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Wildlife Diversity in the Punjab (Pakistan)

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Abstract: The results of the study indicated that irrigated forest plantations are rich in wildlife diversity as compared to sub-mountainous tract. Changa Manga Wildlife Sanctuary was highly diversified with 74 wildlife species. In Kundian (WS) 65 species were identified. In Cheechawatni (WS) and Lal Suhanra (NP) 60 and 58 species were observed respectively. Only 35 species were observed in Shorkot (WS). In sub-mountainous tract, 38 species were observed in Kala Chitta Game Reserve, Attock and 33 in Kathar (GR). Variety of insect species were also noted during the study. Forestry operations, grass-cutting, kana stubbing and livestock grazing were major threats to wildlife. Forestry operations with the objective of wildlife management will be helpful for the conservation of diversified fauna.

Key words: Irrigated plantation, sub-mountainous tract, National Park, wild life sanctuary, game reserve

Introduction

Irrigated forest plantations provide a potential habitat for a variety of wildlife species. These plantations have been raised clearing the thorn forest. Though relics of natural vegetation typical of tropical thorn forest co-exist with irrigated plantation in the form of grooves and patches. However, Sheesham *Dalbergia sissoo*, Kikar *Acacia nilotica*, Safeda *Eucalyptus* spp. and Poplar *Populus* spp. are dominant plant species of irrigated plantations. Mesquite *Prosopis glandulosa* has naturally invaded in the plantations giving under-storey vegetation cover. In some plantations mulberry *Morus alba* has been planted with sheesham. Shrubs, herbs and grasses provide the ground-cover, giving plantation a multi-storey cover. These different canopy-strata attract a variety of wildlife species according to their preference for different plant species. In sub-mountainous tract, the habitat is scrub vegetation. Oleaphulai form main canopy cover, with various under growth.

In both types of habitat i.e. irrigated forest plantations and sub-mountainous tract, habitat degradation is a serious problem. Vegetation is exploited as trees are cut to be used as timber and lopped for firewood. Understorey shrubs, herbs and grasses are heavily grazed by livestock, destroying breeding sites of ground nesting birds and sub-terrestrial animal species. Such factors have adversely affected populations of wildlife species.

For the protection of wildlife species, the plantations and potential areas in sub-mountainous tract have been declared wildlife sanctuaries (WS) and Game Reserves (GR) under Punjab Wildlife Act, 1974.

In Pakistan limited work has been carried by some authors, regarding identification of wildlife species. The work is mainly confined to identification of avian species. Chaudhry and Bhatti (1989) and Chaudhry *et al.* (1992), provided a list of avian species of Changa Manga Wildlife Sanctuary. Khan (1987), studied the bird-life of Daphar and Pakhowal Plantation in district Gujrat. Chaudhry and Maan (1997) studied birds diversity in Daphar Wildlife Sanctuary. Chaudhry and Maan (1997), studied bird diversity in Gatwala, Game Reserve, Faisalabad. However, overall diversity of plantations as a whole was not studied. So the present study was designed to determine the diversity of wildlife species in irrigated forest plantations and sub-mountainous tract in May-June, 1999. Mammals, birds, reptiles amphibians and invertebrates including variety of insect species were studied.

Materials and Methods

Diversity of wildlife species was studied by transect method in the following areas.

1. Changa Manga forest plantation (WS)
2. Daphar and Pakhowal Forest Plantation (WS)
3. Kundian Forest Plantation (WS)

4. Lal Suhanra National Park (NP)
5. Bhagat forest plantation (GR)
6. Shorkot forest plantation (WS)
7. Kamalia plantation (WS)
8. Cheechawatni forest plantation (WS)
9. Kathar, District Rawalpindi (GR)
10. Potential areas for wildlife in District Attock i.e., Kala Chitta, Mahora, Kheri Murat and Kali Dauli (GR)

Transects of variable length were studied, recording observations on both sides of the transect. Wildlife species observed physically were noted. Indirect clues for the presence of species were also considered as:

- | | |
|------------------------------|---|
| i. Calls | Partridges and song birds |
| ii. Nests | Vultures, kites and weaver birds |
| iii. Burrows | Rates, mice, porcupine |
| iv. Faecal pellets | Hare, jackal, fox, jungle cat, nilgai, urial, chinkara and hog deer |
| v. Marks on trees and ground | Wild boar, porcupine |
| vi. Foot-prints | Hare, porcupine, nilgai and deers |

For behavioural study of wildlife species binoculars (7x35) were used. For identification Ali and Ripley (1968) and Roberts (1991, 1992) were consulted. Habitat types and threats to wildlife and habitat were identified.

