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Birds, reptiles and mammals of Sorsan grassland, Rajasthan: A faunal survey

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Abstract
Globally biodiversity is on a decline with time. Hence, the regular documentation of biodiversity of any region is the most important asset for long-term survival of species in that region. Grasslands are considered as a highly productive ecosystem. They play a crucial role in providing suitable habitats for fauna and ideal foraging grounds for animals such as birds, reptiles and mammals. Over 50% of grassland habitats have been lost and degraded in the past two decades due to human interventions especially clearing it for agriculture activities. Thus, habitat destruction/degradation is the major threat to species adapted to grasslands. During the present investigation, the presence of birds, mammals, and reptiles was recorded by using direct observation is Sorsan Grassland of Baran district, Rajasthan (India).

Keywords: birds, fauna, habitat, Sorsan, Rajasthan

Introduction
India owns a distinctive identity in biodiversity, not only because of its geography, history and culture but also because of the pronounced diversity of its natural ecosystems. India is the 6th mega-biodiversity region of the world with only 2.4% of the world's land area, accounts for 7-8% of all recorded species, including over 45,000 species of plants and 91,000 species of animals [1]. Thus, it is very important to document the identity and geographical distribution of species it supports. This information is vital in attempts to preserve and use its biodiversity. The major source of such information is inventories of various kinds, which provides basic information for making day to day decisions for management related to maintenance of balance among natural resources. Such information can be utilized by various government agencies, for protected areas and ownership species distribution and natural vegetation to determine gaps in protected area coverage and to propose new area for protection [2]. The quantity of the life is correlated with healthy environment but Indian ecology faces various grand challenges. The habitat destruction is one of the major threats for decline in majority of faunal populations. In spite of extremely high species diversity and high degree of endemism in tropical forests, 16 million hectares of forest is lost annually [3]. The speed of tropical deforestation is unparalleled in evolutionary history [4]. The transformative effects and role of various faunal species play an important role in grassland and there is need to understand the ecological impacts on the surrounding and biota. The present study documents the faunal biodiversity of Sorsan Grassland of Baran District of Rajasthan, a so far undisturbed area with suitable habitat availability for bird, reptile and mammal species.

Study Area
Sorsan grassland is 35 square kilometers patch distributed between Amalsara and Sorsan village of Anta tehsil in Baran district of Rajasthan (Figure 1). After reports of presence of Great Indian Bustard (Godawan), a near-extinct species and the state bird of Rajasthan, state government in 1984 has banned poaching or hunting of animals in sorsan region under wild life act 1972. It is known for ideal habitat for blackbuck and other wild life. It is 50 km east of Kota (25.00 -25.8^0 N, 76.12- 76.18^0 E) having scrubby vegetation and numerous small water bodies, which harbour amazing varieties of birds as well as animals [5]. Sorsan region is very eco-diverse area; it has several structurally and functionally identifiable ecosystems, such as different types of forests, grasslands, pastures, river catchments, ponds and swamps [6].

Materials and Methods
During present investigation the presence of birds, mammals, and reptiles was determined by using direct observation using field binoculars and high resolution camera. A total of 15 sampling stations were established randomly to cover different habitat types at Amalsara, Niyana and Sorsan Village. The location of each site was at intervals of 250 m apart, sufficient enough to avoid double counting the same species at more than one station. Each point was surveyed for 10 to 15 minutes. This was based on the recommendation by Gregory *et al*. (2006) who stated this approach was suitable: (i) for dense habitats, such as forest and shrubs; (ii) to survey cryptic, shy, and skulking species; (iii) for the populations that are of higher density and are more species rich; (iv) for situations where access is restricted; and (v) particularly for bird-habitat studies.

The survey was conducted in Sorsan forests early in the morning (between 6:30 a.m. and 7:00 a.m. depending on weather) and to be completed before 12:00 p.m. The methodology followed was developed by Richardson *et al*. [7] and Yu-Seong *et al*. [8]. A field 10 × 50 binoculars and mobile

based GPS were used throughout the study for observation of the study animal in the field. Photographs of blackbucks were taken using high resolution camera.

