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Short Commutation

Avifaunal diversity in varying land use patterns of the semi-arid regions of Ramdurga Taluk, Belagavi District, Karnataka, India

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Abstract

Birds are the key agents for various ecosystem services. Degradation and encroachment of bird's habitat affects their population and diversity. The conservation outside the protected areas have been completely neglected and hence, this leads to the study involving avi-faunal diversity in several places of Ramdurga Taluk based on the availability of natural vegetation, wetlands and agricultural lands by opportunistic counts and line transect method. The study recorded 51 species of birds, belonging to 11 Orders and 31 families, of which 28 bird species belongs to the Order Passeriformes and are common to the region. Chaetornis striata (Bristled grass-warbler) and Ciconia episcopus (White necked stork) are the two vulnerable species identified in the study area. Buteo rufinus (Long legged buzzard), Circus melanoleucos (Pied harrier) and Pavo cristatus (Indian peafowl) belongs to Schedule I of Wildlife (Protection) Act, 1972. Maximum number of birds were recorded in Hirekoppa tank followed by Korekoppa and Itnal. Diversity of avifaunal species recorded in Ramdurga Taluk (51 species) is higher when compared to the bird diversity recorded by the Karnataka Forest Department within Ghataprabha Bird Sanctuary (30 species). Study shows that avifaunal species are largely attracted towards water bodies followed by wetland agro-ecosystems due to the availability of food, water resources, habitat and breeding sites. Degradation of wetland agro-ecosystems and forest lands have to be minimized and natural vegetation patches have to be conserved in order to protect the avifaunal diversity and maintain their population trend. Therefore, steps taken towards the conservation of wetlands, wetland flora and natural vegetation indirectly leads to the conservation of avifaunal population.

Keywords: Avifauna, Vegetation diversity, Wetlands, Agro-ecosystem, Protected areas, Conservation.

Introduction

Birds play a very important role in the food chain, ecosystem services (Pollination and dispersal of seeds) and also act as bio-Indicators of environmental pollution[1]. Aquatic ecosystems or wetlands play a vital role in the life cycle of birds. There are some birds which completely depend on the aquatic ecosystems for their activities throughout their life cycle and the other birds which are dependent on wetlands only for certain needs or they might depend on both wetlands and uplands[2]. Aquatic ecosystems are being threatened by encroachments and other anthropogenic activities leading to the degeneration of flora and fauna[3]. These activities eventually alter the natural vegetation of the region making them unsuitable for the birds to roost and breed[4]. As the trend in destruction of bird habitats increases, the population trend of birds decreases[5]. Thus, the need for conservation of birds is of higher importance.

The protected areas have been established with an objective to protect the species that are not capable of surviving elsewhere i.e., surrounding cultivated lands[6]. Protected areas form a core component of the efforts involved in the conservation of biodiversity[7]. Bird Sanctuaries are protected areas which involve protection of birds by preventing encroachment of natural habitats, improvement of natural vegetation for attracting migratory birds and provide space for roosting and breeding activities. Variation in avian biodiversity is seen when a protected area is compared with surrounding cultivable land use patterns. This is mainly due to diversity of trees[6] with varying canopies and heights and water bodies which maintains the micro-climatic conditions of the region. Micro-climatic conditions and life history traits influences the bird activities and migration[8]. Therefore, land use patterns apart from the protected areas also needs conservation of patches of natural vegetation and water bodies which highly supports bird population.

The present study focuses on the bird species identified in and around Yaragatti village, Ramdurg Taluk of Belagavi District. Ramdurga Taluk of Belagavi District is a region of hot and humid climatic conditions with scanty rainfall ranging from 550-650 mm.[9]. The agricultural lands support a wide variety of birds by providing food, water and habitat. Ghataprabha Bird Sanctuary (29.785 sq.kms) is located in Gokak and Hukkeri Taluks of Belagavi District. It is a renowned bird sanctuary in Northern Karnataka located across Ghataprabha River and comprises of 30 bird species[10]. This sanctuary is a natural habitat with vast collection of plants providing food and shelter

for a variety of bird species. Ghataprabha Bird Sanctuary is nearly 42 km from Yaragatti village of Ramdurga Taluk. In contrast, the villages in and around Yaragatti are mostly agricultural lands with dry-land crops such as wheat, Maize, Groundnut, Sunflower, Sugarcane, Cotton, etc. Several studies shows that birds prefer aquatic ecosystems as habitats in general[11] due to the availability of various resources and migratory birds are attracted towards aquatic ecosystems. Considering the Ghataprabha Sanctuary as an ideal habitat, it is essential to understand the population trend of birds in areas with different land-use patterns. Therefore, the objective of the study is to enlist the bird species sighted in and around Yaragatti village and highlight the importance of aquatic ecosystems in the semi-arid regions of Ramdurga Taluk.