Results and Discussion

The results of the study are given in Table 1.

A. Irrigated Forest Plantation: In Changa Manga plantation endangered mammalian species i.e., Nilgai *Boselaphus tragocamelus*, Hog deer *Axis porcinus* and Spotted deer *A. Axis* survive were observed. Few common peafowl *Pavo cristatus* also survive under wild conditions. In plantation 14 species of mammals, 50 birds, six reptiles, two amphibians and 27 species of insects were noted. With the help of burrow characteristics and faecal pellets, three main species of rodents viz., Indian mole rat *Nesokia indica*, Indian gerbil *Tatera indica* and Field mouse *Mus musculus* were identified. Areas with *Desmostachya* and grasses were affected with *Nesokia* infestation while other two species were common on the embankments of water courses and barren areas. Jackal, mongoose and Jungle cat were among predatory animals. Three hog deer were observed. Droppings of Nilgai indicated that small population of nilgai survive in the plantation. With proper management activities, population of both the endangered ungulate species can be restored. Among birds only residential and summer visitors were recorded. In Daphar plantation, hog deer were released for propagation

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Table 1: Diversity of wildlife species

Habitat	No. of wildlife species				
	Mammals	Birds	Reptiles	Amphibians	Insects
Changa Manga (WS*)	14	50	6	2	27
Attock (GR)	9	25	2	2	19
Kundian (WS)	6	56	1	2	--
Lal Suhanra (NP)***	10	40	6	2	--
Bhagat (GR)	6	30	2	2	19
Shorkot (WS)	6	24	3	2	24
Kamalia (WS)	7	40	1	2	27
Cheechawatni (WS)	7	50	1	2	22
Daphar (WS)	11	35	6	2	28
Kathar (GR)**	4	24	3	2	13

* WS = Wildlife Sanctuary, ** GR = Game Reserve, *** NP = National Park
National Park, Wildlife Sanctuary and Game Reserve indicate protective status of the area

that could not survive. According to watch and ward staff, there was natural mortality in hog deer. Afterwards, due to floods in the vicinity of plantation, few hog deer invaded the plantation and presently four to five hog deer survive in the plantation. The preferred area for hog deer was thoroughly surveyed but no animals could be observed. However, through faecal pellets, the presence of hog deer was confirmed.

A number of 35 species of birds were identified and enlisted. Among mammals, Indian gerbil, field mouse, wild hare, porcupine, jackal, jungle cat, mongoose and wild boar were observed. Among reptiles, prints of snakes (un-identified) seemed to be of Krait were observed at two different points. Common frog and toad were observed along water courses flowing through the plantation. Within invertebrates, insects were common, including butterflies, hoppers, beetles and moths of various types, Kundian (WS) was surveyed thoroughly and observations were based on total area rather than transects. In this area 56 species of birds, six mammals, one reptile and two amphibians were noted. Among birds residential and summer visitors were recorded.

Bhagat plantation, Jackal, Jungle, cat, porcupine, desert hare, Bhandicoot rat, Indian mole rat, soft furred field rat, Indian gerbil and mongoose were common. 30 bird species and 19 insect species were noted. Hives of bees were also frequent. In Shorkot plantation, 24 species of birds, six mammals, three reptiles, two amphibian and 24 insects were noted. In Kamalia plantation, 40 bird species, seven mammals, one reptile, two amphibians and 27 insects were noted. In Chechawatni plantation, 50 species of birds, seven mammals, one reptile, two amphibians and 22 insects were noted. Among these plantations Shorkot (WS) was a degraded habitat. Water logging and salinity were threats to habitat and its diversity

Lal Suhanra (NP): National Park area was surveyed thoroughly. It is an extensive plantation with a lake in the form of a wetland. The lake is an important wintering ground for migratory waterfowl. Area was surveyed in morning and evening sessions. 40 species of birds, 10 mammals, six reptiles and two amphibians were noted. Insects could not be studied due to some logistic reasons.

