

SPECIES COMPOSITION OF AVIFAUNA IN NORTHERN PART OF ALAUNGDAW KATHAPA NATIONAL PARK, SAGAING REGION

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Abstract

The study was conducted on the occurrence of bird species in northern part of Alaungdaw Kathapa National Park during the study period from September 2012 to August 2015 with the objectives to identify the avifauna and to examine the species composition and relative abundance of bird species. Sampling sites were stratified based on the vegetation type and fixed radius point count technique was employed. A total of 109 species belonging to 76 genera, 38 families under 13 orders were recorded. The maximum percentage of family composition was observed in Picidae. Black-crested bulbul *Pycnonotus flaviventris* was found as very common species although Great Hornbill *Buceros bicornis*, Oriental-scops Owl *Otus sunia* and Daurian Redstart *Phoenicurus aureus* were recorded as uncommon species. The species composition of bird in dry season was significantly different with other seasons. Globally threatened species such as Great Hornbill *Buceros bicornis* and Red-breasted Parakeet *Psittacula alexandri* as Near-threatened species, and Great Slaty Woodpecker *Mulleripicus pulverulentus* as vulnerable according to IUCN Redlist (2015) were recorded. This result is hoped to provide some data to attract more ecotourism in future.

Keywords: Species composition, Alaungdaw Kathapa National Park, Avifauna, Dry season, Globally threatened species

Introduction

Birds play an important role in forest ecosystem as potential pollinators, seed dispersers and scavengers. They are regarded as a viable indicator for biological biodiversity and changes in environmental conditions (Palei *et al.*, 2012). Many species of birds use different habitats at different time of the year. Many types of ecological habitats are woodland, grassland, cultivated agricultural areas, wetland, open water, sea coast, river bed and

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high mountains (Sibley, 2001). It is necessary to determine the total species richness of a bird community to make informed conservation decisions (Walther and Jean-Louis, 2001). The richness and composition of forest's birds can give an indication for the conservation of biological diversity, and environmental change and the impacts of habitat alternation (Bennun and Dranzoa, 1996).

Threats to birds are varied and complex, but most are linked to human interference in the ecosystem. Habitat destruction includes the deforestation of the world's tropical rainforests, which host a wide variety of birds (Alderton, 2007). For most globally threatened bird species characteristic of forest habitats, habitat loss is the main threat. Many forest birds are intolerant to habitat degradation, collection of fuel, wood and timber (Hicker and Roberts, 1994).

The conservation in Asia and globally also has to face up to the reality of tackling the underlying and indirect causes of biodiversity loss (BirdLife International, 2015). Myanmar may have retained on the highest levels of species richness and most extensive forest cover of any country in mainland South-east Asia due to its political and geographic isolation. While several new protected areas have been declared, much lack of the resources and infrastructure necessary to prevent biodiversity loss from poaching and habitat degradation (Rao *et al.*, 2002).

Son *et al.* (2011) stated that a large number of natural resources for tourism, such as the National Parks, Natural Reserves, and Aquatic/marine Conservation Areas have been put to use for development of tourism, in which bird watching travel included. Development of bird watching helps economic growth and environment conservation (Askari *et al.*, 2014). Moreover, birdwatching is a major component of wildlife tourism, and one of the most rapidly growing tourists to watch birds. The economic, recreational and social significance of bird watching has been recognized elsewhere (Jone and Buckley, 2001). According to the Forest Department, 43 protected areas

were established in Myanmar, including Alaungdaw Kathapa National Park (AKNP) established at 1989. It is also an ASEAN Heritage Park. Several global threatened species were generally inhabited in these areas (Forest Department, 2009). In the present study, petroleum oil productions were observed in the study area. Illegal logging, barely-restricted hunting and destructive agriculture practices have spurred significant wildlife declines and rapid loss of natural habitats. In order to make inventory lists and assess the bird composition in Northern part of the Alaungdaw Kathapa National park, the present studies have conducted during three different seasons. This study provides up to date information about the bird species compositions in the park. The present study aims to identify the avian species and to examine the species composition and relative abundance in different habitats.