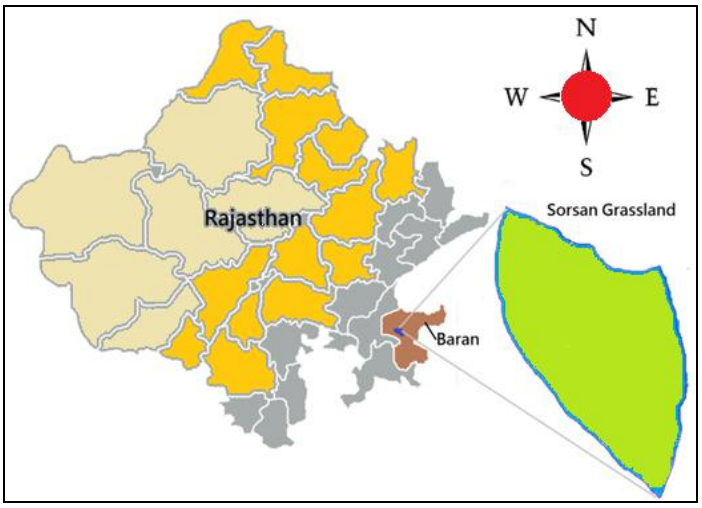

Fig 1: Location map of Sorsan grassland, Baran District, Rajasthan.

Results and Discussion

1. Avian Fauna

There are 9026 species of birds belonging to 78 families of which India have 1340 species [9, 10]. In India about 47 species have been designated as threatened. Population of many bird species, especially in the areas of extreme change of land use pattern, through industrial setup, river valley projects, deforestation for various purpose and other anthropogenic activities, have subjected various habitats to the adversarial impact [11]. These have resulted in decline of population of various species resulting in their local extinctions [12]. Habitat degradation due to accelerating pollution, drainage, weed infestation, siltation and successive droughts has claimed the premature departure of many migratory birds. Sorsan grassland is one of most suitable habits for both resident and migratory birds. During present investigation total 90 different type of avian fauna was identified which belongs to 28 different families. Majority of birds are resident while only 14 are migratory. The list of individual species of all types (resident and migrant species) and in all habitats is shown in Table 1.

Table 1 Avian fauna of Sorsan grassland, Baran, Rajasthan.

S. No.	Common Name	Scientific Name
1	Ashy Prinia	*Prinia socialis*
2	Ashy-crowned Sparrow Lark	*Eremopterix grisea*
3	Asian Koel	*Eudynamys scolopacea*
4	Asian pied starling	*Sturnus contra*
5	Bank Myna	*Acridotheres ginginianus*
6	Barn Owl	*Tyto alba*
7	Baya Weaver	*Ploceus philipinus*
8	Black Drongo	*Dicrurus macrocercus*
9	Black Kite	*Milvus migrans*
10	Black Winged Stilt	*Himantopus himantopus*
11	Black-shouldered Kite	*Elanus caeruleus*
12	Brahminy Starling	*Sturnus pagodarum*
13	Brown Rock-chat	*Ceromela fusca*
14	Cattle Egret	*Bubulcus ibis*
15	Chestnut-bellied Sand grouse	*Pterocles exustus*
16	Chestnut-bellied Sand grouse	*Pterocles exustus*
17	Comb Duck	*Sarkidiornis melanotos*
18	Common Coot	*Fulica atra*
19	Common Greenshank	*Tringa nebularia*
20	Common Hoopoe	*Upupa epops*
21	Common Kestrel	*Falco tinnunculus*
22	Common Moorhen	*Gallinula chloropus*
23	Common Myna	*Acridotheres tristis*
24	Common Pochard	*Aythya ferina*
25	Common Redshank	*Tringa tetanus*