B. Sub Mountainous Tract: In Kathar, the wildlife habitat was sub-mountainous with scrub vegetation. The reserve area was under drought conditions. The available water points in the reserve area were particularly visited. At one water point a pair of Kaleej pheasant was observed. The water available was shared by local people for washing and bathing. Hence wildlife species were exposed to people for all illegal activities. In the study area a temporary hide was observed to camouflage for hunting. Feathers of one Kaleej (σ) were observed falling victim of a hunter or some predator. Pug-marks of Barking deer were observed at four point, near water points. Hunters and poachers are encouraged under drought conditions to

shoot animals/birds at water points.

Total 24 species of birds were noted along with variety of insects. However, due to drought and low humidity, insect species were very few. Strict watch and ward and public awareness are very important to protect diversity of Reserve area.

In District Attock four potential areas were surveyed. The Results are given collectively in the Table 1 for District Attock.

- i. Area in the vicinity of Wildlife Park
- ii. Mahora area
- iii. Kheri Murat
- iv. Kali Dhali area

There was fire problem in the vicinity of Wildlife Park. Along the Attock-Basal road side transects were surveyed to enlist wild life species. In the study area 12 wild boar were observed. The dominance order in the group was one adult female, four sub-adults and seven young one. High degree of parental care was observed in this species. The group crossed the road and female watched, till all the members of herd crossed below the chain link and female crossed in the last. Per km² density of wildboar was very high, indicating that nearly 200-250 wild boar survive in the area. Total five species of mammals, 15 birds, three reptiles, one amphibian and 8 species of insects were recorded.

In Mahora, there was a very small water point (3'x3' dimensions). In the corner of pond one python along with frogs was observed. Almost drought conditions were prevailing in the study area, so insect species were very few. The area was surveyed for urial but according to reports, the population of urial was very low in the study area. Similarly Kheri Murat was surveyed walking along tracks and along the side of tracks. The area was a potential habitat for partridges. With proper management activities, the area can be developed into a revenue generating area through limited hunting. Birds, mammals, reptiles and amphibian were noted. In Kali Dahli area, 3 species of mammals, 10 birds, 3 reptiles, 2 amphibians and 10 species of insects were recorded.

Irrigated forest plantations and sub-mountainous tract provide potential habitat for wildlife species. Plantations are complete ecosystems with three basic components i.e., producers, consumers and decomposers. Survival of endangered mammalian species Nilgai, Hog deer, Cheetal in Changa Manga and Barking deer in Sub-mountainous tract in few numbers indicate deteriorated natural resource. All these ungulate species are under serious threat of extinction and are enlisted in 3rd schedule of Punjab Wildlife Act, 1974.

Desert hare *Lepus nigricollis* is important game species. Hunting is carried throughout the year. Jackal *Canis aureus*, mongoose *Herpestis auropunctatus* and jungle cat *Felis chaus* are predatory mammalian species. Wildboar *Sus scrofa cristatus*, porcupine *Hystrix indica* and different species of

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Annexure A: Species Observed During Study period