Materials and Methods

Study area

Northern part of AKNP in Kani Township is located along the Kalay-Monywa road between 22°26'44.0" to 22°41'10.30" North latitude and 094°29'22.98" to 094°36'36.0" East longitude (Plate 1). Elevation ranges from 171 m to 737 m above the seas level. Different habitats (shrubs, bamboo habitat, indaing habitat and dry mixed deciduous habitat) were assigned. Shrub and bush habitats were predominant with shrubs such as (Bizat) *Eupatorium odoratum*. Bamboo habitats were dominated by Tinwa *Cephalostachyum pergracile* Munro, and Hmyinwa *Dendrocalamus strictus* (Roxb.) Nee., Indaing (Dicterocarp) habitat was characterized by the prevalence of In *Dipterocarpus tuberculatus* Roxb., Ingyin *Shorea siamensis* Wall., and Thitya *S.obtusa* Wall. Mixed deciduous habitat was dominated by Kyune *Tectona grandis*, Pyinkado *Xylla dolabrififormis*, Panga *Terminalla chebula* and Nyaung *Ficus* species.

Study period

The field surveys of this study were conducted from September 2012 to August 2015.

Bird surveys

Bird watching was conducted from 6:00 hrs to 11:30 hrs in the morning and from 15:00 hrs to 18:00 hrs in the afternoon depending on the light condition. Birds were censused using a fixed-radius point count method (Bibby *et al.*, 2000). Visual observation of avifauna was recorded using cameras and binoculars.

Identification of species

Birds were listed according to the classification systems proposed by Clements (2013). Species identification was made followings Smythies (2001), and Robson (2015). The plant species were checked by Kress *et al.* (2003).

Data analysis

Relative abundance=
$$\frac{\text{number of individual of a species}}{\text{Total number of individual of all species in a particular site}}$$

Average relative abundances were categorized as uncommon (uC < 0.01), common (0.01>=C < 0.05), very Common (vC >= 0.05) (Bisht *et al.*, 2004)

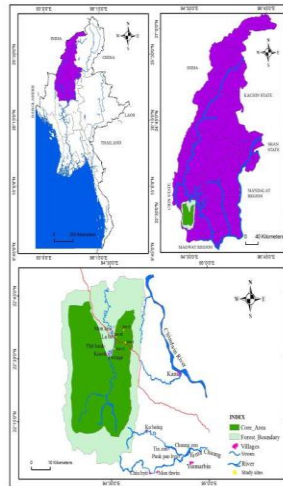


Plate 1 Location map of the study area

(Source: Geography department, Monywa University)

Results

A total of 5248 individuals representing 109 species and 38 families under 13 orders were recorded during September 2012 to August 2015. The maximum percentage of family composition was observed in Picidae. According to index of relative abundance, two very common species, 103 common species and four uncommon species were observed in all habitats. Among the record bird species, Red Jungle Fowl *Gallus gallus*, Black-crested Bulbul *Pycnonotus flaviventris* as very common species, Oriental Scops-owl *Otus sunia*, Great Hornbill *Buceros bicornis*, Common Iora *Aegithina tiphia*, Daurian Redstart *Phoenicurus aureoreus* as uncommon species, and the remaining bird species (103) as common species were observed during the study period (Table 1, Plate 1). The relative abundance scores of bird species observed that 1, 0, 0, 1 were very common; 9, 33, 70, 93 were common; 1, 1, 0, 1 were uncommon at shrub and bush, bamboo, indaing and mixed deciduous habitat, respectively (Table 2). Red Jungle Fowl *Gallus gallus* as

very common species, Daurian Redstart *Phoenicurus aureus* as uncommon species were observed in shrub habitat. In bamboo habitat, Oriental Scops-owl *Otus sunia* was observed uncommon species. Very common species was not observed in that habitat. Black-crested Bulbul *Pycnonotus flaviventris* observed as very common species in mixed deciduous habitat although Great Hornbill *Buceros bicornis* and Common Iora *Aegithina tiphia* were observed as uncommon species.

The highest bird population was recorded in mixed deciduous habitat while the lowest population of the bird species was found in bamboo habitat. Among the different habitats, the number of bird species and individuals were most abundant during the dry season followed by rainy season and cold season (Fig. 1). Great Hornbill *Buceros bicornis* and Red-breasted Parakeet *Psittacula alexandri* were observed as Near-threatened and Great Slaty Woodpecker *Mulleripicus pulverulentus* as vulnerable although all bird species were least concern according to IUCN Redlist. Moreover, mammals such as Phayre's Langur (endangered) and Leopard (vulnerable) were observed in this study area.

Discussion

A total number of 109 species of birds were recorded in northern part of Alungdaw Kathapa National Park indicating rich with avifauna. Among the species recorded, Great Hornbill *Buceros bicornis* and Red-breasted Parakeet *Psittacula alexandri* as Near-threatened and Great Slaty Woodpecker *Mulleripicus pulverulentus*, as vulnerable were observed.

