Scientific Name	Status
1	Common Kestrel	<i>Falco tinnunculus</i>	Winter Visitor
2	Merlin	<i>Falco columbarius</i>	Rare Winter Visitor
3	Eurasian Hobby	<i>Falco subbuteo</i>	Uncommon Winter Visitor
4	Peregrine Falcon	<i>Falco peregrinus</i>	Winter Visitor
		(i) <i>Falco peregrinus peregrinator</i>	Uncommon Winter Visitor
		(ii) <i>Falco peregrinus babylonicus</i> (Barbary Falcon)	Uncommon Winter Visitor
		(iii) <i>Falco peregrinus calidris</i>	Widespread Winter Visitor
5	Lagger Falcon	<i>Falco jugger</i>	Rare Resident
6	Red-necked Falcon/ Red-headed Merlin	<i>Falco chicquera</i>	Drastically Declined Resident

They also feed on small mammals which pose a risk to agricultural lands and food godowns as pests.

Seven species of vultures are found in Sindh including Egyptian Vulture, Bearded Vulture, Red-headed Vulture, Eurasian Griffon Vulture, Cinereous Vulture, Long-billed Vulture and White-backed Vulture. White-rumped Vulture used to be widespread species in Sindh and Punjab. But now they have been severely under decline in the prime zone of Vultures in Tharparkar District.

A hazardous drug named as Diclofenac has been commonly used for the cattle in different areas of Tharparkar district. That drug is the major cause of the high mortality rate in vultures. That drug is anti-inflammatory in action. Diclofenac has the persistent ability as it persist in the bodies of cattle after their death, when these dead bodies are fed upon by vultures, this drug gets transferred to their bodies and causes death due to kidney dysfunction which ultimately leads to kidney failure.

Conservation strategies in Sindh resulted in the increase in numbers of White backed vultures. Conservation efforts included the introduction of Vulture Safe Zones and awareness given to local communities. The ban of hazardous drug Diclofenac was also recommended in the conservational strategies. Now, another drug Meloxicam has been introduced in place of Diclofenac.

Status of Falcons

Falcons are under great stress due to their use in falconry. Arab hunters visit Pakistan every year for Houbara Bustard hunting with the help of Saker, Peregrine and Lagger Falcons in all the four provinces of Pakistan. Large scale falcon trapping by locals for trade takes place in Sindh.

Out of eight species of family Falconidae found in Pakistan, six are reported from Sindh. Out of these, four are migratory and two are resident (Table 5).

Distribution of Key Species of Raptors

Lammergier and Eurasian Hobby are available in Sindh only in restricted habitats of Sindh Kohistan including Kirthar National Park.

Peregrine Falcon is distributed from Islamkot to Nangarparkar area, while Laggar Falcon is frequently recorded in Tharparkar district. Shikra (Fig. 9) is now found in most areas of the district.



Fig. 9. Shikra (Photo credit: Mirza Naim Beg).

As small population of Longbilled Vulture survives in Tharparkar in Karoonjhar Hills and Nagarparkar.

Red-headed Vulture previously believed to be a straggler in Sindh, has been recorded as Winter Visitor in Mithi Area and also found breeding near hills in Virawah in Tharparkar district.

Egyptian Vulture has stabilized in the Tharparkar area and commonly occurs throughout from Mithi to Islamkot to Nagarparkar.

Checklist of Raptors of Sindh

Out of 47 species of Raptors recorded in Pakistan, 38 species have been recorded from Sindh, of which 15 species are resident, while 23 species are migratory (Table 6).

Table 6. Checklist of Raptors of Sindh.

S. No.	Order	Family	Scientific Name	Common Name	Seasonal Status	Habitat
1	Accipitriformes	Accipitridae	<i>Elanus caeruleus</i>	Black-shouldered Kite	R	Open Scrub
2	Accipitriformes	Accipitridae	<i>Milvus migrans</i>	Black Kite	R	Mainly around human habitations
3	Accipitriformes	Accipitridae	<i>Haliastur indus</i>	Brahminy Kite	R	Inland and coastal area
4	Accipitriformes	Accipitridae	<i>Accipiter gentilis</i>	Northern Goshawk	SBV	Forest area
5	Accipitriformes	Accipitridae	<i>Accipiter badius</i>	Shikra	R	Groves around Villages and cultivation
6	Accipitriformes	Accipitridae	<i>Accipiter nisus</i>	Eurasian Sparrow-Hawk	WV	Thorn forest, cultivation
7	Accipitriformes	Accipitridae	<i>Buteo buteo</i>	Common Buzzard	WV	Arid country