1	2	3	4	5	6	7	8	9	10
Indian tree-pie	+	+	-	+	+	+	+	+	+
White-backed vulture	-	+	-	+	+	+	+	+	+
Common myna	+	+	+	+	+	+	+	+	+
Little green bee-eater	+	-	-	+	+	+	+	+	+
Ring dove	+	+	+	+	+	+	+	+	+
Red turtle dove	+	-	+	+	+	+	+	+	+
Pied bush chat	+	+	+	+	+	+	+	+	+
Rose-ringed parakeet	+	+	+	+	+	+	+	+	+
Fantail flycatcher	+	-	-	+	-	+	-	+	+
Red-wattled lapwing	+	-	+	+	+	+	+	+	+
Reed warbler	+	-	+	+	+	+	+	+	+
Indian robin	+	+	+	+	+	+	-	+	+
Black drongo	+	+	+	+	+	+	+	+	+
Spotted owl	+	+	-	+	+	+	-	+	+
Purple sunbird	+	-	+	+	+	+	-	-	+
Common babbler	+	+	-	+	+	+	+	+	+
Bay back shrike	-	-	-	+	-	-	-	-	-
Indian roller	+	-	+	+	+	+	+	+	+
Black partridge	+	+	+	+	+	+	+	+	+
Grey partridge	+	+	+	+	+	+	+	+	+
Red vented bulbul	+	+	+	+	+	+	+	+	+
Pied myna	-	+	-	+	-	-	-	-	-
Rosy starling	-	-	-	+	-	-	-	-	-
Cuckoo	+	-	+	+	+	+	+	+	+
Koel	+	-	-	+	+	+	+	+	+
Crow pheasant	+	-	+	+	+	+	+	+	+
Golden backed wood pecker	-	-	-	+	+	+	+	+	+
Rhyneck	-	+	-	+	-	-	-	-	-
White breasted kingfisher	+	+	+	+	+	+	+	+	+
Common kingfisher	-	-	-	+	-	-	-	-	-
Pied kingfisher	-	-	-	+	+	-	-	-	-
Paradise flycatcher	+	-	-	+	-	-	-	-	-
Golden oriole	+	-	-	+	+	-	-	+	+
Jungle babbler	+	-	-	+	+	+	+	+	+
House crow	+	+	+	+	+	+	-	+	+
House sparrow	+	+	+	+	+	-	-	+	+
Tree sparrow	-	-	-	-	-	-	-	-	-
Magpie robin	+	-	+	+	+	-	-	+	+
Pied flycatcher	-	-	+	+	-	-	-	-	-
Bank myna	+	-	-	+	+	-	+	+	+
Great reed warbler	+	-	+	+	+	-	-	-	+
Red start	-	-	-	+	+	-	-	+	+
Pond heron	-	-	-	+	-	-	-	+	+
White breasted water hen	-	-	-	+	+	-	-	+	-
Common pariah kite	-	-	-	+	+	-	+	+	+
Black winged kite	-	-	-	+	+	-	-	-	-
Honey buzzard	+	-	-	+	+	-	-	-	-
Hoopoe	+	+	+	+	+	+	+	+	+
Crested lark	-	-	+	+	+	-	-	+	-
Little egret	-	-	-	+	+	-	-	-	-
White winged lark	-	-	-	+	-	-	-	-	-
Grey horn bill	-	-	-	+	-	-	-	-	-
Warblers of different species	-	-	-	+	-	+	-	+	+
Swifts	+	-	-	+	-	-	-	+	+
Rufous back shrike	+	-	+	+	+	+	-	+	+
Streaked weaver bird	+	-	-	+	-	-	-	+	+

Abstract (No. of of bird species)

Changa Manga = 50 Daphar = 35 Kathar = 24 Attock = 25 Kundian = 56
 Lal Suhanra = 40 Bhagat Plantation = 30 Shorkot Plantation = 24 Kamalia Plantation = 40
 Cheekawatni Plantation = 50

rats and mice are pest species. Indian gerbil *Tatera indica*, Indian mole rat *Nesobia indica* and field mouse *Mus musculus* are dominant rodent species in plantations. Anwar (1987), studied burrow density of rats and mice on embankments and non crop areas. According to him, rats and mice are serious pest species, causing loss to agriculture crops and cause floods after weaking embankments. However, these also play

an important role in food chain as primary consumers. Avian species in the plantations and sub-mountainous tract are residential, summer visitors and winter visitors (Roberts, 1991, 1992). During the study period residential and summer visitor bird species were recorded. 49 bird species were local and seven species were summer visitors. In Changa Manga 50 bird species were observed. Chaudhry *et al.* (1992) recorded

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Annexure B: Mammals, Reptiles and Amphibians observed during the study period