Mikusinski *et al.* (2001) stated that woodpeckers (family Picidae) are indicators of forest naturalness. Woodpeckers (Picidae) are extremely helpful for the health of forest trees to fight against harmful insects (Arslangundogdu, 2010). Many of the sensitive woodpeckers and other birds disappeared with increasing degrees of forest disturbance (Lammertink, 2004). In the present study, the number of species in family Picidae was higher than other families.

Most woodpeckers feed on variety of insects that attack healthy trees in forest. This indicated that AKNP was sustainable forest. Moreover, the presence of a large variety of woodpeckers enjoying the nature of mixed deciduous forest, it is also known as woodpecker land which attracted most bird watchers interested in tropical birds.

Red Junglefowl *Gallus gallus* was most abundant species in shrub and bush habitat. Collias and Collias (1966) stated that this species associated with the occurrences of bamboo, grass shoots, seed and fruits from a variety of small trees and bushes. The birds were preferred area covered with shrubs, bushes, small trees and euphorbias to the small, grassy clearings. In the present study, Red Junglefowl was mostly observed in shrubs and bushes habitat. Buffalo and cattle dungs and elephant dung were observed in this habitat. These dungs may contain seeds, various insects that provide some source of food to Junglefowl. Black-crested Bulbul *Pycnonotus flaviventris* was very common species which found in mixed deciduous habitat during the study period. Fruiting trees such as *Ficus* spp were more observed in mixed deciduous habitat. Black-crested Bulbul is frugi-/insectivorous bird. The population of frugi-/insectivorous bird fluctuated seasonally and associated with fruiting trees (Cueto and de Casenave, 2000). Theoretically, fruit maturation occurs during the dry season (Melo *et al.*, 2003). High number of bird species and individuals were recorded during cold and dry seasons when most flowering and fruiting trees were abundant during fruiting time, they fed mostly on fruits. At the time of scare of fruits, they forage on insects.

Oriental Scops-owl *Otus sunia* was observed in bamboo habitat as uncommon species. This species is a nocturnal bird with activity beginning at dusk. In the present study, this species was roosted during the day singly. Great Hornbill *Buceros bicornis* in deciduous habitat was recorded as uncommon species in hot season. Johnsingh (2005) pointed out that this species feeds on figs and more insects. The great hornbill's diet consist mainly fruits. Figs are

particularly important as a food source. Moreover, this species forage along branches, moving along by hopping, looking for insects. In the present study, this species was observed in indaing tree in April. The breeding season is occurred in January to April. Great hornbill becomes very vocal. This indicated that the male to join the female. They prefer mature forests particularly emergent that rise above the canopy for nesting (Jame and Kanan, 2009). Common Iora *Aegithina tiphia* was observed as uncommon in mixed deciduous habitat in the study area. This species was uncommon in areas where forest but mostly found in scrubs, cultivated areas and garden (Hoyo *et al.*, 2005). In the present study, this species was found in deciduous forest in AKNP and only species that is foraged was recorded. Daurian Redstart *Phoenicurus auroreus* was observed in shrub and bush habitat as uncommon species. This species is a winter visitor. Insects and seeds are more plentiful in shrub and bush habitat. Daurian Redstart feeds on insects, berries and seeds. Insects are its main food especially during breeding season (Robson, 2015).

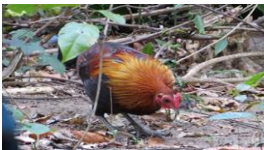
Rajpar and Zakaria (2013) revealed that bird population varied in different habitats depending on vegetation structure and composition, availability of food resources, occurrence of suitable foraging, and nesting. Li *et al.* (2009) revealed that the arthropods were more distributed in the mixed deciduous forest. In the present study, mixed deciduous habitat supported higher bird species and population as compared with other habitats. This is probably due to availability of abundant food sources such as insects, fruits. The distribution of food resources such as arthropods for insectivorous birds within forest changes drastically with the season (Murakami, 2002). Moreover, fruiting trees such as *Ficus lacor* (nyaung gyin) were more observed in this habitat.