Study Area: The study area involves 8 locations of Ramdurga Taluk namely, Gudgoppa, Hosur, M. Chandaragi, Godachi Reserve Forest, Korekoppa, Sopadla, Itnal and Hirekoppa tank. Out of which Gudgoppa, Hosur, M. Chandaragi, Korekoppa, Sopadla and Itnal are agricultural lands growing mostly dry-land crops and horticulture crops such as Mango, Sapota, Papaya, Gua, etc. whereas, Hirekoppa tank is a water tank filled by Irrigation Department during summer located near Mugalihal village. Godachi Reserve Forest (1648.20 ha) is a Southern Tropical Thorn forest with dry vegetation and rocky boulders. Commonly found tree species in the RF includes *Albizia amara, Anogessius latifolia, Chloroxylon Swetenia, Diospyrous melanoxylon, Pongamia pinnata* and *Eucalyptus sp*.

Methodology

The sampling locations were selected based on the prevailing land use pattern. The study was carried out by using line transect method in the month of March 2017 (summer) in order to recognize the role of water bodies influencing the bird activities. The survey was carried out in the early mornings (6 am to 9 am) and in the late evenings (5.00 pm to 8.00 pm) as the highest bird activities such as feeding, grooming, nesting and breeding are observed during these times. The opportunistic counts of birds were recorded during other times of the day[12]. Survey was carried out by counting the number of bird encounters using binoculars, listening to their calls and by using several field guides, internet data, clips of bird calls, etc[13-16]. IUCN status along with Wildlife (Protection) Act, 1972 Schedules of the identified bird species were also studied for understanding their population trend and focus on their conservation and management strategies.

Results and Discussion

During the study period, 51 species of birds, belonging to 11 Orders and 31 families (Table-1) were identified, of which 28 bird species belongs to the Order Passeriformes. Of these 51 birds, 47 species belongs to Schedule – IV, 3 species (*Buteo rufinus, Circus melanoleucos and Pavo cristatus*) belongs to Schedule – I and *Corvus splendens* belongs to Schedule – V of Wildlife (Protection) Act, 1972. *Chaetornis striata* and *Ciconia episcopus* are the only two Vulnerable species identified at the study area. House sparrow (n=8), Black Drongo (n=7), Bee eater (n=6) and Rose ringed parakeet (n=6) are the commonly found birds in most of the locations. The maximum number of species were recorded from Hirekoppa tank (n=23), followed by Korekoppa (n=19) and Itnal (n=12). The highest number of bird species were observed in Hirekoppa tank (water tank) was due to the presence of water in the tank compared to Korekoppa and Itnal (agricultural lands). Korekoppa and Itnal are considered to be an ideal wetland agro-ecosystem compared to other agricultural lands due to their cropping pattern (Sugarcane, Paddy, Jowar, Maize, Onion, Wheat, etc) and fruit bearing trees (*Ziziphus mauritiana, Tamarindus indica, Simarouba glauca, Mangifera indica*, etc). Korekoppa and Itnal thus provides comfortable shelter and breeding and foraging grounds for birds. Due to less diversity of tree species and monoculture plantation in Godachi Reserve Forest, only six species of birds were identified. Thus, the presence of water in Hirekoppa tank during summer season attracts the birds closer to the water bodies when compared to other villages.

This study thus provides a baseline data of the avian diversity in and around Yaragatti village and highlights the importance of bird habitat and breeding sites outside the boundary of Ghataprabha Bird Sanctuary. Identification of 51 bird species in contrast with 30 bird species of Ghataprabha Bird sanctuary shows that the presence of water bodies and vegetation type highly influences avian activities[4] and agro-ecosystems also provide suitable habitats, food, water and breeding sites. Birds also play a vital role in agro-ecosystems to minimize insect and rodent pests[17] and also helps in pollination. Thus, the study proves that the conservation of aquatic ecosystems and provision of proper food, water, nesting and breeding sites for birds without introducing any anthropogenic pollutants to the environment is sufficient enough for the birds to successfully improve their population trend.

Conclusion

The results highlights the importance of water bodies (wetlands) as an ideal habitat preferred by the birds compared to other land-use patterns such as agricultural lands and forest lands. During summer season large numbers of aquatic-avifaunal species are attracted to the diversified vegetation of wetlands indicating them as congenial habitats for their survival. However, the study also revealed that the agro-ecosystems acts as an ideal habitat to support bird species by providing supplementary food such as larvae, bees, grains, seeds, nectar, fruits, etc; and act as efficient breeding sites. Bird abundance decreases with increased human activities, modification of habitats influenced by agricultural and industrial practices. Thus, the diversity and population trend of birds (frugivores, insectivores, nectarivores, granivores, omnivores, etc) varies from place to place based on the availability of resources and diversity of vegetation in an area.