26	Common Redstart	*Phoenicurus phoenicurus*
27	Common Sandpiper	*Actitis hypoleucos*
28	Common Starling	*Sturnus vulgaris*
29	Common Stonechat	*Saxicola torquata*
30	Common Tailorbird	*Orthotomus sutorius*
31	Common Teal	*Anas crecca*
32	Common Wood shrike	*Tephrodornis pondicerianus*
33	Crested Lark	*Galerida cristata*
34	Eurasian Collared Dove	*Streptopelia decaocto*
35	Eurasian Marsh Harrier	*Circus aeruginosus*
36	Eurasian Thick-knee	*Burhinus oedicnemus*
37	Greater Coucal	*Centropus sinensis*
38	Green Bee eater	*Merops orientalis*
39	Grey Francolin	*Francolinus pondicerianus*
40	Grey Heron	*Ardea cinerea*
41	House Crow	*Corvus splendens*
42	House Sparrow	*Passer domesticus*
43	Indian Peafowl	*Pavo cristatus*
44	Indian Pond Heron	*Ardeola grayii*
45	Indian Robin	*Saxicoloides fulicata*
46	Indian Roller	*Coracias benghalensis*
47	Indian Silverbill	*Lonchura malabarica*
48	Jungle Babbler	*Turdoides striatus*
49	Large / Great Egret	*Casmerodius albus*
50	Laughing Dove	*Streptopelia senegalensis*
51	Lesser Pied Kingfisher	*Ceryle rudis*
52	Little Cormorant	*Phalacrocorax niger*
53	Little Egret	*Egretta garzetta*
54	Little Grebe	*Tachybaptus ruficollis*
55	Little Ringed Plover	*Charadrius dubius*
56	Little Stint	*Calidris minuta*
57	Long-tailed shrike	*Lanius schach*
58	Northern Shoveller	*Anas clypeata*
59	Olive-backed Pipit	*Anthus hodgsoni*
60	Oriental Magpie Robin	*Copsychus saularis*
61	Paddy-field Pipit	*Anthus rufulus*
62	Plum-headed Parakeet	*Psittacula cyanocephala*
63	Purple Sunbird	*Nectarinia asiatica*
64	Red wattled Lapwing	*Vanellus indicus*
65	Red-rumped Swallow	*Hirundo daurica*
66	Red-vented Bulbul	*Pycnonotus cafer*
67	River Tern	*Sterna aurantia*
68	Rock Bush Quail	*Perdicula argoondah*
69	Rock Pigeon	*Columba livia*
70	Rose-ringed Parakeet	*Psittacula krameri*
71	Rosy Starling	*Sturnus roseus*
72	Ruddy Shel Duck / Braminy Duck	*Tadorna ferruginea*
73	Rufous Treepie	*Dendrocitta vagabunda*
74	Savanna Nightjar	*Caprimulgus affinis*
75	Shikra	*Accipiter badius*
76	Southern Grey shrike	*Lanius meridionalis*
77	Spot billed Duck	*Anas poecilorhyncha*
78	Spotted Owlet	*Athene brama*
79	Streak throated swallow	*Hirundo fluvicola*
80	White Breasted Kingfisher	*Halcyon smyrnensis*
81	White Wagtail	*Motacilla alba*
82	White-breasted Water hen	*Amaurornis phoenicurus*
83	White-browed Fantail	*Rhipidura aureola*
84	White-browed Wagtail	*Motacilla maderaspatensis*
85	White-eared Bulbul	*Pycnonotus leucotis*
86	Wire-tailed Swallow	*Hirundo smithii*
89	Wire-tailed Swallow	*Hirundo smithii*
90	Zitting Cisticola	*Cisticola juncidis*

2. Herpeto fauna

Herpaeto fauna includes reptiles and amphibians as a group, especially those of a particular region or time period. A lot of diversity along with reptiles, the class reptilian-the Reptiles, more precisely from part of the order squamata which includes the Lizards and amphibian [13]. Among amphibians, the order Anura constitute the vast majority (88%) of living species of amphibians and the bulk of their genetic, physiological, ecological, and morphological diversity, which is represented by a total of 7788 species under 75 families and 462 genera are known from the world [14]. The amphibians are divided in to three orders: Caudata or Urodela (716 species), Gymnophiona or Apoda (207 species) and Anura or Salientia (6865 speceis). The orders of reptiles are the Testudianes, the crocodilian and Rhynchocephalia. Reptiles evolved from amphibians and given rise to the birds and mammals [15]. Group of reptiles can be separated from amphibians by their dry scaly skin and from the Birds absence of furs or hair. Reptiles are more dominant and important group of terrestrial organisms [16] and out of total 10,272 reptilian species, 562 has been reported from India [10]. Reptiles play an important role in the human economy and affect mankind in many ways [17]. However, there is a scarcity of literature as far as reptile fauna of the Sorsan Grassland. The primary sources of information on herpeto-faunal during present investigation come from herpetological surveys conducted in Sorsan Grassland during different months of year. During present investigation total 21 different species of reptiles or amphibians were located in study area (Table 2).