Breeding birds may have been more easily detected in April to May in Myanmar (Bezuijen *et al.* 2010) and breeding season of birds in Myanmar is almost occurred in February to April (Smythies, 2001). In the present study, the population of bird species was the highest in dry season. Many species

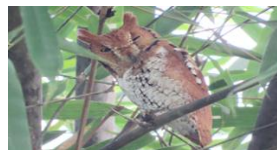
were more detectable in this season because most leaves of trees were shed. Winter visitors (common sandpiper *Actis hypoleucos*, Daurian Redstart *Phoenicurus aureus* and Taiga Flycatcher *Ficeduala albicilla*) and local migrants (such as Shikra *Accipiter badius* and Indian Cuckoo *Cuculus micropterus*) were observed in this season. Thus the highest number of species and individuals were observed in dry season.

Characteristic of forest and habitat loss is the main threat for threatened species. The variety of species and their habitats play an important role in ecosystem function and in many services ecosystems provide (IUCN, 2015). Globally threatened species are more observed in Alaungdaw Kathapa National Park. Among the species observed, Great Hornbill *Buceros bicornis* and Red-breasted Parakeet *Psittacula alexandri* as Near-threatened species and Great Slaty Woodpecker *Mulleripicus pulverulentus* as vulnerable species were observed in the present study.

This result is hoped to provide some data to attract more ecotourism in future. However, there is a need for implementing necessary conservational measures for the stability and sustainability of the living assets. Thus the habitats of Alaungdaw Kathapa National Park should be more managed and conserved to provide rich biodiversity.



Gallus gallus



Otus sunia



Buceros bicornis



Mulleripicus pulverulentus

*Pycnonotus flaviventris**Phoenicurus aureoreus***Plate 1.** Some recorded bird species in the study area**Table 1.** Lists of bird species recorded, and their relative abundance

Order/Family	Scientific name	Habitats			
		SB	B	I	MD
Galliformes					
Phasianidae (0.92%)	<i>Gallus gallus</i>	0.05	0.01	0.02	0.01
Columbiformes					
Columbidae (4.59%)	<i>Streptopelia orientalis</i>	-	-	0.01	0.01
	<i>Streptopelia chinensis</i>	-	-	-	0.01
	<i>Treron curvirostra</i>	-	-	-	0.02
	<i>Treron phoenicopterus</i>	-	-	-	0.02
	<i>Ducula aenea</i>	-	-	-	0.01
Cuculiformes					
Cuculidae (2.75%)	<i>Cuculus micropterus</i>	-	-	0.02	-
	<i>Phaenicophaeus tristis</i>	-	0.01	0.01	0.02
	<i>Centropus sinensis</i>	0.01	-	-	-
Charadriiformes					
Charadriidae (0.92%)	<i>Vanellus indicus</i>	0.01	-	-	0.01
Scolopacidae (0.92%)	<i>Actitis hypoleucos</i>	-	-	-	0.01
Strigiformes					
Strigidae (2.75%)	<i>Otus sunia</i>	-	0.00	-	-
	<i>Athene brama</i>	-	0.01	0.01	0.01
	<i>Glaucidium cuculoides</i>	-	-	0.01	-
Accipitriformes					
Accipitridae (1.83%)	<i>Spilornis cheela</i>	-	-	0.01	0.01
	<i>Accipiter badius</i>	-	-	0.01	0.01
Trogoniformes					
Trogonidae (0.92%)	<i>Harpactes erythrocephalus</i>	-	0.01	0.01	0.01
Bucerotiformes					
Upupidae (0.92%)	<i>Upupa epops</i>	-	-	0.01	-
Bucerotidae (1.83%)	<i>Anthracoceros albirostris</i>	-	-	-	0.03
	<i>Buceros bicornis</i> NT	-	-	-	0.00
Coraciiformes					
Meropidae (2.75%)	<i>Nyctyornis athertoni</i>	-	-	0.02	0.01
	<i>Merops philippinus</i>	-	-	0.01	0.01
	<i>Merops leschenaulti</i>	-	-	0.02	0.01