8	Accipitriformes	Accipitridae	<i>Buteo rufinus</i>	Long-legged Buzzard	WV	Open country
9	Accipitriformes	Accipitridae	<i>Pernis ptilorhynchus</i>	Oriental /Crested Honey Buzzard	WV	Irrigated Forest Plantation
10	Accipitriformes	Accipitridae	<i>Butastur teesa</i>	White-eyed Buzzard Eagle	R	Foothill areas
11	Accipitriformes	Accipitridae	<i>Hieraaetus fasciatus</i>	Bonelli's or Slender Hawk Eagle	WV	Drier Hill Ranges
12	Accipitriformes	Accipitridae	<i>Hieraaetus pennatus</i>	Booted Eagle	WV	Foothill areas
13	Accipitriformes	Accipitridae	<i>Aquila chrysaetos</i>	Golden Eagle	R	Mountainous areas
14	Accipitriformes	Accipitridae	<i>Aquila heliaca</i>	Imperial Eagle	R	Open plains and deserts
15	Accipitriformes	Accipitridae	<i>Aquila rapax</i>	Tawny Eagle	R	Desert tracks
16	Accipitriformes	Accipitridae	<i>Aquila nipalensis</i>	Steppe Eagle	WV	Desert tracts, irrigated cultivation
17	Accipitriformes	Accipitridae	<i>Aquila clanga</i>	Greater Spotted Eagle	WV	Near Lakes
18	Accipitriformes	Accipitridae	<i>Haliaeetus albicilla</i>	White-tailed Eagle	WV	Lakes and Coasts
19	Accipitriformes	Accipitridae	<i>Haliaeetus leucoryphus</i>	Pallas's Fishing Eagle	R	Near Lakes
20	Accipitriformes	Accipitridae	<i>Circetus gallicus</i>	Short-toed Eagle	R	Open dry plains and hills
21	Accipitriformes	Accipitridae	<i>Sarcogyps calvus</i>	Redheaded or King Vulture	WV	Open county near habitations and hills
22	Accipitriformes	Accipitridae	<i>Aegyptius monachus</i>	Cinereous Vulture	WV	Mountains, semi-desert, grassland and coastal areas
23	Accipitriformes	Accipitridae	<i>Gyps fulvus</i>	Eurasian Griffon Vulture	WV	Desert, dry plains and hills
24	Accipitriformes	Accipitridae	<i>Gyps bengalensis</i>	White-rumped Vulture	R	Plains, around human habitation
25	Accipitriformes	Accipitridae	<i>Neophron percnopterus</i>	Egyptian Vulture	R	Around human habitation
26	Accipitriformes	Accipitridae	<i>Gypaetus barbatus</i>	Bearded Vulture or Lammergier	WV	Mountainous
27	Accipitriformes	Accipitridae	<i>Gyps indicus</i>	Long-billed or Indian Vulture	R	Around human habitations
28	Accipitriformes	Accipitridae	<i>Circus cyaneus</i>	Hen Harrier	WV	Salt marsh flats
29	Accipitriformes	Accipitridae	<i>Circus macrourus</i>	Pale or Pallid Harrier	WV	Open country, plains, foothills
30	Accipitriformes	Accipitridae	<i>Circus pygargus</i>	Montagu's Harrier	WV	Open country, foothills
31	Accipitriformes	Accipitridae	<i>Circus aeruginosus</i>	Eurasian Marsh Harrier	WV	Lakes, marshes and lagoons
32	Falconiformes	Pandionidae	<i>Pandion haliaetus</i>	Osprey	WV	Large inland and coastal waters
33	Falconiformes	Falconidae	<i>Falco jugger</i>	Laggar Falcon	R	Open areas
34	Falconiformes	Falconidae	<i>Falco peregrinus</i>	Peregrine Falcon	WV	Drier hilly tracts
35	Falconiformes	Falconidae	<i>Falco subbuteo</i>	Eurasian Hobby	WV	Foothills and valleys
36	Falconiformes	Falconidae	<i>Falco columbarius</i>	Merlin	WV	Scrub desert, mountain valleys
37	Falconiformes	Falconidae	<i>Falco chicquera</i>	Red-necked Falcon	R	Open country with trees
38	Falconiformes	Falconidae	<i>Falco tinnunculus</i>	Common Kestrel	WV	Plains

Legend: R= Resident, WV= Winter Visitor, SBV= Summer Breeding Visitor



Common Kestrel (Photo credit: Mirza Naim Beg).