Table-1: Checklist of Birds recorded in the study area.

Common Name	Scientific Name	Order	Family
Ashy Drongo	*Dicrurus leucophaeus*	Passeriformes	Dicruridae
Ashy Prinia	*Prinia socialis*	Passeriformes	Cisticolidae
Ashy-crowned Sparrow-lark	*Eremopterix griseus*	Passeriformes	Alaudidae
Asian brown flycatcher	*Muscicapa dauurica*	Passeriformes	Muscicapidae
Asian Koel	*Eudynamys scolopacea*	Cuculiformes	Cuculidae
Asian openbill stork	*Anastomus oscitans*	Ciconiiformes	Ciconiidae
Asian paradise flycatcher	*Terpsiphone paradisi*	Passeriformes	Monarchidae
Bengal Bush lark	*Mirafra assamica*	Passeriformes	Alaudidae
Black Drongo	*Dicrurus macrocercus*	Passeriformes	Dicruridae
Black stork	*Ciconia nigra*	Ciconiiformes	Ciconiidae
Blue headed rock thrush	*Monticola cinclorhyncha*	Passeriformes	Muscicapidae
Blue rock pigeon	*Columba livia*	Columbiformes	Columbidae
Bristled grass-warbler	*Chaetornis striata*	Passeriformes	Locustellidae
Brown shrike	*Lanius cristatus*	Passeriformes	Laniidae
Chestnut- headed Bee eater	*Merops leschenaulti*	Coraciiformes	Meropidae
Common crow	*Corvus splendens*	Passeriformes	Corvidae
Common Cuckoo	*Cuculus canorus*	Cuculiformes	Cuculidae
Common Egret	*Ardea alba*	Pelecaniformes	Ardeidae
Common myna	*Acridotheres tristis*	Passeriformes	Sturnidae
Common woodshrike	*Tephrodornis pondicerianus*	Passeriformes	Tephrodornithidae
Eastern skylark	*Alauda gulgula*	Passeriformes	Alaudidae
Eurasian collared dove	*Streptopelia decaocto*	Columbiformes	Columbidae
Forest wagtail	*Dendronanthus indicus*	Passeriformes	Motacillidae
Great Grey Shrike	*Lanius excubitor*	Passeriformes	Laniidae
Great white pelican	*Pelecanus onocrotalus*	Pelecaniformes	Pelecanidae
Greater coucal	*Centropus sinensis*	Cuculiformes	Cuculidae
House sparrow	*Passer domesticus*	Passeriformes	Passeridae

Common Name	Scientific Name	Order	Family
Indian Blue robin	*Larvivora brunnea*	Passeriformes	Muscicapidae
Indian peafowl	*Pavo cristatus*	Galliformes	Phasianidae
Indian roller	*Coracias benghalensis*	Coraciiformes	Coraciidae
Jungle babbler	*Turdoides striata*	Passeriformes	Leiothrichidae
Jungle crow	*Corvus macrorhynchos*	Passeriformes	Corvidae
Large pied wagtail	*Motacilla maderaspatensis*	Passeriformes	Motacillidae
Lesser black backed gull	*Larus fuscus*	Charadriiformes	Laridae
Long legged buzzard	*Buteo rufinus*	Accipitriformes	Accipitridae
Median Egret	*Mesophoyx intermedia*	Pelecaniformes	Ardeidae
Pied bushchat	*Saxicola caprata*	Passeriformes	Muscicapidae
Pied Harrier	*Circus melanoleucos*	Accipitriformes	Accipitridae
Purple rumped Sun bird	*Leptocoma zeylonica*	Passeriformes	Nectariniidae
Red breasted Flycatcher	*Ficedula parva*	Passeriformes	Muscicapidae
Red spurfowl	*Galloperdix spadicea*	Galliformes	Phasianidae
Red wattled lapwing	*Vanellus indicus*	Charadriiformes	Charadriidae
Red whiskered Bulbul	*Pycnonotus jocosus*	Passeriformes	Pycnonotidae
Rose ringed parakeet	*Psittacula krameri*	Psittaciformes	Psittaculidae
Rufous bellied babbler	*Dumetia hyperythra*	Passeriformes	Timaliidae
Small bee-eater	*Merops orientalis*	Coraciiformes	Meropidae
Ultramarine flycatcher	*Ficedula superciliaris*	Passeriformes	Muscicapidae
White breasted Kingfisher	*Alcedo atthis*	Coraciiformes	Alcedinidae
White necked stork	*Ciconia episcopus*	Ciconiiformes	Ciconiidae
White rumped munia	*Lonchura striata*	Passeriformes	Estrildidae
White-bellied Wood pecker	*Dryocopus javensis*	Piciformes	Picidae

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