Order/Family	Scientific name	Habitats			
		SB	B	I	MD
Coraciidae (1.83%)	<i>Coracias benghalensis</i>	0.01	0.02	0.01	0.02
	<i>Eurystomus orientalis</i>	-	-	0.01	0.01
Alcedinidae (0.92%)	<i>Halcyon smyrnensis</i>	-	-	0.01	0.01
Piciformes					
Megalaaimidae (3.67%)	<i>Megalaima lineata</i>	-	-	0.01	0.02
	<i>Megalaima asiatica</i>	-	-	0.02	0.01
	<i>Megalaima australis</i>	-	-	-	0.01
	<i>Megalaima haemacephala</i>	-	-	-	0.01
Picidae (10.09%)	<i>Dendrocopos canicapillus</i>	-	0.01	0.01	0.02
	<i>Dendrocopos analis</i>	-	0.01	0.03	0.04
	<i>Micropternus brachyurus</i>	-	-	0.01	0.02
	<i>Dryocopus javensis</i>	-	-	0.01	0.01
	<i>Chrysophlegma flavinucha</i>	-	0.01	0.01	0.02
	<i>Picus chlorolophus</i>	-	0.01	0.01	0.01
	<i>Picus canus</i>	-	0.01	0.03	0.04
	<i>Dinopium javanense</i>	-	-	0.01	0.02
	<i>Chrysocolaptes lucidus</i>	-	-	0.01	0.01
	<i>Blythipicus pyrrhotis</i>	-	-	-	0.02
	<i>Mulleripicus pulverulentus</i> VU	-	-	0.01	0.02
	Falconiformes				
Falconidae (2.75%)	<i>Microhierax caerulescens</i>	-	-	0.01	0.01
	<i>Falco timunculus</i>	-	-	0.01	0.01
	<i>Falco severus</i>	-	-	0.02	0.03
Psittaciformes					
Psittacidae (2.75%)	<i>Psittacula finschii</i>	-	-	0.01	-
	<i>Psittacula alexandri</i> NT	-	-	0.01	0.01
	<i>Psittacula roseate</i>	-	-	0.01	-
Passeriformes					
Aegithinidae (0.92%)	<i>Aegithina tiphia</i>	-	-	-	0.00
Campephagidae (4.59%)	<i>Tephrodornis gularis</i>	-	-	0.02	0.01
	<i>Coracina macei</i>	-	-	0.02	0.01
	<i>Coracina javensis</i>	-	-	0.01	0.01
	<i>Hemipus picatus</i>	-	0.01	0.01	0.02
	<i>Pericrocotus speciosus</i>	-	-	0.01	0.03
Laniidae (1.83%)	<i>Lanius schach</i>	-	0.01	0.01	0.01
	<i>Lanius tephronotus</i>	-	0.01	0.01	0.01
Oriolidae (3.63%)	<i>Oriolus chinensis</i>	-	-	-	0.03
	<i>Oriolus tenuirostris</i>	-	-	0.01	0.02
	<i>Oriolus xanthornus</i>	-	-	0.01	0.01
	<i>Oriolus traillii</i>	-	-	-	0.01

Order/Family	Scientific name	Habitats			
		SB	B	I	MD
Dicruridae (5.50%)	<i>Dicrurus leucophaeus</i>	-	0.01	0.03	0.03
	<i>Dicrurus annectans</i>	-	-	0.01	0.01
	<i>Dicrurus aeneus</i>	-	-	0.01	0.01
	<i>Dicrurus remifer</i>	-	-	0.02	0.03
	<i>Dicrurus hottentottus</i>	-	-	0.01	0.01
	<i>Dicrurus paradiseus</i>	-	-	0.01	0.03
Monarchidae (0.92%)	<i>Hypothymis azurea</i>	-	0.02	0.01	0.02
Corvidae (1.83%)	<i>Urocissa erythrorhyncha</i>	-	0.01	0.01	0.01
	<i>Dendrocitta vagabunda</i>	-	0.01	0.03	0.02
Paridae (0.92%)	<i>Parus cinereus</i>	-	0.02	0.02	0.02
Cisticolidae (1.83%)	<i>Prinia rufescens</i>	0.01	0.01	-	-
	<i>Prinia inornata</i>	0.01	0.01	-	-
Pycnonotidae (3.67%)	<i>Pycnonotus flaviventris</i>	-	0.01	0.03	0.05
	<i>Pycnonotus cafer</i>	-	-	0.01	0.02
	<i>Iole virescens</i>	-	-	-	0.02
Sylviidae (2.75%)	<i>Orthotomus sutorius</i>	0.01	-	0.01	-
	<i>Phylloscopus claudiae</i>	0.01	0.01	-	0.01
	<i>Abroscopus superciliosus</i>	-	0.02	0.01	-
Timaliidae (2.75%)	<i>Pellorneum ruficeps</i>	-	0.01	-	-
	<i>Garrulax monileger</i>	-	0.03	0.02	0.03
	<i>Garrulax pectoralis</i>	-	0.02	0.02	0.02
Sittidae (1.83%)	<i>Sitta cinnamoventris</i>	-	0.01	0.01	0.01
	<i>Sitta frontalis</i>	-	0.02	0.01	0.02
Sturnidae (0.92%)	<i>Gracula religiosa</i>	-	-	-	0.03
Turdidae (1.83%)	<i>Myophonus caeruleus</i>	-	-	-	0.01
	<i>Turdus boulboul</i>	-	-	0.01	0.01
Muscicapidae (9.17%)	<i>Copsychus saularis</i>	-	0.02	0.01	0.02
	<i>Copsychus malabaricus</i>	-	0.01	0.01	0.01
	<i>Phoenicurus aureus</i>	0.00	-	-	-
	<i>Enicurus immaculatus</i>	-	-	-	0.01
	<i>Saxicola caprata</i>	-	0.01	-	0.01
	<i>Saxicola ferreus</i>	0.01	0.01	-	-
	<i>Monticola gularis</i>	-	-	0.01	0.01
	<i>Monticola solitaries</i>	-	-	-	0.01
	<i>Ficedula albicilla</i>	0.01	-	-	0.01
	<i>Cyornis glaucicomans</i>	-	-	-	0.01
Chloropseidae (1.83%)	<i>Culicicapa ceylonensis</i>	-	-	-	0.01
	<i>Chloropsis cochinchinensis</i>	-	-	-	-
	<i>Chloropsis aurifrons</i>	-	-	-	0.01
Dicaeidae (1.83%)	<i>Dicaeum chrysorrheum</i>	-	-	0.01	0.01