Long-legged Buzzard (Photo credit: Mirza Naim Beg).



Black- shouldered Kite (Photo credit: Mirza Naim Beg).

Protected Species of Raptors in Sindh

All species of Raptors are protected in Sindh under the Sindh Wildlife Protection Ordinance, 1972 (SWPO, 1972) i.e. All members of family **Accipitridae**, i.e. all Hawks, Vultures, Kites, Buzzards, Hawk-eagles, Eagles, Harriers and Ospreys and All members of the family **Falconidae**, i.e. all Falcons, Kestrels, Hobbies (Table 7).

Table 7. Protected Raptor Species under Sindh Wildlife Protection Ordinance, 1972.

Family	Species / Groups
Accipitridae	All Buzzards
	All Eagles
	All Harriers
	Hawk-eagle
	All Hawks
	All Kites
	Osprey
	All Vultures
Falconidae	All Falcons
	All Hobbies
	Kestrel

Raptors Hazardous to Air Crafts

Birds of prey are very harmful for aircrafts operations as they are huge in size and cause a lot of damage to aircrafts after airstrikes. Big sized birds around aerodromes in Sindh included Indian White backed Vulture, Egyptian Vulture, Griffon Vulture, Long-billed Vulture, Marsh Harrier, Crested Honey Buzzard, Pariah Kite, Black-shouldered Kite and White-eye Buzzard. These birds soar in air on thermal waves and fly at good heights. They maneuver over the food and during this practice airstrike happens which may lead to high level damage to aircrafts and sometimes it becomes fatal.

The following birds of prey have been recorded around aerodromes in Karachi, being a potential source of bird collision against the aircrafts. These include: Indian White-rumped Vulture, Egyptian Vulture, Black Kite, White-eye Buzzard, Crested Honey Buzzard and Brahminy Kite (Kanwal *et al.*, 2015).

Species of Raptors not yet recorded from Sindh

Nine species of Raptors though available in other provinces of Pakistan have not yet been recorded from Sindh (Table 8).

Table 8 . Species of Birds of Prey not yet recorded from Sindh.

S. No.	Scientific Name	Common Name	Present Range in Pakistan
1	<i>Gyps himalayensis</i>	Himalayan Griffon	Punjab, KPK
2	<i>Ictinaetus malayensis</i>	Black Eagle	Punjab
3	<i>Spizaetus nipalensis</i>	Mountain Hawk Eagle	Punjab
4	<i>Falco concolor</i>	Sooty Falcon	Balochistan
5	<i>Falco cherrug</i>	Saker Falcon	Balochistan, KPK
6	<i>Spilornis cheela</i>	Crested Serpent Eagle	Punjab
7	<i>Circus melanoleucos</i>	Pied Harrier	Punjab
8	<i>Accipiter virgatus</i>	Besra	Punjab
9	<i>Aquila histata</i>	Indian Spotted Eagle	Punjab, KPK

RECOMMENDATIONS

Based on present study, following measures are recommended for the conservation of raptors in Sindh:

1. Urgently implement Vulture Conservation Strategy for Pakistan, 2016 particularly in Tharparkar, Sindh.
2. Regulate Falcon trapping.
3. Promote captive Falcon rearing/ breeding programs.
4. Prohibit the use of Diclofenac Acid, a drug fatal to Vultures and promote the use of Meloxicam as a substitute in veterinary practices.
5. Control overpopulation of Common Kites.
6. As a part of future conservation strategy, long-term regular monitoring of the population of the two vultures species is suggested to record the trends in their populations through the proactive role for conservation by Sindh Wildlife Department and the Zoological Survey of Pakistan in the Vultures Protected Zone in Tharparkar in particular.

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