1	2	3	4	5	6	7	8	9	10	11
Hog deer	Reported	Barking deer	Urial Chinkara	-	-	-	-	-	-	-
Nilgai	-	-	-	-	-	-	-	-	-	-
Cheetal	-	-	-	-	-	-	-	-	-	-
Jungle cat	+	+	+	+	+	+	+	+	+	+
Jackal	+	+	+	+	+	+	+	+	+	+
Fruit bat	+	-	-	-	-	-	-	-	-	-
Palm squirrel	+	-	-	-	-	-	-	+	+	+
Mongoose	+	-	+	+	+	+	+	+	+	+
Wild hare	+	-	+	+	+	+	+	+	+	+
Wild boar	+	-	+	+	+	+	+	+	+	+
Indian mole rat	-	-	-	-	-	-	-	-	-	-
Indian gerbil	+	-	Bandicoot rat	-	-	-	-	-	-	-
Field mouse	+	-	-	-	-	-	-	-	-	-
Porcupine	+	+	+	+	+	+	+	+	+	+
Reptiles										
Viper	Observed	+	+	-	-	-	+	-	-	-
Varanus	+	+	-	-	-	-	-	-	-	-
Uromastic	+	-	-	-	-	+	+	-	-	-
Lizards	+	+	+	+	+	+	+	+	+	+
Krait	+	-	-	-	-	-	-	-	-	-
Cobra	Reported	-	-	-	-	-	-	-	-	-
Amphibians										
Common frog	+	+	+	+	+	+	-	+	+	+
Common toad	+	+	+	+	+	+	-	+	+	+

Annexure C: Insect species collected during study period

	Butterflies	Hoppers	Months	Beetls	Others
Changa Manga (WS)	10	5	-	7	5
Daphar (WS)	12	10	4	2	-
Kathar (GR)	7	4	2	-	-
Attock	7	4	-	-	8
Kundian (WS)	-	-	-	-	-
Lal Suhanra (NP)	-	-	-	-	-
Bhagat (GR)	6	8	-	5	-
Shorkot (WS)	3	5	2	4	10
Kamalia (WS)	10	10	-	7	-
Cheechawatni (WS)	6	-	5	6	5

81 species in Changa Manga from March-December, 1991. According to them eight species were summer visitors and 10 winter visitors. Khan, (1987) studied in detail birds species in Daphar and Pakhowal wildlife Sanctuaries and in the present study 35 bird species were noted. Difference in number of species can be traced in migration trend of the species. Seasonal variations are important in recording bird species. The residential bird species are oriental in origin. The summer visitors migrate from India and South Africa (Roberts, 1991, 1992). The populations of residential birds such as parakeets, babblers, mynas, shrikes, doves, egrets and tree-pie are not affected by change in season. Similarly reptors are more or less constantly observed. However, migratory bird species are specific for a particular season. However intact study was not carried out by any author to study diversity of any plantation. The problems identified in the present study are very important for the preservation of our wildlife species, for future conservation and sustainable utilization of biodiversity. The study was very important to record wildlife species and for management of wildlife potential areas and sustainable use of biodiversity. Habitat degradation and illegal hunting are the major problems for wildlife species. Strict watch and ward under legal cover of Punjab Wildlife Act, 1974 and participatory management with Forest Department are very important to conserve our bio-diversity.

References

- Ali, S.A. and S.D. Ripley, 1968. Handbook of the Birds of India and Pakistan. Vol. 1. Oxford University Press, Bombay, India.
- Anwar, M., 1987. Burrow density of rats and mice on embankments and non-crop areas. M.Sc. Thesis, Agriculture University, Faisalabad, Punjab, Pakistan.
- Chaudhry, A.A. and M.N. Bhatti, 1989. Wildlife of changa manga wildlife sanctuary. Proc. Pak. Cong. Zool., 9: 31-39.
- Chaudhry A.A., S.A. Malik and G.A. Awan, 1992. A survey of Avian species of changa manga wildlife sanctuary-Pakistan. Proc. Pak. Cong. Zool., 12: 671-681.
- Chaudhry, A.A. and M.A. Maan, 1997. Bio-diversity in Daphar wildlife sanctuary Mandi Baha-Ul-Din Punjab Pakistan. Proceedings of the Abstract Pakistan Zoology Congress, April 4-6, 1997, Karachi, Pakistan.
- Khan, A.A., 1987. The birds life of daphar and pakhowal plantation. Govt. of the Punjab, Lahore.
- Roberts, T.J., 1991. The Birds of Paksitan. Vol. I, Oxford University Press, Oxford.
- Roberts, T.J., 1992. The Birds of Paksitan. Vol. II, Oxford University Press, Oxford.