Order/Family	Scientific name	Habitats			
		SB	B	I	MD
Nectariniidae(3.67%)	<i>Dicaeum cruentatum</i>	-	-	-	0.01
	<i>Anthreptes malacensis</i>	-	-	-	0.01
	<i>Cinnyris asiatica</i>	-	-	-	0.01
	<i>Aethopyga christinae</i>	-	-	0.01	0.01
	<i>Aethopyga siparaja</i>	-	-	-	0.01
Passeridae (0.92%)	<i>Passer flaveolus</i>	-	-	0.01	0.01
Motacillidae (2.75%)	<i>Motacilla alba</i>	-	-	-	0.01
	<i>Motacilla cinerea</i>	-	-	-	0.01
	<i>Anthus hodgsoni</i>	-	0.01	0.02	0.01
Total (species)		11	34	70	95
Total (individuals)		524	660	1197	2867
All total species		109			
All total individuals		5248			

SB = Shrub and bush; B = Bamboo; I = Indaing; MD = Mixed deciduous; NT = Near-threatened species, VU = Vulnerable species

Table 2. Number of bird species in different relative abundance scores in different habitats during the study period

Relative abundance scores	Shrub and bush	Bamboo	Indaing	Mixed deciduous
vC	1	-	-	1
C	9	33	70	93
uC	1	1	-	1
Total	11	34	70	95

vC = very common; C = common; uC = uncommon

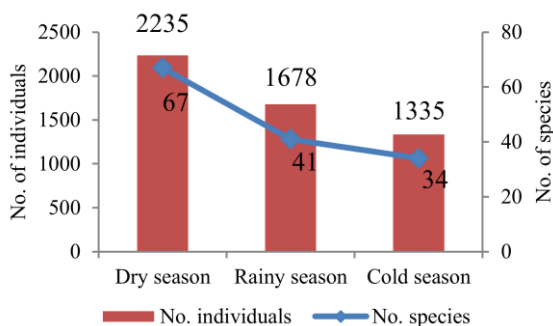


Figure 1. Number of species and individuals of recorded bird species in different seasons

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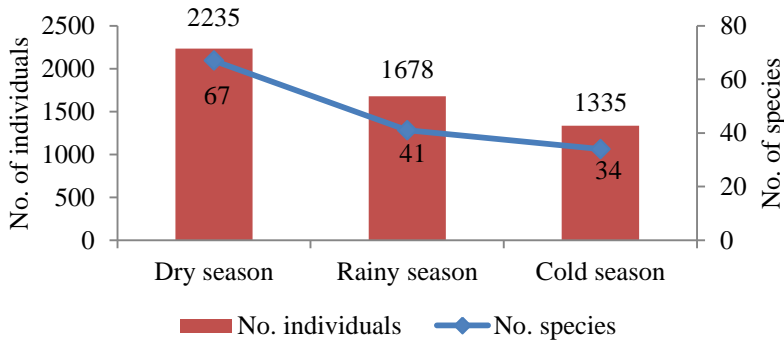


Fig. 1 Number of species and individuals of recorded bird species in different seasons

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