Table 2: Herpeto fauna of Sorsan grassland, Baran, Rajasthan.

S. No.	Common Name	Scientific Name
1.	Bark gecko	*Hemidactylus leschenaultia*
2.	Brahminy worm snake	*Ramphotyphlops braminus*
3.	Bronze skink	*Mabuya macularia*
4.	Brook's House Gecko	*Hemidactylus brooki*
5.	Common cat snake	*Boiga trigonata*
6.	Common Indian skink	*Mabuya carinata*
7.	Common sand boa	*Gongylophis conicus*
8.	Common spotted skink	*Riopa punctata*
9.	Fringe toed lizard	*Acanthodactylus c. Cantoris*
10.	Garden Lizard	*Calotes versicolor*
11.	Glossy bellied racer	*Platyceps ventromaculatus*
12.	House gecko	*Hemidactylus flaviviridis*
13.	Indian Bull Frog	*Hoplobatrachus tigerinus*
14.	Indian monitor lizard	*Varanus bengalensis*
15.	Indian Skipper Frog	*Euphlyctis cyanophlyctis*
16.	Keeled Rock Gecko	*Cyrtodactylus scaber*
17.	Large snake eyed lacerated	*Ophisops microlepis*
18.	Marbled toad	*Duttaphrynus stomaticus*
19.	Red sand boa	*Eryx johnii*
20.	Snake eyed lacerated	*Ophisops jerdoni*
21.	Spectacled cobra	*Naja naja*

3. Mammalian Fauna

Nearly 22 % of the world's mammal species are recognized to be globally threatened or extinct, 63 % are known to not be threatened, and 15 % have insufficient data to determine their threat status [18]. Habitat loss is the greatest threat globally to mammals which is believed to affecting over 2,000 mammal species. The second major threat (mainly in Asia) is utilization/exploitation which is affecting over 900 mammal species. Since 1500, 76 mammal species are considered to have gone Extinct and two are Extinct in the Wild [1].

Mammals have 5,751 documented species, out of which 427 are present in India. Out of 27 major Orders, the three Orders with the most species, namely Rodentia (2,255), Chiroptera (1,150) and Eulipotyphla (450), together comprise over 70% of all mammal species. The other Order like Primates have 414 known species, 49 % are considered threatened. Only four other Orders have a higher percentage of threatened or extinct species: Sirenia (100%), Perissodactyla (81%), Monotremata (60%) and Proboscidea (50%); however, these four orders have far fewer species (IUCN, 2017). Grassland can support high densities of grazing animals, such as blackbuck, chinkara and bluebull [18]. And these herds in turn support iconic predators, including tiger, fox and cheetahs. During present investigation 11 major species of mammals were identified in Sorsan Grassland (Table 3)

Table 3: Mammalian fauna of Sorsan grassland, Baran, Rajasthan.

S. No.	Common Name	Scientific Name
1.	Black buck	*Antilope cervicapra*
2.	Blue Bull	*Boselapbns tragocamales*
3.	Chinkara	*Gazella bennettii*
4.	Common langur	*Presbytis entellus*
5.	Five striped squirrel	*Funambulus pennantii*
6.	Golden jackal	*Canis aureus*
7.	Indian Fox	*Vulpes bengalensis*
8.	Indian gerbil	*Tatera indica*
9.	Indian Grey Wolf	*Canis lupus pallipes*
10.	Jungle Cat	*Felis chaus*
11.	Mole rat	*Heterocephalus glaber*

Conclusion

Evaluating and recording biological diversity intent to develop a strategic framework for predicting the behavior of key variables in order to improve controlling, increase management options and provide an early warning of system modification. Accomplishment of monitoring for biodiversity depends on various factors such as using an appropriate taxon. Various taxa may also provide the information needed to demonstrate relevant changes. Less than fifteen percent of earth's surface is covered by national parks and other conservation areas in total; it is vibrant that these areas alone will not guarantee the survival of species and ecological communities, even in absence of the impacts of ongoing global change. Therefore it is essential that biodiversity rich regions outside protected area be managed in ways that allow protection and conservation of biodiversity as much possible. The Sorsan region has all potential to become bird and blackbuck tourist sanctuary. It has rich faunal diversity of birds, mammals and reptiles which are needed to be protected for long term survival and coexistence with various human activities in this region.

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